K2 SUMMIT® 3G+

MEDIA SYSTEM AND STORAGE PLATFORM

Topic Library

Version 10.0

2019-09-04

www.grassvalley.com

FCC Compliance

In order to comply with FCC/CFR47: Part 15 regulations, it is necessary to use high-quality triple-screened cable assemblies with integrated ferrite suppression at both ends.

Patent Information

This product may be protected by one or more patents.

For further information, please visit: www.grassvalley.com/patents/

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Contents

Release Notes....11
Version 10.0....11
Not supported in this release....11
Additional notes....12
Considerations for first startup out of box....12
K2 Summit formats, models, licenses, and hardware support....12
Passwords and security on Grass Valley systems....15
Installing and configuring support for Windows 10 clients....17
Embedded Security modes and policies....18
Grass Valley Recommended Deployment and Monitoring Solutions....21
Operation considerations....21
Licensing K2 products....22
Licensable options....22
About K2 system software licensing....24
Requesting a license....25
Adding a license....26
Deleting licenses....27
Archiving licenses....27
Version compatibility....27
Compatible Grass Valley products....27
Compatible K2 Summit components....28
Compatible HP ProCurve GigE switch components....29
Compatible recovery applications....30
Known Problems....30

K2 Summit 3G+ Quick Start Guide....41

K2 Summit 3G+ Production Client....43
K2 Summit 3G+ Production Client Specifications....44

Using K2 AppCenter....50
Product Description....50
About K2 systems....50
About remote operation and monitoring....55
Licensing....56
Getting Started....58
Passwords and security on Grass Valley systems....58
Starting AppCenter....59
Starting AppCenter for the first time with a Control Point PC....59
Starting AppCenter after creating a channel suite....60
Locking AppCenter....61
Shutting down AppCenter....61
About system messages....62
Critical system startup messages....63
AppCenter startup errors....63
Viewing AppCenter system status messages....64
Exporting log files....66
Configuration Manager....67
Storage Utility for standalone K2 Summit system....70
About SiteConfig....70
Using AppCenter....71
About AppCenter....71
Tools in AppCenter....74

Conventions used in the AppCenter interface....74
Terms and concepts used in AppCenter....75
Channels overview....76
Channel applications overview....77
Using remote protocols....78
Recording Clips....80
About recording clips....80
About continuous record mode....80
Guide to using the Recorder/Player application: Control view....82
Guide to using the Recorder/Player application: Cue view....84
Before you record: Recorder settings checklist....85
To record a clip....87
Previewing a clip that is recording....90
Using cue points while recording....90
Changing the timecode source....91
Configuring the free run timecode setting....92
Selecting widescreen mode....92
Changing the current bin....92
Renaming a clip....93
Viewing clip properties....94
Locating a clip....94
Displaying available storage space 95
Playing and editing clips....95
About playing clips....95
Selecting the Player application in AppCenter....96
Guide to using Player: Control view....96
Guide to using Player: Cue view....99
Loading media for playout....101
Playing a clip....102
Scheduling a clip to play....102
Selecting loop play....102
Jumping to a specific timecode....102
Using cue points for playback....103
Editing a clip....105
Creating Subclips....108
Viewing clip properties....111
Viewing clip options....111
Displaying Super Out information on output/monitor....111
Working with playlists....112
Introducing the Playlist application....112
Before using Playlist application....113
Selecting Playlist application....115
Guide to using Playlist application....115
Selecting Text or Thumbnail view....119
Selecting monitor information....119
Creating a simple playlist....119
Inserting media in a playlist....120
Combining events in a playlist....121
Splitting an event in a playlist....121
Playing a list....122
Editing and rearranging events in a playlist....123
Managing sections in a list....125
Adding play effects....126
Adding GPI output triggers to playlists....130
Managing playlists 130
Saving a list as a program 132
Importing a text file as a playlist....133

Managing clip media....134
Managing clip media....134
Guide to using the Clips pane....135
Modifying the asset list view....139
Working with bins....141
Working with assets....143
Working with the Recycled Bin....149
Locating assets....149
Working with asset metadata....153
Viewing asset properties....155
Importing and exporting media....157
Importing and exporting files....157
Importing and exporting streaming media....164
Monitoring media file transfers....166
Using Channel Suites....168
Using channel suites....168
Using channel suites with multiple K2 systems or storage locations....170
Accessing a K2 Summit system from multiple Control Point PCs....170
Sharing channels with other users....170
Channel suites and channel configuration considerations....171
Audio/Video Configuration....172
Using Configuration Manager....172
About video scaling settings....172
About aspect ratio conversion modes....173
Applying AFD settings....173
Configuring video reference standard settings....175
Configuring reference file type on a standalone K2 Summit system system....175
Configuring MXF Export Type on a standalone K2 Summit system system....176
About tri-level sync....176
Configuring record channel video settings....177
Configuring record channel audio settings....179
Configuring play channel video settings....180
Configuring play channel audio settings....182
Adjusting play speed options....183
Configuring data track settings....183
Configuring timecode settings....184
Configuring proxy and live streaming settings....185
GPI and other configurations....187
Using GPI input and output triggers....187
Configuring GPI triggers....188
GPI triggers....188
Configuring FTP Overwrite setting....190
Adding a remote host....191
Setting security access permissions....191
Channel Ganging and Track Mapping....191
Channel Ganging....191
Track Mapping....195
ChannelFlex Suite....203
ChannelFlex Suite and licensing....203
K2 Summit formats, models, licenses, and hardware support....203
Super Slo-Mo....206
Multi-Cam....210
3D/Video + Key....214
4K....216
ChannelFlex Suite supported combinations....219
About introducing ChannelFlex Suite on existing K2 systems....224
Keyboard Shortcuts....225

About keyboard operation....225
Channel select controls....225
Basic transport controls....226
Off-speed play controls....226
Shuttle speed controls....226
Stop-Mode transport controls....227
Mark-Point and Cue controls....227
Miscellaneous controls....228
List controls....228
Playlist controls....228

Configuring the K2 system....230
Product description....230
About K2 systems....230
K2 Summit 3G+ system features....230
K2 Summit formats, models, licenses, and hardware support....232
Features of internal storage models....235
Product identification K2 Summit 3G+....235
Front panel indicators K2 Summit 3G system....236
Rear panel view....236
Considerations for first startup out of box....238
K2 Summit system overview....238
Ports used by K2 services....241
RAID drive numbering K2 Summit 3G system....243
Overview of K2 System Tools....244
Configuration Manager....244
Storage Utility for standalone K2 Summit system....246
Remote Desktop Connection....247
About SiteConfig....247
Grass Valley Recommended Deployment and Monitoring Solutions....249
System connections and configuration....250
About networks....250
Network connections....251
Network configuration....252
Configuring Server 2008 for domain....257
Using FTP for file transfer....258
Using reference files....265
MXF Export Type....266
Quicktime and Final Cut Pro support....268
Connecting RS-422 K2 Summit system 3G+ system....269
Connecting GPI....269
Import/export services....269
Using the HotBin capture service....269
Using the XML Import capture service....275
Using the P2 capture service....278
Using the AS02 capture service....282
Using the Export service....288
Licensing K2 capture service software....291
PitchBlue workflow considerations....292
Pinnacle support....292
Compressed VBI import....296
Managing Stand-alone Storage....298
About the internal storage system....298
About the direct-connect storage system....299
Using Storage Utility....299
Managing stand-alone K2 systems with SiteConfig....315
About managing stand-alone K2 clients with SiteConfig....315
SiteConfig and stand-alone K2 clients checklist....315

System requirements for SiteConfig host PC....316
About installing SiteConfig....317
Installing/upgrading SiteConfig....317
Creating a system description for stand-alone K2 clients....319
Creating the control network for stand-alone K2 clients....320
Creating the FTP/streaming network for stand-alone K2 clients (optional)....322
Adding a group....323
Adding stand-alone K2 clients to the system description....324
Modifying stand-alone K2 client unassigned (unmanaged) interfaces....324
Discovering devices with SiteConfig....326
Assigning discovered devices....327
Modifying stand-alone K2 client managed network interfaces....328
Adding a control point PC placeholder device to the system description....333
Assigning the control point PC....333
Making the host name the same as the device name....334
Pinging devices from the PC that hosts SiteConfig....335
About hosts files and SiteConfig....335
Generating host tables using SiteConfig....335
Configuring deployment groups....336
About deploying software for stand-alone K2 clients....337
Managing K2 system software....337
Installing Control Point software....337
Installing K2 software....338
Pre-installed software....338
Backup and recovery strategies....339
Administering and maintaining the K2 system....339
Licensing....339
Configuring K2 security....339
K2 and GV STRATUS security considerations....347
Understanding virus and security policies....348
About tri-level sync....350
Auto log on....351
Regional settings....351
Checking RAM....351
Proxy/live streaming....352
Proxy and live streaming workflow overview....352
About proxy/live streaming....353
Test proxy media generation....354
Proxy/live streaming technical details....354
DynoZoom, live monitoring, and GV STRATUS streaming....356
Remote control protocols....356
About remote control protocols....356
Special considerations for automation vendors....356
RS-422 protocol control connections....357
Security and protocol control....357
Specifications....358
AC power specification....358
Environmental specifications....358
Mechanical specifications....360
Electrical specifications....360
Operational specifications....364
MIB specifications....402
Connector pinouts....406
K2 Summit system connector pinouts....406
K2 Media Server connector pinouts....410
Rack mounting....411
Rack-mount considerations....411

Rack-mount devices....411
Rack mount hardware shipped with the K2 system....416
Mounting the Rack Slides....416
Installing the K2 system on the rack mount rails....418
Making Rack Slide Adjustments....418

Servicing the K2 Summit system....419
Product description....419
Overview description....419
K2 Summit 3G system orientation....421
FRU functional descriptions....422
System Overview....425
Status indicators....425
System Messages....432
About system messages....432
Critical system startup messages....433
AppCenter startup errors....433
Viewing AppCenter system status messages....434
Exporting log files....437
Service procedures....438
About networking....438
Restoring network configuration....438
Enhance network bandwidth....439
Checking services....441
Checking pre-installed software....443
Making CMOS settings....443
Restoring disk controller configuration....443
Recovering the media database....446
Using recovery images....447
Updating the K2 Plus Carrier Board driver....456
Installing the ATTO Fibre Channel card driver....457
Using diagnostic tools....458
Troubleshooting problems....461
Step 1: Check configurations 461
Step 2: Check connections and external equipment....461
Step 3: Check system status messages....461
Step 4: Identify problems using the startup sequence....461
Shutdown/restart problems....464
Checking external equipment....464
Power connection sequence....465
BIOS startup....465
Windows startup....465
K2 Summit system startup....466
Windows startup problems....467
Thermal problems....467
Codec board problems....467
Power supply problems....468
Video problems....468
Audio problems....469
Timecode problems....469
Operational problems....470
System problems....471
Storage problems....471
Network, transfer, and streaming problems....475
Removing and replacing FRUs....476
Removing and replacing FRUs....476
External Parts Removal....476
Internal Parts Removal....483

Grass Valley Knowledge Base....489

Safety Summary....490

Trademarks and Agreements....502
Trademarks....502
Patent Information....502
JPEG acknowledgment....502

Release Notes

Version 10.0

- **K2 Summit 3G+ Production Client** — The K2 Summit 3G+ Production Client offers higher bandwidth, and an updated OS and software base to enable customers to achieve live workflows with SSM and UHD sources. This latest server provides customers with new upgrades of carrier board, CPU module, midplane, and power supply from the K2 Summit 3G.
- **10Gbps Design in Motherboard** — It allows the K2 Server to fully utilize the 10Gbps in the built-in system without card insertion and provides a tremendous speed upgrade from the K2 Summit 3G.
- **Server Scalability** — The K2 Summit 3G+ allows three servers to be stacked together, offering triple the amount of input and outputs available.
- **TripleCam Support** — 3 Input MultiCam on a single K2 channel is now supported with Avid DNxHD 145. It requires the Triple license and SSD storage. One Triple license enables a single channel. Multiple licenses are required for multiple K2 channel support.
- **Integration with K2 Dyno S3 Replay Controller** — Supports the latest K2 Dyno S3 Replay Controller to expand the capabilities of the K2 Summit/Dyno product combination.
- **Windows 10 Operating System** — Supports Windows 10 Operating System for the K2 Summit 3G+ Production Client.
- **SNFS file system** — Upgrade to SNFS version 6.0 is required in this release.

Not supported in this release

The following devices and functionality are not supported with this version of K2 software. Check with your Grass Valley representative regarding availability.

- First-generation K2 Summit/Solo systems
- K2 Summit 3G systems
- K2 SAN systems
- K2 Central systems
- K2 Summit IP systems
- GV STRATUS Video Production and Content Management System
- AMP protocol
- VDCP protocol
- BVW protocol
- K2 TimeDelay
- K2 InSync
- K2 NASCONNECT

Additional notes

The following sections contain additional information about this release.

Considerations for first startup out of box

When you receive a K2 system from the factory, one or more End User License Agreements (EULAs) appear on the screen at first startup. Software licensing agreements require that you accept these EULAs. When you do so, start up processes can proceed. This behavior occurs only at first startup. Subsequent startups do not exhibit this behavior.

K2 Summit formats, models, licenses, and hardware support

Formats are supported as in the following tables.

Table 1: K2 Summit 3G+ system

Formats	Compression	1x	3x Super Slo-Mo, Multi-Cam*, 3D/Video + Key	6x Super Slo-Mo	4K
SD	DV	Encode/decode	Encode/decode. Requires AppCenterElite licenses. TripleCam also requires the Triple license.	Not supported.	Not supported.
	MPEG-2	Encode/decode	Encode/decode. Requires codec Mezz option card. Requires AppCenterElite license. 3x Super Slo-Mo and TripleCam are not supported.	Not supported.	Not supported.
	AVC/H.264	Decode only. Requires AVC license.	Not supported	Not supported	Not supported.

Formats	Compression	1x	3x Super Slo-Mo, Multi-Cam *, 3D/Video + Key	6x Super Slo-Mo	4K
1080i/720p	DVCPROHD	Encode/decode. HD license is required.	Encode/decode. Requires the HD and AppCenterElite license. TripleCam also requires the Triple license.	Encode/decode. Requires codec Mezz option card. Requires HD, AppCenterElite and 6xSSM licenses. Requires K2 Summit 3G chassis with 2.5” hard drives for one channel or high endurance solid state drives for full features with two channels.	Not supported.
	MPEG-2	Encode/decode. HD license is required.	Encode/decode. Requires Mezz codec option card. Requires HD and AppCenterElite licenses. 3x Super Slo-Mo and TripleCam are not supported.	Not supported.	Not supported.

Formats	Compression	1x	3x Super Slo-Mo, Multi-Cam *, 3D/Video + Key	6x Super Slo-Mo	4K
	AVC-Intra	Encode/decode. Requires HD and AVC licenses.	Encode/decode. Requires HD, AppCenterElite and AVC licenses. TripleCam also requires the Triple license.	Encode/decode. Requires codec option card, plus HD, AppCenterElite, 6xSSM and AVC licenses. Requires K2 Summit 3G chassis with 2.5” hard drives for one channel or high endurance solid state drives for full features with two channels.	Not supported.
	AVCHD/H.264	Decode only. Requires HD and AVC licenses.	Not supported	Not supported	Not supported.
	AVC-LongG	Decode only. Requires HD and AVC licenses.	Not supported	Not supported	Not supported.
	Avid DNxHD	Encode/decode. Requires HD and Avid DNxHD licenses.	Encode/decode. Requires HD, AppCenterElite and Avid DNxHD licenses. TripleCam also requires the Triple license and SSD storage.	Not supported	Not supported.

Formats	Compression	1x	3x Super Slo-Mo, Multi-Cam *, 3D/Video + Key	6x Super Slo-Mo	4K
	Apple ProRes	Encode/decode. HD and Apple ProRes licenses.	Encode/decode. HD and Apple ProRes licenses. Requires a Summit 3G codec board. 2-Input Multi-Cam support only.	Not supported	Not supported
1080p	AVC-Intra Class 100	Encode/decode. Requires codec Mezz option card for multi-head operation. Requires HD, 3G and AVC licenses.	Encode/decode. Requires codec Mezz option card. Requires HD, 3G AppCenterElite and AVC licenses. TripleCam is not supported.	Not supported	Encode/decode. One 4K channel requires two codec channels. Requires codec Mezz option cards and high endurance solid state drives. Requires HD, 3G, 4K, AppCenterElite and AVC licenses.

Passwords and security on Grass Valley systems

To provide a basic level of security, Grass Valley systems recognize three different security levels based on Windows users and groups, and the systems ship from the factory with accounts pre-configured accordingly. To access the system you must log on with the user name and password for one of the pre-configured accounts.

The following table shows the different types of users and their privileges.

	Windows administrator	Grass Valley product administrator	K2 product administrator	Grass Valley product user
User name	Administrator	GVAdmin	K2Admin	GVUser
AppCenter Configuration Manager	Full access	Full access	Full access	Can view

	Windows administrator	Grass Valley product administrator	K2 product administrator	Grass Valley product user
AppCenter	Full access	Full access	Full access	Full access; requires an account on the K2 Summit system
Storage Utility	Full access	Full access	Full access	Can't access
K2Config	Full access	Full access	Full access	Can't access
Server Control Panel	Full access	Full access	Can view	Can view
Windows Operating System	Full access	Full access	Limited access (based on Windows user account privileges).	Limited access (based on Windows user account privileges)

To support legacy FTP and security features, K2 systems also have *movie*, *mxfmovie*, *mpgmovie*, and *video_fs* accounts. Do not use these accounts to log in to the Windows operating system on K2 systems.

Related Topics

Accessing Configuration Manager on page 68

Storage Utility for standalone K2 Summit system on page 70

About credentials in SiteConfig

SiteConfig requires administrative privileges on devices in order to perform most of the network configuration and deployment tasks. For known devices types, SiteConfig has a default administrator account and password. These default credentials depend on the SiteConfig version, so check your SiteConfig Release Notes for any changes. When you add a device based on a known device type, SiteConfig references the default administrator account and password. Then, when you use remote desktop or perform software deployment to the device, SiteConfig automatically uses these credentials. These credentials are called "global" credentials for the device since the same credentials are used on all devices of that type in the system.

You can choose to override the default credentials for a given device type. For example, if you have specified a different administrator account or a different password on the devices when commissioning the system, then you want SiteConfig to use these modified credentials.

It is possible to also override the default credentials for a single device.

Installing and configuring support for Windows 10 clients

With the Windows 10 operating system, additional steps are required for generic iSCSI clients, to support configuration via SiteConfig and K2Config. The system requirement for Microsoft .NET Framework is version 4.6.2. The complete procedure is as follows:

1. On the PC that hosts the SiteConfig application, navigate to the directory at which SiteConfig is installed.

   By default the location is `C:\Program Files (x86)\Grass Valley\SiteConfig`.

2. Copy the contents of the `ConnectivityKit` directory and the `DiscoveryAgent Setup` directory to a USB thumb drive, network drive, or some other shared location to make it easier to distribute to each PC.

3. To install and configure SiteConfig support locally at a control network PC, do the following:
   a) Copy the contents of the `ConnectivityKit` directory and the `DiscoveryAgent Setup` directory to the control network PC.
   b) On the control network PC, check the Microsoft .NET Framework version and compare to system requirements for the software you intend to deploy with SiteConfig.
   c) If necessary, install .NET software and the required Windows update.

      You can find the installation file for a .NET version in the `ConnectivityKit` directory.
   d) On the control network PC, run `\DiscoveryAgent Setup\setup.exe`.

      The install wizard opens.
   e) Work through the install wizard and when prompted to select the device type, select **GenericDevice**.
   f) Finish the install wizard.
   g) Open firewall port settings on the PC as follows.

      445 Protocol: TCP. Used by SDB and XMOS Server and NAS. Used by SiteConfig. File and printer sharing. Used by SMB.

      3389 TCP: Used by Remote Desktop for use by SiteConfig.

      18262 TCP: Used by GV ProductFrame Configuration Service, ProductFrame Discovery Agent Service for use by SiteConfig. Used by GV NetConfig Service. gv-pf. UDP: Used by GV NetConfig Service. gv-pf.

      18263 UDP: Used by ProductFrame Discovery Agent Service for GV NetConfig Device Broadcast/Unicast Protocol. Used by SiteConfig. Sent by ControlPoint, received by Devices

      18264 UDP: Used by ProductFrame Discovery Agent Service for GV NetConfig Controller Protocol. Used by SiteConfig. Sent by Devices, received by ControlPoint

      49168 HTTP/TCP: Used by Grass Valley K2 Config for K2Config application connection between a control point PC and the K2 system device configured. Used for most functions.

      49169 TCP: Used by Grass Valley K2 Config for K2Config application connection between a control point PC and the K2 system device configured. Used for a few functions that require longer time periods.

   h) Restart the control network PC.

Embedded Security modes and policies

The Embedded Security solution protects against viruses and other unauthorized programs on the following Grass Valley systems:

- K2 Summit system system

Embedded Security prevents any unauthorized programs from running on the system. It contains a whitelist of programs that are authorized to run. Whenever a program attempts to run, it is checked against the whitelist. If the program is not on the whitelist, Embedded Security blocks the program

from running. SiteConfig, and any software deployed by SiteConfig, is on the whitelist, so you do not need to manage Embedded Security in any way when using SiteConfig to deploy software. All versions of SiteConfig are compatible with Embedded Security.

When installing software manually (without SiteConfig) it might be necessary to manage Embedded Security. When necessary, you can put Embedded Security in Update mode. This mode allows you to manually install software that is not on the whitelist. Do not confuse Update mode with the idea that Embedded Security is "disabled". When in Update mode, Embedded Security is still active. While in Update mode, Embedded Security keeps track of any software you run or install and adds it to the whitelist. When you are done installing software and any required restarts, you must take Embedded Security out of Update mode so that it can protect the system. For software that requires a restart after installation, such as K2 system software and SNFS media file system software, Embedded Security must remain in Update mode until after the restart is complete.

No system restarts are required for entering or leaving Update mode, and a restart does not change the Update mode status. If in Update mode before a restart, the system remains in Update mode after a restart. You use the Embedded Security Manager to enter and leave Update mode.

The following policies apply to the Embedded Security:

- Use Update mode only as instructed by Grass Valley product documentation or as directed by Grass Valley Support. Do not do any other operations with Embedded Security Manager, unless under the direct supervision of Grass Valley Support.
- Do not keep Embedded Security in Update mode long-term, as Embedded Security does extra processing while in Update mode and eventually problems arise when attempting to run software.
- Make sure that Embedded Security is not in Update mode when using SiteConfig to install software. Update mode interferes with SiteConfig's automatic management of Embedded Security and causes problems running the software installed.
- Leave Embedded Security enabled for normal operation of your Grass Valley system. Do not disable Embedded Security except as instructed by Grass Valley product documentation or as directed by Grass Valley Support. Enabling and disabling Embedded Security requires a restart.
- Do not install any programs or modify any operating system settings unless approved by Grass Valley. By design, Embedded Security prevents any programs from being installed or from running that are not present when you receive the system new from Grass Valley. These Grass Valley systems are not general purpose Windows workstations. The applications and configuration have been specifically optimized on each system for its intended use as part of the Grass Valley system.
- While Embedded Security is the key anti-virus component on these systems, you should still follow the Grass Valley anti-virus scan policy and scan all the devices in your Grass Valley system to ensure viruses are not propagated between machines.

Embedded Security is part of the K2 Summit system generic disk image and the K2 Media Server generic disk image compatible with K2 software version 9.0 or higher. Both K2 Media Servers and GV STRATUS servers use the same generic disk image, so GV STRATUS servers inherit the Embedded Security solution. On K2 Summit systems, the Embedded Security solution introduced with K2 software version 9.0 replaces the write filter from previous versions.

Deploy Embedded Security solution - One-time process

You must have a system system-specific recovery disk image of the computer on which you are doing the Embedded Security one-time process.

NOTE: A re-image of the computer might be necessary if the Embedded Security one-time process is done incorrectly. Follow instructions carefully.

This is a two-phase task:

1. Run a script on the local system to which you are deploying software.
2. Deploy software with SiteConfig.

NOTE: You must carefully read and verify that you have completed each step in the task. Do not assume the task is the same as other software install tasks with which you are familiar.

On the computers in your system that are running the Grass Valley Embedded Security solution, you must do a one-time initial deployment process, as instructed by this task. This task isolates the steps required for the one-time process. If you have sufficient knowledge of systems and upgrades, you can modify your software upgrade steps as necessary to do the one-time process at the same time as your other software upgrades, rather than as isolated steps. After you have done this one-time process, you can do future upgrades using the normal upgrade process.

This applies to the following:

- K2 Summit system system

After doing the one-time process, all of these devices receive the benefit of doing future software upgrades using the normal upgrade process. However, only devices with a full Windows Operating System (not an embedded Operating System) receive the benefit of doing Windows Updates, because Windows updates are not supported on devices with an embedded Operating System. For example, K2 Summit system systems have an embedded Operating System so you should never do a Windows update on these systems, regardless of the one-time process, except as directed by Grass Valley support or specific documented procedures.

1. Determine the status of the Embedded Security solution on the computer. You can use SiteConfig check/view software to make this determination or on the local computer you can use the Programs and Features Control Panel to make this determination. Proceed as follows:
   - If the computer does not have **McAfee Solidifier**, which is a component of the Embedded Security solution, do not continue with these steps. The computer must already have the Embedded Security solution before the one-time process is applied.
   - If the computer has **McAfee Solidifier** at version 6.1.1.369, do not continue with these steps. That version indicates that the computer already has the one-time process applied, through either a software installation or a disk image process.
   - If the computer has **McAfee Solidifier** at a version lower than 6.1.1.369, continue with these steps.
2. Procure the McAfee script from the software download page on the Grass Valley website.

   The filename to download is `McAfee-6.1.1.zip`.
3. Use Embedded Security Manager and put the local computer in Update Mode.
4. Unzip and copy the directory containing the McAfee script files to any location on the local computer.
5. On the local computer, in the directory of McAfee script files that you downloaded from the Grass Valley website, run `UpdateMcAfee.cmd`.
6. Delete the directory of McAfee script files from the local computer.

7. In SiteConfig, do the following:
   a) Add the **GV Embedded Security Manager** role to the device.
   b) Add cab file as necessary to the device's deployment group so that the `GVEmbeddedSecurityManager` cab file is available for deployment.
   c) Do a **Check Software** operation on the device.
   d) Deploy software to the device.
8. Use Embedded Security Manager and leave the Update Mode.

   Embedded Security Manager now reports **Enabled**.
9. Restart the system.
10. Do Windows updates on the local computer if it has a full Windows Operating System. Do not do Windows updates on a system with an embedded Operating System.

    You can now install Windows updates KB2859537 and KB2872339, which were previously not allowed, on Grass Valley systems with a full Windows Operating System.

    NOTE: Do not do Windows Updates on* K2 Summit system *systems.

- For future Windows updates, it is no longer necessary to exclude KB2859537 and KB2872339.
- For future deployment of K2 and GV STRATUS software using SiteConfig, it is no longer necessary to put Embedded Security in Update Mode.

  NOTE: If not using SiteConfig, it can still be necessary to put Embedded Security in Update Mode. Refer to your product's software install/upgrade instructions.

Grass Valley Recommended Deployment and Monitoring Solutions

To maximize up-time, a maintenance strategy must provide the ability to easily identify the root cause of an unanticipated hardware or software failure and to quickly compile failure data. The ability to proactively predict failures and to quickly notify those who can rectify them makes the maintenance strategy even more powerful. Grass Valley has a long history of building the necessary functionality into critical broadcast products. With Grass Valley's next generation tool, GV GUARDIAN, remote monitoring and proactive predictive failure analysis are important contributors to Grass Valley system solutions. GV GUARDIAN runs on commercial off-the-shelf server PCs, such as the K2 system control point PC, and is also available as an all-in-one turnkey product. Grass Valley and 3rd party devices report status via Window Messaging, Simple Network Management Protocol (SNMP), or syslog to GV GUARDIAN. The tool provides easy to use, fully autonomous remote monitoring to predict errors, provide proactive notifications, and centrally consolidate error logs and hardware failure information. With GV GUARDIAN you can maximize your up-time with less manpower, as compared to manual system monitoring. Watching for indicator lights, physically scanning logs, and other manual monitoring is far more time consuming, more error-prone, and much less accurate. Grass Valley recommends using GV GUARDIAN as your remote monitoring tool.

Operation considerations

- 6xSSM with Audio requires that a larger RTIO number be entered into SNFS.

- Do not neglect to make a “first birthday” image of each K2 product shortly after installation and configuration is complete.
- Changing system timing requires a restart. This takes effect immediately as soon as the new video standard (NTSC/PAL) is selected. Save all your configuration changes prior to changing the system timing.
- To import/export between systems using AppCenter, in Configuration Manager on the Remote tab, add each system that you want to have available as a source or a destination.
- When transferring between K2 systems and other types of systems, you must specify the IP address, path, and file name to initiate a transfer.
- Constrain media names and filepaths for support across systems. While AppCenter allows you to create bin names and clip names longer than 32 characters, names of this length are not supported on all products.
- Before configuring a channel, eject all clips from the channel. This is required to put changes into effect.
- K2 Summit system systems and K2 Media Servers can operate continuously for a long period of time. A restart at least once every six months is the recommended operational practice. A restart once every year is required.
- Mix effects (an AppCenter Pro feature) are not supported between different compression formats.
- A 3D/Video+Key player channel does not support agile playback or transition (mix) effects.
- A 3D/Video+Key player channel does not support a two-head player model.
- A 3D/Video+Key player channel does not support offspeed play greater than 1 or less than -1. During these offspeed play operations the video is not synchronized between the two video tracks. However, both video outputs will resync when recued.
- Grass Valley recommends that you use a frame synchronizer on incoming video sources that are recorded in AVC-Intra format.
- A best practice is to check the K2 Summit log weekly to monitor the database size. Every 15 minutes the K2 Summit system reports a "Completed database backup..." message that includes the database size. If the size exceeds 80 MB, reduce the number of markers and/or the amount of metadata in clips.
- It is not recommended to use 720p tri-level sync for interlace output formats (such as SD and 1080i). Output timing can be off by a field.
- In the AppCenter Import dialog box there can be a long wait time while network devices are discovered. A message opens asking if you want to continue waiting. If you continue waiting, eventually network devices are discovered and AppCenter continues operating.

Licensing K2 products

The following sections contain instructions for managing K2 product licenses.

Licensable options

Optional applications, bundles of advanced features, and enhanced functionality are available as licensable options for K2 products.

AppCenter licenses are as follows:

	AppCenter Standard	AppCenter Pro	AppCenter Elite
Record	X	X	X

	AppCenter Standard	AppCenter Pro	AppCenter Elite
Continuous Record	X	X	X
Play	X	X	X
Sub-Clipping	X	X	X
Playlists	X	X	X
"Live" Mode (Chase Play)	X	X	X
Video Monitor in Control View	X	X	X
VM Multi-view	X	X	X
Playlist Import		X	X
Channel Ganging		X	X
Audio Track insert		X	X
CC Track insert		X	X
Audio Track assignments		X	X
Scheduled Record per channel (not playlist)		X	X
Scheduled Playback per channel (not playlist)		X	X
Super out on SDI 2 output		X	X
Playlist with M/E Transitions		X	X
Flying M/E Transitions		X	X
Proxy encoding - 4 Channels		X	X
Key+ Fill import (QT32)		X	X
Channel Flex Suite			X
- Multi-Cam (2-input)			X
- 4K			X
- Video + Key			X
- 3D - Left + Right Eye			X
- Super Slo-Mo 2x			X
- Super Slo-Mo 3x			X
- Super Slo-Mo 6x			X
Proxy encoding - 8 Channels			X

Other options and applications include the following:

- HD option
- AVC option (K2 Summit system 3G)
- Avid DNxHD option (K2 Summit system 3G)
- 3G option (K2 Summit system 3G)
- 3G 1080p option (K2 Summit 3G)
- 4K option (K2 Summit 3G)
- 3-input Multi-Cam channel (K2 Summit system 3G)
- 3x 1080p Super Slo-Mo option (K2 Summit 3G)
- 6x Super Slo-Mo option (K2 Summit 3G)
- H.264 playout option (K2 Summit system 3G)
- K2 XML Import capture service
- HotBin Export capture service
- P2 Import capture service
- K2 ShareFlex

As development continues, new options become available. Contact your Grass Valley representative to learn more about current options.

About K2 system software licensing

K2 system software requires a license from Grass Valley. Licensing is enforced at the K2 Summit Production Client, so every K2 client must have a valid license in place. No software version license is required on the control point PC. The K2 Media Server can be licensed for K2 SAN bandwidth, but no K2 system software version license is required on the K2 Media Server.

K2 clients shipping new from the factory are pre-installed with a permanent license in place, so no licensing tasks are required unless you want to add optional features such as AppCenter Pro/Elite.

Licenses are requested through email and managed through the SabreTooth License Manager, which is installed on the Grass Valley product with the Grass Valley software. The SabreTooth License Manager must be located on the Grass Valley product.

License information is stored in XML files that you can manage just like any other file on your system. Node-locked licenses are unique to the system for which they are requested and cannot be used on any other machine. A floating license can be used on multiple machines, one at a time. You should back up the license text files to a separate drive or as part of a recovery image.

Licenses are based on your system's unique identifier, which is partially derived from your system's Media Access Control (MAC) address. If you change your system's MAC address by performing operations such as changing the System Processor card, you must obtain a new license based on the new MAC address.

After temporary licenses expire

After the temporary license expires, if you have not yet obtained a permanent license, the following occurs:

- The K2 system software temporary license will expire. You will not be able to start AppCenter once the license has expired. If running, AppCenter will not stop working, and any remote control protocols will continue to function. However, you will not be able to make any changes in AppCenter, such as altering the configuration.
- The AppCenter Pro temporary license will expire and the AppCenter Pro features will stop functioning.

Requesting a license

This topic applies to Grass Valley SabreTooth licenses. For the system you are licensing, you must provide a generated unique ID to Grass Valley. Grass Valley uses the ID to create your unique license.

1. Log on to the device that you want to license.

   You must log in as a Windows administrator with a local account, not a domain account.

2. Open the License Request Wizard.

   Find the License Request shortcut on the Windows desktop or in the `Grass Valley License Requests` folder.

   The License Request Wizard displays.

3. Read the on-screen instructions, then click **Next**.

   The Customer dialog box displays.

4. Enter the information requested on this page then click **Next**.

   You must provide a valid email address to receive your license file.

   The Sales Number dialog box displays.

5. Enter the Sales Order Number in the field then click **Next**.

   Typically the Sales Order Number is found on the Software License sheet that you received from Grass Valley.

   The Summary dialog box displays.

6. Review the License Request information and click **Finish**.

   A License Request text file, `License_Request_<SalesNumber>.txt`, is generated and saved to the Windows Desktop.

   NOTE: If you are requesting licenses for more than one application, be sure to modify the name of the first License Request text file before saving it to your desktop. (In Notepad, use the Save As command.) Otherwise, the second License Request text file will overwrite it.

7. Do one of the following:
   - Attach the License Request text file to an email.
   - Paste the text directly into an email message.

   You might want to keep a copy of the message for your records.
8. Send the email as instructed by the License Request Wizard.

   An email will be sent from Grass Valley to the return email address you specified; your SabreTooth software license will be provided as a text file.
9. Save this email in case you ever need to re-image this machine.

Next add the license to the SabreTooth License Manager.

If you encounter difficulties when requesting a license

If you encounter difficulties running the License wizard, or the License wizard is not available, try this alternate method:

1. Generate a unique ID of the device where you will install software, as follows:
   a) Double click on the License Manager icon on the Windows Desktop.

      The SabreTooth License Manager opens.
   b) Choose **File | Generate Unique Id** the License Manager.
   c) Click **Copy to clipboard** to copy the generated ID, and **OK** to exit.
2. Prepare an email that includes the following information:
   - Customer Name
   - Customer Email
   - Sales Order Number
   - Unique ID of the device where you will install software.
   - The license types you are requesting.
3. Send the email to GrassValleyLicensing@grassvalley.com.

The SabreTooth license number will be emailed to the email address you specified.

Adding a license

Your software license, `Licenses_<SalesNumber>.txt`, is provided as a text file. Use the License Manager to add this file to your system and enable the desired feature.

1. Double click on the License Manager icon on the Windows Desktop.

   The SabreTooth License Manager opens.
2. Do one of the following:
   - Choose **File | Import License** and navigate to the file location to open the text file.
   - Drag and drop the text file onto the License Manager.

   You will now see the permanent license in SabreTooth, as well as any other licenses, permanent or temporary, that have been installed on this machine.

You should archive the permanent license to a backup system.

Deleting licenses

Deleting a license disables the feature that it enabled. You might want to delete a temporary license prior to its expiry if you have decided not to purchase the feature. You can delete a temporary license after the permanent license has been installed without disabling the licensed product.

1. Select the license in the SabreTooth License Manager.
2. Use the Delete key on your keyboard or right click with your mouse and select **Delete**.

Archiving licenses

You can archive your licenses to a secure external location. This allows you to quickly re-install a license should it be deleted or should you have to downgrade and then re-license the software. You can archive multiple licenses at the same time.

NOTE: If you downgrade to an earlier version of the licensed software, make sure to archive the licenses first.

1. In the SabreTooth License Manager, select the license or licenses.
2. Choose **File | Export License** to open the Save As dialog box.
3. Assign a meaningful name to the file, and save it to the desired location. Grass Valley recommends saving the license file to a USB drive or other external location.

Version compatibility

Versions qualified for compatibility with this version release of K2 software are summarized in the following sections.

Compatible Grass Valley products

Grass Valley products are compatible with this version release of K2 software as follows:

Product	Version	Comments
K2 Dyno S3 Replay Controller	4.0	Check the "Release Notes" section of the K2 Dyno Topic Library for compatible disk image version.
K2 Dyno PA	2.0.2.1870	—
GV Guardian	2.0	—
SiteConfig application	2.1.1.643 or higher	—
Grass Valley LDK8300 Super Slo-Mo HD Camera	—	3x and 2x frame rates supported. Requires AppCenter Elite license.

Product	Version	Comments
Grass Valley LDX 86 Universe System Camera	—	3x and 6x frame rates supported. 4K supported. Requires AppCenter Elite license.
Grass Valley LDK8000 SportElite HD Super Slo-Mo Camera	—	2x frame rate. Requires AppCenter Elite license.
Sony 3300 Super Slo-Mo Camera	—	3x frame rate only; 2x is not supported. Requires AppCenter Elite license.
Kayenne/Karrera	—	Check with your Grass Valley representative for version availability.

Compatible K2 Summit components

The following components are part of K2 Summit 3G+ Production Server. Components are compatible with this release of K2 software as listed in the following table. Compatible versions are pre-installed on the K2 system when you receive it new from Grass Valley. For microcode and firmware filenames, refer to tables later in this section.

Table 2: Component versions

Component	Version	Comments
GrassValley K2 Client software	10.0	Includes AppCenter
Media File System (SNFS)	6.0.0.72562	—
SiteConfig Discovery Agent	2.1.1.202	A minimum version of 1.0.8 is required to support device discovery. Then when you deploy software to the device, the SiteConfig application prompts you to upgrade to the correct version of the Discovery Agent on the device.
Windows Operating System	Windows 10 Enterprise 2016 LTSB (version 1607)	K2 Summit 3G+ Production Client only
QuickTime	7.76.80.95	—
Intel Network Connections	22.6.6.0	—
GV Embedded Security Manager	1.0.0.20	—
McAfee Solidifier	8.0.0.651	—
MegaRAID Storage Manager	17.05.00.02	—

Component	Version	Comments
LSI MegaRaid SAS 2208 ROMB (AIC chipset) controller driver	6.714.5.0	—
Disk image	20171019-K2Plus-Win10	—

Table 3: K2 Summit 3G+Production Client internal storage RAID controller microcode file names

Version	Microcode file
3.460.165-8277	AIC_2208_LSI_FW_3.460.165-8277.rom
Find files at *C:\profile\microcode\Internal Storage\Controller\Summit*	

Table 4: K2 Summit 3G+ Production Client internal storage drive firmware file names

Drive type	Drive size	Storage Utility Identifier	Version	Firmware file
Cloud Speed Ultra II	400GB	SDLF1DAM-400G-1H / 0TS1819	ZR11	Sandisk_400GB_ZR11RE41.ddb
Cloud Speed Ultra II	800GB	SDLF1DAM-800G-1H / 0TS1820	ZR11	Sandisk_800GB_ZR11RE91.ddb
Cloud Speed Ultra II	960GB	SDLF1DAR-960G-1H / 0TS1792	ZR11	Sandisk_960GB_ZR11RP91.ddb
Cloud Speed Ultra II	1600GB	SDLF1CRM-016T-1H / 0TS1821	ZR11	Sandisk_1600GB_ZR11REA1.ddb
Find files at: `C:\profile\microcode\Internal Storage\Drive\Sandisk`				

Compatible HP ProCurve GigE switch components

Components that reside on the HP ProCurve 3400cl series GigE switch and the HP ProCurve 29xx series GigE switch are compatible with this release of K2 software as follows:

Product	Version	Comments
HP ProCurve 2920 series firmware	WB.15.13 or higher	Check with the manufacturer for firmware updates.
HP ProCurve 2910al series firmware	W.15.08.0012	-
HP ProCurve 2900 series firmware	T.11.12	This older version is no longer recommended.
	T.13.23	Upgrade to this version is required. After upgrade, configure QOS settings.

Product	Version	Comments
HP ProCurve 3400cl series firmware	M.08.66	This older version is still compatible
	M.08.86	Upgrade to this version is recommended

Related Topics

Verify/upgrade switch firmware

Compatible recovery applications

To create a recovery image of a K2 device, use compatible versions of the recovery application, as follows:

Product	Recovery application and version	Comments
K2 Summit 3G+ Production Client	Recovery Flash Drive	Use the Recovery Flash Drive that you received with the product. It is identified with the product's serial number and is to be used on that specific K2 Summit 3G+ Production Client only.

Known Problems

The following limitations are present in this release of software. If you wish to obtain more information about these limitations, please mention the reference numbers.

K2 Summit

KT-9014	Description:	Sub bins are not in-synced as K2 InSync enforces bin level limit according to the selected Synchronization Mode.
	Workaround:	Select **Event** synchronization mode to enable synchronization up to 9 levels of sub bins. If **Manual, Periodic, or Timed** synchronization mode is selected, K2 Insync only synchronizes base folder as specified in the configuration and does not create sub bins in the Slave path to match the Master path hierarchy.
KT-9414	Description:	SMB-Multichannel feature in Windows Server 2012 and Windows 10 clients caused SMB traffic to flow over both Control and FTP network paths.
	Workaround:	Disable the feature by entering the following command in the Windows Powershell: `Set-SmbClientConfiguration -EnableMultiChannel $false`

KT-9672	Description:	Audio mapping mute does not take immediate effect on loaded clips or playlists. When the audio mapping mute setting is changed on a clip or playlist that is already loaded it takes about a second of play to take effect.
	Workaround:	After making an audio mapping mute change eject and reload the clip or playlist.
KT-9728	Description:	Audio mapping changes do not take immediate effect on loaded clips or playlists.
	Workaround:	Exit the affected clip(s) and then reload.
KT-9766	Description:	When cueing between events in a Playlist with highlights from local and remote devices response may be slow.
	Workaround:	None.
KT-10041	Description:	K2 Summit 3G+ with Windows 10 system logged in as GVAdmin cannot create new user via normal method of **Settings | Other People | Add another user to this PC**.
	Workaround:	GVAdmin user can add another user to the PC by launching the plugin "lusrmgr.msc" from a command tool window, or via the Start-->run operation.
KT-10120 and KT-10240	Description:	K2 Summit 3G+ does not work with tri-level sync.
	Workaround:	Use black burst sync for genlock. An alternate work-around is to update the K2PlusCB driver on the system by following the *Updating the K2 Plus Carrier Board driver* on page 456 procedure.
KT-10257	Description:	1. K2 Summit 3G+ fails to boot with USB Recovery Flash Drive connected to front panel USB connector. 2. K2 Summit 3G+ front panel USB connector data rates are less than rear panel USB connector data rates.
	Workaround:	1. Boot the K2 Summit 3G+ system with the USB Recovery Flash Drive connected to one of the rear panel USB connectors. 2. Use rear panel USB connector for faster data rates.

Recommended maintenance schedule for K2 products

As with any tool regular maintenance and attention to the K2 clients and servers will help prevent problems and detect issues before they interfere with operations. Be sure to check the operation of K2 clients and servers on a regular basis. Products such as NetCentral and GV Guardian are key components to keep systems running well and alerting when problems arise.

NOTE: Those with the "1 year+" notation have run under normal operation well beyond 1 year in service. We still recommend a preemptive reboot on a regular schedule when such maintenance is planned. This helps ensure the system does not go down for preventable situations when it is not planned.

Grass Valley recommends a regular reboot for clients and servers to avoid situations that will unexpectedly take down a system. Here is the recommended schedule:

K2 Clients (3.3 and earlier software)	6 months
K2 Servers (3.3 and earlier software)	1 year
K2 Summit (7.3 and earlier software)	6 months
K2 Summit (7.4 to 8.1 software)	1 year
K2 Server (Windows Server 2003)	1 year
K2 Summit/Summit3G (9.0 and later software)	1 year+
K2 Server (Windows Server 2008 R2)	1 year+
K2 Server (Windows Server 2012 R2)	1 year+

Known Issues in Previous Releases

K2 Summit

KT-9692	Description:	Importing or exporting clips with ‘@’ in the name triggers error messages.
	Workaround:	Rename the clip so that it does not include ‘@’ in the name before transferring the clip into or out of the K2 Summit system.
KT-9682	Description:	Add track window malfunction with clip in bin with sub-bins. When you add a track to a clip that has one or more sub-bins, the add track window displays no content.
	Workaround:	Move clip to bin without sub-bins and then add tracks to the clip.
KT-9080	Description:	Upgrading with 9.7.0.x installer results in a failed upgrade.
	Workaround:	1. Use SiteConfig to upgrade K2 Summit software for the 9.7.0.2427 build and later. This is the only supported K2 Summit upgrade process for STRATUS sites. This process forces an uninstall then install type of operation with a K2 Summit system, requiring two reboots, one after the uninstall and one after the install. 2. If a "manual" installation process is taking place for a non-STRATUS system without using SiteConfig, etc. then manually perform an uninstall of existing K2 Summit software before installing K2 Summit software for the 9.7.0.2427 build and later.
KT-9078	Description	STRATUS K2 Configuration Service fails to start - install .NET 4.6
	Workaround:	None.
KT-9057	Description:	File transfers fail during failover.

	Workaround:	File transfers are not supported during failover. This is due to the fact that file transfers require building a list of transfers, in memory, and when failover occurs, that memory becomes unavailable (e.g., FSM power down during failover) so there's no way to continue or complete file transfers.
KT-9025	Description:	Error messages when gang recording clips with only one video track.
	Workaround:	When gang recording clips with only one video track (“Record video from all channels to same clip” is unchecked), when the recording is first started, error messages of the form “could not find track #1 of type 11 in movie 'V:/default/Clip_15'” can be observed in the K2 Summit log. These error messages occur only as a single set of events when recording is started. These error messages are benign and can be disregarded. A work-around is to leave “Record video from all channels to same clip” checked.
KT-8727	Description:	4K Monitoring Output available only via SDI connector
	Workaround:	With the 9.7 release, 4K Quadrant Division Recorder and 4K Quadrant Division Player modes of operation are now supported via SMPTE 2022-6 and the 10GigE connectors. The 4K Monitor Output feature described in the topic library is only supported via the SDI IN3 connector, it is not available via SMPTE 2022-6 and the 10GigE connectors.
KT-9363	Description:	Error messages with continuous record mode when used with DNxHD. Known issue version: K2 Summit 9.2, 9.3, 9.4, 9.5, 9.6, 9.7. Error messages are observed at three minute intervals with 1-hour continuous record mode and with the DNxHD encoder is selected for the Compression Format.
	Workaround:	None
KT-9720	Description:	When cueing between events in a Playlist with highlights from local and remote devices, response may be slow.
	Workaround:	None

Known Issues in Previous Releases

K2Config/Site Config and Windows Server 2012

KT-8065	Description:	When installing SharedBinaries on a Windows 2012 Server, it think it's upgrading the QLogic driver.
	Workaround:	De-select QLogic driver upgrade in SiteConfig.
KT-8042	Description:	SiteConfig stuck during upgrade of Summit from 9.4 to 9.5
	Workaround:	Reboot Summit, uninstall 9.4 manually, then install 9.5 manually.
KT-8045	Description	Problem with SiteConfig upgrading SAN from 9.3/9.4 to 9.5.
	Workaround:	Reboot Summit, uninstall 9.4 manually, then install 9.5 manually.
KT-2262	Description:	K2Config/SiteConfig have a problem connecting and configuring Windows Server 2012 machines. The problem is that the Public firewall gets enabled after one of the following occured: 1) Static IP address is set for the NIC port 2) SNFS/Discovery Agent is installed. When the firewall is enabled, SiteConfig can't install software on Server; K2Config can't connect to the server and configure it.
	Workaround:	Disable the firewall manually and then restart SiteConfig/K2Config. Note that the base image has all firewall disabled.

Other

KT-8060	Description:	Channel configuration returns to default after an upgrade.
	Workaround:	If licenses are removed from Summit before a software upgrade the channel channel configuration settings may be reset to default. Please leave existing licenses in place when upgrading from 9.4 to 9.5 or else the channel configuration will reset to the factory default settings.
KT-2490	Description:	Bad E-to-E SD media streams output via 10GigE connector with Multi-Cam Recorder.
	Workaround:	To get out of the bad state, change the Video Input selection to SDI (with a valid PAL/SD signals present on the SDI inputs) and then change back to 10GigE.

AppCenter

ncb00003440	Description:	Bins nested more than nine levels deep are not supported. Database errors can occur.
	Workaround:	Constrain bins to nine levels deep or less. This includes the top-most bin.

ncb00003457	Description:	Closed captioning and/or ancillary data not present in the last few seconds of a growing clip's playout. This occurs when playing out a clip that is being recorded, and the recording stops.
	Workaround:	Stop playout of growing clip before stopping recording. In any case the closed captioning and/or ancillary data is full-length in the recorded clip and present in subsequent playout.
ncb00039062	Description:	The system clock may not update when the TimeOfDay source is changed.
	Workaround:	If this happens reboot after the TimeOfDay source change.
ncb00003919	Description:	When reconfiguring channel security settings on Configuration Manager Security tab, AppCenter does not allow username/password fields to be blank.
	Workaround:	Enter username/password for a valid user account. Once configured, the fields require valid information.
ncb00004073	Description:	Recorded video is one frame late relative to timecode. This occurs if you record using Time-of-day timecode and the source is from channel four's LTC input.
	Workaround:	Connect the house LTC input to channel 1 and use it as the Time-of-day source.
ncb00002648	Description:	AppCenter does not allow a clip to be deleted if the clip is associated with a playlist, program, or subclip.
	Workaround:	First use the "Consolidate Media" feature on the clip, then delete the clip.
ncb00002781	Description:	Video faults continue to occur if Super Slo-Mo inputs lose and then regain phase alignment while recording is underway.
	Workaround:	If inputs lose phase alignment, first restore phase alignment and then stop and restart the recording.
ncb00035282	Description:	On K2 Summit Transmission models, only two audio tracks can be created for new Playlist.
	Workaround:	Switch the channel to a Player/Recorder, set the number of audio channels, then create the Playlist.
ncb00038746	Description:	Audio errors occur when playing a clip while importing from a USB device.
	Workaround:	Copy first, then play. Playback while importing from USB not supported.
ncb00075492	Description:	After a failover event occurs on the K2 SAN, there are multiple decoder errors when playing an Avid DNxHD, AVC-Intra, or DVCPROHD clip that was recorded at the time of the failover.
	Workaround:	Delete clips that exhibit these errors and re-record them.
DE8566	Description:	If a channel is running as a Playlist when it is configured to be a 4K Player, 4K Recorder, 3D/Video+Key Player or 3D/Video+Key Recorder then it will not play or record correctly.

	Workaround:	Be sure all channels are running as a Player/Recorder before changing the configuration to a 4K Player, 4K Recorder, 3D/Video+Key Player or 3D/Video+Key Recorder.
DE9789	Description:	For Multi-Cam Recorder with 2 inputs and split audio 8+8, and proxy file generation enabled, the audio setting has invalid and unselectable configurations.
	Workaround:	1. The number of audio inputs changes to 2, but the choice to select 4 is available. Do not select 4 as it's not valid. 2. If A7/A8 is selected as the first audio input pair for proxy files from one SDI input, the A7/A8 pair is not selectable from a second SDI input.
KT-9220	Description:	When using 3x MultiCam Recording with 16 audio tracks and the independent ancillary data enabled, the recording fails.
	Workaround:	Reduce either the number of Multi-Cams, Audio tracks or using the same ancilliary data for each input.

System

ncb00017096	Description:	The K2 Media Server displays an error because the Dell OpenManage server log fills up.
	Workaround:	Manually clear the log and then configure OpenManage to overwrite the log when full.
ncb00003449	Description:	Slow operations after restarting with a USB device connected.
	Workaround:	Disconnect then reconnect USB device. Normal operation speed is restored.
ncb00002672	Description:	Macintosh systems cannot write to a HotBin directory on the V: drive of an iSCSI or Fibre Channel connected K2 SAN. GV Connect export to the HotBin fails.
	Workaround:	Delete the HotBin, configure Macintosh access in the SNFS configuration file, then recreate the HotBin from the K2 Media Server. Configure the SNFS configuration file as part of the upgrade to this version of K2 software, as instructed in the upgrade procedure earlier in these release notes. If not upgrading, take systems offline, make the change as instructed in the upgrade procedure, then restart the K2 Media Server to put the change into effect.
ncb00004203	Description:	On a K2 Media Server with SNFS on the C: drive, media is lost if you re-image the C: drive

	Workaround:	Before re-imaging, use the `psave.bat` and `prestore.bat` tools included on the USB drive included with the K2 Summit system or upgrade field kit.
ncb00060531	Description:	When configuring a HotBin Export destination folder and entering credentials, a "...cannot start service..." error message appears.
	Workaround:	In Windows Services Control Panel, for Grass Valley Import Service, enter the credentials and start the service.
ncb00038588	Description:	The K2Config application does not open.
	Workaround:	On the PC that hosts the K2Config application, disable the control network interface card, then open the K2Config application, then enable the control network interface card.
ncb00064016	Description:	AFD property is not passed with AVC clips.
	Workaround:	Add an ancillary data track to the AVC clip to carry the AFD property.
ncb00063992	Description:	Some USB 3.0 devices are not recognized as USB 3.0 on the front connectors.
	Workaround:	If the USB 3.0 device is recognized as a USB 2.0 device when plugged in, remove it and plug it in again to be recognized as a USB 3.0 device. If the USB 3.0 device is not recognized at all, plug in a USB 2.0 device, then plug in the USB 3.0 device again to use it. This only needs to be done once after booting. Thereafter the device will be recognized as a USB 3.0 device.
DE6716	Description:	3x Super Slow Motion in 720p record jitters for a few frames after changing the camera format.
	Workaround:	After a camera video format change, discard the first bad frames of the first recording. Recordings thereafter will be good until the camera video format is changed again.
DE6779	Description:	Ancillary data lost on import of P2 clip.
	Workaround:	Contact Grass Valley Support.
DE6940	Description:	An iSCSI-attached K2 Summit SAN client system fails to play or record two channels of 1080p when the other two channels are doing a continuous record of 1080p.
	Workaround:	Only two 1080p channels are supported for iSCSI connected SAN clients. Use FibreChannel connections to use 1080p on more than two channels on SAN clients. While two channels are doing a continuous record of 1080p, do not use the other two channels.
DE6954	Description:	In the K2 TimeDelay application, thumbnails are not updated.
	Workaround:	None. Thumbnails are no longer updated as records continue in K2 TimeDelay.
DE7330	Description:	A long continuous recorded clip might not delete successfully. The clip is deleted from the media file system, yet the clip is still displayed in AppCenter.

	Workaround:	Use the Storage Utility Clean Unreferenced Movies feature. This removes the display of the clip from AppCenter.
DE8525 ncb00075905	Description:	FTP transfers fail to/from a K2 Media Server with role of FTP server. This occurs on first start-up after re-image.
	Workaround:	Reboot the K2 Media Server, and restart the Grass Valley FTP Dameon service.
DE9019	Description:	4K and 6xSSM features do not work when the licenses are installed to a K2 Summit 3G system that is not properly configured to support them.
	Workaround:	Do not install 4K or 6xSSM licenses onto K2 Summit systems that are not properly configured to support these features. Proper configuration includes the correct hardware, media drives and K2 Summit 3G codec modules.
DE9480	Description:	Errors in recording when there is a Fibre Channel SAN client fail-over.
	Workaround:	None.
DE9664	Description:	6-in/2-out performance is slow when using ShareFlex on K2 Summit 3G systems with hard drives.
	Workaround:	Ensure your hardware is able to support this feature. You may also try the following to bring the system back into its operational rating: • Use split audio on the triple Multi-Cam channels instead of no split audio • Drop the video bit rate to 50Mbps • Do not use ShareFlex • Use SSDs instead of hard drives
DE11433	Description:	When running the Summit Diagnostics application, the message `RESULT: CodecMezz Memory Test FAILED` is false. There is nothing wrong with tested component.
	Workaround:	Contact Grass Valley Support to install an update to the Summit Diagnostics application.

Proxy/live streaming

ncb00041093	Description:	Live streaming can fail when the K2 Summit system's IP address is changed.
	Workaround:	On the K2 Summit system navigate to `V:\live streaming` and use Notepad or a similar text editor to open a `*.sdp` file. Check the first IP address listed in the file, on the `o=` line. If it is not the K2 Summit system's Control Connection IP address, delete the `*.sdp` files in the directory and restart the K2 Summit system.
ncb00061128	Description:	Remote desktop connections cause live streaming errors and audio/video sync problems.

	Workaround:	Do not use Remote Desktop on K2 Summit systems that are generating live streams. To restore live streaming audio/video sync, disable the proxy recording and live streaming for that channel, then re-enable live streaming.

Installation

ncb00003885	Description:	If uninstalling or installing K2 client software while applications or connections to AppService are open, the installation program becomes unresponsive.
	Workaround:	To prevent the problem from occurring, shutdown all applications and connections before uninstalling or installing. Then after all applications are shutdown, use Task Manager to stop AppService.
ncb00040814	Description:	Error messages appear during Generic iSCSI software install. This occurs when doing a manual (not SiteConfig) install on a Windows 7 PC. The error messages are similar to "The installation of VS2005.762 appears to have failed..." and "Setup could not find the update.inf file...".
	Workaround:	Ignore the error messages and continue with installation. The software installs successfully. The error messages are caused because the installation program tries to install components that are already present in Windows 7.

Compatibility

ncb00008524	Description:	Transfers to/from M-Series iVDR are not supported.
	Workaround:	Do not attempt to transfer to/from M-Series iVDR.
ncb00025753	Description:	MXF streaming transfer to XDCAM recorder fails.
	Workaround:	None. Some Sony deck models do not comply with the MXF standard.

4K

DE10353	Description:	On the Channel Configuration page, when a **4K Recorder (Top)** or **4K Player (Top)** is selected, channel ganging is used to join two channels together. A side effect is that any channels currently in the gang are removed. E.g., if C1 is configured as a 4K Recorder and C3 and/or C4 are in the gang, they will be removed from the gang.
	Workaround:	Click **Cancel** on the Channel Configuration page and the changes will not take effect.
DE10533	Description:	4K recording (individual quadrant) can get out of sync after video feed interruption.
	Workaround:	Provide a frame sync before the Summit input.

Dyno PA/Dyno

ncb00002810	Description:	On a stand-alone K2 Summit/Solo configured for K2 Dyno PA, the V: drive is not available. This occurs if the K2 system is started without a network connection or otherwise used outside of the Dyno PA system.
	Workaround:	Remove the DLC configuration from the K2 Summit/Solo as instructed in Dyno PA documentation. Verify that the loopback adapter is at the top of the adapter order list. This is required for a stand-alone K2 system that is not part of a Dyno PA system.
ncb00076307	Description:	K2 Dyno playlists with more than four audio tracks do not have the associated audio file, causing problems when exported. This occurs with K2 Dyno software version 2.0.4.143 and K2 Summit software version 8.1.11.1810, in which only four audio tracks are configured.
	Workaround:	Before exporting the playlist, configure the K2 Summit system to record eight audio channels.
DE8555	Description:	Media storage fills rapidly each time a loop record is stopped and restarted with an append record. The amount of lost disk space may become significant after many stops and starts of append record.
	Workaround:	Start a record session and let it continue to run without stopping, and then restart with an append record.

K2 Summit 3G+ Quick Start Guide

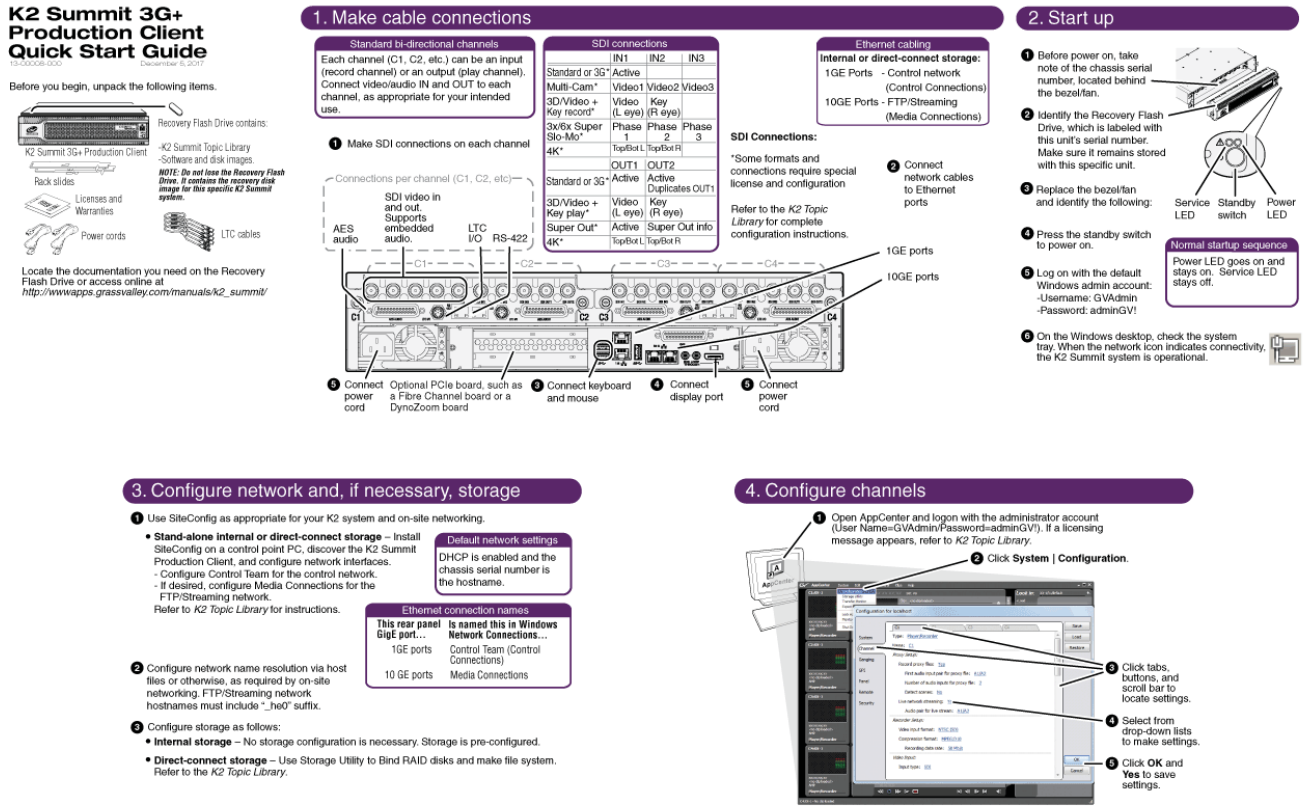


Figure 1: K2 Summit 3G+ Quick Start Guide page 1

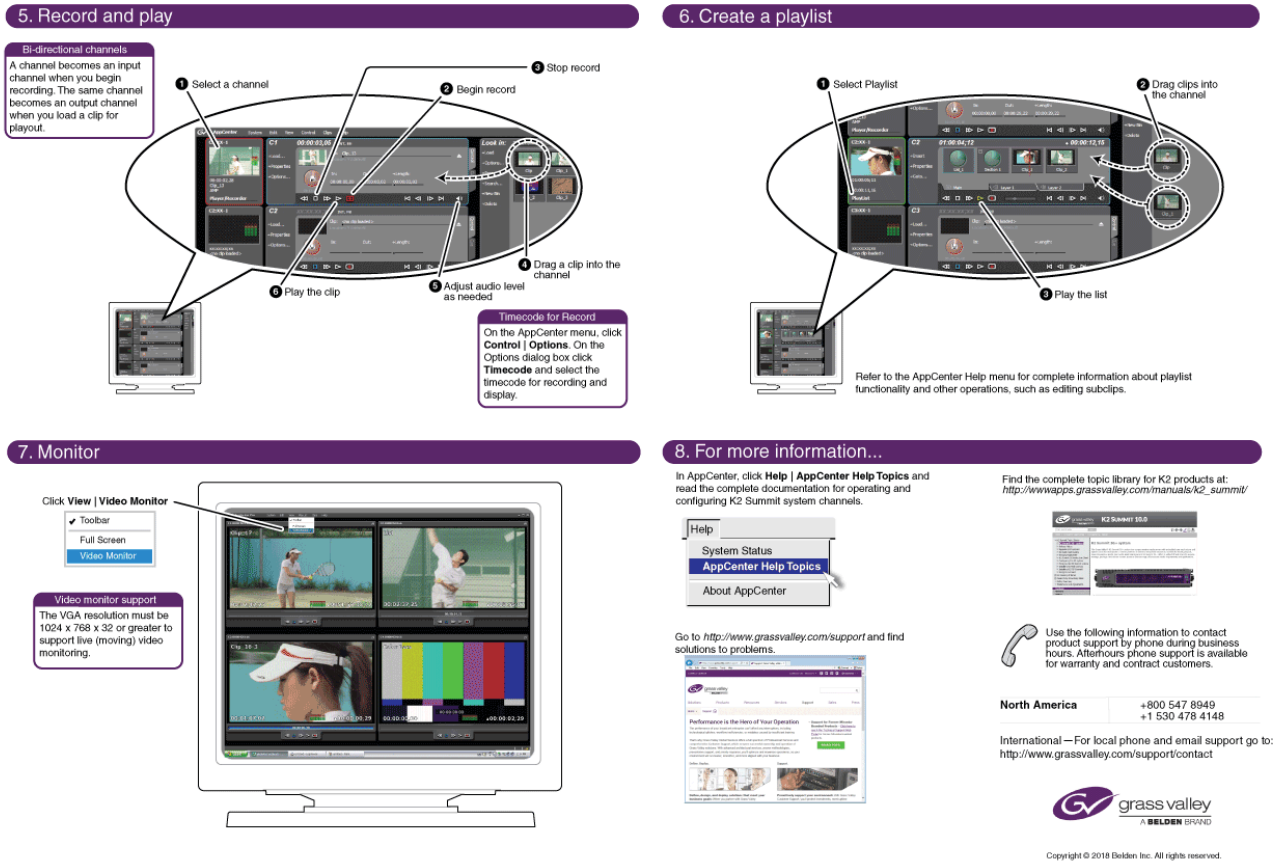


Figure 2: K2 Summit 3G+ Quick Start Guide page 2

K2 Summit 3G+ Production Client

The K2 Summit 3G+ Production Client is optimized for a broad range of production and broadcast applications. The server supports end-to-end SD/HD workflows in DVCPRO, MPEG-2, AVC-Intra, H.264/AVCHD, Avid DNxHD and Apple ProRes (720p/1080i) formats.

The K2 Summit 3G+ Production Client is optimized for production, live event workflows and broadcast applications. Teamed with the K2 Dyno S3 Replay Controller, K2 Summit 3G+ offers an ideal solution for live events such as sports and concerts, studio production, news and any application that requires quick access to recorded media. A K2 Summit 3G+ Production Client can be deployed as a standalone K2 Summit system with internal storage for use in a distributed environment. K2 Summit 3G+ standalone systems are optimized to work in a file-based environment.

The K2 Summit client performs all video and audio I/O using built-in encoders and decoders. The K2 Summit 3G+ allows three servers to be stacked together, offering triple the amount of input and outputs available.

The K2 Summit 3G+ Production Client is a 2 RU platform with redundant hot-swappable power supplies, as well as redundant 1G and 10G Ethernet ports to provide a tremendous speed upgrade from the K2 Summit. It includes an embedded OS that runs off of an M.2 solid state drive (SSD) providing fast and reliable operation. Each channel is built around a high-performance RISC processor, an embedded real-time operating system, and performs video/ audio processing in the robust and secure manner needed for a 24/7, frame-accurate environment.

K2 Production Features

The K2 Summit 3G+ Production Client has been specifically designed for the needs of live event productions such as sporting events where instant replays need to be available immediately at the push of a button. Highlights, playlists and resources such as record channels from multiple systems can be shared by users. All channels are bidirectional and can easily and quickly switch between record and play.

ChannelFlex

ChannelFlex doubles the K2 Summit 3G+'s capability from supporting four video streams to eight video streams in application-specific configurations:

- Record up to 8 camera feeds in DV, XDCAM HD, AVC-Intra or Avid DNxHD formats
- Record up to two 2X/3X super slo-mo cameras in DVCPRO HD, AVC-Intra or Avid DNxHD formats
- Record up to four 3D cameras or video+key pairs: HD in AVC-Intra/SD in IMX30
- Play up to four 3D files or video+key pairs: HD in AVC-Intra/SD in IMX30

10 GbE Ethernet interfaces

The 10GbE ethernet interfaces have been added to increase bandwidth and production capabilities of the K2 system. With the 10Gpbs moving away from a card insertion, it allows the K2 Summit 3G+ Production Client to fully utilize the 10Gpbs in the system and provides a tremendous speed upgrade from the K2 Summit.

Flexible Monitoring Options

With the built-in VGA multiviewer, all four channels can be monitored in normal mode or up to eight streams when ChannelFlex (requires AppCenter Pro or Elite) is in operation. An SDI monitor output is available with timecode burn-in for each channel. A user-definable text overlay option

(requires AppCenter Elite) is available for both monitor displays, enabling various information such as channel/clip name, transport controls, play speed, audio meters and more to be displayed in any location with various text sizes and colors. A truly unique feature allows a streaming proxy of either input or output video and audio to allow monitoring using an IP network and a standard client viewer.

Built-in Mix Effects

For generating quick highlight packages, often all that is required are simple dissolves or fades between two clips. Each channel has this capability built-in (most servers require two channels to do a mix effect). An integrated mixer dissolves between two clips or to a matte color. The color and transition times are user-definable.

Multiple Format Capabilities

The K2 Summit 3G+ Production Client is the only server that provides agile codecs enabling playback of SD or HD content seamlessly on the same timeline with any supported format (DV/ DVCPRO, MPEG-2, AVC-Intra, H.264, Avid DNxHD or Apple ProRes). With seamless and automatic up/down/cross- conversion of clips to your desired output resolution, the K2 Summit 3G+ Production Client provides full support for all SD and HD formats. The K2 Summit 3G+ Production Client also supports the industry-wide AFD standard for aspect ratio conversion. As a result, you only need to store a single-format version of a clip in order to play it out in the appropriate SD or HD format. The K2 Summit 3G+ Production Client is capable of simultaneously encoding a low-resolution proxy along with the high-resolution recording to extend workflows to the user's desktop. The K2 Summit 3G+ Production Client features smooth, high-quality, bidirectional, slow-motion playback and enhanced jog/shuttle control for all formats including MPEG-2 Long GOP. Playback trails recording by a fraction of a second so replay is virtually instantaneous (requires AppCenter Elite). Slo-mo playback and freeze frames are jitter-free at even the slowest speeds due to the use of line interpolation technology.

K2 Summit 3G+ Production Client Specifications

Description

2 or 4 SD/HD channels

All channels are bidirectional

Two-or four-channel configurations:

- SD: DV, IMX and MPEG-2 I-Frame & Long GOP
- HD: DV, XDCAM HD, XDCAM EX, MPEG-2 I-Frame & Long GOP
- DVCPRO HD, AVC-Intra, DNxHD and Apple ProRes

Play different formats back-to-back:

- SD/HD/3G/4K clips
- 720p/1080i
- 1080p 3G
- 2160p 4K
- DV/MPEG/AVC-Intra/H.264/AVCHD

Instant replay capability.

Video Channels

2 or 4 bidirectional HD/SD-SDI record/ play channels

SD SDI: SMPTE 259M, ITU R601, 525/625 line component, 10-bit

HD-SDI: SMPTE 292M, 10-bit

HD: SMPTE 424M

Formats

SD:

DV, DVCAM, DV25, DV50

MPEG-2@ML 4:2:0, I-Frame & Long GOP 2-15 Mb/s

MPEG-2 @ML 4:2:2, I-Frame & Long GOP 4-50 Mb/s

HD:

MPEG-2@HL 4:2:0, I-Frame & Long GOP 12-100 Mb/s

MPEG-2 @HL 4:2:2, I-Frame & Long GOP 20-100 Mb/s

XDCAM HD (18, 25, 35 Mb/s)

XDCAM HD 4:2:2 (50 Mb/s)

XDCAM EX

DVCPRO HD

AVC-Intra 50/100 (optional)

AVC-Intra Class 100 1080p50/60 Level A (optional)

H.264/AVCHD playback (optional)

DNxHD 115, 120, 145, 175, 185, 222 Mb/s

Apple ProRes (720p/1080i), 422 Proxy, 422 LT, 422 and 422 HQ

720p and 1080i (optional)

Compression:

Video: MPEG-4 part 10

Audio: AAC

ChannelFlex Modes (optional)

Multicam (up to 4 channels)

Multicam mode

Synchronized multichannel record and play to support two UHD/4K channels

Super slo-mo (1 or 2 channels)

3D (up to 4 channels)

Video+key (up to 4 channels)

HD/SD-SDI monitor output with timecode burn-in and custom text overlays

Multiviewer monitor mode with custom text overlays

Other Features include:

Fast boot times with embedded OS on M.2 solid state drive (SSD)

Built-in mix effects on each channel: video dissolves and audio crossfades supported via APIs and AppCenter Pro playlist

Import/export all formats as MXF OP1a, SMPTE 360M (GXF) or QuickTime

File system enables edit-in-place of QuickTime files

Expanded internal storage capacity – 16 TB

Software-based codecs for agile playback and easy configuration

Increased bandwidth to support more channels, higher bit rates, faster file transfers

Super slow-motion support in DVCPRO HD, AVC-Intra and DNxHD formats

Full XDCAM HD workflow support including multicam mode

1080p50/60 Level A support using AVC-Intra

Embedded operating system on M.2 solid state drive (SSD)

Automatic up/down conversion, user-definable aspect ratio conversion, and closed caption preservation

ANC data preserved and full AFD processing

Scales from two to four channels to more than 100 channels

Audio Special Features

Full multichannel audio support – 16 SDI audio tracks per video channel (32 audio tracks per clip on disk)

Scrub audio support (±2X)

Audio click elimination

Agile playback of clips with different supported audio formats

Audio tagging and audio mapping (with K2 AppCenter Pro)

Audio mix effects (PCM only)

Cross fade between tracks

Fade up/down

Power Requirements

Dual redundant 600W maximum, 400W typical

Auto-sensing, hot-swap

100-240 VAC, 50-60 Hz

Monitor Modes

SDI monitor out w/timecode burn-in

Display port to replace VGA output

Video Playback Output

Any supported format can be played seamlessly back-to-back

Output can be delayed at pixel resolution within a range of one frame

Freeze mode: frame or field Off-speed play: line interpolation provides jitter free slow-motion playback in both directions

Video Mix Effects (optional) Dissolves between two video tracks on same channel

Fade up/down to matte color (default is black)

Max duration per transition: user selectable

Environmental Characteristics

Operating temperature: 10° to +40°C (50° to 104°F)

Non-operating temperature: -40° to +60°C (-40° to 140°F)

Operating relative humidity: 20% to 80% from -5° to +45°C (23° to 113°F)

Non-operating relative humidity: 10% to 80% from -30° to +60°C (-22° to 140°F)

GPI

12 in, 12 out: 25-pin D connector (DB25)

Dimensions

Height: 9 cm (3.5 in.) – 2 RU

Width: 44.5 cm (17.5 in.)

Depth: 61.6 cm (24.5 in.)

Weight: 24 kg (53 lbs.) maximum

Redundancy

Redundant power supplies (hot-swappable)

Redundant cooling

Up/Down/Cross Conversion and Aspect Ratio

525 to 1080i, 525 to 720p, 625 to 1080i, 625 to 720p

720p to 1080i cross conversion

AFD support for 4:3 to 16:9 aspect ratio conver- sion with format specified on a channel basis with clip-by-clip override capability

Bar, half-bar, crop and stretch options configurable via UI, or K2.net

E-to-E Mode

Less than one frame delay

No re-timing applied

Audio

Record or play up to 16 tracks per channel

32 audio tracks per clip stored on disk

Embedded Audio Tracks

16 tracks embedded, per video channel

Reference Genlock

NTSC/PAL black composite analog

Two HD-BNC connectors, 75Ω passive loop through

Burst frequency lock: PAL, +10 Hz at subcarrier NTSC, +20 Hz at subcarrier

Tri-Level sync conforms to SMPTE 296M-2001 for 1280x720P systems and SMPTE274M-2008 for 1920x1080

Timecode

LTC SMPTE 12M, one per channel

One mini-XLR per input and one mini-XLR with input and output

1 kΩ input, 50Ω output impedance

One VITC reader/writer per video:

Lines 10-21 on 525 configurations, lines 6-23 on 625 configurations

Ancillary timecode

Control Interconnects:

Four RS-422 serial ports

1G/10GbE Ethernet interfaces

Protocols:

K2.net native API

Media Exchange

MXF OP1a, GXF (SMPTE 360M), AVI and QuickTime

Discrete AES/EBU Audio Tracks (per video channel)

8 input and 8 output tracks (4 AES pairs) audio

DB25 pin connector (optional) – Yamaha

AES D-sub pin out (CD8AES & MY8AE)

Audio Specifications

Input: 48 kHz, 16-or 24-bit digital audio=PCM

Sample rate conversion on inputs (32 kHz to 96 kHz) to 48 kHz

Output: 48 kHz clock derived from video reference, 16- or 24-bit

Compliant with SD-SMPTE 259M, HD-SMPTE 292M

Compressed audio types: AC-3 and Dolby E pass-through

Audio delay adjustable ±200 ms relative to output video

Remote Monitoring

Grass Valley SNMP-based remote facility monitoring software

Certifications UL 60950, FCC Class A, EMC Class A, CE, C-Tick, CSA 60950, IEC 950, EN 60950

Included in Package

Power cords (2)

LTC cables (4)

Quick Start guide

USB stick with documentation

Table 5: K2 Summit 3G+ production clients with internal storage (in hours*)

Format Data Drives	DV 25	DV 50	DV 100	AVCI 50	AVCI 100	6x SSM	4K
400 GB RAID-5 (5x400)	101	54	28	64	33	6	4
400 GB RAID-5 (10x400)	201	108	57	127	66	11	8
800 GB RAID-5 (5x800)	201	108	57	127	66	11	8
800 GB RAID-5 (10x800)	402	216	114	255	131	22	15
1600 GB RAID-5 (10x1600)	804	432	227	509	262	45	31

RAID-5 = 2 LUNs, each with 4 data drives and one parity drive

*Time for video with four 16-bit audio channels, no ancillary data. Times are estimated and can vary by ±10%.

Using K2 AppCenter

Product Description

Topics in this section describe Grass Valley products. Check online topic library for latest update.

About K2 systems

The K2 Summit system is a cost-effective Broadcast Enterprise Server that incorporates IT server platform and storage technologies to deliver a networked solution to facilities for ingest, playout, news integration, sports, and media asset management. Each K2 system model is a comprehensive platform that provides a suite of user applications, system tools, and the largest range of third-party interactivity in the industry.

The K2 Summit system is designed for “headless” operation from a remote control point using Grass Valley Control Point software. You can also use the Microsoft Windows Remote Desktop Connection application on your PC to connect to the K2 system for configuration or administration.

The K2 Summit system is further described in the following topics.

K2 Summit 3G+ system features

The following features apply to the K2 Summit 3G+ Production Client:

- Windows 10 IoT LTSB.
- MS Server 2012.
- Embedded Security for protection against viruses and other unauthorized programs.
- Bidirectional channels (channel can be either an input channel or it can be an output channel).
- Two or four channels per chassis. Configurations include:
  - SD : DV, IM X and MPEG-2 I-Frame and Long GOP
  - HD: DV, XDCAM HD, XDCAM EX, MPEG-2 I-Frame and Long GOP, DVCPRO HD, AVC-Intra, DNxHD andApple ProRes
- Play different formats back-to-back:
  - SD and HD clips
  - 720p/1080i
  - 1080p 3G
  - DV/MPEG/AVC-Intra/H.264/AVCHD
- Instant replay capability

- ChannelFlex – part of AppCenter Elite:
  - Multicam mode
  - Synchronized multichannel record and play to support UHD/4K
  - Super Slo-Mo mode
  - 3D mode
  - Video+key mode
  - HD/SD-SDI monitor output with timecode burn-in and custom text overlays
  - Multiviewer monitor mode with custom text overlays
- Fast boot times with embedded OS on M.2 solid state drive (SSD)
- Option for up to 16 TB of internal hard disk storage
- Built-in mix effects on each channel:
  - Video dissolves and audio crossfades supported via APIs and AppCenter Pro playlist
- Import/export all formats as MXF OP1a, SMPTE 360M (GXF) or QuickTime
- File system enables edit-in-place of QuickTime files
- Expanded internal storage capacity – 16 TB
- Software-based codecs for agile playback and easy configuration
- Increased bandwidth to support more channels, higher bit rates, faster file transfers
- Super slow-motion support in DVCPRO HD, AVC-Intra and DNxHD formats
- Full XDCAM HD workflow support including multicam mode
- 1080p50/60 Level A support using AVC-Intra
- Embedded operating system on M.2 solid state drive (SSD)
- Automatic up/down conversion, user-definable aspect ratio conversion, and closed caption preservation
- ANC data preserved and full AFD processing
- Full multichannel audio support – 16 SDI audio tracks per video channel (32 audio tracks per clip on disk)
- SDI video inputs and outputs.
- AES/EBU or embedded audio inputs and outputs.
- Standard Definition (SD) video formats and High Definition (HD) video formats.
- Support for DV, MPEG-2, AVCHD/H.264, AVC-Intra, AVC-LongG, and Avid DNxHD. For details regarding licenses, hardware support, and video codec specifications, refer to related topics in the "Using K2 AppCenter" section of the K2 Topic Library.
- 3G codec module hosts codec option cards that are programmable for multiple formats and functions.
- Mixed format playback of SD or HD clips on the same timeline.
- Up/down/cross HD/SD conversion (e.g. SD and HD clips ingested, then played back as SD or HD clips) or as a different SD or HD format (e.g. 720p to 1080i).
- 4K, Super Slo-Mo, Multi-cam, and 3D/Video + Key features are available as part of the ChannelFlex Suite.
- 4K/UHD workflow and 4K/UHD Pan & Zoom using the GV DynoZoom software.
- High endurance SSD internal storage for 6-in/2-out configuration, 6x Super Slow Motion (SSM), and 4K/UHD workflow.

- Redundant power supply, cooling fans for reliability.
- 2.5 inch media storage drives.
- M.2 SSD system drive.
- Type IV CPU carrier module with 8 GB RAM.
- USB 3.0 interface for file exchange.
- Ability to create nested bins, i.e. sub-bins within bins.
- Freeze mode can be frame or field.
- Various video mix effects (e.g. dissolves between two video and audio tracks on the same channel, or fade thru matte color).
- Remote operation and configuration via AppCenter.
- 1/10 Gigabit Ethernet ports.
- Remote control over RS-422 or Ethernet.
- Stand-alone internal storage.
- Internal multi-viewer output provides a display of up to eight channels in real time when used with ChannelFlex.

Audio and Closed Caption/ Teletext Multilingual Support

Audio and Closed Caption/Teletext Multilingual Support Each video channel has up to eight AES/EBU or 16 embedded channels of PCM or compressed audio. For easy track management, each audio track can be identified with a language descriptor (requires AppCenter Pro or Elite). Additional audio features include scrub audio up to 2X, audio meters for each channel, an internal audio delay capability and the ability to adjust levels during recording or playback. It also performs an audio ramp down/ ramp up between clips to eliminate audio clicks and/or pops. Additional audio tracks can be imported into a clip to easily add additional languages (requires AppCenter Pro or Elite). In addition multiple closed captions or teletext files can be imported from third-party captioning editors for additional language support (requires AppCenter Pro or Elite).

K2 Summit formats, models, licenses, and hardware support

Formats are supported as in the following tables.

Table 6: K2 Summit 3G+ system

Formats	Compression	1x	3x Super Slo-Mo, Multi-Cam*, 3D/Video + Key	6x Super Slo-Mo	4K
SD	DV	Encode/decode	Encode/decode. Requires AppCenterElite licenses. TripleCam also requires the Triple license.	Not supported.	Not supported.

Formats	Compression	1x	3x Super Slo-Mo, Multi-Cam*, 3D/Video + Key	6x Super Slo-Mo	4K
	MPEG-2	Encode/decode	Encode/decode. Requires codec Mezz option card. Requires AppCenterElite license. 3x Super Slo-Mo and TripleCam are not supported.	Not supported.	Not supported.
	AVC/H.264	Decode only. Requires AVC license.	Not supported	Not supported	Not supported.
1080i/720p	DVCPROHD	Encode/decode. HD license is required.	Encode/decode. Requires the HD and AppCenterElite license. TripleCam also requires the Triple license.	Encode/decode. Requires codec Mezz option card. Requires HD, AppCenterElite and 6xSSM licenses. Requires K2 Summit 3G chassis with 2.5” hard drives for one channel or high endurance solid state drives for full features with two channels.	Not supported.
	MPEG-2	Encode/decode. HD license is required.	Encode/decode. Requires Mezz codec option card. Requires HD and AppCenterElite licenses. 3x Super Slo-Mo and TripleCam are not supported.	Not supported.	Not supported.

Formats	Compression	1x	3x Super Slo-Mo, Multi-Cam *, 3D/Video + Key	6x Super Slo-Mo	4K
	AVC-Intra	Encode/decode. Requires HD and AVC licenses.	Encode/decode. Requires HD, AppCenterElite and AVC licenses. TripleCam also requires the Triple license.	Encode/decode. Requires codec option card, plus HD, AppCenterElite, 6xSSM and AVC licenses. Requires K2 Summit 3G chassis with 2.5” hard drives for one channel or high endurance solid state drives for full features with two channels.	Not supported.
	AVCHD/H.264	Decode only. Requires HD and AVC licenses.	Not supported	Not supported	Not supported.
	AVC-LongG	Decode only. Requires HD and AVC licenses.	Not supported	Not supported	Not supported.
	Avid DNxHD	Encode/decode. Requires HD and Avid DNxHD licenses.	Encode/decode. Requires HD, AppCenterElite and Avid DNxHD licenses. TripleCam also requires the Triple license and SSD storage.	Not supported	Not supported.

Formats	Compression	1x	3x Super Slo-Mo, Multi-Cam *, 3D/Video + Key	6x Super Slo-Mo	4K
	Apple ProRes	Encode/decode. HD and Apple ProRes licenses.	Encode/decode. HD and Apple ProRes licenses. Requires a Summit 3G codec board. 2-Input Multi-Cam support only.	Not supported	Not supported
1080p	AVC-Intra Class 100	Encode/decode. Requires codec Mezz option card for multi-head operation. Requires HD, 3G and AVC licenses.	Encode/decode. Requires codec Mezz option card. Requires HD, 3G AppCenterElite and AVC licenses. TripleCam is not supported.	Not supported	Encode/decode. One 4K channel requires two codec channels. Requires codec Mezz option cards and high endurance solid state drives. Requires HD, 3G, 4K, AppCenterElite and AVC licenses.

Features of internal storage models

K2 Summit systems have media drives as follows:

- K2 Summit 3G system — Up to twelve media drives

This makes the internal storage K2 system a self-contained, stand-alone unit, with no external devices for storage connections required. You can transfer media in and out of the internal storage K2 system via Gigabit Ethernet. You can also export media to a mapped drive or USB-attached storage.

About remote operation and monitoring

The K2 Summit system is designed as a “headless” unit. This means that there is no need to connect a keyboard, monitor, and mouse directly to the K2 system, as ongoing operation, configuration, and monitoring can be accomplished from a PC on the network. You can lock the K2 system locally, as you would normally lock a Windows computer, but still access it from a Control Point PC. From this Control Point PC, you can use channels from different sources in one channel suite. The K2 AppCenter application is included with the K2 system and supports this headless functionality.

Automation protocols and other optional applications can also be used to control K2 systems remotely.

The K2 AppCenter status bar can be used to monitor the K2 system as it ingests, outputs, or transfers media.

Windows Remote Desktop Connection

You can use the Microsoft Windows Remote Desktop Connection application to make a remote connection to a Grass Valley system that runs the Windows operating system.

Take the following into consideration when connecting to K2 systems:

- Before you can use the Remote Desktop Connection, you need network access and permissions to connect to the K2 system.
- You can use either the name or the IP address to access the K2 system.
- Do not use the Remote Desktop Connection to access the PC running the Control Point software or to access the AppCenter application; results may be unreliable.
- Take care when accessing an online K2 system on which media access is underway. The additional load on network and system resources could cause unpredictable results.
- Lack of robust video/graphic support can cause video display problems. Remote desktop connections can interrupt proxy and live streaming. AppCenter video monitoring is not supported through Remote Desktop Connection.

Licensing

Grass Valley continues to develop the K2 product family to better meet a wide range of customer requirements. As these developments become available, you can add the specific functionality you need with Grass Valley software licenses. Detailed procedures for installing licenses come with option kits or are included in release notes for K2 products. Contact your Grass Valley representative to learn more about the licensing structure and for purchasing information.

Software version licenses

At major software releases, significant new features are added. If you are licensed for the software release, you can upgrade your software and received the benefits of the new features.

Licensable options

Optional applications, bundles of advanced features, and enhanced functionality are available as licensable options for K2 products.

AppCenter licenses are as follows:

	AppCenter Standard	AppCenter Pro	AppCenter Elite
Record	X	X	X
Continuous Record	X	X	X
Play	X	X	X
Sub-Clipping	X	X	X

	AppCenter Standard	AppCenter Pro	AppCenter Elite
Playlists	X	X	X
"Live" Mode (Chase Play)	X	X	X
Video Monitor in Control View	X	X	X
VM Multi-view	X	X	X
Playlist Import		X	X
Channel Ganging		X	X
Audio Track insert		X	X
CC Track insert		X	X
Audio Track assignments		X	X
Scheduled Record per channel (not playlist)		X	X
Scheduled Playback per channel (not playlist)		X	X
Super out on SDI 2 output		X	X
Playlist with M/E Transitions		X	X
Flying M/E Transitions		X	X
Proxy encoding - 4 Channels		X	X
Key+ Fill import (QT32)		X	X
Channel Flex Suite			X
- Multi-Cam (2-input)			X
- 4K			X
- Video + Key			X
- 3D - Left + Right Eye			X
- Super Slo-Mo 2x			X
- Super Slo-Mo 3x			X
- Super Slo-Mo 6x			X
Proxy encoding - 8 Channels			X

Other options and applications include the following:

- HD option
- AVC option (K2 Summit system 3G)
- Avid DNxHD option (K2 Summit system 3G)
- 3G option (K2 Summit system 3G)

- 3G 1080p option (K2 Summit 3G)
- 4K option (K2 Summit 3G)
- 3-input Multi-Cam channel (K2 Summit system 3G)
- 3x 1080p Super Slo-Mo option (K2 Summit 3G)
- 6x Super Slo-Mo option (K2 Summit 3G)
- H.264 playout option (K2 Summit system 3G)
- K2 XML Import capture service
- HotBin Export capture service
- P2 Import capture service
- K2 ShareFlex

As development continues, new options become available. Contact your Grass Valley representative to learn more about current options.

Getting Started

Passwords and security on Grass Valley systems

To provide a basic level of security, Grass Valley systems recognize three different security levels based on Windows users and groups, and the systems ship from the factory with accounts pre-configured accordingly. To access the system you must log on with the user name and password for one of the pre-configured accounts.

The following table shows the different types of users and their privileges.

	Windows administrator	**Grass Valley product administrator**	**K2 product administrator**	**Grass Valley product user**
User name	Administrator	GVAdmin	K2Admin	GVUser
AppCenter Configuration Manager	Full access	Full access	Full access	Can view
AppCenter	Full access	Full access	Full access	Full access; requires an account on the K2 Summit system
Storage Utility	Full access	Full access	Full access	Can’t access
K2Config	Full access	Full access	Full access	Can’t access
Server Control Panel	Full access	Full access	Can view	Can view

	Windows administrator	Grass Valley product administrator	K2 product administrator	Grass Valley product user
Windows Operating System	Full access	Full access	Limited access (based on Windows user account privileges).	Limited access (based on Windows user account privileges)

To support legacy FTP and security features, K2 systems also have *movie*, *mxfmovie*, *mpgmovie*, and *video_fs* accounts. Do not use these accounts to log in to the Windows operating system on K2 systems.

Related Topics

Accessing Configuration Manager on page 68
Storage Utility for standalone K2 Summit system on page 70

Starting AppCenter

You can start AppCenter by clicking on the AppCenter shortcut on the Windows desktop. AppCenter will not automatically start up.

If you are using AppCenter on a local K2 Summit system, you can begin using it immediately after you log on. The first time you run AppCenter remotely through a network-connected Control Point PC, you need to set up a channel suite before you can use AppCenter.

NOTE: If the* K2 Summit system *was shut down using Windows 10 Standby mode, AppCenter will not start up, even though the* K2 Summit system *machine itself boots up normally.

Related Topics

Starting AppCenter for the first time with a Control Point PC on page 59
Starting AppCenter after creating a channel suite on page 60

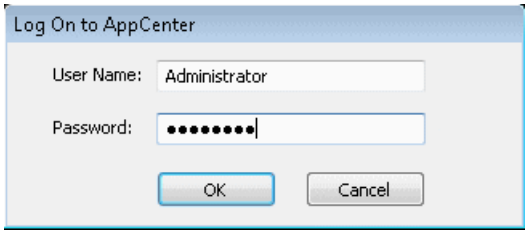
Starting AppCenter for the first time with a Control Point PC

Before you can run AppCenter from a network-connected PC running Control Point software, you must do the following:

1. Log on to AppCenter.
2. Configure a channel suite.

Logging on to AppCenter

The first time you start AppCenter, a Log On dialog box displays. Enter your user name and password.



NOTE: Your domain configuration might require that you use the syntax of machine name\user name. For example, if you have difficulty logging on to a* K2 Summit system*, try logging on as <K2 system>\GVUser.

Once you have logged in, the Suite Properties dialog box displays.

Configuring a channel suite

You need to configure the channel suite before you can use it. To configure a channel suite, specify the K2 source that you want to use and add its channels to a channel suite. You can add channels from several sources to one channel suite, with a maximum of 16 channels in one channel suite.

1. At the blank Suite Properties dialog box, click the **Add** button. An Add Channel dialog box displays.
2. Enter the K2 Summit system host name or IP address.
3. Click **OK**. A second Add Channel dialog box displays, listing the channels on the specified K2 Summit system.
4. Select the channels you want in your channel suite and click **OK**.
5. Review the changes you have made to the Suite Properties dialog box and click **OK**.

Once you have saved the changes to the channel suite, you can modify the channel suite's name and location or rename or reorganize the channels. Descriptive channel names are especially helpful when using a channel suite with channels from multiple sources.

Starting AppCenter after creating a channel suite

For subsequent AppCenter startups using a Control Point PC, AppCenter will attempt to start by opening the last-used channel suite. If you have deleted or moved the last-used channel suite, you need to create a new channel suite or cancel the Channel Suite Properties dialog box and open the channel suite you want to use.

If you are running AppCenter with a Control Point PC, AppCenter opens with the last-used channel suite. To change the channel suite, select **System | Open Suite** or **System | New Suite**. To open one of the four last-used channel suites, select **System | Recent Suites**. Channel suites are saved by default in the C:\Profile\ChannelSuites directory in XML format.

If one of the channels is not available, the title bar for that channel will display its state, for example: “In Use”, “Disconnected”, and so on.

Related Topics

Managing channel suites on page 169

Locking AppCenter

You can lock both local AppCenter running on a K2 Summit system and remote AppCenter running on a Control Point PC.

You can lock the AppCenter interface so that keyboard and mouse input is disabled.

- To lock AppCenter, do the following:
  - Click **System | Lock AppCenter**.

  The Lock AppCenter dialog box appears. All keyboard and mouse input to AppCenter is now disabled. The Lock AppCenter dialog box remains on the screen as an indicator that AppCenter is locked.
- To unlock AppCenter, do the following:
  - On the Lock AppCenter dialog box, click **Unlock** and when prompted “…unlock AppCenter?” click **Yes**.

  The Lock AppCenter dialog box closes. Keyboard and mouse input to AppCenter is now enabled.

Shutting down AppCenter

To shut down AppCenter, do one of the following:

- Click the standard Windows **X** button in the title bar.
- Select **System | Shutdown**. The Shutdown dialog box opens.

AppCenter shut down options

When you shut down AppCenter, you have the following options:

Shutdown Mode	Description
Exit to Windows	Exit AppCenter and display the Windows desktop. If shutting down AppCenter from a Control Point PC, close the channel suite and display the Windows desktop. If you select this option, a second dialog box displays asking you to confirm that you want to exit, since any applications that are running (including remote protocols) will be stopped. Use the desktop shortcut to restart AppCenter.

Shutdown Mode	Description
Suspend channel suite	Exit AppCenter and display the Windows desktop. Applications and remote protocols in suspended channel suites keep running. Channels may be commandeered by another user using another Control Point PC. If all channels in a suspended channel suite are taken over in this manner, the channel suite is shut down. If you want to shut down the current channel suite but keep AppCenter running, you can open or create a channel suite in the System menu. Use the desktop shortcut to restart AppCenter.
Restart	Exit AppCenter and restart the Windows operating system.
Shut Down	Shut down the Windows operating system and power-off the K2 Summit system.

NOTE: If you shut AppCenter down locally, you must re-start it locally.

NOTE: If you shut down AppCenter from a network-connected Control Point PC, the* K2 Summit system *is still running and can be accessed locally or from another network-connected Control Point PC.

About system messages

The following messages are displayed to indicate system status:

- Normal BIOS messages — These messages can be observed on a locally connected VGA monitor during normal startup processes.
- BIOS POST error messages — If there is a problem these messages are displayed on a locally connected VGA monitor. During the Power On Self Test (POST), the BIOS checks for problems and displays these messages.
- AppCenter startup messages — As AppCenter opens the system determines if health is adequate by checking critical subsystems. A dialog box is displayed that indicates progress and displays messages.
- Status bar and StatusPane messages — During normal operation AppCenter displays system status messages on the status bar. From the status bar you can open the StatusPane to see both current and previous messages. You can observe these messages in AppCenter on a locally connected VGA monitor or on a network connected control point PC.
- Storage Utility messages — While you are using Storage Utility, pop-up message boxes inform you of the current status of the storage system.

Related Topics

Viewing AppCenter system status messages on page 64
Critical system startup messages on page 63
Viewing AppCenter system status messages on page 64
Critical system startup messages on page 63
Viewing AppCenter system status messages on page 64
Critical system startup messages on page 63
Viewing AppCenter system status messages on page 64
Critical system startup messages on page 63

Critical system startup messages

The following messages appear in the AppCenter system startup message box as critical subsystems are checked during startup processes. If a critical failure is detected, the K2 Summit system is rendered inoperable and the failure message appears.

Critical subsystem check messages	Failure messages
System Startup	Startup error
	Missing or bad hardware
	A real time processor is not functioning correctly
Checking hardware…	Hardware fault
Checking media disks…	One or more media disks failed to initialize
	Missing or bad hardware
	Missing or bad database
Checking file system…	No file system is running
Checking database…	Database fault
Checking real-time system status…	A real-time system failed to initialize
Updating configuration…	Failed to synchronize configurations
Starting services…	Unable to communicate with <service name>

AppCenter startup errors

If you start AppCenter and the K2 Summit system is not running, or your login information is not correct, you will see a Startup Error message.

The following table describes the two most common startup error messages.

Startup Error	Description
Log on failed	Your user name or password is not valid for this K2 Summit system. Remember that the password is case sensitive. • Click **Ignore** to view the AppCenter channels. If working remotely, you will see the channels from the last-used channel suite. Or, • Click **Retry** to enter the login information again. Or, • Click Abort. If you are accessing AppCenter through a network-connected Control Point PC, **Abort** lets you try to create a new channel suite. If you are accessing AppCenter locally, it lets you exit to Windows. For assistance with your user name or password, consult your Windows administrator.

Startup Error	Description
<K2 system>:<error>	The K2 Summit system might be offline or have had difficulty with the start up checks. There are various reasons why AppCenter is having difficulty connecting to the K2 Summit system; for example, the error might say there is no file system or that the K2 Summit system has been taken offline for maintenance. • Verify that the host name or IP address is correct and see if you can correct the problem. • If working locally, reboot the K2 Summit system. If working from a network-connected Control Point PC, select **System	Reconnect** from the AppCenter **System** menu.

Viewing AppCenter system status messages

System status messages are displayed in the AppCenter status bar. There are two types of system status messages, as follows:

- Channel status messages — In normal operation, this type of message displays the current operating status of the selected channel.
- System error messages — If a problem develops with the system software or a hardware subsystem, this type of message is displayed for approximately 5 seconds. Afterward, the display returns to the channel status message and the error message is written to the status log file. When a message is written to the status log, a *Status Icon* indicates the severity of the message.

Related Topics

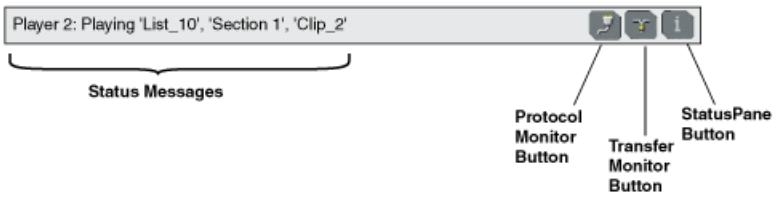
Troubleshooting problems

Troubleshooting problems

Troubleshooting problems

Status bar

System status messages appear in the AppCenter status bar, which is located across the bottom of the AppCenter window, and consists of a message area, several tool buttons, and a status icon. The button icons appear only when the related function is active. In the position of the StatusPane button, status icons appear.



The status bar displays information about the state of the delegated channel as well as low-level error messages. (High priority error messages are displayed in pop-up windows.)

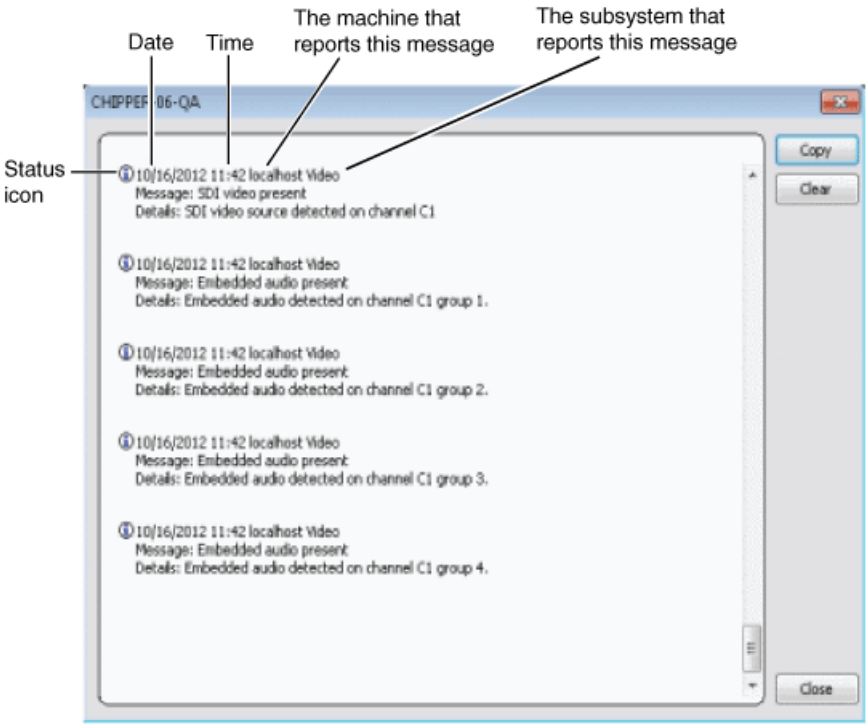
If you select a channel, a status message appears on the left-hand side of the status bar. If a potential error arises while an application is running in a channel, a status message flashes briefly on the left-hand side of the status bar, and an icon displays on the right-hand side. Double click on the icon to open the status pane to view a more detailed message about the channel's status.

The status icon changes depending on the status of the current status message.

Icon	Name	Description
	Information	A recent information message is present.
	Warning	There is at least one warning message, and no alert messages.
	Alert	There is at least one uncleared alert message.

Status pane

Current and previous system status messages can be viewed in the StatusPane. The system status pane also displays general information such as the video and audio settings on the channels. To open the StatusPane, click **Help | System Status**.



The StatusPane is used to view detailed system messages including status, warning, and error messages. System status messages provide status icons and a description of the status event reported by the message. If there is a problem, a corrective action is indicated. Use these messages along with troubleshooting problems to determine if a service procedure is necessary.

If you have a remote AppCenter Channel Suite with channels from multiple K2 systems, the messages from the different machines are combined in the StatusPane that you view from the Channel Suite. To help you determine which machine is generating a message, each message lists the machine name.

NOTE: If the Clear button is grayed out, you do not have the necessary privileges to perform this action, based on the type of user account with which you are currently logged on.

Related Topics

Passwords and security on Grass Valley systems on page 15

Copying StatusPane messages to the clip board

1. Select the message or messages in the StatusPane.
2. Click **Copy**.

After copying the message, it can be pasted using standard Windows techniques.

Clearing messages

Clearing messages from the StatusPane removes them from the logging database and the StatusPane. This also clears the state of the subsystem indicators so they no longer display the alert and warning symbols.

1. Open the StatusPane, then click **Clear**.
2. When a message prompts you to confirm, click **Yes**.

All messages are removed from the StatusPane and logging database.

Exporting log files

This topic describes how to export log files from the K2 Summit system. The log files include the following:

- All application and media database messages
- Version information
- Configuration file, from Configuration Manager

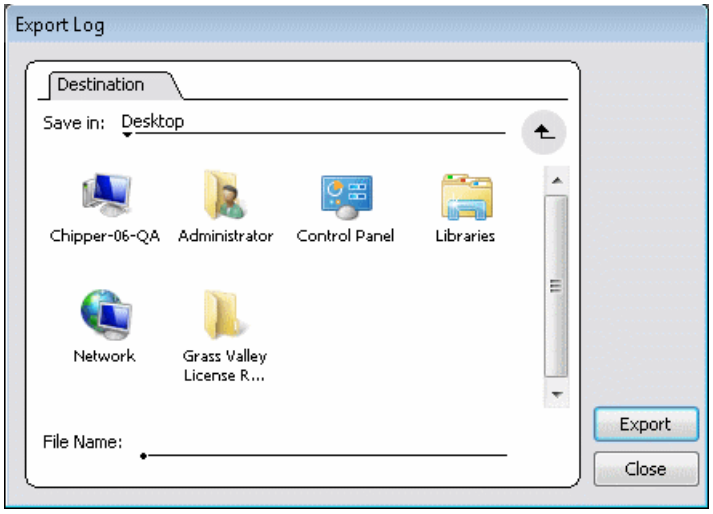
The exported files are combined in a ZIP file. The ZIP file can be sent to Grass Valley product support where they can analyze the logs to determine the operational status of your system.

NOTE: ExportLog does not export StatusPane messages. To capture StatusPane messages, you can copy StatusPane messages to the clip board.

1. Log in as Administrator.

2. Do one of the following to open the Export Log dialog box.
   - In AppCenter click **System | Export Log**.
   - From the Windows desktop, click **Start | All Programs | Grass Valley| Export logs**.
   - From the Windows desktop, click **Start | Run**, type `c:\profile\exportlog` in the Run dialog box, then click **OK**.

   The Export Log dialog box opens.



3. Browse to `C:\Logs` to save the log file.
4. Name the log file.
5. Click **Export**. A progress bar appears.
6. When the export process is complete, and message confirms success. Click **OK** and close the Export Log dialog box to continue.
7. Find the log file at the specified location.

Related Topics

Copying StatusPane messages to the clip board on page 66
Copying StatusPane messages to the clip board on page 66
Copying StatusPane messages to the clip board on page 66

Configuration Manager

The Configuration Manager is the primary configuration tool for a K2 Summit system. It makes settings that apply to the overall internal storage K2 Summit system as well as settings that apply to individual channels.

Configuration Manager settings are stored in a database. When the K2 Summit system starts up it reads the current settings from the database and configures itself accordingly. When you modify a setting in Configuration Manager you must save the setting in order to update the database and reconfigure the K2 Summit system.

You can also save settings out of Configuration Manager into a configuration file, which is a stand-alone XML file. Likewise, you can load settings into Configuration Manager from a configuration file. However, you must use Configuration Manager as the means to save the settings to the database before the settings actually take effect. Configuration files are not linked directly to the database.

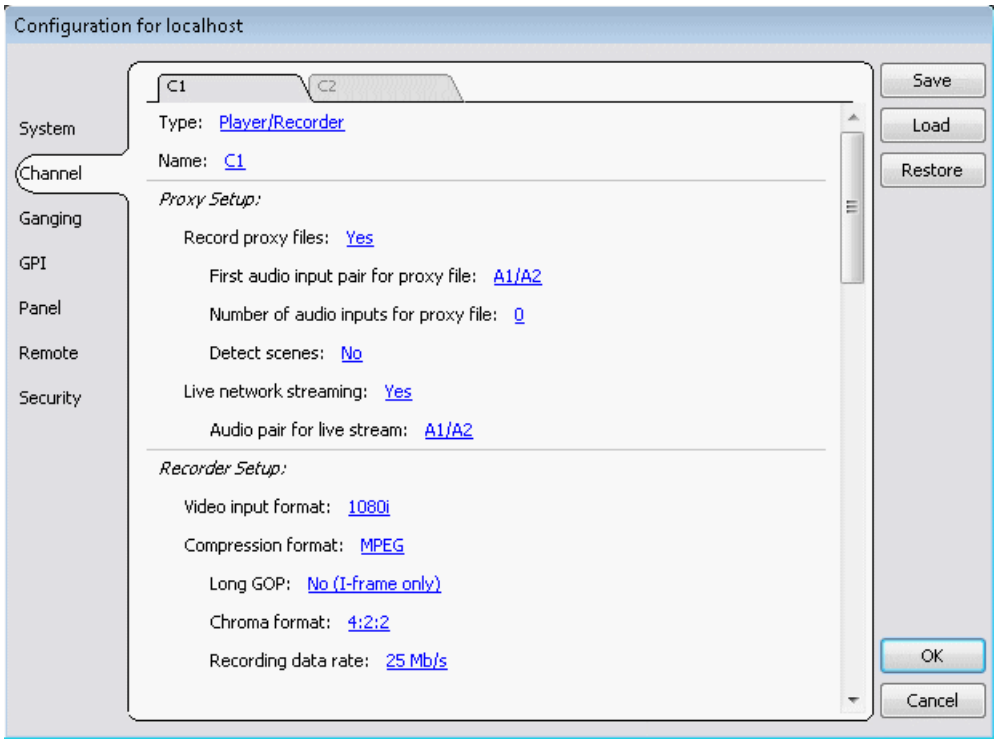
You can use configuration files as a means to back up your settings. You can also use configuration files to save several different groups of customized settings, each with a unique name, so that you can quickly load settings for specialized applications.

If you save a configuration file and then upgrade your K2 system software, there can be compatiblity issues. If the upgraded software version has new features, the saved configuration file might not be compatible.

Accessing Configuration Manager

You access Configuration Manager through the K2 AppCenter application from the local K2 Summit system or from the Control Point PC.

To access the configuration settings, open AppCenter and select **System | Configuration**.



Related Topics

Saving and restoring Configuration Manager settings on page 69
Passwords and security on Grass Valley systems on page 15

Saving and restoring Configuration Manager settings

Settings can be saved as a configuration file. You can save any number of uniquely named custom configuration files. You can load a configuration file to restore system settings.

To save custom settings:

1. In the Configuration Manager, click the **Save** button.

   The Save As dialog opens.
2. Use the up arrow or select folders to navigate to the folder in which you want to save the configuration file.
3. Enter a name for the configuration file.

   Do not name the file *Default*Config.xml, as this name is reserved for the factory default configuration file. Otherwise, standard Windows 10 file naming restrictions apply.
4. Click **Save** and **Close**.

To restore custom settings:

1. If you want to save current settings, you should save them as a configuration file before continuing.
2. In the Configuration Manager, click the **Load** button.

   The Open dialog opens.
3. Use the up arrow or select folders to navigate to the custom configuration file.
4. Select the custom configuration file.
5. Click **Open**.

   The custom settings are loaded into Configuration Manager, but they have not been saved and put into effect.
6. Click **OK** to save and apply settings, and to close the Configuration Manager.

Restoring default Configuration Manager settings

You can restore factory default settings as follows:

- Restore some individual settings or groups of settings by selecting the **Default** button which appears below the settings in the configuration screen.
- Restore all the settings in Configuration Manager at once to their default values as explained in the following procedure.

1. If you want to save current settings you should do so before proceeding.
2. In the Configuration Manager dialog, click **Restore**.

   The default settings are loaded into Configuration Manager, but they have not yet been saved and put into effect.
3. Click **OK** to save settings and close Configuration Manager.

Related Topics

Saving and restoring Configuration Manager settings on page 69

Storage Utility for standalone K2 Summit system

This manual explains Storage Utility for stand-alone K2 Summit system.

The Storage Utility is your primary access to the media file system, the media database, and the media disks of the K2 Summit system for configuration, maintenance, and repair. It is launched from the K2 AppCenter application.

⚠ ***CAUTION: Use the Storage Utility only as directed by a documented procedure or by Grass Valley Support. If used improperly, the Storage Utility can render your K2 system inoperable or result in the loss of all your media.***

NOTE: Do not use the MegaRAID utility on a K2 system. This utility is for use by qualified Grass Valley Service personnel only. When this utility is opened it scans the SCSI bus and interferes with record and play operations.

Accessing Storage Utility

Grass Valley strongly recommends that you access Storage Utility by selecting **System | Storage Utility** in AppCenter. However, if you are unable to access AppCenter, then open Storage Utility by clicking on the Storage Utility desktop icon.

For Storage Utility procedures for internal storage, refer to *K2 System Guide*.

NOTE: Use the Storage Utility only as directed by a documented procedure or by Grass Valley Support. If used improperly, the Storage Utility can render your K2 system inoperable or result in the loss of all your media.

About SiteConfig

SiteConfig is Grass Valley's tool for network configuration and software deployment. SiteConfig is a ProductFrame application. ProductFrame is an integrated platform of tools and product distribution processes for system installation and configuration.

You can use SiteConfig as a stand-alone tool for planning and system design, even before you have any devices installed or cabled. You can define networks, IP addresses, hostnames, interfaces, and other network parameters. You can add devices, group devices, and modify device roles in the system.

As you install and commission systems, SiteConfig runs on a designated PC. It discovers devices, configures their network settings, and manages host files. SiteConfig also manages software installations and upgrades and provides a unified software package with compatible versions for deployment across multi-product systems.

You should use SiteConfig for network configuration and software deployment at installation and throughout the life of the system in your facility. This enforces consistent policy and allows SiteConfig to keep a record of changes, which makes the system easier to maintain and aids in troubleshooting should a problem arise.

SiteConfig displays information from a system description file, which is an XML file.

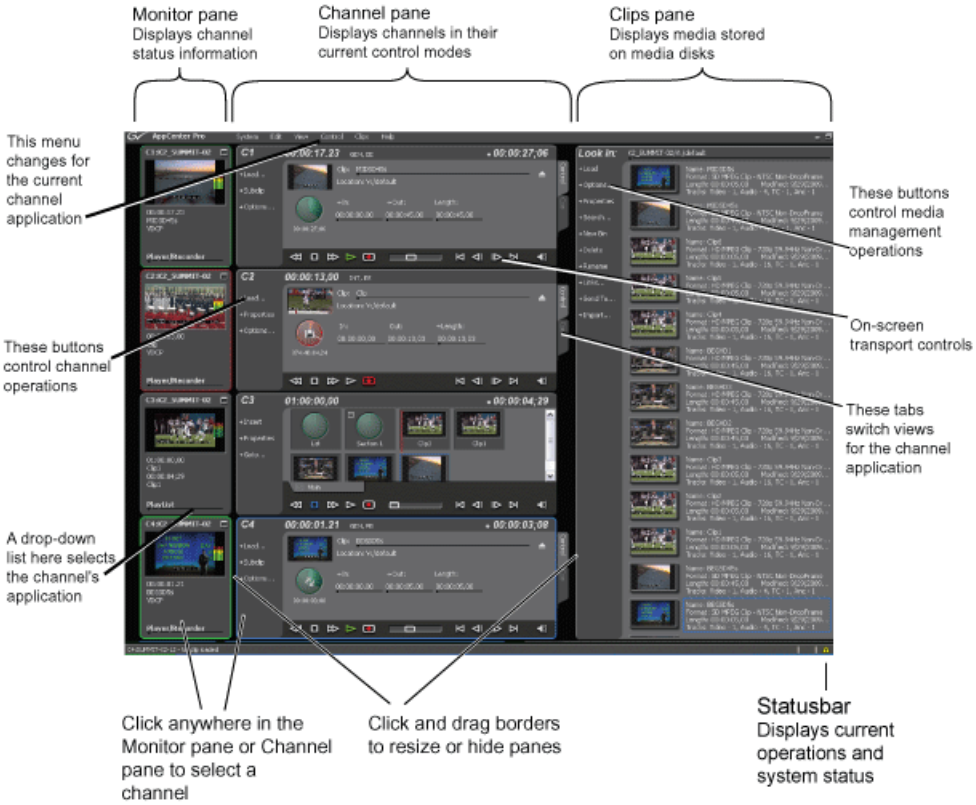
Using AppCenter

About AppCenter

AppCenter is the built-in video disk recorder and player application that provides a single interface for tasks such as channel control, configuration, clip management, media transfers, channel monitoring, and system monitoring.

You can access AppCenter using a network-connected PC with Control Point software or you can access it by connecting a VGA monitor, mouse, and keyboard to the K2 Summit system. To support live video, the VGA resolution must be 1024 x 768 x 32 or greater to support live (moving) video monitoring. If the monitor resolution is not adequate, AppCenter might limit the number of visible channels to three or less.

NOTE: If you are using the optional K2 TimeDelay application, see the K2 TimeDelay online help for information on using TimeDelay with AppCenter.



Main components in the AppCenter user interface

The following table describes the main components in the AppCenter window:

AppCenter Component	Description
Monitor pane	Displays the current information for the channel. Displays a thumbnail of the clip currently loaded in the channel and indicates the current control application for the channel. Shows EE or playback video. Contains a drop down menu for changing the channel's application. For the currently selected channel, the monitor pane has a white background.
Channel pane	Displays each channel in its current application. Only one channel can be selected at a time. The currently selected channel is displayed with a white background.
Clips pane	Displays media stored on the K2 Summit system and provides controls for media management.
Status Bar	Displays status and error messages, and includes tool buttons for opening Transfer Monitor, Status Pane, or the Protocol Monitor dialog box.

Playing channels in multi-view screen

- Select **View | Video Monitor** to fill the entire screen with a view of all four channels' monitor panes. This is useful when you want to monitor video from several different channels simultaneously.

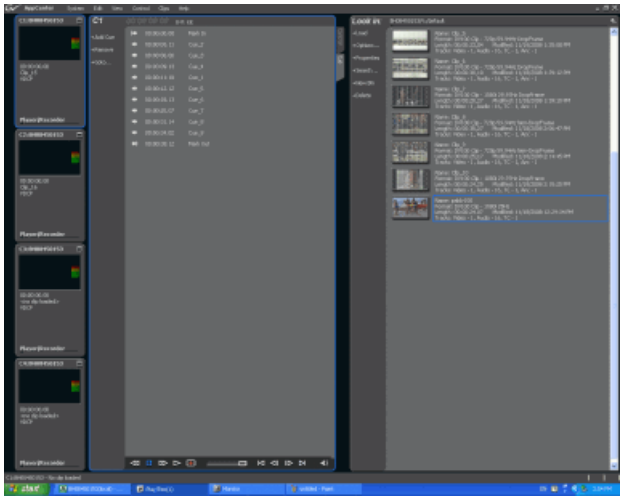
The VGA resolution must be at least 1024 x 768 x 32 to support live video. The multi-view video monitor option is only available on a local K2 Summit system; it is not accessible from a PC running Control Point software. It requires the Grass Valley AppCenter Pro application, which is separately licensed from the AppCenter application. For more information, consult your Grass Valley representative.

Related Topics

Displaying Super Out information on output/monitor on page 111

Playing the channel pane in full screen

- Select **View | Full screen** to fill the entire channel pane with only the selected channel. This is useful when you need more room to display information, such as a long series of clips in the text view of the player application.



- To return to split screen, select **View | Split screen**. If all channels cannot be displayed, a scrollbar appears on the left side of the pane. Scrolling in the channel monitor pane also applies to the control applications when viewed in Split Screen mode.

Tools in AppCenter

AppCenter includes the following tools for managing the K2 Summit system and its assets.

Tools	Essentials Tasks
Configuration Manager	Configuring system settings
Transfer Monitor	Monitoring media transfers, including network transfers and file import/export
Online Help	Complete documentation of operational tasks

Conventions used in the AppCenter interface

The following table describes the graphical conventions used for the user controls in the AppCenter interface. These graphical elements are used throughout the interface to indicate such items as drop-down lists and text entry controls.

	Convention	Graphical Description and User Action
❶	Drop-down list	A horizontal line and arrowhead. Select and choose from a list of items in the drop-down list.
❷	Context Menu	This menu changes depending on the application of the selected channel: player/recorder or playlist.
❸	Text Entry Control	A horizontal line and small dot. Select to open the text entry dialog box.
❹	Eject Button	Select to eject the current clip
❺	View Tabs	Select one tab or the other to toggle between different views in Player application or in Playlist application.
❻	Timecode Entry Control	A horizontal line and small dot. Select to open the timecode entry dialog box.
❼	Meter bar Button	Select to toggle between the Meter bar and the application interface. The Meter bar contains audio meters, and the audio level controls.
❽	Assignable Button Groups	Some button groups are assignable. Holding down a button opens a pop-up menu that lists the alternative button choices. This allows you to customize the user interface to suit your workflow.

Terms and concepts used in AppCenter

Assignable buttons – Some buttons are assignable, meaning you can change the order that buttons appear in some button groups to better suit your workflow. Holding down the left mouse button on an assignable button causes a pop-menu to appear that lists the alternative button choices for that button.

Bin – A bin is a container used to organize assets like clips and lists in the same way as directories or folders are used on a typical computer system. Bins can be nested inside other bins. A bin is associated with a single disk volume. The bins display in alphabetical order.

Channel application – Channels in AppCenter are always in one application or another. Each application has its own set of buttons, lists, controls, and other characteristics, relative to the operations performed in that application. The name of the application for the channel is displayed in the channel's monitor pane, which is also where you can change the application for the channel.

Clip thumbnail – Used for visual identification of a clip. By default, the thumbnail is generated from the 16th frame of video. You can select a new thumbnail using Player. If no thumbnail is available, an icon is displayed showing there is no thumbnail.

Current Bin – The current bin functions as the target bin when recording clips or creating playlists. It is also the source bin used to load clips and lists.

Selected channel – There is always one channel that is selected. When a channel is selected, the channel is displayed with a blue outline around the channel pane. The monitor pane has a red outline if recording and a green outline if playing a clip or playlist; if selected while the channel is inactive, the monitor pane is also outlined in blue. The keyboard is delegated to controlling the selected channel. To select the channel either select a channel in the monitor pane or press a keyboard shortcut. Changing the channel selection does not disrupt other channels, they continue to operate in the background.

Storage – The term "Storage" is used to refer to external, shared storage. Storage that is used with a stand-alone K2 Summit system will be specifically designated as "internal storage" or as "direct connect" storage, which is storage directly attached to the stand-alone.

Timecode – Timecode is displayed in hours:minutes:seconds:frames. However, the timecode syntax differs based on whether the video is drop frame or non-drop frame.

	First Field	Second Field
Non-drop frame	. (period)	: (colon)
Drop frame	, (comma)	; (semicolon)

For example, in drop frame timecode, a clip could start on 01:15:00,04 and end on 01:15:00;09.

Volume – The set of media drives that functions as a single physical disk.

Channels overview

A channel is a set of resources that together have the capability to record or play media. AppCenter channels have applications for performing tasks such as recording or playing. When AppCenter starts, each channel comes up in an application. There is always one channel selected in AppCenter. The title bar displays the selected channel's name and the control application running on it.

When a channel is selected, the control application that is using that channel is the active control application. To select a channel, click on the channel monitor pane or click the control application in the control applications pane. The selected channel can receive input from the keyboard. Selecting a channel does not affect processing on any of the other channels, which operate in the background.

In a channel suite, you can name a channel or change the order in which the channels appear in the AppCenter window.

Administrators can set user permissions for each channel. Depending on your security settings, you could be denied permission to operate a channel. For more information, see the *K2 System Guide*.

Channel suites

A channel suite is a collection of channels. If you are using AppCenter through a network-connected PC with Control Point software, the channels are accessed through a channel suite. Channel suites allow you to customize the channels to run particular applications or save the clips to specific locations. You can add channels from different sources to one channel suite. Each channel suite can have up to 16 channels.

NOTE: If you are running a* K2 Summit system *locally, you cannot use channel suites. You can only use the channels on that K2 system.

Channels in AppCenter

In AppCenter, the channels are labeled C1, C2, C3, C4 (for K2 Summit systems). Each channel is bidirectional, that is, you can designate the channel to any application available on the system. Once you designate a channel to run a specific application, the channel remains designated to the application until you change it. You can change the channel's application in the Channel monitor. ChannelFlex Suite functionality is configured in Configuration Manager.

Note: When you select **No** for I-picture only in the Channel Configuration Manager, the recording will be Long GOP. If you select **Yes** for I-picture only, the recording will be I-frame only.

Channel applications overview

AppCenter channels have applications for performing essential tasks. When AppCenter starts, each channel comes up in its last used application. You can change the channel application.

Selecting a channel application

1. In the monitor pane, select the channel application drop-down list Player/Recorder for the channel.
2. Choose an application.

The selected application replaces the current application and appears in the channel's space in the channel pane. The channel becomes the selected channel.

Available channel applications

AppCenter provides standard Playlist and Player/Recorder applications to run on a channel without any special licensing. TimeDelay, Event Monitor, ChannelFlex Suite and other licenses make additional channel applications available.

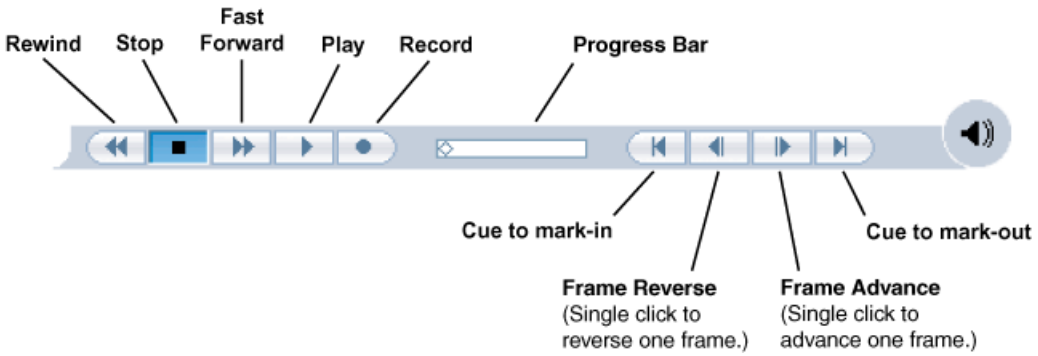
Remote protocol applications are configured on each channel under **Control | Options**. Standard remote protocol applications are AMP, BVW, VDCP. The Event Scheduler license enables the Event Monitor application.

Related Topics

Selecting a channel application on page 77
Configuring a channel for remote control on page 79

Using on-screen transport controls

When a channel is selected, the on-screen transport controls appear. All standard channel applications have on-screen transport controls.



Using remote protocols

You can control AppCenter using remote control devices and applications software developed for the K2 Summit system that use industry-standard serial or Ethernet control protocols. You can enable remote control mode from AppCenter.

Related Topics

About remote control protocols on page 356

About Event Scheduler support

When licensed for Event Scheduler, the Event Monitor application is available. This application is a monitor-only application that displays the list of events scheduled in Event Server for a channel. The events must be scheduled by another application.

Indicators and controls in Event Monitor are as follows:

black text	For an event whose time has passed (above the time cursor), this event has completed successfully. For an event in the future (below the time cursor), this event is not yet scheduled or pending.
red text	An error occurred when processing this event.
dashed red line	This is displayed over the event that is in progress.

blue text	This event is pending, on the timeline and ready to begin at the specified time.
expand/contract icon	This icon is displayed beside absolute events in the list. Use it to hide or show the events after it.

Configuring a channel for remote control

You can configure a channel for remote control either locally or through a network-connected Control Point PC. Operating remote control from AppCenter provides extended features that allow local and remote control at the same time.

You can select a remote protocol to use with individual channels.

To modify the remote protocol setting for a channel:

1. Click on the channel whose protocol you want to specify.
2. Select **Control | Options**. The Options dialog box displays.
3. If it is not already displayed, select the **Control** tab.
4. Select the desired protocol and remote settings, and click **OK**. If using VDCP protocol to control transfers, you must set up the video network and the *Controller ID*.

   NOTE: The protocol control port is pre-set and cannot be modified.

5. Test the system and recheck settings, if required.

Protocol Mode	Description
Local only	Allows you to monitor the record or play channel operations and view clip information locally only. There is no control from any external device.
Remote only	Allows you to monitor the record or play channel operations and view clip information only using remote protocol. All control comes from the external device. The buttons, menu items, and other interface controls are disabled. You can select this mode by choosing the Remote only option in the Options dialog box
Local and Remote	Allows you to control the record or play channel locally as well as remotely. You can select this mode by choosing Remote and Local in the Options dialog box.

Related Topics

Controlling transfers with VDCP

Recording Clips

About recording clips

The Player/Recorder application records clips in AppCenter. You can play the clip while it is still recording, or you can finish the recording, and then play the clip or add it to a playlist. In addition to recording clips, you can add cue points to clips and create new sub clips.

The Player/Recorder application requires a player/recorder channel. The application has two views — Control view and Cue view. The Control view allows you to record clips. The Cue view is used to add, remove, or rename cue points within a clip and create new subclips.

Select record channel signal inputs – Before you start recording, you might need to select video, audio, and timecode inputs.

Missing or intermittent timecode:

- If VITC, LTC or ANC is the selected timecode source and the signal is missing, the current timecode display shows XX:XX:XX:XX while the clip is being recorded. After the recording has finished, the clip is automatically re-striped starting from 0. Also, clips recorded without timecode will show no mark-in/mark-out timecode after recording.
- When VITC or LTC is detected, but the signal is intermittent, the display shows XX:XX:XX:XX any time the signal disappears. Clips with missing or intermittent timecode will show this behavior during playback in a play channel.
- If VITC or LTC is intermittent, try one of the following solutions:
  - Use the internal timecode generator as the timecode source for recording.
  - Stripe the timecode after the clip is recorded using the Recorder/Player application.

Re-recording and appending clips is not supported through the AppCenter – You cannot record over a previously recorded clip. To replace the unwanted clip, delete it and record a new one. Also, appending to previously recorded clips is not supported; once the recording is stopped, you cannot start the recording again using the same clip. If a clip is currently loaded when record is selected, the clip is ejected, and a new clip is created before recording begins.

NOTE: Appending to previously recorded clips is supported through AMP Serial Control Protocol. Contact Grass Valley for more information on control devices available.

No pre-roll time — Recording begins as soon as record is selected.

About continuous record mode

Continuous record allows you to specify a fixed-length recording that records continuously. When the fixed length you specify is reached, AppCenter begins to erase the oldest media in 3 minute segments to make room for new media. In this way, new media is continuously recorded while the recording is kept to a fixed length. (For very long continuous records, the segment size groups up to 15 minutes.)

The continuous recording is stored as a program. The program thumbnail is displayed in the Clips pane immediately after the recording starts. While recording, you can load the continuous record program in another Recorder/Player application for playout or to create subclips. The media referenced

by the subclips that you create is saved outside the continuous record program and does not subtract from the continuous record length. The subclips can be inserted in a Playlist application as play events.

NOTE: A program, such as a playlist, cannot be saved in AVI format.

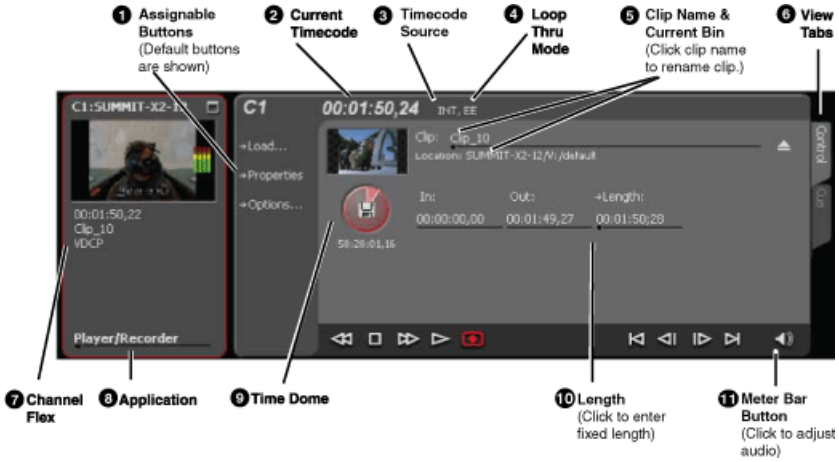
Continuous mode operational considerations

Consider the following when planning for Continuous Record operation:

- Maximum continuous record length– Maximum record length is limited by the amount of storage space and the compression settings used. If the fixed length you enter exceeds the available disk space, the fixed length is automatically adjusted to equal the available space.
- Modifying the continuous record name or length– You can modify the continuous record name or length during record. If you reduce record length, the oldest media outside the new record length is erased.
- Stopping continuous record– If the recording is stopped before the fixed length is reached, the resulting program duration is the time elapsed since the recording started. Like normal record mode, you cannot stop then start a continuous recording. Once record is stopped, you must eject the program and create a new continuous record.
- Transferring the continuous record program– The continuous record program cannot be transferred to a file or networked device until record is stopped.
- Continuous record storage space is not reserved– Continuous record is allowed to start as long as the record length you enter is less than the available storage; however, the storage space is not reserved. For example, you could have enough storage space to start the continuous record, but you are still allowed to transfer media or otherwise fill disk space. Warning messages are displayed in the AppCenter StatusBar when available storage reaches 10% total disk space. All recording is halted when media storage reaches its full threshold.
- Pausing the continuous record program in Recorder/Player application– You cannot pause the continuous record program in Recorder/Player application indefinitely. Eventually, the record length is reached and the video at the current position is erased. As this happens, the current position is advanced in 3 minute increments as the oldest unused media is erased.
- Changing thumbnail image– Thumbnail images displayed in the Clips pane are generated using the 16th frame of video. The thumbnail image for a continuous record program appears as normal until the fixed length is reached. Then, the thumbnail will update every 3 minutes as media is erased beginning with the oldest unused media. As the media used to generate thumbnails is erased, new thumbnails are generated.
- Erasing oldest media is suspended when creating a subclip– When creating subclips in Player application, erasing oldest media is suspended when the first mark is entered (mark-in or mark-out). This means that the continuous record program length could grow larger than the length specified. Erasing media is resumed and the oldest media outside the fixed length is purged when the second mark is entered and you select the Accept button. You could inadvertently fill storage space if you enter the subclip marks, but fail to click the Accept button. NOTE: Erasing oldest media is also resumed when you exit subclip mode by ejecting the subclip, or by clicking the Source Clip button.
- Use genlocked inputs for time delay– For error-free time delay operation, ensure that the video input is genlocked to the video reference signal. This will eliminate periodic picture shift.

Guide to using the Recorder/Player application: Control view

The following shows the basic controls in the Recorder/Player application found in AppCenter, which uses the Player/Recorder application to record a clip. The Player/Recorder channel is referred to as C1, C2, C3 or C4.



	Control	Description and User Operation
1	Assignable buttons	Assignable buttons allow you to modify the button assignments to best suit your workflow. Hold down a button to open a pop-up menu that lists the alternative button choices.
2	Current timecode	Indicates the current timecode of the timecode source selected for the channel. Text color is white during record, and dimmed at other times. The timecode value of XX:XX:XX:XX is displayed when the timecode source is not present or is invalid.
3	Timecode source	The text displayed to the right of current timecode indicates the timecode source.
4	Loop thru mode	This text indicates if “E-to-E (LoopThru) mode” is selected. See Record Menu below.
5	Clip Name Edit Control	Displays the clip’s name and location in the media storage system. To rename the clip, click and enter text. You can change the current bin. You can use the Clips pane to manage and organize clips.
6	View tabs	These tabs toggle between Control and Cue Points view.
7	ChannelFlex	If the channel is configured to be a ChannelFlex type, it is displayed in this area. ChannelFlex requires an AppCenter Elite license.

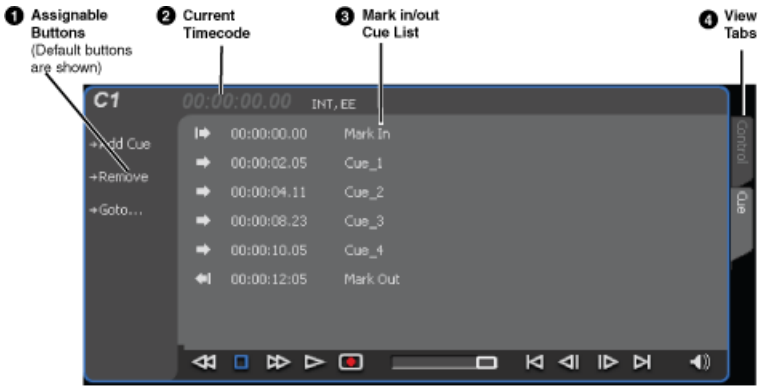
	Control	Description and User Operation
❽	Application	A drop-down list allows you to select between None, Playlist, Player/Recorder, or (if licensed for AppCenter Elite) addition selections. If the Player/Recorder application is selected, you can play or record using the pane controls.
❾	Time Dome	This multi-function indicator displays either record progress only, or available storage and record progress. The Time Dome also indicates when the record channel is in Continuous Record mode. Available storage is estimated using the amount of free disk space and the video compression settings for the channel. The record progress indicator makes one revolution every 10 seconds in normal record, or one revolution during a fixed length recording. You can change the Time Dome function by right-clicking on the Time Dome and choosing an application from the pop-up menu.
❿	Length	Select the Length control to enter the clip length, then choose record. Recording continues until you choose stop or the specified fixed length is reached.
⓫	Meter bar button	Displays the Meter bar, which contains the audio record level controls and signal meters. Changes to the audio level are saved for the channel.

Control	Description and User Operation
Recorder **Control** menu	**Load Clip** – Opens the Load Clip dialog box. (Only available on the SD-00 K2 Summit Production Client) **New Clip** – Used to create and name clip prior to starting the recording. If a clip is already loaded, selecting New Clip ejects the current clip and creates a new one. **Schedule Start Time** – Opens the Trigger At entry box so a start time can be entered. **Locate** – Locates the currently loaded clip in the Clips pane. **Properties** – Opens the Properties dialog for the currently loaded clip. **Auto Subclips**– The auto subclip check box changes the way that the subclip mode behaves. When it is NOT checked, clips have to be accepted manually. When it is checked, a subclip will be created as soon as you set a mark out. **Widescreen** – Sets the channel for recording widescreen format. (720p and 1080i clips are always recorded in widescreen, whether this is selected or not.) **E-to-E (LoopThru) mode** – When selected, the following occurs: “EE” is displayed on the channel pane, next to the Timecode Source indicator; when no clip is loaded, the signal that is currently present at the channel input is passed through; when a record operation stops the clip remains in the Recorder. The signal that is currently present at the channel input passes through (video, audio, and timecode).

Related Topics

Changing the timecode source on page 91
Changing the current bin on page 92
Using Fixed Length record mode on page 88

Guide to using the Recorder/Player application: Cue view



	Control	Description and User Operation
❶	Assignable Buttons	Assignable buttons allow you to modify the button assignments to best suit your workflow. Hold down the left mouse button to open a pop-up menu that lists the alternative button choices.
❷	Current Timecode	Indicates the current timecode of the timecode source selected for the channel. Text color is white during record, and dimmed at other times. The timecode value of *XX:XX:XX:XX* is displayed when the timecode source is not present or is invalid.
❸	Timecode Source	Indicates the mark in, mark out, and cue points of the recording session.
❹	View tabs	These tabs toggle between Control view and Cue Points view.
	Recorder Cue View **Control** Menu	In addition to commands described in the Assignable Buttons section, the Control menu of the Cue view contains the following option: **E-to-E mode** – When selected, the following occurs: "EE" is displayed on the channel pane, next to the Timecode Source indicator; when no clip is loaded, the signal that is currently present at the channel input plays out; when a record operation stops the clip remains in the Recorder. The signal that is currently present at the channel input plays out.

Before you record: Recorder settings checklist

Before recording, check the following recorder channel settings.

Record Channel Setting	Procedure
Verify video and audio input selection	In the monitor pane, check the thumbnail and its audio level indicators to verify the correct record channel inputs are selected. If there is a problem, correct the settings.
Verify video compression data rate. You can manage storage capacity and video quality by adjusting the record channel compression data rate. Generally set as high as possible to obtain the storage capacity needed.	Under the **System** menu, click **Configuration**.
Verify digital audio compression setting	Under the **System** menu, click **Configuration**.

Record Channel Setting	Procedure
Verify the timecode source. Make sure to select a valid timecode source. You can use the internal timecode generator, VITC, or LTC.	Refer to the procedure to change the timecode source.
Verify widescreen mode setting. This setting only applies to SD clips. If the SD video source is in widescreen format, select widescreen mode for the recorder. This attribute is saved with the clip. (720p and 1080i clips are always recorded in widescreen, whether this is selected or not.)	In AppCenter main menu, select the desired Player/Recorder channel, set the Control view tab, and select **Control | Options | Widescreen 16:9** to toggle widescreen mode. ***NOTE: The clip aspect ratio cannot be changed once the clip is recorded. If you want to change the clip's aspect ratio attribute you must re-record the clip.***
Adjust audio level (if needed). You can use the audio leveling feature to adjust the analog or digital audio input levels, excluding dolby encoded digital audio.	In the Recorder pane, select the **Meter bar** button. Adjust audio level using the graphical faders. Select the Meter bar button again to return to Recorder view.
Verify audio monitor settings. You can select which audio channels to monitor.	Select **Control | Options** and click the **Audio** tab.
Verify working bin. The clip is recorded to the currently configured working bin, regardless of the bin currently displayed in the Clips pane.	Select **Control | Options** and click the **Bin & AFD** tab.
Verify video compression settings. Choosing a video compression setting is a trade-off between image quality and storage capacity. Higher video quality produces larger files which take up more storage space and take longer to transfer to external devices.	Select **System | Configuration** to modify the video compression settings.

Related Topics

Changing the timecode source on page 91

To record a clip

Topics in this section provide instructions for recording a clip.

Using New Clip record mode

To create and name a clip before recording starts:

1. Verify video, audio, widescreen, and other settings for your recording.
2. Select **New Clip** to create and load a clip.
3. To rename the clip, select the default clip name Clip: Clip_1 Location:V:/default, then enter a new clip name.

   If a Multi-Cam channel, you can name both clips.
4. Select the record button on the onscreen transport controls.

   The recording progresses until you select **Stop**.

Related Topics

Before you record: Recorder settings checklist on page 85

Using Crash record mode

Crash record occurs when you start a recording without specifying a clip name. The clip is given a default name, then the recording continues until you select stop.

To crash record:

1. Verify video, audio, and other settings for your recording.
2. Select the record button on the onscreen transport controls.

   The recording progresses until you select **Stop**.

Related Topics

Before you record: Recorder settings checklist on page 85

Scheduling a recording

This feature is part of the licensable AppCenter Pro option.

You can schedule a recording to start at a specified time. Scheduled Start Time uses Time of Day timecode source, which can be driven by either the system clock or LTC. VITC or Anc VITC/LTC cannot be used to drive the Time of Day.

1. Select **Control | Schedule Start Time**.

   Trigger at entry box appears.
2. Enter the time when you want the recording to start and click **OK**.

   The time of day, trigger time, and a countdown are displayed.

Related Topics

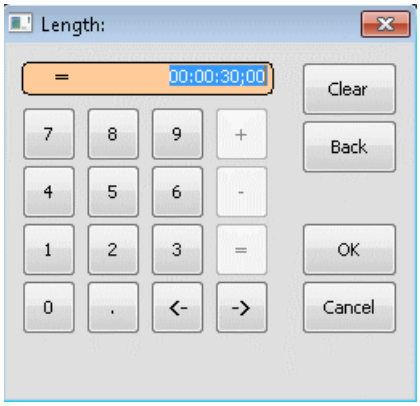
Scheduling a clip to play on page 102
To record a clip on page 87

Before you record: Recorder settings checklist on page 85

Using Fixed Length record mode

You can specify the clip length before recording, or during recording. As long as there is sufficient storage space, a fixed length recording continues until the clip length is reached or until you select stop.

1. Verify video, audio, and other settings for your recording.
2. Select **Length** in the Recorder pane.



   The Length dialog box appears.

3. Enter the clip length by typing only numbers, colons are added automatically.
4. Choose **OK** in the dialog box, or press **Enter**.
5. Select the record button on the onscreen transport controls.

Recording continues until **Stop** is selected or the desired length is reached. While recording, the mark in and mark out update with the current status of the clip. The Time Dome gives a visual indication of the percent complete as well as a countdown from the specified length down to **00:00:00:00**.

Related Topics

Before you record: Recorder settings checklist on page 85

Specifying clip length after recording has begun

While a clip is recording you can enter the clip length as follows:

1. Select **Length** in the Recorder pane.

   The timecode dialog box appears.

2. Enter the desired length, then select **OK** or **Enter**.

   If the entered length is valid, and longer than the amount of material already recorded, the clip continues to record until it reaches the specified length or until you select **Stop**.

Related Topics

Before you record: Recorder settings checklist on page 85

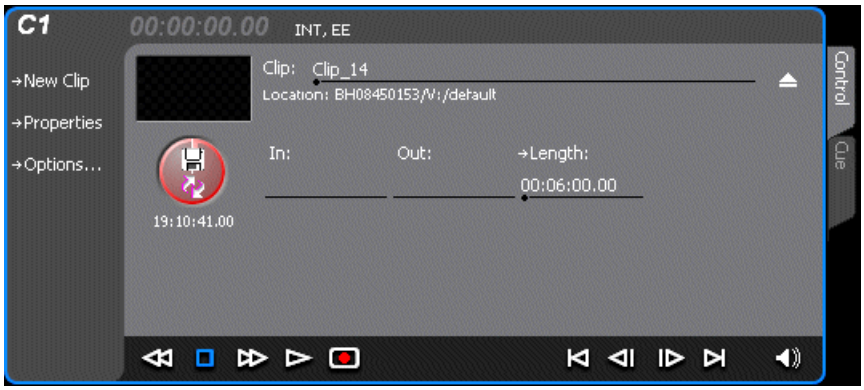
Using continuous record

You can configure Recorder for Continuous Record mode. Continuous record is useful for applications that normally use Continuous Record, for example a manual time delay.

1. Click the **Time Dome** button.

   The Time Dome pop-up menu appears.

2. Choose **Continuous Record** in the pop-up menu.



   The Time Dome changes to display continuous record.

3. Click **Length**.

   The Length dialog box appears.

4. Enter the clip length by typing only numbers, colons are added automatically.
5. Click **OK** in the dialog box, or press **Enter**.
6. Select the record button on the onscreen transport controls.

   Recording continues until **Stop** is selected. While recording, the mark in and mark out update with the current status of the clip. The Time Dome gives a visual indication record progress.

7. Load and play the clip in Player/Recorder application:

   - Drag and drop from the recording monitor pane to the playing monitor pane.

   The play channel becomes the selected channel, and the clip is cued and ready for play.

Related Topics

Before you record: Recorder settings checklist on page 85
About recording clips on page 80

Previewing a clip that is recording

Preview loads the currently recording clip into a play channel. The play channel becomes the selected channel, and the clip is cued and ready for play.

To preview a clip:

1. Start the record process.
2. Preview the clip:
   a) In the Monitor pane, use the drop-down list to select the Player application.
   b) Drag the clip thumbnail from the channel running the Recorder application to the channel running the Player application.

   The play channel becomes the selected channel, and the clip is cued and ready for play. If a play channel is already playing a clip, no warning message is displayed in the status bar.
3. To play the clip, select the onscreen transport controls. ▸

Using cue points while recording

Cue points enable you to move quickly from one frame to another in a clip. You can use cue points to manage clip play out or create subclips. You can add, remove, or rename cue points while a clip is being recording.

To add a cue to a clip while the clip is recording, you need to begin the recording while in Control mode. Once the recording has begun, you can switch to Cue mode and modify the clip with cue points.

Adding a cue point while recording

NOTE: While the clip is record mode, do not use the transport controls.

1. Select Player/Recorder from the application drop-down list.
2. Begin recording.
3. In the Record pane, click on the Cue tab. The Cue view displays.
4. Do one of the following:
   - Click the **Add Cue** button.
   - Select **Control | Add Cue**.

   A cue point is added to the cue list using a unique name, e.g. Cue_1.

Related Topics

To record a clip on page 87
Scheduling a recording on page 87
Scheduling a clip to play on page 102

Removing a cue point

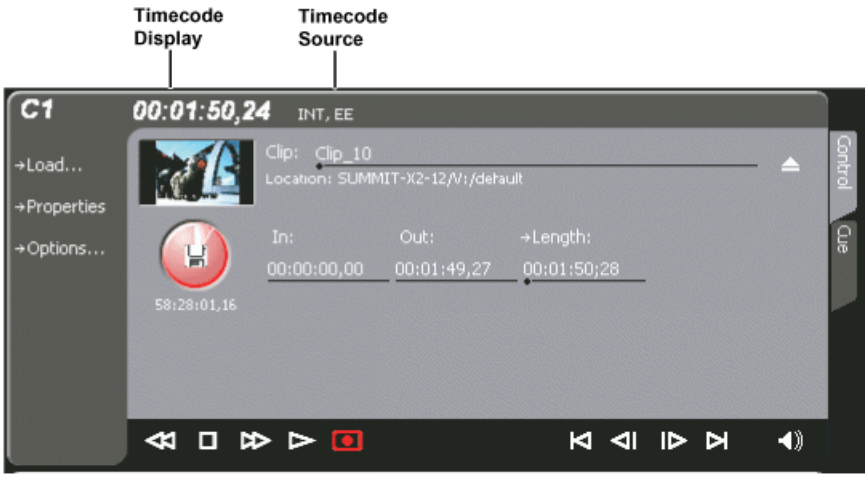
1. While recording, click on the Cue tab.

2. Select a cue point in the list.
3. Do one of the following:
   - Click the **Remove** button.
   - Select **Control | Remove**.

Renaming a cue point

1. While recording, click on the Cue tab.
2. In Cue view, select a cue point in the list.
3. Select **Control | Rename.**
4. Use the text entry dialog to enter a new cue name, then click **OK** or press **Enter**.

Changing the timecode source



To change the timecode source:

1. Click on the channel whose timecode you want to specify.
2. Select **Control | Options**. The Options dialog box displays.
3. **Timecode** tab.

4. Choose a timecode source, then click **OK**.

Timecode Source	Description
AncVITC	Available on HD channels only. Timecode is read from ancillary VITC.
VITC	Available on SD channels only. Timecode is read from the VITC input for the channel.
LTC	Available on HD/SD channels. Timecode is read from the LTC input for the channel.
AncLTC	Available on HD channels only. Timecode is read from ancillary LTC.
Time of Day	Available on HD or SD recordings. Time of Day is an internal generator. You can select either LTC feeds or Windows system clock as the clock source to drive the generator. LTC feeds can be from Channels 1, 2, 3, or 4.
Start Time	Available in HD or SD. When Start Time is selected, you can specify the timecode to use when the recording starts. The drop frame option is enabled when the system timing is set to the 525 line standard (NTSC). Drop frame timecode allows the generator to operate as an accurate clock.

Configuring the free run timecode setting

When you select this setting along with a timecode source setting, the K2 Summit system system ignores any dropouts or discontinuities in the incoming timecode after a recording starts. You must make this setting on each channel. It is not a global, system-wide setting.

1. Click on the channel whose timecode you want to specify.
2. Select **Control | Options**. The Options dialog box displays.
3. Select the **Timecode** tab.
4. Select the **Free run while recording** checkbox and then click **OK**.

Selecting widescreen mode

When recording SD video that is 16:9 aspect ratio, select the widescreen attribute. To change the Widescreen attribute, select **Control | Widescreen**.

The attribute is saved as part of the video media file. On up-conversion playout, the attribute is used by the Player/Recorder channel to handle aspect ratio on playout when the clip is played on K2 Summit system.

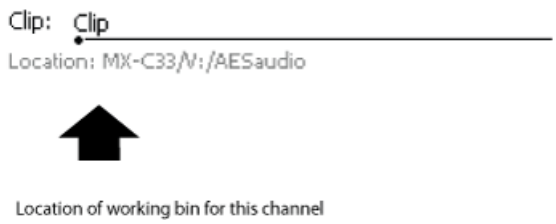
NOTE: AppCenter always records 720p and 1080i video in the 16:9 ratio, whether the widescreen attribute is selected or not.

Changing the current bin

On the K2 system, a fixed amount of disk space is reserved for storing media files— the V:\ partition. Within the V:\ disk partition, your clips and playlists are stored in *bins*, which function like directories in a file system. You can organize your media by creating and removing bins in AppCenter. You

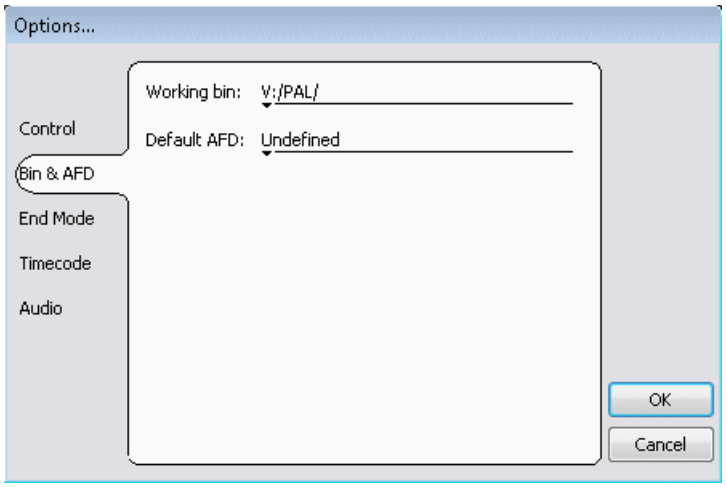
can have channels from multiple sources in one channel suite; the clips displayed are those on the source that has the currently selected channel.

When recording starts, the new clip is stored in the *current bin,* which is also referred to as a working bin. Each channel has its own working bin. You can change the current bin to determine where you want the clip stored. The current bin name is displayed under the clip name in the display.



NOTE: If you rename the working bin, the bin automatically becomes the default bin.

- Change the current bin by doing the following:
  a) Make sure the record channel is selected.
  b) Click the drop-down list showing the clip's location, choose a bin.
- You can also change the current bin by doing the following:
  a) From the main menu, select **Control | Options.**
  b) Click the Bin & AFD tab, then choose a bin from the list.



You can also change the working bin by loading a clip into a channel (for example, by using drag-and-drop) from a bin that is not the current working bin for that channel. The bin from which you loaded the clip then becomes that channel's working bin.

Related Topics

Applying AFD settings on page 173

Renaming a clip

You can rename a clip during or after recording.

To rename a clip:

1. Select the clip name control Clip: Clip_1 Location:V:/default in the Recorder application.
2. Enter the new clip name using the on-screen keyboard.
3. Click **OK**, or press **Enter**.

   If a clip with the new name already exists in the current bin, an error message is displayed.

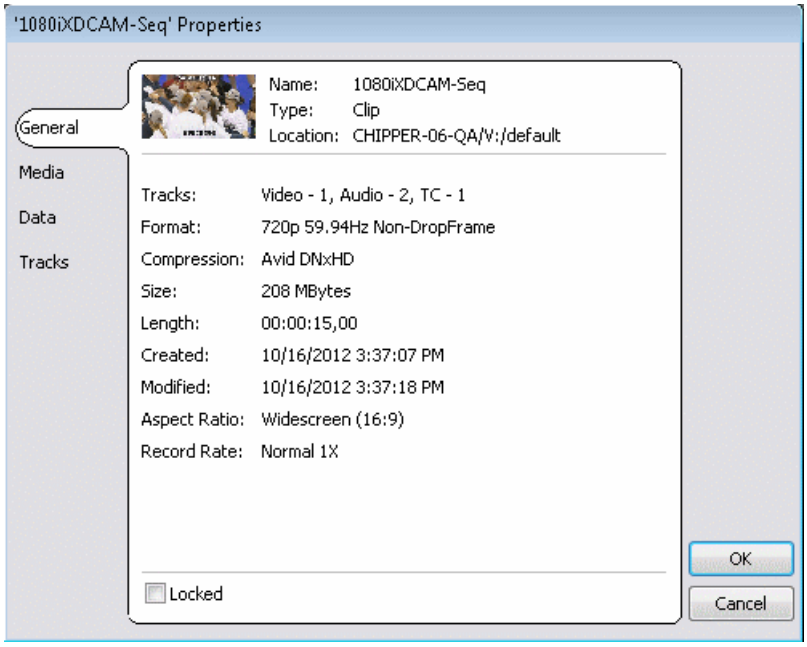
Viewing clip properties

You can view the properties of a clip loaded in the Recorder application.

In the Record application, do one of the following:

- Click the **Properties** button.
- Select **Control | Properties.**

  The Properties dialog box opens.



Locating a clip

You can locate the currently loaded clip by displaying the contents of the current bin in the Clips pane, as follows:

1. After or during recording, select **Control | Locate**.
2. The Clips pane displays the contents of the bin where the clip is located.

Displaying available storage space

In the Recorder pane, you can display available storage using the Time Dome. The available storage displayed is the storage on the K2 system accessed by the currently selected channel.

1. Select the **Time Dome** button.

   The Time Dome pop-up menu appears.

2. Choose **Available Storage** in the pop-up menu.

   The Time Dome changes to display available storage.

   Available storage displayed is based on the channel recording compression setting in the Configuration dialog box; an HD channel has less available storage than an SD channel. (To access the Configuration dialog box, select **System | Configuration**.) A filled Time Dome represents no storage remaining. Available storage is also displayed numerically under the Time Dome. The white line functions as a "sweep second hand" to show record progress. It sweeps through a complete revolution every 10 seconds when crash recording or makes a single revolution on a fixed length record.

Playing and editing clips

About playing clips

The information in this chapter describes how to play and edit clips recorded on K2 Summit system. You can play clips in a variety of ways including off-speed play and triggered by GPI. In addition to editing existing clips, you can create new clips using the subclip feature and add cue points to clips.

The Player/Recorder application allows you to play media stored on the K2 system, including clips and programs. The application requires a play channel and has two views— Control view and Cue view. The Control view allows you to play clips, trim clips, and create new subclips. The Cue view is used to add cue points within a clip. After adding cue points, you can use the cue list to start playback from any cue point in the list.

About Live Play (Chase Play)

With AppCenter Pro, you can record an event in one channel, drag the thumbnail into a play channel, and play the clip out while it is being recorded. This feature can also be controlled by the K2 Dyno™ Replay Controller. You can control the Live Play (Chase Play) as follows:

Control + L — The play channel plays **live**, playing the clip as it is recorded.

Spacebar — The play channel stops playing in Live Play mode.

Related Topics

Operational specifications on page 364

Working with clips that are still recording

The following restrictions apply when working with a clip in the Player application that is currently recording:

- You cannot rename the clip. (However, you can rename the clip in the recording channel or from the Media pane.)
- The clip mark-in/mark-out points cannot be modified.
- Subclips created from a clip currently being recorded can only have a Mark Out equal to the last frame that has been recorded when the subclip is created. You cannot create a clip longer than has been recorded under the assumption that the unrecorded frames will "fill it in."
- The length of the record-to-play delay depends on if the clip is in local storage or shared storage. Refer to the "Operational Specifications" section for media file system performance specifications.

Otherwise, clips that are currently being recorded behave normally. As a reminder, "Read-Only" is displayed in the Player application when the clip loaded or playing is still being recorded.

Related Topics

Operational specifications on page 364

Playing a playlist saved as a program

Playlists can be loaded and played in the Player or Playlist applications. You can also save a playlist as a program and then play it in the Player application. A program includes all the media in the playlist but does not include any event that breaks the flow of playout, such as a pause or a transition. When a program is loaded in the Player application, it is handled in the same way as a simple clip.

Related Topics

Saving a list as a program on page 132

Selecting the Player application in AppCenter

The Player application requires a single play channel. If the play channel is currently being used in another application, such as a Playlist application, you can use the following steps to select the Player application. Selecting the Player application causes the play channel operation to stop, then the Player application is started.

To start the Player application on a play channel:

In the monitor pane, select the control mode drop-down list for the play channel, then choose **Player**.

The channel switches to the Player application and becomes the selected channel.

Guide to using Player: Control view

The Control view allows you to play a clip, modify its name, adjust mark in and mark out points, create sub-clips, and stripe timecode. Selecting the **Control** view tab shows the Control view. The following describes the essential controls in the Control view.

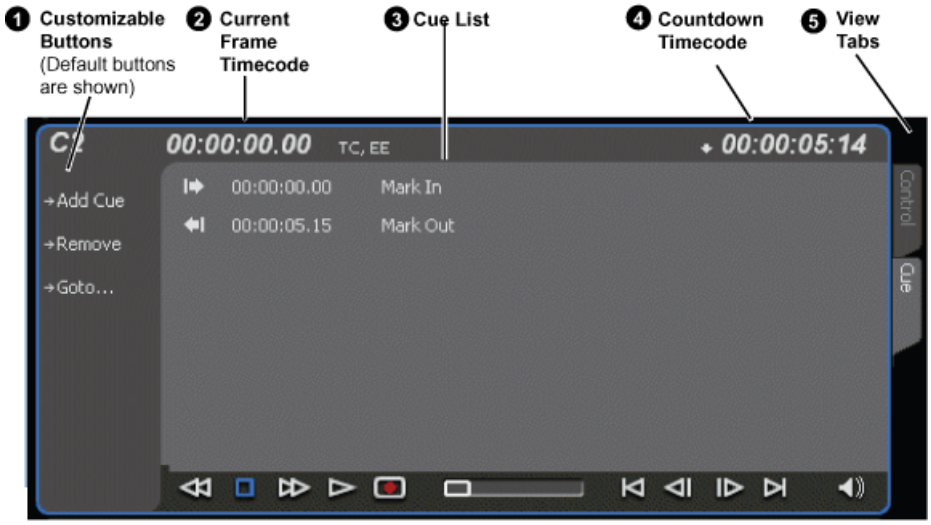
	Control	Description and User Operation
1	Assignable Buttons	Assignable buttons allow you to modify the button assignments to best suit your workflow. Hold down a button to open a pop-up menu that lists the alternative button choices. The Subclip button toggles between the Source Clip and Subclip settings.
2	Clip Timecode	Indicates the recorded timecode of the current frame being played. The timecode value of *XX:XX:XX:XX* is displayed when there is no recorded timecode.Stop mode is indicated by TC (recorded timecode) or Gen (zero-based, internal generated timecode).
3	Clip Name & Current Bin	Displays the clip's name and location in the video storage file system. To rename the clip, click the Clip Name, then enter a new name.
4	Countdown Timecode	Displays the time remaining in the clip .
5	View tabs	These tabs toggle between Control and Cue views. Control is used for playing and editing of clips. During playback, you can use the Cue view to add cue points so that you can quickly cue a clip to a frame.
6	ChannelFlex	If the channel is configured to be a ChannelFlex type, it is displayed in this area. ChannelFlex requires AppCenter Elite license.

	Control	Description and User Operation
❼	Application	A drop-down list allows you to select between none, Playlist, Player/Recorder, or additional selections if licensed for AppCenter Elite. If the Player/Recorder application is selected, you can play or record using the pane controls.
❽	Thumbnail	Used to visually identify the clip. By default, the thumbnail is generated using the 16th frame of video. To change the thumbnail, position the clip to the desired frame, then click the thumbnail.
❾	Time Dome	This multi-function control displays play progress, or play progress with media marks which shows the relative position of mark-in/mark-out points in the clip. The timecode underneath indicates play time remaining. The Time Dome is also used to enable loop play. Select the Time Dome, then use the pop-up menu to choose the display mode or to control loop play mode.
	Play Progress	
	Media marks	
	Loop playback	
❿	Set Mark-in and Set Mark-out	These buttons are used to set new mark-in or mark-out points. Position the clip to the desired frame, then click the In or Out buttons. Unused media is not deleted. To clear a mark, click the button, then choose yes in the pop-up dialog box. Marks are reset to the beginning or end of available media.
⓫	Meter bar Button	Displays the Meter bar, which contains the audio play level controls and signal meters. Click Save to save changes made to the clip audio level. Click Unity to return the audio levels to the last saved level. Click Mute to mute/unmute the audio.

Control	Description and User Operation
Player Menu - Control view	**Load** – Select to open the Load Clip dialog box, which displays the contents of the current bin. Select a clip, then choose OK to load. **New Clip** – Used to create and name a clip prior to starting the recording. If a clip is already loaded, selecting New Clip ejects the current clip and creates a new one. **Subclip** – Opens the Subclip mode, which allows you to create subclips from the currently loaded clip. A subclip is an entirely new clip that references media in another clip. **Goto** – Used to jump to a specific timecode. Select Goto, to open the Goto dialog box, then enter an absolute or relative timecode value, or use the scrub bar to go to the desired position. **Schedule Start Time** – Opens the Trigger At entry box so a start time can be entered. **Stripe Timecode** – Opens the Stripe Timecode dialog box, which allows you to replace the existing timecode track for the loaded clip. You can replace with time of day, or a specific start timecode. **Locate** – Finds the location of the selected clip. **Properties** – Opens the Properties dialog box for the currently loaded clip. **Auto Subclips** – The auto subclip check box changes the way that the subclip mode behaves. When it is NOT checked, clips have to be accepted manually. When it is checked, a subclip is created as soon as the user sets a mark out. **E-to-E (LoopThru) mode** – When selected, the following occurs: “EE” is displayed on the channel pane, next to the Timecode Source indicator; when no clip is loaded, the signal that is currently present at the channel input plays out; when a record operation stops the clip remains in the Recorder. The signal that is currently present at the channel input plays out. **Widescreen** – Sets the channel for recording widescreen format. **Options** – Opens the Options dialog for the currently loaded clip.

Guide to using Player: Cue view

The Player application Cue view is used to add cue points to the clip. The Cue view allows you to set, modify, and jump to cue points on the loaded clip. Clicking the **Cue** tab displays the Cue view. The following describes the basic controls in the Cue view.



	Control	Description and User Operation
❶	Assignable Buttons	Assignable buttons allow you to modify the button assignments to best suit your workflow. Hold down a button to open a pop-up menu that lists the alternative button choices.
❷	Current Frame Timecode	Indicates the recorded timecode of the current frame being played. The timecode value of *XX:XX:XX:XX* is displayed when there is no recorded timecode.
❸	Cue List	Displays a list of cue points that are set for the loaded clip. Cue points are listed in chronological order beginning with the mark-in point and ending with the mark-out point.
❹	Countdown Timecode	Displays the time remaining in the clip. To select the countdown mode you want to monitor, open the Options dialog box by selecting Options in the context menu.
❺	View tabs	These tabs toggle between Control view and Cue Points view.

Control	Description and User Operation
Player Menu	**Add Cue** – Used to add a cue to a clip: In the Control view, start the clip playing. Select the Cue tab. At the desired timecode, select Control | Add Cue. **Remove** – Used to remove a cue. **Rename** – Used to rename a cue. **Create Clip** – Creates a sub clip from highlighted cue points. **Create All** – Creates sub clips from all cue points. **Cue Selection** – Cues the first selected cue point for playback showing a still frame of video for the cue point. **E-to-E (LoopThru) mode** – When selected, the following occurs: "EE" is displayed on the channel pane, next to the Timecode Source indicator; when no clip is loaded, the signal that is currently present at the channel input plays out; when a record operation stops the clip remains in the Recorder. The signal that is currently present at the channel input plays out.

Loading media for playout

You can load clips or programs in the play display for playout.

NOTE: Loading a clip from a bin into a play channel changes the working bin for that channel.

Loading clips from the clips pane

1. Select a play channel by clicking in the channel's monitor pane.
2. Locate the clip in the clips pane. If necessary, change bins by clicking the current bin control and selecting from the drop-down list.
3. Load the clip in one of the following ways:
   - Drag the clip from the clips pane into the play channel.
   - Choose the **Load** button in the clips pane, then select the clip.
   - Double-click on the clip.
   - Select the clip, then press **Enter** on the keyboard.

Loading a clip from the Player application

1. Select a play channel by clicking in the channel's monitor pane.
2. Open the Load Clip dialog using one of the following:
   - Click the **Load** button in Player.
   - Select **Control | Load**.
3. If needed, use the **Look in** drop-down list to browse to the desired bin.

4. Select a clip in the Load Clip dialog, then click **OK**.

   The clip is loaded in the player.

Related Topics

Using cue points for playback on page 103
Playing a clip on page 102

Playing a clip

Once a clip is loaded in the Player application, you can play the clip or search for a specific frame of video using the transport controls.

Scheduling a clip to play

This feature is part of the licensable AppCenter Pro option.

You can schedule a clip to start playing at a specified time. Scheduled Start Time uses Time of Day driven by the system clock or LTC.

1. Select **Control | Schedule Start Time**.

   Trigger At entry box appears.

2. Enter the time when you want the recording to start and click **OK**.

   The time of day, trigger time, and a countdown are displayed.

Related Topics

Scheduling a recording on page 87
To record a clip on page 87

Selecting loop play

Loop play allows the clip to play in a continuous loop until **Stop** is pressed. The Time Dome is used to enable/disable loop play.

- Click the **Time Dome** button , then choose **Loop Mode** in the pop-up menu.

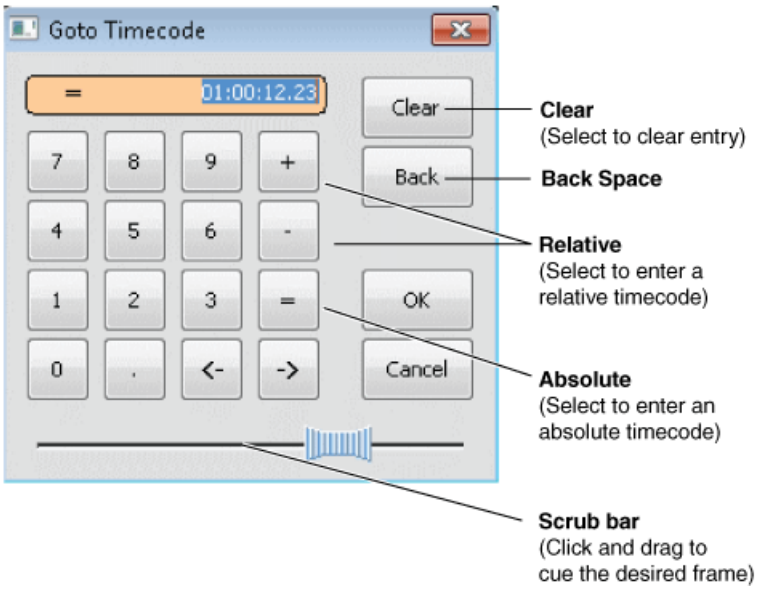
Jumping to a specific timecode

The Goto dialog box allows the player application to jump to the specific clip timecode that you enter. You can enter an absolute timecode value based on recorded timecode, or a relative timecode value, that is, cue the video to a point +/- some value relative the current frame. If you don't know the timecode value of the frame you want, you can click and drag the scrub bar to shuttle to the desired frame.

To jump to a specific timecode:

1. With a clip loaded in the Player application, do one of the following:
   - Click the **Goto** button.
   - Select **Control | Goto**.

   The Goto Timecode dialog box appears.



2. Perform one of the following:
   - Enter a **relative** timecode value, select the '+' or '-' key, enter timecode, then click **OK**.
   - Enter an **absolute** timecode value, select the '=' key, enter timecode, then click **OK**.
   - Click and drag the scrub bar to cue the desired frame.

Related Topics

Loading a clip from the Player application on page 101
Playing a clip on page 102
Loading clips from the clips pane on page 101

Using cue points for playback

Cue view allows you to add cue points to a clip. You can use cue points to manage clip play out or create subclips. The following sections describe how to work with cue points.

About using cue points

When you select Cue view, a chronological list of cue points is displayed. The list begins with the mark-in point and ends with the mark-out point. You can add additional cue points to mark other frames within the clip. You can add cue points while the clip is playing or in stop mode. When you add a cue point, it is listed by a default name (such as "cue_1") and timecode value.

Cue points cannot be moved; however, you can remove a cue point and use the transport controls, or Goto Timecode dialog box to enter a new cue point at the current position.

Cue points can be used to:

- **Manage clip playout** – Jumps to the selected cue or next cue.
- **Create subclips** – You can create a subclip from the selected cue point. The selected cue point becomes the mark-in point, while the mark-out point is the same as the source clip. If more than one cue point is selected, a subclip is created using the first and last cue points.

When working with cue points, keep these considerations in mind:

- **Cue points are retained when a clip is copied or transferred (GXF or Streams)** – With using GXF or streams, cue points are stored with the clip. All the cue points of the original clip are retained when the clip is copied or transferred to another server. Cue points are not retained for other file transfers.
- **Cue points and trimming** – After you trim a clip by moving the mark-in or mark-out points, the cue points outside the new mark-in and mark-out points are cleared and must be reinserted.
- **Cue points and subclips** – Subclips created from a clip with cue points retain all cue points that fall between the marks of the new subclip. The subclip has its own mark in and mark out points.
- **Cue points and programs** – Cue points cannot be added to a program.

Related Topics

Creating subclips in Cue view on page 110

Viewing the cue list

1. Select a play channel by clicking in the channel's monitor pane.
2. Select the Cue tab.

   The Cue view appears showing the cue list for the clip loaded in the Player application. Initially, only the mark-in and mark-out cue points are listed.

Adding a cue point

While the clip is playing or in the stop mode, use the transport controls to find the desired frame in the clip, then do one of the following:

- Click the **Add Cue** button.
- Select **Control | Add Cue**.

A cue point is added to the cue list using a unique name, e.g. Cue_1. Using the preview feature, you can play and add cue points to a clip while it is still being recorded.

Related Topics

Adding a cue point while recording on page 90

Removing a cue point

1. In Cue view, select a cue point in the list.

2. Do one of the following:
   - Click the **Remove** button.
   - Select **Control | Remove**.

Jump to the selected cue point

Use the following steps to jump to the selected cue point.

1. In Cue view, select a cue point in the list.
   a) Click the **Goto** button, then select **Selection**.
2. Press the **Play** button on the onscreen transport controls.

   Playout starts from the cued frame.

Jump to the next cue point

Use the following steps to jump to the next cue point. Depending on the current play position, the clip will cue to the next cue point in the clip.

1. In Cue view, click the **Goto** button, then select **Next Cue**.
2. Press the **Play** button on the onscreen transport controls.

   Playout starts from the cued frame.

Renaming a cue point

1. In Cue view, select a cue point in the list.
2. Select **Control | Rename.**
3. Use the text entry dialog to enter a new cue name, then click **OK** or press **Enter**.

Editing a clip

Topics in this section describe the process of editing a clip.

Moving clip mark-in/mark-out points

Every clip has a mark-in point and a mark-out point that refer to the first and last frames displayed when the clip is played. When first recorded, clip marks are set to the beginning and end of available media. You can edit the clip marks in order to reference only the desired media. When clip marks are moved, the unused media is not *deleted.* Clearing the marks resets them to the first and last frames of the recorded clip.

NOTE: If the source media has been erased, the subclip retains 1 second of media on each side of the mark-in and mark-out points.

The following restrictions apply when editing clip marks:

- Mark-in must precede the mark-out
- Marks cannot be set outside the recorded media

- Marks cannot be changed on a clip that is still being recorded.

NOTE: If more media exists after the current mark, a <<< or >>> symbol is displayed beneath the In/Out timecode. To permanently remove media outside the marks, refer to "Erasing a clip's unused media" under Managing Clip Media.

To move clip marks, load the clip in player, then use one of the following methods.

- Moving clip marks: Using the In/Out buttons
- Moving clip marks: Using the timecode entry controls
- Moving clip marks: Using the clip length control

Related Topics

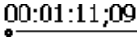
Clearing mark-in/mark-out points on page 106

Erasing a clip's unused media on page 146

Moving clip marks: Using the In/Out buttons

1. Use the transport controls to locate the desired frame.
2. In Control view, click the **In** button to set mark-in point, or click the **Out** button to set mark-out point.
3. In the Confirm Mark Change window, click **Yes**.

Moving clip marks: Using the timecode entry controls

1. In Control view, select the mark-in or mark-out timecode control  to open the timecode entry dialog box.
2. Enter a timecode value, then click **OK** or press **Enter**.

   Alternatively: Use the current position scrub bar in the timecode entry dialog box to locate the desired frame, then select **OK**.

Moving clip marks: Using the clip length control

Entering a new clip length moves the mark-out point.

1. Click the **Length** timecode entry control.
2. Enter a new clip length and click **OK**.

   The clip length changes by moving the mark-out point.

Clearing mark-in/mark-out points

Clearing a mark point resets the mark to its default position — mark-in is set to the beginning of available media; mark-out is set to the last frame of available media.

To clear a mark point, do one of the following:

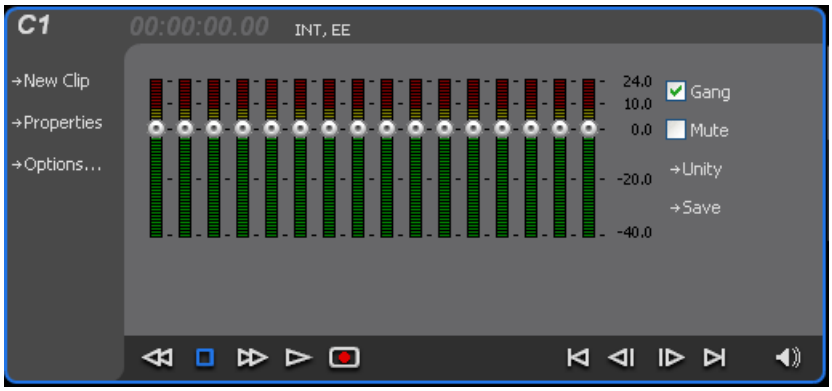
- In Play view, click and hold the **In** or **Out** button, then choose **Clear Mark** in the pop-up menu.
- In Play view, select the mark-in or the mark-out timecode control and click **Clear**, then **OK** to clear the mark.

Adjusting clip audio level

The audio meter display provides audio level adjustment for clips loaded in the player display. Saved audio levels are used every time the clip is loaded and played. Unsaved changes are lost when the clip is ejected.

To adjust audio level:

1. In the Player application, click the Meter bar button.
2. Adjust the audio level in one of the following ways:
   - Adjust the graphical faders individually or "ganged," which ensures all channels use the same gain.
   - Click **Unity** to set audio back to the last saved level.



3. Click **Save** to save changes to the clip audio level.
4. Click **Mute** to mute or unmute the clip audio level.
5. Click the Meter bar button again to return to the Player application.

Changing the clip thumbnail image

The clip thumbnail is displayed in AppCenter for visual identification of the clip. By default, the 16th frame is used to generate the thumbnail image.

To change the clip thumbnail:

1. While monitoring the play channel output, use the onscreen transport controls to position the clip to the desired video frame.
2. In Player, click on the thumbnail, then select **Yes** in the Change Thumbnail dialog box.

   NOTE: If clip marks are edited so that the video frame used to generate the thumbnail is outside the new clip marks, the thumbnail is reset to a position near the mark-in of the modified clip.

To reset the thumbnail:

- Select the thumbnail image, then choose **Reset** in the pop-up menu.

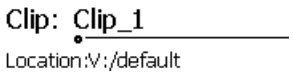
  This resets the clip thumbnail to the 16th frame in the clip.

Striping timecode (replacing the timecode track)

The stripe timecode dialog allows you to overwrite the existing timecode track for the loaded clip. You can replace the recorded timecode with time of day, or a specific start timecode value.

1. Load the clip in the play channel.
2. In Control view, select **Control | Stripe Timecode**. The Stripe Timecode dialog box opens.
3. Specify the replacement timecode:
   - **Time of Day** – The new timecode track will start with the current time of day and will contain continuous values ranging from the current time of day plus the length of the clip.
   - **Fixed Time** – After choosing this option, select the timecode entry control, and enter a start timecode value. The new timecode track will contain continuous values ranging from the specified starting value to the starting value plus the length of the clip.
   - **Drop frame** – The drop frame option is available when system timing is set to 525 line standard (drop frame is a timecode adjustment that applies to NTSC video only). Drop frame allows the timecode track to indicate the actual running time of the clip. Drop-frame time code yields precise running times, but frames are not all numbered sequentially. A frame number must be dropped periodically to keep the clock right.

Renaming a clip in the Player application



1. In the Control view, select the clip name control.
2. Enter the new clip name.
3. Click **OK**, or press **Enter**.

Creating Subclips

A subclip is a clip created by referencing a portion of media from another clip. For example, if you recorded a two hour clip, you could create several short subclips to use as previews or advertisements. Each subclip refers to a small portion of the original clip and is listed along with all other clips in the clips pane. When working with subclips, the original clip is sometimes called the *source clip*. After creating subclips, you can delete the source clip.

Subclips created from a clip that is still recording can only have a mark-out equal to the last frame that has been recorded when the subclip is created. You cannot create a subclip longer than what has been recorded with the assumption the media will “fill in”. You can create subclips from a clip being recorded in loop record mode. In loop record mode, media referenced by the subclips is retained while unreferenced media is discarded.

You can load subclips in the Control view and edit the mark-in/mark-out points the same as a clip, provided the unreferenced source media has not been erased.

NOTE:

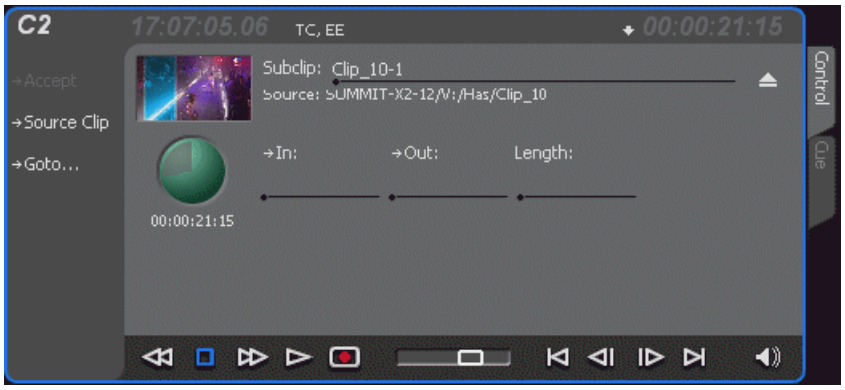
If the source media has been erased, the subclip retains 1 second of media on each side of the mark-in and mark-out points.

Related Topics

Moving clip mark-in/mark-out points on page 105

To create subclips

1. Load a clip in the player.
2. In the Player Control view, click the **Subclip** button.



The Subclip display appears with a new subclip loaded. The **In** and **Out** buttons are flashing indicating no mark-in or mark-out points are defined. The default subclip name follows the form *<source clip name>-<number>*, for example, if the source clip name is *PlayoffGame*, the subclip name is *PlayoffGame-1*.

3. To rename the subclip, click the subclip name control Subclip: PlayoffGame, and enter the new name in the Clip Name dialog, then click **OK**, or press **Enter**.

   Renaming the subclip creates a new seed name. For example, if you rename the subclip *PlayoffGame-1* to *Highlight*, subsequent subclips created are named *Highlight-1*, *Highlight-2*, and so on.

4. Enter the subclip marks as follows:
   a) Using the transport controls, position the clip to the desired frame for mark-in, then click the **In** button.
   b) Using the transport controls, position the clip to the desired frame for mark-out, then click the **Out** button.

   Alternatively: Select the mark-in or mark-out timecode entry controls and enter a specific timecode value.

   Alternatively: Select the **Length** timecode entry control and enter a clip length, then create either a mark-in or a mark-out point. If the source media has been erased, the subclip retains 1 second of media on each side of the mark-in and mark-out points.

   NOTE: Until you enter the subclip marks, the Accept button is grayed out.

5. In Subclip view, click **Accept**.

   The subclip is saved and ejected, then Player returns to Subclip view with a new subclip name loaded.

   NOTE: Clicking the Source Clip button or the Eject button prior to pressing the Accept button closes Subclip mode without creating a new clip. Both of these buttons are used to exit Subclip mode.

Related Topics

Moving clip mark-in/mark-out points on page 105

About Auto Subclip mode

In Auto-Subclip mode, you simply set mark-in, then set mark-out. On setting mark-out, the subclip is **automatically generated and ejected**, and a new subclip name is loaded in the Subclip display.

Auto Subclip mode is useful when you want to create subclips while a source clip is playing. You simply load a clip, press play, then create subclips by selecting In, Out, In, Out, etc.

To enable Auto Subclip mode:

- In the Player application Control view, click **Control | Auto Subclips**.

Creating subclips in Cue view

In Cue view, you can automatically create a subclip from a selected cue point. The selected cue point becomes the mark-in point, while the mark-out point is the same as the source clip. If more than one cue point is selected, a subclip is created using the first and last cue points. This feature allows you to manage the media of interest as a separate clip rather than media between cue points in a clip. For example, once you've made a subclip, it can be added to a playlist.

By default, subclips generated from the cue list are given names of the format *<clip name>-<first cue name>*. For example, a subclip generated from a cue point named "cue_1" in a clip named "MyClip" is named "MyClip-cue_1". If a clip already exists with this name, you are prompted to enter a unique name.

To create a subclip from media between two selected cue points:

1. Select two cue points in the cue point list.
2. Click **Control | Create Clip**.

To create a subclip using a selected cue point as mark-in:

1. Select the cue point to use as the mark-in for the new clip.
2. Click **Control | Create Clip**.

   The subclip is terminated by the source clip mark-out point.

To create a subclip for all cue points:

1. Click **Control | Create All**.

In some cases, a progress dialog is displayed as the clips are generated.

Each subclip is terminated using the mark-out of the source clip.

Viewing clip properties

To view the properties of a clip loaded in Player, do one of the following:

- Click the **Properties** button.
- Select **Control | Properties.**

Viewing clip options

Clip options allow you to choose which audio channels to monitor.

To view the options of a clip loaded in Player:

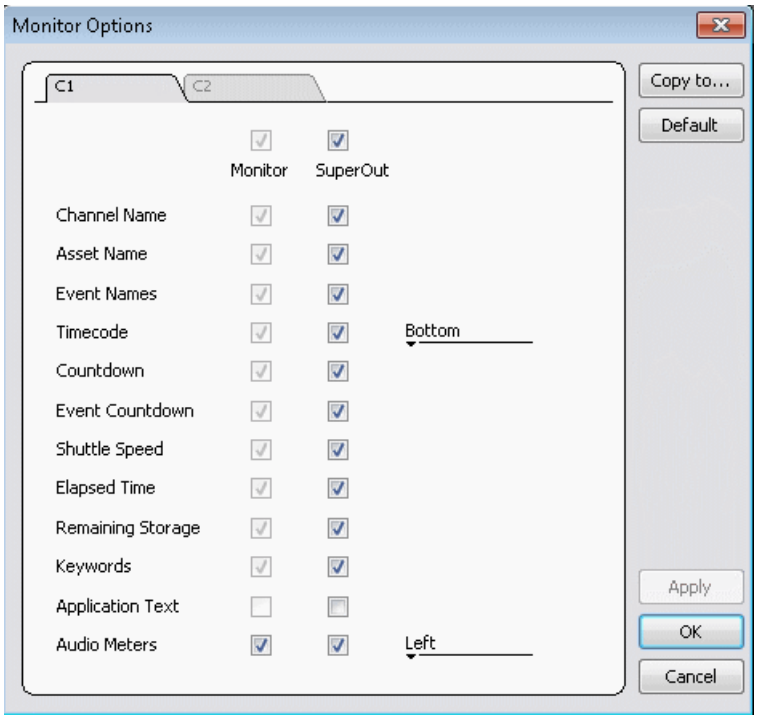
- Select **Control | Options.**

Displaying Super Out information on output/monitor

If licensed for AppCenter Pro or Elite, you can display information on a channel's SDI OUT2 signal and on the VGA video monitor.

1. Click **System | Monitor Options**.

   The Monitor Options dialog box opens.



2. Select the tab for the channel that plays the video with the information you are displaying.

3. Do one or both of the following:
   - To display information on the VGA video monitor for the channel, select the checkbox above **Monitor**.
   - To display information on the channel's SDI OUT2, select the checkbox above **SuperOut**.
4. Select the checkbox for each type of information you are displaying.
5. From the drop-down list, select the location to display the information.
6. Configure other channels as follows:
   - To configure other channels with the same settings as the current channel, click **Copy to**.
   - To configure other channels with their own settings, repeat previous steps as appropriate.
7. When fully configured, click **OK** to apply settings and close.

Working with playlists

Introducing the Playlist application

In addition to playing a single clip, AppCenter play channels can also play lists that contain clips and programs stored on the K2 system.

The following table summarizes the basic features supported in playlist application.

Basic Feature	Description
Editing playlists	Events in a playlist can be rearranged or removed, and new events added between existing ones.
Editing events in the list	Events can be renamed and trimmed. Trimming an event moves the mark-in and mark-out points. This only affects the event, not the source clip.
Event transitions	Transitions between all events in a list are made by a cut, i.e. the last frame of an event is followed by the first frame of the next event.
Loop on a section	Sections are provided within the list to provide flexibility during playout. A section can be set up to loop indefinitely. The section can be taken out of the loop by manual intervention.
Loop on a list	Lists can be set up to loop indefinitely. The list can be taken out of the loop by manual intervention.
Pause at the end of events	Events can pause playout at their end. At event pauses, you can choose to show black, freeze on last frame, or freeze on next event.
Pause at the end of sections	Sections can pause playout at their end. At section pauses, you can choose to show black, freeze on last frame, or freeze on next event.

Basic Feature	Description
Saving a playlist as a program	Playlists can be saved as a program. This saves the media and transitions, but nothing that breaks the flow of playout, such as pauses. You can insert a program into a playlist, or play a program in the standard Player application.
GPI output triggers	AppCenter provides 12 GPI output signals through a rear panel connector for controlling external equipment. You can configure events in a playlist to trigger GPI outputs. A GPI trigger does not disrupt playout of the play events. GPI triggers can be set to occur at the beginning or end of an event or section, or at these points with some offset.
GPI Input triggers	You can assign any of the 12 GPI inputs to control one or more play channels and the action you want the AppCenter channel(s) to take—play, VAR play, cue next event, or cue next section, etc. AppCenter includes more extensive GPI output trigger features.

Before using Playlist application

Read the following sections before using Playlist application.

Terms used in Playlist application

The following terms are used in the Playlist application.

Term	Definition
Playlist	A list is a sequence of events.
Event	Events are the components that make up a list. Events are created by adding a clip or program to sections in a list.
Section	Playlists created in AppCenter contain at least one section. All events in a playlist are contained in sections. Sections have properties that include repeat and pause. A playlist can have up to 100 sections. Each section can contain up to 1000 events.
Source Clip	The clip inserted in a list to create a play event.
Program	Playlists can be saved as a program in the K2 system. Programs created from a playlist include all the media and transitions in the playlist, but nothing that breaks the flow of playout, such as a pause at the end of an event. Programs are also created from the continuous record mode.

Symbols used in Playlist application

The following table describes the symbols used to describe the properties of items in the list— play events, sections, and the list itself.

Symbol	Description
	Locked: The item is locked and cannot be edited.
	Pause: At the end of playout, this item will cause playout to pause.
	Loop: At the end of playout, the item will repeat.
	GPI Output Trigger: This event or section triggers one or more GPI outputs.

Working with programs

A program is a clip generated from a playlist using the **Save As Program** feature in the Playlist application. A program includes all the media in the playlist, but does not include any event that breaks the flow of playout such as a pauses between events. You can insert programs into other playlists as an event, or load and play them using the standard Player application. You can also send a program to a file or a video network stream.

Related Topics

Importing and exporting streaming media on page 164

Using mixed aspect ratios in a playlist

AppCenter can play clips with different aspect ratios in a single playlist.

The AppCenter supports playout of mixed format clips displayed with default or selectable modes such as bars, crop, or stretch on both SD and HD outputs.

Refer to specifications about how the system displays mixed aspect ratios.

Related Topics

Aspect ratio conversions on HD K2 client on page 372

Using mixed video resolutions in a single playlist

Playlists can contain events with different video resolutions. When the list is played, the media is converted as needed to match the play channel video output type selected.

Inserting a clip that is still recording

Clips that are currently recording behave as other clips do in a list except for the following restriction: the event-out timecode is set to the last recorded frame at the time the clip is inserted. You can move the event-out timecode as needed while the clip is still recording or after record is stopped.

Improving performance while modifying a playlist

If you are making multiple changes to a playlist, especially a long playlist, you can improve response time by playing the list while editing it. This allows you to add/remove/modify events without waiting for database updates, since changes to the playlist are not saved until playout stops.

Inserting a playlist in a playlist (workarounds)

While AppCenter does not support a true “nested” playlist, you can retain some of the functionality of inserting a playlist in a playlist in the following ways.

- Save the list as a program, then insert it into another playlist as an event.
- Use multi-item select and copy/paste.
- Copy/paste events or sections within the same list or from other lists.
- Copy the list in the Clips pane, then load and edit the list.

Selecting Playlist application

The Playlist application requires a single play channel. If a play channel is currently being used by another application, you can select the Playlist application. Selecting the Playlist application causes the current application to exit when Playlist application is started.

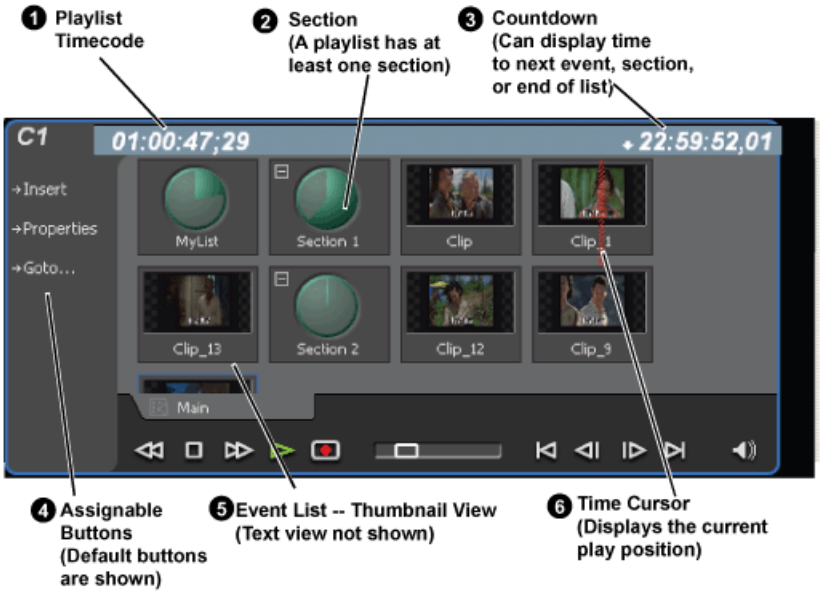
To start Playlist application on a play channel, in the channel’s monitor pane, select the application drop-down list and choose **Playlist**. The channel switches to Playlist application and becomes the selected channel.

Changing the channel application in AppCenter to Playlist switches the working bin to the bin displayed in the Clips pane rather than the bin specified for that channel. This behavior is also observed if you have the working bin set to one bin but load a clip from another bin onto the channel.

Guide to using Playlist application

Playlist allows you to manage a list— insert, move, or modify events, and to control playout of the list. You can also select the type of display for the asset list– text view, or thumbnail view. The following describes the basic controls.

List in thumbnail mode



	Control	Description and User Operation
1	Playlist Timecode	Though each play event contains the timecode information from its source clip, the timecode for the list is generated internally. This timecode can be an offset from a specific timecode (the default is 01:00:00;00).
2	Section (Text View) Section (Thumbnail View)	A list has at least one section, but can have up to 100. All events belong to a section, and each section can have up to 1000 events. In Thumbnail View, the section is displayed as a Time Dome which shows the amount of the section that has played. An empty Time Dome indicates the section has not started to play. Sections can be expanded or collapsed to reveal or hide the events that belong to the section. Expanded sections are indicated by a '-' symbol.
3	Countdown Timecode	Displays the time to the next event, section or end of the list.
4	Assignable Buttons	Assignable buttons allow you to modify the buttons located in the Playlist toolbar to best suit your workflow. Holding down a button opens the button pop-up menu that lists the alternative button choices.

	Control	Description and User Operation
❺	Event List	The Event List contains play events. Play events are created from clips or programs that can be added to the list in two ways: drag and drop from the Clips pane or using the Insert button in the Clips pane. By default, play events added to a list inherit the source clip's name, but you can rename events. Play events and sections can be configured to trigger GPI outputs. GPI triggers can be set to occur when the event or section starts, ends, or at these points plus or minus some offset. A GPI trigger does not disrupt playout of the play events that follow it. You can view the Event List in either the text view or thumbnail view. Thumbnail view displays clip thumbnails along with Time Domes for the list play progress, and section play progress. To change the view, select Options in the Playlist menu.
❻	Time Cursor	The time cursor indicates the current play position. The time cursor is displayed over the event currently being played.

Control	Description and User Operation
Playlist Menu	**Insert Event** — Opens the Insert Event dialog box, which allows you to insert all event types. **Add Section** — Adds a section to the end of the list. Once you add the section, you can move it. **New List** — Opens the New List dialog box where you can choose the current bin and specify the new list name before creating it. When a new list is created, the current list is ejected and the new list is created containing one section and no events. **Open List** — Closes the current list and allows you to open an existing list. **Eject List** — Ejects the current list. **Import List** — Imports a text file and saves it in a playlist format. **Rename List** — Rename the list currently loaded in Playlist application. **Save As Program** – Saves the current list as a program. The new program is listed in the Clips pane with other assets. Programs can be played using the Player application, or inserted in a list in Playlist application. **Set Event In** – Used to change the in point of the event. Event In/Out changes do not affect the source clip's mark in and out values, but only the event's marks used by the Playlist. **Set Event Out** – Used to change the out point of the event. Event In/Out changes do not affect the source clip's mark in and out values, but only the event's marks used by the Playlist. **Split event** — Used to break one event into two events of the same name. **Combine events** — Used to combine two events into one in a playlist. **Locate** – Locates the list or source clip for an event, depending on the selection, in the Clips pane. **Properties** – Opens the properties dialog box for the selected item— list, section, or play event. Properties dialog box includes pages for setting up list timecode, adding metadata, and setting list attributes that will occur when playback reaches the end of the list. Options include repeat, or pause. Section properties and event properties dialog boxes include options for setting the end behavior— repeat or pause, and GPI output properties. **Move Up** – Moves the selected event up in the list. **Move Down** – Moves the selected event down in the list. **Goto** – Opens the Goto pop-up menu which allows you to jump to selection, next event, next section, or a timecode that you specify. **Options** – Opens the Options dialog box which allows you to choose the list monitoring information displayed in the Playlist application and the monitor pane.

Related Topics

Selecting Text or Thumbnail view on page 119

Selecting Text or Thumbnail view

The event list has two viewing modes: Thumbnail view and Text view. Thumbnail view displays events as thumbnails along with the section and the list time domes. The text view lists events descriptions in text format. You can select which event attributes are displayed in text view.

Use the following steps to select the view mode best for you:

1. Select **Playlist | Options**.

   The Options dialog box appears with the View settings tab selected.

2. Select a view mode:

   - **Text View** - displays events in text form including an event icon, name and an additional attribute selectable using the **Show** drop-down list. Show attributes are: **Duration**, **Name only**, **Start time**, or **Start time and duration**.
   - **Thumbnail View** - displays events in thumbnail form along with the event name.

3. Click **OK** to save settings and close the Options dialog box.

Selecting monitor information

You can select the monitoring information displayed for the list. The selections you make determine the list attributes that are displayed in the following locations:

- **List information displayed in the monitor pane** - List information is displayed under the thumbnail in the monitor pane. You can select the list attributes displayed in the monitor pane.
- **Countdown timecode displayed in the Playlist toolbar** - The countdown timer can count down to the next section, the next event, or the end of list.

To select the monitor mode:

1. Select **Playlist | Options**.

   The Options dialog box appears.

2. Click the **Monitor** tab.

   The Monitor settings page appears.

3. Select one of the monitor information options.
4. Click **OK** to save settings and close the Options dialog box.

Creating a simple playlist

When Playlist application is started, an empty channel pane displays “No List”. You must create a new list. The first list is by default labeled “List”; new lists are named “List_n”, where n is the first

number that results in a unique file name. You cannot eject a list. Instead, create a new list or open an existing playlist.

1. Do one of the following:
   - To create a new list, select **Playlist | New List**.

     The New List dialog box is displayed.
   - For an existing playlist, click the Insert button and select an event.
2. Select the bin where you want to store the list, edit the default name for the new list, then click **OK**.

   NOTE: Make sure you do not violate asset naming limitations.

The current list closes and the new list is created containing one section and no events.

Related Topics

Limitations for creating and naming assets and bins on page 384

Inserting media in a playlist

A new list contains one section and no events. Events are played in the order they are inserted. You can move events in the list up or down, or insert new events between existing ones by selecting the insertion point.

Selecting the insertion point in a playlist

- When using the **Insert** button or menu item, the insertion point is after the currently selected event.
- When using the drag and drop method, you see a drop cursor as you drag the event over the list. The drop cursor indicates where the new event will be inserted.

NOTE: The time cursor only indicates the current play position, and cannot be selected and moved. Selecting and dragging may inadvertently select and move the event.

Inserting events

To insert a play event, do one of the following:

- Drag and drop assets from the Clips pane using the drop cursor to locate the insertion point.
- Drag and drop from the monitor pane of a play channel. Select the thumbnail or video image, then drag to the playlist channel. Use the drop cursor to locate the insertion point.
- Double-click an asset in the Clips pane. The asset is inserted in the list after the insertion point.
- Select an event in the list as the insert point, then select one or more assets in the Clips pane. Click **Insert** in the Clips pane to insert the event after the insert point.
- Select an event in the list as the insert point, then click **Insert** in the Playlist channel, and select one or more assets in the Insert Event dialog box. Click **OK** to insert the events.
- In the Insert Event dialog box you can click on the **Event Name** text entry control and type the name of a clip. This selects the clip for insertion into the playlist. With this method it is no longer necessary to browse to the clip in order to select it.

- Press CTRL + N to open a text entry dialog in which you can type the name of a clip. This selects the clip for insertion into the playlist.

Using copy and paste to insert play events

Any asset that can be selected can be placed on the clipboard and pasted into another application that accepts that type of asset. For example, you can copy a play event from the Playlist application on one play channel and paste it into the Playlist application on another play channel. You can also copy a clip from the Clips pane and paste it into the Playlist application.

The Cut, Copy, and Paste operations are performed by using the AppCenter's Edit menu, by using the standard keyboard shortcuts (CTRL+C, CTRL+X, CTRL+V), or by using the right-click menus of cut, copy and paste.

- To insert an asset from the Clips pane using the clipboard:
  a) In the Clips pane, select one or more assets.
  b) Copy the assets to the clip board.
  c) Select an insertion point in the list.
  d) Paste the asset from the clipboard into the list.
- To use the clipboard to move or copy events already in a play list:
  a) Select the event(s) you wish to move or duplicate.
  b) Copy or Cut the selection to the clipboard.
  c) Select the new insertion point in the list.
  d) Paste the event(s) from the clipboard into the list.

Combining events in a playlist

To combine two or more events in a playlist into one event, follow these steps:

1. Highlight all events. A blue line is visible around all the highlighted events.
2. From the file menu, select **Playlist | Combine events**. The events are now combined under the name of the first event in the selection.

   NOTE: The individual assets are not combined, merely the events in the playlist.

Splitting an event in a playlist

To split an event into two events, follow these steps:

1. Highlight the event. A blue line is visible around the highlighted event.
2. Play the event to the point where you want to split it.
3. From the file menu, select **Playlist | Split events**. The event is now split into two events of the same name. You can rename or delete one event without affecting the other.

   NOTE: The asset is not split and renamed, merely the event.

Playing a list

Once the list is complete, you can open it, play it, and eject it as described in the following sections.

Opening a playlist

If you want to open the same playlist simultaneously on multiple channels, the channels must be running on the same K2 Summit system, otherwise, a “Failed to open…” message is displayed.

To open a list, do the following:

1. Select **Playlist | Open List**.

   The Open List dialog box appears.

2. Locate and select the list you want to open, then click **Open**.

   Before the list is opened, the currently loaded list is closed. In Playlist application there is no eject button, so you can open an existing list or create a new list without manually closing the currently loaded list.

   NOTE: If a playlist has been locked, you cannot open it.

Playing a playlist

You can perform the following operations to play a playlist using the AppCenter user interface. You can also use the keyboard shortcuts for all transport controls.

To...	Do this...
Begin playing at the top of the list	Open the list, then press the **Play** button on the onscreen transport controls.
Continue playout after a pause in the list	Press the **Play** button on the onscreen transport controls.
Play the specified timecode	Select **Goto**, and then choose **Timecode** in the Goto pop-up menu. Specify a timecode in the dialog box and click **OK**.
Play the next event	Select **Goto**, and then choose **Next Event** in the Goto pop-up menu.
Play the next section	Select **Goto**, and then choose **Next Section** in the Goto pop-up menu.
Play an event or section	First, select the event or section, then click **Goto**, and choose **Selection** in the Goto pop-up menu. Then press the **Play** button on the onscreen transport controls.
Avoid delays when jumping to a new event or section	First select the new event or section, then wait until the diamond or standby icon is filled in before jumping to the new event or section.

Playlists always play the default audio tracks, even when named mapping is in place.

Ejecting a playlist

To eject a list, do the following:

Select **Playlist | Eject List**.

The list is ejected from the Playlist channel.

Editing and rearranging events in a playlist

The following topics explain how to edit and rearrange events in a playlist.

Editing event marks

You cannot edit events while the list is playing. Every event has a event-in point and an event-out point that refer to the first and last frames displayed when the event plays. When first created, event marks are set to the mark-in and mark-out of the source clip. You can edit the event marks in order to reference only the desired media.

The following restrictions apply when editing event marks:

- Event-in must precede the Event-out.
- Event marks cannot be set outside the recorded media of the source clip.

NOTE: If more media exists outside the current mark, a <<< or >>> symbol is displayed beneath the current event mark timecode.

Setting the Event In/Out marks

To move clip marks:

1. Use the transport controls to locate the desired frame.
2. Select **Playlist | Set Event In** to set mark-in point or **Playlist | Set Event Out** to set mark-out point. The Confirm Marks dialog box opens.
3. Click **Yes** to accept the edited mark.

Modifying the Event In/Out marks

To modify event marks:

1. Select the event you are modifying.
2. Open the properties dialog box by doing one of the following:
   - Select **Playlist | Properties**.
   - Click the **Properties** button.
3. Click the **General** tab.
4. Select the Event In, Event Out, or Length edit control and do one of the following:
   - To modify marks, enter the timecode value to specify mark locations.
   - To clear marks, click the **Clear** button or delete the timecode value.

5. Click **OK**.

Moving events

To the change the order of events in a list, perform one of the following:

- Drag and drop the event into another location in the list.
- Select an event, then choose **Move Up** or **Move Down** buttons on the **Playlist** menu. The event moves up or down one position in the list.
  - Use the **Edit** menu to **Copy**, **Cut**, or **Paste** the event. When you paste the event, it is inserted after the currently selected event.

    NOTE: You can paste events that you copied from a list running on another playlist channel.

Removing events

To remove an event, perform one of the following:

- Select the event, then press the Delete key on your keyboard.
- Select the event, right-click, then select **Remove**.
- Use the **Edit** menu to **Cut** the event. (When you paste the event elsewhere, it is removed from this playlist.)
- Right-click on the event and select **Cut**. (When you paste the event elsewhere, it is removed from this playlist.)

Copying events

To copy an event, perform one of the following:

- Use the **Edit** menu to **Copy** the event.
- Right-click on the event and select **Copy**.

Renaming events

To rename an event, perform the following:

1. Select the event, then select **Playlist | Properties**.
2. Click on the name of the event in the Properties dialog box and use the on-screen keyboard to change the name.
3. Click **OK**.

   NOTE: Make sure you do not violate asset naming limitations.

Related Topics

Limitations for creating and naming assets and bins on page 384

Locating the event source clip

The Locate menu item is used to locate and select the source clip in the Clips pane that generates an event.

To locate the source clip:

- Select the event, then select **Playlist | Locate**.

  The source clip is selected in the Clips pane.

Viewing event properties

1. Select the event.
2. Open the properties dialog box by doing one of the following:
   - Select **Playlist | Properties**.
   - Click the **Properties** button.
   - Right-click the event and select **Properties**.

Related Topics

To pause at the end of an event on page 127

Managing sections in a list

A list has at least one section; all events belong to a section. Sections management tasks include the following:

- Adding and removing sections
- Moving and copying sections
- Renaming sections

Adding and removing sections

A playlist has at least one section but can have up to 100 sections. All events belong to a section, and each section can have up to 1000 events.

To add a section:

1. Select **Playlist | Add Section.** The new section is inserted at the end of the list.
2. Use the **Edit** menu to **Cut**, **Copy**, or **Paste** a section. When you paste the section, it is inserted after the currently selected section.

   NOTE: You can paste a section that you copied from a list running on another play channel.
3. Right-click on the section and select **Cut**, **Copy**, or **Paste**.

To remove a section, perform one of the following:

- Select the section in the list, right-click and select **Remove**.
- Use the **Edit** menu to **Cut** a section.
- Select the section, then click the **Remove** button.

This button only appears in full screen viewing mode (unless you have customized your user interface to include it as one of the assignable buttons).

Moving and copying sections

To change the order of sections in a list, perform one of the following:

- Drag and drop the section into another location in the list.
- Select a section, then select **Playlist | Move Up** or **Move Down**.

  The section moves up or down one position in the list.
- Use the **Edit** menu in the AppCenter toolbar or standard keyboard shortcuts to **Cut**, **Copy**, or **Paste** the section.

  When you paste the section, it is inserted after the currently selected section.
- Right-click on the section and select **Cut**, **Copy**, or **Paste**.

NOTE: You can paste sections that you copied from a list running on another play channel.

Renaming sections

To rename a section:

1. Select the section.
2. Open the properties dialog box by doing one of the following:
   - Select **Playlist | Properties**.
   - Click the **Properties** button.
   - Right-click on the section and select **Properties**.
3. Select the section name, then enter a new name.

   NOTE: Make sure you do not violate asset naming limitations.
4. Click **OK**.

Related Topics

Limitations for creating and naming assets and bins on page 384

Adding play effects

These settings determine what happens at the end of the list, section, or event when the list is played.

To repeat at the end of a playlist

You can loop on a list until you manually stop playing.

1. Open the list properties dialog box by doing one of the following:
   - Select the list icon in the event list, then click the **Properties** button.
   - Right-click on a list and select **Properties**.
2. Click **End**, then choose the **Repeat** option.
3. Click **OK** to close.

NOTE: If you leave a player channel in Loop mode, a remote protocol-controlled playlist might either miss all of the events and stop or simply cue the clip and not play.

To pause at the end of a section

To pause at the end of a section:

1. Select the section.
2. Open the properties dialog box by doing one of the following:
   - Select the section icon in the event list, then click the **Properties** button.
   - Right-click on a section and select **Properties**.
3. Click **End**.
4. Select the **Pause** drop-down list. Use the drop-down list to choose whether to **Freeze on last frame, Freeze on next event, none, Show black** or **Show E-to-E**.
5. Click **OK**.

Based on your selection, the section repeats when it comes to the end or each event's properties are modified to include the specified pause type. During playback, each event will remain paused at its end until you intervene. The pause symbol ● appears in the corner of the event thumbnail.

To pause at the end of an event

1. Select the event.
2. Open the properties dialog box by doing one of the following:
   - Select the list icon in the event list, then click the **Properties** button.
   - Right-click on a list and select **Properties**.
3. Click **End**.
4. Use the **Pause** drop-down list to choose whether to **Freeze on last frame, Freeze on next event, Show black** or **Show E-to-E**.
5. Click **OK**.

The pause symbol ● appears in the corner of the event thumbnail.

Related Topics

To add pauses or transitions to all events in a playlist, section, or event on page 128

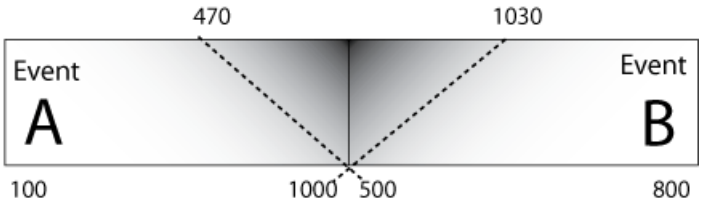
To remove pause from all events in a section on page 129

About transition effects

This feature is part of the licensable AppCenter Pro option on supported formats.

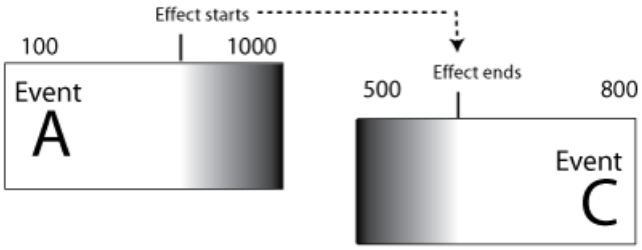
In Summit, AppCenter Pro lets you make transitions to all events in a section or list. There are two types of transitions: you can apply transitions to all the events in a section or playlist, or you can apply transitions that only apply when you skip from one event to another.

Transition effects applied to playlist, section, or event properties



When you use the Properties| All Events feature to apply a transition such as the "Dissolve" effect to adjacent events, there is some overlap. In this example, Event B starts at 500, but AppCenter Pro starts the fade effect at 470. If there is no extra material at 470, a still frame will be displayed until 500 is reached.
This effect can apply to an event, a section, or a whole playlist depending on whether you have selected playlist, section, or clip properties.

Transition effects applied while skipping from one event to another



When you apply a transition effect such as "Dissolve" and skip from one event to another using Options | Go To , AppCenter Pro starts the effect at the indicated point on event A and ends the effect at the indicated point on event C. (There is no overlap.)

Related Topics

Operational specifications on page 364
Transition effects formats and limitations on page 397

To add pauses or transitions to all events in a playlist, section, or event

Properties for each event currently in this section of the playlist are modified to include the specified pause or transition type. If you later add an event to this section and you want it to have the same effect, you must manually modify its properties. Properties of events added later are not automatically modified unless you select Apply to new events.

If you have selected Pause, during playback each event will remain paused at its end until you intervene. The pause symbol ● appears in the corner of the event thumbnail.

NOTE: Apart from Freeze, all transition effects require AppCenter Pro licensing.

To add a pause or transition at the end of an event or all events in a playlist or section:

1. Select the event, section, or list.
2. Open the properties dialog box by doing one of the following:
   - Click the **Properties** button.
   - Right-click on a section and select **Properties**.
3. Click **All Events**.
4. To add a pause, select the **Pause** drop-down list, select **freeze on last frame**, **freeze on next event**, **none**, **show black**, or **show E to E**.
5. To add a transition, select the **Transition** dropdown list, select **none**, **dissolve**, **Fade thru black, Fade thru white, Audio cross-fade**, or **Audio fade thru silence.** If desired, click **include audio**.
6. If you are adding a transition, you can also enter a time for the length of the transition: **.25**, **.50**, **.75**, **1.00**, **1.50**, or **2.00** seconds.
7. To have the effect apply to events added from this point on, Apply to New Events button.
8. When finished, click the **Apply All** button. (If you click **OK**, the dialog box closes without saving any changes.)

To add transitions to all events in a playlist

The AppCenter Pro handles transitions made on the fly.

NOTE: All transition effects require AppCenter Pro licensing.

To add an on-the-fly pause or transition to a playlist:

1. With the playlist open, select **Playlist | Options** and select the **Go To** tab.
2. Select the desired transition, and click **OK**.

   NOTE: Check specifications for limitations on the transition length.

When you use the **Go To** feature to skip from one event, the transition takes effect.

Related Topics

Transition effects formats and limitations on page 397

To remove pause from all events in a section

To remove pauses at the end of all section events:

1. Select the section.
2. Open the properties dialog box by doing one of the following:
   - Click the **Properties** button.
   - Right-click on a section and select **Properties**.
3. Click **All Events**.
4. Select the **Change event pauses** check box, then choose the **Remove all pauses** option.

5. Click **OK**.

Pauses are removed from all events in the section. The section now plays without pausing between any events.

Adding GPI output triggers to playlists

You can assign GPI output triggers to events and sections in a playlist. The GPI outputs can be used to trigger external equipment when the list plays. Before you can use GPI output triggers in a list, you must use Configuration Manager to assign GPI outputs to a channel that is running the Playlist application. If you want to play a list that was created on another channel, you must ensure that GPI triggers assigned to all applicable channels use the same names, otherwise the GPI triggers will not occur. Using identical GPI naming also allows copying and pasting sections and events between lists to be played on different channels.

To trigger GPI outputs:

1. Use Configuration Manager to assign GPI outputs to the current Playlist channel by selecting **System | Configuration**.
2. Make the changes to the GPI settings.
3. Select an event or section in the playlist, then open the properties dialog box by doing one of the following:
   - Click the **Properties** button.
   - Right-click on an event or section and select **Properties**.
4. Select Trigger GPI, then use the drop-down list to select a GPI output. If no GPI outputs are listed, use Configuration Manager to assign GPI outputs to the current channel, then return to this step.
5. Select the trigger action for the GPI output:

Action	Trigger point
Start of event or section	First frame of event or section
End of event or section	Last frame of event or section
Start plus	Start of event or section plus the time you enter. Offset should not exceed the event or section total length.If the offset time entered exceeds the event or section length, a warning message is displayed.
End minus	End of event or section minus the time you enter. Offset should not exceed the event or section total length. If the offset time entered exceeds the event or section length, a warning message is displayed.

6. Click **OK** to save settings.

Managing playlists

You can manage playlists by doing the following tasks.

Saving a copy of a playlist

When you are creating a new playlist, you might find it easier to use an existing, similar playlist as your starting point, rather than creating a list from scratch. To do this you must first save a copy of the playlist with a new name. Then you can alter it without changing the original playlist.

To save a copy of a playlist:

1. In the Clips pane, select the playlist.
2. Copy the playlist onto the clipboard, using the **Edit** menu or standard keyboard shortcuts.
3. Paste the playlist into the Clips pane. If you paste the list into the same bin that you copied it from, a dialog box appears giving you the choice to Abort, Ignore, or Retry (saving as a different name).
4. Load the copied playlist into the Playlist application, and alter it to create your new playlist.

Renaming a playlist

You can rename a playlist using the Playlist menu.

1. Select the playlist in the Clips pane.
2. In the Playlist file menu, select **Playlist | Rename List**.
3. Use the on-screen keyboard to enter and new name and click **OK**.

   NOTE: Make sure you do not violate asset naming limitations.

   The renamed list appears in the Clips pane.

Related Topics

Limitations for creating and naming assets and bins on page 384

Locking a playlist

You can lock a list to prevent changes from being made.

1. Make sure that the list to be locked is selected in the list pane.
2. Open the list properties dialog box, doing one of the following:
   - Select the list icon in the event list, then click the **Properties** button.
   - Right-click on the list and select **Properties**.
3. Click **General**, then choose the **Locked** option.
4. Click **OK** to close. The lock symbol appears. 🔒

Setting the playlist timecode

The playlist timecode is displayed in the toolbar. This selection is also used to generate LTC timecode for the play channel. You cannot stripe the playlist timecode; however, you can stripe the timecode of the loaded clip.

To select the playlist timecode:

1. Open playlist properties dialog by performing one of the following:
   - Click the **Properties** button.
   - Right-click on a list and select **Properties**.

   The List Properties dialog box is displayed.
2. Click **Timecode** in the properties dialog box.
3. Select **Drop Frame**.

   The drop frame option is available when system timing is set to 525 line standard. Drop frame allows the playlist timecode to indicate the actual running time of the list.
4. Specify a start time, then click **OK**.

   The start timecode is displayed in the toolbar.

Related Topics

Striping timecode (replacing the timecode track) on page 108

Locating a playlist in the Clips pane

- Select **Playlist | Locate**.

  The bin containing the list is shown in the Clips pane.

Viewing playlist properties

Select the playlist, then open the properties dialog box by doing one of the following:

- Select **Playlist | Properties**.
- Click the **Properties** button.
- Right-click on a playlist and select **Properties**.

Related Topics

Locking a playlist on page 131
Setting the playlist timecode on page 131

Saving a list as a program

Playlists can be saved as a program so that they can be managed as a single clip. This saves the events in the list, but nothing that breaks the flow of playout such as pauses or effects between events or sections. Saving a list does not consume media storage space since the program merely references the source clip media that is already stored in the media file system. If the source clips are deleted, the media referenced by the program is preserved.

You can insert programs into other playlists, or load and play them using the standard Player application. In Player application, you can edit the program mark-in and mark-out points providing the source clips referenced by the program have not been deleted. If that is the case, 1 second of media is preserved before and after the program mark-in and mark-out allowing some trimming.

1. Load the playlist in the Playlist application.

2. Select **Playlist | Save As Program**.
3. Use the **Save In** control to change the current bin if required.
4. Select the **Program Name** text entry control to change the program name, then click **OK**.

   NOTE: Make sure you do not violate asset naming limitations.

The list is saved as a program in the current bin.

Related Topics

Limitations for creating and naming assets and bins on page 384

Importing a text file as a playlist

This feature is part of the licensable AppCenter Pro option.

Import text file as playlist — If you are licensed for AppCenter Pro, you receive the import text file as playlist feature. With this feature you can specify a playlist as a text file and then import it into AppCenter. You can choose to import the playlist as a new list or append to an existing list. When appending to an existing list, the imported playlist is added as a section at the end of the existing list.

The information in the text file must be arranged as follows:

- The text file must have at least three columns, separated by spaces or tabs.
- For each row, one column must specify the clip name, one column must specify the mark in point, and one column must specify the duration.
- The clip name can include a path, or it can be a simple clip name with no path. Spaces in the path/name are not allowed.
- The format for specifying a path with the clip name is volume:/binname/clipname. For example, *V:/default/Clip_1*.
- If the clip name has no path, the clip must be in the current bin.
- Timecode can be formatted with separators or without separators. If without separators, it must be in format HHMMSSFF. If with separators, it can be in single-digit format H:M:S:F, it can be in double-digit format HH:MM:SS:FF, or it can have the single-digit and double-digit formats combined. Colon, semicolon, period, and comma are all legal timecode separators.
- A “wild character” 99:99:99:99 can be used, in either the mark in or duration columns, to indicate that the clip should be inserted in its entirety.
- A section can be specified in the following 3 ways:
  - <section>

    Results in a section with a default name and no pause
  - <section> MyCommercialPod

    Results in a section named "MyCommercialPod" with no pause
  - <section> MyCommercialPod StopBlack

    Results in a section named "MyCommercialPod" with a pause at the end that displays black. Pause type can be any of the following: StopBlack, StopFreeze, StopNext, or StopEE.

- Timecode values are allowed to be out of range, as AppCenter normalizes timecode values when the playlist is played out. For example, if in the text file, the seconds value is greater than 60, as in 00:25:75:00, AppCenter rounds up the minutes value and converts the timecode to 00:26:15:00.
- You can specify sections in the imported playlist by adding a row at the beginning of a section that contains just the <*section*> specifier.

The following example shows the contents of a text file that specifies a playlist with two sections.

```
Clip01 00:00:00:00 00:00:30:00
Clip03 00:25:00:00 00:01:00:00
Clip10 00:00:20:00 00:00:05:00
Clip11 00:00:04:00 00:00:02:00
Clip12 00:00:25:00 00:00:02:00
Clip13 00:00:00:00 00:00:05:00
<section>
V:/abin/Clip15 00:41:46:00 00:00:04:00
V:/abin/Clip16 00:10:00:00 00:00:05:00
V:/abin/Clip17 00:20:00:00 00:00:05:00
V:/abin/Clip18 00:30:00:00 00:00:05:00
V:/abin/Clip19 00:10:00:00 00:00:05:00
V:/abin/Clip04 00:00:00:00 00:10:00:00
```

Importing a text file as a playlist into AppCenter

To import a text file as a playlist into AppCenter, do the following:

1. Select a channel with its application set to playlist.
2. If the text file contains simple clip names with no path, in the Clips pane select the bin that contains those clips.
3. Click **Playlist | Import List**.

   The Import dialog box opens.
4. Browse to and select the text file that specifies the playlist, then click **Import**.

   The Import File Layout dialog box opens.
5. Specify which column in the text file contains names, which column contains mark in points, and which column contains durations, then click **OK**.

   The playlist appears in AppCenter.

All playlist sections added during an import have a pause added automatically at the end.

Managing clip media

Managing clip media

The AppCenter Clips pane is used to manage the assets stored in K2 media storage. Almost all the media management tasks you'll perform fall in the following topics.

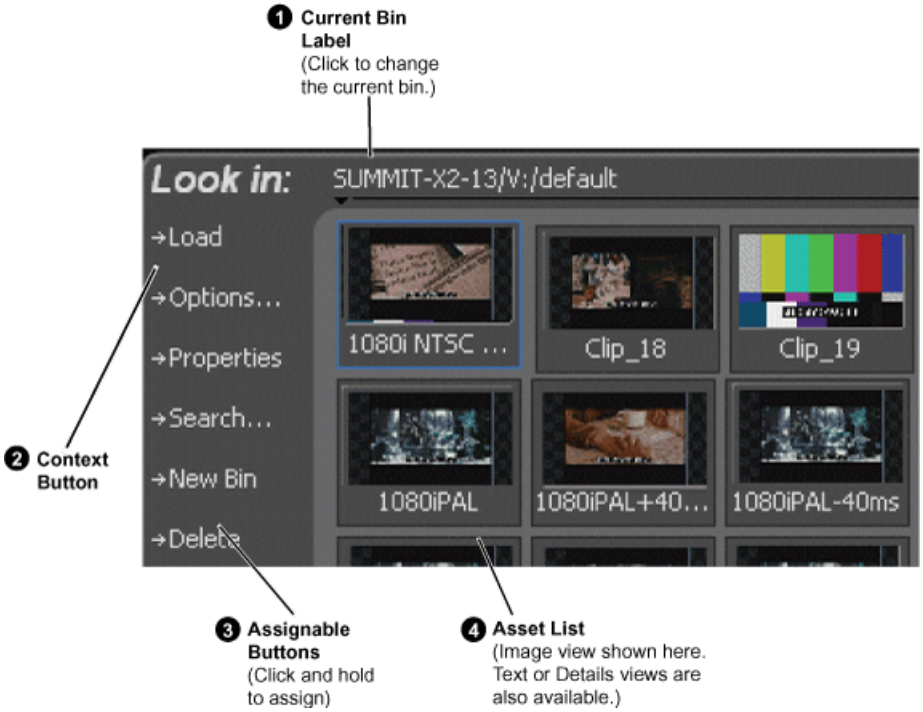
Guide to using the Clips pane

The Clips pane in the AppCenter user interface provides tools for managing assets stored on the media drives. Assets include clips, and playlists, and programs. In addition to the typical file management tasks such as browse, copy, move, delete, and managing the directory structure, you'll also use the Clips pane to transfer files to other devices, and to import or export assets using standard file formats.

When using a AppCenter remotely from a Control Point PC, you can have channel suites with channels from K2 Summit system that access internal storage or shared K2 storage systems. The storage displayed is the storage accessed by the active channel, that is, the channel currently selected.

Viewing the Clips pane

The Clips pane is always displayed in AppCenter. The size of the Clips pane changes when you resize the monitor pane or the channel pane. At its minimum size the Clips pane displays a single column of clip thumbnails.



	Control	Description and User Operation
1	Current Bin Label	Displays the name and location of the current bin, or the summary of the search or link operation. At first time start-up, the current bin is `V:/default`. The bin named 'default' is on the internal disk volume. Click the current bin label to change the current bin and organize bins.

	Control	Description and User Operation
❷	Context Button	The operation and label of the context button changes with the application of the selected channel. • Load – Displayed when the selected channel is in Player application or Recorder mode. Loads the asset selected in the asset list. • New Event– Displayed when the selected channel is in Playlist application Event View. Creates an unattached event in the playlist that can be previewed and then inserted. • Insert – Displayed when the selected channel is in Playlist application List View. Inserts selected assets into the playlist. ***NOTE: Double-clicking the asset in the asset list performs the same function as clicking the context button.***
❸	Assignable Buttons	Assignable buttons allow you to modify the button assignments to best suit your workflow. Hold down a button to open the button pop-up menu that lists the alternative button choices. • Properties– Opens the Properties dialog for the selected asset. • Search– Opens the search dialog box. • New Bin– Creates a new bin. To create a new bin in the current disk volume, click New Bin, then enter the new bin name using onscreen or external keyboard. The list displays the bins in alphabetical order. • Options– Opens the options dialog box which allows you to modify how assets are displayed in the asset list. • Delete– Deletes the selected item(s). • Rename– Opens the Rename dialog box. • Send to– Opens the Send to dialog box used to send the asset to a file, or streaming transfer to another networked device.
❹	Asset List: Select from three view options— Text, Image, or Details	Displays the list of assets located in the current bin. You can scroll through the list using the up/down arrow keys on an external keyboard. Right-click to open the Asset Context menu. You can change how assets are shown by selecting the view option. View options include Image (thumbnail), Text, or Details (includes thumbnail and detailed text). Assets recorded using a different video standard or compression type than the current system setting cannot be loaded and played on the K2 Summit Production Client. For example, if you record a PAL clip, you cannot play it on a channel that is configured for NTSC. These assets appear “grayed” in the Clips pane asset list.

Terms used in the Clips pane

The following table describes the terms used in the Clips pane.

Asset	Description
Bin	A container used to organize assets, similar to a directory or folder on a computer. A bin is contained within a disk volume. The K2 system supports nested bins, that is, a bin contains another bin. The bins display in alphabetical order.
Current Bin	The current bin functions as the target bin when recording clips, or as the source bin when loading clips. The current bin contents are listed in the Clips pane. The *V:/default* bin is created automatically. The name *default* cannot be edited and the bin cannot be deleted.
Disk Volume	The K2 Summit system media storage disk volume is formatted using the K2 system media file system. The disk volume uses the drive letter 'V:'. The disk volume can be internal or it can be part of the K2 external storage system.
Playlist	A sequence of events that can be loaded and played using the Playlist mode. Playlists are created in the Playlist application by adding clips or programs to a list.
Media	Media is the video, audio, and timecode source material recorded on the disk drives. Each media type is stored in its own file, which is referenced by one or more clips for playback.
Clip	A clip references the media files stored on the media drives to allow playback of the video and associated audio and timecode recorded from a single source. Deleting a clip deletes the media referenced by the clip only if it is not referenced by another clip. You can use the Find Links feature to find related assets.
Program	Programs are generated from continuous record mode or from a playlist using the Playlist mode. Programs generated in Playlist application include all the media and transitions in the playlist, but nothing that breaks the flow of playout, such as a pause at the end of an event.

Related Topics

Finding linked assets on page 152

About the Current Bin drop-down list

To access the Current Bin drop-down list, click the Current Bin label.

Current bin menu items

Menu Item	Description and User Operation
Organize Bins	Opens the Organize Bins dialog box used to manage bins— create, delete, rename, change current bin..

Menu Item	Description and User Operation
Bin List	List of all the bins in the current disk volume. A volume must always have at least one bin. The default bin is created automatically. The bins display in alphabetical order.
Recycle Bin	Displays the contents of the Recycle Bin. All assets deleted from the asset list are stored in the Recycle Bin until it is emptied.

Related Topics

Working with bins on page 141
Working with the Recycled Bin on page 149

About the Clips menu

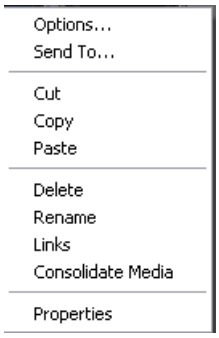
Click **Clips** in the AppCenter main menu to display the Clips pane context menu. The following table describes the context menu items.

Menu Item	Description
New Bin	Creates a new bin in the current disk volume. Use the onscreen or external keyboard to enter the bin name.
Organize Bins	Allows you to manage the bins. The bins display in alphabetical order.
Empty Recycle Bin	Permanently removes all items from the Recycle Bin. By default, deleted assets are moved to the Recycle Bin and remain there until it is emptied.
Delete	Deletes the selected asset.
Rename	Opens the Rename dialog box for the selected asset.
Select All	Selects all items in the asset list. Operations available for Select All include: delete, send to, and copy.
Search	Opens the Search dialog box, which is used to perform basic or advanced searches.
Links	Opens the Links dialog box allowing you to locate other assets that are linked to the selected asset. For example, a subclip is linked to the source clip.
Send To	Opens the Send To dialog box, which is used to send assets to a different location– another bin, disk volume, or another K2 Summit system. Send To is also used to export clips or programs to local windows drives or networked devices.
Import	Opens the Import dialog box, which is used to import assets from the following sources: • Media streams from another K2 Summit Production Client. • Other media file formats from a local drive or over the network.
Properties	Opens the Properties dialog box for the selected asset.

Menu Item	Description
Options	Opens the Options dialog box, which allows you to change the way assets are displayed in the asset list.

About the asset context menu

To open the asset context menu, right-click the asset.



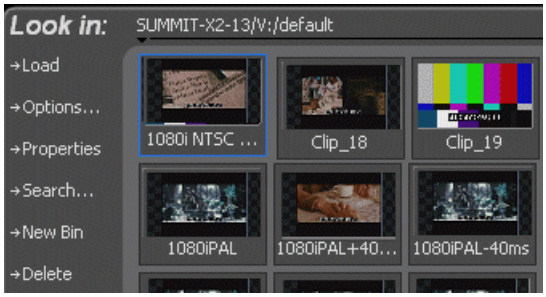
Menu Item	Description
Options	Opens the Options dialog box which allows you to change the way assets are displayed in the asset list.
Send To	Opens the Send To dialog box which is used to send assets to a different location– another bin, disk volume, or another K2 Summit Production Client. Send To is also used to export clips or programs to local windows drives or networked devices.
Cut, Copy, Paste	Used to move assets, or make a additional copies. Copying a clip does not consume media disk space. Only a new reference to existing media is created.
Delete	Deletes the selected asset.
Rename	Opens the Rename dialog box for the selected asset.
Links	Opens the Links dialog box allowing you to locate other assets that are linked to the selected asset.
Consolidate media	Erase unused media.
Properties	Opens the Properties dialog box for the selected asset.

Modifying the asset list view

The asset list in the Clips pane displays the contents of the current bin and the results from searches or from requests for linked assets. You can choose one of three views to best suit your workflow.

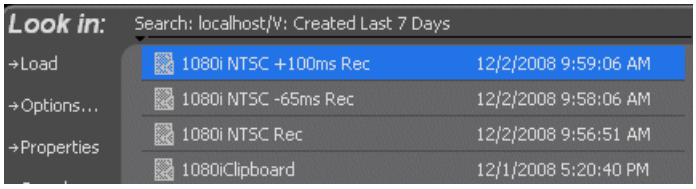
1. Select **Clips | Options**.

2. In the View tab, select one of the following view options:
   a) Image view



   Displays the asset name and thumbnail image for each asset in the bin. Playlists are displayed as a stack of thumbnails. You can change the video frame used to generate the thumbnail.

   b) Text view



   The text view displays an icon and name for each asset and one attribute of your choice. To select an asset attribute, select the **Show** drop-down list in the View Options dialog box, then select one of the following attributes.

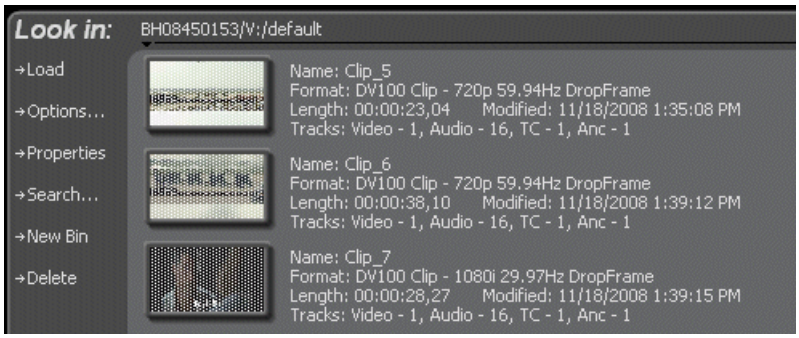
   Attribute display options:

   - Create Date
   - Modified Date
   - Length
   - Type
   - Location (full path)

   The following table describes symbols shown in Text view

Asset Symbols used in the Text View	Asset Type
	Clips with audio and video
	Video only clip
	Playlist

   c) Details view



Details view displays assets with both a thumbnail and a detailed text description.

3. If you want to sort the assets, click the Sort tab, then choose how you want assets sorted.
4. Click **OK**.

The clips pane displays with the new view and sort order.

Working with bins

Topic in this section provide information about K2 system bins.

Using security with bins

By default, permission is set to Full Control for “Everyone” on K2 bins. In case of conflicts arising from a user belonging to multiple groups, the Deny permission always overrides the Allow permission. K2 administrators may create users and groups and set permissions for them. For information on how to implement security permissions, see the *K2 System Guide*.

Changing current (working) bin.

- In the Clips pane, click the Current Bin label, then choose a bin from the list.
- You can also change the working bin by loading a clip into a channel (for example, by using drag-and-drop) from a bin that is not the current working bin for that channel. The bin from which you loaded the clip then becomes that channel’s working bin.

Exploring bins

Exploring a bin in the Organize Bins dialog box causes it to display in the Media Monitor pane. Exploring a bin does not make that bin the default setting for recording clips. A clip that is being recorded is stored in the working bin that has been specified for its channel. Each channel has its own working bin. To change the current bin where a clip will be recorded, click the Options button on the channel pane. Loading a clip from a bin into a play channel changes the working bin for that channel.

1. In the Clips pane, select the Current Bin drop-down list, then select **Organize Bins**. The bins display in alphabetical order.
2. In the Organize Bins dialog box, select a bin, then click **Explore**.

   NOTE: If the Explore button is grayed out, you do not have Explore permission. Without permission to explore a bin, you cannot rename or delete a bin either. For information on security and permissions, see the K2 System Guide.

3. Close the Organize Bins dialog box.

Creating a new bin

1. Open the Organize Bin dialog box using one of the following methods:
   - Select **Clips | New Bin**.
   - Click the **New Bin** button in the clips pane.
   - In the Clips pane:
     - Select the Current Bin drop-down list, then select **Organize Bins**. The bins display in alphabetical order.
     - In the Organize Bins dialog box, select where you want the bin to be created (e.g. at the top level or as a sub bin of an existing bin), then click **New Bin**.

   NOTE: Make sure you do not violate bin naming and nesting limitations.
2. Enter the new bin name, then click **OK**.

   The new bin appears in the Organize Bins dialog box.

   NOTE: There are additional buttons displayed, which permit you to rename or delete the bin.
3. Close the Organize Bins dialog box.

Related Topics

Limitations for creating and naming assets and bins on page 384

Deleting a bin

NOTE: Even with the appropriate permissions, you cannot delete a bin containing assets that are locked or in use. However, the unlocked assets in the bin can be deleted.

1. In the Clips pane, select the Current Bin label, then select **Organize Bins**.
2. In the Organize Bins dialog box, choose the bin you want to delete.
3. Click the **Delete** button.

   Deleted bins and assets are moved to the Recycle Bin unless the "*Remove items immediately when deleted.*" option is set for the Recycle Bin.

   Holding down the SHIFT key during delete also bypasses the Recycle Bin.
4. Click **Yes** in the Confirm Delete dialog box.
5. Close the Organize Bins dialog box.

Related Topics

Bypassing the Recycled Bin when deleting on page 149

Renaming a bin

1. In the Clips pane, select the Current Bin label, then select **Organize Bins**.
2. In the Organize Bins dialog box, select the bin you want to rename.

   NOTE: If the Rename button is grayed out, you do not have permission to rename the bin.

3. Click **Rename**.
4. Edit the bin name.

   NOTE: Make sure you do not violate bin naming limitations.
5. Click **OK**.

   NOTE: If you rename the working bin, it changes to the default bin. If the renamed bin contains assets that are locked or in use, two bins will appear after renaming— one with the new name and one with the old name containing the problem asset.
6. Close the Organize Bins dialog box.

   NOTE: The bins display in alphabetical order.

Related Topics

Limitations for creating and naming assets and bins on page 384

Working with assets

Assets displayed in the Asset List include clips, subclips, playlists, and programs. Refer to the following sections to work with assets.

Renaming an asset

1. Select the asset in the Asset List.
2. Select **Rename** using one of the following:

   - Select **Clips | Rename**.
   - Select **Rename** in the asset context menu.
   - Click the **Rename** button in the Clips pane.

   The Rename dialog box appears.

   If the Rename button is not displayed in the Clips pane, refer to assignable buttons in the Guide to using the Clips pane section.
3. Edit the asset name, then click **OK**.

   NOTE: Make sure you do not violate asset naming limitations.

   NOTE: Assets that are locked or in use cannot be renamed.

Related Topics

Limitations for creating and naming assets and bins on page 384
Guide to using the Clips pane on page 135

Selecting multiple assets

You can select multiple assets in the Clips pane as follows:

- Select **Clips | Select All**.
- Using mouse and keyboard, hold the SHIFT or CTRL key on the keyboard while selecting multiple assets with the mouse or arrow keys.

Moving an asset to another bin

There are two ways to move an asset to another bin: Using Cut/Paste or the Send To dialog box.

Using the cut and paste commands

1. Select the asset(s) in the asset list.
2. Cut the asset to the clipboard using one of the following:
   - Select **Cut** in the asset context menu.
   - Select **Edit** in the AppCenter main menu, then choose **Cut**.
   - Use keyboard shortcut **Ctrl + X**.
3. Change the current bin to the target bin.
4. Paste the asset(s) from the clipboard to the current bin.

   The Paste operation is accessed in the same way as Cut.

   NOTE: If an asset is locked or currently being recorded, it remains in the existing bin while the remaining assets are moved to a new bin with the specified name.

Using Send To

1. Select the asset(s) in the Asset List.
2. To open the Send To dialog box using do one of following:
   - Select **Clips | Send To**.
   - Select **Send To** in the asset context menu.
   - Click the **Send To** button in the Clips pane.

   If the Send To button is not displayed in the Clips pane, refer to assignable buttons in the Guide to using the Clips pane section.

   The Send dialog box appears.
3. Click the Bin tab.
4. Select **Move to** in the right-hand drop-down list.
5. Select the target bin name.
6. Click the **Send** button to close the Send dialog box, and move the file.

Related Topics

Guide to using the Clips pane on page 135

Copying an asset

The copy command creates a new asset that references the same media files belonging to the original asset. Copying an asset does not duplicate the media files. Copying does not impact the media storage space available.

The naming convention for copied assets in the same bin adds an underscore ("_") and a number after the original name. For example, the copied clip for "Clip1" will be "Clip1_1", "Clip1_2" and so on.

You can copy or move assets in two ways, as follows:

Using the copy and paste commands

1. Select the asset(s) in the asset list.
2. Copy the asset to the clipboard using one of the following:
   - Select **Copy** in the asset context menu.
   - Select **Edit** in the AppCenter toolbar, then choose **Copy**.
   - Use the keyboard shortcut **Ctrl + C**.
3. If needed, change the current bin to the target bin.
4. Paste the asset(s) from the clipboard to the current bin.

   The Paste operation is accessed in the same way as Copy.

   NOTE: If an asset is locked or currently being recorded, it remains in the existing bin, while the remaining assets are moved to a new bin with the specified name.

Using Send To

1. Select the asset(s) in the Asset List.
2. To open the Send To dialog box do one of following:
   - Select **Clips | Send To**.
   - Select **Send To** in the asset context menu.
   - Click the **Send To** button in the Clips pane.

   If the Send To button is not displayed in the Clips pane, refer to assignable buttons in the Guide to using the Clips pane section.

   The Send dialog box appears.
3. In the Send dialog box, click **Bin**, then **Copy to** in the left-hand drop-down list.
4. Select the target bin name.
5. Click the **Send** button to close the Send dialog box, and copy the file.

Related Topics

Guide to using the Clips pane on page 135

Deleting an asset

You can delete assets to free storage space. You can safely delete a clip without harming the subclips, playlists, and programs created from it. The media referenced by subclips, playlists, and programs is preserved when the clip is deleted. Once the source clip is deleted, subclips and playlist events retain an extra 1 second of media before and after their mark points to allow some trimming.

If you want to delete an asset that has a sub-clip or that is part of a playlist or a program, you must first use the Consolidate Media feature.

Deleted assets are moved to the Recycle Bin unless the bypass Recycle Bin option is used. You must empty the Recycle Bin to free storage space.

To delete an asset:

1. If associated with playlist, program, or sub-clip, right-click on the asset and select **Consolidate Media**.
2. Select the asset or assets in the Asset List.
3. Select **Delete** using one of the following:
   - Select **Clips | Delete**.
   - Select **Delete** in the asset context menu.
   - Click the **Delete** button in the Clips pane.

   If the Delete button is not displayed in the Clips pane, refer to assignable buttons in the Guide to using the Clips pane section.

   A progress dialog box appears when deleting multiple assets. If the selected asset is contained in the Recycle Bin, it is permanently removed; otherwise, it is moved from its original bin into the Recycle Bin. If an item of the same name is already in the Recycle Bin, the new item is automatically renamed.

   NOTE: Assets that are locked or currently being recorded cannot be deleted.

Related Topics

Guide to using the Clips pane on page 135

Bypassing the Recycled Bin when deleting on page 149

Erasing a clip's unused media

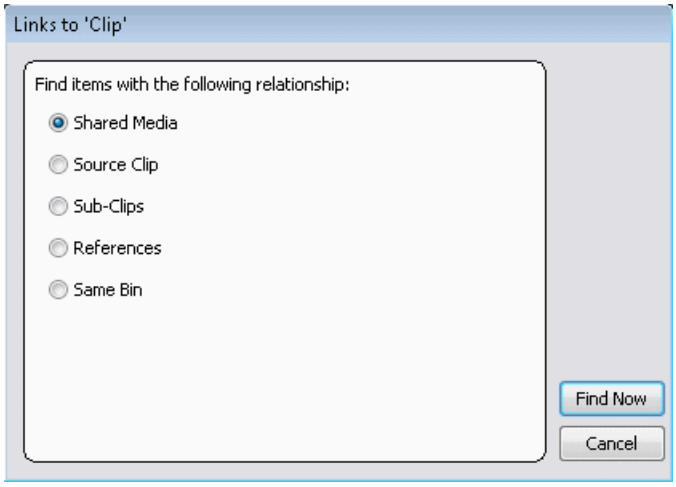
For K2 Summit system systems, you can use the Consolidate Media feature to delete unwanted material from trimmed clips, subclips, programs or playlists. Although similar to the Erase Unused Media feature in K2 Media Client systems, there are some differences in how material is handled. The following table describes the similarities and differences.

When using...	K2 Media Client Erase Unused Media	Summit Consolidate Media
Trimmed clips (Media not referenced by any subclip, program, or playlist)	Any unused storage is released; the media outside the in/out marks is erased.	No effect; nothing is erased.

When using...	K2 Media Client Erase Unused Media	Summit Consolidate Media
Subclips, programs, or playlists	With the Erase Unused Media feature, the source clip and the subclip both reference the same media. Unused media is not erased from a subclip unless the source clip has first been deleted manually.	With the Consolidate Media feature, the subclip media is copied from the source material. Once you have consolidated the media, you can manually delete the source media; the subclip is not affected. Consolidating the media also removes the links to the assets. ***NOTE: Before consolidating media, make sure you have enough storage for the newly copied material. Maintain free space equivalent to the longest clip consolidated.***

NOTE: One second of media is retained (for editing) before and after the trimmed clip, subclip, program or playlist.

When you consolidate media, the links between the assets are also removed.



Consolidating media

To consolidate media:

1. Select the clip in the asset list.
2. Right-click on the asset and select **Consolidate Media**.

   A Consolidating message box appears.

   NOTE: To verify that the media has been consolidated, you can check the file size in the V:\ drive.

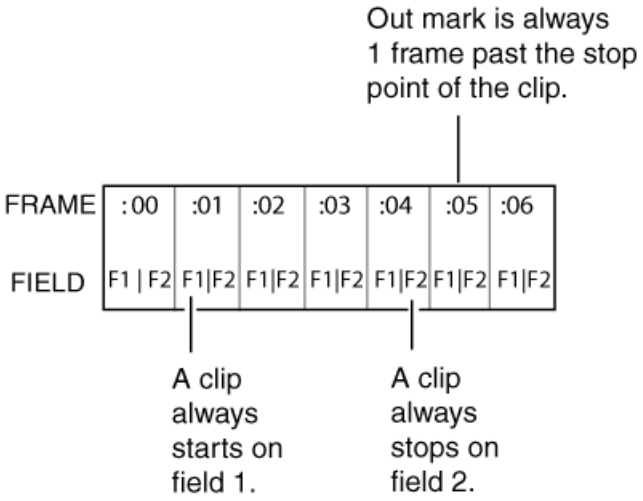
After consolidating media, the following is true:

- Media outside the clip marks is erased except that portion referenced by a subclip, playlist event, or program.

- All subclips and events generated from the source clip retain 1 second of media before the mark-in and after the mark-out.
- Event-in becomes the first video frame of the file.
- Event-out becomes the last video frame of the file.
- Clip length becomes the total file length.

Understanding field dominance

In interlaced video, each frame is composed of two fields. In Grass Valley systems such as a K2 Summit system, video is field-1 dominant; each frame consists of field 1 followed by field 2. For example, when you navigate through the clip to the beginning, the K2 Summit system system goes to field 1. When you navigate through a clip to the end, the K2 Summit system goes to field 2.



The in point of any trimmed clip always starts at field 1 of a frame. The out point of a trimmed clip is always one frame past the stop point of the clip. For example, if the last playable frame is 01:15:00,04 then the out-point mark is 01:15:00;05.

Locking an asset

Locked assets cannot be renamed, deleted, or modified in any way.

To lock an asset:

1. Select the asset in the Asset List.
2. To view the Properties dialog box for the selected asset, do one of the following:
   - Select **Clips | Properties**.
   - Select **Properties** in the asset context menu.
   - Click the **Properties** button in the Clips pane.

   If the Properties button is not displayed in the Clips pane, refer to assignable buttons in the Guide to using the Clips pane section.

   The Asset Properties dialog box appears.

3. Click the General tab, then select the **Locked** check box to lock the asset.
4. Click **OK** to close the Properties dialog box.

Related Topics

Guide to using the Clips pane on page 135

Working with the Recycled Bin

To work with the recycled bin, refer to the following topics.

Viewing the Recycled Bin contents

- In the Clips pane, select the Current Bin label, then select **Recycled Bin**.

  The Recycled Bin assets are displayed in the asset list as the current bin. You can work with assets in the Recycle Bin just like any other bin.

Emptying the Recycled Bin

1. In the Clips pane, select the Current Bin label, then select the **Organize Bins**.
2. In the Organize Bins dialog box, select **Recycled Bin** from the bin list.
3. Click **Empty**, then **Yes** to confirm.
4. Close the Organize Bins dialog box.

Bypassing the Recycled Bin when deleting

NOTE: Holding down the SHIFT key during delete also bypasses the Recycled Bin.

1. In the Clips pane, select the Current Bin label, then select the **Organize Bins**.
2. In the Organize Bins dialog box, choose **Recycled Bin**.
3. Select **Remove items immediately when deleted** or hold down the SHIFT key during delete.
4. Close the Organize Bins dialog box.

Locating assets

Three tools are provided for locating assets: Sorting, Search, and Links. You can set how assets are sorted by selecting the “sort by” attribute for the asset list. For example, you can sort by name, modified date, length, etc. The Search dialog box provides both basic search and advanced search modes for locating assets anywhere in the K2 system media storage. Advanced search mode allows you to define search criteria for assets based on user-defined metadata. The Links dialog box helps you determine assets that are related. For example, you can locate the source clip used to generate a subclip or you can determine if there are copies of a given clip.

Sorting assets in the Asset List

You can sort assets by file attributes such as date, name, length, and create date using the Options dialog box.

To change how assets are sorted:

1. Open the Options dialog box using one of the following methods:
   - Select **Clips | Options**.
   - Right-click an asset, then select **Options** in the asset context menu.
   - Click the **Options** button in the Clips pane.

   If the Options button is not displayed in the Clips pane, refer to assignable buttons in the Guide to using the Clips pane section.
2. Click the **Sort** tab in the Options dialog box.
3. Choose the desired sorting attribute and order, then click **OK**.

   The Asset List sorts in the order specified.

NOTE: When assets are added or renamed, assets may not remain listed according to the selected sort order. To re-sort the assets, repeat this procedure, or press F5 to refresh the Asset List.

Related Topics

Guide to using the Clips pane on page 135

Using Basic search

The Search dialog box provides the basic search mode for locating assets anywhere in the K2 system media storage.

1. Open the Search dialog box by doing one of the following:
   - Select **Clips | Search**.
   - Click the **Search** button in the Clips pane.

   If the **Search** button is not displayed in the Clips pane, refer to assignable buttons in the Guide to using the Clips pane section.

2. Choose **Basic** search, then specify search criteria on the **Text**, **Date** and **Type** tabs. The search is performed using the combination of search criteria on all three tabs.

   - **Search by text** – If you know all or part of an asset name, use the **Text** tab. Select the text entry control, then type all or part of the asset name in the "Enter Search Text" dialog box. The default text search mode is "any word" or "word portion". For example, if you enter the word *fire*, search will find all asset names that contain fire, for example, *fires* and *house fire*. For an "exact phrase" search, use a single quote or double quote to specify the phrase. For example, if you enter *"forest fire"*, search will locate all asset names that contain the phrase *forest fire*.

     If the **Search names only…** option is selected, the search is applied to asset names. If not selected, the search includes all asset metadata.

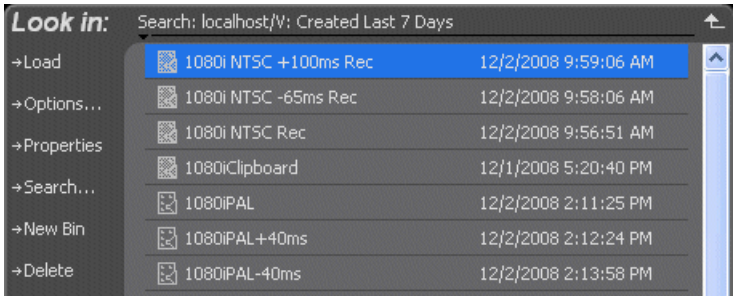
   - **Search by date** – If you are searching for assets created or modified within a specific date or time range, use the **Date** tab. By default, the **All Dates** box is selected. To specify date criteria, select the **Find items** option to enable the controls under it. Use the drop-down list to choose **Created** or **Modified**, then do one of the following:

     - Select the **between** option, and then specify a date range. Click the edit control to display a calendar for easy input.
     - Select the **in the last** option, and then use the drop-down lists to specify a time within a recent number of minutes, hours, days, or months.

   - **Search by Type** – In the **Type** tab, select the type of assets— clips, programs or lists to be searched. Search results will only include the selected types.

3. Once you have selected the search criteria, click **OK** to start the search.

The search results are displayed in the Clips pane. The text in the Current Bin control is replaced with a brief summary of the search. For example, *Search: movie* - indicates all the clips, programs and lists with names like movie1, movie2, or *Search: Created Last 7 Days* for assets created in the last week.



When you perform a search, the most recent four searches are displayed. The older ones get removed. At any one time, you see four searches at most in the bin list. There is no way to delete these.

Related Topics

Guide to using the Clips pane on page 135
Working with asset metadata on page 153

Using Advanced Search

The Search dialog box provides the advanced search mode that provides an extended set of attributes for locating assets anywhere in the K2 system media storage.

1. Open the Search dialog box by doing one of the following:
   - Select **Clips | Search**.
   - Click the **Search** button in the Clips pane.

   If the **Search** button is not displayed in the Clips pane, refer to assignable buttons in the Guide to using the Clips pane section.
2. Choose **Advanced** search to create and view advanced search criteria.

   When Advanced search is used, Basic search criteria are ignored.
3. Click **Add** to add new search criteria, or click **Remove** to remove it, then click **OK** to start the search.

   You can select advanced search attributes along with their conditions and value choices. Advanced searches can include metadata attributes.
4. Once you have added all the search criteria, click **OK** to add the criteria.
5. Click **OK** to start the search.

The search results are displayed in the Clips pane. The text in the Current Bin control is replaced with a brief summary of the search.

Related Topics

Guide to using the Clips pane on page 135
Working with asset metadata on page 153

Finding linked assets

The Links dialog box helps you locate assets that are related based on the links criteria that you can specify.

1. In the asset list, select the asset for which you want to find linked assets.
2. Open the Links dialog box by performing one of the following steps:
   - Select **Clips | Links**.
   - Right-click an asset, then select **Links**.
   - Click the **Links** button in the Clips pane.

   If the Links button is not displayed in the Clips pane, refer to assignable buttons in the Guide to using the Clips pane section.

3. Choose one of the link relationships to use.

Link Relationship	Description
Shared media	Find all assets that reference the same media files, that is, the same video, audio, timecode files in the media file system.
Source clip	Find the source clip from which a subclip was created.
Subclips	Find all subclips created from the selected clip.
References	When a playlist or program is selected, find all the assets that are referenced by the playlist or program.When a clip is selected, find all the playlists and events that reference that clip.
Same bin	Generate a list of assets that are located in the same bin

4. Click **Find Now**.

The results of the link operation are displayed in the Clips pane. The text in the Current Bin label is replaced by a brief summary of the links operation.

NOTE: Unlike the search results, link results are not cached. You must perform the Links operation each time to discover linked assets.

Related Topics

Guide to using the Clips pane on page 135

Working with asset metadata

The properties dialog box displays information about an asset. The properties dialog box also includes a user defined metadata feature that allows you to define and add your own information about an asset. You can specify the metadata name, data type, and value.

The metadata you add for one asset automatically appears on properties pages for all existing and future assets, except with no value entered. The values you specify for an asset are retained with the asset for the following operations: copy, move, and send to. The metadata you define for an asset can be used as search criteria in advanced search.

Metadata types and their possible values are described in the following table.

Data Type	Value	Example: Name/Value
String	User-defined string	Producer: John Doe
Integer	An integer value	Episode: 4
Float	A number expressed in floating point	Version: 1.2
Date	Date	Air Date: 10/31/03
Boolean	True or False	QA: False

Adding and modifying asset metadata

Use the following steps to add or modify metadata in the properties dialog box. The metadata names you add will appear in the properties dialog box for all assets.

1. Select an asset in the Clips pane asset list.
2. Open the Properties dialog box using one of the following methods:
   - Select **Clips | Properties**.
   - Select **Properties** in the asset context menu.
   - Click the **Properties** button in the Clips pane.

   If the Properties button is not displayed in the Clips pane, refer to assignable buttons in the Guide to using the Clips pane section.

   The properties dialog box appears.
3. Click the **Data** tab, then click **Add Data** or **Modify** on the data page.
4. Define or modify metadata using the following steps:
   a) Select **Name**, then enter the metadata name in the Name dialog box. Names are not case sensitive. “Episode” and “episode” are treated the same. You cannot modify names of existing metadata.
   b) Select **Type**, then choose a data type from the drop-down list. Metadata types include: String, Integer, Float, Date, and Boolean.
   c) Select **Value**, then enter a metadata value in the Value dialog box.
   d) Click **OK** to close the Add or Modify dialog box and save changes.

Related Topics

Guide to using the Clips pane on page 135
Working with asset metadata on page 153

Clearing metadata

Clearing metadata removes the value entered for the selected metadata but does not delete the metadata name from the properties data page.

1. Select the asset in the Clips pane asset list.
2. Open the Properties dialog box using one of the following:
   - Select **Clips | Properties**.
   - Select **Properties** in the asset context menu.
   - Click the **Properties** button in the Clips pane.

   If the Properties button is not displayed in the Clips pane, refer to assignable buttons in the Guide to using the Clips pane section.

   The properties dialog box appears.
3. Click the **Data** tab, then scroll to locate and select the metadata entry you want to clear.
4. Click **Clear**.

   The metadata value is now blank.

5. Repeat step 3 and step 4 to clear other metadata values.
6. Click **OK**.

If the metadata name is used by any other asset, that is, a value has been entered on another properties page, the metadata name will remain on all properties pages.

Related Topics

Guide to using the Clips pane on page 135

Deleting asset metadata

You may need to delete a metadata name, that is, remove it from all properties pages when it becomes obsolete, or to repair a typographical error. There is no “delete metadata” feature; however, metadata names are checked every time you close a properties dialog box. If a metadata name is not being used, that is, no values are entered for the metadata name on any asset properties page, the metadata name is automatically deleted and removed from all metadata pages.

Deleting justly created metadata name

To delete a metadata name you just created:

1. In the asset Properties dialog box, click **Data**.
2. Select the metadata name you want to delete.
3. Click **Clear**.
4. Click **OK**.

The metadata name is removed from all asset properties pages since no metadata value exists for any asset.

Deleting a metadata name already in use

To delete a metadata name already in use:

- To completely purge a metadata name, you must clear the metadata value on all asset properties data pages. When the last asset is cleared, and the properties dialog is closed, the metadata name is purged and removed from all properties pages.

Viewing asset properties

The properties dialog box varies depending on the asset.

Viewing clip properties

1. Select the clip in the Clips pane asset list.

2. Open the Clip Properties dialog box using one of the following:
   - Select **Clips | Properties**.
   - Select **Properties** in the asset context menu.
   - Click the **Properties** button in the Clips pane.

   If the Properties button is not displayed in the Clips pane, refer to assignable buttons in the Guide to using the Clips pane section.

The Clip Properties dialog box appears. There are three pages in the clip dialog box. **General**, **Media**, and **Data**. The General and Media pages are self explanatory. The Data page is used to add metadata to the clip.

Related Topics

Guide to using the Clips pane on page 135

Working with asset metadata on page 153

Viewing the General properties page

The General properties page displays basic information about the clip, including tracks, format, compression, size, etc. A radio button enables you to lock the clip.

Viewing Media Properties page

The Media page displays all the relevant clip timecodes, including clip marks, and the first and last frame of the clip. A Time Dome gives a graphical display of the relative position of the marks within the recorded media. The Aspect Ratio Conversion drop-down list allows you to specify how you want AppCenter to handle an aspect ratio conversion.

Viewing Data properties page

This page allows you to define your own metadata and specify values for that metadata.

Related Topics

Working with asset metadata on page 153

Viewing playlist properties

- The playlist properties dialog box includes features that control list playback in the Playlist mode.

Viewing program properties

1. Select the program in the Clips pane asset list.
2. Open the Program Properties dialog box using one of the following methods:
   - Select **Clips | Properties.**
   - Select **Properties** in the asset context menu.
   - Click the **Properties** button in the Clips pane.

   If the Properties button is not displayed in the Clips pane, refer to assignable buttons in the Guide to using the Clips pane section.

The Program Properties dialog box is displayed with three pages; **General, Media,** and **Data**. The General page is self explanatory. The Media page has information about mark in- and mark-out times. The Data page is used to add metadata to the program.

Related Topics

Guide to using the Clips pane on page 135
Working with asset metadata on page 153

Viewing bin properties

1. In the Clips pane, select the Current Bin label, then select **Organize Bins**. The bins display in alphabetical order.
2. In the Organize Bins dialog box, select a bin. The bin properties are displayed in the Organize Bins dialog box.

Viewing volume properties

1. In the Clips pane, select the Current Bin label, then select **Organize Bins**.
2. In the Organize Bins dialog box, select a disk volume. The volume properties are displayed in the Organize Bins dialog box.

Importing and exporting media

Importing and exporting files

This section describes the process of importing and exporting files using AppCenter. You can also transfer media with the following methods:

- FTP applications
- Import/export services that use watched folders
- Protocols such as AMP
- Programs and applications that request transfers using the K2 API

Related Topics

Using FTP for file transfer on page 258
Import/export services on page 269
Using AMP protocol to control K2 systems
About importing and exporting files on page 157

About importing and exporting files

You can import and export files using standard multimedia. Source files can be located on a mapped network drive. The source and destination devices must be in the same domain.

If importing or exporting files by accessing a K2 Summit system with remote AppCenter on a network-connected Control Point PC, your view of the “local” Windows file system is a view of the Control Point PC. However, the “local” drives (such as C:) that AppCenter uses for source and

destination are not the local drives of the Control Point PC. Therefore you must map a network drive on the Control Point PC to create a verified source or destination. To do this, go to the source machine, create a shared folder, then on the Control Point PC map that shared folder as a network drive. Then you can import or export using the shared network drive. Refer to procedures later in this section.

NOTE: Do not use the* K2 Summit system *C: system drive for any kind of transfers.

K2 media storage (the V: drive) is the only local drive in the K2 Summit system that have adequate capacity for transfers. If files have to be imported or exported from "local" disks, the only disks a user can use is the V: drive. Otherwise, you must use a mapped network drive.

If importing from a 3rd party external drive, playing media while importing is not supported.

NOTE: If you import to a file or stream media that has the same name as an asset already existing in the destination location, an Abort/Rename/Retry dialog box appears.

Related Topics

To map a source or destination drive for K2 system import/export on page 158

Adding a remote host

Grass Valley recommends manually adding each remote host that you want to import or export files to. Do this for K2 systems.

To import/export between systems using AppCenter, follow these steps:

1. Open Configuration Manager and select the Remote tab.
2. Add each system that you want to have available as a source or a destination.
   a) Enter the name or the IP address of the K2 Summit system where you want to import or export streaming media assets. (Grass Valley recommends that you use host names. For more information on host files, see the *K2 System Guide*.)
   b) When adding a remote host that uses AMP remote control protocol, select a Controller ID.

To map a source or destination drive for K2 system import/export

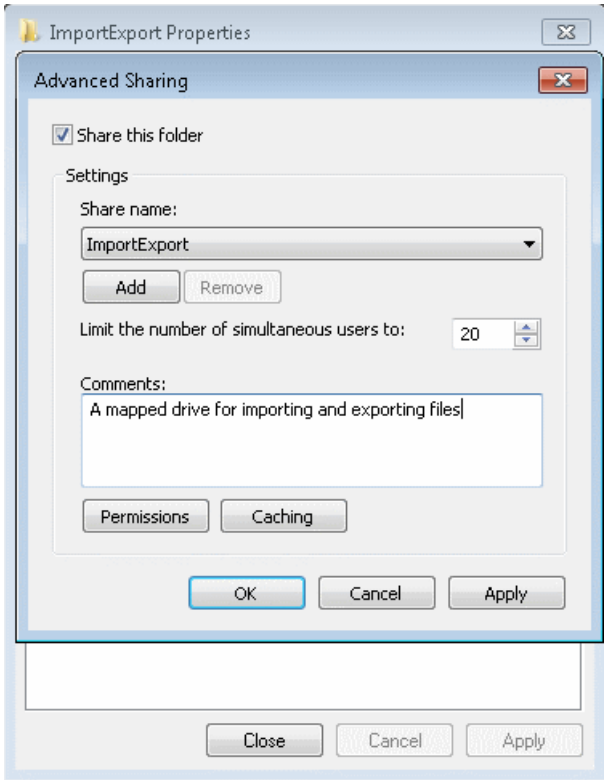
This procedure provides a mapped network drive for file import/export on the machine on which you are using AppCenter, such that you can use the drive as a verified source or destination via AppCenter's Import or Send To features. This is required in the following cases:

- When using AppCenter on a Control Point PC for any file import or export. You cannot use the local drive for file import or export on a Control Point PC.
- When using AppCenter on an standalone K2 Summit system and the source or destination is not on the local K2 Summit system.

1. On the machine that is the source or destination, create a folder to be used for file import and export.

2. Share the folder using standard Windows procedures.

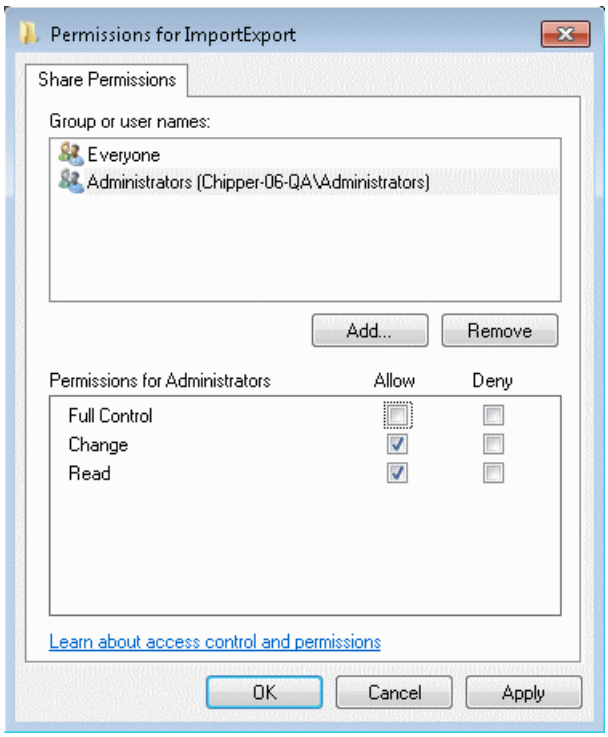
   You must map drive of source device only, not K2 Summit system.



3. Make sure that permissions are set to allow read and write access to the appropriate user or group accounts, according to your site's security policies.

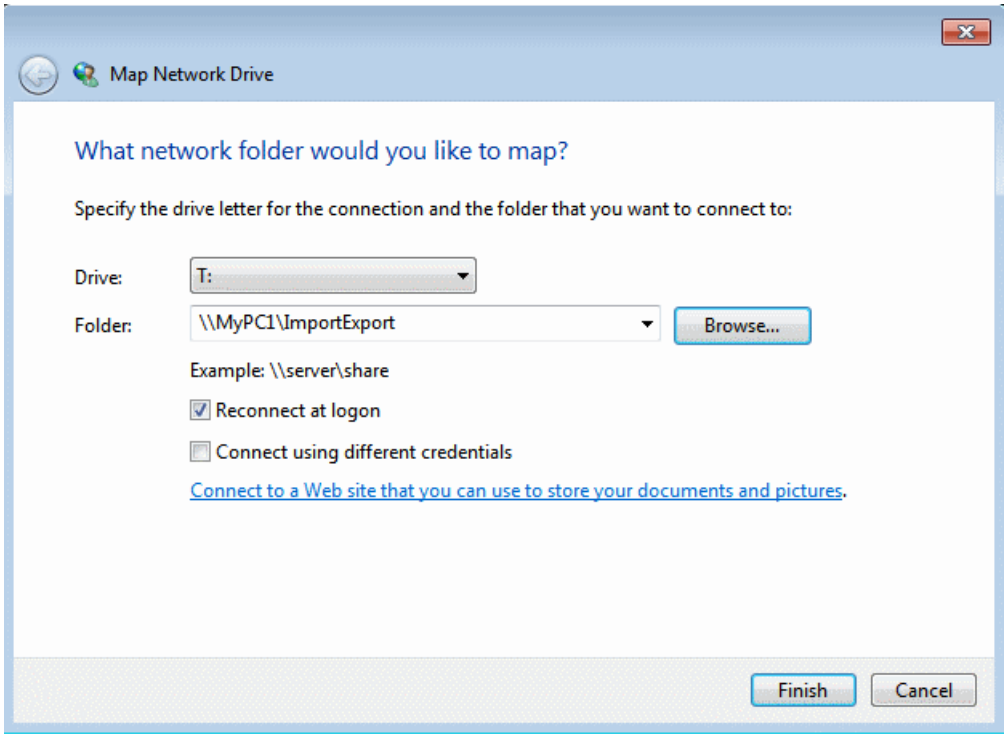
   The folder must be shared to allow access by the user account that logs on to the K2 Summit system system.

   When mapping a shared drive, GVAdmin account must have access to the shared location.



NOTE: A drive that you map for export must not require user credentials for access. If user credentials are required, the export transfer fails.

4. On the machine on which you are using AppCenter, map the shared folder as a network drive. For example, if the shared folder is on *MyPC1*, map the T: drive to *\\MyPC1\ImportExport*.



You can now use the mapped network drive as a source or destination for file transfer using the AppCenter Import or Send To features.

To import a file

Use the following procedures to import a video file.

When you import media from a file, the media is converted and stored using the K2 system native file format.

The file to be imported must be in a verified source location for file import. Examples of verified sources are as follows:

- When using AppCenter on a standalone K2 Summit system and the source is a local drive, the local drive is a verified source. It is not necessary to share a folder or map a drive.
- When using AppCenter on a Control Point PC and the source is a local drive on the Control Point PC, create a verified source as follows:
  - On the Control Point PC, share a folder.
  - On the Control Point PC, map the shared folder as a network drive.
- When using AppCenter on a Control Point PC and the source is a local drive on a K2 Summit system you are accessing with AppCenter, create a verified source as follows:
  - On the K2 Summit system, share a folder.
  - On the Control Point PC, map the shared folder as a network drive.

NOTE: The appearance of the asset list and file open dialog boxes is determined by the Options setting.

To import a video file, do the following:

1. Verify the current bin. The current bin is the destination directory for the import operation.
2. Place the file to be imported in a verified source location.
3. In the AppCenter main menu, select **Clips | Import**.

   The Import dialog box opens.
4. Click **File**.
5. In the Source section, browse to locate and select the source file.

   The **Look in** label shows the current location. The list under the **Look in** label displays the contents of the current location. The Import dialog automatically filters the list of files to show only the type of files that can be imported (such as .gxf, .mxf, and so on). You can select items in the list (such as a *machine*, drive, or folder) to explore its contents.

   Clicking the up-arrow button moves up one directory level in the storage hierarchy.

   The Look in drop-down list allows you to choose from one of the most recent source locations visited (history).
6. Verify the destination directory indicated next to **Bin Name**. This is where the imported file is placed.
7. Modify the clip name, if needed, by selecting the **Clip Name** edit control.
8. Click **Import** and proceed as follows.

   If you are importing a video file, the import begins. You do not need to continue with the next step in this procedure.

   NOTE: Import is a background task and can be monitored using the Transfer Monitor.
9. Once you have specified how to import the file, click **OK.**

Related Topics

About importing and exporting files on page 157
To map a source or destination drive for K2 system import/export on page 158

About exporting files

You can export K2 system clips using standard media file formats.

Files can be exported over an Ethernet connection to network drives or to common forms of removable media.

NOTE: If you export to a file or stream media that has the same name as an asset already existing in the destination location, an Abort/Rename/Retry dialog box appears.

Related Topics

Operational specifications on page 364

About sending files to standalone external drives

Transferring to and from a USB drive is supported on a local standalone K2 Summit system. USB drive transfers on K2 Summit SAN-attached system or Control Point PCs are not supported. Assets must be exported to a USB drive one at a time. Attempts to export more than one asset at the same time will result in the transfer aborting.

The following are operational considerations when sending files to external drives:

- **Estimating clip file sizes -** AppCenter does not prevent you from sending a file that is larger than the space available on the target disk. The transfer fails when the disk becomes full. To avoid this problem, check the clip size reported in the clip properties dialog box. You can use this to estimate the disk space required for the clip.
- **Best transfer performance -** File transfers are handled concurrently, up to four at a time. Additional transfer requests are queued.
- **Adding/Removing USB devices -** The USB connectors on the rear panel and front panel can be used to connect a mouse, keyboard, USB drive, or other USB device. Do not plug or unplug these devices while the K2 Summit system is being used for critical play to air activity.
- **Maximum file sizes when exporting assets to USB drives -** Exporting assets with long durations may result in file sizes that exceed 4GB. Some USB drives are formatted using FAT/FAT32, which has the 4GB maximum file size limitation. Attempting to send a file to these disk volumes will cause the transfer operation to fail. Disk volumes formatted using NTFS allow larger maximum file sizes. Before exporting an asset, be sure to check that the file size is less than 4GB, otherwise, ensure that the file system on the target drive supports larger files sizes.

Related Topics

Passwords and security on Grass Valley systems on page 15

To export to a file

The destination must be a verified destination for file export. Examples of verified destinations are as follows:

- When using AppCenter on a standalone K2 Summit system and the destination is a local drive, the local drive is a verified destination. It is not necessary to share a folder or map a drive.
- When using AppCenter on a Control Point PC and the destination is a local drive on the Control Point PC, create a verified destination as follows: On the Control Point PC, share a folder. On the Control Point PC, map the shared folder as a network drive.
- When using AppCenter on a Control Point PC and the destination is a local drive on a K2 Summit system you are accessing with AppCenter, create a verified destination as follows: On the K2 Summit system, share a folder. On the Control Point PC, map the shared folder as a network drive.

To export to a file, do the following:

1. Verify that the source and destination devices are in the same domain.
2. Select the clip or clips in the Clips Pane that you want to send to a file.

3. Open the Send to dialog box using one of the following steps:
   - Select **Clips | Send to**
   - Right-click the clip in the Clips Pane and select **Send to**

   The Send dialog box opens.
4. Click **File,** then locate and select the destination directory.

   The **Save in** label shows the current destination. The list under the **Save in** label displays the contents of the current destination. You can select items in the list (such as a *machine*, drive, or folder) to explore its contents.

   Clicking the up-arrow button moves up one directory level in the storage hierarchy.

   The Save in drop-down list allows you to choose from one of the most recent target locations used (history).
5. Use the **File Type** drop-down list to select the file format.
6. If desired, modify the destination file name using the **File Name** edit control. File Name: MyClip
7. Click **Send**.

NOTE: Export is a background task and can be monitored using the Transfer Monitor. If the operation fails for any reason, the asset is deleted from the target location.

Related Topics

About importing and exporting files on page 157

To map a source or destination drive for K2 system import/export on page 158

If the file export does not behave as expected…

If you have trouble locating an exported file, you might not be using a verified destination. Check that the destination is really at the location you expect. For example, if you select what appears to be the local drive in the Send dialog box, you might discover that the file actually goes to a different machine, as explained in the following table.

If you are using AppCenter on a...	The local drive is located on...
Standalone K2 Summit system	The standalone K2 Summit system
Control Point PC remotely accessing a standalone K2 Summit system	The standalone K2 Summit system

Importing and exporting streaming media

This section describes the process of importing and exporting streaming media using AppCenter. You can also transfer media using an FTP application. For information on using FTP, refer to the "Configuring the K2 System" section of this Topic Library.

About importing and exporting streaming media

You can transfer media between a K2 Summit system and other Grass Valley media devices using the **Import** and the **Send to** features. The K2 system supports streaming media transfers over the

FTP/streaming network. Source or destination devices for a streaming transfer include K2 Summit system. The format for such streaming is GXF. You must configure your network for streaming transfers prior to using these features.

NOTE: If importing to or exporting from other products, you must first add the remote host in Configuration Manager.

A transfer job is created for each "import" or "send to" operation. Once created, transfer jobs are added to the transfer job queue where they are dispatched in a first in, first out basis. Transfer jobs are handled in the order they appear in the queue. A standalone K2 Summit system can handle up to four concurrent transfer jobs. Any additional, up to 100 requests at a time, wait in the queue. You can use the Transfer Monitor to check the status of your transfer requests.

NOTE: The bit rate while streaming clips between machines is not symmetrical. For example, when streaming to a remote machine the data rate can be twice as fast as the rate streaming from a remote machine. This is due to the way transfer statistics are measured.

Related Topics

Adding a remote host on page 158
Importing streaming media on page 165
Exporting streaming media on page 166
Movie formats for GXF imports/exports: on page 165
Transfer timings and Interchange Standards on page 165

Movie formats for GXF imports/exports:

Depending on system software versions of source and destination devices, it might be required that all video and audio segments in a GXF transferred file be of the same media type. Refer to release notes for the software version for more information.

Transfer timings and Interchange Standards

The timing of the transfer with record/play operations depends on the clip's storage location. For information about transfer timings or interchange standards, refer to the operational specifications.

Related Topics

Operational specifications on page 364

Importing streaming media

K2 Summit system allows playout of movies that are still transferring in. Make sure the bandwidth of the import task is greater than the media bit rate.

NOTE: The appearance of the asset list and file open dialog boxes is determined by the View Option setting. Use the Clips Pane context menu to choose Image or Text view.

1. In the Clips Pane, select the bin to which you want to stream media. The current bin will be the *destination* bin for the import operation.
2. Select **Clips | Import**.

   The Import dialog box opens.
3. Click **Stream**.

4. In the Source section, browse to locate and select the source clip. (For some cross-product transfers, depending on software versions, you might need to specify the volume, bin, and media asset name. Refer to release notes for specifications.)

   The **Look in** label shows the current location. The list under the **Look in** label displays the contents of the current location. You can select items in the list such as *machine*, disk volume or a *bin*, to explore its contents.

   Clicking the up-arrow button moves up one directory level in the storage hierarchy.

   The **Look in** drop-down list allows you to choose from one of the most recent source locations visited (history).
5. In the Destination section, **Bin Name** displays the name of the current bin which specifies the destination bin.
6. Specify a clip name, if desired, by clicking the **Clip Name** edit control.
7. Click **Import** to start the transfer.

NOTE: Import is a background task and can be monitored using the Transfer Monitor.

Exporting streaming media

1. In the Clips Pane, select the asset(s) you want to transfer.
2. Open the Send to dialog box using one of the following steps:
   - Select **Clips | Send to**
   - Right-click the clip and select **Send to**

   The Send to dialog box appears.
3. Click **Stream**, then locate and select the stream destination.

   The **Stream to** label shows the current destination. The list under the **Stream to** label displays the contents of the current location. You can select items in the list (a *machine*, disk volume, or a *bin*) to explore its contents.

   Clicking the up-arrow button moves up one directory level in the storage hierarchy.

   The **Stream to** drop-down list allows you to choose from one of the most recent target devices (history).
4. Click **Send** to transfer the asset(s).

NOTE: Send to is a background task and can be monitored using the K2 system Transfer Monitor tool.

Monitoring media file transfers

The Transfer Monitor is used to monitor all K2 system transfer jobs and their status. A transfer job is created for each “send to” or “import/export” operation. Once created, transfer jobs are added to the transfer job queue where they are dispatched in a first in, first out basis. Up to four transfer jobs can execute simultaneously. Any additional jobs wait in the queue.

NOTE:

If the System | Transfer Monitor menu option is grayed out, review your level of user access.

Starting the Transfer Monitor

To start Transfer Monitor, perform one of the following:

- Select **System | Transfer Monitor**
- In the AppCenter Statusbar, double-click the **Transfer Monitor** button.

The Transfer Monitor button appears when a transfer job is present.

Transfer Monitor pages and buttons

In the Transfer Monitor, transfer jobs are categorized and displayed on one of three pages—Receiving, Sending, and Completed pages. On each page the transfer jobs are displayed using a thumbnail image along with a brief description of its source, destination and status. Jobs that have encountered errors are shown with a red circle next to a brief description of the error(s).

- **Source** – The source of the transfer job. If the source includes multiple files, the first file name is displayed plus a '…' sign beside it. You can find the full path of all the source files from the Properties page.
- **Destination** – The destination of the transfer job. You can find the full path of all the destination files from the Properties page.
- **Status** – For ongoing transfer jobs, the transfer rate is displayed in megabytes per second and percentage of job completed. All jobs waiting in the queue are shown as “Pending”. Jobs that encountered an error or errors are displayed with a red circle next to a brief description of the error(s).
- **Properties Button** – Used to view more detailed information about a transfer job.
- **Remove Button** – Used to abort and remove jobs from the transfer queue.

Receiving Page

The Receiving page displays all import transfer jobs.

Sending Page

The Sending page displays all “Send to” transfer jobs and their status.

Completed Page

The Completed page displays all jobs that have completed successfully. Completed jobs are automatically cleared after approximately 36 hours. You can manually clear jobs from the completed list using **Remove** or **Remove All**.

Related Topics

Viewing detailed transfer job properties on page 168

Viewing transfer jobs in Transfer Monitor

Each transfer job is displayed in the Transfer Monitor with a thumbnail image along with a brief description of its source, destination and status. Jobs that have encountered errors are shown with a red circle by them.

You can find more detailed information about a transfer job from its Properties page. The Properties information can be accessed while the transfer is taking place or after it has finished, regardless of whether the media has been transferred successfully or not.

- Source: The source of the transfer job. If the source includes multiple files, the first file name is displayed plus a '…' sign beside it. You may find the full path of all the source files from the Properties page.
- Destination: The destination of the transfer job. You may find the full path of all the destination files from the Properties page.
- Status: For ongoing transfer jobs, the transfer rate is displayed in megabytes per second and percentage of job completed. All jobs waiting in the queue are shown as “Pending”. Jobs that encountered errors are displayed along with an error code. You may find a more detailed error message in the Properties page.

Viewing detailed transfer job properties

1. In the Transfer Monitor, select a transfer job.
2. Click **Properties.**
3. When the Transfer Job Properties dialog box appears, select the **Transfer** tab to examine transfer properties.

Removing transfer jobs from the completed list

You can remove transfer jobs from the Completed page.

1. In Transfer Monitor, click **Completed**.
2. Remove the transfer jobs using one of the following:
   - Select the job to remove, then click **Remove**.
   - Select the jobs to remove, then click **Remove All**.

Using Channel Suites

Using channel suites

Use channel suites for remote AppCenter operation of one or more K2 Summit system systems. Channel suites are part of the Control Point software installed on a remote PC. You cannot use channel suites on a local K2 Summit system.

You can manage your channel suites from the System menu. When you open AppCenter, the system automatically opens the last-used channel suite. If you have a channel suite already running when you open a channel suite or create a new one, a dialog box displays asking if AppCenter should shut down or suspend current channel suite and applications in it.

If you select **Close Channel Suite**, you exit AppCenter and close the channel suite. Any channels that are running are stopped.

If you select **Suspend**, you exit AppCenter but the K2 Summit system keeps running any current application. (For example, if recording, the application keeps recording.) In this state, any channels

in the channel suite may be commandeered by another user. If all the channels in the channel suite are taken over in this manner, a suspended channel suite is shut down.

If there is an unplanned shut down on the K2 Summit system, the channels in remote AppCenter display a "disconnected" status in the channel title bar. Select **System | Reconnect** to connect to the K2 Summit system again. If the AppCenter application crashes on your network-connected Control Point PC, connections with the K2 Summit system are put into a suspended state while waiting for the PC to reconnect. The K2 Summit system continues to run any current applications or protocol.

A channel suite is saved as an XML file on the Control Point PC. The default location is *C:\Profile\ChannelSuites*. In this XML file, information for channel order, alias names, and the application that runs on a channel is stored. For example, if you run the Recorder application on a channel, the next you open the channel suite the Recorder application persists on that channel.

Related Topics

Sharing channels with other users on page 170

Managing channel suites

The following table describes the basic channel suites tasks and the actions necessary to complete them.

Task	Action
Add a channel to the currently active channel suite	In AppCenter, select **System	Suite Properties** and click **Add**. You can add up to 16 channels to a channel suite.
Configure the channel settings	In AppCenter, select **System	Configuration**.
Create a new channel suite	In AppCenter, select **System	New Suite**, name the channel suite, and add channels. Note: you can create a new channel suite while currently running a different channel suite. When you finish creating the suite, you are offered the choice of closing down or suspending the current channel suite. By default, the new channel suite is saved in the `C:\Profile\ChannelSuites` directory. You can overwrite an existing channel suite by selecting **System	New Suite**, highlighting the name of the channel suite you want to overwrite, and then proceeded as if it were an entirely new channel suite.
Delete a channel from the currently active channel suite	In AppCenter, select **System	Suite Properties** and click **Remove**. Deleting a channel removes it from the channel suite. It does not affect the channel itself.
Delete a channel suite	In the Windows Explorer application, locate the channel suite. Channel suites are saved by default in the `C:\Profile\ChannelSuites` directory in XML format. Highlight the file and hit the **Delete** key.
Open a channel suite	In AppCenter, select **System	Open Suite** Channel suites are saved by default in the `C:\Profile\ChannelSuites` directory in XML format. Note: to open one of the last four recently used channels, select **System	Recent Suites**.

Task	Action
Organize channels in a channel suite	In AppCenter, select **System	Suite Properties**. Highlight the channel you want to reorder and click either **Move Up** or **Move Down**.
Rename a channel in a channel suite	In AppCenter, select **System	Suite Properties** and click **Rename**. Channel names must be 16 characters or less. Note: to rename an open channel suite, AppCenter must shut down all the channels and then re-open the suite.
Rename a channel suite	In AppCenter, select **System	Suite Properties**. In the Suite Properties dialog box, enter the new suite name and click **Save**. Note: renaming a channel suite while it is running causes all the channels to stop and any clips to be ejected. AppCenter needs to reconnect to the K2 Summit system that are affected by this change.

Using channel suites with multiple K2 systems or storage locations

Channel suites have the capability to operate channels from multiple sources through one Control Point PC. You can move from a channel on one source to a channel on another without disrupting playout.

You can use a channel suite with channels that access media stored on different K2 Summit system or K2 SANs. The clip bin displayed is the bin where the channel currently active stores its clips.

Take care when loading clips into channels. When the clips for the currently active channel are displayed in the Clips pane, you might not be able to load those clips into a channel that is not currently active, if that channel is on a different source. For example, if you have channels in your channel suite from standalone K2 Summit system “A” and from standalone K2 Summit system “B”, you cannot drag and drop a clip from the “A” system to load it into a “B” system channel. To load a clip across storage locations in this manner requires a transfer of the clip from system “A” to system “B.” You must perform that transfer as a separate task, as attempting a cross-system load of a clip does not trigger a transfer.

Accessing a K2 Summit system from multiple Control Point PCs

You can have the same channel suite saved on different Control Point PCs. This is useful in the event of a Control Point PC crash while running AppCenter. Within two minutes of an unplanned shut down, the K2 Summit system suspends the channels in the affected channel suite. If you have the same channel suite on another Control Point PC (that is, a channel suite with the exact same name), you can open the channel suite on the other Control Point PC. When you do this you must use the same user credentials. Then you can continue your work.

Sharing channels with other users

Channels are used exclusively by one application and one user, but multiple users on different PCs can access different channels on the same server at the same time. You can share channels with users who are accessing the same source from networked-connected Control Point PCs. To release

a channel, select <None> in the application drop-down list in the channel monitor pane. The title bar of the channel changes to “Available”.

If a channel is in use by another user, you can still have the channel as part of your channel suite. In this status, the channel says “in use” in the title bar of the clip and includes information on the current user, computer, and application.

Taking over a channel

While you are using a channel, another user can commandeer it. When this happens the channel says “in use” in the title bar of the clip and includes information on the current user, computer, and application.

- If you click on an application drop-down list in a channel that another user has assigned an application to, a pop-up message asks you to confirm that you want to take the channel over.
- For example, if user1 has designated Channel 1 to run a Player application on Control Point PC1, user2 can go into Channel 1 in his channel suite on Control Point PC2 and select Recorder from the application drop-down list. User2 will see this message:

  ‘Channel1:*K2 system*’ is currently used by ‘user1’ running ‘Player’ on ‘PC1’. Are you sure you want to eject this clip and launch a ‘Recorder’?
- Clicking Yes will allow the second user to begin the new application on this channel.

Channel suites and channel configuration considerations

While you can separate the channels on a single K2 Summit system for operation by using one or more channel suites, the channels on a K2 Summit system are always combined in one interface when you use Configuration Manager. This means that it is possible to open Configuration Manager from within a channel suite and configure a channel that is not present in that channel suite. Therefore, make sure you know the control and operating status of a channel before you modify its configuration.

Likewise, if your channel suite has channels from multiple sources, it is possible to open Configuration Manager on each of those sources from within the one channel suite. Therefore, make sure you select the channel you intend to configure before you open Configuration Manager.

When you modify channel configuration in Configuration Manager, the changes are saved in a configuration file on the K2 Summit system, not on the network-connected Control Point PC.

Administrators can set user permissions for each channel. Depending on your security settings, you could be denied permission to operate a channel. For more information, see the *K2 System Guide*.

Take special care when modifying a channel configuration as follows:

- Changes that apply to all channels on a K2 Summit system. This can affect media operations in other channel suites that contain channels from that K2 Summit system.
- Changes that require rebooting the K2 Summit system, such as switching the video reference from NTSC to PAL. This can stop the media operations in other channel suites that contain channels from that K2 Summit system.

NOTE: Configuration changes require K2 admin access privileges.

Audio/Video Configuration

Using Configuration Manager

To modify settings in Configuration Manager, you must be currently logged in to AppCenter with administrator privileges.

NOTE: Using HD requires an XDP (HD) license. If you do not have an HD license, refer to the SD configuration specifications only.

Open Configuration Manager from the AppCenter menu bar at **System | Configuration**.

NOTE: If you are accessing a* K2 Summit system *from a Control Point PC with a channel suite that has channels from multiple sources, make sure that you select a channel from the* K2 Summit system *that you want to configure before opening Configuration Manager.

About video scaling settings

The AppCenter video scaling feature allows you to play clips with different aspect ratios and picture resolutions on the same play channel.

AppCenter handles video scaling as follows:

- When recording a SD clip, you should specify whether the clip is standard or widescreen video. This sets the clip aspect ratio attribute. This attribute is saved as part of the media file. If the SD clip is played out on a HD channel, the aspect ratio attribute is recognized.
- SD material that is transferred or recorded into the system, along with its audio and metadata, is upconverted with selected aspect ratio when played on an HD channel. HD material is downconverted along with its audio when played on SD channel. HD and SD clips can be played back-to-back.
- Agile playout of mixed format clips displays with default or selectable modes such as bars, crop, or stretch on both SD and HD outputs.
- During play channel setup, you must select the video output for each play channel– standard or high definition. This will determine if the clip picture resolution needs up-conversion or down-conversion.
- For each play channel you must specify the active format description (AFD) settings to use when the picture image needs to be resized. Selections include crop, bars, halfbars and stretch.
- There are two settings: **Aspect Ratio** and **Aspect Ratio Conversion**. The K2 Summit system applies these settings as follows:
  - The K2 Summit system uses the Aspect Ratio setting only when AFD is known and when down-conversion takes place.
  - The K2 Summit system uses the Aspect Ratio Conversion setting only when AFD is not present or is undefined and either up-conversion or down-conversion takes.

  For example, if you change the Aspect Ratio Conversion setting and then play a clip with AFD present, the output does not change.
- For the highest video quality, select a video output format that eliminates the need for up or down conversion.
- AppCenter can play clips with different aspect ratio attributes in a single playlist.

NOTE: Some video output connectors become inactive for some video type selections.

Related Topics

Active Format Description (AFD) specifications on page 373

About aspect ratio conversion modes

The aspect ratio conversion mode setting for the play channel determines how the picture image is resized for playout.

Related Topics

Aspect ratio conversions on HD K2 client on page 372

Applying AFD settings

Active Format Description (AFD) can be used to automatically determine the proper aspect ratio to use for up- and down-conversions.

In AppCenter, you can specify the AFD settings:

- in the Clip Properties dialog box, for that clip only
- in the Channel Options dialog box, for newly recorded clips on that channel

You can also make settings in Configuration Manager to specify under what conditions the K2 Summit system should process AFD (for output only, on a per-channel basis).

When recording, the following AFD settings are available:

SD	HD
Undefined	Undefined (Undefined means no AFD has been set; the clip remains as is.)
16:9 Full screen	4:3 Pillarbox
4:3 Full screen	16:9 Full screen
16:9 Letterbox	14:9 Pillarbox
14:9 Letterbox	16:9 Full screen with 4:3 center

Channels with HD licenses need to set the AFD values when aspect ratio conversion has been performed while playing out video. Channels that are SD-only do not perform aspect ratio conversion; AFD values do not need to be adjusted on those channels.

Clips with AFD recorded on a K2 Media Client will play on a K2 Summit system, and vice versa. Clips will have either ARC or AFD properties, not both. AFD in ancillary data is preserved in the data track during recording.

NOTE: Other methods of expressing AFD, such as video index or bar data, are not supported.

Related Topics

Active Format Description (AFD) specifications on page 373

Setting AFD in the Clip Properties

Any modification to the AFD settings made here applies to the selected clip only.

1. In the Clips pane, right-click on the clip.
2. Select **Properties**.
3. In the Clip Properties dialog box, click on the **Media** tab.
4. Click the AFD drop-down list. Select the AFD setting and click **OK**.

Setting AFD in the Channel Options

Any modification to the AFD settings made here applies to input on the selected recorder or player/recorder channel only.

1. In AppCenter, select the channel where you want to set the AFD value.
2. Click the **Options** button.
3. In the Options dialog box, click on the Bin & AFD tab.
4. Click the AFD drop-down list. Select the AFD setting and click **OK**.

Setting AFD in the Configuration Manager

AFD settings made in Configuration Manager apply only to output on the specified channel.

1. From the File menu, select **System | Configuration**.
2. In Configuration Manager, click the Channel tab and the specific channel tab that you want to modify.
3. Scroll down to AFD settings and select one of the options:

For this setting...	Configure as needed...

AFD Settings	Defines AFD in clips output from the K2 Summit system. You can select the following:
	• **Record AFD as clip property**:
	  • Yes – When an AFD setting is present it is set as the default in clip properties. This is the default K2 system behavior.
	  • No – When an AFD setting is present it is not set in clip properties.
	• **Generate AFD on Output**:
	  • Always – As automatically determined by the K2 system.
	  • When Known – As set in clip properties.
	  • Never – Pass-through any AFD already present.
	• **SD 16:9 Full screen up-conversion AFD**: Select AFD code1010 or 1001, as required by your site's downstream processing. This does not affect the visual display at the K2 system output.

4. Click **OK** to apply the setting

Configuring video reference standard settings

The video reference standard setting is global to the K2 Summit system and applies to all channels. For the reference standard currently selected, the only clips available for playout are those that use that reference standard. Clips that use a different reference standard are disabled (grayed out).

NOTE: When you change the video reference standard setting, a restart is required to put the change into effect.

1. In AppCenter, open the Configuration Manager.
2. Click **System**.
3. Configure settings as follows:

For this setting...	Configure as needed...
Reference Standard	Choose **NTSC** or **PAL**.
	Determine status of **Reference present**. • Green LED — source present • Black LED — source not present
	Determine status of **Reference locked**. • Green LED — system locked • Black LED — system not locked

Related Topics

Active Format Description (AFD) specifications on page 373
Configuring data track settings on page 183

Configuring reference file type on a standalone K2 Summit system system

1. In AppCenter, click **File | System | Configuration**.
   Configuration Manager opens.
2. In Configuration Manager, click the **System** tab.
3. In Reference Files settings, for the **Reference file type** setting, select one of the following:
   - None — K2 software does not create reference files.
   - QuickTime — K2 software creates QuickTime reference files.
4. Click **OK** to apply the setting.
5. Restart the standalone K2 Summit system to put the change into effect.

Configuring MXF Export Type on a standalone K2 Summit system system

1. In AppCenter, click **File | System | Configuration**.
   Configuration Manager opens.
2. In Configuration Manager, click the **System** tab.
3. In MXF Export settings, for the **MXF Export Type** setting, select one of the following:
   - **377M**: SMPTE ST 377:2004 compliant. Ensures compatibility with older products.
   - **377-1**: SMPTE ST 377-1:2009 compliant.
   - **ARD and 377-1**: ARD is only for AVC-Intra Class 100 (720p and 1080i PAL only) and XDCAMHD-422 (1080i PAL only). For other formats, the clip will be set to 377-1 export type if this option is selected.
4. Click **OK** to apply the setting.
5. Restart the standalone K2 Summit system to put the change into effect.

Related Topics

MXF Export Type on page 266
Configuring MXF Export Type on a K2 SAN system

About tri-level sync

The K2 Summit system supports tri-level sync as a genlock reference source. The reference must be in an HD format and frame rate that is supported by the K2 Summit system, as follows:

- Reference Standard: NTSC (59.97Hz)
  - 1080i 29.97
  - 720p 59.94
- Reference Standard: PAL (50Hz)
  - 1080i 25
  - 720p 50

The K2 Summit system automatically detects, switches, and syncs to the reference. When you configure the reference standard for either NTSC (59.97Hz) or PAL (50Hz) in K2 AppCenter Configuration Manager, a restart is required to put the change into effect and the system starts with a SD reference format by default. It then attempts to detect a reference in a format and frame rate that is compatible with the current reference standard setting. When the K2 Summit system detects a reference in a supported format, it automatically switches to that format. This allows the system to switch between SD and HD tri-level formats with frame rates that are compatible with the reference standard setting. When the K2 Summit system locks to a new reference format, it saves the format and frame rate information, and upon restart it returns to the saved format and frame rate.

Do not use a progressive reference with an interlace output. For example, do not use 720p tri-level sync for interlace output formats (such as SD and 1080i). Output timing can be off by a field with this type of incompatibility.

The K2 Summit system treats the following conditions as a loss of reference:

- No reference is present
- A reference in an unsupported format is present
- A reference in a supported format is present but it has a frame rate that is not compatible with the current reference standard setting.

In these cases the K2 Summit system internal genlock flywheel provides a stable reference for the last reference set. The system reports this status in K2 AppCenter Configuration Manager Reference Standard by a black "Reference present" indicator.

Configuring record channel video settings

Video record compression settings are not global; they can be set on a channel by channel basis.

1. If you are using a channel suite with channels from multiple sources, select a channel from the K2 Summit system that you want to configure.
2. In AppCenter, click **System | Configuration**.

   Configuration Manager opens.
3. Click **Channel**, and select a channel.

4. Configure settings as follows:

For this setting...	Configure as needed...
Type	If licensed for AppCenter Elite you can configure the channel to be a ChannelFlex Suite Channel. When you do so, settings change accordingly.
Name	If desired, enter a name for the channel.
Input format	Changing video input format does not require a restart of the K2 Summit system. If changing between SD and HD, however, there is a wait time up to 24 seconds for each recorder channel after clicking the **OK** button in Configuration Manager.
Recorder Setup: Video input format	If 720p or 1080i or 1080p 3G Level A is selected: • Green LED — input present • Black LED — input not present
Recorder Setup: Compression format	Settings are available, based on codec option cards, HD licensing options, and input formats.
Video Input: Input type	K2 Summit system are SDI only.
Ancillary data timecode inputs (LTC or VITC)	If 720p or 1080i or 1080p 3G Level A is selected: • Green LED — input present • Black LED — input not present
Automatic VITC detection	Turn on or off as desired. VITC settings vary based on selection.
Starting VITC line or VITC line 1	Available range varies, based on NTSC or PAL selection
Ending VITC line or VITC line 2	Available range varies, based on NTSC or PAL selection
AFD settings	Refer to AFD specifications.

Related Topics

Active Format Description (AFD) specifications on page 373
ChannelFlex Suite and licensing on page 203

Configuring record channel audio settings

On the K2 Summit system, available settings change depending on the audio input selected, as in the following sections.

AES/EBU audio settings

1. In AppCenter, click **System | Configuration**.
   Configuration Manager opens.
2. Click **Channel**, and select a player/recorder channel.
3. For **Audio input type**, select **AES / EBU**.
4. Configure as follows:

For this setting...	Configure as needed...
Number of audio inputs	Select the number of inputs. Settings below change, based on your selection.
A1/A2 input format	Select the input format.
A3/A4 input format	Select the input format.
Timing offset	Between -200ms and +200ms. The default value is 0 ms.
Audio Input Tags	Add tags for languages or other purposes to this channel's audio tracks.
Display audio meters	Select **System	Monitor Options**, select the **Display the Following Channel Status** radio button, and check the **Audio Monitors** box.

Related Topics

Adding audio tags on page 199

Embedded audio settings

1. In AppCenter, click **System | Configuration**.
   Configuration Manager opens.
2. Click **Channel**, and select a player/recorder channel.
3. For **Audio input type**, select **Embedded**.

4. Configure as follows:

For this setting...	Configure as needed...
Number of audio inputs	Select the number of inputs. Settings below change, based on your selection.
Embedded input group(s)	Selections available are dependent on "Number of audio inputs" setting above
A1/A2... input format	Select the input format.
Timing offset	Between -200ms and +200ms. The default value is 0 ms.
Audio Input Tags	Add tags for languages or other purposes to this channel's audio tracks.
Display audio meters	Select **System	Monitor Options**, select the **Display the Following Channel Status** radio button, and check the **Audio Monitors** box.

Related Topics

Adding audio tags on page 199

Configuring play channel video settings

1. If you are using a channel suite with channels from multiple sources, select a channel from the K2 Summit system that you want to configure.
2. In AppCenter, click **System | Configuration**.

   Configuration Manager opens.
3. Click **Channel**, and select a channel.

4. Scroll to locate and configure settings as follows:

For this setting...	Configure as needed...
Type	If licensed for AppCenter Elite you can configure the channel to be a ChannelFlex Suite Channel. When you do so, settings change accordingly.
Name	If desired, enter a name for the channel.
Video Output	NTSC or PAL available depending on video reference standard setting.
Aspect ratio	Select a HD or SD format.
Aspect ratio conversion	Select the conversion option. Refer to topics about aspect ratio conversions.
Still-play mode	Determines how to generate the still-play signal for the play channel when it is setup to freeze on last frame of video in stop mode. You can select the following: • **Field (interpolated)**: This is the default setting and uses the content of one field for both fields during still-play for a one field freeze. This mode eliminates the motion jitter that can be present in Interlaced mode. • **Frame (interlaced)**: This mode displays two fields in still play mode for a two field freeze. With this mode you might see some motion jitter in still-play.
Test Mode (Colorbars + Tone)	Temporarily displays 75% colorbar signal on the channel output. It also generates an audio tone on all audio outputs. This setting is for test purposes only, so it is not saved.
Video Output Timing	Delays the video output.
Ancillary data timecode output	If 720p or 1080i selected, inserts the recorded timecode track as ancillary timecode on playout. Overrides any ancillary timecode packets stored on data track. Refer to specifications about data track support.
VITC output generator	If SD is selected, you can select VITC lines.

For this setting...	Configure as needed...

AFD Settings	Defines AFD in clips output from the K2 Summit system. You can select the following:
	• **Record AFD as clip property**:
	  • Yes – When an AFD setting is present it is set as the default in clip properties. This is the default K2 system behavior.
	  • No – When an AFD setting is present it is not set in clip properties.
	• **Generate AFD on Output**:
	  • Always – As automatically determined by the K2 system.
	  • When Known – As set in clip properties.
	  • Never – Pass-through any AFD already present.
	• **SD 16:9 Full screen up-conversion AFD**: Select AFD code1010 or 1001, as required by your site's downstream processing. This does not affect the visual display at the K2 system output.

Motion Smoothing	Select Motion Smoothing during 3xSSM and 6xSSM for off-speed play of 1080i output. Turning this feature on will smooth the picture and reduce jitter.

Related Topics

About video scaling settings on page 172
ChannelFlex Suite and licensing on page 203
Data track support on K2 Summit system HD channels on page 381
Changing the timecode source on page 91
Supported conversions from SD to HD using AFD on page 377
Supported conversions from HD to SD using AFD on page 378

Configuring play channel audio settings

1. In AppCenter, click **System | Configuration**.
   Configuration Manager opens.
2. Click **Channel**, and select a player/recorder channel.

3. Configure as follows:

For this setting...	Configure as needed...
Embedded output group(s)	Select **None** or **Groups 1, 2, 3, 4**.
Timing offset	Between -200 ms and +200 ms. The default is 0 ms.
Force PCM Status Bit	Select **Yes** to set the status of all playout audio tracks to PCM. This setting applies to both PCM audio tracks and non-PCM audio tracks. Do not use this setting unless required by your specific workflow.
Audio Output Tags	Add tags for languages or other purposes to this channel's audio tracks.
Display audio meters	Select **System	Monitor Options**, select the **Display the Following Channel Status** radio button, and check the **Audio Monitors** box.

Related Topics

Adding audio tags on page 199

Adjusting play speed options

1. In AppCenter, click **System | Configuration**.

   Configuration Manager opens.
2. Click **Channel**.
3. Click **Panel**.
4. Configure as follows:

For this setting...	Configure as needed...
Jog speed	Playback advances or retards one frame at a time according to the direction of the setting.
Shuttle speed	Sets the speed for shuttle play or playback.
VAR setting	Variable speed play. Specify the play speed; otherwise, the speed remains at the preset play speed or the last variable play speed used.
Always start at VAR preset	Initial play speed can be set to start at the preset speed.

Configuring data track settings

Do not configure these settings unless you are qualified and understand your system's data track requirements. Consult with Grass Valley for recommendations.

1. In AppCenter, click **System | Configuration**.

   Configuration Manager opens.
2. Click **Channel**, and select a player/recorder channel.

3. Select a video input format.
4. Scroll down and locate **Data Track** settings.
5. Configure as follows:

For this setting...	Configure as needed...
Record ancillary data	Select **Yes** to create a data track and store ancillary data packets.
CEA-608 to DTV CC transcoder	Select **Yes** to automatically convert CEA-608 closed caption data to 708 DTV CC packets.
Record uncompressed VBI and captioning to data track	Available if SD selected. Selecting No retains compatibility with Profile XP Media Platform.
Uncompressed VBI lines	Available if SD selected.
Teletext Output Lines	Click a link in this section to map one or more Teletext lines to play out on a different line.
Output OP-47 packet on line	Map the video line which OP-47 ancillary data packets are output for playout, or select **Source line** to leave the packets unmoved.

Related Topics

Configuring video reference standard settings on page 175
Data bridging of VBI information on K2 Summit system HD channels on page 382
Line mapping of ancillary data packets on K2 Summit system HD channels on page 383
CEA 608 to CEA 708 DTV CC Transcoder and FCC requirements on page 381

Configuring timecode settings

1. In AppCenter, click **System | Configuration**.
   Configuration Manager opens.
2. Click **System**.
3. Configure as follows:

For this setting...	Configure as needed...
Time of Day	Select one of the following: • **System Clock**: This setting uses the Windows operating system clock. If you select this source you should verify that the clock's time is correct. • **LTC Input**: Choose if using LTC timecode. Select which channel you want to use as the Time of Day source.

Configuring proxy and live streaming settings

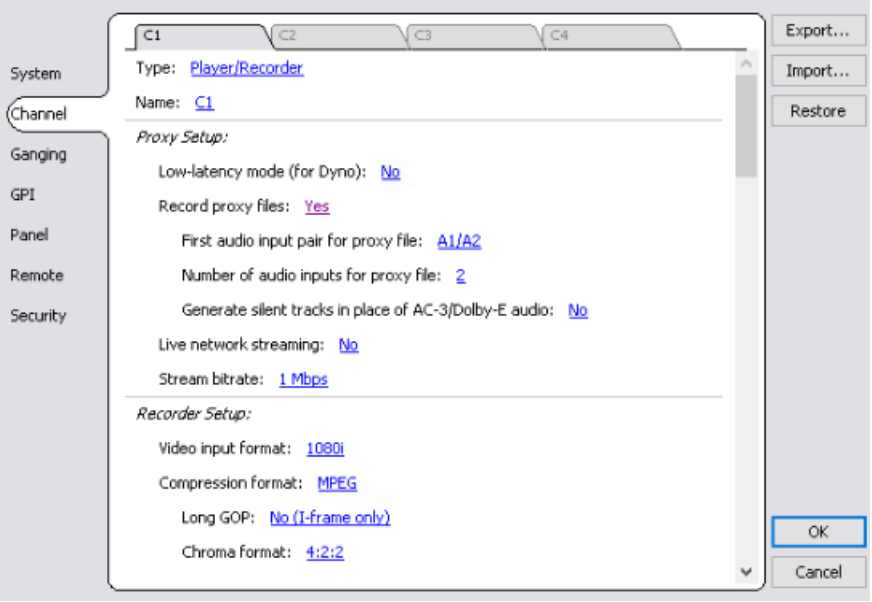
On the K2 Summit system, configure proxy and live streaming settings as in the following sections. For complete information about proxy and live streaming, refer to related topics in the "Configuring the K2 System" section of this Topic Library.

Enable proxy files

1. In AppCenter, click **File | System | Configuration**.

   Configuration Manager opens.

2. In Configuration Manager, click the **Channel** tab.



3. Select a channel.
4. In Proxy Setup settings, set **Record proxy files** to **Yes**.

   This setting and the **Live network streaming** setting are related to DynoZoom and live monitoring. Refer to related topics in the "Configuring the K2 System" section of this Topic Library.

5. Select the audio included in the proxy file as follows:

   - Select the first audio input pair to include in the proxy file.
   - Select the number of audio inputs to include in the proxy file.

     NOTE: The K2 Summit system includes audio pairs beginning with the first pair selected and then each subsequent audio pair up to the selected number of audio inputs.

   - Select **Yes** to enable silent PCM audio generation in place of Dolby audio streams when recording a proxy file.

     NOTE: If set to "No", any Dolby audio tracks will be excluded from being written to the proxy file and any PCM audio tracks will be shifted from their original placement.

6. Select the **Stream bitrate** for the proxy as follows:
   - **4 Mbps** — High bitrate for higher streaming proxy quality.
   - **1 Mbps** — Low bitrate to optimize the speed of streaming proxy.

   NOTE: Streaming bitrate of 8 Mbps is not supported for proxy file generation.
7. Select another channel and configure as desired.
8. Click **OK** to apply the settings.

Related Topics

DynoZoom, live monitoring, and GV STRATUS streaming on page 356
Configuring proxy and live streaming settings on page 185
Proxy/live streaming technical details on page 354
Proxy/live streaming formats and specifications on page 370
Proxy/live streaming on page 352

Enable live streaming

1. In AppCenter, click **File | System | Configuration**.
   Configuration Manager opens.
2. In Configuration Manager, click the **Channel** tab.
3. Select a channel.
4. In Proxy Setup settings, set **Live network streaming** to **Yes**.

   If **Record proxy files** is set to **No**, low-latency streaming media is generated. Use this only as recommended for specific K2 Dyno Replay Controller applications, as low-latency streaming media can overload network bandwidth.
5. Select the audio input pair to include in the proxy stream.
6. Select the **Stream bitrate** for the proxy as follows:
   - **8 Mbps** — High bitrate for highest streaming proxy quality.
   - **4 Mbps** — Medium bitrate for medium streaming proxy quality.
   - **1 Mbps** — Low bitrate to optimize the speed of streaming proxy.
7. Select another channel and configure as desired.
8. Click **OK** to apply the settings.

Related Topics

DynoZoom, live monitoring, and GV STRATUS streaming on page 356
Proxy/live streaming on page 352

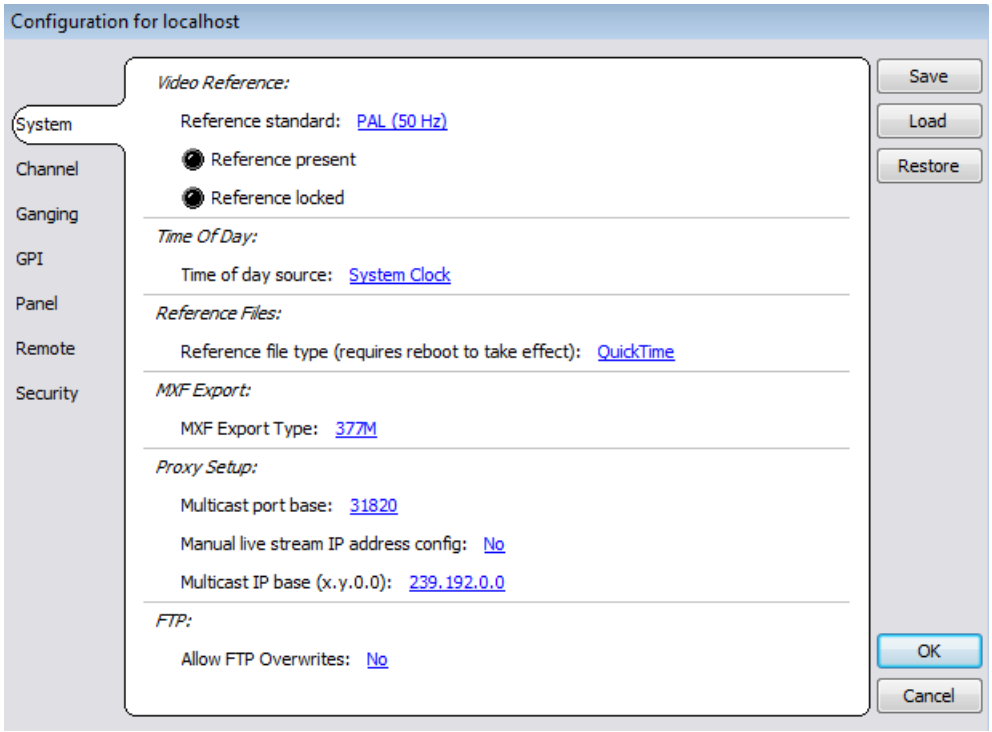
Configure live streaming multicast

This task describes the configuration of multicast settings using AppCenter.

1. In AppCenter, click **System | Configuration**.
   Configuration Manager opens.

2. In Configuration Manager, click the **System** tab.

   These settings apply to all channels on the K2 Summit system.



3. In Proxy Setup settings, select and enter the **Multicast port base**.

   This is the first UDP port address for elementary streams.

4. To set the multicast IP base address for each channel independently, set **Manual live stream IP address config** to **Yes**.
5. Select **Multicast IP base (x.y.0.0)**.

   The K2 Summit system applies channel-specific IP addresses from this base.

6. Enter the IP address in the **Multicast IP base (x.y.0.0)** dialog box.
7. Click **OK**.
8. Click **OK** to apply the settings.

GPI and other configurations

Using GPI input and output triggers

The K2 Summit system provides 12 GPI inputs and 12 GPI outputs on a single DB-25 pin rear panel connector. GPI input triggers can be used to control channels, including recording, playing, stopping, and skipping a playlist event. GPI output triggers can be defined for channels and inserted in playlists to control external equipment as the list is played.

If you want to trigger record via GPI input on four channels simultaneously, make sure all the channels have new clips waiting for the GPI input, in the cue record state.

For information about GPI connectors, see topics in the "Configuring the K2 System" section of this Topic Library.

Configuring GPI triggers

Use the configuration tool provided in the AppCenter file menu. Select **System | Configuration** to define the GPI input or output triggers for a channel.

The following features are part of the licensable AppCenter Pro option.

The Control drop-down list has three selections: Application, Position Trigger, and Channel State.

- Application — allows you to select the GPI trigger on the level of the Playlist application. Must be used in conjunction with a specified channel. For example, if after having selected a channel in the Configuration Manager, you then select Application, you can open up the Playlist Properties dialog box and assign a GPI output event to each clip or event in a Playlist.
- Position Trigger — indicates the position when the GPI output is triggered, e.g. at the beginning or the end of a clip.
- Channel State — indicates the status of the channel when the GPI output is triggered, for example when recording or when idle. Used in conjunction with a trigger state. For example, in a Playlist application, you can set the trigger so that the GPI output is triggered when clip is first loaded but not when it's playing or when it’s re-cued to beginning.

GPI triggers

To access GPI settings, select **System | Configuration** and click on the GPI tab. The settings are located under two tabs: GPI-Input and GPI-Output. GPI output triggers have user-assignable names. The following tables describe the GPI functions under each tab.

GPI Input

On the GPI tab, select GPI-Input…	Make settings as needed…		
GPI Input 1. . . GPI Input 12	Trigger channel(s)	C1, C2, C3, C4	Select the channel to trigger the GPI input.
GPI Input 1. . . GPI Input 12	Trigger action	Play	Play current loaded clip or playlist in assigned Player channel. Supports the playback of SSM clip or playlist.
		Record	Start recording a clip in Recorder channel.
		Stop	Stop playback or record of assigned channel.
		Rewind	Rewind playback of assigned channel. Channel stays in rewind mode until the beginning of clip is reached or another transport action is taken.

On the GPI tab, select GPI-Input…	Make settings as needed…		
		Fast Forward	Fast forward playback of assigned channel. Channel stays in the fast forward mode until the end of clip is reached or another transport action is taken.
		Cue Start	Cue to start of clip loaded in Player or Playlist channel.
		Cue End	Cue to end of clip loaded in assigned channel.
		Eject	Ejects the current clip.
		Cue Next Event	Goes to next event in a Playlist and stops.
		Cue Prev Event	Goes to previous event in a Playlist and stops.
		Cue Next Section	Goes to next section in a Playlist and stops.
		Cue Prev Section	Goes to previous section in a Playlist and stops.
		Take Next Event	Used with Event Scheduler. Starts playback or record of the next event, regardless of start type.
		Take Next Scheduled Event	Used with Event Scheduler. Starts playback or record of the next event with a scheduled start time or approximate start time. (Note: follow events are skipped.)
		VAR Playback	Plays loaded clip in VAR mode with preset speed.
GPI Input 1. . . GPI Input 12	Active	High Low	Select the active signal (high or low) required. This is determined by the external equipment connected to the GPI input.

Related Topics

Adjusting play speed options on page 183

GPI Output

On the GPI tab, select GPI-Output…	Make settings as needed…		
GPI Output 1. . . GPI Output 12	Channel	C1, C2, C3, C4	Select the channel on which to trigger the GPI Output.
GPI Output 1. . . GPI Output 12	Active	High Low	Select the active signal (high or low) required. This is determined by the external equipment connected to the GPI Output.
GPI Output 1. . . GPI Output 12	Control (This menu and the items on it are part of the licensable AppCenter Pro option)	Application Position trigger Channel state	Determines whether the GPI output is triggered by the application (e.g., by the Properties dialog box in Playlist), the position (e.g. at the beginning or end of a clip) or the state of the selected channel (e.g. playing, recording, idle, etc.)
GPI Output 1. . . GPI Output 12	Trigger name (Available when Application selected)	GPI-Out-X	Enter the name of the action triggered by the GPI output.
GPI Output 1. . . GPI Output 12	Trigger at (Available when Position trigger selected)	Start of material End of material Start of material plus End of material minus	When Start/End of material plus/minus offset appears
GPI Output 1. . . GPI Output 12	Activate when (Available when Channel state selected)	Playing Recording Cued for play Cued for record Idle	Once a channel has been selected, this setting triggers the GPI output when the channel is in the specified state.

NOTE: If you want to play a list that was created on another play channel, you must ensure that GPI triggers assigned to the play channels use the same names; otherwise the GPI triggers will not occur. Using identical GPI names also allows copying and pasting sections and events between lists.

Configuring FTP Overwrite setting

1. In AppCenter, click **File | System | Configuration**.
   Configuration Manager opens.

2. In Configuration Manager, click the **System** tab.
3. In FTP settings, for the **Allow FTP Overwrites** setting, select one of the following:
   - **Yes**: Clips with existing names get overwritten during an FTP put operation.
   - **No**: An FTP put operation specifying an existing clip name causes the FTP put operation to fail. (This is the default behavior)
4. Click **OK** to apply the setting.

   For more information, see topics in the "Configuring the K2 System" section of this Topic Library.

Related Topics

Using FTP for file transfer on page 258

Adding a remote host

Open Configuration Manager to access remote host settings.

On the Remote tab…	Make settings as needed…
Host name	Enter the name or the IP address of the K2 Summit system where you want to import or export streaming media assets. (Grass Valley recommends that you use host names. For more information on host files, see topics in the "Configuring the K2 System" section of this Topic Library.
Controller Id	When adding a remote host that uses AMP remote control protocol, select a Controller id.

Setting security access permissions

Open Configuration Manager to access security settings. For more information, see topics in the "Configuring the K2 System" section of this Topic Library.

Channel Ganging and Track Mapping

Channel Ganging

This feature is a part of the licensable AppCenter Pro option.

Channel ganging allows you to link two or more channels in a ‘gang’ to synchronize control of the channels.

About Channel Ganging

This feature is part of the licensable AppCenter Pro option.

Channel ganging allows you to control the playing or recording of clips on all the channels in the gang. Ganging record channels together allows you to record up to 4 video or 64 audio tracks. When you gang play channels together, you can play one clip on all channels or control the playing of different clips on all the channels in the gang.

If a clip is created with more than 16 audio tracks, but only one video track, when you play it back on a gang of play channels, only the first video channel plays the video track. (A ganged clip with 16 audio tracks or less plays the video track in all the play channels in the gang.)

NOTE: Do not gang play and record channels together. Do not gang playlists.

Configuring channel ganging

Channels must be assigned to a gang using the **Ganging** tab in the Configuration Manager.

1. In AppCenter, select the Player/Recorder application in the channel pane.
2. Select **System** then **Configuration** and click on the **Ganging** tab.
3. Assign the channels to a gang, and check the appropriate boxes. For a description of the configuration choices, see "Components of the channel ganging configuration."
4. To save changes, do one of the following:
   - To apply changes to the current configuration file, click **OK**.
   - To save the changes in a new configuration file, click **Save**, to save the configuration file, then click **OK**.

   If the **Record/play same clip on all channels of Gang** box has been checked, the channel pane label switches to G1 or G2 in the first channel in the gang. The other channels in the gang display "In Use" in the channel pane and "Gang" in the application drop-down list.

NOTE: You cannot remove a channel from a gang by setting the channel application to <none>. To remove a channel from a gang, change the channel's ganging assignment in Configuration Manager.

Related Topics

Components of the channel ganging configuration on page 192

Components of the channel ganging configuration

The following table describes the main components in the Ganging Configuration window.

Feature	Description
Gang 1, Gang 2	Allows you to select which channels to gang together. You can have up to two gangs on any one K2 Summit system.

Feature	Description
Record/Play same clip on all channels of gang	**If this box is checked:** Ganged channels can record multi-track audio and video. The controls on the first channel affect all the channels in the gang, including settings for loop playback, continuous record, and E-to-E. Starting a record causes the same clip to be recorded on all the record channels in the gang. The first channel displays the name of the clip and the number of the gang, G1 or G2. The other record channels in the gang display “The channel is currently used by” in the channel pane. If you configure a gang of play channels and load a multi-track clip onto one channel, the tracks are automatically loaded on the other channels in the gang. For example, if you have four ganged play channels and load a clip with three tracks, the first three channels load the three tracks. **If this box is not checked:** The settings on the first channel for loop playback, continuous record, and E-to-E affect all the channels in the gang. Though the channels are labeled as a gang (G1 or G2), if recording each channel functions as a single record channel. To begin recording, eject any existing clip, select **New Clip** and press the **Record button** on each channel. If playing, the ganged channels can play different clips on each channel. The play and stop controls are synchronized, but each clip must be loaded or ejected on each channel. Adding cue points to one clip does not affect the cue points on different clips in the other channels. This box is disabled if any of the channels in the gang are configured as ChannelFlex channels.

Feature	Description
Record audio from all channels to same clip	**If this box is checked:** The audio from more than one channel in the gang is recorded. Up to 32 audio tracks can be recorded on one clip: for example tracks 1-16 from the first channel and tracks 17-32 from the second channel, or four tracks from each channel in a gang of four channels, and so on. To direct the routing, you can assign label tags to the audio tracks before or after the clip is recorded. When you play the clip, unless you specify otherwise, the first 16 audio tracks play on the first channel and the second 16 audio tracks (tracks 17-32) play on the second channel. If there is only one video track and you play the clip on a gang of player channels, the video plays on the first channel only. The other video channels, if any, play black. **If this box is not checked:** The audio from the first channel in the gang is recorded, up to a total of 16 audio tracks. If there is only one video track and you play the clip on a gang of player channels, the video plays on all the channels in the gang. This box is disabled if any of the channels in the gang are configured as ChannelFlex channels
Record video from all channels to same clip	**If this box is checked:** Video from all channels in the gang is recorded. You can record up to four video tracks on one clip. The order of video tracks in the clip is determined by the order of channels in the group. **If this box is not checked:** Only video from the first channel in the gang is recorded. This box is disabled if any of the channels in the gang are configured as ChannelFlex channels.

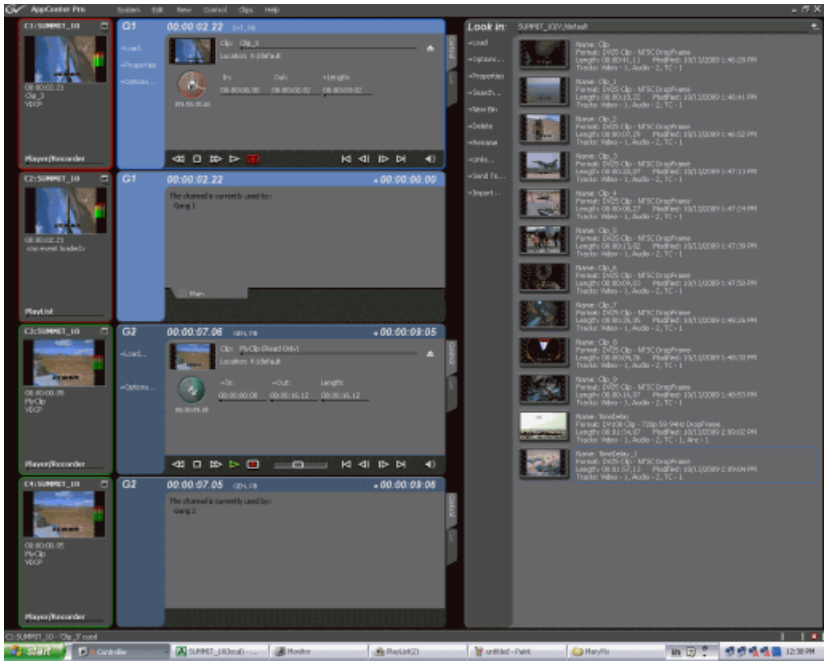
Related Topics

Configuring track mapping on page 199
Re-arranging the order of the tracks on page 202

Using channel ganging

Ganging record channels allows you to create multi-track clips with one record session. Ganging play channels allows you to play different audio or video simultaneously on two different channels. For example, you could have an English audio track on one play channel, while another channel played a Spanish audio track. Or you could play one video on two channels, with SD output on one channel and HD output on the other. (If using HD video, the SD channel would down-convert and the HD channel would pass the video through.) Once configured, a gang of channels can be controlled by clicking on the channel controls. You cannot gang play and record channels together, or playlists.

The following illustration shows two gangs: the first gang (G1) recording a clip and the second gang (G2) playing another clip. Both gangs have been configured to record audio and video on more than one channel. In G1, if you click the Record button on the first channel pane, both channels record the clip. Any of the controls in the first channel affect both channels in the gang, including settings for loop playback, continuous record, and E-to-E. In G2, the same clip is playing out on both channels. The first channel displays the name of the clip and a thumbnail of the video. The monitor pane for each channel displays the channel number, machine name, and is outlined in red or green to indicate whether the gang is a play or a record.



NOTE: A* K2 Summit system *treats all the channels in a gang as if they were set to the same application. If you create a four-channel gang but set two of the ganged channels to Player/Recorder and the other two to <none>, the resulting clip will have four video tracks. Playing a clip on a gang with extra channels can result in hearing audio on channels that aren't playing video. For example, if you play a clip with two video tracks on a three-channel gang, the last channel has no video, but audio is still embedded.

Unganging Channels

You can only ungang a channel from Configuration Manager; you cannot change the allocation of the channel by changing the selection on the application drop-down list. Unganging the channels again causes all of the channels to stop recording or playing.

Track Mapping

This feature is a part of the licensable AppCenter Pro option.

Track mapping lets you label video and audio tracks, and control audio input and routing.

About track mapping

This feature is part of the licensable AppCenter Pro option.

AppCenter lets you configure audio input and output routing, assign labels to audio tracks, or specify which video track you want to be the key. You can have multiple tracks with the same name in a clip. Track mapping is supported for individual clips. It is not supported for clips in a playlist.

Labeling the audio tracks in a clip and the output channels in Configuration Manager allows you to map specific tracks to specific output channels. You can assign output labels to primary output channels alone or to both primary and secondary output channels. (If there is no label on the primary output channel, you cannot assign a label to the secondary output.)

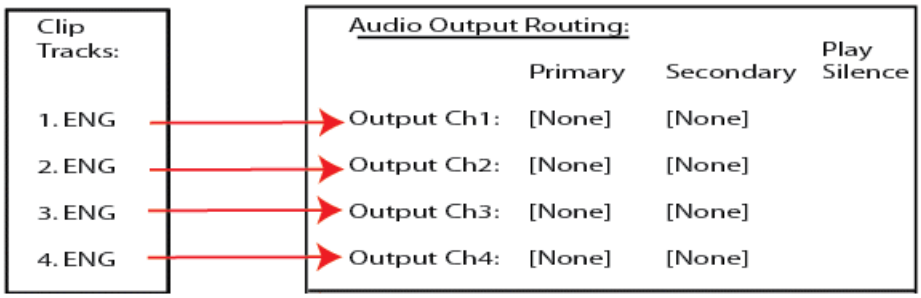
In addition to the existing language labels, you can specify an audio track number in the form of A#, where # is a number from 1 to the last track number (up to 64).

AppCenter maps the audio tracks to the output channels based on specific criteria. The following sections give a detailed description of the track mapping that results based on each of these criteria:

- If no labels are assigned to any output channel
- If unique labels are assigned to audio tracks and output channels
- If language groups are used
- If the primary output alone is labeled
- If both primary and secondary outputs are labeled
- If no output labels match the track labels
- If no labels are assigned to any output channel

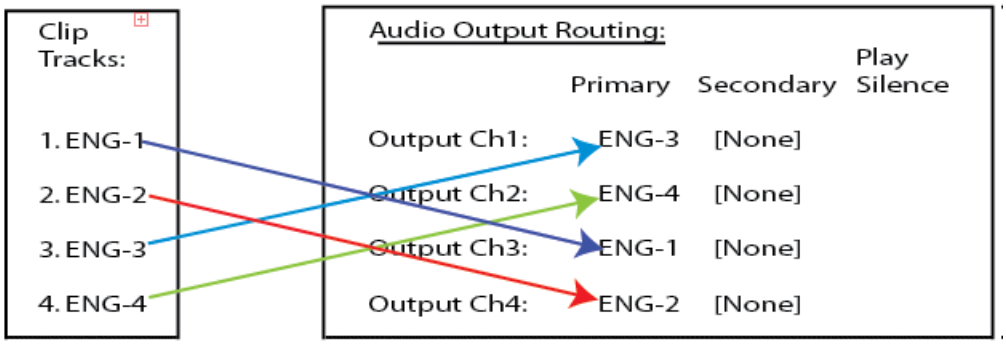
If no labels are assigned to any output channel

If no audio output routing is specified, AppCenter plays out the audio tracks according to their order in the clip, regardless of the labels of the individual tracks. In the following illustration, the first four audio tracks are routed to audio output channels 1 through 4.



If unique labels are assigned to audio tracks and output channels

If you assign unique labels to each of the tracks in a clip, and assign the same labels to a corresponding output channel, AppCenter routes each track exclusively to its matching output channel. The following illustration shows one example of how unique labels are evaluated.



If language groups are used

You can have multiple tracks and output channels with the same label. If multiple tracks have the same label, AppCenter evaluates where to map the tracks as follows:

- An output channel's primary and secondary output labels are considered together as a "language group" when assigning an audio track for playout. If two channels have the same primary label but have different secondary labels, then those channels have different language groups. For example, a channel with labels FRE + GER is considered a different language group than a channel with labels FRE + ENG.
- Each output channel, in order from first to last, is evaluated to determine if the label or language group matches a labeled audio track in the clip. The first channel with a label or language group that matches the track label plays that audio track. If the clip has several audio tracks with the same label, the first matching output channel plays the first audio track, the second matching output channel plays the second audio track, and so on.
- The Play Silence box. If the AppCenter does not find a matching label or language group for the output channels, and the Play Silence box has been checked in Configuration Manager, the channel plays silence.

This evaluation process is further described in the following sections:

- If the primary output alone is labeled
- If both primary and secondary outputs are labeled
- If no output labels match the track labels
- If Play Silence if checked
- If Play Silence is not checked

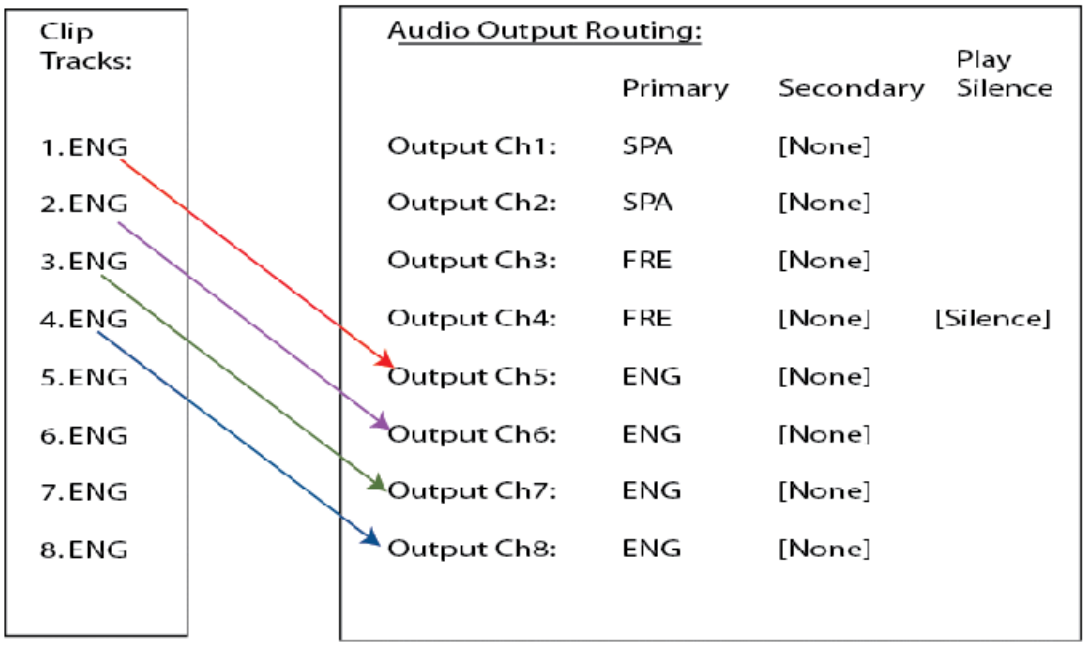
If the primary output alone is labeled

If the output routing channels are assigned primary labels, AppCenter evaluates the labels to see if they match with the track labels in the clip as follows:

- If there are no secondary labels assigned, then only the primary labels are evaluated.
- Labels are evaluated in numerical order, that is, from the first to last.
- After labels are evaluated in numerical order, the Play Silence check box is evaluated to determine if it is checked or un-checked.

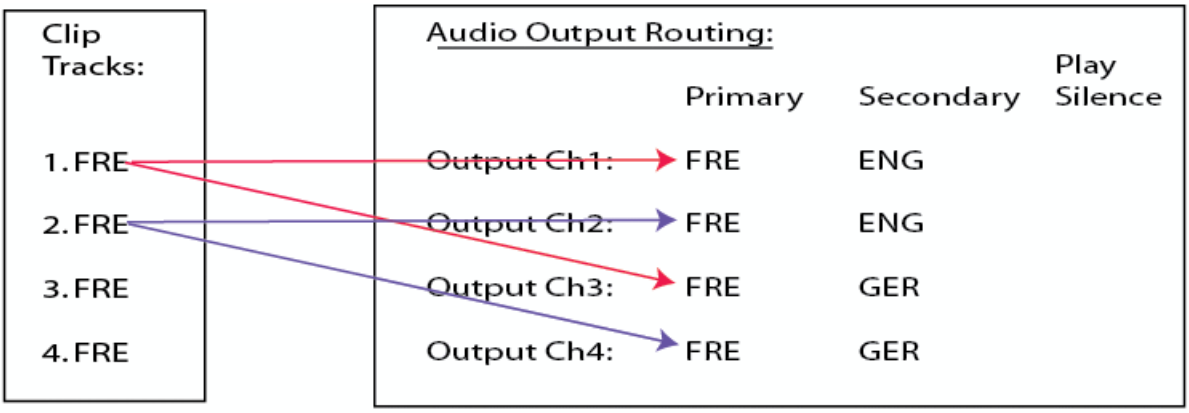
The following illustration shows an example of how AppCenter maps non-unique labeled audio tracks to non-unique labeled output channels. In this example, the first four output channels have primary output labels that do not match with any of the track labels, so they are bypassed.

Because AppCenter maps the first track label to the first matching output label, the first ENG track is routed to the first audio output labeled ENG (in this example, output channel 5), the second ENG track is routed to the next audio output labeled ENG (output channel 6), and so on.



If both primary and secondary outputs are labeled

The primary and secondary labels of an output channel are considered a “language group”. A clip’s audio track label is matched to a language group’s primary label. For example, consider the following illustration:



The language group for channel 1 and channel 2 (FRE + ENG) is different than the language group for channel 3 and channel 4 (FRE + GER). If a clip has audio tracks 1–4 labeled “FRE”, channels 1–2 play out clip tracks 1–2, and channels 3–4 also play out clip tracks 1–2.

If no output labels match the track labels

If no output labels match any track labels in the clip, AppCenter evaluates the output routing based on whether the Play Silence box is checked or not. (The Play Silence box is configured in Configuration Manager.

If Play Silence is checked

If AppCenter finds an output channel with a label that matches the label on an audio track in the clip, the Play Silence box is ignored.

However, if no matching label is found, and the Play Silence box has been checked in Configuration Manager, the channel plays silence.

If Play Silence is not checked

If there are no matching labels for output channels and the Play Silence box has not been checked in Configuration Manager, the output channel plays the matching numbered audio track. Basically, the output channel behaves as if it were unlabeled.

Related Topics

Adding audio tags on page 199
Renaming a video or audio track on page 200
Re-arranging the order of the tracks on page 202

Configuring track mapping

To set up track mapping in AppCenter, you need to add audio tags in Configuration Manager and name the tracks in the clip itself.

You can do the following during configuration:

- Add audio tags
- Rename a video or audio track

Related Topics

Adding audio tags on page 199
Renaming a video or audio track on page 200

Adding audio tags

This feature is part of the licensable AppCenter Pro and Elite versions.

Before recording a clip, you can add audio tags to the audio input and output. Select a name from the drop-down list or enter a track name. Adding input and output tags before recording a clip can help streamline the routing of the tracks. A track name cannot be more than 16 characters long. You can also label audio tags after recording a clip.

1. In the Channel tab of the Configuration Manager, scroll down to the Audio Input or Audio Output section. The sections are grouped under each channel tab.

2. Click **<Add Tags...>**.
   - To assign a label to audio input tracks, click on the drop-down list next to the track you want to label, and select the label, or enter in a name.
   - If you are labeling audio output tracks, you can assign primary or secondary labels or check the Play Silence box.
3. Click **OK**. The tags are now displayed in the Configuration Manager.
4. To have the changes apply to this configuration file, click **OK**.
5. To save the changes in a new configuration file, click **Save** save the configuration file, and then click **OK**.

Related Topics

Renaming a video or audio track on page 200

Mapping audio channels

In AppCenter Pro and Elite versions, there is support for up to 64 tracks of audio for an existing clip. In addition to existing language labels, you can specify a track number in the form A# where # is a number from 1 to the last track number ("A64"). This allows you to map the audio track to a specific track index rather than a language tag. If you want to map all 64 tracks, you must gang them in four 16 channel groups. If a clips has less than 32 audio tracks, then audio tracks 33 through 64 repeat. **Note:** Do not label your audio track Axx (where xx is numbered 1-64). These names are reserved for mapping only.

1. In the Channel tab of the Configuration Manager, scroll down to the Audio Output section. The sections are grouped into 16 channels under each channel tab (C1-C4).
2. Select **<Add Tags...>**.
   - Enter a name in the Primary or Secondary audio output track, or check the Play silence options. Continue to enter names for up to 64 audio tracks. Note that the first Primary Audio Output tag name appears in the Audio Output Tags in the Configuration Channel tab.
3. If you want to map all 64 audio tracks, you must gang them in four 16 channel groups: Ch 1: tracks 1-16, Ch 2: tracks 17-32, Ch 3: tracks 33-48 and Ch 4: tracks 49-64.
4. To have the changes apply to this configuration file, click **OK**.

Renaming a video or audio track

If no input tags have been specified, any audio tracks that you have recorded appear in the Clip Properties dialog box as **A1**, **A2**, etc. The video tracks by default are labeled **Video**. Multiple video and audio tracks can be labeled with the same name.

1. Open the Clip Properties dialog box and select the Tracks tab.
2. Highlight the track and perform one of the following actions:
   - Click the **Rename** button.
   - Right-click with the mouse and select Rename.
   - Double-click on the track name.

3. A drop-down list displays, allowing you to select a new name for the track. You can also enter in a name. Track names can be up to 16 characters long.

Making use of track mapping

You can add, remove, or re-arrange audio or video tracks in a clip through the Tracks tab of the Clip Properties dialog box.

Importing audio tracks

This feature is part of the licensable AppCenter Pro option.

You can import an audio track from an audio file. The file must be in the .wav format with a sample rate of 48 kHz. The imported file is aligned to the start of the clip.

1. Highlight the clip that you want to import the track into.
2. Open the Clip Properties. (list ways) and select the Track tab.
3. Click the **Import** button.
4. The Windows Open dialog box displays the following:
5. Browse to the .wav file to import and click **OK**.

   When you import a file, the new track appears at the end of the working asset's track list. The file name is used as the initial audio track label. After the file has been imported, you can highlight the track and rename it with the **Rename** button.

   If the duration of the imported audio track(s) is lesser than the clip duration, silent audio will be played for imported tracks after the valid audio duration.

Related Topics

To map a source or destination drive for K2 system import/export on page 158

WAV audio interchange specification on page 396

Adding a video or audio track

This feature is part of the licensable AppCenter Pro and Elite versions.

You can view, edit, add or remove video and audio tracks in a clip. The tracks should be of the same format. (For example, if you have an NTSC clip, do not add a PAL track to it.) You can have up to four video tracks or 32 audio tracks in one clip. Added tracks are aligned to the start of the clip.

Clips may contain tracks of different lengths. The length of the overall clip is limited to the length of the original track. For example, if you have a clip that is thirty seconds long and you add a two-minute audio track, AppCenter adds only the first thirty seconds of audio from the added track.

NOTE: If an additional track is longer than the original track, any material beyond the length of the original track is not played as shown in the illustration below.

If an additional track is shorter than the original track, video plays black, ancillary data tracks are blank, and audio is silent as illustrated below.

To add a video or audio track, follow these steps:

1. In the Clips Properties dialog box, select the Tracks tab.
2. Click the **Add Track** button.

   The Select Asset dialog box displays.
3. Browse to the asset that has the tracks you want to add. Click **OK**. The Select Tracks dialog box displays.
4. You can select a track by checking the box next to the track or, within the audio or video sections, by highlighting the track you want to add, right-clicking with the mouse, and then checking the box. When you have selected the tracks, click OK. The Clip Properties dialog box shows yellow sunbursts next to the track icons of the newly added tracks.
5. To accept the changes, click **OK**.

Removing a video or audio track

To remove a video or audio track, follow these steps:

1. Open the Clip Properties dialog box and select the Tracks tab.
2. Highlight the track and perform one of the following actions:
   - Click the **Remove** button.
   - Right-click with the mouse and select Remove.
   - Press the Delete key on the keyboard.

Re-arranging the order of the tracks

You can change the order of the tracks, by using the mouse to drag and drop tracks within the video and audio sections. Grass Valley recommends grouping tracks with the same label together. Grouping like tracks together can be helpful if you have several tracks with the same label and you need to configure the audio output routing in the Configuration Manager.

Related Topics

About track mapping on page 196

ChannelFlex Suite

ChannelFlex Suite and licensing

The features in this chapter are part of the ChannelFlex Suite, which requires the AppCenter Elite license.

K2 Summit formats, models, licenses, and hardware support

Formats are supported as in the following tables.

Table 7: K2 Summit 3G+ system

Formats	Compression	1x	3x Super Slo-Mo, Multi-Cam*, 3D/Video + Key	6x Super Slo-Mo	4K
SD	DV	Encode/decode	Encode/decode. Requires AppCenterElite licenses. TripleCam also requires the Triple license.	Not supported.	Not supported.
	MPEG-2	Encode/decode	Encode/decode. Requires codec Mezz option card. Requires AppCenterElite license. 3x Super Slo-Mo and TripleCam are not supported.	Not supported.	Not supported.
	AVC/H.264	Decode only. Requires AVC license.	Not supported	Not supported	Not supported.

Formats	Compression	1x	3x Super Slo-Mo, Multi-Cam *, 3D/Video + Key	6x Super Slo-Mo	4K
1080i/720p	DVCPROHD	Encode/decode. HD license is required.	Encode/decode. Requires the HD and AppCenterElite license. TripleCam also requires the Triple license.	Encode/decode. Requires codec Mezz option card. Requires HD, AppCenterElite and 6xSSM licenses. Requires K2 Summit 3G chassis with 2.5” hard drives for one channel or high endurance solid state drives for full features with two channels.	Not supported.
	MPEG-2	Encode/decode. HD license is required.	Encode/decode. Requires Mezz codec option card. Requires HD and AppCenterElite licenses. 3x Super Slo-Mo and TripleCam are not supported.	Not supported.	Not supported.

Formats	Compression	1x	3x Super Slo-Mo, Multi-Cam *, 3D/Video + Key	6x Super Slo-Mo	4K
	AVC-Intra	Encode/decode. Requires HD and AVC licenses.	Encode/decode. Requires HD, AppCenterElite and AVC licenses. TripleCam also requires the Triple license.	Encode/decode. Requires codec option card, plus HD, AppCenterElite, 6xSSM and AVC licenses. Requires K2 Summit 3G chassis with 2.5” hard drives for one channel or high endurance solid state drives for full features with two channels.	Not supported.
	AVCHD/H.264	Decode only. Requires HD and AVC licenses.	Not supported	Not supported	Not supported.
	AVC-LongG	Decode only. Requires HD and AVC licenses.	Not supported	Not supported	Not supported.
	Avid DNxHD	Encode/decode. Requires HD and Avid DNxHD licenses.	Encode/decode. Requires HD, AppCenterElite and Avid DNxHD licenses. TripleCam also requires the Triple license and SSD storage.	Not supported	Not supported.

Formats	Compression	1x	3x Super Slo-Mo, Multi-Cam*, 3D/Video + Key	6x Super Slo-Mo	4K
	Apple ProRes	Encode/decode. HD and Apple ProRes licenses.	Encode/decode. HD and Apple ProRes licenses. Requires a Summit 3G codec board. 2-Input Multi-Cam support only.	Not supported	Not supported
1080p	AVC-Intra Class 100	Encode/decode. Requires codec Mezz option card for multi-head operation. Requires HD, 3G and AVC licenses.	Encode/decode. Requires codec Mezz option card. Requires HD, 3G AppCenterElite and AVC licenses. TripleCam is not supported.	Not supported	Encode/decode. One 4K channel requires two codec channels. Requires codec Mezz option cards and high endurance solid state drives. Requires HD, 3G, 4K, AppCenterElite and AVC licenses.

Super Slo-Mo

This feature is part of the ChannelFlex Suite, which requires the AppCenter Elite license. This feature also requires the HD license.

About Super Slo-Mo

This feature is part of the ChannelFlex Suite, which requires the AppCenter Elite license. This feature also requires HD, 3G, and AVC licenses.

You can connect a Super Slo-Mo camera to two or three SDI inputs on a K2 Summit system channel. You must configure the channel to record Super Slo-Mo. When so configured, the channel is record-only, not bi-directional record/play. The K2 Summit system records Super Slo-Mo at 2x frame rate, 3x frame rate, or 6x frame rate, as configured. This creates a Super Slo-Mo clip. A Super Slo-Mo clip contains no audio or ancillary data.

The K2 Summit system accommodates LTC, ancLTC, or ancVITC timecode for a Super Slo-Mo clip as follows:

- A Super Slo-Mo clip contains embedded timecode extracted from Super Slo-Mo phase 1.
- For 2x frame rate, timecode repeats every two frames.

- For 3x frame rate, timecode repeats every three frames.
- For 6x frame rate, timecode repeats every six frames.

The result is that a Super Slo-Mo clip can function as if it has 1x clip length and timecode, even though it is actually 2x, 3x, or 6x times longer.

A Super Slo-Mo channel is in E-to-E (LoopThru) mode.

You can play the Super Slo-Mo clip on a standard bi-directional record/play channel. SDI OUT2 provides the Super Out feature on phase 1.

Import/Export and GXF transfer of a Super Slo-Mo clip are supported with other K2 Summit system systems at version 7.1.x software or higher.

An indicator icon S3 that a clip is a Super Slo-Mo clip appears in the Clips pane and in clip properties. The indicator icon displays accordingly as follows:

- S2 — 2x Super Slo-Mo clip
- S3 — 3x Super Slo-Mo clip
- S6 — 6x Super Slo-Mo clip

Super Slo-Mo requirements and restrictions

This feature is part of the ChannelFlex Suite, which requires the AppCenter Elite license. This feature also requires the HD license.

- Phase 1, Phase 2, and Phase 3 inputs must be locked and phase aligned with each other.
- Phase 1, Phase 2, and Phase 3 must be connected to a channel's SDI IN1, SDI IN2, and SDI IN3 respectively.
- You cannot change the 2x/3x/6x configuration while recording is underway.
- Loss of any phase input results in black for that phase of video in the clip.
- Super Slo-Mo clips are HD and therefore the Super Slo-Mo feature requires the HD license.
- When recording a Super Slo-Mo clip, no audio and ancillary data tracks are created.
- Super Slo-Mo cameras in the following list are supported:
  - Grass Valley LDK8300 Camera; 3x and 2x
  - Grass Valley LDK8000 SportElite HD; 2x
  - Grass Valley LDX HiSpeed Camera; 3x
  - Grass Valley LDX XtremeSpeed Camera; 3x and 6x
  - Sony 3300 - 3x only; 2x is not supported
- When using 6X SSM or UHD4K camera systems, verify that 3G signal cables are used between the XCU and K2 Summit system inputs.
- When exporting a 2x, 3x, or 6x Super Slo-Mo clip, and MOV (QuickTime) file types do not retain the original Super Slo-Mo timecode information. Therefore upon import, the timecode numbers will no longer match the video material.
- Stream/Import/Export of a Super Slo-Mo clip is not supported with K2 systems at a 3.x version of software.
- The maximum continuous record length for a Super Slo-Mo clip is 24 hours.
- This feature is not compatible with TimeDelay.

- One or more Super Slo-Mo channels can be a part of an AppCenter channel gang, but the "Record/play same clip on all channels of Gang" feature is not available for that gang.
- 6x Super Slow Motion camera support is not available on K2 Solo.
- Requires configuration of the RTIO value in Storage Utility to improve performance.

Related Topics

RTIO specifications for standalone K2 Summit 3G system on page 397

Super Slo-Mo camera formats

Formats specified for output by Super Slo-Mo cameras are supported as follows:

Camera	Format	Frame Rate (Hz)	Speed support
Grass Valley LDK8000 SportElite HD Camera	• 720p • 1080i	• 50/59.94/100/119.88 • 50/59.94/100/119.88	2x;
Grass Valley LDK8300 Camera	• 720p • 1080i	• 50/59.94/100/119.88/150/179.82 • 50/59.94/100/119.88/150/179.82	2x; 3x
Grass Valley LDX HiSpeed Camera	• 720p • 1080i	• 50/59.94/150/179.82 • 50/59.94/150/179.82	3x
Grass Valley LDX XtremeSpeed Camera	• 720p • 1080i • 1080p	• 50/59.94/150/179.82/300/359.64 • 50/59.94/150/179.82/300/359.64 • 50/59.94/150/179.82	• 3x in 720p; 1080i; 1080p • 6x in 720p; 1080i
Sony 3300	• 720p • 1080i	• 50/59.94/150/179.82 • 50/59.94/150/179.82	3x

Configuring Super Slo-Mo

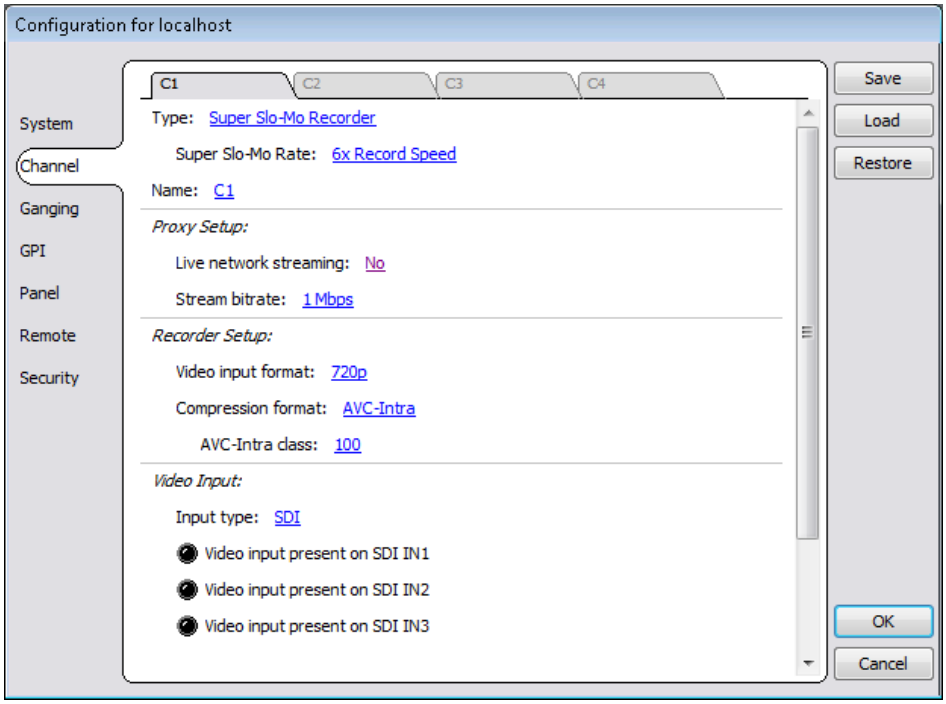
This feature is part of the ChannelFlex Suite.

The following licenses must be installed:

- K2-APPCENTER-ELITE license
- K2-XDP-2HDL
- K2-XDP2-AVC-2CH

- K2-XDP2-3G-2CH (1080p).

1. Open Configuration Manager, click **Channel**, and select a channel tab.



2. For Type, select **Super Slo-Mo Recorder**.

   Only those settings supported by a Super Slo-Mo channel are displayed.

   NOTE: If you have the AppCenter Elite license yet the Super Slo-Mo option does not appear, it means you do not have the HD license, which is required for Super Slo-Mo. You must also have the appropriate compression license, such as DV or AVC licenses.

3. For Super Slo-Mo Rate, select one of the following:

   - **2x Record Speed**
   - **3x Record Speed**
   - **6x Record Speed**

4. If desired, assign a name to the channel.
5. In the Proxy Setup setting, set **Live network streaming** to **No**.
6. Select Video input format.

Related Topics

DynoZoom, live monitoring, and GV STRATUS streaming on page 356
Configuring proxy and live streaming settings on page 185
Proxy/live streaming technical details on page 354
Proxy/live streaming formats and specifications on page 370

Multi-Cam

This feature is part of the ChannelFlex Suite, which requires the AppCenter Elite license.

About Multi-Cam

This feature is part of the ChannelFlex Suite, which requires the AppCenter Elite license. Three inputs requires 3-input Multi-Cam license. Two inputs included in AppCenter Elite license.

You can connect up to three video sources to SDI IN1, SDI IN2, and SDI IN3 in a channel. You must configure the channel as a Multi-Cam record channel. The K2 Summit system records up to three clips, one from each video input, and automatically gives them default names.

If ancillary data and/or timecode is present on SDI IN1, each Multi-Cam clip contains that ancillary data and/or timecode. LTC timecode is also shared for all clips.

The K2 Summit system can record the same audio for all clips, or it can record separate audio for each clip. You can configure these audio options as desired.

In E-to-E (LoopThru) mode, SDI OUT1 and SDI OUT2 show the signal coming in at SDI IN1, SDI IN2, and SDI IN3 respectively. When in this mode, the VGA Video Monitor displays up to three inputs, but at a smaller size, in the area for the single channel.

Each Multi-Cam clip plays as a standard clip on a standard bi-directional record/play channel.

Each audio meter is represented for each audio input. You must have a high resolution monitor (720p or 1080i) to view all of the audio meters for 3x Multi-Cam record.

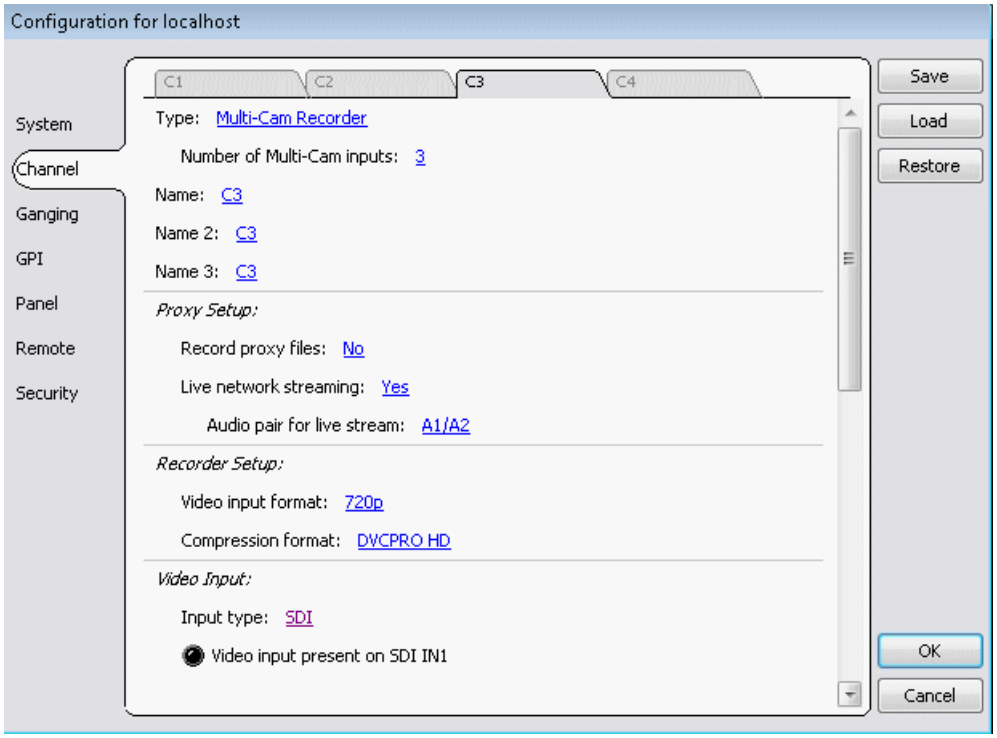
Multi-Cam requirements and restrictions

This feature is part of the ChannelFlex Suite, which requires the AppCenter Elite license.

- Three inputs require 3-input Multi-Cam license. Two inputs included in AppCenter Elite license.
- Multiple licenses required for multiple K2 channel support.
- SDI IN1, SDI IN2, and SDI IN3 must be frequency locked with each other.
- Input 1, Input 2, and Input 3 must be connected to a channel's SDI IN1, SDI IN2, and SDI IN3 respectively.
- When recording the same audio for all clips, embedded audio is extracted only from the Input 1 and the number of recorded audio tracks is limited to sixteen.
- When recording audio separately for each clip, you can have up to sixteen tracks per Multi-Cam input.
- When in split audio mode, only 4 audio per clip can be recorded with 3-input Multi-Cam channel.
- This feature is not compatible with K2 TimeDelay.
- One or more Multi-Cam channels can be a part of an AppCenter channel gang, but the "Record/play same clip on all channels of Gang" feature is not available for that gang.
- Requires the K2 3-input Multi-Cam license that enables support for 3-input Multi-Cam on a single K2 channel. Multiple licenses required for multiple K2 channel support.

Configuring Multi-Cam

1. Open Configuration Manager, click **Channel**, and select a channel tab.



2. For Type, select **Multi-Cam Recorder**.
3. For Number of Multi-Cam inputs, select **2** or **3**.
4. (Optional) For Name, enter a name to identify input **SDI IN1**.
5. (Optional) For Name 2, enter a name to identify input **SDI IN2**.
6. (Optional) For Name 3, enter a name to identify input **SDI IN3**, if applicable.
7. Scroll down to the Audio Input section and do one of the following:
   - If you want all clips to have audio from Input 1, set **Split audio** to **No**.
   - If you want each clip to have audio from its own input, set **Split Audio** to **Yes**.

8. If you set Split audio to Yes, choose one of the following settings for **Number of split audio inputs**:

Setting	Embedded audio	AES audio
2+2	The first two audio tracks on Input 1 go to clip 1. The first two audio tracks on Input 2 go to clip 2.	AES audio tracks 1 and 2 go to clip 1. AES audio tracks 3 and 4 go to clip 2.
4+4	The first four audio tracks on Input 1 go to clip 1. The first four audio tracks on Input 2 go to clip 2.	AES audio tracks 1- 4 go to clip 1. AES audio tracks 5-8 got to clip 2.
8+8	The first eight audio tracks on Input 1 go to clip 1. The first eight audio tracks on Input 2 go to clip 2.	Not supported.
2+2+2	The first two audio tracks on Input 1 go to clip 1. The first two audio tracks on Input 2 go to clip 2. The first two audio tracks on Input 3 go to clip 3.	AES audio tracks 1 and 2 go to clip 1. AES audio tracks 3 and 4 go to clip 2. AES audio tracks 5 and 6 go to clip 3.
4+4+4	The first four audio tracks on Input 1 go to clip 1. The first four audio tracks on Input 2 go to clip 2. The first four audio tracks on Input 3 go to clip 3.	Not supported.

9. In the **Embedded input group(s)** setting, select one from the following:
   - Group 1
   - Group 2
   - Group 3
   - Group 4
10. Select the input format for each audio input.
11. Configure remaining channel settings as appropriate.

Related Topics

Accessing Configuration Manager on page 68

Independent ancillary data for Multi-Cam record

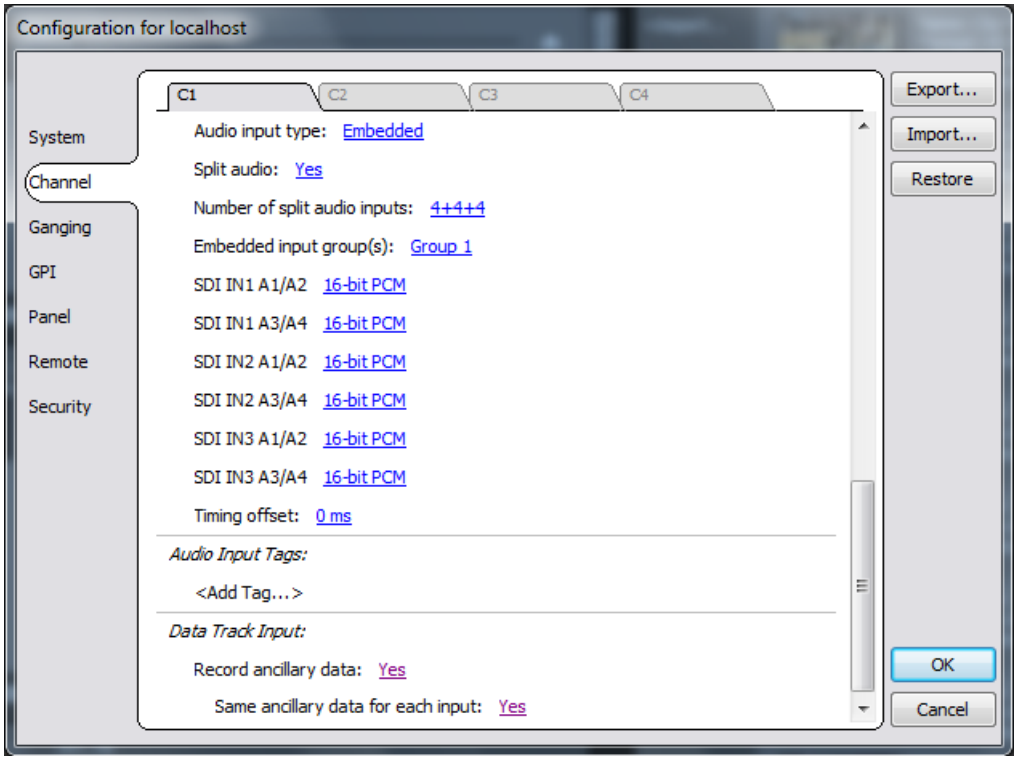
You may select to turn ancillary data on or off for each Multi-Cam Summit record channel. Options for turning ancillary data on or off can be found in the AppCenter Channel Configuration screen.

When you select the options for configuring the channel in AppCenter, under the Data Track Input section to Yes, a second option appears: “Same ancillary data for each input.” Selecting Yes will result in the ancillary data being recorded for those clip using the ancillary data from input 1.

Changes to this setting may not be made while recording or when a Dyno session is in use.

Turning on the same ancillary data for each input

1. From AppCenter, select **Configuration>Channel** tab. The Channel configuration screen displays:



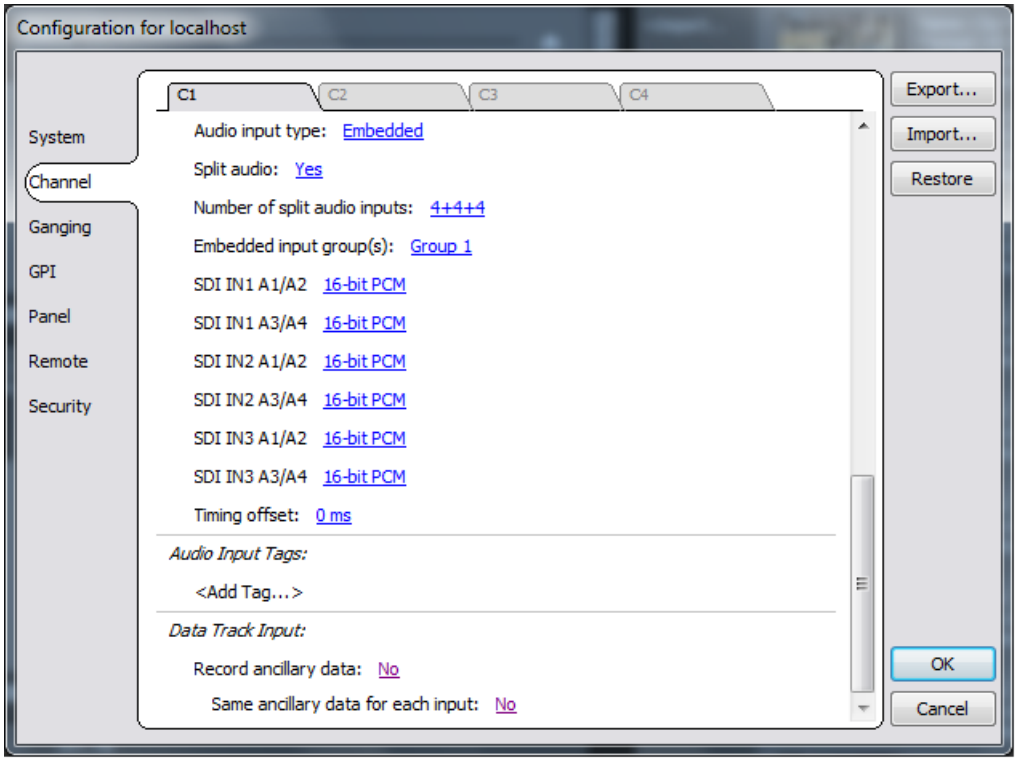
2. Under the Data Track Input section, select **Yes** for **Record ancillary data:**
3. Select **Yes** for **Same ancillary data for each input.** This applies the same ancillary data coming from input 1 to each of the 3 clips recorded.
4. Click **OK**.

Selecting ancillary data for individual channels

You may specify to have each input to have separate ancillary data for each multi-cam Summit record channel. Options for this can be found in the AppCenter Channel Configuration screen. If

you have 3 Multi-Cams: the first clip (A) comes from input 1, the second clip (B) comes from input 2 and the third clip (C) comes from input 3.

1. From AppCenter, select **Configuration>Channel**tab. The Channel configuration screen displays:



2. Under the **Data Track Input** section, select **Yes for Record ancillary data:.**
3. Select **No** for **Same ancillary data for each input.** This allows you to get ancillary data for each input.
4. Click **OK**.

3D/Video + Key

The features in this section are part of the ChannelFlex Suite, which requires the AppCenter Elite license.

About 3D/Video + Key

This feature is part of the ChannelFlex Suite, which requires the AppCenter Elite license.

You can connect SDI IN1 and SDI IN2 on a K2 Summit system channel to use the 3D/Video + Key feature. SDI IN1 is Video or Left Eye. SDI IN2 is Key or Right Eye. To record, you must configure the channel as a 3D/Video + Key record channel. The K2 Summit system records a single 3D/Video + Key clip with two video tracks.

In a 3D/Video + Key clip, video track 1 is Video (or right eye) and video track 2 is Key (or left eye). If ancillary data and/or timecode is present on SDI IN1, the 3D/Video + Key clip contains that

ancillary data and/or timecode. The clip's audio is recorded from SDI IN1. You can also create a 3D/Video + Key clip using the Add Track feature.

In E-to-E (LoopThru) mode, SDI OUT1 and SDI OUT2 show the signals coming in at SDI IN1 and SDI IN2 respectively. When in this mode or when playing a 3D/Video + Key clip, the VGA Video Monitor displays the two video signals, but at a smaller size, in the area for the single channel.

When you play a 3D/Video + Key clip on a channel that is configured as a 3D/Video + Key play channel, SDI OUT1 plays the Video (or right eye) and SDI OUT2 plays the Key (or left eye). When you play a standard clip on a channel that is configured as a 3D/Video + Key play channel, SDI OUT2 plays a full Key (white). AppCenter Playlist and Loop Play support 3D/Video + Key clips. A 3D/Video + Key play channel supports playlist mode.

You can stream a 3D/Video + Key clip as GXF to/from other K2 Summit system systems.

Related Topics

Adding a video or audio track on page 201

3D/Video + Key requirements and restrictions

This feature is part of the ChannelFlex Suite, which requires the AppCenter Elite license.

- Video and Key tracks must be the same compression format.
- Video or Left Eye must be connected to the channel's SDI IN1 and Key or Right Eye must be connected to the channel's SDI IN2.
- SDI IN1 and SDI IN2 must be frequency locked with each other.
- Audio is limited to eight embedded tracks or eight AES tracks recorded per channel, recorded from SDI IN1.
- A 3D/Video+Key player channel does not support agile playback or transition (mix) effects.
- A 3D/Video+Key player channel does not support a two-head player model.
- A 3D/Video+Key player channel does not support offspeed play greater than 1 or less than -1. During these offspeed play operations the video is not synchronized between the two video tracks. However, both video outputs will resync when recued.
- Super Out is not supported on a channel configured for 3D/Video + Key.
- 3D/Video + Key is not compatible with TimeDelay.
- One or more 3D/Video + Key channels can be a part of an AppCenter channel gang, but the "Record/play same clip on all channels of Gang" feature is not available for that gang.
- AVC-Intra Class 100 not supported.
- Requires configuration of the RTIO value in Storage Utility to improve performance.

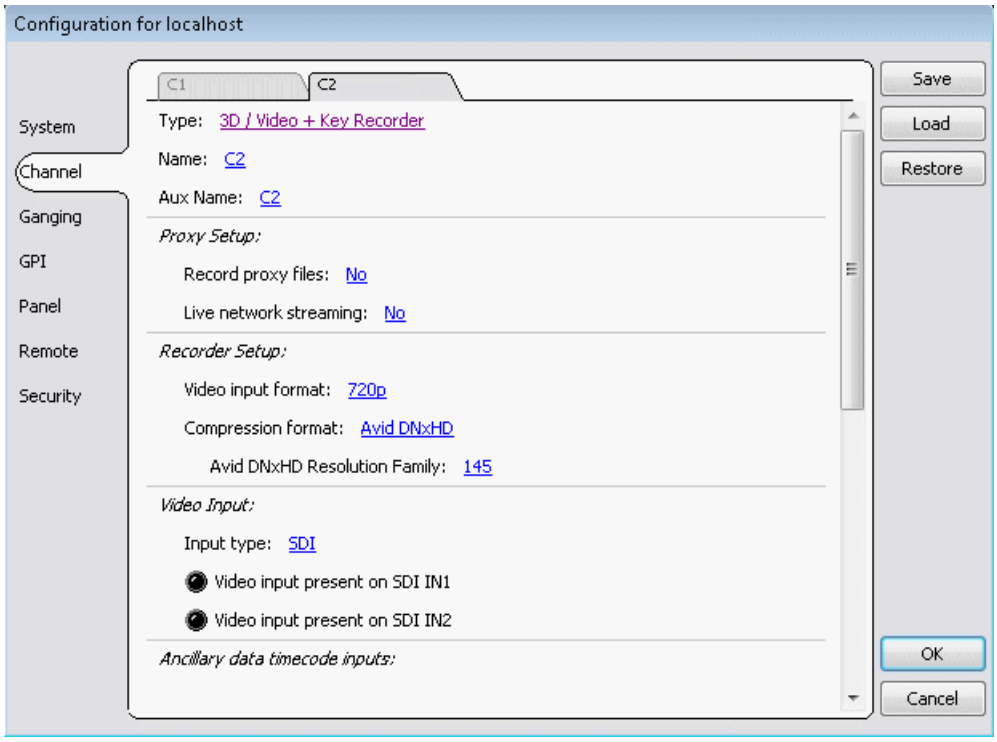
Related Topics

RTIO specifications for standalone K2 Summit 3G system on page 397

Configuring 3D/Video + Key

This feature is part of the ChannelFlex Suite, which requires the AppCenter Elite license.

1. Open Configuration Manager, click **Channel**, and select a channel tab.



2. For Type, select **3D / Video + Key Recorder** or **3D / Video + Key Player**.
3. If you selected **3D / Video + Key Recorder**, enter names as follows:
   a) For Name, enter a name to identify SDI IN1.
   b) For Aux Name, enter a name to identify SDI IN2.
4. If you selected **3D / Video + Key Player**, enter names as follows:
   a) For Name, enter a name to identify SDI OUT1.
   b) For Aux Name, enter a name to identify SDI OUT2.
5. Configure remaining channel settings as appropriate.

4K

This feature is part of the ChannelFlex Suite, which requires the AppCenter Elite license.

About 4K

This feature is part of the ChannelFlex Suite, which requires the AppCenter Elite license. The 4K feature is only available on the K2 Summit 3G system chassis. First generation K2 Summit system and K2 Summit system chassis are not supported.

You can set a K2 Summit 3G system channel to 4K Recorder (Top) to record two of the four quadrants of a 4K image. The next channel is automatically set to 4K Recorder (Bottom) to record the other two quadrants. Both channels are ganged to act as one recorder, so two adjacent ganged channels are used to record all four quadrants of a 4K image.

NOTE: Only C1 or C3 have the option to be selected as 4K Recorder (Top) or 4K Player (Top). There are no selectable 4K options for C2 and C4. C1 will always gang with C2, and C3 will always gang with C4.

When you record a 4K clip, SDI IN1 of the first channel is 4K Recorder Top Left and SDI IN2 is 4K Recorder Top Right. On the next channel, SDI IN1 is 4K Recorder Bottom Left and SDI IN2 is 4K Recorder Bottom Right.

When you play a 4K clip, two adjacent ganged channels are used to play all four quadrants of a 4K clip. On the channel configured as a 4K Player (Top) channel, SDI OUT1 is 4K Player Top Left and SDI OUT2 is 4K Player Top Right. On the next channel, SDI OUT1 is 4K Player Bottom Left and SDI OUT2 is 4K Player Bottom Right.

You can record a single 4K clip with four 1080p video tracks, 8 audio tracks, and one timecode track. You can also have proxy live streaming of the 4K clip to/from other K2 Summit 3G systems.

NOTE: Each channel of the Codec board has 3 inputs. For a 4K Recorder and 4K Player, the third input is converted to a Monitor Output. The signal coming from the BNC is 1080p that is down-converted from the 4K source.

4K requirements and restrictions

This feature is part of the ChannelFlex Suite, which requires the AppCenter Elite license.

- Requires 3G CODEC boards with mezzanines, 3G licenses, 4K licenses, K2 Summit 3G system chassis and SSD drives.
- SDI IN1 and SDI IN2 must be frequency locked with each other.
- Video input format must be 1080p 3G Level A.
- Compression format must be AVC-Intra Class 100.
- Audio input type must be Embedded.
- AES audio input type is not supported.
- Ancillary data tracks are not supported.
- ShareFlex is not supported.
- Proxy file generation and scene change detection are not supported.
- When using 6X SSM or UHD4K camera systems, verify that 3G signal cables are used between the XCU and K2 Summit system inputs.
- Requires configuration of the RTIO value in Storage Utility to improve performance.

Related Topics

RTIO specifications for standalone K2 Summit 3G system on page 397

Configuring 4K Channels on the K2 Summit system

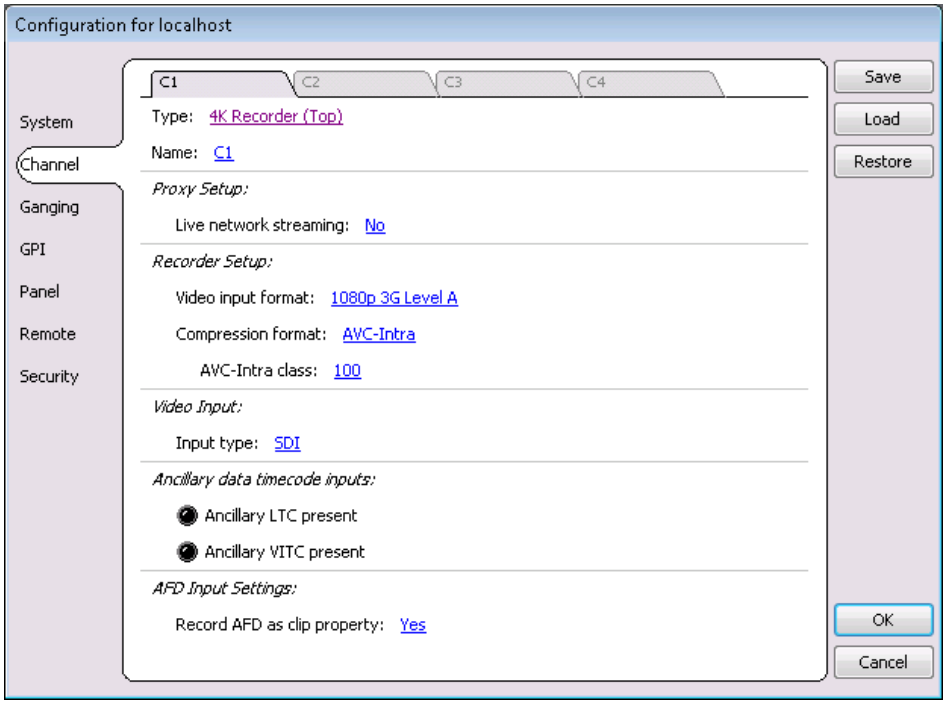
This feature is part of the ChannelFlex Suite.

The following licenses must be installed:

- K2-APPCENTER-ELITE license
- K2-XDP-2HDL
- K2-XDP2-AVC-2CH
- K2-XDP2-3G-2CH (1080p). If using DynoZoom, two licenses are required to support two play and two record channels.
- K2-XDP2-UHDTV1 (4K). If using DynoZoom, two licenses are required to support two play and two record channels.

NOTE: On a K2 Summit system that supports DynoZoom, the DynoZoom board in the K2 Summit system and the DynoZoom Frame must be connected via PCIe and the DynoZoom Frame must be powered on before the K2 Summit system is powered on.

1. Open Configuration Manager and click **Channel**.
2. Select **C1**.



3. For Type, select **4K Recorder (Top)**.

   Only those settings supported by a 4K Recorder channel are displayed.

   NOTE: If you have the AppCenter Elite license yet the 4K Recorder option does not appear, it means you do not have the 1080p license and the 4K license, which are also required.

   When you set C1 to 4K Recorder (Top), C2 is automatically set to 4K Recorder (Bottom). No settings are available for configuration on C2, because they are automatically configured, dependent on C1 settings.

4. In the Proxy Setup setting, set **Live network streaming** to **No**.

5. If desired, assign a name to the channel.
6. To set the 4K player, select **C3**.
7. For Type, select **4K Player (Top)**.

   Only those settings supported by a 4K Player channel are displayed.

   When you set C3 to 4K Player (Top), C4 is automatically set to 4K Player (Bottom). No settings are available for configuration on C4, because they are automatically configured, dependent on C3 settings.
8. If desired, assign a name to the channel.
9. In the Proxy Setup setting, set **Live network streaming** to **Yes**.

   The channel generates low-latency streaming media, which can be displayed on a K2 Dyno Replay Controller.

   Set this on the Program channel only. Multiple channels generating low-latency streaming media can overload network bandwidth.
10. Set **Stream bitrate** to the lowest setting appropriate for your required image quality.

    High bitrate streaming media can overload network bandwidth.
11. If operating with DynoZoom, in **Video Output** settings, for **Pan+Zoom**, select **On**.

    Set this on the Program channel only. If set on multiple channels, it takes effect on the channel with the lowest channel number only.
12. Click **Save** and **OK** to close.

Related Topics

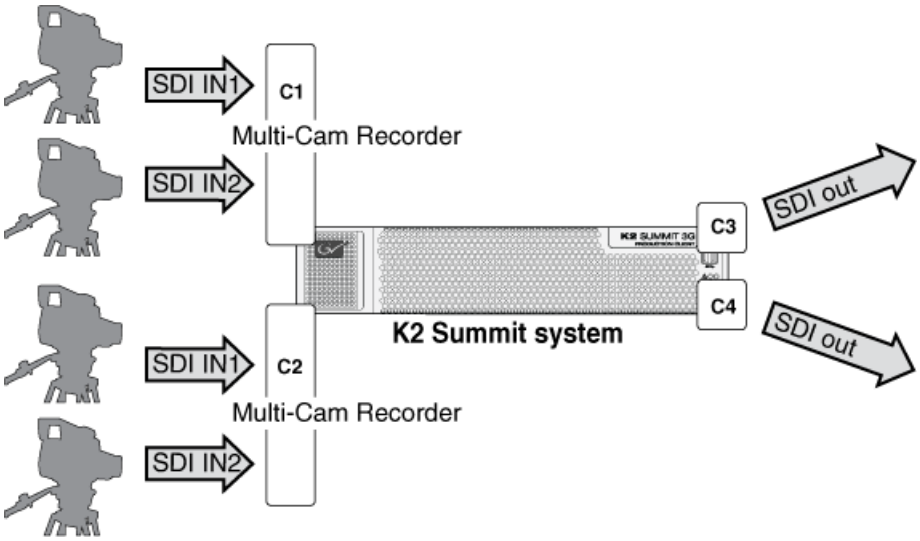
Configuring record channel audio settings on page 179
Embedded audio settings on page 179
Configuring play channel audio settings on page 182

ChannelFlex Suite supported combinations

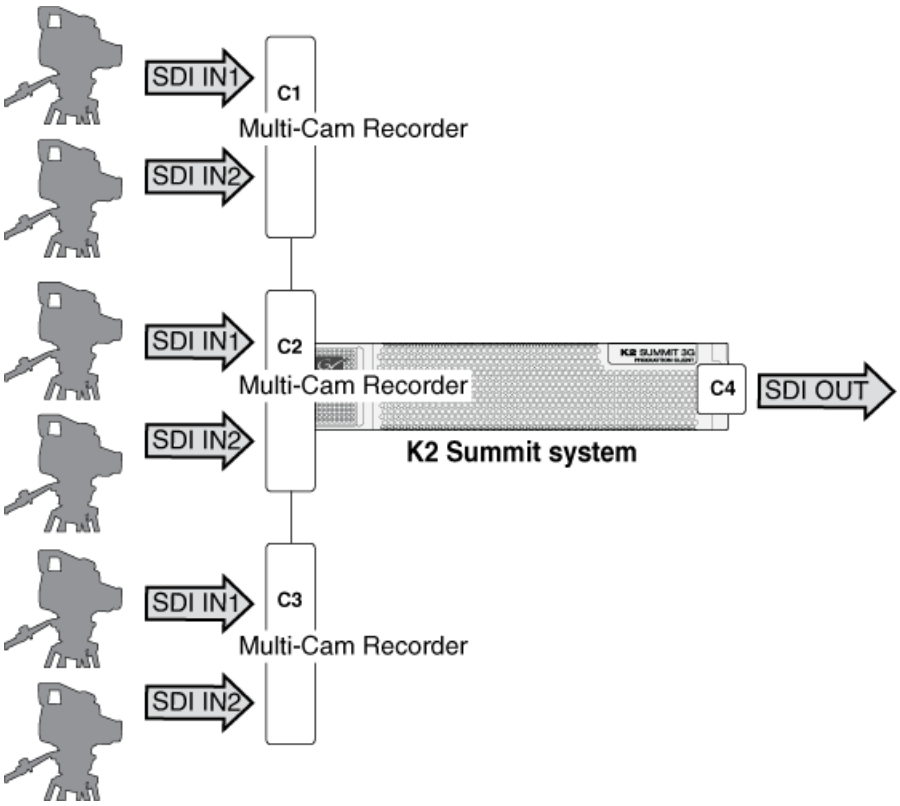
The overall load on system resources must be considered when using multiple inputs and outputs per channel on multiple channels, as each input/output stream consumes system resources. FTP transfers, off-speed play, and media drive rebuilds also consume system resources, so they must be considered as well. The channel combinations illustrated below are typical applications that maximize ChannelFlex channels. These combinations have been qualified by Grass Valley, with the following considerations:

- These combinations assume an HD format with 100 Mbps data rate, which produces a high load on system resources.
- If you use off-speed play above 1x at the same time an FTP transfer is underway, the available FTP bandwidth can be reduced by as much as 50%.
- If a media drive rebuild is in progress it can result in a slight reduction in available FTP bandwidth.

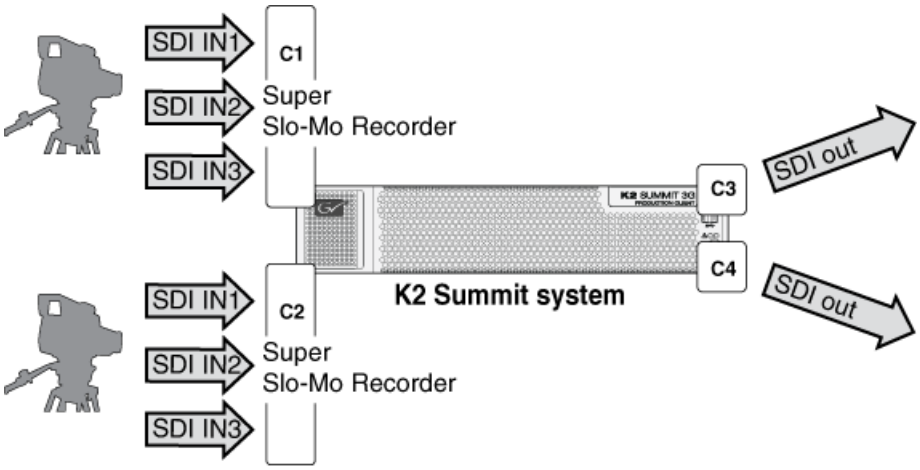
K2 Dyno Replay system, 4 IN, 2 OUT



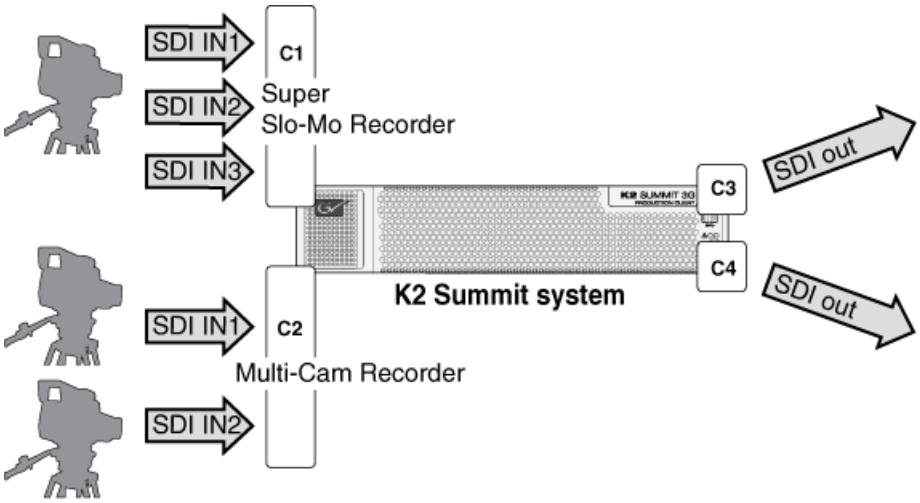
K2 Dyno Replay system, 6 IN, 1 OUT



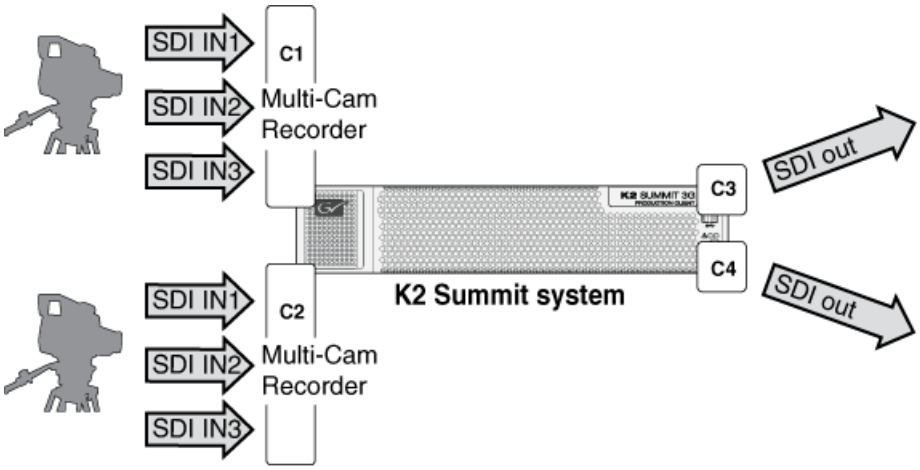
K2 Dyno Replay system, 2 (3x/6x) SSM IN, 2 OUT



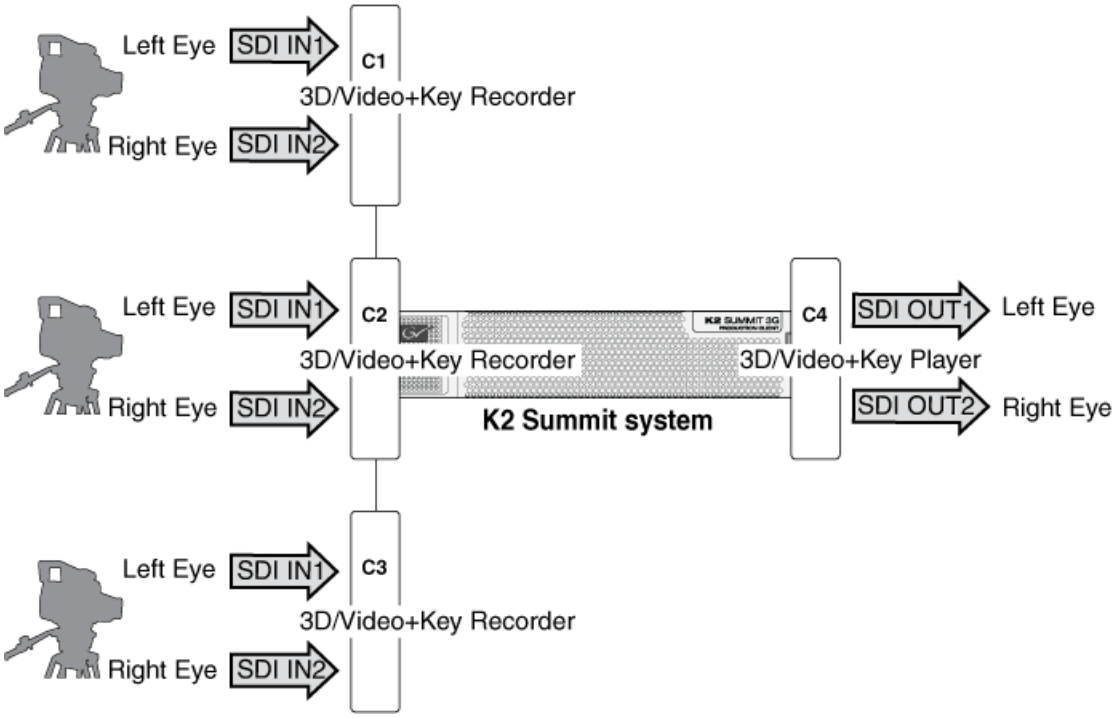
K2 Dyno Replay system, 1 (3x/6x) SSM IN, 1 Multi-Cam IN, 2 OUT



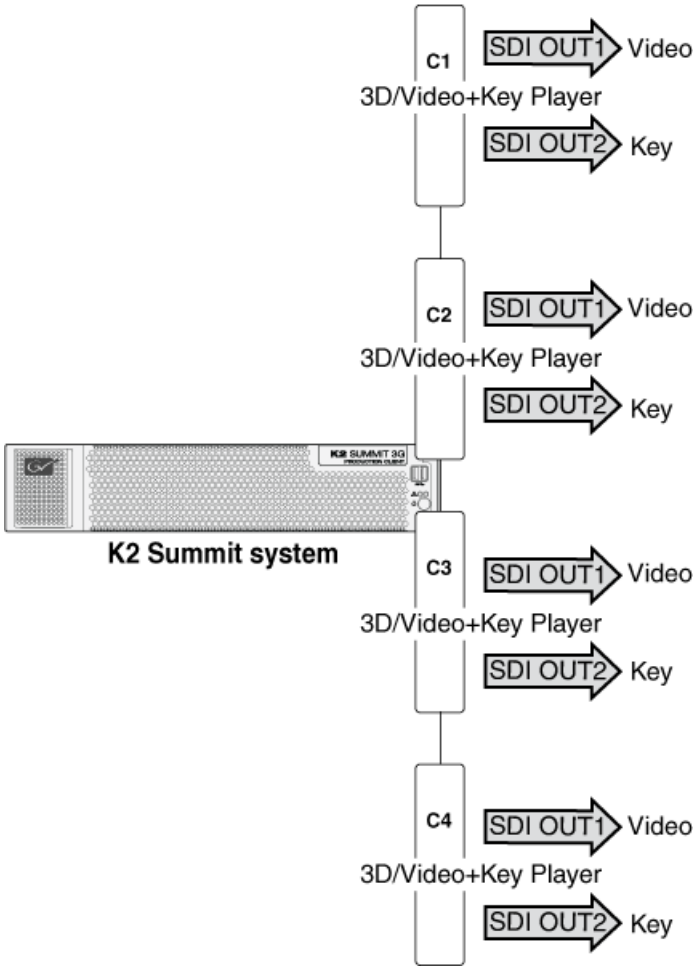
Multi-Cam, 6 IN, 2 OUT



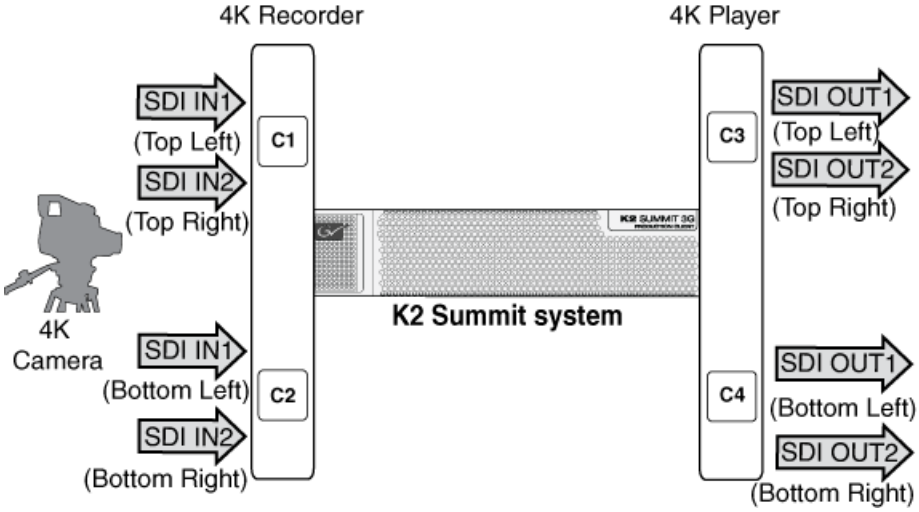
3D – 3 L/R Eye IN, 1 L/R Eye OUT



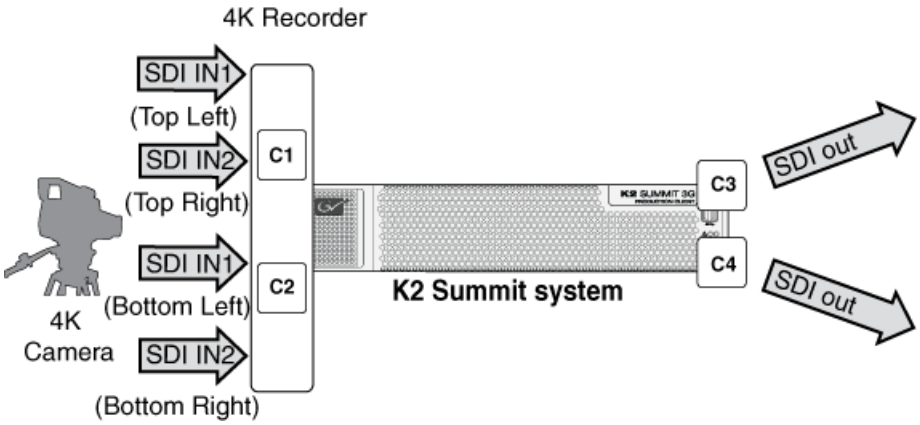
Key/Fill Playout



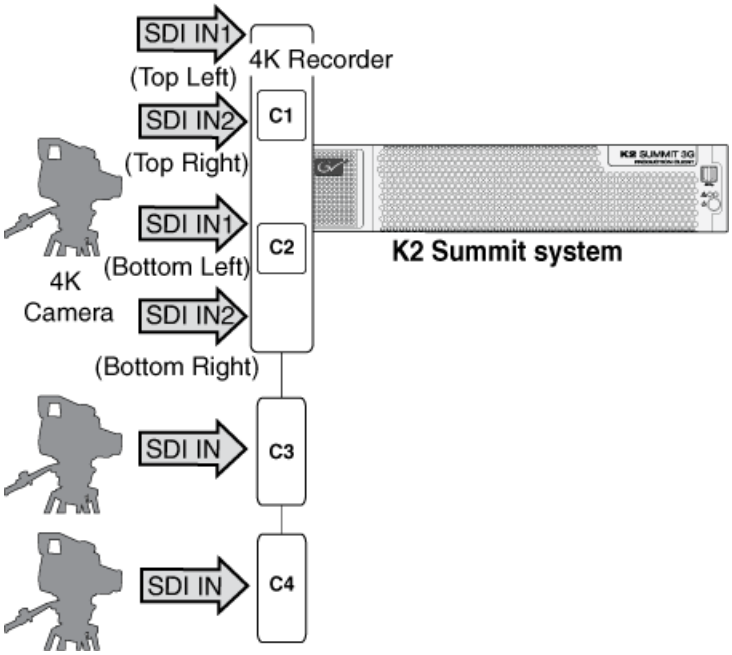
4K – 1 4K record via 4 SDI INs in 2 channels, 1 4K playout via 4 SDI OUTs in 2 channels



4K – 4 IN, 2 OUT



4K – 6 IN



About introducing ChannelFlex Suite on existing K2 systems

When you upgrade to a K2 system software version that supports ChannelFlex Suite and then begin to use ChannelFlex Suite features, you increase the number of inputs and outputs on the K2 Summit system. To support this increased load on system resources, you must adjust your system, as follows:

- Standalone K2 Summit system – This includes standalone K2 Summit systems. These system require an updated RTIO setting. You must update this setting when you upgrade.

- K2 SANs – These system might require additional disks for bandwidth and additional K2 Media Servers to act as iSCSI bridges (TOEs), depending on the number and type of inputs and outputs you are adding by your use of ChannelFlex Suite features. Contact your Grass Valley representative to evaluate your system and its suitability for supporting your use of ChannelFlex Suite.

Related Topics

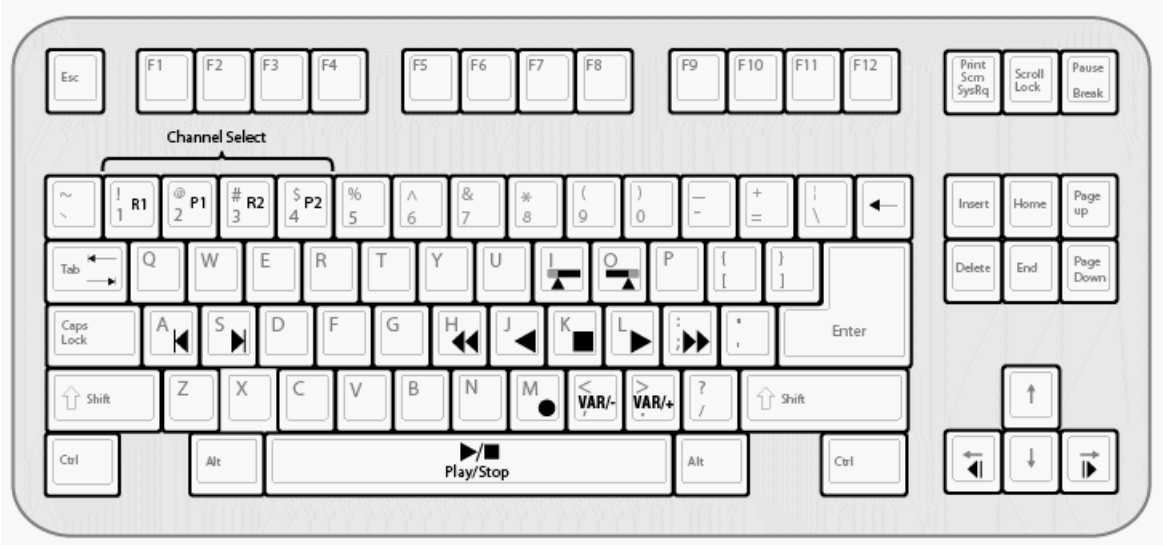
RTIO specifications for standalone K2 Summit 3G system on page 397

Keyboard Shortcuts

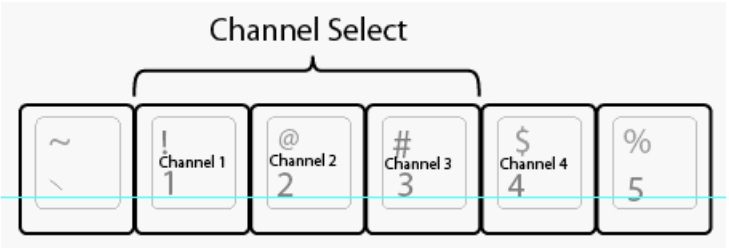
About keyboard operation

A keyboard can be used to control the K2 Summit system. A full keyboard is shown below.

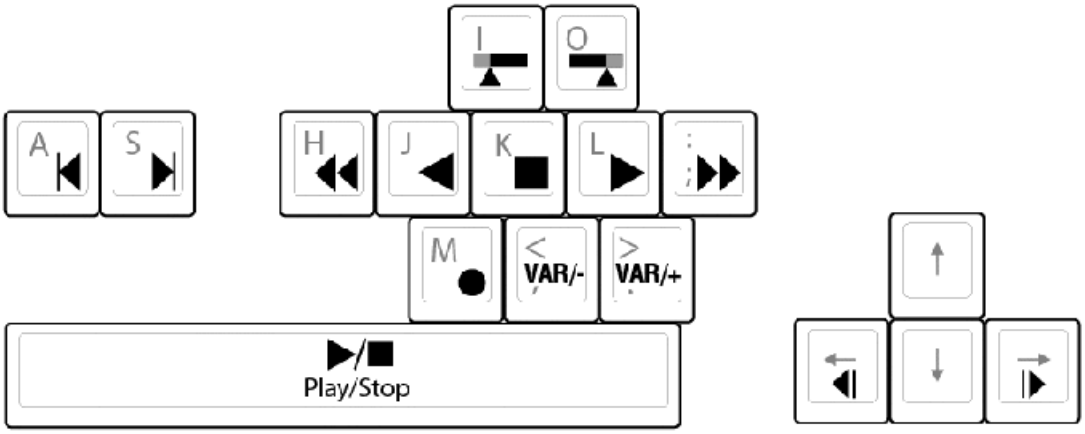
NOTE: Keyboard shortcuts are disabled when text entry dialog boxes are open.



Channel select controls



Basic transport controls



Off-speed play controls

For this action...	Press
Play faster	Shift + L (Repeat this key sequence to increment the play speed up to the maximum forward shuttle speed.)
Play slower	Shift + J (Repeat this key sequence to decrement the play speed up to the maximum reverse shuttle speed.)
VAR/speed increment	period (.) (Press for VAR play mode, then repeat to increment VAR speed.)
VAR/speed decrement	comma (,) (Press for VAR play mode, then repeat to decrement VAR speed.)

Shuttle speed controls

For this action...	Press	For this action...	Press
+ 0.2X speed	Shift + 1	- 0.2X speed	Ctrl + 1
+ 0.33 speed	Shift + 2	- 0.33 speed	Ctrl + 2
+ 0.5X speed	Shift + 3	- 0.5X speed	Ctrl + 3
+ 1X speed	Shift + 4	- 1X speed	Ctrl + 4
+ 1.5X speed	Shift + 5	- 1.5X speed	Ctrl + 5

For this action...	Press	For this action...	Press
+ 2X speed	Shift + 6	- 2X speed	Ctrl + 6
+ 4X speed	Shift + 7	- 4X speed	Ctrl + 7
+ 9X speed	Shift + 8	- 9X speed	Ctrl + 8
+ 16X speed	Shift + 9 (see Note A below)	- 16X speed	Ctrl + 9 (see Note A below)
+ 32X speed	Shift + 0 (see Note B below)	- 32X speed	Ctrl + 0 (see Note B below)

NOTE: A) If shuttle speed, as configured in Configuration Manager, Panel, is set to "+16X to -16X"

NOTE: B) If shuttle speed, as configured in Configuration Manager, Panel, is set to "+ 32X to - 32X"

Speed controls are not cumulative. Each keyboard shortcut sets speed relative to baseline normal (zero) speed, rather than adding/subtracting from current speed.

Stop-Mode transport controls

For this action...	Press
Cue to mark-in	A, Shift + I
Cue to mark-out	S, Shift + O
Next frame	Arrow-right
Previous frame	Arrow-left
Go forward 1 second	Shift + Arrow-right
Go back 1 second	Shift + Arrow-left

Mark-Point and Cue controls

For this action...	Press
Set mark-in	I
Set mark-out	O
Clear mark-in	Ctrl + I
Clear mark-out	Ctrl + O

Miscellaneous controls

Action	Press
Live Play (Chase Play)	Ctrl + L (To toggle back to the regular setting, press the Space bar
Copy	Ctrl + C
Cut	Ctrl + X
Paste	Ctrl + V
Open online help	F1

List controls

The following shortcuts are used to control lists such as text view in Clips pane, or Playlist's List view.

Action	Press
Select previous item in list	Up arrow
Select next item in list	Down arrow
Scroll to previous page	Page Up
Scroll to next page	Page Down
Scroll to top of list	Home
Scroll to bottom of list	End
Delete current selection	Delete, Backspace

Playlist controls

Action	Press
Next event	Shift + S, Ctrl + S, Ctrl + Arrow-right
Previous event	Shift + A, Ctrl + A, Ctrl + Arrow-left

Action	Press
Next section	Shift + Ctrl + S, Shift + Ctrl + Arrow-right
Previous section	Shift + Ctrl + A, Shift + Ctrl + Arrow-left
Goto an event	Hold down the Alt key while clicking the event

Configuring the K2 system

Product description

About K2 systems

The K2 Summit system is a cost-effective Broadcast Enterprise Server that incorporates IT server platform and storage technologies to deliver a networked solution to facilities for ingest, playout, news integration, sports, and media asset management. Each K2 system model is a comprehensive platform that provides a suite of user applications, system tools, and the largest range of third-party interactivity in the industry.

The K2 Summit system is designed for “headless” operation from a remote control point using Grass Valley Control Point software. You can also use the Microsoft Windows Remote Desktop Connection application on your PC to connect to the K2 system for configuration or administration.

The K2 Summit system is further described in the following topics.

K2 Summit 3G+ system features

The following features apply to the K2 Summit 3G+ Production Client:

- Windows 10 IoT LTSB.
- MS Server 2012.
- Embedded Security for protection against viruses and other unauthorized programs.
- Bidirectional channels (channel can be either an input channel or it can be an output channel).
- Two or four channels per chassis. Configurations include:
  - SD : DV, IM X and MPEG-2 I-Frame and Long GOP
  - HD: DV, XDCAM HD, XDCAM EX, MPEG-2 I-Frame and Long GOP, DVCPRO HD, AVC-Intra, DNxHD andApple ProRes
- Play different formats back-to-back:
  - SD and HD clips
  - 720p/1080i
  - 1080p 3G
  - DV/MPEG/AVC-Intra/H.264/AVCHD
- Instant replay capability
- ChannelFlex – part of AppCenter Elite:
  - Multicam mode
  - Synchronized multichannel record and play to support UHD/4K
  - Super Slo-Mo mode
  - 3D mode
  - Video+key mode
  - HD/SD-SDI monitor output with timecode burn-in and custom text overlays
  - Multiviewer monitor mode with custom text overlays

- Fast boot times with embedded OS on M.2 solid state drive (SSD)
- Option for up to 16 TB of internal hard disk storage
- Built-in mix effects on each channel:
  - Video dissolves and audio crossfades supported via APIs and AppCenter Pro playlist
- Import/export all formats as MXF OP1a, SMPTE 360M (GXF) or QuickTime
- File system enables edit-in-place of QuickTime files
- Expanded internal storage capacity – 16 TB
- Software-based codecs for agile playback and easy configuration
- Increased bandwidth to support more channels, higher bit rates, faster file transfers
- Super slow-motion support in DVCPRO HD, AVC-Intra and DNxHD formats
- Full XDCAM HD workflow support including multicam mode
- 1080p50/60 Level A support using AVC-Intra
- Embedded operating system on M.2 solid state drive (SSD)
- Automatic up/down conversion, user-definable aspect ratio conversion, and closed caption preservation
- ANC data preserved and full AFD processing
- Full multichannel audio support – 16 SDI audio tracks per video channel (32 audio tracks per clip on disk)
- SDI video inputs and outputs.
- AES/EBU or embedded audio inputs and outputs.
- Standard Definition (SD) video formats and High Definition (HD) video formats.
- Support for DV, MPEG-2, AVCHD/H.264, AVC-Intra, AVC-LongG, and Avid DNxHD. For details regarding licenses, hardware support, and video codec specifications, refer to related topics in the "Using K2 AppCenter" section of the K2 Topic Library.
- 3G codec module hosts codec option cards that are programmable for multiple formats and functions.
- Mixed format playback of SD or HD clips on the same timeline.
- Up/down/cross HD/SD conversion (e.g. SD and HD clips ingested, then played back as SD or HD clips) or as a different SD or HD format (e.g. 720p to 1080i).
- 4K, Super Slo-Mo, Multi-cam, and 3D/Video + Key features are available as part of the ChannelFlex Suite.
- 4K/UHD workflow and 4K/UHD Pan & Zoom using the GV DynoZoom software.
- High endurance SSD internal storage for 6-in/2-out configuration, 6x Super Slow Motion (SSM), and 4K/UHD workflow.
- Redundant power supply, cooling fans for reliability.
- 2.5 inch media storage drives.
- M.2 SSD system drive.
- Type IV CPU carrier module with 8 GB RAM.
- USB 3.0 interface for file exchange.
- Ability to create nested bins, i.e. sub-bins within bins.
- Freeze mode can be frame or field.
- Various video mix effects (e.g. dissolves between two video and audio tracks on the same channel, or fade thru matte color).

- Remote operation and configuration via AppCenter.
- 1/10 Gigabit Ethernet ports.
- Remote control over RS-422 or Ethernet.
- Stand-alone internal storage.
- Internal multi-viewer output provides a display of up to eight channels in real time when used with ChannelFlex.

Audio and Closed Caption/ Teletext Multilingual Support

Audio and Closed Caption/Teletext Multilingual Support Each video channel has up to eight AES/EBU or 16 embedded channels of PCM or compressed audio. For easy track management, each audio track can be identified with a language descriptor (requires AppCenter Pro or Elite). Additional audio features include scrub audio up to 2X, audio meters for each channel, an internal audio delay capability and the ability to adjust levels during recording or playback. It also performs an audio ramp down/ ramp up between clips to eliminate audio clicks and/or pops. Additional audio tracks can be imported into a clip to easily add additional languages (requires AppCenter Pro or Elite). In addition multiple closed captions or teletext files can be imported from third-party captioning editors for additional language support (requires AppCenter Pro or Elite).

K2 Summit formats, models, licenses, and hardware support

Formats are supported as in the following tables.

Table 8: K2 Summit 3G+ system

Formats	Compression	1x	3x Super Slo-Mo, Multi-Cam*, 3D/Video + Key	6x Super Slo-Mo	4K
SD	DV	Encode/decode	Encode/decode. Requires AppCenterElite licenses. TripleCam also requires the Triple license.	Not supported.	Not supported.
	MPEG-2	Encode/decode	Encode/decode. Requires codec Mezz option card. Requires AppCenterElite license. 3x Super Slo-Mo and TripleCam are not supported.	Not supported.	Not supported.

Formats	Compression	1x	3x Super Slo-Mo, Multi-Cam *, 3D/Video + Key	6x Super Slo-Mo	4K
	AVC/H.264	Decode only. Requires AVC license.	Not supported	Not supported	Not supported.
1080i/720p	DVCPROHD	Encode/decode. HD license is required.	Encode/decode. Requires the HD and AppCenterElite license. TripleCam also requires the Triple license.	Encode/decode. Requires codec Mezz option card. Requires HD, AppCenterElite and 6xSSM licenses. Requires K2 Summit 3G chassis with 2.5” hard drives for one channel or high endurance solid state drives for full features with two channels.	Not supported.
	MPEG-2	Encode/decode. HD license is required.	Encode/decode. Requires Mezz codec option card. Requires HD and AppCenterElite licenses. 3x Super Slo-Mo and TripleCam are not supported.	Not supported.	Not supported.

Formats	Compression	1x	3x Super Slo-Mo, Multi-Cam *, 3D/Video + Key	6x Super Slo-Mo	4K
	AVC-Intra	Encode/decode. Requires HD and AVC licenses.	Encode/decode. Requires HD, AppCenterElite and AVC licenses. TripleCam also requires the Triple license.	Encode/decode. Requires codec option card, plus HD, AppCenterElite, 6xSSM and AVC licenses. Requires K2 Summit 3G chassis with 2.5” hard drives for one channel or high endurance solid state drives for full features with two channels.	Not supported.
	AVCHD/H.264	Decode only. Requires HD and AVC licenses.	Not supported	Not supported	Not supported.
	AVC-LongG	Decode only. Requires HD and AVC licenses.	Not supported	Not supported	Not supported.
	Avid DNxHD	Encode/decode. Requires HD and Avid DNxHD licenses.	Encode/decode. Requires HD, AppCenterElite and Avid DNxHD licenses. TripleCam also requires the Triple license and SSD storage.	Not supported	Not supported.

Formats	Compression	1x	3x Super Slo-Mo, Multi-Cam *, 3D/Video + Key	6x Super Slo-Mo	4K
	Apple ProRes	Encode/decode. HD and Apple ProRes licenses.	Encode/decode. HD and Apple ProRes licenses. Requires a Summit 3G codec board. 2-Input Multi-Cam support only.	Not supported	Not supported
1080p	AVC-Intra Class 100	Encode/decode. Requires codec Mezz option card for multi-head operation. Requires HD, 3G and AVC licenses.	Encode/decode. Requires codec Mezz option card. Requires HD, 3G AppCenterElite and AVC licenses. TripleCam is not supported.	Not supported	Encode/decode. One 4K channel requires two codec channels. Requires codec Mezz option cards and high endurance solid state drives. Requires HD, 3G, 4K, AppCenterElite and AVC licenses.

Features of internal storage models

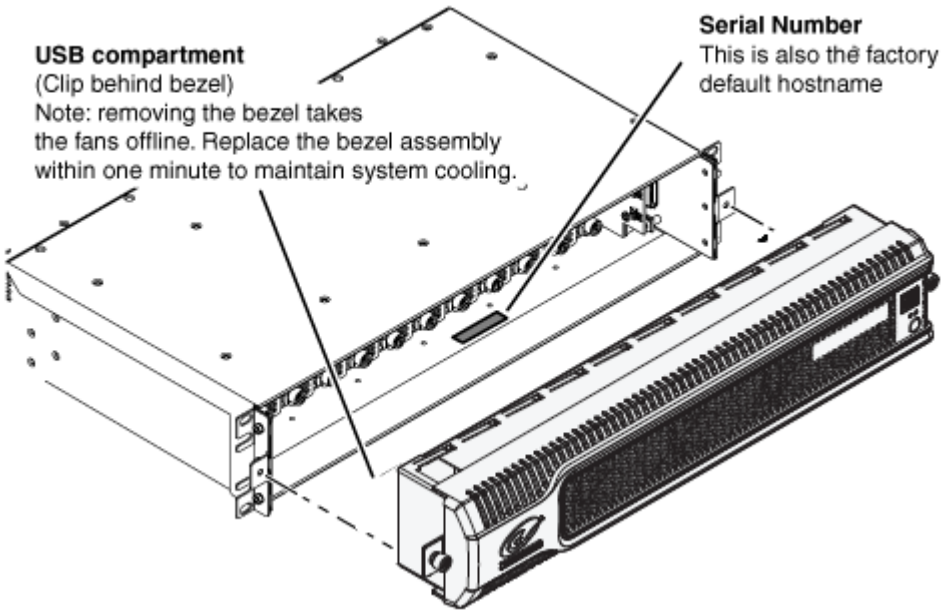
K2 Summit systems have media drives as follows:

- K2 Summit 3G system — Up to twelve media drives

This makes the internal storage K2 system a self-contained, stand-alone unit, with no external devices for storage connections required. You can transfer media in and out of the internal storage K2 system via Gigabit Ethernet. You can also export media to a mapped drive or USB-attached storage.

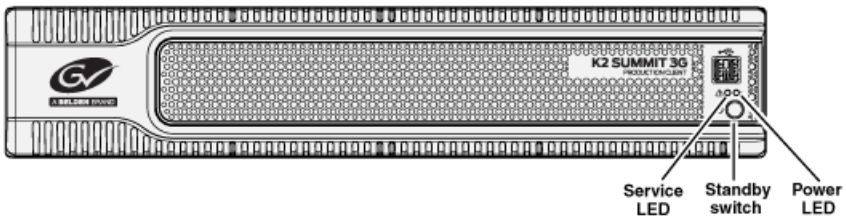
Product identification K2 Summit 3G+

The K2 Summit 3G system+ has labels affixed to the chassis that provide product identification as illustrated:



Front panel indicators K2 Summit 3G system

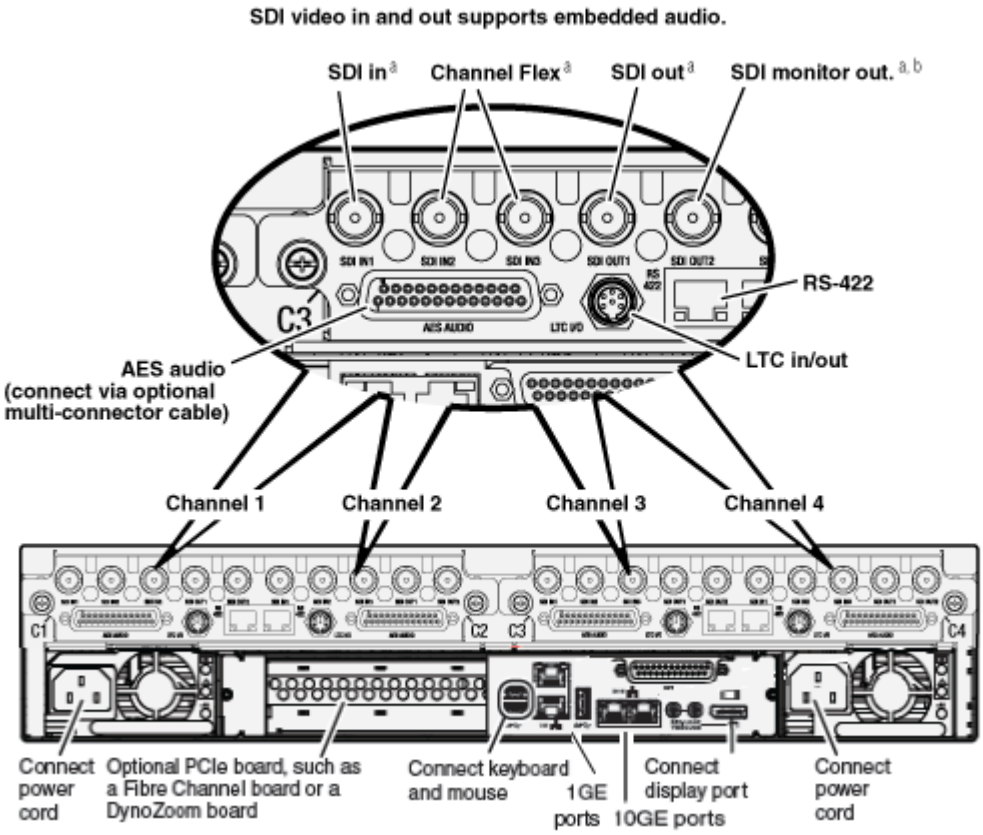
With the front bezel in place, the indicator LEDs are visible. The LEDs indicate the status of the machine. For example, when the Service LED is a steady yellow light, this could signify that one of the power cables is unplugged. For more information on indicator LEDs, see the "Servicing the K2 Summit system" section of the K2 Topic Library.



Rear panel view

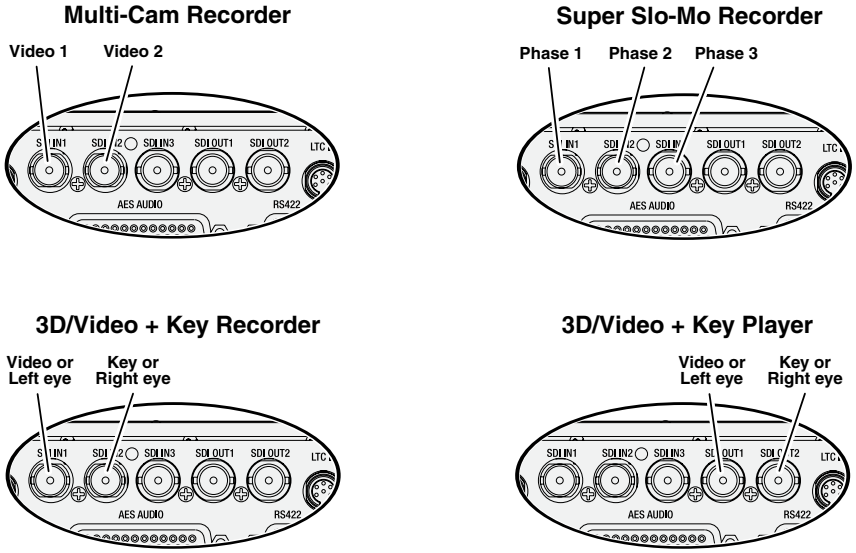
The following illustrations identify the rear panel connectors and components.

K2 Summit 3G+ models rear panel



ChannelFlex rear panel connections

ChannelFlex Suite features require the AppCenter Elite license. Super Slo-Mo also requires the HD license. When configured for these features, channel connections are as follows:



ChannelFlex Suite features do not support AVC-Intra Class 100.

Refer to the *K2 AppCenter User Manual* for more information on ChannelFlex Suite features.

Considerations for first startup out of box

When you receive a K2 system from the factory, one or more End User License Agreements (EULAs) appear on the screen at first startup. Software licensing agreements require that you accept these EULAs. When you do so, start up processes can proceed. This behavior occurs only at first startup. Subsequent startups do not exhibit this behavior.

K2 Summit system overview

The K2 Summit system are purpose-built clients based on COM Express compact computer with dedicated systems to provide the video disk recorder functionality. This section explains the major architectural blocks.

Related Topics

Application System on page 239
Real Time System on page 239
Media control and processing on page 239
Loop through, E to E, and feeds on page 240

Application System

The K2 Summit Production Client application system architecture uses the COM Express form factor to provide functionality similar to that of standard PC-type computers. The carrier module contains a CPU module, built in Ethernet, and USB ports. On the K2 Summit Production Client, the carrier module also includes one PCIe board slot for expansion.

The Application system uses a Windows embedded operating system (Windows 10 IoT LTSB) upon which all internal storage K2 system applications run for configuration and control of the unit.

Real Time System

Each channel hosts a complete Real Time system that provides the core video disk recorder functionality. Primary components are as follows:

- Dedicated processor for media access and processing.
- Codec circuits responsible for encoding/decoding video and processing audio and timecode, including the media-related input and output connectors.

The Real Time system uses a dedicated operating system. This operating system manages all the hardware involved in controlling the flow of video, audio, timecode, genlock, and GPI in and out of the K2 system.

Media control and processing

The following section explains how the Application system and the Real Time system work together to provide K2 system functionality.

The high processing requirements of digital video can overwhelm the processor on a standard desktop PC, resulting in wait-times that destroy the video's essential real-time aspect. The K2 system avoids this problem by providing dedicated systems that isolate processing needs. The components that work together to provide this functionality are as follows:

Application system — Dedicated to control, configuration, and networking functions that do not require real-time accuracy. The Application system has the following components:

- Application software provides the user interface for operating the K2 system. The software runs as Windows programs.
- The Media File system manages clips. It includes a database that associates the clip with its video, audio, and timecode files and a dedicated file system (separate from the Windows file system) that controls access to the raw data that makes up each file. Any reading and writing of clips, be it through play and record operations or through file transfers and media streaming, is managed by the database. The database and file system run as Windows programs.

Storage system — Includes the media disk drives, controllers, drivers, and adapters necessary for access and movement of the data. While the primary data flow is within the overall control of the Real Time system, some components and their communication pathways cross over into the Application system. For example, the media drives appear as the V: drive to the Windows operating system.

Real Time system — Manages the media flow between the Storage system and the inputs and outputs. The Real Time system has dedicated processors and time-sensitive mechanisms to serve media processing needs while maintaining real-time accuracy.

When you control play and record operations from within the Application system you trigger a chain of events that eventually crosses over into the Real Time system and results in media access. The following sequence is an example of this type of chain of events:

1. A user operates the Player application to play a particular clip. The Player application asks the Media File system for permission to access the clip. The Media File system grants access. In shared storage models, the Media File system enforces shared storage policies in order to grant the access. When access is granted, the Player application initiates play access to the clip.
2. The database identifies the files that make up the clip and the file system instructs the Storage system to open access to the files.
3. The Storage system finds the raw data and opens the appropriate read access. At this point both the Application system and the Real Time system are involved. Windows controls the media drives and controllers, so the Real Time system makes file requests to Windows and it causes the data to be transferred to buffers on the Real Time processor. The data is then available to the Real Time system so that it can be processed at exactly the right time.
4. The Real Time system processes the media, decompresses it, adjusts its timing, and moves it as required to play the clip as specified by the user.

Loop through, E to E, and feeds

Behaviors related to input signals routed to output connectors are described in the following topics.

Related Topics

About remote control protocols on page 356

Recording synchronous and asynchronous feeds

For best results in all workflows, use synchronous feeds, defined as follows:

- All outputs are locked to the house reference
- All inputs are genlocked to the house reference and at zero time

The K2 Summit Production Client can record inputs that are asynchronous, with the following considerations:

- The encoder clock and the audio clock are derived from the input signal, which enables frame accurate recording of all inputs.
- Outputs are timed to the reference and if no reference is present, the output runs free.
- If the input video rate does not equal the output video rate (asynchronous) then video tearing or jumping can occur when input/output synch is critical, such as in the following:
    - K2 TimeDelay
    - SD-00 or Summit E-to-E (LoopThru) mode
    - HD-00 Loopback

Loop through on K2 Summit

The Player/Recorder application has a “E-to-E (LoopThru) mode” selection on the Control menu. This mode applies when the channel is under local AppCenter control as well as when it is under remote control, for all protocols.

This “E-to-E (LoopThru) mode” feature allows you to monitor the video that is being recorded. The video is routed back essentially untouched. Any audio or timecode that is on the input video stream is still there on the loop through output. The K2 Summit system and the loop through videos must be locked to a video reference for the loop through feature to work properly. This “E-to-E (LoopThru) mode” feature should not be confused with true E to E. True E to E is not supported on the K2 Summit system.

When “E-to-E (LoopThru) mode” is not selected, the channel behaves as follows:

- “PB” is displayed on the channel pane, next to the Timecode Source indicator.
- When no clip is loaded, black plays out.
- When a record operation stops, Recorder becomes Player and the clip remains in the Player. The clip’s last frame plays out.

When “E-to-E (LoopThru) mode” is selected, the channel behaves as follows:

- “EE” is displayed on the channel pane, next to the Timecode Source indicator.
- When no clip is loaded, the signal that is currently present at the channel input plays out.
- When a record operation stops, Recorder stays Recorder and the clip remains in the Recorder. The signal that is currently present at the channel input plays out.

Ports used by K2 services

The following ports are used by the applications and system tools of the K2 family of products:

20	TCP: Used by mpgsession.exe, mxfsession.exe, gxfsession.exe, or ftpd.exe for FTP.
21	TCP: Used by ftpd.exe for FTP data.
81	Protocol: TCP. Used by SNFS for GUI (Java). User starts at port 81, redirected to 443.
161	UDP: Used by snmp.exe for SNMP.
162	UDP: Used by snmptrap.exe for SNMP trap.
443	Protocol: TCP. Used by SNFS for GUI (Java). Used by GV STRATUS applications for HTTPS secure communication with GV STRATUS Core Server. Used by EDIUS Workgroup applications for HTTPS secure communication with Flexera server for license activation.
1062	Protocol: TCP. Used by SNFS for Blockpool. Both ports 1062 and 1063 if HA primary.
1063	Protocol: TCP. Used by SNFS for Blockpool. Both ports 1062 and 1063 if HA primary.
1070	Used by SNFS for GUI (Java connection to Linter).
1070	Used by SNFS for GUI (Java connection to Linter).

1527	Protocol: TCP. Used by SNFS for GUI (Java connection to derby database).
3389	TCP: Used by Remote Desktop for use by SiteConfig.
3811	Protocol: TCP. Used by Grass Valley AppService for 3rd party applications to communicate using AMP protocol. Used by SDB Server and GV STRATUS Rundown outgoing AMP communication to control playout channels. Used by Ignite for AMP, Video Server Control.
5164	Protocol: TCP. Used by SNFS for fsmpm, IOPS.
5189	Protocol: TCP. Used by SNFS for HA Manager. Symbol HAMGR_DEFAULT_PORT.
8080	Protocol: TCP. Traffic: HTTP. Used by GV STRATUS Summit Services. Used by WCF service provided by the GV STRATUS Workflow Engine. Used by WCF service provided by the GV STRATUS Rules Engine.
8100	HTTP/TCP: Used by Macintosh systems for the SabreTooth licensing web service to check out licenses
8732	Protocol: TCP. Traffic: HTTP. Used by Site Config data service .
8733	Protocol: TCP. Traffic: HTTP. Used by K2 Config data service .
8734	Protocol: TCP. Traffic: HTTP. Used by Site Config data service .
8735	Protocol: TCP. Traffic: HTTP. Used by K2 Config data service.
14500	Protocol: TCP. Used by SNFS for snpolicyd.
18262	TCP: Used by GV ProductFrame Configuration Service, ProductFrame Discovery Agent Service for use by SiteConfig. Used by GV NetConfig Service. gv-pf. UDP: Used by GV NetConfig Service. gv-pf.
18263	UDP: Used by ProductFrame Discovery Agent Service for GV NetConfig Device Broadcast/Unicast Protocol. Used by SiteConfig. Sent by ControlPoint, received by Devices
18264	UDP: Used by ProductFrame Discovery Agent Service for GV NetConfig Controller Protocol. Used by SiteConfig. Sent by Devices, received by ControlPoint
20566	Protocol: TCP. Used by SNFS for MySQL. Only used internally on an MDC.
31820	Protocol: UDP. Used for live streaming from K2 Summit/Solo systems. This is the default base for UDP ports, with the range being 31820 to 31827. Other ranges are possible, depending on the UDP port base configured on the K2 Summit/Solo system.
49168	HTTP/TCP: Used by Grass Valley K2 Config for K2Config application connection between a control point PC and the K2 system device configured. Used for most functions.
49169	TCP: Used by Grass Valley K2 Config for K2Config application connection between a control point PC and the K2 system device configured. Used for a few functions that require longer time periods.
49170	HTTP: Used by Grass Valley Transfer Queue Service for Transfer Manager connection between source system and destination system.
49171	TCP: Used by Grass Valley AppService for AppCenter connection between control point PC and K2 client/Solo, and used by GV STRATUS application and services to connect to Grass Valley K2 AppService.

49172	HTTP: Used by Grass Valley Storage Utility Host for connection for Storage Utility between the control point PC and the K2 system being configured.
50872	UDP: Used by K2 Appcenter to discover K2 systems on the network.
60001	Protocol: TCP. Used by ACSLS Tape Libraries. Related to SNFS.
60002	Protocol: TCP. Used by ACSLS Tape Libraries. Related to SNFS.

RAID drive numbering K2 Summit 3G system

In the K2 Summit 3G system, internal RAID drives are numbered as follows. This numbering is displayed in Storage Utility.

Disk 0	Disk 1	Disk 2	Disk 3	Disk 4	Disk 5	Disk 6	Disk 7	Disk 8	Disk 9	Disk 10	Disk 11

Drives are configured as RAID 1.

Drive numbering	Explanation
Disk 0	These two RAID drives make up LUN 0.
Disk 1	
Disk 2	These two RAID drives make up LUN 1.
Disk 3	
Disk 4	These two RAID drives make up LUN 2.
Disk 5	
Disk 6	These two RAID drives make up LUN 3.
Disk 7	
Disk 8	These two RAID drives make up LUN 4.
Disk 9	
Disk 10	These two RAID drives make up LUN 5.
Disk 11	

For configurations with eight drives, slots 0 - 3 and slots 6- 9 are populated.

Overview of K2 System Tools

Configuration Manager

The Configuration Manager is the primary configuration tool for a K2 Summit system. It makes settings that apply to the overall internal storage K2 Summit system as well as settings that apply to individual channels.

Configuration Manager settings are stored in a database. When the K2 Summit system starts up it reads the current settings from the database and configures itself accordingly. When you modify a setting in Configuration Manager you must save the setting in order to update the database and reconfigure the K2 Summit system.

You can also save settings out of Configuration Manager into a configuration file, which is a stand-alone XML file. Likewise, you can load settings into Configuration Manager from a configuration file. However, you must use Configuration Manager as the means to save the settings to the database before the settings actually take effect. Configuration files are not linked directly to the database.

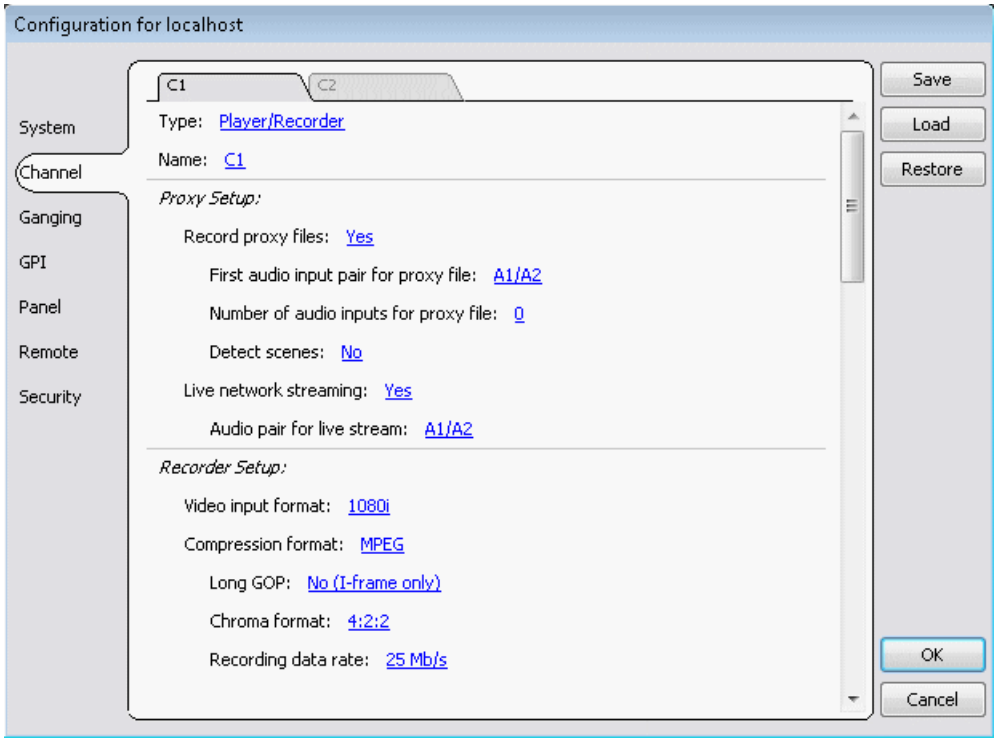
You can use configuration files as a means to back up your settings. You can also use configuration files to save several different groups of customized settings, each with a unique name, so that you can quickly load settings for specialized applications.

If you save a configuration file and then upgrade your K2 system software, there can be compatiblity issues. If the upgraded software version has new features, the saved configuration file might not be compatible.

Accessing Configuration Manager

You access Configuration Manager through the K2 AppCenter application from the local K2 Summit system or from the Control Point PC.

To access the configuration settings, open AppCenter and select **System | Configuration**.



Related Topics

Saving and restoring Configuration Manager settings on page 69
Passwords and security on Grass Valley systems on page 15

Saving and restoring Configuration Manager settings

Settings can be saved as a configuration file. You can save any number of uniquely named custom configuration files. You can load a configuration file to restore system settings.

To save custom settings:

1. In the Configuration Manager, click the **Save** button.

   The Save As dialog opens.

2. Use the up arrow or select folders to navigate to the folder in which you want to save the configuration file.
3. Enter a name for the configuration file.

   Do not name the file *Default*Config.xml, as this name is reserved for the factory default configuration file. Otherwise, standard Windows 10 file naming restrictions apply.

4. Click **Save** and **Close**.

To restore custom settings:

1. If you want to save current settings, you should save them as a configuration file before continuing.
2. In the Configuration Manager, click the **Load** button.

   The Open dialog opens.
3. Use the up arrow or select folders to navigate to the custom configuration file.
4. Select the custom configuration file.
5. Click **Open**.

   The custom settings are loaded into Configuration Manager, but they have not been saved and put into effect.
6. Click **OK** to save and apply settings, and to close the Configuration Manager.

Restoring default Configuration Manager settings

You can restore factory default settings as follows:

- Restore some individual settings or groups of settings by selecting the **Default** button which appears below the settings in the configuration screen.
- Restore all the settings in Configuration Manager at once to their default values as explained in the following procedure.

1. If you want to save current settings you should do so before proceeding.
2. In the Configuration Manager dialog, click **Restore**.

   The default settings are loaded into Configuration Manager, but they have not yet been saved and put into effect.
3. Click **OK** to save settings and close Configuration Manager.

Related Topics

Saving and restoring Configuration Manager settings on page 69

Storage Utility for standalone K2 Summit system

This manual explains Storage Utility for stand-alone K2 Summit system.

The Storage Utility is your primary access to the media file system, the media database, and the media disks of the K2 Summit system for configuration, maintenance, and repair. It is launched from the K2 AppCenter application.

⚠ ***CAUTION: Use the Storage Utility only as directed by a documented procedure or by Grass Valley Support. If used improperly, the Storage Utility can render your K2 system inoperable or result in the loss of all your media.***

NOTE: Do not use the MegaRAID utility on a K2 system. This utility is for use by qualified Grass Valley Service personnel only. When this utility is opened it scans the SCSI bus and interferes with record and play operations.

Remote Desktop Connection

You can use the Microsoft Windows Remote Desktop Connection application to make a remote connection to a Grass Valley system that runs the Windows operating system.

Take the following into consideration when connecting to K2 systems:

- Before you can use the Remote Desktop Connection, you need network access and permissions to connect to the K2 system.
- You can use either the name or the IP address to access the K2 system.
- Do not use the Remote Desktop Connection to access the PC running the Control Point software or to access the AppCenter application; results may be unreliable.
- Take care when accessing an online K2 system on which media access is underway. The additional load on network and system resources could cause unpredictable results.
- Lack of robust video/graphic support can cause video display problems. Remote desktop connections can interrupt proxy and live streaming. AppCenter video monitoring is not supported through Remote Desktop Connection.

Accessing Remote Desktop Connection

1. Do one of the following:
   - Click the **Start** button on the Windows task bar
   - Press the Windows key on the keyboard.
2. Select **Programs | Remote Desktop Connection**.

   The Remote Desktop dialog box opens.
3. Enter the name or IP address of the system to which you are making the remote connection and click **Connect**.

   To enable Remote Desktop, type

   ```
   remote settings
   ```

   in the search box and select **Allow remote access to your computer**.

About SiteConfig

SiteConfig is Grass Valley's tool for network configuration and software deployment. SiteConfig is a ProductFrame application. ProductFrame is an integrated platform of tools and product distribution processes for system installation and configuration.

You can use SiteConfig as a stand-alone tool for planning and system design, even before you have any devices installed or cabled. You can define networks, IP addresses, hostnames, interfaces, and other network parameters. You can add devices, group devices, and modify device roles in the system.

As you install and commission systems, SiteConfig runs on a designated PC. It discovers devices, configures their network settings, and manages host files. SiteConfig also manages software

installations and upgrades and provides a unified software package with compatible versions for deployment across multi-product systems.

You should use SiteConfig for network configuration and software deployment at installation and throughout the life of the system in your facility. This enforces consistent policy and allows SiteConfig to keep a record of changes, which makes the system easier to maintain and aids in troubleshooting should a problem arise.

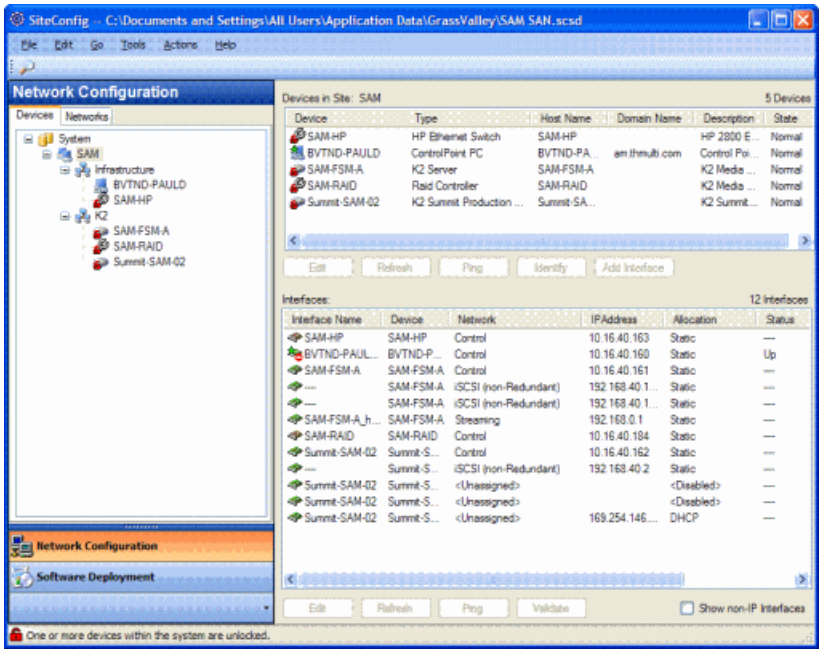
SiteConfig displays information from a system description file, which is an XML file.

Opening SiteConfig

1. Do one of the following: Use the SiteConfig shortcut on the Windows desktop or in the Start menu to open SiteConfig.
   - On the Windows desktop, click the **Grass Valley SiteConfig** shortcut.
   - On the Windows **Start** menu, in the **Grass Valley** folder, click the **SiteConfig** shortcut.
2. SiteConfig opens as follows:
   - If you have previously opened SiteConfig, the SiteConfig main window opens with the most recently used system description loaded.
   - If you have not previously used SiteConfig or if SiteConfig does not have access to a system description file, you are prompted to create a new system description or to import an existing system description.
3. Respond as appropriate.

SiteConfig main window

The SiteConfig main window is as follows:



The left side of the screen shows the tree view of the currently loaded system description. The Network Configuration and Software Deployment buttons at the bottom of the tree view activate either the network configuration workspace or the software deployment workspace.

The network configuration workspace on the left has two tabs: a Devices tab to display the tree of devices in the system and a Networks tab to show the hierarchy of networks defined in the system.

The software deployment workspace also has two tabs: a Devices tab that displays the same tree view of devices but provides information about the software roles assigned to the devices and the software currently installed on devices. The Deployment Groups tab provides the interface to manage software deployment tasks.

Select an item in the tree and the view on the right side of the screen shows details about the item selected. Select a site or group to show information about all the items that fall under the selected item.

Right-click an item to access a context menu of operations.

Icon overlays on items and tooltips provide status and warning feedback.

Grass Valley Recommended Deployment and Monitoring Solutions

To maximize up-time, a maintenance strategy must provide the ability to easily identify the root cause of an unanticipated hardware or software failure and to quickly compile failure data. The ability to proactively predict failures and to quickly notify those who can rectify them makes the maintenance strategy even more powerful. Grass Valley has a long history of building the necessary functionality into critical broadcast products. With Grass Valley's next generation tool, GV GUARDIAN, remote monitoring and proactive predictive failure analysis are important contributors to Grass Valley system solutions. GV GUARDIAN runs on commercial off-the-shelf server PCs,

such as the K2 system control point PC, and is also available as an all-in-one turnkey product. Grass Valley and 3rd party devices report status via Window Messaging, Simple Network Management Protocol (SNMP), or syslog to GV GUARDIAN. The tool provides easy to use, fully autonomous remote monitoring to predict errors, provide proactive notifications, and centrally consolidate error logs and hardware failure information. With GV GUARDIAN you can maximize your up-time with less manpower, as compared to manual system monitoring. Watching for indicator lights, physically scanning logs, and other manual monitoring is far more time consuming, more error-prone, and much less accurate. Grass Valley recommends using GV GUARDIAN as your remote monitoring tool.

System connections and configuration

About networks

The following section describe networks as they apply to K2 systems.

Control network description

The control network is for communication between devices and components. It does not have real-time media traffic or streaming/FTP media traffic. The control network traffic must be separated from the streaming/FTP network traffic and the media (iSCSI) network traffic. This separation may be provided by different subnets, VLANs, or physical switch fabrics. The control network and the streaming/FTP network, if on different subnets, may be on the same VLAN. The control network and the media (iSCSI) network must not be on the same VLAN. Static IP addresses with name resolution via host files are recommended for the control network.

Streaming/FTP network description

The streaming/FTP network is for media transfers and FTP traffic. The streaming/FTP network network traffic must be separated from the control network traffic and the media (iSCSI) network traffic. This separation may be provided by different subnets, VLANs, or physical switch fabrics. The control network and the streaming/FTP network, if on different subnets, may be on the same VLAN. The control network and the media (iSCSI) network must not be on the same VLAN. Static IP addresses with name resolution via host files are recommended for the streaming/FTP network. Hostnames of network adapters that are dedicated to the streaming/FTP network must be aliased in the hosts file with the `_he0` suffix. This directs the streaming traffic to the correct port.

Media (iSCSI) network description

It must be on a different subnet than the control network and the streaming/FTP network. Furthermore, its traffic is kept physically separate from that of other networks. This separation is provided by dedicated ports, cables, and by a dedicated VLAN on the Ethernet switch or by separate switches. Static IP addresses are required for the media network. Name resolution is not necessary, so media network IP addresses are not required in host files.

Network considerations and constraints

- If your GV STRATUS system is on a domain, all servers and client PCs on that system that have any interaction with Grass Valley components must be logged on to Windows with a domain user account. Do not use a local user account.
- Do not use any 10.1.0.n or 10.2.0.n IP addresses. These are used by the K2 RAID maintenance port and must be reserved for that purpose. If these addresses are otherwise used, maintenance port communication errors occur.

Network connections

Use the information in this section as appropriate to connect the Gigabit (1GBaseT) Ethernet network for your application:

Ethernet cable requirements

For making Ethernet connections, cabling must meet the following requirements:

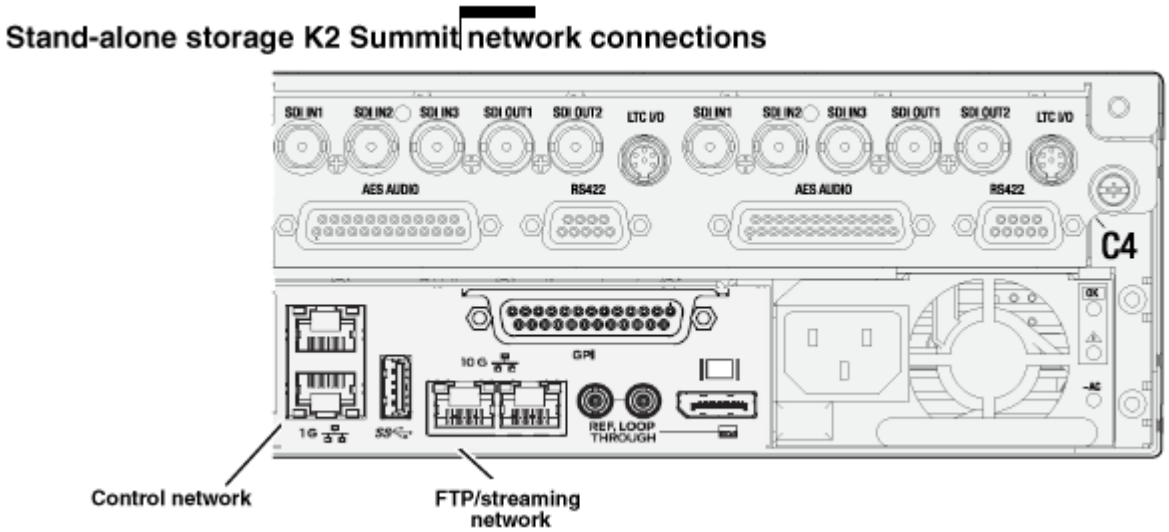
- Use CAT5e or CAT6 cables. The maximum cable length is 50 meters for CAT5e and 100 meters for CAT6.

About network ports

When you receive a K2 Summit Production Client from the factory, it has a specific network configuration, including a loopback adapter and two of the four Gigabit Ethernet ports configured as a teamed pair.

Making network connections

Connect network ports as appropriate for the K2 Summit system 3G+ option as in the following illustration.



In these illustrations the first generation K2 Summit system is shown. Connections are identical on the K2 Summit 3G system.

Network configuration

This section contains instructions for configuring network connections.

About network functionality

K2 networks support the following:

- Remote control and configuration of the internal storage K2 system using AppCenter from a Control Point PC.
- Remote control of the internal storage K2 system using devices and applications software developed for the K2 system that use industry standard remote control protocols over Ethernet.
- Stream media transfers between K2 systems and other supported Grass Valley systems. Streaming transfers allow loading and playing a clip before the transfer is complete.
- Standard data network capability.
- General networking tasks such as file sharing and mapping network drives.

The procedures in this section guide you to relevant settings, but do not instruct you on the specific settings required for your network. It is assumed that you understand Ethernet networks in general and your particular network needs and that you can apply that understanding to make the required settings using standard Windows procedures. If you need help with these procedures, contact your network administrator.

About modifying or restoring network settings

Before configuring network settings, consider the following:

- Loopback adapter — When you receive a K2 Summit Production Client from the factory, it has a loopback adapter installed. The loopback adapter allows the media file system to continue operating if an Ethernet cable is disconnected. Do not modify the loopback adapter. If you need to restore the loopback adapter, refer to the Service Manual for your K2 product.

  The loopback IP address is 192.168.200.200. Keep that IP address reserved on your network. Do not assign it to any other device. If this causes conflicts with your existing network, consult your Grass Valley representative.
- Hostname changes — If you change the host name, remote AppCenter and other systems could have difficulty connecting.
- Restoring factory default network settings — Several settings are configured at the factory and should never be modified. If you suspect settings have been changed, you should reimage the K2 system to restore settings. Refer to the Service Manual for your K2 product for recovery image and network configuration procedures.

Related Topics

Embedded Security modes and policies on page 18

Configure network settings for a stand-alone K2 systems

Stand-alone K2 systems with internal or direct-connect storage ship from the factory DHCP configured. If your control network has DHCP/DNS and you are satisfied to use the factory default host name (which is the serial number), then no local configuration of the control connection is required.

If the Windows network settings need to be configured, you must have Windows administrator security privileges on the K2 system.

1. Access the Windows desktop on the K2 system. You can do this locally with a connected keyboard, mouse, and monitor or remotely via the Windows Remote Desktop Connection.
2. Open the **Network and Internet - Network and Sharing - Network Connections Control Panel**.
3. Continue with standard Windows procedures to configure the TCP/IP protocol properties. You can set up the network using DHCP, DNS, WINS, or other standard networking mechanisms.

   ***NOTE: On small networks or networks with certain security policies a DHCP server or domain name server (DNS) might not be available. In this case you can set up a static IP address and create a host file on each* K2 system.**

4. Configure the control connection on the K2 system as follows:
   a) Configure the network connection with the following name:

      The control ports are 1 GigE ports 1 (Control Connection #1) and 2 (Control Connection #2) on the rear panel of K2 Summit 3G+.

      ⚠ ***CAUTION: Under no circumstances should you modify the loopback adapter. The loopback IP address is 192.168.200.200. Keep that IP address reserved on your network. Don't assign it to any other device. If this causes conflicts with your existing network, consult your Grass Valley representative.***

5. Configure the FTP/streaming connection (if needed) on the K2 system.

   This connection must have an IP address that is on a different subnet from the control connection. There are special name resolution requirements for the FTP/streaming network.

   Configure as follows:

   a) Configure the network connection with the following name:

      Media Connection #1

      This is GigE port 2 on the rear panel.

6. If prompted, shutdown and restart Windows.
7. If you are going to FTP/stream video between K2 systems, configure for streaming video between K2 systems; otherwise, the K2 system is ready for standard data networking tasks.

Related Topics

Embedded Security modes and policies on page 18

Streaming video between K2 systems

It is required that FTP/streaming traffic be on a separate subnet from control traffic. To reserve bandwidth and keep FTP/streaming traffic routed to dedicated ports, IP addresses for FTP/streaming ports must have double name resolution such that hostnames are appended with the "_he0" suffix. You can use host tables or another mechanism, such as DNS, to provide the name resolution. This directs the streaming traffic to the correct port.

In most K2 systems, network name resolution is provided by host tables, which are found in hosts files. The following procedure describes how to set up hosts tables to provide name resolution for both the control network and the FTP/streaming network. If you are using other mechanisms for name resolution, use the host table examples here to guide you.

Setting up the K2 system for FTP/streaming transfer has the following network requirements:

- For stand-alone internal storage K2 systems, the K2 machine is the source/destination for FTP/streaming transfers. FTP/streaming traffic uses the FTP GigE port (Media Connection #1) on the K2 client.
- Some kind of name resolution process must be followed. You have the following options:
  - Set up hosts files located on each networked device so that you reference host names through the hosts files.
  - Edit the DNS entries. See your network administrator.
- The host name of all peer K2 systems and Profile XP systems must be added to a Remote host registry using the K2 AppCenter Configuration Manager.
- To import to or export from a K2 system, both the source and destination must be in the same domain.

Set up hosts files

Set up a hosts file located in `C:\WINDOWS\system32\drivers\etc\hosts` on each K2 system. If you include the names and addresses of all the systems on the network, then you can copy this information to all the machines instead of entering it in the hosts file on each machine.

To provide the required name resolution for the FTP/streaming network, in the hosts file each system that is a transfer source/destination has its host name listed twice: once for the control network and once for the FTP/streaming network. The host name for the streaming network has the extension "_he0" after the name. The K2 systems use this information to keep the FTP/streaming traffic separate from the control traffic.

So in the hosts file, you must add the "he_0" extension to a K2 Media Server hostname and associate that hostname with the K2 Media Server's FTP/streaming network IP address.

1. Open Notepad or some other text editor. When you open the text editor you must right-click and select **Run as administrator**.
2. In the text editor, open the following file:

   `C:\WINDOWS\system32\drivers\etc\hosts`

3. Enter text in two lines for each K2 system that is a transfer source/destination.
   a) Type the IP address for the control network, then use the TAB key or Space bar to insert a few spaces.
   b) Type the machine name, such as `K2-Client`. This sets up the host file for resolving the machine name on the control network. The machine name must not have any spaces in it.
   c) On the next line, type the IP address for the FTP/streaming network, then use the TAB key or Space bar to insert a few spaces.
   d) Type the machine name followed by the characters "_he0". Be sure to use the zero character, not the letter 'o'. Refer to the following example:

```
00.16.42.10   K2-Client
00.0.0.10     K2-Client_he0
```

4. For systems that are not a transfer source/destination, the second line (for the FTP/streaming network) is not required.
5. If there are UIM systems on the FTP/streaming network, make sure you follow the UIM naming conventions. Refer to the *UIM Instruction Manual*.
6. Once you have added the host names for the all the systems on the networks for which the host file provides name resolution, save the file and exit the text editor.
7. Copy the hosts file onto all the other machines to save you editing it again.
8. Add host names to AppCenter to enable streaming.

Related Topics

Embedded Security modes and policies on page 18
Add host names to AppCenter to enable streaming on page 256

Sample K2 client configuration and hosts file

The following example shows the contents of a default Windows hosts file with new lines added that match the IP addresses and host names in the previous sample diagram.

All lines beginning with a # are comments and can be ignored or deleted.

```
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# For example:
# 102.54.94.97     rhino.acme.com # source server
# 38.25.63.10      x.acme.com   # x client host

127.0.0.1          localhost

10.16.42.10        K2-Client
10.0.0.10          K2-Client_he0

10.16.42.101       K2-Client-1
10.16.42.102       K2-Client-2

10.16.42.22        K2-MediaServer-1
10.0.0.22          K2-MediaServer-1_he0

10.16.42.23        ControlPointPC
```

```
10.16.42.60         NewsEdit1
10.0.0.60           NewsEdit1_he0

10.16.42.31         SAN_XP1
10.0.0.32           SAN_XP1_he0 SAN_UIM1_he0
10.16.42.32         SAN_UIM1
```

Add host names to AppCenter to enable streaming

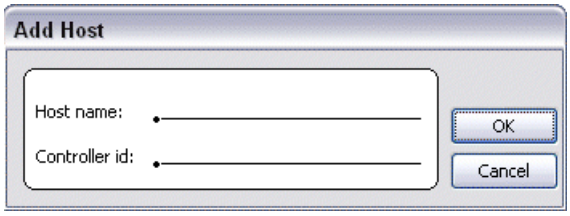
In K2 AppCenter, you must add the host names of all peer K2 systems on the network that support streaming transfers. Adding host names is required to allow selection of networked K2 systems in the AppCenter user interface and to provide a successful network connection for streaming. The host names added appear in the “Import” and “Send to” dialog boxes.

NOTE: By default, the K2 system host name is the same as the Windows operating system computer name.

1. Open AppCenter for the K2 client.
2. In the AppCenter toolbar, select **System**, then choose **Configuration**.
3. Select the **Remote** tab.

   The Remote Settings dialog box displays, showing any network host names that have been added.
4. Select **Add**, to open the Add Host dialog box, then do the following:
   a) Select the Host name field, then enter the computer name of a peer K2 system.

      Make sure to enter the exact computer name. Any differences will result in being unable to connect to the K2 system.



   b) If you are using VDCP remote protocol to perform video network transfers, use the following steps to add a unique Controller ID for each host. Otherwise, you can ignore this step and proceed to the next step.
      - Select controller id field.
      - Enter the controller ID of the K2 system, then select **OK**. Use a number between 1 and 255 that is not assigned to any other K2 system.
   c) Select **OK** in the Add Host dialog box.
5. Repeat the previous step for the remaining K2 systems.
6. In the Configuration dialog box, select **OK** to save settings.

Once the host names are added, the K2 system is ready for streaming operation. For information on transfer compatibility and supported formats, refer to K2 system specifications. For procedures on transferring media, refer to the *K2 AppCenter User Manual*.

NOTE: If you have trouble, try using the ping utility in the Windows command prompt using either the IP address or host name. Troubleshoot as needed. Also, refer to the Service Manual for your K2 system for troubleshooting procedures.

Related Topics

K2 Summit Transmission models specifications

Configuring Server 2008 for domain

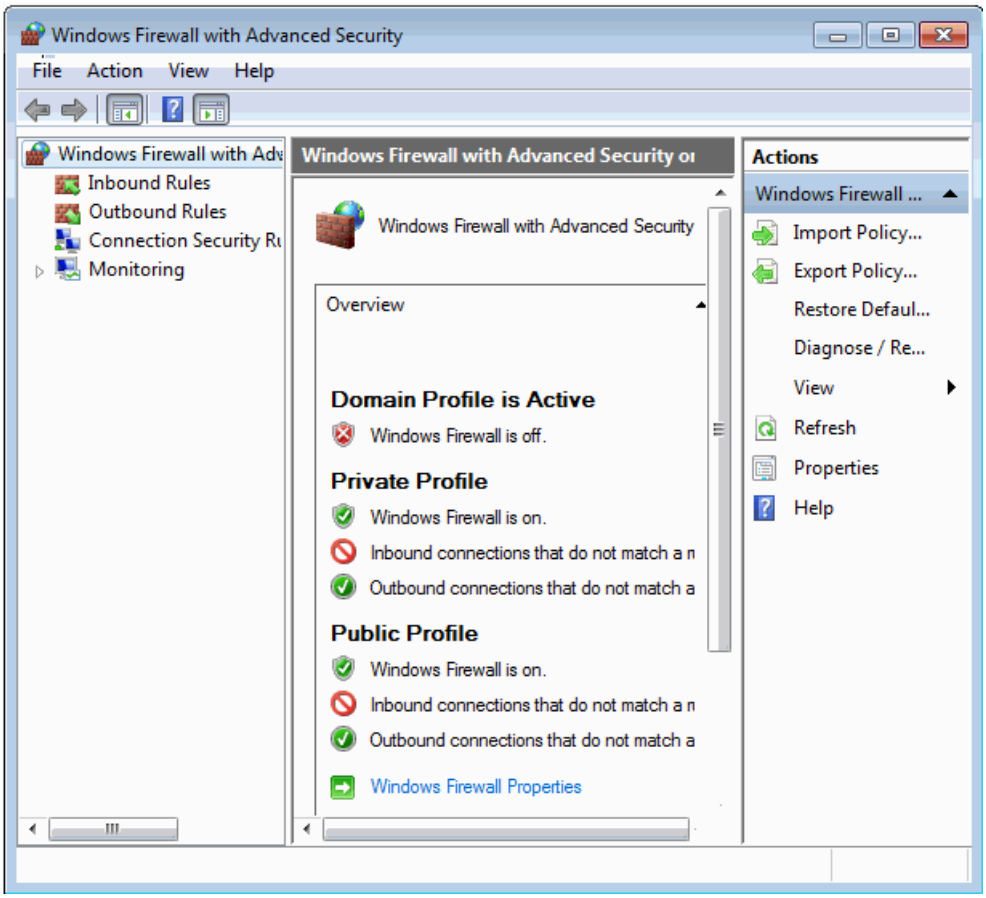
This topic applies to Grass Valley servers with a base disk image created prior to mid-2011. Server disk images created after that time do not require this special configuration.

Systems with the Microsoft Windows Server 2008 R2 operating system require special configuration. A server must have its firewall disabled for proper K2 system operation. This includes the Windows firewall that has different profiles for workgroup, domain, etc. You must do the following steps to disable the firewall.

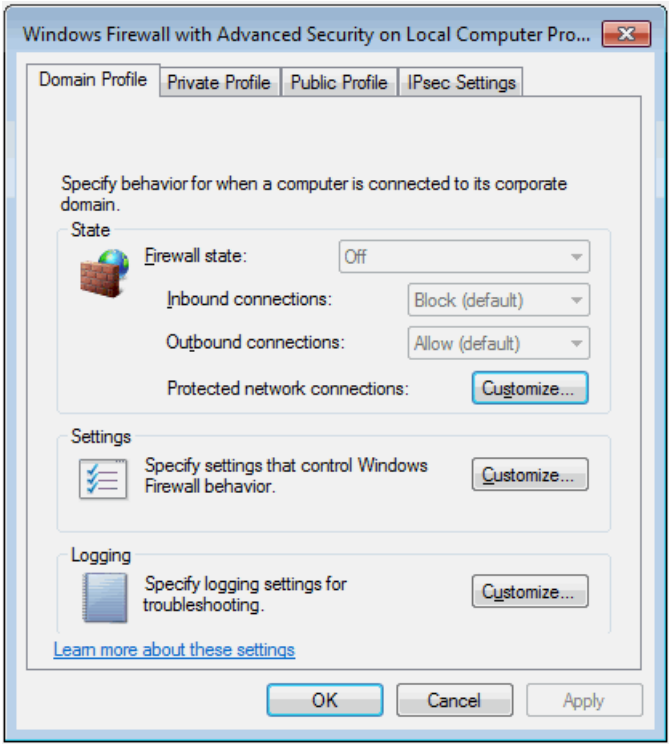
1. Log in to the server with Windows administrator privileges.
2. From the Windows desktop click **Start** and in the **Search programs and files** box type the following and then press **Enter**.

   `wf.msc`

   The Windows Firewall with Advanced Security window opens.



3. At the bottom of the Overview section, click **Windows Firewall Properties**.
   The Properties dialog box opens.



4. On the **Domain Profile** tab, set **Firewall state** to **Off**.
5. On the **Private Profile** tab, set **Firewall state** to **Off**.
6. On the **Public Profile** tab, set **Firewall state** to **Off**.
7. Click **OK** to save settings and close.

Using FTP for file transfer

This section contains topics about the K2 FTP interface.

About the K2 FTP interface

The K2 FTP interface has the following modes:

- Movie mode — FTP operations are performed on assets in the K2 media database. This is the mode on a K2 systems with a media database, such as online/production K2 SANs and stand-alone K2 Summit systems.
- File mode — FTP operations are performed on files. This is the mode on systems without a media database, such as Nearline K2 SANs.

The K2 FTP interface can run in the movie mode and the file mode simultaneously.

On online/production K2 SANs and stand-alone K2 Summit systems, FTP clients can log into the K2 FTP server using credentials for Windows user accounts that are registered on the K2 system. When such accounts are used, the K2 FTP server exposes “virtual” folders at the FTP root. A virtual folder exists for each video file format that is supported by the FTP server. Navigation to one of these virtual folders allows an FTP client to get or put clips in that file format.

In addition, the K2 FTP server supports reserved user login names that directly places the FTP client in a particular mode of operation. The FTP login names and their modes are as follows:

movie FTP gets/puts supported for K2 clips in the GXF file format; the clip's root becomes the FTP root.

mxfmovie FTP gets/puts supported for K2 clips in the MXF file format; the clip's root becomes the FTP root

mpgmovie FTP puts supported for MPEG program and transport streams; the clip's root becomes the FTP root

qtmovie FTP gets/puts supported for K2 clips in the QuickTime file format; the clip's root becomes the FTP root

video_fs Pinnacle FTP emulation mode

k2vfs All FTP operations supported on generic files on the K2 system's media file system; media file system root becomes the FTP root.

You can use Internet Explorer to access the FTP interface to see an example.

If clips are created by record or streaming on a K2 file system such that media files have holes/gaps, i.e. unallocated disk blocks, in them, then that clip represents a corrupt movie that needs to be re-acquired. The K2 system handles corrupt movies of this type on a best-effort basis. There is no guarantee that all available media, especially media around the edges of the holes/gaps, is streamed.

You can also apply K2 security features to FTP access.

When using FTP in a shared storage environment, ensure that all FTP communication takes place on the FTP/streaming network, and not on the Control network.

Related Topics

FTP access with an FTP client on page 263
FTP and media access security on page 344
FTP and media access security on page 261
Importing via Pinnacle emulation K2 FTP on page 295

Limitations with complex media types

Depending on the system software versions of source and destination devices, it is possible that lists or programs containing mixed video formats or compression types, or mixed audio types cannot stream to other devices, nor can they be exported to a file. Refer the "About This Release" section of the K2 Topic Library for the specific software versions for details.

Exporting in GXF preserves sequences and lists in their original form.

For other formats, exporting sequences and lists with uniform video and audio types generates a file that represents a single continuous clip (a clip with no cuts), which is called "flattening". Flattening a list preserves only the video and audio referenced by the list – all control features such as looping, transitions and mix effects are lost.

Flattening export is not supported for sequences and lists containing mixed video and audio types or lists and sequences containing long GOP video tracks.

Transferring between different types of systems

While GXF transfer of media with mixed format (such as an agile playlist) is supported between K2 systems, it might not be supported between a K2 system and a non-K2 system, depending on system software versions. Refer to the release notes for the software version.

You can also use remote control protocols to initiate transfers.

Related Topics

About remote control protocols on page 356

K2 Summit Transmission models specifications

Transfer mechanisms

You can move material between systems using the following mechanisms, each of which offers a different set of features:

- Manual mechanisms — These are the AppCenter transfer features. Refer to the K2 AppCenter User Manual for AppCenter instructions. When transferring between K2 systems you can browse and select files for transfer. When transferring between K2 systems and other types of systems, one or more of the following might be required, depending on software versions. Refer to release notes for the version information:
  - Specify the IP address, path, and file name to initiate a transfer.
  - Add the remote host in Configuration Manager before the transfer.
  - Enter machine names in compliance with UIM naming conventions.
- Automatic mechanisms, including the following:
  - K2 FTP interface — This interface supports transfers via third party FTP applications, such as automation systems. To demonstrate this, you can use Internet Explorer to transfer files between a PC and the FTP interface on a stand-alone K2 Summit Production Client or a K2 Media Server on the same network.
  - Remote control protocols — Industry standard remote control automation applications can initiate transfers. The protocol command must be sent to the K2 client. This applies to both stand-alone and shared storage K2 systems.

Related Topics

Configuring FTP Overwrite setting on page 190

About remote control protocols on page 356

FTP access by automation on page 261

FTP access and configuration

For basic LAN access, the following Grass Valley products can connect as an FTP client to the K2 FTP server with no special configuration required:

- K2 Summit Production Client

For WAN access, contact your Grass Valley representative for assistance.

If the FTP client is not one of these Grass Valley products, contact the product's supplier or your network system administrator for assistance with configuring TCP window scaling. Any computer that connects as an FTP client to the K2 FTP server must have TCP window scaling enabled. Refer to http://support.microsoft.com/kb/q224829/ for more information on this feature. Never set Tcp1323Opts without setting TcpWindowSize. Also, Windows NT 4.0 does not support TCP window scaling, but will still communicate with Grass Valley products in a LAN environment.

FTP access by automation

Using FTP, third parties can initiate transfers between two K2 systems or between a K2 system and another FTP server. Transfers of this type are known as "passive" FTP transfers, or "server to server" transfers.

If you are managing transfers with this scheme from a Windows operating system computer, you should disable the Windows firewall on that computer. Otherwise, FTP transfers can fail because the Windows firewall detects FTP commands and can switch the IP addresses in the commands.

NOTE: You should disable the Windows firewall on non-K2 systems issuing passive FTP transfer commands.

FTP and media access security

The following systems host the K2 FTP interface:

- A stand-alone K2 system.
- A K2 Media Server that takes the role of FTP server

The way in which the K2 FTP interface applies media access security is explained in this section.

The K2 FTP interface uses the credential information for the current FTP session logon and checks it against the access control list for a K2 bin. This is the access control list that you set up through the Organize Bins dialog box in AppCenter. Any media access related operations such as get, put, dir, rename and delete are checked against the FTP session's logon credentials to access the media. For example, if an FTP session is denied access to List Bin Contents for bin A, then the session can not initiate a dir operation on bin A to list the contents of the bin. Furthermore, the session can not transfer clips into bin A using the put operation.

For the purpose of legacy support with older Profile systems, accounts for user movie or user mxfmovie are provided on the K2 system. There is also a video_fs account for Mac/FCP access. These accounts are automatically set up when you install K2 software version 3.2 or higher. Do not restrict access for these accounts. If your security policy requires restricting access to these accounts, contact Grass Valley Support.

FTP overwrite

By default, the K2 FTP server does not allow overwriting a clip with the same name during a transfer. However you can set the FTP Overwrite setting in the Configuration Manager of K2 AppCenter.

If the K2 FTP server is configured for overwrites, it will implicitly delete a clip with the existing name and then proceed to create the new clip with the same name. If the delete operation fails (for reasons such as the clip was being used by a channel), the FTP transfer operation will also fail.

Configuring FTP Overwrite setting

1. In AppCenter, click **File | System | Configuration**.

   Configuration Manager opens.
2. In Configuration Manager, click the **System** tab.
3. In FTP settings, for the **Allow FTP Overwrites** setting, select one of the following:
   - **Yes**: Clips with existing names get overwritten during an FTP put operation.
   - **No**: An FTP put operation specifying an existing clip name causes the FTP put operation to fail. (This is the default behavior)
4. Click **OK** to apply the setting.

   For more information, see topics in the "Configuring the K2 System" section of this Topic Library.

Related Topics

Using FTP for file transfer on page 258

About FTP internationalization

The K2 FTP interface supports clip and bin names in non-English locales (international languages) as follows:

- Non-ASCII localized characters represented as UTF-8 characters.
- All FTP client/server commands are in ASCII.
- The named movie asset is Unicode 16-bit characters
- The K2 FTP client converts between Unicode and UTF-8 strings explicitly.

Also refer to “Internationalization” section in the "Configuring the K2 System" section of this Topic Library.

The Microsoft FTP client (the ftp.exe program which users run from a Windows console or DOS prompt) does not convert from a Unicode string to a UTF-8 string. Instead, it passes the Unicode string directly to the FTP server which can cause errors. To avoid these errors, in the FTP command, every reference to the clip path must be in UTF-8.

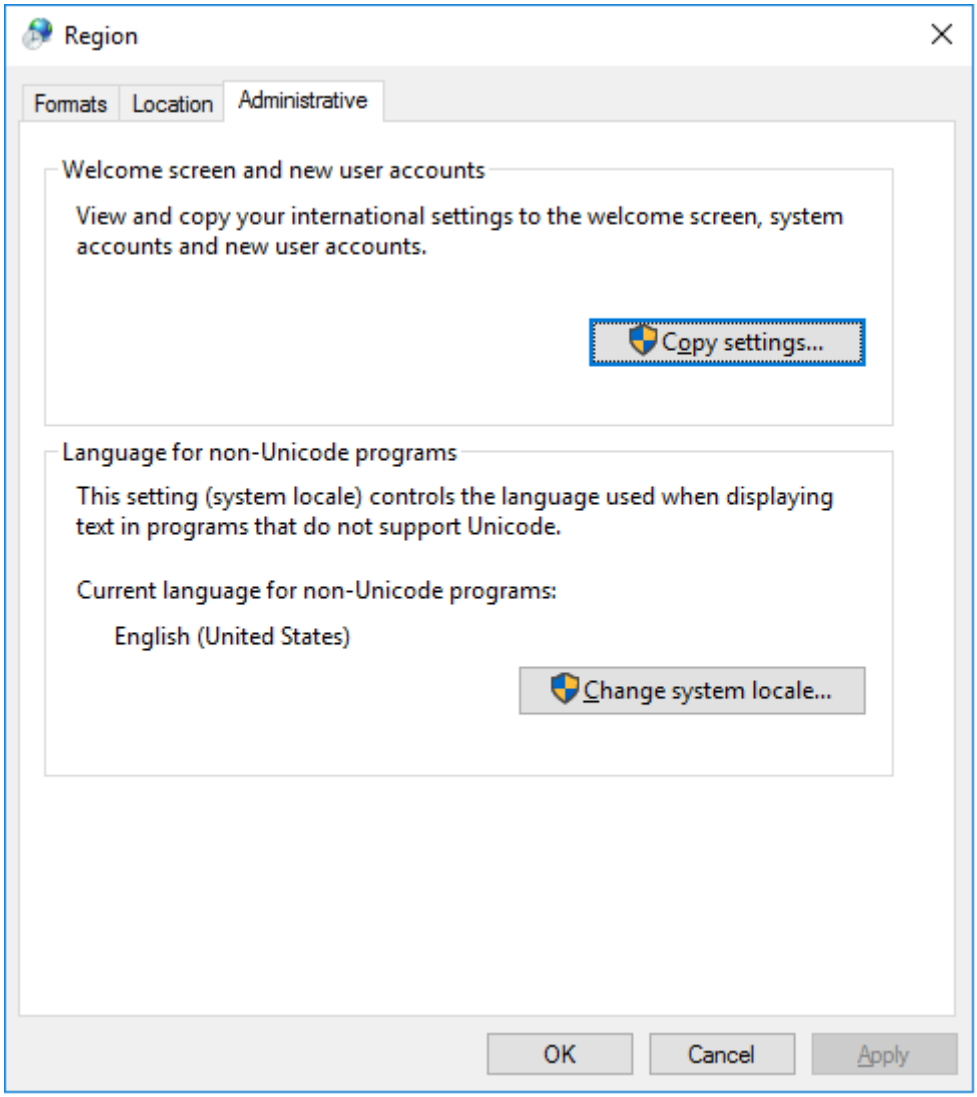
A specific language setting is required on the computer that hosts the K2 FTP interface. This requirement applies to a K2 Media Server, and a stand-alone K2 client, as they all host the K2 FTP interface.

Related Topics

Internationalization on page 383

Setting the FTP language

1. Open the **Region** control panel.



2. On the **Administrative** tab make sure "Current language for non-Unicode programs" is set to **English (United States)**.
3. If you made a change click **Apply** and **OK**, and when prompted restart the computer to put the change into effect.

Related Topics

Embedded Security modes and policies on page 18

FTP access with an FTP client

You can use an FTP client to transfer files via FTP between a PC and the FTP interface on a stand-alone K2 system or a K2 Media Server, so long as both source and destination machines are on the same network.

To access FTP, use the following syntax: `ftp://<username:password@hostname>`. The username/password can be any account set up on the machine hosting the FTP interface. The hostname can be the name of a stand-alone K2 client or it can be the name of a K2 Media Server. (You cannot make a FTP connection to a K2 client with shared storage or to a K2 Control Point PC.)

Once you have logged in, the two virtual directories are displayed.

GXF — General Exchange Format (SMPTE 360M). This is the standard Grass Valley file interchange format. Refer to specifications for media types supported.

MXF — Media Exchange Format (SMPTE 377M). Refer to specifications for media types supported.

Inside the GXF and MXF folders you can see the contents of the system.

The file's name, size, etc, is reported. "Size" refers to the clip duration (in video fields).

You can use an FTP client to transfer a file from your stand-alone K2 system or K2 Media Server to a folder on your PC. You can also transfer a file from your PC to the appropriate folder on your stand-alone K2 system or K2 Media Server.

Be careful not to mix files from the two types of file interchange formats. GXF files can only be transferred to the GXF folder, and MXF files can only be transferred to the MXF folder. If you try to transfer a clip into the incorrect folder, the transfer fails. For example, *`clip1.gxf`* can be transferred into the *`K2-MediaSVR/GXF/default/`* folder, but not into the *`K2-MediaSVR/MXF/default/ folder`*.

Related Topics

FTP and media access security on page 261

FTP commands supported

The following table lists the FTP commands that the K2 FTP interface supports.

FTP command name	FTP command description	K2 FTP support
USER	User Name	Supported
PASS	Password	Supported
ACCT	Account	Not supported
CWD	Change working directory	Supported
CDUP	Change to parent directory	Supported
SMNT	Structure mount	Not supported
REIN	Reinitialize	Not supported
QUIT	Logout	Supported
PORT	Data port	Supported
PASV	Passive	Supported
TYPE	Representation type	Supported
STRU	File structure	Not supported

FTP command name	FTP command description	K2 FTP support
MODE	Transfer mode	Not supported
RETR	Retrieve	Supported
STOR	Store	Supported
STOU	Store unique	Not supported
APPE	Append (with create)	Not supported
ALLO	Allocate	Not supported
REST	Restart	Not supported
RNFR	Rename From	Supported
RNTO	Rename To	Supported
ABOR	Abort	Supported
DELE	Delete	Supported
RMD	Remove directory	Supported
MKD	Make directory	Supported
PWD	Print working directory	Supported
LIST	List	Supported. Reports clip size in number of video fields.
NLST	Name List	Supported
SITE	Site Parameters	Supported
SYST	System	Supported
SIZE	Size of file (clip)	Supported. Reports an approximated clip size in bytes. The size is the estimated size of the clip in the K2 system, not the byte size that K2 exports in the FTP get operation.
STAT	Status	Supported
HELP	Help	Supported
NOOP	No Operation	Supported

Using reference files

When you create a simple K2 clip on a K2 system, K2 software can create a corresponding reference file. The reference file is stored in a directory in the clip's folder on the V: drive. You can configure the software to create QuickTime reference files or no reference files. The following topics provide information about reference files on K2 systems.

About QuickTime reference files

The following formats are supported as QuickTime reference files:

- DV
- AVC-Intra
- XDCAM-EX
- XDCAM-HD
- XDCAM-HD 422
- IMX
- Avid DNxHD
- Apple ProRes

The K2 clip must be a simple clip in order to create the reference file. With the QuickTime reference file you can open the K2 clip with QuickTime tools, such as Final Cut Pro, for playback and editing. For some formats the QuickTime tool does not provide default support, so you must configure the tool as necessary to support the format. The QuickTime tool must be run on another system. Running the QuickTime player or other QuickTime tools on the K2 system is not supported. You have options for connections, access, and software to support your workflow requirements.

Configuring reference file type on a standalone K2 Summit system system

1. In AppCenter, click **File | System | Configuration**.
   Configuration Manager opens.
2. In Configuration Manager, click the **System** tab.
3. In Reference Files settings, for the **Reference file type** setting, select one of the following:
   - None — K2 software does not create reference files.
   - QuickTime — K2 software creates QuickTime reference files.
4. Click **OK** to apply the setting.
5. Restart the standalone K2 Summit system to put the change into effect.

MXF Export Type

When importing and exporting MXF the K2 system behaves as follows, in relation to the MXF Export Type setting in K2Config or in K2 AppCenter:

- The MXF Export Type setting applies to all MXF exports on the K2 system. There is one setting for one K2 system.
- For export, the K2 system must be set to one of the following MXF Export Types:
  - **377M**: SMPTE ST 377:2004 compliant. Ensures compatibility with older products.
  - **377-1**: SMPTE ST 377-1:2009 compliant.
  - **ARD and 377-1**: ARD is only for AVC-Intra Class 100 (720p and 1080i PAL only) and XDCAMHD-422 (1080i PAL only).

- By default the K2 system is set to SMPTE ST 377:2004. This setting is only applicable to the MXF op1a import and export.
- The SMPTE ST 377:2004 setting is recommended for compatibility with older systems which do not support SMPTE ST 377-1:2009.
- The following format does not support SMPTE ST 377-1:2009 export. Therefore the format is always exported as SMPTE ST 377:2004, regardless of the MXF Export Type setting:
  - D10 media
- ARD profile is the MXF profile based only on AVC-Intra Class 100 and XDCAMHD-422 formats for compliance with ARD consortium.
- The following format does not support ARD export. Therefore the format is always exported as SMPTE ST 377-1:2009, when **ARD and 377-1** option is selected:
  - DV media
  - Avid DNxHD media
  - Media in NTSC format
- For import, both SMPTE ST 377:2004 and SMPTE ST 377-1:2009 are supported, regardless of the MXF Export Type setting. The MXF Export Type setting affects export only.

Related Topics

Configuring MXF Export Type on a standalone K2 Summit system system on page 176
Configuring MXF Export Type on a K2 SAN system
MXF export behavior on K2 systems on page 389

Configuring MXF Export Type on a standalone K2 Summit system system

1. In AppCenter, click **File | System | Configuration**.

   Configuration Manager opens.
2. In Configuration Manager, click the **System** tab.
3. In MXF Export settings, for the **MXF Export Type** setting, select one of the following:
   - **377M**: SMPTE ST 377:2004 compliant. Ensures compatibility with older products.
   - **377-1**: SMPTE ST 377-1:2009 compliant.
   - **ARD and 377-1**: ARD is only for AVC-Intra Class 100 (720p and 1080i PAL only) and XDCAMHD-422 (1080i PAL only). For other formats, the clip will be set to 377-1 export type if this option is selected.
4. Click **OK** to apply the setting.
5. Restart the standalone K2 Summit system to put the change into effect.

Related Topics

MXF Export Type on page 266
Configuring MXF Export Type on a K2 SAN system

Quicktime and Final Cut Pro support

You can access K2 media as QuickTime for editing in Final Cut Pro, as explained in the following topics.

Operation guidelines

Take the following into consideration as you use Final Cut Pro on K2 storage.

- Do not use the K2 AppCenter "Erase Unused Media" operation on clips that you are accessing on K2 storage.

Export to K2 storage

When exporting media to K2 storage, Final Cut Pro export options must be constrained so that the resulting media is playable on a K2. The exported media must match the frame rate of movies supported on the K2 system. This is especially important in XDCAM where there are 25, 29.97/30, 50 and 59.94/60 rates.

1. Create the Final Cut Pro clip with a single track of video.
2. Save the Final Cut Pro clip with a `.mov` extension.
3. Use the Final Cut Pro "Using QuickTime Conversion" method to export the Final Cut Pro clip as a stream movie to the K2 HotBin.

   Make sure the frame rate is supported on the K2 system.

   For material originally recorded on a K2 system, supported frame rates are as follows:

   - If you are exporting 1080i material the frame rate must be "Current" or 60 (50 for PAL).
   - If you are exporting 720p material the frame rate must be "Current" or 60.
   - If you are exporting 720p material for 1080i conversions the frame rate must be 60 (50 for PAL).

The HotBin imports the clip into the K2 system as K2 media. As a by-product of the import, the K2 system creates a QuickTime reference file for the new K2 media.

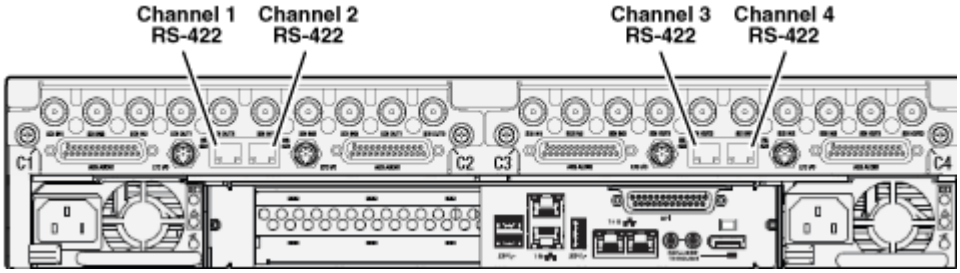
About QuickTime import delay

When you copy a file into a K2 HotBin, the HotBin watches for the file to close and the copy operation to stop, which should indicate the file is complete, before it begins to import the file into K2 storage. However, Final Cut Pro repeatedly opens and closes any QuickTime file as it exports the file, so it is possible that the K2 HotBin can detect a file closed event and begin to import the file before Final Cut Pro is done. If this occurs, the K2 HotBin import for that file fails.

To avoid this problem, when you configure a K2 HotBin you can configure the QuickTime import delay setting. This setting allows you to adjust how long a QuickTime file must be idle (no data being written to the file) before the HotBin begins to import the file into K2 storage. The recommended default value is 15 seconds. If you have problems with failed imports and you suspect that Final Cut Pro is holding on to the file with pauses longer than 15 seconds, you should increase the QuickTime import delay time and re-try the import. The HotBin process constrains the QuickTime import delay range to between 10 and 60 seconds.

Connecting RS-422 K2 Summit system 3G+ system

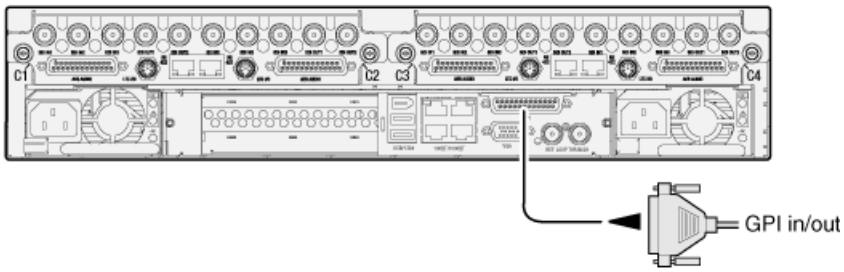
You can control the K2 system with RS-422 connections for protocol control as illustrated:



Refer to topics in the "Using K2 AppCenter" section of the K2 Topic Library to configure the K2 system for remote control.

Connecting GPI

The K2 Summit system provides 12 GPI inputs, and 12 GPI outputs on a single DB-25 rear panel connector, as illustrated:



K2 Summit 3G system shown. Connection is identical on first generation K2 Summit system.

Refer to topics in the "Using K2 AppCenter" section of the K2 Topic Library for GPI configuration procedures.

Related Topics

GPI I/O specifications on page 364

GPI I/O connector pinouts on page 409

Import/export services

Using the HotBin capture service

This section contains topics about the K2 HotBin Import capture service.

About the HotBin capture service

The functionality of the HotBin service is provided by the Grass Valley Import Service. The HotBin service provides a way to automate the import of files as clips into the K2 media file system and

database. This is similar to what happens when you manually import files one at a time using K2 AppCenter import features, except with the HotBin service the files are automatically imported. The HotBin service can import any file or stream type that is supported as a K2 file-based import.

By default, the service does not start automatically. If you have never configured or used the service, it is set to startup type Manual. When you configure the service for the first time, the service is set to startup type Automatic. However, if you upgrade or otherwise re-install your K2 System Software, the service is re-set to startup type Manual.

NOTE: Therefore, you must re-configure the service after K2 System Software upgrade/reinstall in order to set the startup type back to Automatic.

There is no Grass Valley license required specifically for the HotBin service. But, you need the HotBinExportService Sabretooth license for the export operation.

Before you can use the HotBin service, it must be configured through the K2 Capture Services utility. The HotBin service must be configured on the K2 system that receives the imported media.

Once configured, the HotBin service monitors a watched folder (a HotBin). The watched folder is a specified source directory on a source PC. The watched folder can be on a stand-alone K2 system. When files are placed in the watched folder, the HotBin service imports them as a clip into the specified destination bin. The destination bin is on the K2 system that receives the imported media and is within that K2 system's media file system and database.

The HotBin service automatically creates sub-directories in the watched folder (source directory), described as follows:

- Success — After the HotBin service successfully imports the files in the source directory into the destination bin on the K2 system, it then moves those files into the Success directory.
- Fail — If the HotBin service can not successfully import the files in the source directory into the destination bin on the K2 system, it moves the failed files into the Fail directory.
- Archive — If there are files in the source directory when the Hot Bin service first starts up, it does not attempt to import those files into the K2 system. Instead, it moves those files into the Archive directory. This occurs when you first configure the Hot Bin service, if you manually stop/start the Hot Bin service, and when you upgrade K2 system software.

Related Topics

K2 Summit Transmission models specifications

Prerequisites for using the HotBin capture service

Before you can configure and use the HotBin capture service, the following requirements must be satisfied:

- K2 system software must be at version 3.2.56 or higher.

Use topics in this section as appropriate to satisfy prerequisites.

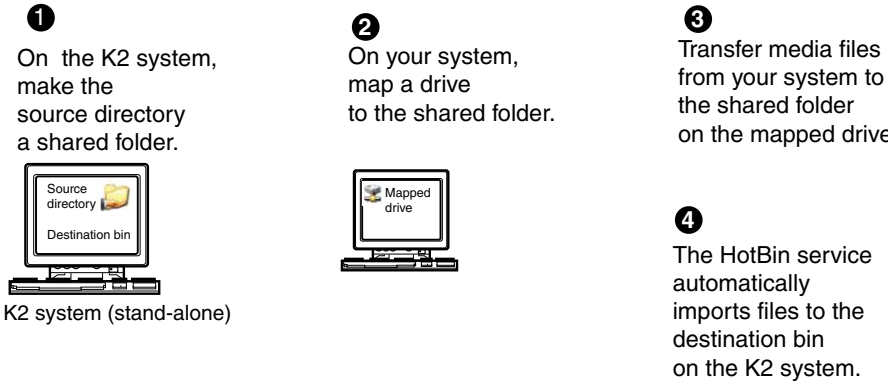
Considerations for using the HotBin capture service

When you are configuring and using the K2 HotBin capture service, bear in mind the following considerations:

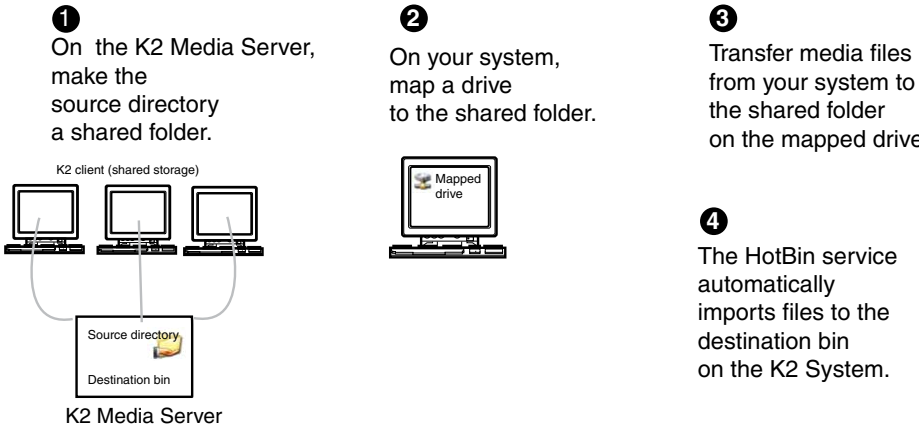
- You must be logged in with administrator privileges on the K2 system as well as having the appropriate security permissions to access the watched folder or bin.
- If you have multiple source folders (for import) or destination folders (for export) on external systems, use the same user account for all capture service access to all systems.
- It is recommended that you keep the source directory and destination bin located on the local V: drive, which is their default location.
- Do not configure any other location with files that must be retained. When the HotBin service first starts up it removes files in the source directory.
- If you require that the source directory and destination bin be on different systems, system clocks must be synchronized. The Cleanup Frequency function depends on accurate system clocks.
- If you specify a destination bin name that does not yet exist, the K2 system creates it when files are transferred to it.
- Imports are serialized. For example, if you drop two clips into the watched folder for import, the capture service does not queue the second clip for import until the first clip is imported. This is different than the ordinary K2 transfer process.
- Capture service imports are serialized with other K2 transfers. For example, if fourteen items are already queued up from ordinary K2 transfers, and you drop content into the watched folder for import, the import triggered by the capture service becomes the fifteenth clip in the transfer queue.
- After the capture service imports media into K2 media storage successfully, the capture service immediately deletes the original media files from the watched folder. If the import fails, the original media files are retained in the watched folder for the number of days specified as the Cleanup Frequency.
- The “Cleanup Frequency” (purge) feature deletes files in the Success sub-directory and in the Fail sub-directory. It does not delete files in the Archive sub-directory.
- Files in the Success, Fail, and Archive sub-directories are “hidden” files in Windows Explorer. To see these files you must select Show Hidden Files in the Windows Explorer Folder Options dialog box.

Grass Valley recommends that you use the HotBin service as demonstrated in the following diagram.

Using the HotBin service with a standalone K2 system



Using the HotBin service with a K2 SAN



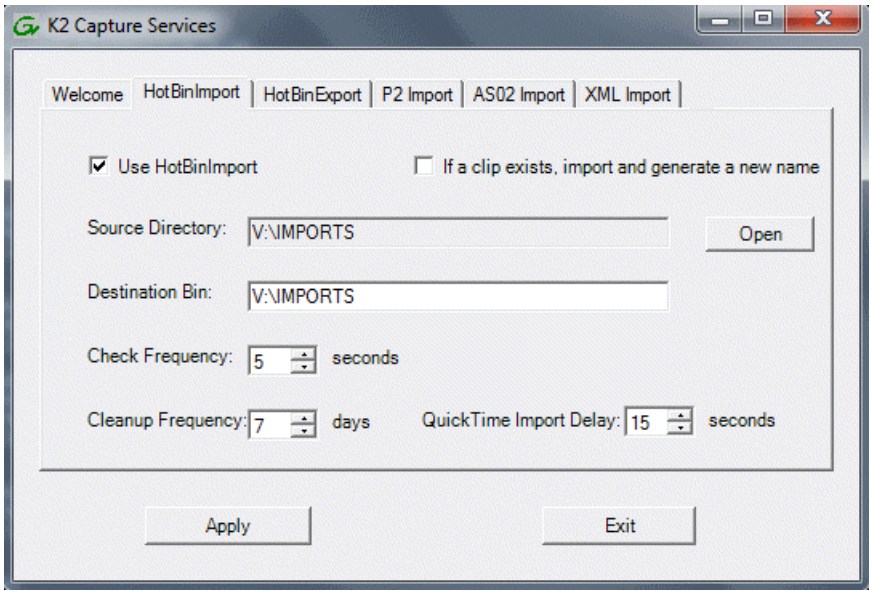
While not preferred, you can also use the HotBin service if the source directory is on another system. The following table lists the requirements for accessing a source directory located on various operating systems.

If your source directory is on:	...and the source directory is on a shared folder on a mapped drive, you need:
Another Windows system	• Administrator privileges for the K2 system • A user account with log-in service rights for your system
Apple OS operating system	• Privileges as listed above. • The identical user name and password on both systems. For example, if you have a Apple OS user named Jane, you would need to have a user named Jane on your Windows system with the same password. From the Windows Control Panel, select **Administrator Tools	Local Security Policy	User Rights Assignment	Log on as service** and click **Add New User**.

Configuring the HotBin Capture Service

NOTE: Once configured, the service deletes files in the watched folder or bin (source) that are older than the specified cleanup frequency.

1. From the **Start** menu, access the **All Programs** menu and select **Grass Valley | K2 Capture Services**. The K2 Capture Services utility dialog box is displayed.
2. Click the **HotBinImport** tab.



3. Select **Use HotBinImport**.

4. To retain the current version of a clip at the destination that is named the same as a clip you are importing, select **If a clip exists, import and generate a new name**.

   The Hotbin service increments the file name of the imported clip so it does not overwrite the clip at the destination.

5. Enter the paths to the source directory and destination bin. If the source directory does not currently exist, it will automatically be created.

   NOTE: Do not configure the source directory to be a location with files that must be retained. When the HotBin service first starts up it removes files in the source directory.

6. For Check Frequency, it is recommended that you accept the default value. This value specifies how often you want the capture service to check the source directory for new files.
7. For the Cleanup Frequency, it is recommended that you accept the default value. This value specifies the maximum age of files in the source directory. The capture service deletes files that are older than this age.
8. If the source directory is not on the local K2 system, a User Account dialog box displays. Enter the user information that you use to access the source directory. If part of a domain, enter the domain name.
9. If necessary, configure QuickTime Import Delay.

   This setting adjusts how long a QuickTime file must be idle (no data being written to the file) before the HotBin begins to import the file into K2 storage. The recommended setting is 15 seconds.

10. When your capture service settings are complete, click **Apply**.

    If prompted, restart the K2 system.

The HotBin service checks the source directory for files. If files are present, the HotBin service moves them to the Archive sub-directory. It does not import the files into the destination bin on the K2 system.

Place files in the source directory to trigger the Hot Bin import processes.

HotBin capture service components

The following table describes the components that support K2 HotBin capture service functionality.

Name	Description
Grass Valley Import Service	This is the service that provides the functionality for a K2 capture service. It is the service that automatically creates the K2 clip from the media files in the watched folder (source directory) and puts the K2 clip in the K2 media storage (destination bin).
K2 Capture Services utility	Configures K2 capture services.
Source directory	This is the watched folder. It is a standard file system directory. When media files are placed in this directory, the capture service automatically creates a K2 clip in the K2 media storage. By default, the location of the source directory is `V:/IMPORTS`.
Check frequency	Determines how often (in seconds) the watched folder is checked for new files.

Name	Description
Cleanup frequency	Determines how long (in days) a file remains in the watched folder. A file with a file-creation date older than the specified number of days is deleted.
Destination bin	The clip bin in the K2 media storage that receives the K2 clip created by the capture service. The destination bin is in the K2 media database and appears in AppCenter as a media bin. By default, its location is `V:/IMPORTS`.

Using the XML Import capture service

This section contains topics about the K2 XML Import capture service.

About the XML Import capture service

The K2 XML Import capture service provides a way to have media automatically imported into a K2 system when it is pushed to the K2 system by a third party application. The XML Import capture service has a watched folder. The watched folder is a standard file system directory that can be recognized by the Windows operating system. You transfer the media to the directory using the third party application.

By default, the service does not start automatically. If you have never configured or used the service, it is set to startup type Manual. When you configure the service for the first time, the service is set to startup type Automatic. However, if you upgrade or otherwise re-install your K2 System Software, the service is re-set to startup type Manual. Therefore, you must re-configure the service after K2 System Software upgrade/reinstall in order to set the startup type back to Automatic.

After all the media files are finished being transferred to the watched folder, the third party application then transfers an XML file to the watched folder. This XML file defines the media files and specifies how they are to be assembled to create a K2 clip. When the XML file finishes transferring to the watched folder, the capture service goes into action and validates the XML file to make sure it has the proper structure. If the XML file is valid, the capture service then does the necessary processing to create the clip in the K2 media storage. The media is then available as a K2 clip, ready for playout.

The K2 XML Import capture service and its watched folder must be on a K2 system that hosts the K2 FTP interface, as follows:

- Stand-alone K2 system — When media files and the XML file are pushed to the watched folder, the capture service creates a K2 clip in the internal storage or direct-connect media storage of the K2 system. The watched folder must be on the K2 system's V: drive.

Prerequisites for using the XML Import capture service

Before you can configure and use the XML Import capture service, the following requirements must be satisfied:

- K2 system software must be at a version that supports the XML Import capture service. Refer to the "About This Release" section of the K2 Topic Library for information on XML Import capture service version compatibility.

- The K2 XML Import capture service must be licensed on the stand-alone K2 system or K2 Media Server. This is a Grass Valley software license.
- The application that pushes the media files and XML file to the watched folder must provide valid files according to K2 XML Import capture service requirements. Developers of applications can contact Grass Valley Developer Support for more information

Use topics in this section as appropriate to satisfy prerequisites.

Considerations for using the XML import capture service

When you are configuring and using the K2 XML Import capture service, bear in mind the following considerations:

- You must be logged in with administrator privileges on the K2 system as well as having the appropriate security permissions to access the watched folder or bin.
- After the capture service imports media into K2 media storage successfully, the capture service immediately deletes the original media files from the watched folder. If the import fails, the original media files are retained in the watched folder for the number of days specified as the Cleanup Frequency.
- The transfer of the media files, then the XML file, must be 100% complete before the K2 XML Import capture service begins to create the clip in K2 media storage.

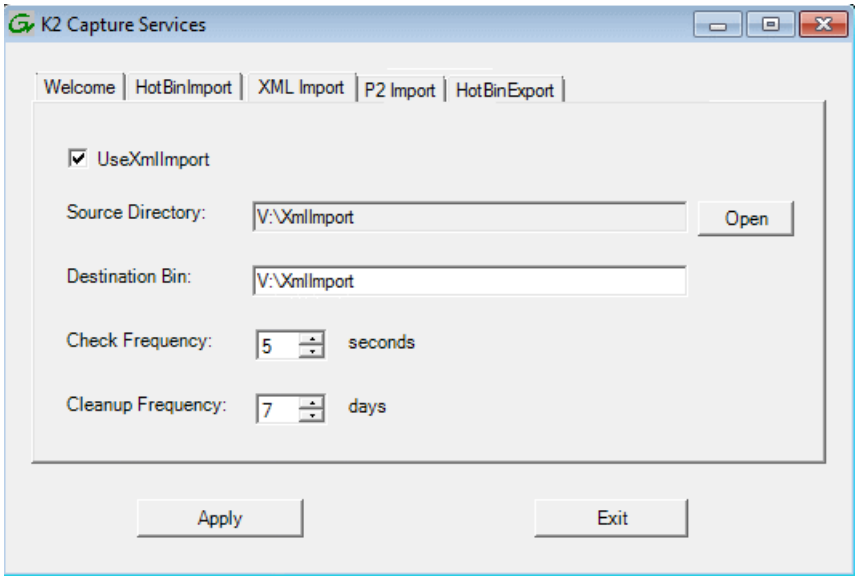
Configuring the XML Import Capture Service

NOTE: Once configured, the service deletes files in the watched folder or bin (source) that are older than the specified cleanup frequency.

1. From the **Start** menu, access the **All Programs** menu and select **Grass Valley | K2 Capture Services**.

   The K2 Capture Services utility dialog box is displayed.

2. Click the **XML Import** tab.



3. Select **UseXMLImport**.

   If you have not yet licensed the XML Import capture service, a "…start the process of getting a license now?" message appears. Follow on-screen instructions to obtain a license. After licensing, restart the K2 Capture Services utility and continue with this procedure.

4. Enter the paths to the source directory and destination bin, which are defined as follows:

   - Source Directory — This is the watched folder. It is a standard file system directory. It must be on the K2 system's V: drive. When valid media is placed in this directory, the capture service automatically creates a K2 clip in the K2 media storage.
   - Destination Bin — The clip bin in the K2 media storage that receives the media processed by the capture service. The destination bin is in the K2 media database and it appears in AppCenter as a media bin. The bin must be on the K2 system's V: drive. If you specify a destination bin name that does not yet exist, the K2 system creates it when the K2 clip is created.

5. For Check Frequency, it is recommended that you accept the default value. This value specifies how often you want the capture service to check the source directory for new files.
6. For the Cleanup Frequency, it is recommended that you accept the default value. This value specifies the maximum age of files in the source directory. The capture service deletes files that are older than this age.
7. When your capture service settings are complete, click **Apply**.

   If prompted, restart the K2 system.

The service checks the source directory for any files that are beyond the specified cleanup age and deletes them from the directory.

Testing the XML Import Capture Service

1. Place media files into the watched folder.
2. On the K2 System, open Windows Edge, browse to the watched folder and verify that files have completed the transfer. The transfer must be 100% complete before the capture service triggers the processes to create the K2 clip.
3. Place a valid XML file into the watched folder.
4. On the K2 System, open Windows Explorer, browse to the watched folder and verify that XML file has completed the transfer. The transfer must be 100% complete before the K2 XML Import capture service triggers the processes to create the K2 clip.
5. After the K2 clip is created, verify that the media appears in the destination bin.
6. Play to verify success.

XML Import capture service components

The following table describes the components that support K2 XML Import capture service functionality.

Name	Description
Grass Valley Import Service	This is the service that provides the functionality for a K2 capture service. It is the service that automatically creates the K2 clip from the media files in the watched folder (source directory) and puts the K2 clip in the K2 media storage (destination bin).
K2 Capture Services utility	Configures K2 capture services.
Source directory	This is the watched folder. It is a standard file system directory. When media files are placed in this directory, the capture service automatically creates a K2 clip in the K2 media storage. By default, the location of the source directory is `V:\XmlImport`.
Check frequency	Determines how often (in seconds) the watched folder is checked for new files.
Cleanup frequency	Determines how long (in days) a file remains in the watched folder. A file with a file-creation date older than the specified number of days is deleted.
Destination bin	The clip bin in the K2 media storage that receives the K2 clip created by the capture service. The destination bin is in the K2 media database and appears in AppCenter as a media bin. By default, its location is `V:\XmlImport`.

Using the P2 capture service

This section contains topics about the K2 P2 Import capture service.

About the P2 capture service

The K2 P2 Import capture service provides a way to have P2 media automatically imported into a K2 system. The K2 P2 Import capture service supports importing DV and AVC-Intra content based on the P2 MXF OP-ATOM files, as well as AVC LongG content based on the P2 MXF OP1B files.

The P2 Import capture service has a watched folder. The watched folder is a standard file system directory that can be recognized by the Windows operating system. You transfer the media to the directory and it is imported into the K2 system.

By default, the service does not start automatically. If you have never configured or used the service, it is set to startup type Manual. When you configure the service for the first time, the service is set to startup type Automatic. However, if you upgrade or otherwise re-install your K2 System Software, the service is re-set to startup type Manual.

NOTE: Therefore, you must re-configure the service after K2 System Software upgrade/reinstall in order to set the startup type back to Automatic.

The watched folder receives the nested directories that define P2 media for one clip or multiple clips. All the P2 audio files, video media files and P2 XML files must be transferred to the watched folder. All P2 media files (MXF files) need to be copied first into the appropriate folders. After the media files have been copied, the P2 clip XML file must be copied into it's appropriate folder. The presence of the XML file triggers the P2 import capture service to begin importing the content. If

the P2 file is valid, the capture service then does the necessary processing to create the clip in the K2 media storage. The media is then available as a K2 clip, ready for playout.

The K2 P2 Import capture service and its watched folder must be on a K2 system that hosts the K2 FTP interface, as follows:

- Stand-alone K2 system — When media files and the P2 files are pushed to the watched folder, the capture service creates a K2 clip in the internal storage or direct-connect media storage of the K2 system. The watched folder must be on the K2 system's V: drive.

Prerequisites for using the P2 capture service

Before you can configure and use the P2 Import capture service, the following requirements must be satisfied:

- K2 system software must be at a version that supports the P2 Import capture service. Refer to the "About This Release" section of the K2 Topic Library for information on P2 Import capture service version compatibility.
- The K2 P2 Import capture service must be licensed on the stand-alone K2 system, K2 Media Server or K2 Central TX server. This is a Grass Valley software license.
- The Panasonic storage device that is the source of the P2 media must be on a separate PC and all Panasonic drivers must exist on that PC.
- The directories/file transferred to the watched folder must be valid files according to P2 requirements.
- The K2 system also supports playback of P2 AVC-Intra clips. This requires that the AVC-Intra codec card to be installed.

Use topics in this section as appropriate to satisfy prerequisites.

Considerations for using the P2 capture service

When you are configuring and using the K2 P2 Import capture service, bear in mind the following considerations:

- You must be logged in with administrator privileges on the K2 system as well as having the appropriate security permissions to access the watched folder or bin.
- If you have multiple source folders (for import) or destination folders (for export) on external systems, use the same user account for all capture service access to all systems.
- You can share the K2 V: drive, so that the Panasonic storage device can access via CIFS.
- P2 content can be dragged/dropped onto the V: drive watch folder from a Panasonic storage device.
- After the capture service imports media into K2 media storage successfully, the capture service immediately deletes the original media files from the watched folder. If the import fails, the original media files are retained in the watched folder for the number of days specified as the Cleanup Frequency.
- The transfer of the directories/files must be 100% complete before the capture service begins to create the clip in K2 media storage.

- P2 content is imported as follows:
  - A simple clip with striped timecode is created.
  - Video (DV, AVC-Intra, or H.264) track is imported and added to the clip
  - Audio tracks are imported and added to the clip
  - There is no P2 Import of metadata into the clip
  - An ancillary data track is imported only for P2 AVC LongG content.

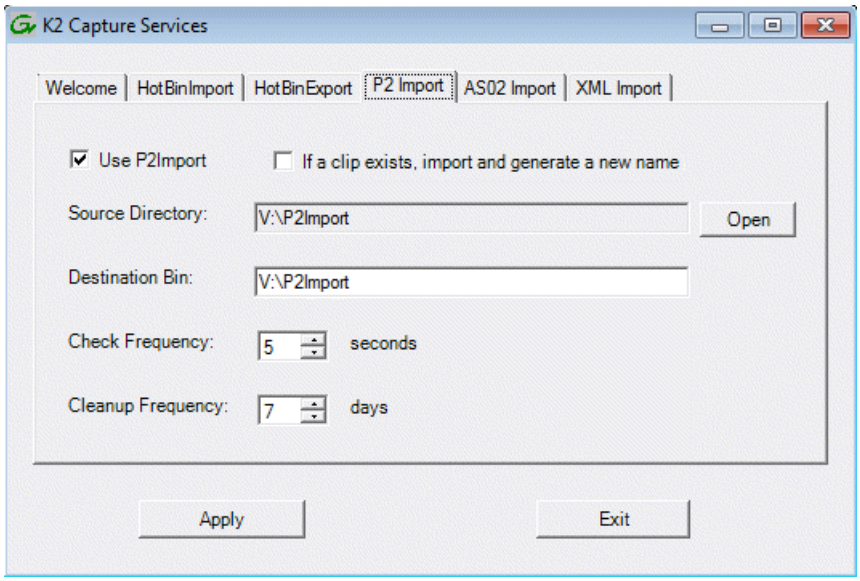
Configuring the P2 Capture Service

NOTE: Once configured, the service deletes files in the watched folder or bin (source) that are older than the specified cleanup frequency.

1. From the **Start** menu, access the **All Programs** menu and select **Grass Valley | K2 Capture Services**.

   The K2 Capture Services utility dialog box is displayed.

2. Click the **P2 Import** tab.



3. Select **Use P2Import**.

   If you have not yet licensed the P2 Import capture service, a "…start the process of getting a license now?" message appears. Follow on-screen instructions to obtain a license. After licensing, restart the K2 Capture Services utility and continue with this procedure.

4. To retain the current version of a clip at the destination that is named the same as a clip you are importing, select **If a clip exists, import and generate a new name**.

   The Hotbin service increments the file name of the imported clip so it does not overwrite the clip at the destination.

5. Enter the paths to the source directory and destination bin, which are defined as follows:
   - Source Directory — This is the watched folder. It is a standard file system directory. It must be on the K2 system's V: drive. When valid media is placed in this directory, the capture service automatically creates a K2 clip in the K2 media storage.
   - Destination Bin — The clip bin in the K2 media storage that receives the media processed by the capture service. The destination bin is in the K2 media database and it appears in AppCenter as a media bin. The bin must be on the K2 system's V: drive. If you specify a destination bin name that does not yet exist, the K2 system creates it when the K2 clip is created.
6. For Check Frequency, it is recommended that you accept the default value. This value specifies how often you want the capture service to check the source directory for new files.
7. For the Cleanup Frequency, it is recommended that you accept the default value. This value specifies the maximum age of files in the source directory. The capture service deletes files that are older than this age.
8. When your capture service settings are complete, click **Apply**.

   If prompted, restart the K2 system.

The service checks the source directory for any files that are beyond the specified cleanup age and deletes them from the directory.

Testing the P2 Capture Service

1. Place P2 directories/files into the watched folder.
2. On the K2 System, open Windows Edge, browse to the watched folder and verify that files have completed the transfer. The transfer must be 100% complete before the capture service triggers the processes to create the K2 clip.
3. After the K2 clip is created, verify that the media appears in the destination bin.
4. Play to verify success.

P2 capture service components

The following table describes the components that support K2 P2 Import capture service functionality.

Name	Description
Grass Valley Import Service	This is the service that provides the functionality for a K2 capture service. It is the service that automatically creates the K2 clip from the media files in the watched folder (source directory) and puts the K2 clip in the K2 media storage (destination bin).
K2 Capture Services utility	Configures K2 capture services.
Source directory	This is the watched folder. It is a standard file system directory. When media files are placed in this directory, the capture service automatically creates a K2 clip in the K2 media storage. By default, the location of the source directory is `V:\P2Import`.
Check frequency	Determines how often (in seconds) the watched folder is checked for new files.

Name	Description
Cleanup frequency	Determines how long (in days) a file remains in the watched folder. A file with a file-creation date older than the specified number of days is deleted.
Destination bin	The clip bin in the K2 media storage that receives the K2 clip created by the capture service. The destination bin is in the K2 media database and appears in AppCenter as a media bin. By default, its location is `V:\P2Import`.

Using the AS02 capture service

This section contains topics about the K2 AS02 Import capture service.

About the AS-02 capture service

The K2 AS-02 Import capture service provides a way to have AS-02 media automatically imported into a K2 system. The AS-02 Import capture service has a watched folder. The watched folder is a standard file system directory that can be recognized by the Windows operating system. You transfer the media to the directory and it is imported into the K2 system.

By default, the service does not start automatically. If you have never configured or used the service, it is set to startup type Manual. When you configure the service for the first time, the service is set to startup type Automatic. However, if you upgrade or otherwise re-install your K2 System Software, the service is re-set to startup type Manual. Therefore, you must re-configure the service after K2 System Software upgrade/reinstall in order to set the startup type back to Automatic.

The watched folder receives the nested directories that define AS-02 media. After all the directories/files are finished being transferred to the watched folder, the capture service goes into action and validates the AS-02 media to make sure it has the proper structure. If the AS-02 file is valid, the capture service then does the necessary processing to create the clip in the K2 media storage. The media is then available as a K2 clip, ready for playout.

The K2 AS-02 Import capture service and its watched folder must be on a K2 system that hosts the K2 FTP interface, as follows:

- Stand-alone K2 system — When media files and the AS-02 files are pushed to the watched folder, the capture service creates a K2 clip in the internal storage or direct-connect media storage of the K2 system. The watched folder must be on the K2 system's V: drive.

Related Topics

AMWA AS-02 interchange on page 391

Prerequisites for using the AS-02 capture service

Before you can configure and use the AS-02 Import capture service, the following requirements must be satisfied:

- K2 system software must be at a version that supports the AS-02 Import capture service. Refer to the "About This Release" section of the K2 Topic Library for information on AS-02 Import capture service version compatibility.
- K2 Extended File Services must be licensed on the stand-alone K2 system or K2 Media Server. This is a Grass Valley software license.
- The directories/file transferred to the watched folder must be valid files according to AS-02 requirements.

Use topics in this section as appropriate to satisfy prerequisites.

Related Topics

AMWA AS-02 interchange on page 391

Considerations for using the AS-02 capture service

When you are configuring and using the K2 AS-02 Import capture service, bear in mind the following considerations:

- You must be logged in with administrator privileges on the K2 system as well as having the appropriate security permissions to access the watched folder or bin.
- If you have multiple source folders (for import) or destination folders (for export) on external systems, use the same user account for all capture service access to all systems.
- After the capture service imports media into K2 media storage successfully, the capture service immediately deletes the original media files from the watched folder. If the import fails, the original media files are retained in the watched folder for the number of days specified as the Cleanup Frequency.
- The transfer of the directories/files must be 100% complete before the capture service begins to create the clip in K2 media storage.

Related Topics

AMWA AS-02 interchange on page 391

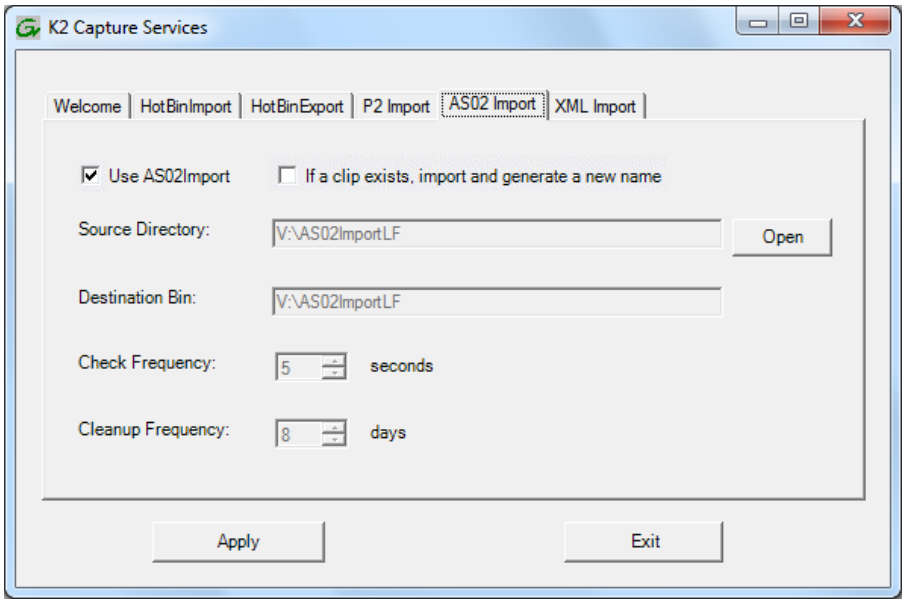
Configuring the AS-02 Capture Service

NOTE: Once configured, the service deletes files in the watched folder or bin (source) that are older than the specified cleanup frequency.

1. From the **Start** menu, access the **All Programs** menu and select **Grass Valley | K2 Capture Services**.

   The K2 Capture Services utility dialog box is displayed.

2. Click the **AS02 Import** tab.



3. Select **Use AS02Import**.

   If you have not yet licensed the AS-02 Import capture service, a "…start the process of getting a license now?" message appears. Follow on-screen instructions to obtain a license. After licensing, restart the K2 Capture Services utility and continue with this procedure.

4. To retain the current version of a clip at the destination that is named the same as a clip you are importing, select **If a clip exists, import and generate a new name**.

   The Hotbin service increments the file name of the imported clip so it does not overwrite the clip at the destination.

5. Enter the paths to the source directory and destination bin, which are defined as follows:

   - Source Directory — This is the watched folder. It is a standard file system directory. It must be on the K2 system's V: drive. When valid media is placed in this directory, the capture service automatically creates a K2 clip in the K2 media storage.
   - Destination Bin — The clip bin in the K2 media storage that receives the media processed by the capture service. The destination bin is in the K2 media database and it appears in AppCenter as a media bin. The bin must be on the K2 system's V: drive. If you specify a destination bin name that does not yet exist, the K2 system creates it when the K2 clip is created.

6. For Check Frequency, it is recommended that you accept the default value. This value specifies how often you want the capture service to check the source directory for new files.
7. For the Cleanup Frequency, it is recommended that you accept the default value. This value specifies the maximum age of files in the source directory. The capture service deletes files that are older than this age.
8. When your capture service settings are complete, click **Apply**.

   If prompted, restart the K2 system.

The service checks the source directory for any files that are beyond the specified cleanup age and deletes them from the directory.

Related Topics

AMWA AS-02 interchange on page 391

Testing the AS-02 Capture Service

1. Place AS-02 directories/files into the watched folder.
2. On the K2 System, open Windows Edge, browse to the watched folder and verify that files have completed the transfer. The transfer must be 100% complete before the capture service triggers the processes to create the K2 clip.
3. After the K2 clip is created, verify that the media appears in the destination bin.
4. Play to verify success.

Related Topics

AMWA AS-02 interchange on page 391

Importing AS-02 clips

In this procedure the following are used as examples:

On the customer repository there are directories and files that make up an AS-02 clip named "Clip_A", with a structure as follows:

- `bin` (this is a directory that contains the directories and files that make up the AS-02 clip named "Clip_A".)
  - `Clip_A.mxf` (this is the AS-02 MXF version file for the AS-02 clip named "Clip_A".)
  - `media` (this is a directory that contains the essence files for the AS-02 clip named "Clip_A".)
    - `Clip_A_v0.mxf`
    - `Clip_A_a0.mxf`
    - `Clip_A_a1.mxf`
    - `Clip_A_vanc0.mxf`

On the K2 system the AS-02 watch folder is on the `V:` drive as follows:

- `V:`
  - `AS-02Import`

1. On the K2 system, in the AS-02 watch folder create a clip name directory. Name the directory with the name of the AS-02 clip you are importing.

   For example, you now have the following directory structure on the K2 system:

   - `V:`
     - `AS-02Import`
       - `Clip_A` (this is the clip name directory)

2. On the K2 system, in the clip name directory, create a directory and name it with the name of the essence files directory from the customer repository.

   For example, you now have the following directory structure on the K2 system:

   - `V:`
     - `AS-02Import`
       - `Clip_A`
         - `media` (this is the essence files directory)

3. Copy all the files from the customer repository essence files directory to the K2 system essence files directory.

   For example, you now have the following directories and files on the K2 system:

   - `V:`
     - `AS-02Import`
       - `Clip_A`
         - `media`
           - `Clip_A_v0.mxf`
           - `Clip_A_a0.mxf`
           - `Clip_A_a1.mxf`
           - `Clip_A_vanc0.mxf`

   NOTE: All copied essence files must have the same name as essence files in the original AS-02 clip.

4. After all essence files are copied, copy the AS-02 MXF version file from the customer repository into the K2 system AS-02 clip name directory.

   For example, you now have the following directories and files on the K2 system:

   - `V:`
     - `AS-02Import`
       - `Clip_A`
         - `Clip_A.mxf` (this is the AS-02 MXF version file)
         - `media`
           - `Clip_A_v0.mxf`
           - `Clip_A_a0.mxf`
           - `Clip_A_a1.mxf`
           - `Clip_A_vanc0.mxf`

   The transfer starts when the K2 AS02 capture service detects the AS-02 MXF version file.

   After the transfer is complete, the K2 AS02 capture service deletes the directories you created and the files you copied.

5. Repeat above steps for all AS-02 clips that you want to import into the K2 system.

AS-02 capture service components

The following table describes the components that support K2 AS-02 Import capture service functionality.

Name	Description
Grass Valley Import Service	This is the service that provides the functionality for a K2 capture service. It is the service that automatically creates the K2 clip from the media files in the watched folder (source directory) and puts the K2 clip in the K2 media storage (destination bin).
K2 Capture Services utility	Configures K2 capture services.
Source directory	This is the watched folder. It is a standard file system directory. When media files are placed in this directory, the capture service automatically creates a K2 clip in the K2 media storage.
Determines how often (in seconds) the watched folder is checked for new files.	
Cleanup frequency	Determines how long (in days) a file remains in the watched folder. A file with a file-creation date older than the specified number of days is deleted.

Name	Description
Destination bin	The clip bin in the K2 media storage that receives the K2 clip created by the capture service. The destination bin is in the K2 media database and appears in AppCenter as a media bin.

Related Topics

AMWA AS-02 interchange on page 391

Using the Export service

This section contains topics about the K2 Export capture service.

About the Export capture service

The Export capture service provides a way to have media automatically exported from a K2 system. The capture service has a watched bin. The watched bin is a K2 storage system bin. You place the media in the bin and it is exported from the K2 system.

By default, the service does not start automatically. If you have never configured or used the service, it is set to startup type Manual. When you configure the service for the first time, the service is set to startup type Automatic. However, if you upgrade or otherwise re-install your K2 System Software, the service is re-set to startup type Manual. Therefore, you must re-configure the service after K2 System Software upgrade/reinstall in order to set the startup type back to Automatic.

You configure the watched bin to export the K2 media as your desired clip format. After you place the K2 clip in the watched bin, the capture service goes into action and validates the media to make sure it has the proper structure for the desired file format. If it is valid, the capture service then does the necessary processing to export the clip to the destination folder.

The Export capture service and its watched bin must be on a K2 system that hosts the K2 FTP interface, as follows:

- Stand-alone K2 system — When you place a K2 clip in the watched bin, the capture service exports the clip from the internal storage or direct-connect media storage of the K2 system. The watched bin must be on the K2 system's V: drive.

Prerequisites for using the Export capture service

Before you can configure and use the Export capture service, the following requirements must be satisfied:

- The K2 system must support the clip format you plan to export. This could require specific hardware and/or licenses.
- K2 system software must be at a version that supports the Export capture service. Refer to the "About This Release" section of the K2 Topic Library for information on Export capture service version compatibility.
- The capture service must be licensed on the stand-alone K2 system, K2 Media Server or K2 Central TX server. This is a Grass Valley software license.

Use topics in this section as appropriate to satisfy prerequisites.

Considerations and requirements for using the Export service

When you are configuring and using the Export service, do the following:

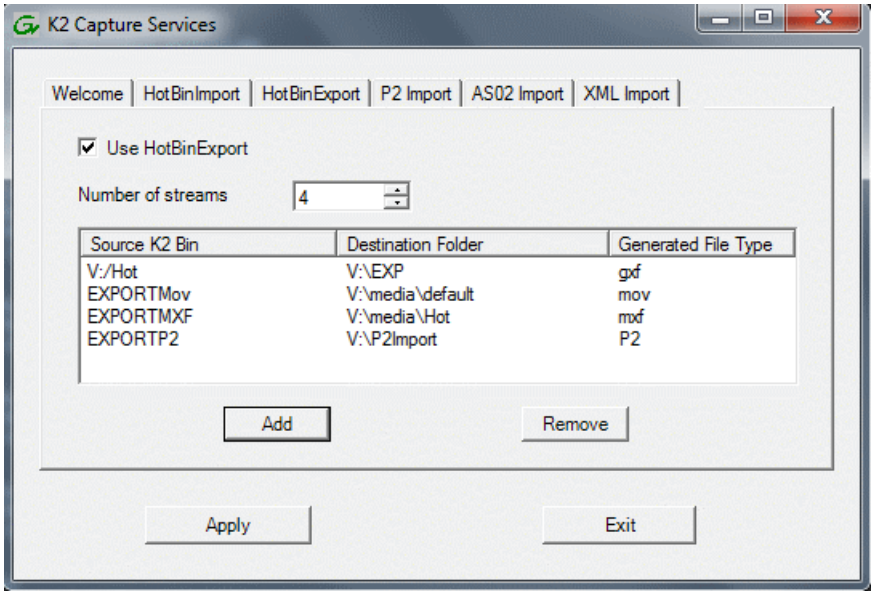
- You must be logged in with administrator privileges on the K2 system as well as having the appropriate security permissions to access the watched folder or bin.
- If the destination folder (for export) is on a remote machine, you must configure the "movie" user account as a local user account on that machine. The "movie" user account is not supported as a domain administrator account. Configure the account as follows:
  - Username: `movie`
  - Password: `M0vieK2M0vie`

  The password uses the number zero character, not the letter O character.
- If the destination folder (for export) is on a remote machine, the local K2 Summit system must be able to access the remote system. If on a domain, you can use any account with Read/Write privileges. The FTP server which is hosting the HotBin Export is required to be on the same domain. The Grass Vally Import Service does not start until the FTP server is on the same Domain.
- If you have multiple source folders (for import) or destination folders (for export) on external systems, use the same user account for all capture service access to all systems.

Configuring the Export Capture Service

1. From the **Start** menu, access the **All Programs** menu and select **Grass Valley | K2 Capture Services**.

   The K2 Capture Services utility dialog box is displayed.
2. Click the **HotBinExport** tab.



3. Select **Use HotBinExport**.

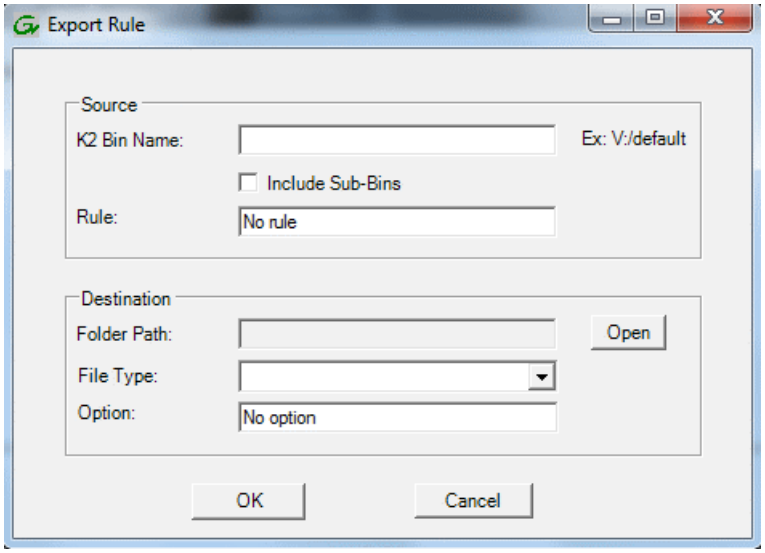
   If you have not yet licensed the HotBin Export capture service, a "…start the process of getting a license now?" message appears. Follow on-screen instructions to obtain a license. After licensing, restart the K2 Capture Services utility and continue with this procedure.

4. Select the number of streams.

   Exports run serially. If you select one stream, only one export can occur at a time. If you select multiple streams, multiple exports can occur at one time.

5. Click **Add**.

   The Export Rule dialog box opens.



6. Configure as follows:

   - Source K2 Bin Name — Required. This is the watched bin. The bin must be on the K2 system's V: drive. It must be in the K2 media database and appears in AppCenter as a media bin. When valid clips are placed in this bin, the HotBin Export capture service automatically exports the clips.
   - Include Sub-Bins — Optional. When selected, clips are exported if they are in a bin nested inside the Source K2 Bin.
   - Rule — Do not configure this field. Leave the default value as it is.
   - Destination Folder Path — Required. This is a standard file system directory. It receives the files/directories exported by the Export capture service. If you specify a destination folder that does not yet exist, the K2 system creates it when exporting. If the destination folder is not on the local K2 system, you are prompted to enter user account credentials to access the source directory. You must enter user account credentials that have administrator level privileges on the remote system. If part of a domain, the user account must be a domain administrator account. When you enter a domain account, you must enter the domain name.

     NOTE: You must use the same user account for all capture service access to all systems.

   - File Type — Required. Select the file format in which K2 clips are exported.
   - Option — Do not configure this field. Leave the default value as it is.

7. Click **OK** to save settings and close the Export Rule dialog box.
8. Repeat previous steps to add additional Export HotBins.

Testing the Export Capture Service

1. Place the clips to export into the watched bin.
2. Verify that the media appears in the destination.
3. Play to verify success.

Export capture service components

The following table describes the components that support Export capture service functionality.

Name	Description
Grass Valley Import Service	This is the service that provides the functionality for the capture service. It is the service that automatically exports K2 clips from the K2 media storage.
K2 Capture Services utility	Configures K2 capture services.
Source K2 bin	This is the watched bin. It is a bin in K2 media storage. When files are placed in this directory, the capture service automatically exports them from K2 media storage.
Destination folder	The folder that receives the files exported from the K2 media storage.

Licensing K2 capture service software

Licensing is required for K2 capture service software as follows:

- To use the XML Import capture service, you must obtain a XML Import capture service license from Grass Valley.
- To use the P2 Import capture service, you must obtain a P2 Import capture service license from Grass Valley.
- To use the Export capture service, you must obtain an Export capture service license from Grass Valley.

Licenses are requested through the K2 License Wizard and managed through the SabreTooth License Manager, which are installed with K2 system software.

1. To start the licensing process, open the K2 Capture Services utility and on the tab for your capture service, select the “Use…” checkbox.

   If you do not yet have a license, a “…start the process of getting a license now?” message appears.

2. Click **Yes** and **OK** to open the K2 License Wizard for the type of license. Refer to *K2 Release Notes* for procedures and information on obtaining and managing licenses.

PitchBlue workflow considerations

The K2 Summit system supports the H.264 format used in the PitchBlue workflow. However, you must consider the intended PitchBlue workflow when using this H.264 media, as it is not supported for general purpose use outside of the PitchBlue workflow.

The K2 Summit system ingests the PitchBlue material without any error correction. The material often has anomalies, such as incomplete last frame, that the K2 Summit system accepts as-is. When PitchBlue plays out this material under VDCP automation control, it plays the known-good material only. The automation playout system tracks the portions of the imported PitchBlue content for playout by interacting with the traffic and other related playout automation components. Anomalies can be identified so that they are not played out. In this way, the automation playout system avoids the errors that would otherwise occur if the material were used for general purpose playout without automation control.

Therefore, you must adhere to the complete PitchBlue workflow from ingest through playout for all PitchBlue material. Do not attempt to play out PitchBlue material except as part of the prescribed PitchBlue workflow.

NOTE: Playing out PitchBlue material in any other way can cause errors.

Pinnacle support

The K2 system can automatically convert Pinnacle material into K2 clips as part of a FTP transfer or a HotBin import, as described in the topics in this section.

Pinnacle material that can be converted

A Pinnacle clip is stored as a folder on a Pinnacle MediaStream server. The folder structure for its MPEG program/system stream based content is as follows:

```
<folder> clipname
  <file> header (contains Pinnacle clip metadata)
  <file> ft (Pinnacle version of “Frame Index Table”)
  <file> info (File used to hold automation specific data. Not
  used by Pinnacle.)
  <file> std (The MPEG program or system stream -
  essence/media)
```

You have the following options for the Pinnacle material to convert:

- Convert only the media essence (the std file).
- Convert the metadata along with the media essence.

Pinnacle import mechanisms

You have the following options for import/transfer mechanisms:

- K2 HotBin import — This method converts only the media essence. It does not convert the Pinnacle clip metadata. You drop the Pinnacle clip's std file into a K2 HotBin. Then the K2 HotBin process imports, converts, and creates a K2 clip. The K2 clip is available for playout when the process is complete.
- K2 FTP import — This method converts only the media essence. It does not convert the Pinnacle clip metadata. Your third-party FTP client connects to the K2 FTP server as a normal K2 FTP session and puts the Pinnacle clip's std file.
- Pinnacle emulation K2 FTP import — This method converts the Pinnacle clip metadata along with the media essence. Your third-party automation vendor or FTP client connects to the K2 FTP server with the Pinnacle specific login, creates a new directory, and puts the Pinnacle clip files in the new directory. The K2 FTP server creates a corresponding K2 clip. The K2 clip is available for playout while the content is being transferred. The K2 clip contains timecode, mark in/out points, and other metadata as defined by the Pinnacle clip metadata.

Enabling Pinnacle import

Before you import your Pinnacle material, familiarize yourself with the configuration options in the following procedure.

1. To import Pinnacle material, create the following registry value:

   ```
   HKEY_LOCAL_MACHINE\Software\Wow6432Node\Grass Valley Group\Streaming
   REG_DWORD "ImportPinnacleStreams" = 1
   ```

   Without this registry value, the K2 system does not handle the import correctly.

2. Do one of the following:

   - If you do not want to import captions and timecode from your Pinnacle material, skip the remainder of this procedure. No further configuration is necessary.
   - If you want to import captions and timecode from your Pinnacle material, continue with this procedure. Read each step carefully and proceed only if you are sure that your Pinnacle material is suitable.

3. To optionally import VITC from Pinnacle clips, proceed with this step as appropriate.

   - If you know that VITC was not recorded on your Pinnacle material in the Pinnacle-private uncompressed VBI data, skip to the next step. Do not create a registry value.
   - If you know that your Pinnacle material was recorded with VITC as Pinnacle-private uncompressed VBI lines and you want to preserve this timecode when you import the content into the K2 system, then create the following registry key:

   ```
   KEY_LOCAL_MACHINE\Software\Wow6432Node\Grass Valley Group\Streaming
   REG_DWORD "ExtractPinnacleVitc" = 1
   ```

   This instructs the K2 system to extract and preserve the VITC.

4. To optionally import captions from Pinnacle clips, proceed with this step as appropriate.
   - If you know that captions were not recorded on your Pinnacle material in the Pinnacle-private uncompressed VBI data, skip the remainder of this procedure. Do not create a registry value.
   - If you know that your Pinnacle material was recorded with closed captions or teletext data as Pinnacle-private uncompressed VBI lines and you want to preserve the captions when you import the content into the K2 system, then create the following registry key:

```
HKEY_LOCAL_MACHINE\Software\Wow6432Node\Grass Valley Group\Streaming
REG_DWORD "ExtractPinnacleCaptions" = 1
```

   This instructs the K2 system to extract and preserve the captions.

When you are no longer using the K2 system to import Pinnacle material, you can delete all of the above registry values that you created to support the import.

Importing via K2 Hot Bin

1. If you have not already done so, configure a K2 HotBin.
2. Rename the Pinnacle clip's *std* file with your desired K2 clip name and a **.mpg* extension.
3. Drop the file in the K2 HotBin.

Importing via K2 FTP

1. With your third-party FTP client, connects to the K2 FTP server as a standard K2 FTP session.
2. Use the FTP `put` command to transfer the Pinnacle clip's *std* file with your desired K2 clip name.

   Use the following example as a guideline:

```
ftp mx-proto-b14
Connected to mx-proto-b14.
220 FTP Server (1, 0, 0, 1) ready.
User (mx-proto-b14:(none)): administrator
331 Password required for user administrator.
Password:
230 Logged in, and aspect successfully set to MOVIE, stream mode GXF.
ftp> bin
200 Type set to IMAGE.
ftp> put std /MPG/V:/default/646405_IMX30_ MXF_IPN
200 PORT command okay.
150 Opening MOVIE mode data connection for
/explodedFile/V:/default/646405_IMX30_ MXF_IPN.
226 Transfer complete.
ftp: 54547968 bytes sent in 14.05Seconds 3883.25Kbytes/sec.
ftp> quit
221 Goodbye.
```

Importing via Pinnacle emulation K2 FTP

1. With your third-party automation vendor or FTP client, connect to the K2 FTP server as follows:

   FTP username: video_fs

   FTP password: .video_fs

   The username and password are case sensitive.
2. Create a directory named for the Pinnacle clip.
3. Put the following Pinnacle clip files in the directory in the following order:

   header

   ft

   info (optional)

   std

   Use the following example as a guideline:

```
J:\>ftp mx-proto-b14
Connected to mx-proto-b14.
220 FTP Server (1, 0, 0, 1) ready.
User (mx-proto-b14:(none)): video_fs
331 Password required for user video_fs.
Password:
230 Logged in, and aspect successfully set to MOVIE, stream mode PIN.
ftp> bin
200 Type set to IMAGE.
ftp> mkdir pinnacle_clip
250 Command "XMKD pinnacle_clip" succeeded.
ftp> cd pinnacle_clip
250 Change of directory to explodedFile/V:/default/pinnacle_clip
successful, xfer mode PIN.
ftp> put header
200 PORT command okay.
150 Opening MOVIE mode data connection for header.
226 Transfer complete.
ftp: 132 bytes sent in 0.00Seconds 132000.00Kbytes/sec.
ftp> put ft
200 PORT command okay.
150 Opening MOVIE mode data connection for ft.
226 Transfer complete.
ftp: 393216 bytes sent in 0.11Seconds 3574.69Kbytes/sec.
ftp> put std
200 PORT command okay.
150 Opening MOVIE mode data connection for
/explodedFile/V:/default/pinnacle_clip.
226 Transfer complete.
ftp: 56097960 bytes sent in 16.25Seconds 3452.18Kbytes/sec.
ftp> quit
221 Goodbye.
```

Related Topics

About the K2 FTP interface on page 258

Specifications for Pinnacle support

- Pinnacle clips do not indicate timecode as drop-frame. The K2 import assumes non-drop-frame values.
- The time-code used in the header file and recorded into the MPEG Video GOP header starts out as 00:00:00:00 by default. If the option to extract VITC is not enabled, or no VITC is detected on import, timecode extracted from the MPEG Video GOP manifests as the timecode track for the imported K2 clip.
- Pinnacle servers preserve non-MPEG-1 (Musicam) audio as Pinnacle-private elementary streams within the program stream *std* file. Pinnacle clips allow up to 8 channels of audio. On import the K2 system detects the private stream audio packets when they are present and generates the appropriate K2 audio track(s).
- When importing Pinnacle content recorded as an MPEG1 system stream, any Pinnacle-private audio from MPEG2 program stream based clips is lost.
- The K2 system supports extraction of the following kinds of Pinnacle-private audio:
  - PCM-16, PCM-20 (PCM-20 is converted into PCM-24 on import)
  - DolbyE and AC-3
- If you enable the option via registry key, the K2 system examines specific VBI lines when it detects Pinnacle-private VBI lines, as follows:
  - Line 21 (default, can be overridden via registry) is examined for the presence of close captioning or SDP teletext. If detected, this is appropriately de-modulated into EIA-608 close caption or OP-47 subtitling packets and inserted as ancillary data packets into an ancillary data track on the imported clip.
  - Line 19-PAL and 14-NTSC (default, can be overridden via registry) is examined for the presence of VITC. If detected, this is appropriately de-modulated into SMPTE 12M compliant time-code values which is inserted as time-code values into the time-code track on the imported clip.
- The following applies to the Pinnacle emulation K2 FTP import:
  - All supported FTP commands, with the exception of those mentioned below, respond as they do for a conventional K2 FTP session. For instance, commands such as renames and deletes operate on K2 clips, directory listings reveal K2 clips and bins, and so on.
  - Navigation (`cd`) to K2 bins is allowed. By default, the *default* K2 bin is projected as the FTP root.
  - The `MKD/XMKD` command does not create a K2 bin for the argument specified, but merely retains the argument as the name of the K2 clip to be created based on following `STOR` commands.
  - The `CWD/XCWD` command does not allow navigation to a K2 bin. If the Pinnacle clip name used in a previous MKD command is used as an argument to `CWD`, the K2 FTP server does not internally navigate to that “bin”, but rather merely returns a success status.
  - The `STOR` command only honors `ft`, `std`, or `header` as arguments, or filenames with a *.mxf* extension. When the K2 FTP server receives data for the *std* file it creates a K2 clip with the name issued by a previous `MKD/XMKD` command.

Compressed VBI import

The K2 system can be set up to import Standard Definition (SD) Compressed VBI closed captioning. The feature can be useful for workflows that include SD clips from Profile XP and other video

servers, or for facilities transitioning from SD to HD. If you are interested in this feature, contact Grass Valley Support to determine if it is appropriate for your system design. If appropriate, Grass Valley Support can provide you with the instructions to enable the feature.

About compressed VBI import processes

The K2 system extracts closed captioning by decoding the compressed video. The K2 system then inserts the extracted closed captioning as an SD ancillary data track into the K2 clip. These processes occur as the material is being transferred into the K2 system.

These processes take place on the K2 device performing the import. During these import processes the CPU consumption on the system performing the import is higher than with conventional imports. Take this into consideration when planning to use this feature.

Compressed VBI import specifications

The compressed VBI import is supported as follows:

- SD MPEG only.
- All forms of import are supported, such as FTP, automation protocols, AppCenter, Capture services, and InSync.
- GXF, MXF, MPEG, and MOV imports extract closed captioning from SD 720x512 video.
- D-10/IMX SD MPEG video is supported
- SD 525 line (NTSC) closed captioning is supported
- SD 625 line (PAL) teletext is not supported
- The first SD video track encountered is processed for compressed VBI. Multiple video tracks are not processed.
- If the incoming video contains compressed VBI lines but closed caption data is not present, the resultant K2 clip has an ancillary data track containing “blank” closed caption data. On playout, the blank closed caption data is inserted into the video, but no closed caption is displayed for the video.
- If an MPEG program/transport stream contains both ATSC Closed Captioning inserted into the MPEG picture user data and compressed VBI lines, the K2 system ignores the compressed VBI lines and processes for the ATSC Closed Captioning instead.
- The K2 system does not process the incoming video when the following occurs:
  - The video does not contain compressed VBI lines
  - The video already contains an ancillary data track
  - The video is High Definition (HD)
  - The video is a GXF complex movie, such as a program or a playlist.

Managing Stand-alone Storage

About the internal storage system

A K2 Summit system with internal drives for media storage is a self-contained, stand-alone unit, with no external devices for storage, audio, or video connections required.

Related Topics

K2 Summit 3G Transmission models features

K2 Summit 3G internal storage system

The storage system on an internal storage second generation K2 Summit system includes the following:

M.2 SSD — The M.2 SSD boot media on the front interconnect board serves as the system drive. The Windows operating system, applications, and other standard computer software components reside on the system drive.

RAID drives — There are slots for twenty-four 2.5 inch, or twelve 3.5 inch RAID drives, located behind the front bezel assembly in the front of the unit. These drives are for media storage. Media data is written across all of the drives, except for one drive (used for recovery). This media group appears as the V: drive to the Windows operating system.

Disk controller board — The disk controller board provides the RAID functionality for the internal disks. It is mounted vertically in the front of the unit. K2 Summit 3G systems with direct-connect storage or shared SAN storage do not contain a disk controller board, as RAID disks are in the external RAID storage devices.

RAID 5 – Drives configured as RAID 5 require that the equivalent of the space in one drive be dedicated for storing parity stripes. It requires that all of the drives but one be present to operate. The data is distributed across all of the drives. Upon failure of a single drive, subsequent reads can be calculated from the distributed parity so that no data is lost.

With RAID 5, data and parity (which is additional data used for recovery) are striped across three or more disks. If a disk gets an error or starts to fail, data is recreated from this distributed data and parity block— seamlessly and automatically. Essentially, the system is still operational even when one disk fails and until you can replace the failed drive. Another benefit of RAID 5 is that it allows the drives to be "hot-swappable." This means in case a drive in the array fails, that drive can be swapped with a new drive without shutting down the server and without having to interrupt users who may be accessing the server. It's a good solution for fault tolerance because as drives fail , the data can be rebuilt to new disks as failing disks are replaced.

RAID 1 — Drives configured as RAID 1 provide redundancy. The two disks in a RAID 1 LUN are redundant partners. Any single disk in a LUN can fail and disk access can continue. When a disk fails, error messages in the AppCenter StatusPane inform you of the problem. You can then replace the failed disk. The data is rebuilt on the replacement disk and redundancy is restored.

RAID 0 — Media drives configured as RAID 0 offer no redundancy. If any single RAID 0 media drive fails, all data is lost on all media drives.

About the direct-connect storage system

A K2 Summit system that is directly connected to an external K2 RAID storage device for media storage is a self-contained, stand-alone unit.

The storage system on direct-connect storage K2 Summit system includes the following:

System Drive — Compact Flash (first generation Summit) or mSATA (Summit 3G) boot media serves as the system drive. The Windows operating system, applications, and other standard computer software components reside on the system drive.

Fibre Channel card — The direct-connect K2 Summit system has a direct Fibre Channel connection to external K2 RAID. The K2 Summit system must have the optional Fibre Channel card installed to support this connection.

There are no internal RAID drives or a disk controller board in a direct-connect storage K2 Summit system.

RAID 5 — Drives configured as RAID 5 provide redundancy. There are six disks in one RAID 5 LUN. A disk in a LUN can fail and disk access can continue. When a disk fails, error messages in the AppCenter StatusPane inform you of the problem. You can then replace the failed disk. The data is rebuilt on the replacement disk and redundancy is restored.

Using Storage Utility

This section contains topics about using Storage Utility for stand-alone internal storage.

About Storage Utility

You can use Storage Utility for general maintenance tasks on a stand-alone internal storage K2 system. Refer to the Service Manual for your K2 product for repair procedures, such as those required to replace a failed drive.

The Storage Utility runs on either the local K2 system or from a Control Point PC. In both cases the Storage Utility's primary functionality is hosted by the K2 system. The Storage Utility uses the connection to the RAID disks for access and configuration.

A stand-alone K2 system runs in either an online mode or an offline mode. These modes are required for Storage Utility operations. Online/offline modes are as follows:

- Online mode — This is the stand-alone K2 system's normal operating mode. When the stand-alone K2 system is in the online mode and you open Storage Utility, you can stay in this mode while you view the devices, LUNs, and disks of the internal storage system, but you can not configure the storage system. However, some operations are available that do not configure the storage system, such as identify a drive (flash the drive LEDs), get controller logs, disable a drive, and force a drive to rebuild.

- Offline mode — In this mode the stand-alone K2 system channels are disconnected and all media access operations are disabled. You are prompted to put the stand-alone K2 system into offline mode when you select an operation that configures the storage system. When the stand-alone K2 system is in the offline mode you can configure the storage system and perform all Storage Utility operations. When you exit Storage Utility you can put the stand-alone K2 system back into online mode.

⚠ ***CAUTION: Use the Storage Utility only as directed by a documented procedure or by Grass Valley Support. If used improperly, the Storage Utility can render your K2 system inoperable or result in the loss of all your media.***

Related Topics

Storage Utility for standalone K2 Summit system on page 70

Opening Storage Utility

There are two ways to open Storage Utility for work on a stand-alone K2 system, as explained in the following sections.

Opening Storage Utility through AppCenter

Unless prevented by a system problem, you should always open Storage Utility through AppCenter. When you do this your AppCenter login permissions are passed to Storage Utility, so you do not have to log in to Storage Utility separately.

If you are running AppCenter on the local K2 system, as Storage Utility opens it connects to the storage system of that local K2 system. If you are running AppCenter on a control point PC, as Storage Utility opens it connects to the storage system of the K2 system that hosts the channel currently selected in AppCenter.

1. Open AppCenter, either on the local K2 system or on the control point PC and log in.

   Make sure you log in to AppCenter with appropriate privileges, as this log in is passed to Storage Utility. Administrator-level permission is necessary for most Storage Utility operations. If you log in with user-level permissions, the Storage Utility menu item is disabled.

2. If you are running AppCenter from a control point PC and you have channels from multiple K2 systems in your channel suite, select a channel from the stand-alone K2 system whose storage you intend to configure with Storage Utility. This is important as Storage Utility automatically connects to the K2 system that hosts the currently selected channel.

   NOTE: Make sure you are connecting to a stand-alone K2 system. You should never connect Storage Utility directly to a K2 client that uses shared (SAN) storage.

3. From the AppCenter **System** menu, select **Storage Utility**.

   Storage Utility opens.

4. If you are connecting from a control point PC, you should verify that you are connected to the correct K2 system. To verify this, use the Identify feature to flash the disks on the K2 system.

Related Topics

About identifying disks on page 303

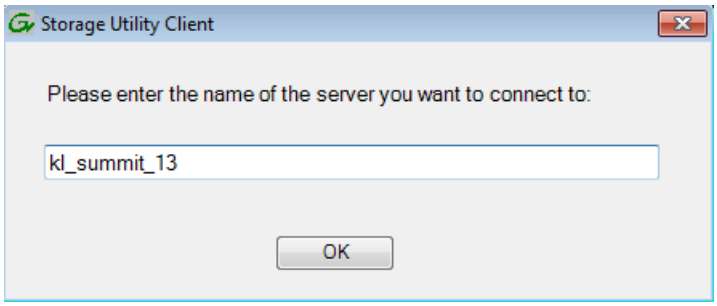
Opening Storage Utility Independently

Do not open Storage Utility independently unless there is a problem that prevents you from opening it through AppCenter.

1. Open the Storage Utility shortcut on the Windows desktop or from the Windows Start Menu at **Programs | Grass Valley | Storage Utility**.

   A dialog box opens in which you specify the machine to connect to with Storage Utility.

   NOTE: Make sure you are connecting to a stand-alone K2 system. You should never connect Storage Utility directly to a K2 client that uses shared storage.



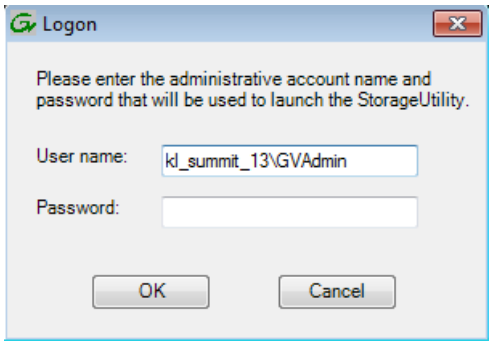
2. Enter the name or IP address of the K2 system for which you intend to use Storage Utility. If you are opening Storage Utility on a local K2 system, enter the name of that K2 system. Click **OK**.

   The Storage Utility logon dialog box opens.

3. Log on to the Storage Utility with GVAdmin user name, which includes administrative privileges. Administrator-level permission is necessary for most Storage Utility operations.

   Storage Utility opens.

   For user name, you might need to enter the machine name as the domain to successfully log in.

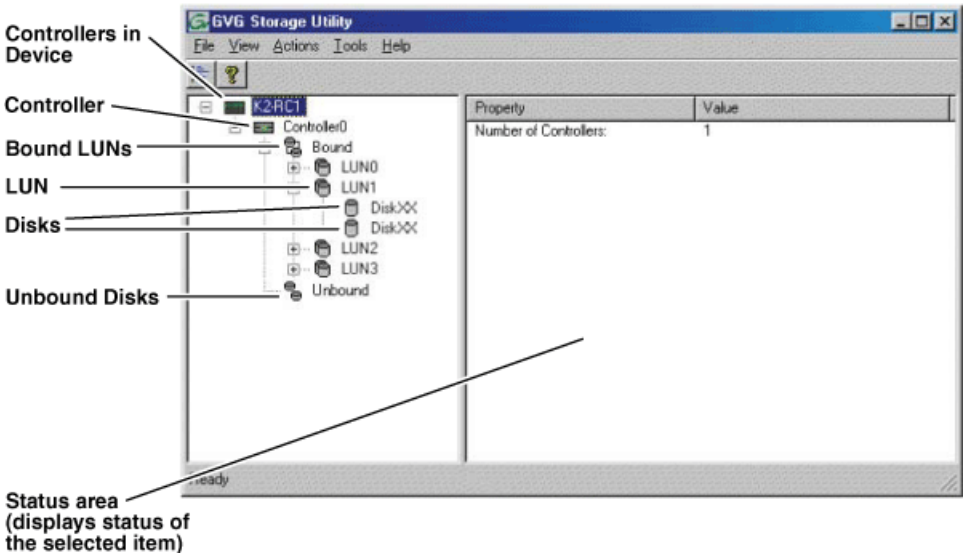


4. If you are connecting from a control point PC, you should verify that you are connected to the correct K2 system. To verify this, use the Identify feature to flash the disks.

Related Topics

About identifying disks on page 303

Overview of Storage Utility



The Storage Utility user interface includes a tree view in the left-hand pane, and a status information area displayed in the right-hand pane. The tree view displays the hardware that makes up the storage system connected. The context menus in the tree view are used to configure storage. The right-hand status pane displays information about the item selected in the tree view. The tree view hierarchy is as follows:

Controllers in Device — Provides a logical grouping of RAID Controllers by device.

Controller — Represents the RAID Controllers found. These are numbered in the order discovered. The controller icon represents both RAID Controller A and, if installed, RAID Controller B. To determine if an optional RAID Controller B is installed, select the Controller icon in the tree view, then examine the status pane for peer status.

Bound LUNs — Expanding the Bound node displays all bound LUNs.

LUN — Represents a bound LUN. Expanding the LUN node displays the disk modules that make up the LUN.

UnBound disks — Expanding the UnBound node, displays all unbound disk modules.

Disks — Represents the disk modules.

The Storage Utility detects disks available and lists them on the opening screen.

Refer to the following procedures to use Storage Utility for maintenance tasks

Checking storage subsystem status

Some limited status information for storage subsystems is displayed in the Storage Utility. This can be helpful when configuring storage.

You can view status information by selecting items in the tree view.

Item in tree view	Status information displayed
Controllers in Device	Number of Controllers
Controller	Microcode Version
Bound	Number of LUNs
LUN	Binding Type, such as RAID 1 State (online or offline)
Disk	Firmware Vendor State Product ID Capacity
Unbound	Number of disks

Checking controller microcode

As explained in the previous section, to check controller microcode, select the controller in the tree view and the microcode version is displayed.

About identifying disks

The Identify feature allows you to flash the disk LEDs so that you can physically locate a specific disk module or group of disk modules that make up a LUN. Always use the disk identify feature before removing and replacing a failed disk module. Accidentally removing the wrong disk module can destroy all data on the disk drives.

You can also use this feature to verify the K2 system to which you are currently connected.

Identifying internal disks

1. Open Storage Utility and in the tree view expand all nodes so that all disks are displayed.
2. On the K2 Summit system, remove the front bezel assembly.

   NOTE: Replace the bezel assembly within one minute to maintain system cooling.

3. The tables below illustrates the position of drives as numbered in the K2 Summit system chassis. Compare the drive number positions and the disk numbering displayed in Storage Utility to identify drive locations.

   K2 Summit 3G+ Production Client

Disk 0	Disk 1	Disk 2	Disk 3	Disk 4	Disk 5	Disk 6	Disk 7	Disk 8	Disk 9	Disk 10	Disk 11

4. Position yourself so you can see the RAID drive LEDs.
5. Identify the disks in a LUN or identify a single disk, as follows:
   a) In the Storage Utility tree view, right-click a LUN or right-click a single disk, then select **Identify LUN** or **Identify Disk** in the context menu.

      A message box opens with a message that informs you that a disk or disks are blinking.

   b) View disks.

      The LEDs display an amber color flashing several times a second. This flashing pattern can stop automatically after a specific time interval, such as ten seconds.

   c) Verify the location of the disk or disks.

Get controller logs

1. In the tree view, select the controller.
2. Click **Actions | Get Controller Logs**.
3. A message informs you of the location of the logs.
4. Find the following files on the local K2 Summit system system at *C:\logs*:

   tty.log

   ControllerEvents.log

Check disk mode pages

1. In the tree view, right-click the controller and select **Check DIsk Mode Pages**.
2. Messages report the results of the check. For each disk that has mode pages set incorrectly, click **Yes** when prompted "…restore the default mode page settings?".

Disabling a disk

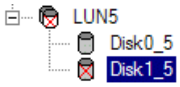
1. In the tree view, right-click the disk and select **Advanced | Disable** and **OK** to confirm.

   A message "The drive is spinning down…Please wait" appears.

   If internal storage, the Service LED on the K2 system displays a flashing yellow pattern three time a second.

2. When the message "Operation succeeded…now safe to remove disk" appears, click **OK**.

3. The Storage Utility displays red Xs on tree view icons to represent a disk fault and a degraded LUN.



NOTE: On the K2 Media Client, remember that the LUN 0 (disks 0_0 and 0_1) is the system drive. Do not attempt disk operations on the system drive.

Forcing a disk to rebuild

With RAID 0 there is no RAID redundancy, so disks do not rebuild. With other RAID types, such as RAID 1, if media access (record/play) is underway, when you insert a media disk it automatically begins to rebuild. If there is no media access underway, to start the rebuild process either begin a media operation or use the following procedure:

1. In the tree view, identify the faulty disk . If the disk is not currently in the fault state, the Rebuild option is not available.
2. In the tree view, right-click the faulty disk and select **Rebuild**.
3. When the message "Succeeded to start rebuild…" appears, click **OK**.

   If internal storage, the Service LED on the K2 system displays a flashing pattern alternating yellow/green once a second.

Unbind LUN

With internal storage, you can only unbind one LUN at a time. Also make sure the controller is not busy with other processes, such as rebuilding a disk. If the controller is busy, the unbind LUN operation fails.

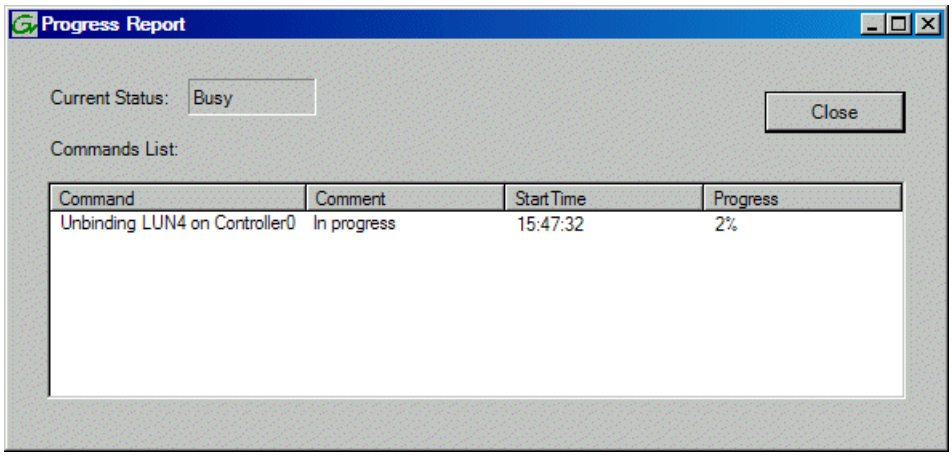
⚠ ***CAUTION: Unbinding destroys all data stored on disk modules.***

Refer to topics about direct-connect external storage before using this procedure on direct-connect systems.

1. In the tree view, right-click the LUN and select **Unbind LUN**.
2. If online, messages appear "…offline mode now?" and "…continue?". Click **Yes** to put the system in offline mode.

   AppCenter channels go offline.
3. When warning messages appear "…destroy all existing media…" and "Are you sure?", click **OK** to continue.

4. The Progress Report opens and displays unbind progress.



5. When progress reports 100% complete, the LUN is unbound.
6. Restart the K2 system.

NOTE: On the K2 Media Client, remember that the LUN 0 (disks 0_0 and 0_1) is the system drive. Do not attempt disk operations on the system drive.

Related Topics

About the direct-connect Fibre Channel card

Bind Luns

When you bind a LUN, you select one or more unbound disks and create a new LUN. The Storage Utility places this new LUN at the bottom of the list and numbers it accordingly. However, with internal storage, disk numbers are enforced by the chassis slot in which the disk resides. Therefore, depending on the number and sequence of LUNs created, it is possible that the LUN numbers and the disk numbers do not match. When you create a new file system, this mismatched numbering does not hamper functionality. However, to make the internal storage K2 system easy to service, you should retain the correct numbering sequence. To do this you must unbind all media LUNs and then bind disks in sequence. On a K2 Media Client, do not unbind LUN0, which is the system drive.

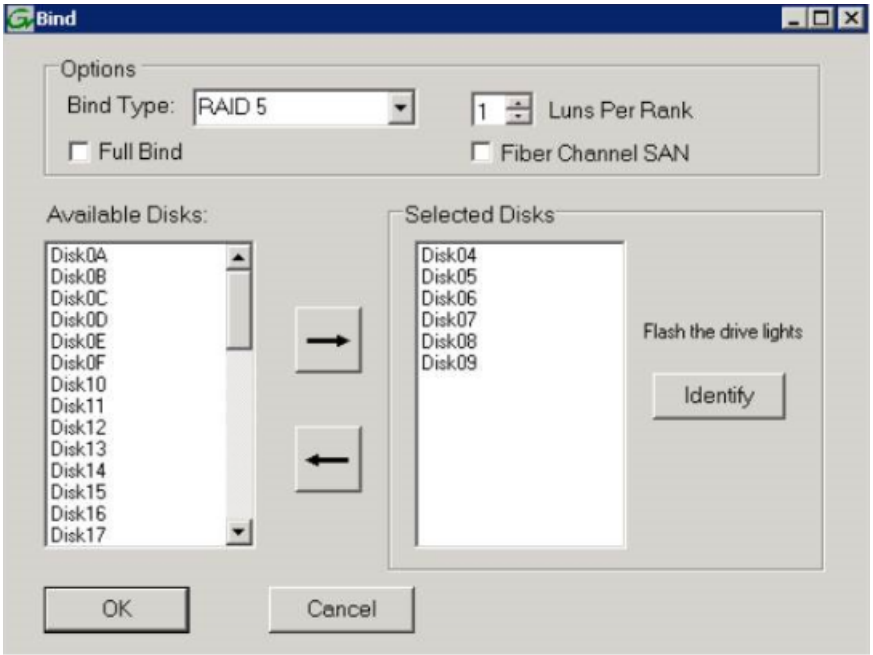
Refer to topics about direct-connect external storage before using this procedure on direct-connect systems.

1. In the tree view, right-click the **Unbound** node and select **Bind LUN**.

2. If online, messages appear "…offline mode now?" and "…continue?". Click **Yes** to put the system in offline mode.

   AppCenter channels go offline.

   The Bind LUN dialog box opens showing all unbound disks for the controller listed in the Available Disk list.



3. Make a LUN selection in the **Bind Type** drop-down list and proceed as follows:
   - RAID 0 — Optional for internal storage first generation K2 Summit systems and K2 Summit 3G systems.

     In the Available Disks list, select one media disk, then click the arrow button to add it to the Selected Disks list.
   - RAID 1 — For internal storage first generation K2 Summit systems and K2 Summit 3G systems.

     In the Available Disks list, select two contiguous disks, then click the arrow button to add them to the Selected Disks list. (TIP: Use ‘shift-click’ or ‘control-click’ to select disks.)
   - RAID 5/6 — For direct-connect storage and direct attached Summit on K2 Summit systems.

     In the Available Disks list, select six contiguous disks, then click the arrow button to add them to the Selected Disks list. (TIP: Use ‘shift-click’ or ‘control-click’ to select disks.)

   NOTE: As an aid in identifying a disk module’s physical location, select it in the Selected Disks list, then click the Identify button. This causes the disk drive LED to flash.

   NOTE: When binding the disks, you must bind the disks from top to bottom (as it appears in Storage Utility, you cannot skip any disks.

   NOTE: Disks must be of the same capacity within each LUN/RANK. Binding wil fail if the disks are not of the same size and capacity and you will get an unknown error.

   If you are binding LUNs with expansion chassis, the Storage Utility screen will appear similar to the following:

4. Click OK to close the Bind LUN dialog box and begin the binding process.

   The Progress Report opens and displays binding progress.

5. Repeat the previous steps for remaining unbound disks. You do not need to wait until the first LUN is bound before you can start binding the next LUN. Multiple LUNs can be in the binding process all at the same time.
6. When progress reports 100% complete for all the LUNs that you are binding, proceed to the next step.
7. Restart the K2 system.
8. After binding one or more new LUNs, you must make a new file system.

Related Topics

About the direct-connect Fibre Channel card

Making a new media file system on a K2 Summit system on page 310

Changing RAID type for internal storage

On an internal storage K2 Summit 3G system, you can change the internal media storage to be either RAID 1 or RAID 0, as follows:

- RAID 1 — If Solid State Drives (SSD), RAID 1 is required. If Hard Disk Drives (HDD), RAID 1 is recommended for the "full" media drive option, which is eight hard drives on a first generation K2 Summit system. Not recommended for media drive options with fewer hard drives. With RAID 1, two media drives are configured as a mirrored pair to make one LUN. The capacity of each LUN is roughly equivalent to the capacity of one drive, so your total media storage capacity is approximately 50% of the sum total of all the drives. Since drives are mirrored in each LUN, your media is protected against drive failure. If a drive fails, the other drive in the LUN provides continued media access while you replace the failed drive.
- RAID 0 — With RAID 0 there is no mirroring, so your total media storage capacity is roughly equivalent to that of all drives combined. However, your media has no RAID protection against drive failure. If one media drive fails, the entire group of drives fails and you lose all your media.

Depending on your needs for capacity versus protection, you can change from one RAID type to another, as explained in the following procedure.

NOTE: This procedure loses all media.

1. If you need to retain media, transfer it to another K2 system or otherwise back it up.
2. Unbind all media LUNs.
3. Restart.
4. Bind media drives, as one of the following:
   - RAID 0 — Bind each media drive as a RAID 0 LUN.
   - RAID 1 — Bind the ten drives as five RAID 1 LUNs.
5. Restart.
6. Make a new file system.
7. If you backed up your media, you can now transfer it back.

Related Topics

Unbind LUN on page 305

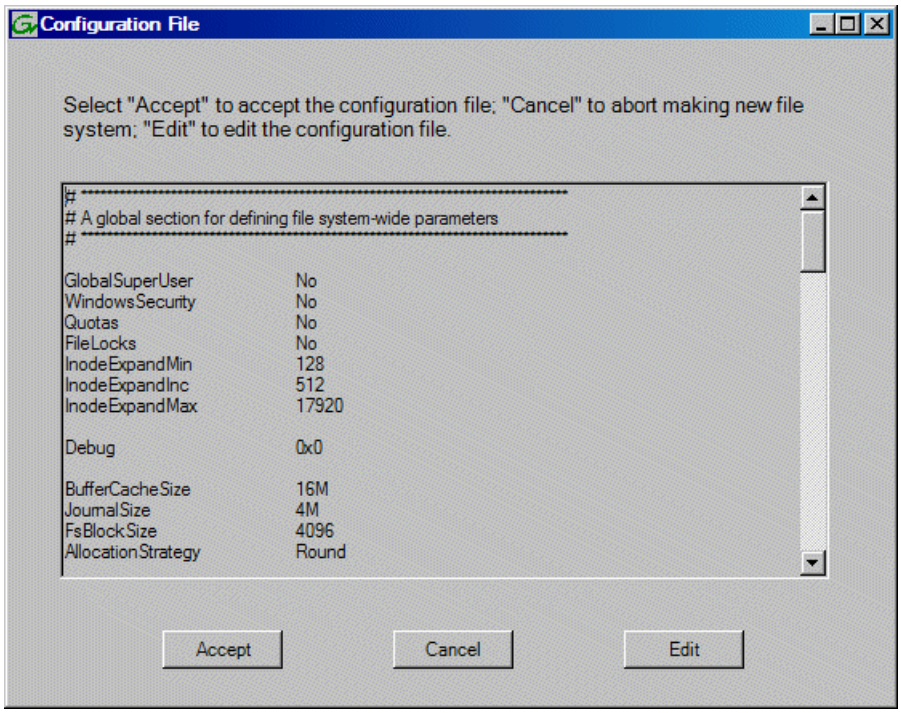
Bind Luns on page 306
Making a new media file system on a K2 Summit system on page 310

Making a new media file system on a K2 Summit system

If your SNFS file system name is currently “default”, when you make a new file system the name changes to “gvfs_hostname”, where hostname is the name of the stand-alone K2 system. Also, Storage Utility creates unique disk labels, which is a requirement for compatibility with Dyno PA.

1. Click **Tools | Make New File System**.
2. If online, messages appear “…offline mode now?” and “…continue?”. Click **Yes** to put the system in offline mode.

   AppCenter channels go offline. The Configuration File window opens.



3. You can view media file system settings, but do not change settings unless instructed to do so by a documented procedure or by Grass Valley Support. Click **Accept**.

   A “Making new file system. Please wait” message box displays progress.
4. When a message “Succeeded to make the new file system. The server will be restarted now” appears, click **OK** to restart.
5. If the operation fails to make a new file system, re-initialize the file system first. To re-initialize, click **Tools | Re-initialize File System** and repeat all steps in this topic to make the new file system.

If you have Macintosh systems accessing the stand-alone K2 system, you should check that the SNFS file system volume is configured correctly on the Macintosh systems. Refer to K2 FCP Connect procedures in the "Installing K2 FCP Connect" section of the K2 Topic Library.

Related Topics

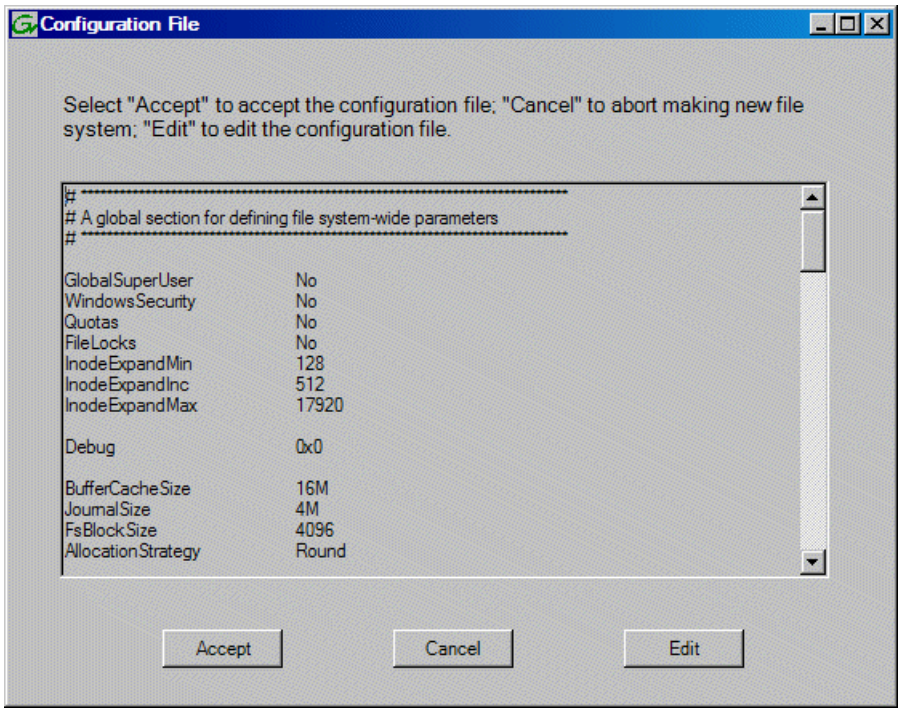
RTIO specifications for standalone K2 Summit 3G system on page 397

Modifying the media file system on a K2 Summit system

Do not modify the media file system unless instructed to do so by a documented procedure or by Grass Valley Support.

1. Click **Tools | Modify File System**.
2. If online, messages appear "…offline mode now?" and "…continue?". Click **Yes** to put the system in offline mode.

   The Configuration File window opens.



3. Click **Edit** and modify file system parameters as required..
4. When a message "...The server will be restarted now" appears, click **OK** to restart.

Related Topics

RTIO specifications for standalone K2 Summit 3G system on page 397

Checking the media file system

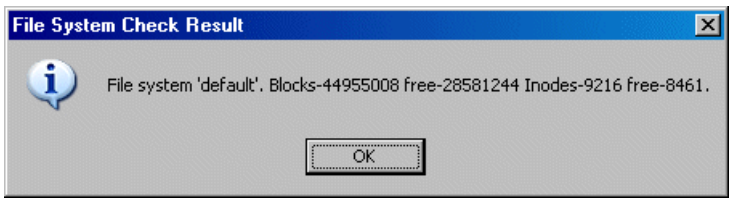
- Media operations must be stopped. You must put the standalone K2 System offline as part of this procedure.

This procedure checks the media file system but retains current media files.

1. In Storage Utility, click **Tools | Check File System**.
2. If online, messages appear "…offline mode now?" and "…continue?". Click **Yes** to put the system in offline mode.

   AppCenter channels go offline.
3. A message box appears "Checking media file system. Please wait". Observe progress.

   If problems are discovered they are reported. If the check process passes, when the process is complete a message appears to confirm success.



4. Click **OK** to dismiss the results.
5. Messages appear "…online mode now?" and "…continue?". Do one of the following:
   - Click **Yes** to put the system in online mode. This is the recommended option in most cases. For example, even if you plan to next clean unreferenced files and/or movies, that operation requires that the system be online, so you should put it online now. When you click Yes, AppCenter channels go online.
   - Click **No** to keep the system in offline mode. This is not recommended for most cases. Only do this when you are sure that subsequent operations require the system to be offline.

Your file system has been checked.

Cleaning unreferenced files and movies

- The standalone K2 system must be online. If K2 AppCenter channels are in the offline state, the clean unreferenced files/movies operations fail.

These procedures allow you to keep the media database and the media files in sync. You can check the movies (clips) in the media database for the references to media files that should be currently stored on the media disks. Likewise, you can check for media files that are not referenced by a movie in the media database. If you find any unreferenced files or movies, you can delete them.

Clean unreferenced files

1. In Storage Utility, click **Tools | Clean Unreferenced Files**.
2. A message box appears "…searching …Please wait". Observe progress.

3. A message box reports results. Respond as follows:
   - If no unreferenced files are found, click **OK** to dismiss the results.
   - If unreferenced files are discovered, you are prompted to delete them. Click **Yes** to delete the files or **No** to leave the files intact.

The process writes a log file to `C:\profile\logFS.txt`, which you can check for more information.

Clean unreferenced movies

1. In Storage Utility, click **Tools | Clean Unreferenced Movies**.
2. A message box appears "…searching …Please wait". Observe progress.
3. A message box reports results. Respond as follows:
   - If no unreferenced movies are found, click **OK** to dismiss the results.
   - If unreferenced movies are discovered, you are prompted to delete them. Click **Yes** to delete the movies or **No** to leave the movies intact.

The process writes log files to `C:\profile\cleanupDB.txt` and `C:\profile\MediaDB.txt`, which you can check for more information.

Downloading controller microcode

You might be instructed in K2 release notes to upgrade controller microcode. This allows you to take advantage of enhancements and benefit from improved performance and reliability.

To determine your current controller microcode version, select the controller in the Storage Utility tree view, then in the properties reported in the right-hand pane, note the controller microcode version. Use the following procedure if you need to download controller microcode.

1. Refer to *K2 Release Notes* to determine microcode types, versions, files, and any other special instructions regarding the particular controller microcode you are downloading.
2. In the Storage Utility, right-click the controller in the tree view, then select **Load Controller Microcode** in the context menu.
3. If online, messages appear "…offline mode now?" and "…continue?". Click **Yes** to put the system in offline mode.

   AppCenter channels go offline. The Open File dialog box opens.
4. In the Open File dialog box, browse to the desired microcode file, select the file.
5. Click **OK.**

   The Progress Report window appears showing the microcode download task and the percentage completion.
6. When finished, exit Storage Utility.
7. Put AppCenter channels back online.
8. Restart.

Downloading disk drive firmware

You might be instructed in K2 release notes to upgrade disk drive firmware. This allows you to take advantage of the disk drive enhancements and benefit from improved performance and reliability.

To determine your disk drive type and current firmware version, select a disk drive icon in the Storage Utility tree view, then note the drive properties reported in the right-hand pane. Use the following procedure if you need to download disk drive firmware.

NOTE: The disk drives are upgraded one at a time which can take as long as 2 minutes per drive. Take this into consideration when scheduling the upgrade.

1. Refer to *K2 Release Notes* to determine firmware types, versions, files, and any other special instructions regarding the particular disk drive firmware you are downloading.
2. In the Storage Utility, right-click a disk in the tree view, then select **Advanced | Download Disk Firmware** in the context menu.
3. If online, messages appear "…offline mode now?" and "…continue?". Click **Yes** to put the system in offline mode.

   AppCenter channels go offline. The Open File dialog box opens.
4. In the Open File dialog box, browse to the latest firmware file for your disks, select the file, and click **OK.**

   For internal drives, watch the lights on the drive to which you are downloading firmware. The lights flash as firmware loads. Wait until the lights have completed their flashing pattern. This can take several minutes.

   The Progress Report window appears showing the disk firmware download task and the percentage completion.
5. Repeat this procedure on each drive.
6. When finished, exit Storage Utility.
7. Put AppCenter channels back online.
8. Restart.

Placing the K2 system into online mode

If the stand-alone K2 system is in offline mode and you have completed your storage system configuration tasks, you have the following options to return the system to the online mode:

- Exit Storage Utility and bring channels online — If Storage Utility is closed, first open Storage Utility and then exit Storage Utility. When you exit Storage Utility you are prompted "…back to online mode?". Click **Yes**.

  After exiting Storage Utility, if AppCenter is open the channels remain offline. To bring channels online, if you are running AppCenter on a Control Point PC, select **System | Reconnect**. If you are running AppCenter on a local K2 system, close and reopen AppCenter.
- Restart the K2 system — Restarting automatically resets the system to online mode. When you log into AppCenter channels connect and come up online.

Managing stand-alone K2 systems with SiteConfig

About managing stand-alone K2 clients with SiteConfig

The topics in this section apply to the following K2 client products:

- K2 Summit Production Client with internal storage
- K2 Summit Production Client with direct-connect storage

Work through the topics sequentially to get SiteConfig set up to remotely configure and manage one or more K2 clients. Then you can use SiteConfig for software upgrades and other management tasks.

SiteConfig and stand-alone K2 clients checklist

Use the following sequence of tasks as a guideline to set up SiteConfig and do your initial configuration for one or more stand-alone K2 clients. This checklist outlines the recommended workflow for a new system.

	Task	Comment
☐	Select a PC to use as the SiteConfig control point PC	Review system requirements and network access requirements about installing SiteConfig.
☐	Install SiteConfig on the control point PC	—
☐	Create a system description and add a custom site to the system description	If you already have a SiteConfig system description managing other devices in your facility, you can use that system description also for your stand-alone K2 clients, rather than creating a new system description.
☐	Add a control network to the site. You can also add a FTP/streaming network if desired	—
☐	Add a group for your K2 clients to the system description	—
☐	Add a placeholder K2 client to the system description for each of your actual K2 clients	—
☐	Configure the names of the placeholder K2 clients	—
☐	Configure the network interfaces of the placeholder K2 clients	Specify IP address ranges and other network details
☐	Discover your K2 clients	—
☐	Assign each discovered K2 client to its placeholder K2 client	—

	Task	Comment
☐	For each discovered and assigned K2 client, edit each network interface. Specify network settings and apply them to the K2 client.	On each K2 client, set the control network interface IP address first, then the FTP/streaming network interface, if present. Also set the hostname.
☐	Add a control point PC placeholder device to the system description	—
☐	Discover the control point PC and assign it to the placeholder control point PC	—
☐	If not already set correctly, set the hostname of discovered devices	Make sure the device name is correct, then make the hostname the same as the device name.
☐	Ping each K2 client and the control point PC to test network communication	—
☐	Generate host table information and distribute to hosts files on each K2 client and on the control point PC	Make sure you have completed network configuration of all network interfaces across all devices to ensure complete and valid host table information. You can use SiteConfig to copy hosts files to devices, or you can manage hosts files yourself.
☐	Create a deployment group	—
☐	Add stand-alone K2 clients to the deployment group	—

System requirements for SiteConfig host PC

The PC on which SiteConfig is installed must meet the following requirements:

Requirements	Comments
Operating system	Microsoft Windows (Must be a U.S. version): • XP Professional Service Pack 3 • Server 2003 • Vista Enterprise Service Pack 1 • Windows 7 • Server 2008 R2
RAM	Minimum 512 MB, 1 GB recommended
Graphics acceleration	Must have at least 128 MB memory
Processor	Pentium 4 or higher class, 2 GHz or greater
Hard disk space	400 MB
Microsoft .NET Framework	Version 4.0

Requirements	Comments
Java JRE	1.3.1_12 and 1.4.2_05 or higher. Required for the HP Ethernet Switch configuration interface, which is used for K2 SANs.
XML	Microsoft XML 4 Service Pack 2 is required.

About installing SiteConfig

SiteConfig uses a protocol that involves sending Ethernet broadcast messages to discover and configure devices. To enable this protocol to work correctly, there must be unrestricted network access between the PC that hosts SiteConfig and the devices to be discovered.

This is achieved if control network interfaces are all connected to the same switch or to multiple switches interconnected with ISLs/trunks. If your site requires that other switches and/or routers be in the network path, you must make sure that no restrictions are in place that block SiteConfig protocols.

Also, do not install SiteConfig on a PC on which a drive from a managed device is mapped as an administrative share (C$). For example, if you have a PC set up to run anti-virus software and for this purpose you have network drives set up on the PC mapped to C$ shares on devices, then do not use that PC to host SiteConfig and manage those devices.

For a given system, there should be just one instance of SiteConfig managing the system.

Installing/upgrading SiteConfig

- The PC on which you are installing SiteConfg must meet system requirements.
- The PC must be connected to the LAN on which all the devices to be managed are connected.
- There must be no routed paths to the devices to be managed.

1. Procure SiteConfig installation files from the Grass Valley website or via other distribution mechanisms.

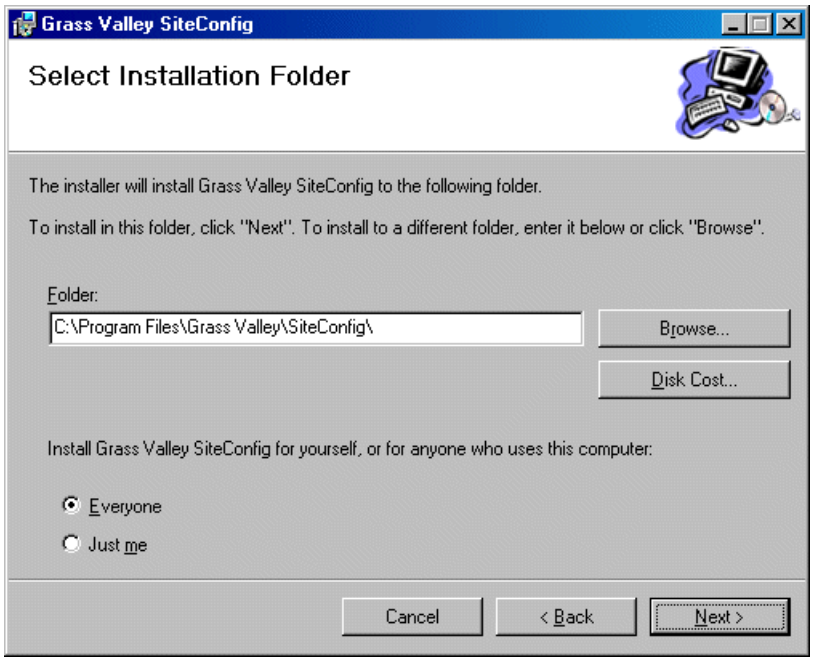
   The following directory and files are required to install SiteConfig:

   - `DotNetFx` directory
   - `ProductFrameUISetup.msi`
   - `setup.exe`

2. If you already have a version of SiteConfig installed, go to Windows **Add/Remove Programs** and uninstall it.
3. Double-click `setup.exe`.

   The installation wizard opens.

4. Work through the wizard pages, clicking **Next** and **Finish**.



If the PC does not have the appropriate version of Microsoft .NET, the SiteConfig installation programs installs it.

5. Open the Windows operating system Services control panel on the PC and look for an entry called " ProductFrame Discovery Agent".

   The Discovery Agent must be installed on the SiteConfig PC so that the PC can be discovered by SiteConfig and added to the system description as a managed device. This is necessary to ensure name resolution in SiteConfig's hosts file.

   The Discovery Agent is also known as the Network Configuration Connect Kit. For example, in Windows Add/Remove Programs, it can be displayed as either Network Configuration Connect Kit or SiteConfig Discovery Agent.

6. Proceed as follows:

   - If the Discovery Agent is not installed, navigate to the SiteConfig install location's Discovery Agent Setup subdirectory and double-click the `DiscoveryAgentServiceSetup.msi` file. This launches the setup program and installs the Discovery Agent. Follow the setup wizard to complete installation. A restart is required after installation. Then continue with the next step in this procedure.
   - If the Discovery Agent is already installed, continue with the next step in this procedure.

7. If not already configured, configure the SiteConfig PC with a valid Ethernet IP address for the LAN using Windows Network Connections.
8. If you are not going to be using SiteConfig to manage system hosts files, put the system hosts file on the SiteConfig PC.

Creating a system description for stand-alone K2 clients

Do not do this task if:

- You already have or are developing a SiteConfig system description managing other devices in your facility and that system description has the correct networks and connectivity for your stand-alone K2 clients. In this case, skip ahead to the task in which you add a group to the system description for your stand-alone K2 clients.

Do this task if:

- You do not yet have a system description appropriate for managing your stand-alone K2 clients.

1. Open SiteConfig and proceed as follows:
   - If a dialog box opens that gives you the choice of creating or importing a system description, it means SiteConfig does not have access to a system description file. Click **Create**.
   - If the SiteConfig main window opens, click **File | New**.

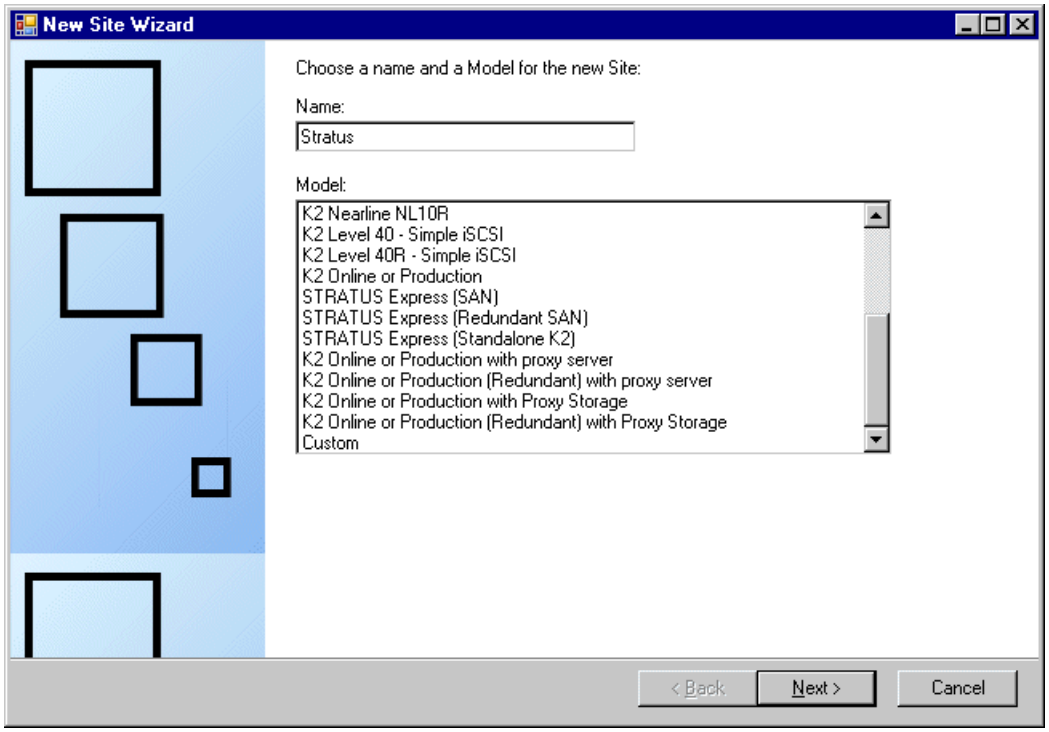
   The Create New System Description dialog box opens.
2. In the Create New System Description dialog box, enter the name of the file for the system description you are creating.

   It is recommended that you store the system description file in the default location, rather than browsing to store the file in a different location. SiteConfig always accesses the default location.
3. Click **OK**.

   A blank system description loads, which displays just the top-level System node in the tree view.

4. In the **Network Configuration | Devices** tree view, right-click the **System** node or a **Site** node and select **Add Site**.

   The New Site Wizard opens.



5. Enter a name for the site you are creating, considering the following:
   - Keep the site name short, as it becomes the root identifier that is the default prefix for device and network names.
   - Sites in the tree view are automatically sorted alphabetically.
6. Select **Custom** and click **Next**.
7. Click **Finish** to create the site.

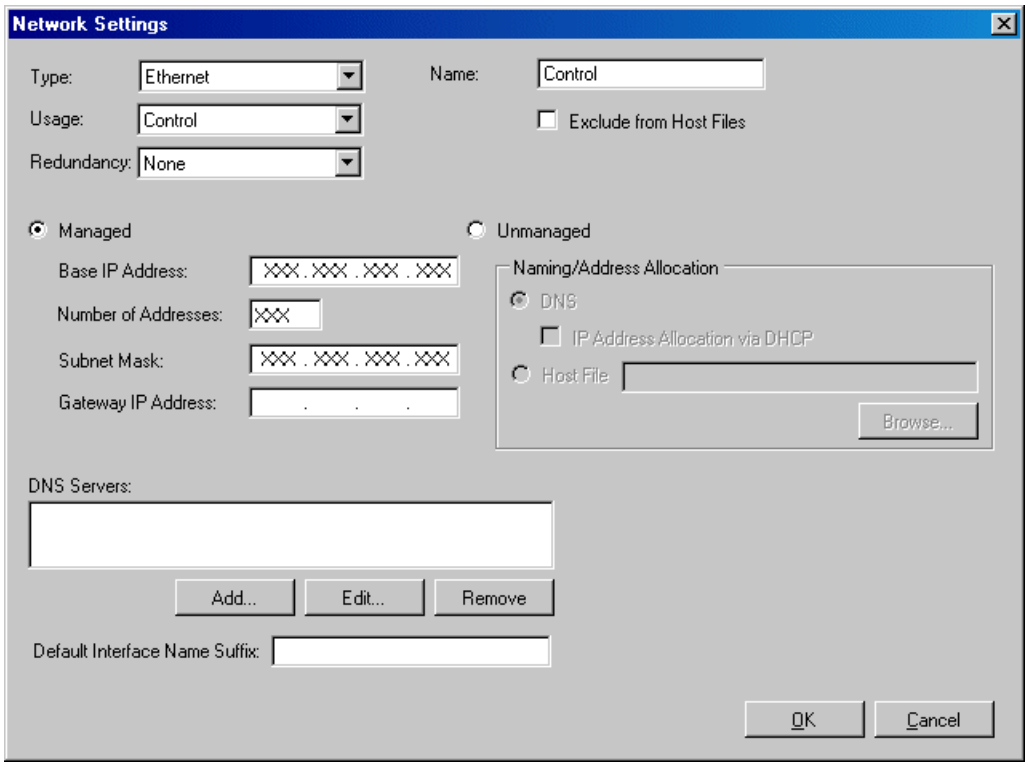
The site is displayed in SiteConfig in the tree view with groups and device placeholders displayed under the site node. New networks are displayed in the tree view of networks in the Networks tab.

Creating the control network for stand-alone K2 clients

1. In the **Network Configuration | Networks** tree view, select a System node or a Site node.

2. Proceed as follows:
   - To add a network under the currently selected node, in the tree view right-click the node and select **Add Network**.

   The Network Settings dialog box opens.



3. Configure the settings for the network as follows:

Setting...	For control network
Type	*Ethernet* is required
Usage	*Control* is required
Redundancy	*None* is required.
Name	*Control* is recommended
Exclude from Host Files	*Unselected* is required
Managed	*Selected* is required
Base IP Address	The first (lowest) IP address in the range of IP addresses managed by SiteConfig. Required.
Number of Addresses	The number of IP addresses in the range managed by SiteConfig. Required.
Subnet Mask	The network's subnet mask. Required.
Gateway IP Address	Additional network settings managed by SiteConfig. Allowed.
Unmanaged	*Unselected* is required. Related settings are disabled.
DNS Servers	Servers providing DNS for name resolution. Allowed.
Default Interface Name Suffix	Not allowed

4. Click **OK** to save settings and close.

Creating the FTP/streaming network for stand-alone K2 clients (optional)

If you transfer media to/from the stand-alone K2 client, create a FTP/streaming network.

1. In the **Network Configuration | Networks** tree view, select a System node or a Site node.
2. Proceed as follows:
   - To add a network under the currently selected node, in the tree view right-click the node and select **Add Network**.

   The Network Settings dialog box opens.

3. Configure the settings for the network as follows:

Setting...	For FTP/streaming network
Type	*Ethernet* is required
Usage	*FileTransfer* is required
Redundancy	*None* is required.
Name	*Streaming* is recommended
Exclude from Host Files	*Unselected* is required
Managed	*Selected* is required
Base IP Address	The first (lowest) IP address in the range of IP addresses managed by SiteConfig. Required.
Number of Addresses	The number of IP addresses in the range managed by SiteConfig. Required.
Subnet Mask	The network's subnet mask. Required.
Gateway IP Address	Additional network settings managed by SiteConfig. Allowed.
Unmanaged	*Unselected* is required. Related settings are disabled.
DNS Servers	Servers providing DNS for name resolution. Allowed.
Default Interface Name Suffix	*_he0* is required

4. Click **OK** to save settings and close.

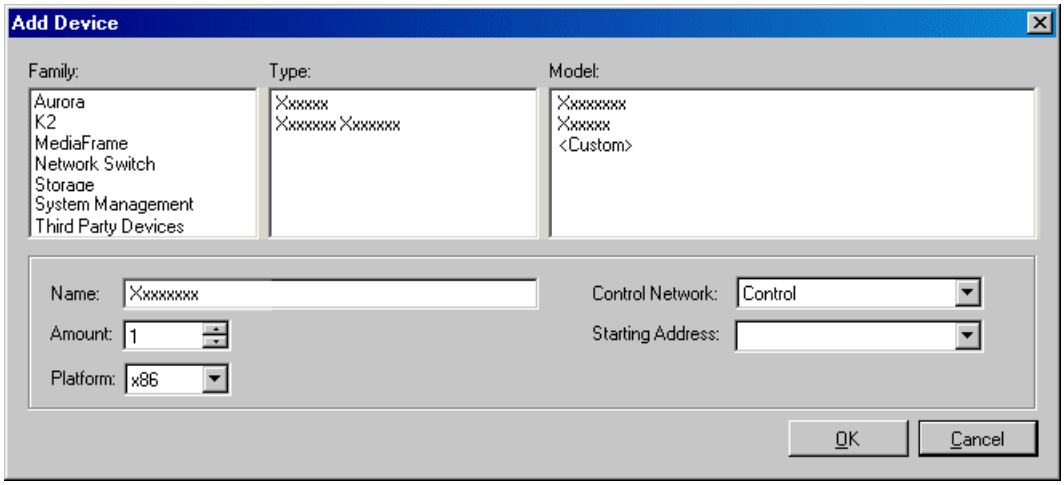
Adding a group

1. In the **Network Configuration | Networks** tree view, right-click a site node and select **Add Group**. The group appears in the tree view.
2. Right-click the group and select **Rename**.
3. Enter the desired name for the group.

Adding stand-alone K2 clients to the system description

- The system description must contain a group.

1. In the **Network Configuration | Devices** tree view, right-click a group and select **Add Device**.



2. Configure settings for the device you are adding as follows:
   - Family – Select **K2**.
   - Type – Select the appropriate type of K2 system.
   - Model – Select the model with the appropriate storage.
   - Name – This is the device name, as displayed in the SiteConfig device tree view and device list view. This name can be different than the host name (network name). You can accept the default name or enter a name of your choice. Devices in the tree view are sorted alphabetically.
   - Amount – You can add multiple devices, as currently defined by your settings in the Add Device dialog box. An enumerator is added to the name to create a unique name for each device added.
   - Control network– Select the control network.
   - Starting Address – Select from the list of available addresses on the selected control network. If adding multiple devices, this is the starting address, with addresses assigned sequentially to each device added.
3. Click **OK** to save settings and close.
4. Repeat these steps for each of your stand-alone K2 clients.

Modifying stand-alone K2 client unassigned (unmanaged) interfaces

- The system description must have a stand-alone K2 client that is a placeholder device.

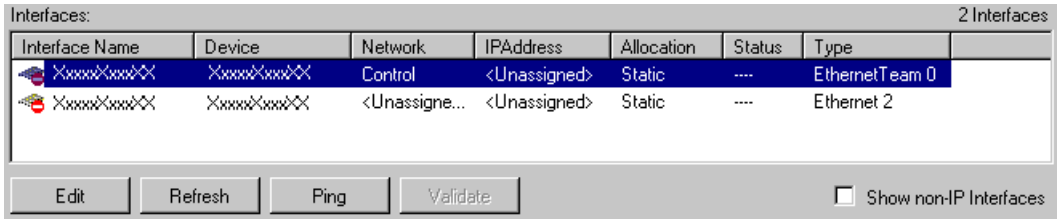
- The placeholder device must have one or more unmanaged network interfaces.

Use this task to modify unmanaged network interfaces on a standalone K2 client as follows:

- K2 Summit Production Client

1. In the **Network Configuration | Devices** tree view, select a stand-alone K2 client placeholder device.

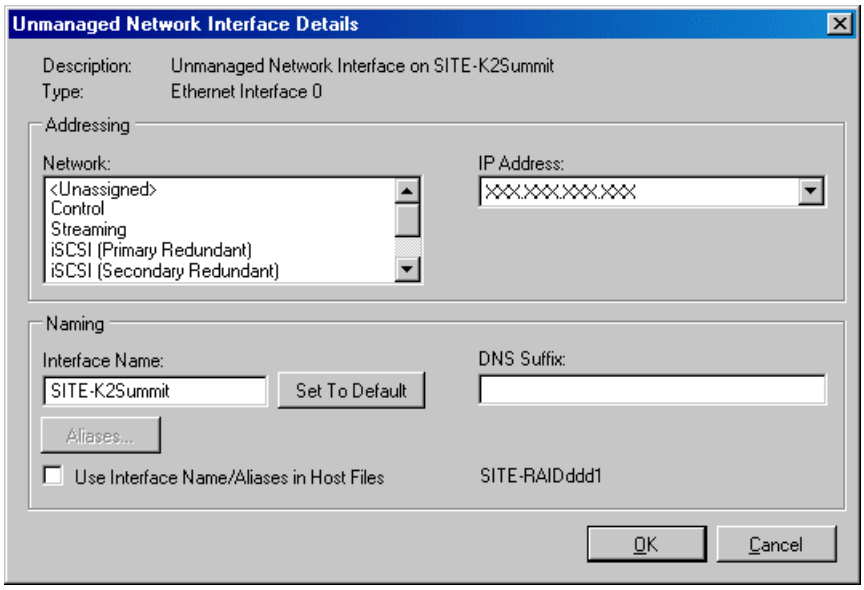
   The interfaces for that device are displayed in the interfaces list view.



   Edit the control network interface first.

2. In the interfaces list view, right-click an interface and select **Edit**.

   The Unmanaged Network Interface Details dialog box opens.



3. Configure the settings for the interface as follows:

Setting...	For control network interface
Network	*Control* is required
IP Address	The IP address for this interface on the network. Required.
Interface Name	The device host name. Required.
Set to Default	Not recommended. Sets the interface name to SiteConfig default convention, based on the root Site name and device-type.
...use Interface Name/Aliases in Host Files...	*Unselected* is required. Since not selected, the default behavior occurs, which is to use the device host name in the hosts file.
Aliases	Not allowed
DNS Suffix	Allowed, if applicable to the network. The DNS suffix is added to the interface name.

4. Click **OK** to save settings and close.
5. If you have a FTP/streaming network, repeat these steps but select the stand-alone K2 client's other network interface and configure settings as follows.

Setting...	For FTP/streaming network interface
Network	*Streaming* is required
IP Address	The IP address for this interface on the network. Required.
Interface Name	The device host name with the " _he0" suffix added is required. For example, if the host name is *K2prod01*, then *K2prod01_he0* is required here.
Set to Default	Not recommended. Sets the interface name to SiteConfig default convention, based on the root Site name and device-type.
...use Interface Name/Aliases in Host Files...	*Selected* is required
Aliases	Not allowed
DNS Suffix	Allowed, if applicable to the network. The DNS suffix is added to the interface name.

6. Click **OK** to save settings and close.
7. Repeat this procedure for each of your stand-alone K2 client placeholder devices.

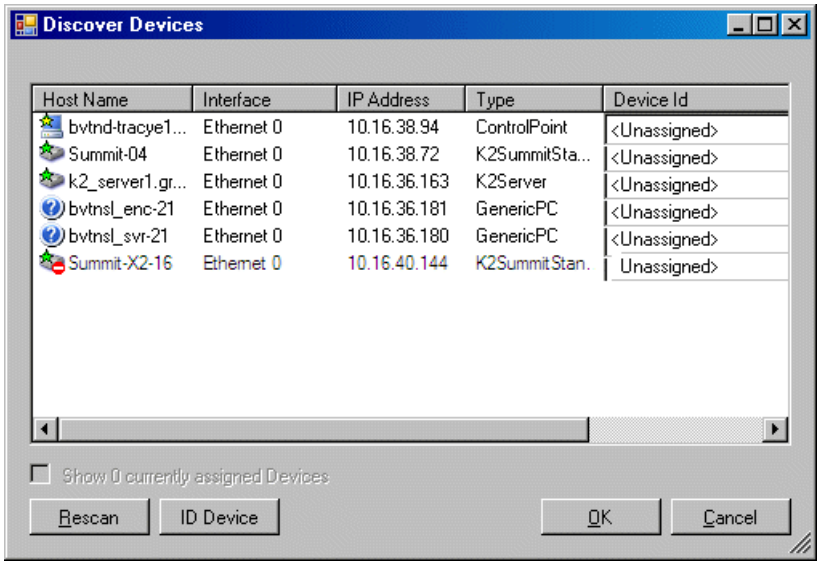
Discovering devices with SiteConfig

- The Ethernet switch or switches that support the control network must be configured and operational. If multiple switches, ISLs are connected and trunks configured.
- The PC that hosts SiteConfig must be communicating on the control network.

- There must be no routers between the PC that hosts SiteConfig and the devices to be discovered.
- Devices to be discovered must be Windows operating system devices, with SiteConfig support installed.
- Devices must be cabled for control network connections.
- If discovering a device with Microsoft Windows Server 2008 operating system, the device must have an IP address, either static or DHCP supplied.

1. Open SiteConfig.
2. In the toolbar, click the discover devices button.

   The Discover Devices dialog box opens.



   A list of discovered devices is displayed.

3. Click **Rescan** to re-run the discovery mechanism. You can do this if a device that you want to discover has its network connection restored or otherwise becomes available. Additional devices discovered are added to the list.

Assigning discovered devices

- Devices must be discovered by SiteConfig
- Discovered devices must not yet be assigned to a device in the system description
- The system description must have placeholder devices to which to assign the discovered devices.

1. If the Discovered Devices Dialog box is not already open, click the discover devices button .

   The Discover Devices dialog box opens.

2. Identify discovered devices.
   - If a single device is discovered in multiple rows, it means the device has multiple network interfaces. Choose the interface that represents the device's currently connected control connection. This is typically Ethernet ... 0.
   - If necessary, select a device in the list and click **ID Device**. This triggers an action on the device, such as flashing an LED or ejecting a CD drive, to identify the device.
3. To also view previously discovered devices that have already been assigned to a device in the system description, select **Show … currently assigned devices**.

   The currently assigned devices are added to the list. Viewing both assigned and unassigned devices in this way can be helpful to verify the match between discovered devices and placeholder devices.
4. In the row for each discovered device, view items on the Device Id drop-down list to determine the match with placeholder devices, as follows:
   - If SiteConfig finds a match between the device-type discovered and the device-type of one or more placeholder devices, it displays those placeholder devices in the list.
   - If SiteConfig does not find a match between the device-type discovered and the device-type of a placeholder device, no placeholder device is displayed in the list.
5. In the row for a discovered device, click the Device Id drop-down list and select the placeholder device that corresponds to the discovered device.

   If there is no corresponding placeholder device currently in the system description, you can select **Add** to create a new placeholder device and then assign the discovered device to it.
6. When discovered devices have been assigned, click **OK** to save settings and close.
7. In the **Network Configuration | Devices** tree view, select each of the devices to which you assigned a discovered device.

Modifying stand-alone K2 client managed network interfaces

- The physical device you are configuring must be discovered and must be assigned to a device in the SiteConfig system description.
- SiteConfig must have communication with the device.
- The device must be defined in the system description with an appropriate network interface.

Use this task to modify managed network interfaces on stand-alone K2 client models as follows:

- K2 Summit Production Client

1. In the tree view select a K2 client, then in the Interfaces list view, identify interfaces as follows:
   - A stand-alone K2 client's other interface is for FTP/streaming. If you have a FTP/streaming network, you can configure and use this interface if desired.

2. In the Interfaces list view determine the interface to configure, as follows:
   - Identify the interface with which SiteConfig is currently communicating, indicated by the green star overlay icon. This should be the control network interface.
   - Verify that the interface over which SiteConfig is currently communicating is in fact the interface defined for the control network in the system description. If this is not the case, you might have the control network cable connected to the wrong interface port. The control connection should always be the first port on the motherboard, except when you have a loopback connection.
   - Configure the control network interface first before configuring any of the other interfaces.
   - After you have successfully configured the control network interface, return to this step to configure each remaining interface.

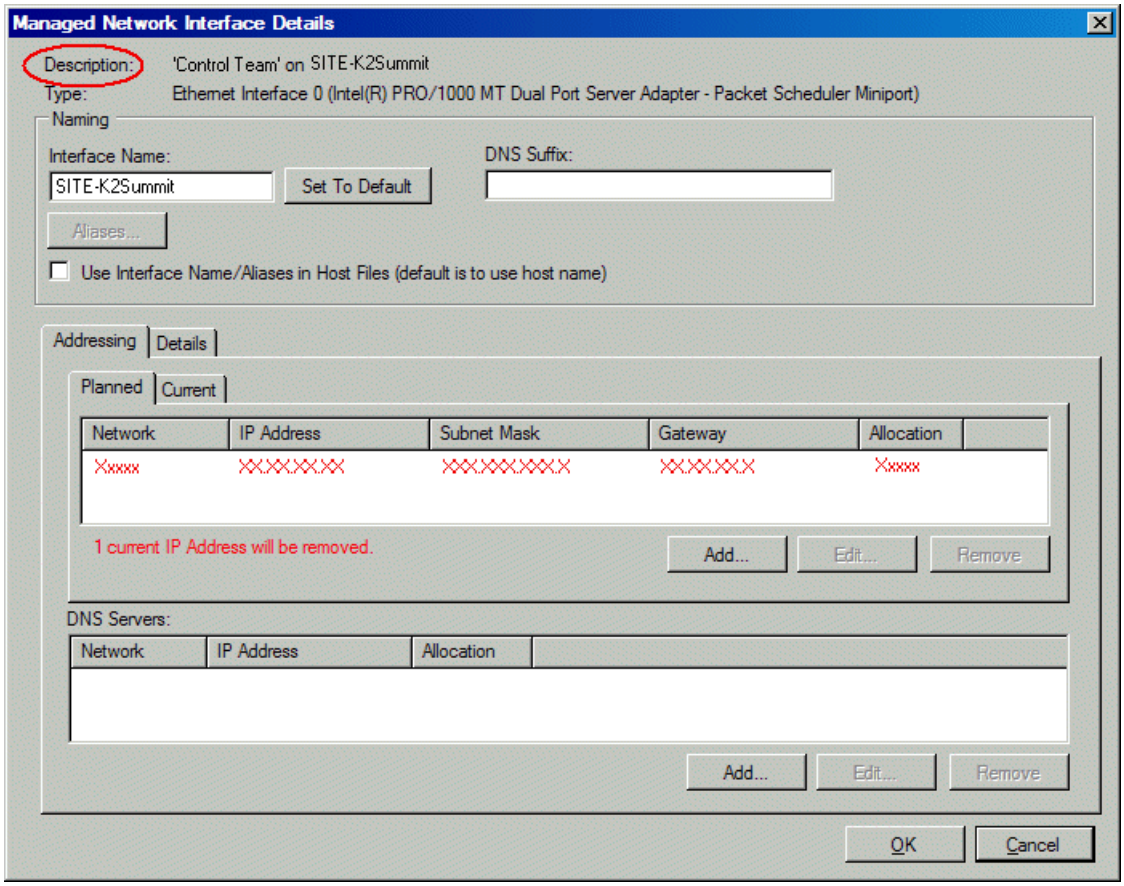
3. In the Interfaces list view, check the icon for the interface you are configuring.

   If the icon has a red stop sign overlay, it indicates that current settings and planned settings do not match or that there is some other problem. Hover over the icon to read a tooltip with information about the problem.

   NOTE: Make sure that the device is unlocked in SiteConfig before proceeding. For a K2 Summit Production Client with K2 software at a version lower than 9.0, this disables the write filter.

4. In the Interfaces list view, right-click the interface you are configuring and select **Edit**.

   The Managed Network Interface Details dialog box opens.

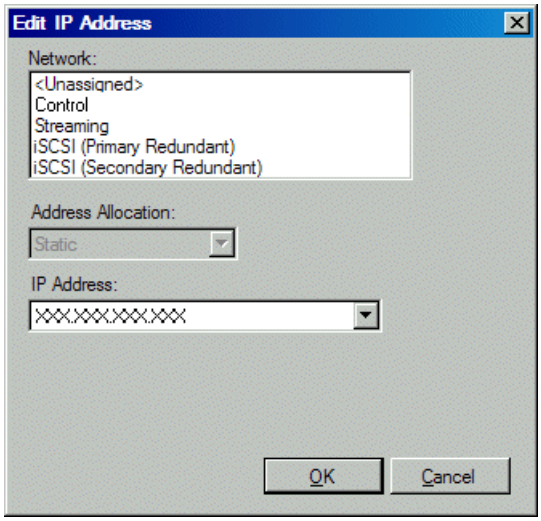


5. Identify the interface on the discovered device that you are configuring.
   - Identify Ethernet LAN adapters by their "Description" name. This is the Windows connection name. SiteConfig reads this name from the device and displays it at the top of this dialog box. This is the most accurate way to identify the network adapter on the discovered device that you are configuring.

6. Evaluate settings on the Planned tab and change if necessary.
   - Compare settings on the Planned tab with settings on the Current tab.
   - If you want to keep the current settings as reported in the Current tab, click **Remove** to remove the planned settings.
   - Do not specify multiple IP addresses for the same interface. Do not use the Add button.
   - Refer to SiteConfig Help Topics for information about planned and current IP configuration.

7. To modify planned settings, do the following:
   a) Select the network settings and click **Edit**.

      The Edit IP Address dialog box opens.



8. When you have verified that the planned settings are correct, click **OK**, then **Yes** to apply settings to the device and close.

   A Contacting Device message box reports progress.
9. After configuring control network settings, do the following
   a) If a message informs you of a possible loss of communication, click **OK**.

      This message is normal, since this is the network over which you are currently communicating.
   b) In the Device list view, observe the device icon and wait until the icon displays the green star overlay before proceeding.

      The icon might not display the green star overlay for several seconds as settings are reconfigured and communication is re-established.
   c) In the Interface list view, right-click the interface and select **Ping**.

      The Ping Host dialog box opens.

      If ping status reports success, the interface is communicating on the control network.
10. If you have a FTP/streaming network, repeat steps but select the stand-alone K2 client's other network interface. Open the Managed Network Interface Details dialog box and configure the interface for the FTP/streaming network.
11. Identify the interface on the discovered device that you are configuring.
    - On any stand-alone K2 client, for the FTP/streaming network, configure Media Connection #1.

12. Configure naming settings as follows:

Setting...	For network interface Media Connection #1
Interface Name	The device host name with the "_he0" suffix added is required.
Set To Default	Not recommended
DNS Suffix	Allowed, if applicable to the network. The DNS suffix is added to the interface name.
Aliases	Not allowed
Use Interface Name/Aliases in Host Files	*Selected* is required

13. As in steps earlier in this procedure, reconcile planned and current settings. If you must edit the IP address, make settings as follows:

Setting...	For network interface Media Connection#1
Network	*Streaming* is required
Address Allocation	*Static* is required.
IP Address	The IP address for this interface on the network. Required.

14. When you have verified that the planned settings are correct, click **OK**, then **Yes** to apply settings to the device and close.

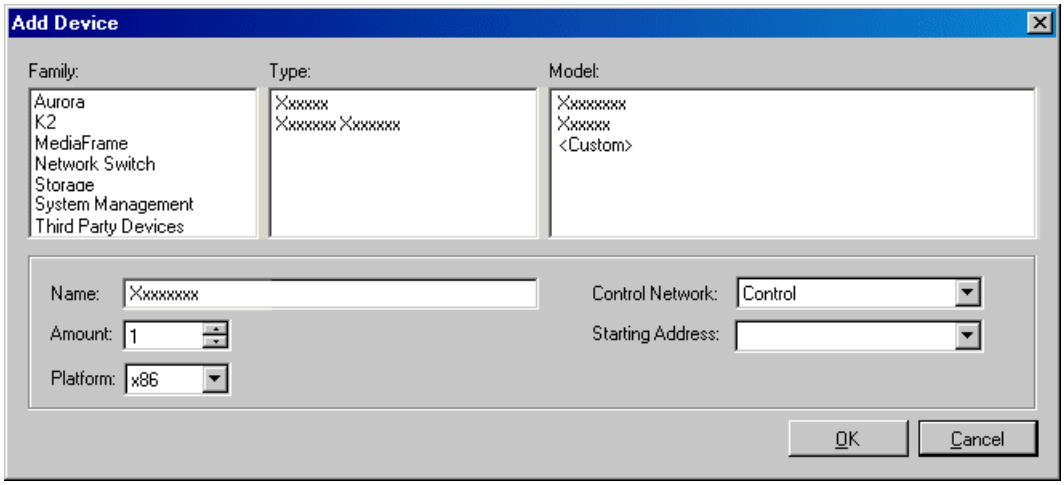
    A Contacting Device message box reports progress.

    NOTE: For a K2 Summit Production Client with K2 software at a version lower than 9.0, when configuration is complete, make sure you lock the device in SiteConfig. This enables the write filter.

Adding a control point PC placeholder device to the system description

- The system description must contain a group.

1. In the **Network Configuration | Devices** tree view, right-click a group and select **Add Device**.



The Add Device dialog box opens.

2. Configure settings for the device you are adding as follows:
   - Family – Select **System Management**.
   - Type – Select **ControlPoint PC**.
   - Model – Select **Control Point PC**.
   - Name - This is the device name, as displayed in the SiteConfig device tree view and device list view. You must configure this name to be the same as the host name on the actual control point PC.
   - Amount – Leave this setting at **1**. Do not attempt to configure multiple control point PC simultaneously.
   - Control Network – Select the control network.
   - Starting Address – Select the IP address that is the address currently configured on the actual control point PC.

3. Click **OK** to save settings and close.

Verify that IP settings for the placeholder device's control network interface are identical to those on the actual control point PC before using SiteConfig to discover the control point PC on the control network.

Assigning the control point PC

- The SiteConfig control point PC must have the SiteConfig Discovery Agent installed. The Discovery Agent is also known as the Network Configuration Connect Kit. In Windows Add/Remove Programs, it can be displayed as either Network Configuration Connect Kit or SiteConfig Discovery Agent.

- The system description must contain a control point PC placeholder device.
- The placeholder's control network interface must be configured with the control network IP address that is currently on the actual control point PC.
- The device name of the control point PC placeholder must be the same as the host name of the actual control point PC.

In this procedure you discover the physical control point PC and assign it to the placeholder control point PC in the system description.

1. Open SiteConfig on the control point PC.
2. Discover devices and identify the control point PC discovered device.
3. Assign the discovered device to the control point PC placeholder.
4. In the **Network Configuration | Devices** tree view, select the control point PC.
5. In the Interfaces list view, right-click the control network interface and select **Edit**.

   The Managed Network Interface Details dialog box opens.
6. Evaluate IP settings as follows:
   - If only Current settings are displayed (the Planned tab is not displayed), it means the planned settings you configured on the placeholder device are identical to those on the actual control point PC If this is the case, no further configuration is required.
   - If both a Current tab and a Planned tab are displayed, it means the planned settings you configured on the placeholder device are not identical to those on the actual control point PC. If this is the case, do not apply planned settings. Doing so overwrites IP settings on the actual control point PC, which stops network communication. Instead, select the **Planned** tab and click **Remove**.

   NOTE: Do not click OK if planned settings (red text) are displayed.
7. When you are sure that only Current settings are displayed and that those are the current valid settings for the control point PC, click **Apply**, then **OK** to save settings and close.

Making the host name the same as the device name

1. Verify that the current device name, as displayed in the SiteConfig tree view, is the same as your desired host name.
2. In the **Network Configuration | Devices | Device** list view, right-click the device and select **Edit**.

   The Edit Device dialog box opens.
3. Identify the state of buttons as follows:
   - If the host name is different than the device name, the **Set to Device Name** button is enabled.
   - If the host name is the same as the device name, the **Set to Device Name** button is disabled.
4. If enabled, click **Set to Device Name**.

   This changes the host name to be the same as the device name.
5. Click **OK**.
6. When prompted, restart the device.

Pinging devices from the PC that hosts SiteConfig

- The devices you are pinging must be in the SiteConfig system description.

You can send the ping command to one or more devices in the system description over the network to which the SiteConfig host PC is connected. Typically this is the control network.

1. In the **Network Configuration** | **Networks** tree view, select a network, site, or system node.
2. In the Devices list view, select one or more devices. Use Ctrl + Click or Shift + Click to select multiple devices.
3. Right-click the selected device or devices and select **Ping**.

   The Ping Devices dialog box opens and lists the selected device or devices.

The Ping Devices dialog box reports the progress and results of the ping command per device.

About hosts files and SiteConfig

SiteConfig uses the network information in the system description to define a hosts file and allows you to view the hosts file. SiteConfig can manage this hosts file on Windows operating system devices that are in the system description and that are part of a SiteConfig managed network.

When you have successfully assigned devices and applied planned network settings to interfaces, it is an indication that host table information, as currently captured in the system description, is valid and that you are ready to have SiteConfig assemble the host table information into a hosts file. Your options for placing this host table information on devices are as follows:

- If you do not want SiteConfig to manage your host table information, you can manage it yourself. This is typically the case if your facility has an existing hosts file that contains host table information for devices that are not in the SiteConfig system description. In this case, you can have SiteConfig generate a single hosts file that contains the host table information for the devices in the system description. You can then copy the desired host table information out of the SiteConfig hosts file and copy it into your facility hosts file. You must then distribute your facility hosts file to devices using your own mechanisms.
- If you want SiteConfig to manage all information in hosts files on devices, you can have SiteConfig copy its hosts file to devices. In so doing, SiteConfig overwrites the existing hosts files on devices. Therefore, this requires that all devices that have name resolution through the hosts file be configured accordingly in the SiteConfig system description.

If you choose to have SiteConfig write hosts files to devices, the process consumes system resource and network bandwidth. Therefore you should wait until you have verified the information for all devices/interfaces in the host file, rather than updating hosts files incrementally as you discover/assign devices.

SiteConfig does not automatically deploy hosts files to managed devices as you add or remove devices. If you add or remove devices from the system description, you must re-deploy the modified hosts file to all devices.

Generating host tables using SiteConfig

- Planned control network settings must be applied to control network interfaces and devices must be communicating on the control network as defined in the system description.

- Interfaces for networks that require name resolution via the hosts file, such as the FTP/streaming network, must have settings applied and must be communicating.
- Host names defined in the system description must be correct.
- The SiteConfig PC must be added to the system description so that it is included in the host tables generated by SiteConfig.

When you add or modify devices or their IP addresses in the SiteConfig system description, you should update host tables on all devices that use them.

1. In the **Network Configuration | Networks** tree view, select a network, site, or system node.
2. Click **View Hosts file**.

   A Hosts File Contents window opens that displays the contents of the hosts file as currently defined in the system description.
3. Verify the information in the hosts file.
4. Do one of the following:

   - If you are managing host table information yourself, click **Save As** and save a copy of the hosts file to a location on the control point PC. Then open the copy of the hosts file, copy the desired host table information from it, and paste it into your facility hosts file as desired. Then you can use your own process to distribute the facility hosts file to devices. Remember to distribute to the control point PC so that SiteConfig and other management applications such as K2Config can resolve network host names.
   - If SiteConfig is managing hosts files, do the following:

   NOTE: Writing hosts files to multiple devices consumes system resource and network bandwidth. Therefore it is recommended that you wait and do this after the system is complete and fully implemented, rather than updating hosts files incrementally as you discover/assign devices.

   a) In the **Network Configuration | Devices | Devices** list view, right-click a device to which you intend to write the hosts file and select **View Current Host File**.

      A Host File Contents window opens that displays the contents of the hosts file that is currently on that actual device.

   b) Verify that there is no information that you want to retain in the device's current hosts file that is not also in the hosts file as currently defined in the system description. If you need to save the device's current hosts file, click **Save As** and save to a different location.

   c) In the **Network Configuration | Devices | Devices** list view, right-click a device or use Ctrl + Click to select multiple devices, and select **Update Host File**.

      The current hosts file is overwritten with the hosts file as defined in the system description.

Configuring deployment groups

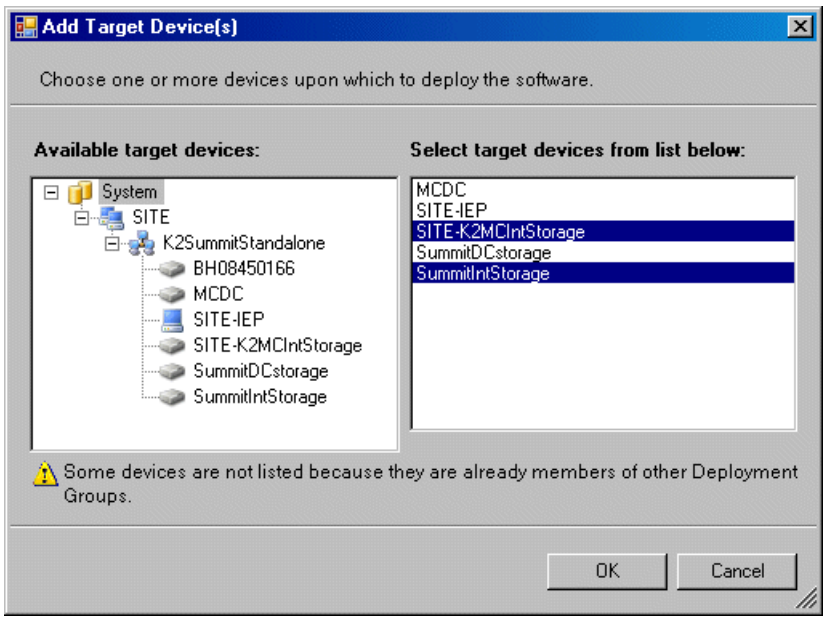
- The device must be assigned in the SiteConfig system description and network connectivity must be present.

1. In the **Software Deployment | Deployment Groups** tree view, right-click the top node and select **Add Deployment Group**.

   A deployment group appears in the tree view.
2. Right-click the deployment group, select **Rename**, and enter a name for the deployment group.

3. Right-click the deployment group and select **Add Target Device**.

   The Add Target Device(s) wizard opens.



4. In the Available Target Devices tree view, select the node that displays the devices that you are combining as a deployment group.
5. In the right-hand pane, select the devices that you are combining as a deployment group.

   To select multiple devices, you can drag through the devices, use Ctrl + Click, or use Shift + Click.
6. Click **OK**.

   The devices appear in the Deployment Groups tree view under the deployment group.

About deploying software for stand-alone K2 clients

You must control the sequence of software deployment tasks and device restarts as you upgrade software. The exact steps can vary from software version to version. Make sure you follow the documented task flow in the release notes for the version of software to which you are upgrading.

Managing K2 system software

Installing Control Point software

If you are using the Grass Valley Control Point PC, it comes from the factory with software installed, so you should not need to install software.

If you intend to use a PC that you own as a Control Point PC, make sure that you choose a PC that meets system requirements for supporting Control Point software. Then install software and configure as follows:

1. Set up Windows user accounts according to your site's security policies. Refer to related topics in the "About This Release" section of the K2 Topic Library for the list of accounts and passwords.
2. Install the following software, as it is required to support K2 Control Point software:
   - MSXML 4.0
   - .NET Framework 4.6.2

   You can find this software on your K2 Summit system's USB Recovery Flash Drive.
3. Install K2 Control Point PC software, as referenced earlier in this chapter.
4. It is recommended that you install the following software, so that you can accomplish a broad range of operational and administrative tasks from the control point PC:
   - Java Real Time Environment Update 7 or higher. Required for the HP Ethernet Switch configuration interface, which is used for K2 SANs (shared storage).
   - QuickTime 7, for local viewing of exported media. You can find this on your K2 Summit system's USB Recovery Flash Drive.
   - Adobe Acrobat Reader, for reading documentation from the K2 Documentation Set.
5. Install SiteConfig. It is recommended that you use SiteConfig to manage stand-alone K2 Summit systems. It is required that you use SiteConfig to manage K2 SANs.
6. Install SNMP manager software.

   Refer to related topics about Grass Valley recommended deployment and monitoring solutions in the "About This Release" section of the K2 Topic Library.
7. Create a backup image.

Related Topics

Control Point PC system requirements on page 401

Installing K2 software

Except as noted in the preceding sections, when you receive your K2 Summit system, you do not need to install software. The system has software pre-installed at the factory.

If you are upgrading software on a K2 Summit system, refer to related topics in the "About This Release" section of the K2 Topic Library for that version of software for specific upgrade procedures.

Before upgrading K2 software, you should make a recovery image.

Pre-installed software

Software is pre-installed on K2 products when you receive them from the factory. Refer to related topics in the "About This Release" section of the K2 Topic Library for version updates.

Backup and recovery strategies

Find information on creating images, restoring from images, and other backup and recovery information as follows:

For this device…	Find information in this documentation:
K2 Summit system	K2 Summit Service Manual

Administering and maintaining the K2 system

Licensing

Grass Valley continues to develop the K2 product family to better meet the needs of a wide range of customer requirements. As these developments become available, you can add the specific functionality you need with Grass Valley software licenses. Detailed procedures for installing licenses come with option kits or are included in release notes for K2 products. Contact your Grass Valley representative to learn more about the licensing structure and for purchasing information.

Software version licenses

At major software releases, significant new features are added. If you are licensed for the software release, you can upgrade your software and receive the benefits of the new features.

Licensable options

Optional applications, bundles of advanced features, and enhanced functionality are available as licensable options for K2 products. Refer to the *K2 Release Notes* for a list of options, and contact your Grass Valley representative to learn more about options.

Configuring K2 security

The section contains topics about K2 security.

Overview of K2 security features

K2 security features reference Windows operating system user accounts and groups on the local K2 system to determine permission levels. Depending on the account used to log on to the Windows operating system, to log on to K2 applications, or to otherwise authenticate system access, permission is granted for various levels of operational and media access.

K2 systems offer security features as follows:

- Windows operating system — Depending on the current Windows logon, permission is granted to make security and user account settings in the Windows operating system.

- K2 applications — Depending on the user account used to log on to the application, permission is granted to control and configure the application. These K2 applications include AppCenter, Storage Utility, and the K2 System Configuration application.
- Media access — There are three types of media access security, as follows:
  - Media access in AppCenter — You can set user permissions on the K2 bins that store your media. Then, depending on the current AppCenter logon, permission is granted for AppCenter operations on the media in the bins.
  - Media access via FTP — The user permissions set on K2 bins in AppCenter also determine access via FTP. Depending on the FTP session logon, permission is granted for FTP commands accessing the media in the bins.
  - Media access via protocols — The permissions set on K2 bins in AppCenter also determine access for channels controlled by protocols. Depending on the channel accessing the media, permission is granted for operations on the media in the bins.
- Channel access security — You can set user permissions for each channel. Then, depending on the current AppCenter logon or protocol operating a channel, permission is granted or denied to operate the channel.

Related Topics

Passwords and security on Grass Valley systems on page 15
AppCenter operations and media access security on page 344
FTP and media access security on page 344
Protocol control of channels and media access security on page 345
About channel access security on page 346

Example: Setting up user access to bins

In this example User A requires a private bin in which only they can see media or have any access to media. User B requires a bin that provides media to other users, but prevents other users from modifying the media. To set up security features to meet these requirements, do the following:

Task	Documentation
Log on to the local K2 system with Windows administrator permissions.	*Passwords and security on Grass Valley systems* on page 15
Configure a “userA” account and a “userB” account on the local K2 client.	Use standard Windows procedures
Log on to AppCenter with GV administrator permissions.	*Passwords and security on Grass Valley systems* on page 15
Create a “userA_private” bin and a “userB_share” bin on the local K2 system.	*K2 AppCenter User Manual*

Task	Documentation
For bin "userA_private" configure an access control list with permissions as follows: • Create a group and add all users except user A to the group. For this group, set permissions to: Deny Full Control • userA: Allow Full Control	*Configuring media access security for K2 bins* on page 343
For bin "userB_share" configure an access control list with permissions as follows: • Create a group and add all users except user B to the group. For this group, set permissions to: Allow List Bin Contents, Allow Read, Deny Write, Deny Delete • userA: Allow Full Control	*Configuring media access security for K2 bins* on page 343
Log on to AppCenter as userA. Test userA access to bins. Log off.	—
Log on to AppCenter as userB. Test userB access to bins. Log off.	—

Example: Setting up user access to channels

In this example User A requires exclusive access to channels 1 and 2 and User B requires exclusive access to channels 3 and 4. To set up security features to meet these requirements, do the following:

Task	Documentation
Log on to the local K2 system with Windows administrator permissions.	*Passwords and security on Grass Valley systems* on page 15
Configure a "userA" account and a "userB" account on the local K2 client.	Use standard Windows procedures
Log on to AppCenter with GV administrator permissions.	*Passwords and security on Grass Valley systems* on page 15
For channels 1 and 2, configure access control lists with permissions as follows: • Create a group and add all users except user A to the group. For this group, set permissions to: Deny • userA: Allow	*About channel access security* on page 346
For channels 3 and 4, configure access control lists with permissions as follows: • Create a group and add all users except user B to the group. For this group, set permissions to: Deny • userB: Allow	*About channel access security* on page 346

Task	Documentation
Log on to AppCenter as userA. Test userA access to channels. Log off.	—
Log on to AppCenter as userB. Test userB access to channels. Log off.	—

Passwords and security on Grass Valley systems

To provide a basic level of security, Grass Valley systems recognize three different security levels based on Windows users and groups, and the systems ship from the factory with accounts pre-configured accordingly. To access the system you must log on with the user name and password for one of the pre-configured accounts.

The following table shows the different types of users and their privileges.

	Windows administrator	Grass Valley product administrator	K2 product administrator	Grass Valley product user
User name	Administrator	GVAdmin	K2Admin	GVUser
AppCenter Configuration Manager	Full access	Full access	Full access	Can view
AppCenter	Full access	Full access	Full access	Full access; requires an account on the K2 Summit system
Storage Utility	Full access	Full access	Full access	Can't access
K2Config	Full access	Full access	Full access	Can't access
Server Control Panel	Full access	Full access	Can view	Can view
Windows Operating System	Full access	Full access	Limited access (based on Windows user account privileges).	Limited access (based on Windows user account privileges)

To support legacy FTP and security features, K2 systems also have *movie*, *mxfmovie*, *mpgmovie*, and *video_fs* accounts. Do not use these accounts to log in to the Windows operating system on K2 systems.

Related Topics

Accessing Configuration Manager on page 68
Storage Utility for standalone K2 Summit system on page 70

Configuring media access security for K2 bins

The permissions you set on a K2 bin restricts access to the media in the bin via AppCenter operations, via FTP, and via protocol control of channels.

You can set permissions on a K2 bin as follows:

- Write — Allow access to rename or delete any of the clips located in the bin.
- Delete — Allow access to delete any of the clips located in the bin.
- Read — Allow access to the clips located in a bin, but deny the ability to modify the clips.
- List Bin Contents — Allow or deny access to explore the contents of the bin. This permission also controls access to transfer clips in/out of the bin and to perform search operations on the bin.
- Full Control — Allow or deny all of the above permissions plus the ability to modify the permissions on a bin.

As you configure permissions, take the following into account:

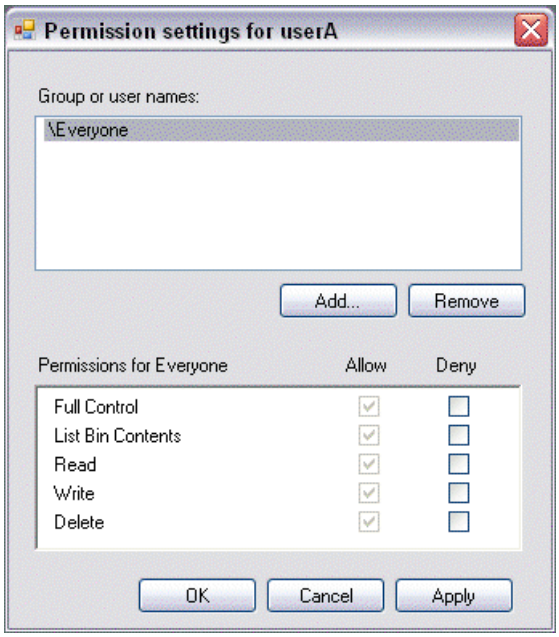
- In case of conflicts, the Deny permission always overrides the Allow permission.
- Do not restrict access for the *movie*, *mxfmovie*, and *video_fs* accounts. These accounts are used for access by applications and modifying permissions can cause applications and transfers to fail. If your security policy requires restricting access to these accounts, contact Grass Valley Support.
- By default, the “Everyone” group is set to Full Control, with all permissions allowed. When you create a new bin it has these default permissions applied automatically.
- Avoid using the “Everyone” group to restrict permissions. Doing so causes some or all operations to fail, regardless of the account currently logged on.
- The “system” user account must retain access to bins and files.
- Never deny any permissions to the user NT AUTHORITY\System.
- The user account that originally created a bin always retains the ability to modify permissions on that bin.

If you need to restrict access to a K2 bin that you have created, set up a media access control list on the bin, as instructed in the following procedure.

1. Make sure you are logged on to Windows and AppCenter with administrator privileges.
2. Create user accounts and bins as necessary to support your permission policies.
3. In the Clips pane, select the Current Bin drop-down list, then select **Organize Bins**. The Organize Bins dialog box opens.

4. Create a bin if necessary, or otherwise select the bin for which you are setting permissions and then click **Permission**. The Permission settings dialog box opens.

   NOTE: You can not set permissions on the default bin or on the Recycle bin.



5. Add users and groups to the access control list and set permissions as follows:
   a) Click **Add**. The Select Users or Groups dialog box opens. This is the standard Windows operating system interface to users and groups, so you can use standard Windows procedures. In the "Enter the object names…" box, you can enter the users or groups for which you want to set permissions, then click **OK**.
   b) In the Permission settings dialog box, select a user or group and then set permissions as desired.
6. Click **Apply**, **OK**, and **Close** to save settings and close dialog boxes.

AppCenter operations and media access security

AppCenter uses the credential information for the current AppCenter logon and checks it against the access control list for a K2 bin. This is the access control list that you set up through the Organize Bins dialog box in AppCenter. In this way, AppCenter determines whether to allow or deny operations on media in a K2 bin.

Once permissions are granted based on the current logon account, those permissions remain in place until that account logs off of AppCenter.

FTP and media access security

The following systems host the K2 FTP interface:

- A stand-alone K2 system.

- A K2 Media Server that takes the role of FTP server

The way in which the K2 FTP interface applies media access security is explained in this section.

The K2 FTP interface uses the credential information for the current FTP session logon and checks it against the access control list for a K2 bin. This is the access control list that you set up through the Organize Bins dialog box in AppCenter. Any media access related operations such as `get`, `put`, `dir`, `rename` and `delete` are checked against the FTP session's logon credentials to access the media. For example, if an FTP session is denied access to List Bin Contents for bin A, then the session can not initiate a `dir` operation on bin A to list the contents of the bin. Furthermore, the session can not transfer clips into bin A using the `put` operation.

For the purpose of legacy support with older Profile systems, accounts for user `movie` or user `mxfmovie` are provided on the K2 system. There is also a `video_fs` account for Mac/FCP access. These accounts are automatically set up when you install K2 software version 3.2 or higher. Do not restrict access for these accounts. If your security policy requires restricting access to these accounts, contact Grass Valley Support.

Protocol control of channels and media access security

Protocol security restricts a channel in its access to the media in a bin, regardless of what user is currently logged on to AppCenter. This is different than the other types of media access security, in which the security restricts the user (as currently logged on to AppCenter) in their access to the media in a bin, regardless of what channel is being used.

Nevertheless, permissions for protocol channels are still derived from user accounts. In AppCenter's Configuration Manager, on the Security tab you can associate a user account with a channel of protocol control. Based on that association, when a protocol controls the channel, AppCenter checks the credential information for the associated user account against the access control list for a K2 bin. This is the access control list that you set up through the Organize Bins dialog box in AppCenter. In this way, AppCenter determines whether to allow or deny that channel's operations on the media in the bin.

By default, protocols have administrator privileges for media access. In addition, protocols are always allowed access to a channel.

Associating a protocol channel with a user account

1. Make sure you are logged on to Windows and AppCenter with administrator privileges.
2. Create user accounts and bins as necessary to support your permission policies.
3. Click **System | Configuration**. Configuration Manager opens.
4. Click a channel tab.
5. Click the **Security** tab.
6. Enter the username, the password, and (if applicable) the domain for the user account that you are associating with the channel.

   When this channel is under protocol control and it accesses media in a bin for which permissions have been set, AppCenter makes the channel's access to the media equivalent to this user's access to the media.
7. Click **OK** to save Configuration Manager settings and close Configuration Manager.

8. Restart AppCenter to put the change into effect.

About channel access security

Channel access security restricts the user (as currently logged on to AppCenter) in their use of an AppCenter channel, regardless of what bin or what media is involved. This is different than media access security, in which the security restricts the user in their access to the media in a bin, regardless of what channel is being used.

You can set up an access control list for each channel through the channel's Permissions dialog box. AppCenter uses the credential information for the current AppCenter logon and checks it against the access control list for a channel. In this way, AppCenter determines whether to allow or deny access to the channel's controls.

When you set up a channel access control list, you select the permissions for the channel as follows:

Allow — The user can operate the channel. All channel controls are enabled.

Deny — The user can not operate the channel. The controls are not displayed on the channel pane.

If neither Allow nor Deny are selected permissions are inherited from the user's parent group.

You configure these permissions to apply to users and groups. By default, all channels have their permission set to allow access to "Everyone". In case of conflicts arising from a user belonging to multiple groups, the Deny permission always overrides the Allow permission.

When you log on to AppCenter on a local K2 system, permissions for all local channels are based on the single user logged on. Therefore channel permissions are enforced for just one user at a time across all local channels. If you require that channel permissions be enforced simultaneously for different users each accessing their own channel or channels on a single K2 system, those users must log on via a remote AppCenter channel suite from a Control Point PC. The remote AppCenter channel suite allows each channel to be operated by a different user.

Once permissions are granted based on the current logon account, those permissions remain in place until that account logs off of AppCenter.

If you need to restrict access to an AppCenter channel, configure channel access security by setting up a channel access control list.

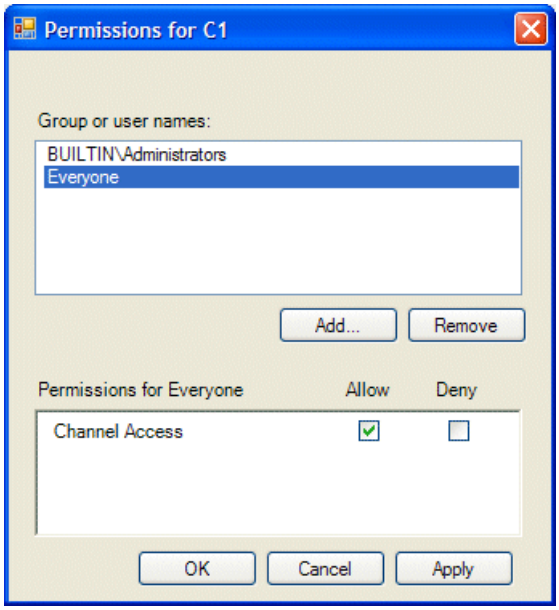
Setting up a channel access control list

1. Make sure you are logged on to Windows and AppCenter with administrator privileges.
2. Create user accounts and bins as necessary to support your permission policies.
3. Click **System | Configuration**. Configuration Manager opens.
4. Click a channel tab.
5. Click the **Security** tab.

   NOTE: Do not configure protocol user setup. This is for protocol media access security only and has nothing to do with channel access security.

6. Click **Permission**.

   The Permissions dialog box opens.



7. Add users and groups to the access control list and set permissions as follows:
   a) Click **Add**. The Select Users or Groups dialog box opens. This is the standard Windows operating system interface to users and groups, so you can use standard Windows procedures. In the "Enter the object names…" box, you can enter the users or groups for which you want to set permissions, then click **OK**.
   b) In the Permission settings dialog box, select a user or group and then set permissions as desired.

      Remember that by default, "Everyone" is set to Allow. You might need to change this in order to configure your permission policies.

   NOTE: You can not change permissions for the BUILTIN\Administrators account.
8. Click **Apply** and **OK** to save settings and close the Permissions dialog box.
9. Click **OK** to save Configuration Manager settings and close Configuration Manager.
10. Restart AppCenter to put the change into effect.

K2 and GV STRATUS security considerations

Access Control Lists (ACLs) specify individual user or group rights to specific system objects such as programs, processes, or files. K2 Summit systems enforce ACLs for security and permissions on K2 bins and channels, while the GV STRATUS system has its own mechanism for security. The GV STRATUS system always accesses the K2 Summit system via the internal system account, which by default is GVAdmin, and the K2 Summit system is configured by default to allow full access to that account. This is an important consideration to allow the systems to operate together. Therefore you must not change the default configuration of security and permissions on your K2

Summit systems that are part of your GV STRATUS system. This includes Windows operating system ACL settings and K2 AppCenter security/permission settings on bins and channels. Changing these settings could prevent the GV STRATUS system from accessing the K2 Summit system. Configure security using GV STRATUS security only. Do not configure K2 Summit security.

Understanding virus and security policies

Read the topics in this section for a better understanding of your system.

Windows operating system update policy

Grass Valley recognizes that it is essential to deploy Microsoft security patches to Windows operating system products as quickly as possible. As Grass Valley systems are used to meet the mission-critical requirements of your environment, it is imperative that these systems be kept up to date in order to maintain the highest level of security available. To that end, Grass Valley recommends that for standard-edition Windows operating system products, you install all important updates provided by Microsoft. In the unlikely event that one of these updates causes ill effects to a Grass Valley system, you are urged to uninstall the update and contact Grass Valley customer service as soon as possible. Grass Valley will investigate the incompatibility and, if necessary, provide a software update or work-around to allow the system to properly function with the Microsoft update in question.

Note that this policy applies to “Important” updates only. There are countless updates not classified as “Important” that are made available by Microsoft. If you believe that one or more of these other updates must be applied, contact Grass Valley prior to installation. This policy also applies to standard-edition (not embedded) operating systems only. Do not attempt to update an embedded Windows operating system in any way except as directed by Grass Valley for the specific product.

You should exercise common sense when applying updates. Specifically, do not download or install an update while a Grass Valley product is being used for mission-critical purposes such as play to air.

NOTE: If a computer does not have the Grass Valley* Embedded Security *solution one-time initial deployment process applied, do not install any Windows updates. Apply the one-time process before installing Windows updates.

Embedded Security modes and policies

The Embedded Security solution protects against viruses and other unauthorized programs on the following Grass Valley systems:

- K2 Summit system system

Embedded Security prevents any unauthorized programs from running on the system. It contains a whitelist of programs that are authorized to run. Whenever a program attempts to run, it is checked against the whitelist. If the program is not on the whitelist, Embedded Security blocks the program from running. SiteConfig, and any software deployed by SiteConfig, is on the whitelist, so you do not need to manage Embedded Security in any way when using SiteConfig to deploy software. All versions of SiteConfig are compatible with Embedded Security.

When installing software manually (without SiteConfig) it might be necessary to manage Embedded Security. When necessary, you can put Embedded Security in Update mode. This mode allows you

to manually install software that is not on the whitelist. Do not confuse Update mode with the idea that Embedded Security is "disabled". When in Update mode, Embedded Security is still active. While in Update mode, Embedded Security keeps track of any software you run or install and adds it to the whitelist. When you are done installing software and any required restarts, you must take Embedded Security out of Update mode so that it can protect the system. For software that requires a restart after installation, such as K2 system software and SNFS media file system software, Embedded Security must remain in Update mode until after the restart is complete.

No system restarts are required for entering or leaving Update mode, and a restart does not change the Update mode status. If in Update mode before a restart, the system remains in Update mode after a restart. You use the Embedded Security Manager to enter and leave Update mode.

The following policies apply to the Embedded Security:

- Use Update mode only as instructed by Grass Valley product documentation or as directed by Grass Valley Support. Do not do any other operations with Embedded Security Manager, unless under the direct supervision of Grass Valley Support.
- Do not keep Embedded Security in Update mode long-term, as Embedded Security does extra processing while in Update mode and eventually problems arise when attempting to run software.
- Make sure that Embedded Security is not in Update mode when using SiteConfig to install software. Update mode interferes with SiteConfig's automatic management of Embedded Security and causes problems running the software installed.
- Leave Embedded Security enabled for normal operation of your Grass Valley system. Do not disable Embedded Security except as instructed by Grass Valley product documentation or as directed by Grass Valley Support. Enabling and disabling Embedded Security requires a restart.
- Do not install any programs or modify any operating system settings unless approved by Grass Valley. By design, Embedded Security prevents any programs from being installed or from running that are not present when you receive the system new from Grass Valley. These Grass Valley systems are not general purpose Windows workstations. The applications and configuration have been specifically optimized on each system for its intended use as part of the Grass Valley system.
- While Embedded Security is the key anti-virus component on these systems, you should still follow the Grass Valley anti-virus scan policy and scan all the devices in your Grass Valley system to ensure viruses are not propagated between machines.

Embedded Security is part of the K2 Summit system generic disk image and the K2 Media Server generic disk image compatible with K2 software version 9.0 or higher. Both K2 Media Servers and GV STRATUS servers use the same generic disk image, so GV STRATUS servers inherit the Embedded Security solution. On K2 Summit systems, the Embedded Security solution introduced with K2 software version 9.0 replaces the write filter from previous versions.

Grass Valley anti-virus scan policy

Grass Valley systems are based on the Microsoft Windows operating system. It is important to defend this system against virus or Spyware attacks. However, you must use a strategy that allows you to scan Grass Valley systems without interrupting media access. The Grass Valley Embedded Security solution on K2 and GV STRATUS systems is a qualified strategy. If you use Embedded Security on a device, do not use other anti-virus strategies on that device. Contact Grass Valley Support to determine the strategy best suited to your environment.

Network and firewall policies

The following protection policies are recommended:

- Where possible, the K2 system should be run in a closed and protected environment without network access to the corporate IS environment or the outside world.
- If the K2 system must operate in a larger network, Grass Valley recommends that access be through a gateway or firewall to provide anti-virus protection. The firewall should allow incoming HTTP (TCP port 80) connections for client and configuration connections to the K2 system inside the private network.
- Access to the K2 system should be controlled in order to limit the likelihood of malicious or unintended introduction of viruses.

About tri-level sync

The K2 Summit system supports tri-level sync as a genlock reference source. The reference must be in an HD format and frame rate that is supported by the K2 Summit system, as follows:

- Reference Standard: NTSC (59.97Hz)
  - 1080i 29.97
  - 720p 59.94
- Reference Standard: PAL (50Hz)
  - 1080i 25
  - 720p 50

The K2 Summit system automatically detects, switches, and syncs to the reference. When you configure the reference standard for either NTSC (59.97Hz) or PAL (50Hz) in K2 AppCenter Configuration Manager, a restart is required to put the change into effect and the system starts with a SD reference format by default. It then attempts to detect a reference in a format and frame rate that is compatible with the current reference standard setting. When the K2 Summit system detects a reference in a supported format, it automatically switches to that format. This allows the system to switch between SD and HD tri-level formats with frame rates that are compatible with the reference standard setting. When the K2 Summit system locks to a new reference format, it saves the format and frame rate information, and upon restart it returns to the saved format and frame rate.

Do not use a progressive reference with an interlace output. For example, do not use 720p tri-level sync for interlace output formats (such as SD and 1080i). Output timing can be off by a field with this type of incompatibility.

The K2 Summit system treats the following conditions as a loss of reference:

- No reference is present
- A reference in an unsupported format is present
- A reference in a supported format is present but it has a frame rate that is not compatible with the current reference standard setting.

In these cases the K2 Summit system internal genlock flywheel provides a stable reference for the last reference set. The system reports this status in K2 AppCenter Configuration Manager Reference Standard by a black "Reference present" indicator.

Auto log on

If you set a K2 Summit Production Client to automatically log on to the Windows operating system at startup, AppCenter honors this setting. This means that at startup AppCenter bypasses its log in dialog box and opens automatically. For more information about how to turn on automatic login in the Windows operating system, including security risks and procedures, refer to the related Microsoft knowledge base article.

Regional settings

On all K2 Summit Production Clients in the Windows Control Panel “Region,” there are special FTP internationalization requirements regarding the language for non-Unicode programs to support FTP transfers. Do not change these settings.

Related Topics

About FTP internationalization on page 262
Internationalization on page 383
Setting the FTP language on page 263

Checking RAM

You can determine the amount of Random Access Memory (RAM) on your K2 Summit system's CPU module.

1. Connect the the K2 Summit system's USB Recovery Flash Drive to the K2 Summit system.
2. On the USB Recovery Flash Drive, locate and double-click the following:

   `CPUList.exe`

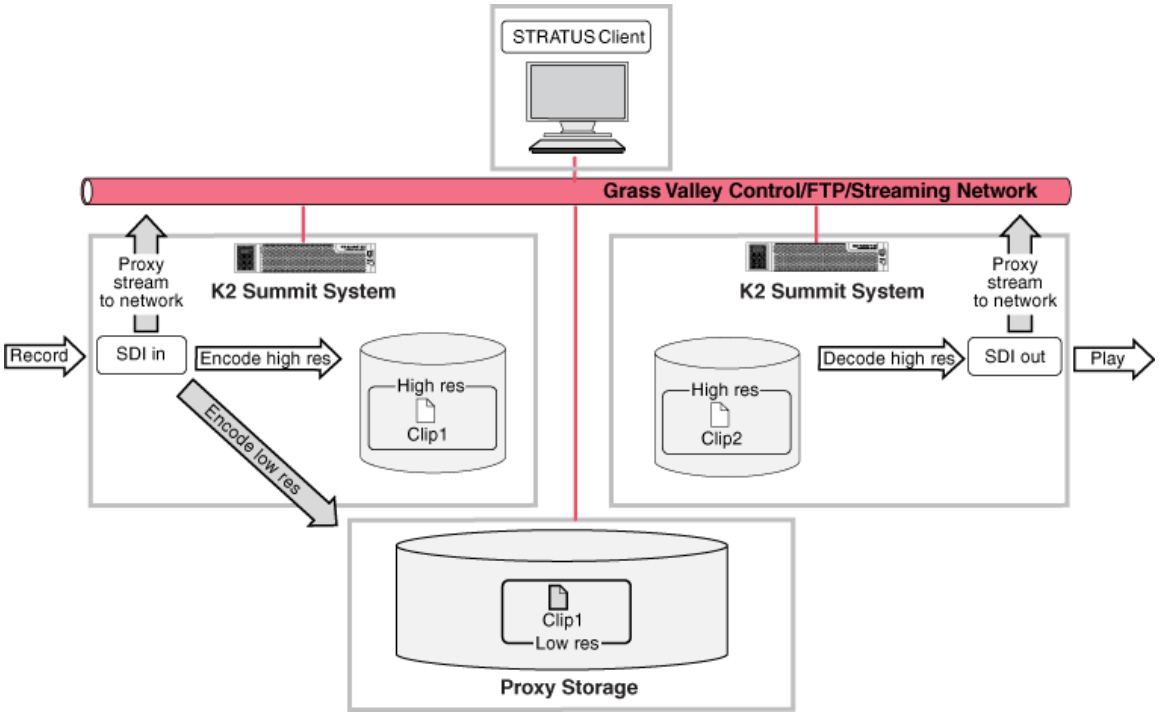
   A System Inventory window opens and displays information about the manufacturer, model, and amount of RAM on the CPU module.
3. Press **Enter** to close the System Inventory window.

Related Topics

About memory requirements

Proxy/live streaming

Proxy and live streaming workflow overview



When licensed and configured, a K2 Summit system creates low-resolution representations of high-resolution media. Similar to PB/EE functionality, the K2 Summit System creates a live stream of low-resolution media at the SDI input and a live stream of low-resolution media at the SDI output, whether or not record/play operations are underway. These streams are multicast to the network and are available to applications on the network. When media is recorded, the K2 Summit system encodes a high resolution clip and a low resolution proxy clip. The system keeps these clips associated so any changes take effect simultaneously for both clips.

The GV STRATUS application accesses the low-resolution media over the network. When you monitor the K2 Summit system SDI inputs and outputs, the application displays the live stream. When you view an asset, the application displays the proxy representation of the asset. When you edit an asset, the K2 Summit system makes your changes on both the proxy and the high resolution asset.

The K2 Summit system can also generate low-latency streaming media for use by DynoZoom and live monitoring. Refer to related topics in the "Configuring the K2 System" section of this Topic Library.

Related Topics

DynoZoom, live monitoring, and GV STRATUS streaming on page 356

Configuring proxy and live streaming settings on page 185

Proxy/live streaming technical details on page 354
Proxy/live streaming formats and specifications on page 370

About proxy/live streaming

The K2 Summit system writes proxy files to a CIFS share, using credentials for the internal system account, which by default is GVAdmin. A proxy file contains the video track, audio tracks, and timecode. The file is a fragmented MPEG-4 file, which can record/play in chunks. This allows you to play a growing proxy file while it is still recording.

Each K2 Summit system channel multicasts a low-resolution live stream. The K2 Summit system has an HTTP server over which it makes the SDP file available to applications that play the live stream. The K2 Summit system can also generate low-latency streaming media for use by DynoZoom and live monitoring. Refer to related topics in the "Configuring the K2 System" section of this Topic Library.

A Type II, Type III, or Type IV CPU module is required to support proxy/live streaming.

An AppCenter Pro or AppCenter Elite license on the K2 Summit system enables proxy/live streaming. If licensed for AppCenter Pro, a live stream is available from each of the four channels. If licensed for AppCenter Elite, ChannelFlex features allow you to configure up to eight inputs/outputs, so up to eight live streams are similarly available. When a K2 Summit system is licensed, in Configuration Manager (a part of the K2 AppCenter application) you can configure proxy/live streaming for each channel. You can turn proxy file recording on or off, and you can turn live network streaming on or off. When you turn proxy file recording on, you can then select up to eight audio tracks to include in the proxy file. You can also turn automatic scene detection on or off. When you turn scene detection on, you can configure the minimum scene length. When you turn proxy live network streaming on, you can then select two audio tracks (one pair) to include in the proxy stream.

If licensed for AppCenter Elite, a ChannelFlex channel generates proxy/live streaming as follows:

- Multi-cam Recorder — Both high-resolution assets have their own proxy file. Two live streams are also available. If shared audio, the proxy file and live stream are generated as follows: the first input includes video, audio, and timecode; the second input includes video but does not include audio and timecode.
- 3D / Video + Key — Two live streams are available as follows: the first input/output includes video, audio, and timecode; the second input/output includes video but does not include audio and timecode. Proxy files are not created.
- Super Slo-Mo Recorder — A video-only proxy file and a video-only live stream are generated that are normal speed, which means that they are one half or one third the Super Slo-Mo record rate.

Proxy recording is not supported for continuous record mode.

Network switches and firewalls must be configured to allow the multicast live streaming traffic. IGMP Snooping must be enabled on the network that carries the low-resolution live streaming traffic.

Related Topics

DynoZoom, live monitoring, and GV STRATUS streaming on page 356
Configuring proxy and live streaming settings on page 185

Proxy/live streaming technical details on page 354
Proxy/live streaming formats and specifications on page 370
Proxy/live streaming technical details on page 354

Test proxy media generation

This test is valid for standalone K2 Summit systems. You can check the proxy media that the K2 Summit system generates. This can be helpful in troubleshooting situations where you need to verify that the proxy is available to other applications, such as the GV STRATUS application.

Use this procedure for test purposes only. Accessing proxy media as explained in this procedure is not supported for operational use.

1. Verify that in K2 AppCenter Configuration Manager, a K2 Summit system channel is enabled for live network streaming and for recording proxy files.
2. Verify that there is video available at the channel's SDI input.
3. Verify proxy live network streaming as follows:
   a) On the K2 Summit system, navigate to `C:\live stream`.
   b) Identify the file that corresponds to the channel enabled for live network streaming.

      The file name is `hostname_Cx,sdp`, where `x` is the channel number.
   c) Double-click the file that corresponds to the channel enabled for live network streaming.

      QuickTime Player opens.
   d) View and verify the proxy video stream.
4. Verify recording proxy files as follows:
   a) Navigate to the proxy location.

      On a K2 Summit system that has not been configured to write proxy elsewhere, the location is `V:\proxy`. If configured by applications such as GV STRATUS to write proxy elsewhere, navigate to the configured location.
   b) While viewing the proxy location, start recording a new clip on the K2 Summit channel enabled for recording proxy files.

      The K2 Summit system creates a new folder at the proxy location. The folder is named with a long GUID.
   c) Stop the recording on the K2 Summit channel.
   d) In the new folder, double-click the `proxy.mp4` file.

      QuickTime Player opens.
   e) View and verify the proxy file.

Proxy/live streaming technical details

The K2 Summit system writes proxy files to the proxy location specified in the GV STRATUS Control Panel application. On the specified device the location is `V:\proxy\`. For each clip recorded, the K2 system creates a directory and names it with the asset GUID, which is a long, unique string of characters. These directory names do not correspond to clip names or other human readable information. The directory contains the proxy files, which include the proxy video and audio files,

as well as thumbnails files and a scene change file. The proxy video file is a fragmented MPEG-4 file. For test purposes, you can open the proxy file in a video player application that supports fragmented MPEG-4.

The K2 Summit system multicasts the low-resolution live stream using Real-time Transport Protocol, with UDP ports for the MPEG video with timecode and UDP ports for audio tracks, as defined by the Session Description Protocol (SDP). For each channel, the K2 system generates a `*.sdp` file that contains the streaming media initialization parameters. The K2 system updates the file whenever you change the live streaming configuration. You can find these files on the K2 system at `V:\live streaming`. For test purposes, you can open a file in a text editor and read the IP addresses and ports assigned to the multicast session and other configuration information for the stream.

The K2 Summit system can also generate low-latency streaming media for use by DynoZoom and live monitoring. Refer to related topics in the "Configuring the K2 System" section of this Topic Library.

The K2 Summit system generates for each of its channels the specific live streaming network ports and IP addresses based on a port base and an IP address base. The port base is the first UDP port address for elementary streams. The IP address base is the first two octets in the IP address, as specified by the Internet Assigned Numbers Authority (IANA). By default, the port base is 31820 and the IP address base is 239.192.0.0. With these default bases, the range of network ports is UDP 31820 to 31827 , and the range of IP addresses is 239.192.x.x to 239.195.x.x. Grass Valley recommends that you use these default settings. However, if necessary for your site's network policies, you can also change the K2 system's default settings. You can configure the port base and the IP address base. Only IP addresses specified by IANA for multicast are allowed. Do not attempt to edit the `*.sdp` files, as the K2 system generates them automatically whenever the system is restarted. If you change the IP address of the K2 system, you must restart in order to update the IP address in the `*.sdp` file.

The K2 Summit system hosts a simple web server over which it delivers the live stream via HTTP. For test purposes, you can access the live stream by entering a URL of the following convention in a standard web browser:

```
http://<httpservername>/live/<k2systemname>_<Cn>.sdp
```

For example, to view the live stream from channel four on a K2 system named Summit01, the URL is `http://Summit01/live/Summit01_C4.sdp`. The http server name is the same as the name of the K2 system.

Related Topics

DynoZoom, live monitoring, and GV STRATUS streaming on page 356
Configuring proxy and live streaming settings on page 185
Proxy/live streaming formats and specifications on page 370
About proxy/live streaming on page 353

DynoZoom, live monitoring, and GV STRATUS streaming

The K2 Summit system is configurable to generate one of the following types of live network streaming media:

- A proxy low bitrate stream, designed for good resolution with minimal network bandwidth impact. This is the stream used by the GV STRATUS system.
- A low-latency high bitrate stream, designed for fast performance. The bit-rate of this stream is adjustable. High bitrate streaming media and/or streaming from multiple K2 Summit system channels can overload network bandwidth. This is the stream used by the K2 Dyno Replay Controller for DynoZoom and for live monitoring.

The K2 Summit system interprets Proxy Setup settings in K2 AppCenter Configuration Manager to determine the type of streaming media generated from a channel, as follows:

- Proxy stream: Record proxy files set to Yes; Live network streaming set to Yes. For GV STRATUS, use these settings on all channels.
- Low-latency stream: Record proxy files set to No; Live network streaming set to Yes. For K2 Dyno Replay Controller live monitoring or DynoZoom, use these settings on your Program play channel.

In addition, if you use DynoZoom, in your Program play channel's Video Output settings, Pan+Zoom must be set to On.

It is important to control the bit-rate and the number of channels generating low-latency streaming traffic on your network, as it can affect the performance of transfers and other operations of your system.

Remote control protocols

About remote control protocols

This section provides information for using remote control protocols to operate K2 Summit systems. It is intended for use by installers, system integrators, and other persons responsible for setting up automation systems at a customer site.

For information about configuring AppCenter to enable protocol control of a K2 channel, refer to topics in the "Using K2 AppCenter" section of the K2 Topic Library.

Special considerations for automation vendors

The following information is provided for your convenience as you set up your chosen automation product to control K2 systems. Consult your automation vendor for complete information.

Harris settings

The Harris automation product uses VDCP protocol.

The following settings are required for the Harris automation product:

Setting	Mixed compression format playout	Same compression format playout	Comments
Disk Prerolls	1 second	10 frames	—
Frames to send Play early (Preroll Play)	1 second	10 frames	These two settings should be the same as the Disk Prerolls setting. However, if there is extra fixed latency in your RS-422 communication path, you might need to adjust the settings differently.
Frames to send Record early (Preroll Record)	1 second	10 frames	
Disk Port Comm Timeout	60 frames	60 frames	This is the minimum required by K2. Do not use the Harris default value, which is 10.
Back To Back Rec	Unchecked	Unchecked	K2 does not support this feature.

RS-422 protocol control connections

You can connect one RS-422 cable to each channel. Each RS-422 connection controls the channel to which it is connected only. Connect the RS-422 cabling as required, then refer to topics in the "Using K2 AppCenter" section of the K2 Topic Library to configure the K2 system for remote control.

Specifications for the RS-422 connection are as follows:

- Data Terminal Equipment (DTE)
- 38.4K Baud
- 1 Start bit
- 8 Data bits
- 1 Parity bit
- 1 Stop bit

Related Topics

Configuring a channel for remote control on page 79

Security and protocol control

The K2 security features can be configured to restrict protocol control of channels.

Related Topics

Protocol control of channels and media access security on page 345

Specifications

AC power specification

Table 9: K2 Summit 3G AC power specification

Characteristic	Specification
Power supply	Dual, redundant
Mains Input Voltage	90 to 260V auto-range, 47-63Hz
Power consumption	450W typical (standalone) 390W typical (SAN client) Maximum AC current 8A @ 115VAC, 4A @ 230VAC

⚠ ***WARNING: Always use a grounded outlet to supply power to the system. Always use a power cable with a grounded plug, such as the one supplied with the system.***

Environmental specifications

The K2 Summit 3G system specification is shown in the following table:

Characteristic	Specification
Ambient Temperature Non-Operating	-40° to +60° C
Ambient Temperature Operating	10° to +40° C
Relative Humidity	Operating 20% to 80% from 10° to +40° C Non-Operating 10% to 85% from -30° to +55° C Do not operate with visible moisture on the circuit boards
Operating Altitude	To 10,000 feet IEC 950 compliant to 2000 meters
Storage Altitude	To 40,000 feet
Non-Operating Mechanical Shock	30G 11 ms trapezoid
Random Vibration Operational	0.27 GRMS (5-500Hz)

Characteristic	Specification
Random Vibration Non-Operational	2.38 GRMS overall .019 g2/Hz (5-100Hz) .009 g2/Hz (200-350Hz) .0065 g2/Hz (500 Hz)
Equipment Type	Information Technology
Equipment Class	Class 1
Installation Category	Category II Local level mains, appliances, portable equipment, etc.
Pollution Degree	Level 2 operating environment, indoor use only.

The first generation K2 Summit system specification is shown in the following table:

Characteristic	Specification
Ambient Temperature Non-Operating	-40° to +60° C
Ambient Temperature Operating	10° to +40° C
Relative Humidity	Operating 20% to 80% from 10° to +40° C Non-Operating 10% to 80% from -30° to +60° C Do not operate with visible moisture on the circuit boards
Operating Altitude	To 10,000 feet IEC 950 compliant to 2000 meters
Storage Altitude	To 40,000 feet
Non-Operating Mechanical Shock	30G 11 ms trapezoid
Random Vibration Operational	0.27 GRMS (5-500Hz)
Random Vibration Non-Operational	2.38 GRMS overall .0175 g2/Hz (5-100Hz) .009375 g2/Hz (200-350Hz) .00657 g2/Hz (500 Hz)
Equipment Type	Information Technology
Equipment Class	Class 1
Installation Category	Category II Local level mains, appliances, portable equipment, etc.
Pollution Degree	Level 2 operating environment, indoor use only.

Specifications vary for transmission products.

Related Topics

K2 Summit 3G Transmission models requirements and restrictions

Mechanical specifications

The K2 Summit 3G Production Client specification is shown in the following table

Dimension	Measurement
Height	3.5 in (89mm)
Width	17.6 in (447 mm)
Depth [1]	24.3 in (617 mm) total 23.0 in (585 mm) rack depth
Weight:	55.0 lbs (25.0 kg) maximum

Electrical specifications

The following sections describe the electrical specifications:

Serial Digital Video (SDI)

The K2 Summit system system specification is shown in the following table

Parameter	Specification
Video Standard	SD: 525 Line or 625 Line component HD: 720p or 1080i
Number of Inputs	1 per channel standard. 2 or 3 per channel when licensed for ChannelFlex Suite.
Number of Outputs	2 per channel
Data format	Conforms to SMPTE 259M (SD) and 292M (HD)
Number of bits	10bits
Embedded Audio Input	SD data format conforms to SMPTE 259M (48kHz, 20bits) HD data format conforms to SMPTE 299 48 kHz (locked to video) and 16- or 24- bit PCM Compatible with AC-3 and Dolby-E
Embedded Audio Output	Output data format is 48 kHz 24-bit User can disable embedded audio on SDI output
Connector	BNC, 75 ohm, No loop-through

[1] Adjustable rack-mounting ears accommodate different rack depth limitations.

Parameter	Specification
nominal Amplitude	800mV peak-to-peak terminated
DC Offset	0 +0.5V
Rise and Fall Times	SD: 400 - 1500ps; measured at the 20% and 80% amplitude points HD: less than 270ps
Jitter	less than 0.2UI peak-to-peak
Max Cable Length	SD 300 meters HD 125 meters
Return Loss	greater than or equal to 15db, 5Mhz to 1.485Ghz

Genlock Reference

The K2 Summit system system specification is shown in the following table:

Characteristic	Description
Signal Type	NTSC/PAL Color Black Composite Analog
Connectors	2 BNC, 75 ohm passive loop through
Signal Amplitude Lock Range	Stays locked to +6 dB and -3 dB
Input Return Loss	Greater than or equal to 36 dB to 6MHz
Tri-level sync	Supported

System Timing

The K2 Summit system system specification is shown in the following table. All delay values shown are relative to Black Reference.

Characteristic	Description
Encoder timing	Derived from the video input
Nominal Playback Output Delay	Adjustable (Default: Zero timed to reference genlock)
SD Output Delay Range (Independent for each play channel)	525 lines • Frames: 0 to +1 • Lines: 0 to +524 • Samples: 0 to +1715 clock samples

Characteristic	Description
	625 lines • Frames: 0 to +3 • Lines: 0 to +624 • Samples: 0 to +1727 clock samples
HD Output Delay Range (Independent for each play channel)	1080i at 29.97 FPS (SMPTE ST 274:2008) • Frames: 0 to +1 • Lines: 0 to +1124 • Pixels: 0 to +2199
	1080p at 59.94 FPS (SMPTE ST 274:2008) • Frames: 0 to +1 • Lines: 0 to +1124 • Pixels: 0 to +2199
	720p at 59.94 FPS (SMPTE ST 296:2012) • Frames: 0 to +1 • Lines: 0 to +749 • Pixels: 0 to +1649
	1080i at 25 FPS (SMPTE ST 274:2008) • Frames: 0 to +1 • Lines: 0 to +1124 • Pixels: 0 to +2639
	1080p at 50 FPS (SMPTE ST 274:2008) • Frames: 0 to +1 • Lines: 0 to +1124 • Pixels: 0 to +2639
	720p at 50 FPS (SMPTE ST 296:2012) • Frames: 0 to +1 • Lines: 0 to +749 • Pixels: 0 to +1979
Loop through/EE	The video, AES, and LTC inputs pass to the output connectors as loop through.

AES/EBU Digital Audio

The K2 Summit system system specification is shown in the following table:

Parameter	Specification
Standard	AES3
Audio Inputs	4 Channels per video input/output on DB-25. Supports 32 KHz to 96 KHz inputs, which are sample rate converted to 48 KHz, 16 bit, 20 bit, or 24 bit digital audio sources.
Audio Outputs	4 Channels per video output. Audio mapping is direct and fixed. AES outputs are active at all times. Audio is output using a 48kHz clock derived from the video reference. Supports 16- or 24-bit media. On playout, audio is synchronized with video as it was recorded. Compatible with AC-3 and Dolby-E
Input Impedance	110 ohms, balanced
Audio time shift	Configurable relative to video for both record and playout.

LTC Input/Output

The K2 Summit system system specification is shown in the following table:

Parameter	Specification
Standard	SMPTE 12M Longitudinal Time Code, AC coupled, differential input
Number of Inputs	1 per video input - Shared 6 pin conn. with output
Number of Outputs	1 per video output
Input Impedance	1K ohm
Output Impedance	110 ohm
Minimum Input Voltage	0.1 V peak-to-peak, differential
Maximum Input Voltage	2.5 V peak-to-peak, differential
Nominal Output Voltage	2.0 V peak-to-peak differential.
LTC Reader	LTC reader will accept LTC at rates between 1/30 and 80 times the nominal rate in either forward or reverse directions.
LTC Transmitter	LTC transmitter outputs LTC at the nominal frame rate for the selected standard at 1x speed, forward direction only.

VITC Input/Output

The K2 Summit system system specification is shown in the following table.

Parameter	Specification
VITC waveform	lines 10-20 NTSC (525 Line); lines 10-22 PAL (625 Line) VITC is decoded on each SDI input and inserted on each SDI output. VITC Reader configurable for a search window (specified by two lines) or set to manual mode (based on two specified lines). VITC Writer inserts VITC data on two selectable lines per field in the vertical interval. The two lines have the same data. VITC is not decoded off of the video reference input.

RS-422 specification K2 Summit 3G system

The RS-422 interface conforms to ANSI/SMPTE 207M-1997 standard (SMPTE 422).

The K2 Summit system system specification is shown in the following table.

Characteristic	Description
Number of Inputs/Outputs	1 per channel
Connector type	Female RJ45

GPI I/O specifications

The K2 Summit system system specification is shown in the following table.

Characteristic	Description
Number of Inputs/Outputs	12 inputs and 12 outputs.
Connector type	Female DB 25pin
GPI Input	TTL 0-0.8 V Low; 2.4-5 V High; 1 mA external current sink
GPI Output	Max Sink Current: 100 mA; Max Voltage: 30 V Outputs are open drain drivers. Max. voltage when outputs are open = 45V Max. current when outputs are closed = 250mA Typical rise times approximately 625ns Typical fall times approximately 400ns

Operational specifications

This section contains specifications related to media operations.

Related Topics

Video codec description K2 Summit system on page 365

Playout of multiple formats on page 370
Active Format Description (AFD) specifications on page 373
VBI/Ancillary/data track specifications on page 378
Internationalization on page 383
Limitations for creating and naming assets and bins on page 384
Video network performance on page 386
About file interchange mechanisms on K2 systems on page 386
Media file system performance on K2 systems on page 396
Transition effects formats and limitations on page 397
Protocols supported on page 398
Transfer compatibility with K2 Summit system on page 398
Control Point PC system requirements on page 401

Video codec description K2 Summit system

K2 Summit 3G Production Client specifications are shown in the following tables. Licenses and/or hardware options are required to enable the full range of specifications.

DV formats

Format	Sampling	Frame Rate	Data Rate	Other
DVCAM 720x480i 720x576i	4:1:1/4:2:0	29.97, 25	28.8 Mbps	Conforms to IEC 61834
DVCPRO25 720x480i 720x576i	4:1:1	29.97, 25	28.8 Mbps	Conforms to SMPTE 314M
DVCPRO50 720x487.5i 720x585i	4:2:2	29.97, 25	57.6 Mbps	Conforms to SMPTE 314M
DVCPRO HD 1280x1080i 1440x1080i	4:2:2	29.97, 25	100 Mbps	Conforms to SMPTE 370M
DVCPRO HD 960x720p	4:2:2	59.94, 50	100 Mbps	Conforms to SMPTE 370M

MPEG-2 formats

Format	Sampling	Frame Rate	Data Rate (Mbps)	Other
720x480i	4:2:0	29.97	2-15	I-frame and long GoP
720x480i	4:2:2	29.97	4-50	I-frame and long GoP
720x512i	4:2:2	29.97	4-50	I-frame and long GoP
720x576i	4:2:0	25	2-15	I-frame and long GoP
720x576i	4:2:2	25	4-50	I-frame and long GoP
720x608i	4:2:2	25	4-50	I-frame and long GoP
D10/IMX 720x512i	4:2:2	29.97	30, 40, 50 CBR	I-frame only
1280x720p	4:2:0	59.94, 50	20-80	I-frame and long GoP
1280x720p	4:2:2	59.94, 50	20-100	I-frame and long GoP
D10/IMX 720x608i	4:2:2	25	30, 40, 50 CBR	I-frame only
1920x1080i	4:2:0	29.97, 25	20-80	I-frame and long GoP[2]
1920x1080i	4:2:2	29.97, 25	20-100	I-frame and long GoP
XDCAM-HD 1440x1080i	4:2:0	29.97, 25	18 VBR, 25 CBR, 35 VBR	Long GoP
XDCAM-HD422 1920x1080i	4:2:2	29.97, 25	50 CBR	Long GoP
XDCAM-HD422 1280x720p	4:2:2	59.94, 50	50 CBR	Long GoP
XDCAM-EX 1920x1080i	4:2:0	29.97, 25	35 VBR	Long GoP
XDCAM-EX 1280x720p	4:2:0	59.94, 50	25 CBR, 35 VBR	Long GoP

K2 systems record closed GoP structure. If an open GoP clip is imported, it is fully supported, including trimming the clip, playout of the clip, using the clip in playlists, and exporting the clip.

[2] Decode of lower bit rate is possible

AVC-Intra formats

Format	Sampling	Frame Rate	Data Rate	Other
AVC-Intra Class 50 1440x1080i	4:2:0	29.97, 25	50 Mbps	Requires licenses or hardware for support on different K2 Summit system models.
AVC-Intra Class 50 960x720p	4:2:0	59.94, 50	50 Mbps	
AVC-Intra Class 100 1920 x 1080i	4:2:2	29.97, 25	100 Mbps	
AVC-Intra Class 100 1280 x 720p	4:2:2	59.94, 50	100 Mbps	
AVC-Intra Class 100 1920 x 1080p	4:2:2	59.94, 50	200 Mbps	

Related Topics

K2 Summit formats, models, licenses, and hardware support on page 12

AVCHD/H.264 formats

The following formats are for AVCHD and PitchBlue content. These are only supported for play output (decode) on AVCHD. A license is required. Record input (encode) is not supported.

Format	Sampling	Frame Rate	Data Rate	Other
720x480i	4:2:0	29.97	4-50	H.264-style open GoP. GoP length up to 30 frames. Up to 4 B-frames between anchor frames.
	4:2:2	29.97	4-50	
720x512i	4:2:2	29.97	4-50	
720x576i	4:2:0	25	4-50	
	4:2:2	25	4-50	
720x608i	4:2:2	25	4-50	
1920x1080i	4:2:0	29.97, 25	24 Mbps max.	
	4:2:2	29.97, 25	24 Mbps max.	
1440x1080i	4:2:0	29.97, 25	24 Mbps max.	
	4:2:2	29.97, 25	24 Mbps max.	
1280x720p	4:2:0	59.94, 50	24 Mbps max.	

Format	Sampling	Frame Rate	Data Rate	Other
	4:2:2	59.94, 50	24 Mbps max.	

Related Topics

K2 Summit formats, models, licenses, and hardware support on page 12

AVC-LongG formats

The following formats are for AVC-LongG content. These are only supported for play output (decode). A license is required. Record input (encode) is not supported.

Format	Sampling	Frame Rate	Data Rate	Other
AVC-LongG6 1920x1080i	4:2:0	29.97, 25	6 Mbps	LongG
AVC-LongG6 1280x720p	4:2:0	59.94, 50	6 Mbps	
AVC-LongG12 1920x1080i	4:2:0	29.97, 25	12 Mbps	
AVC-LongG12 1280x720p	4:2:0	59.94, 50	12 Mbps	
AVC-LongG25 1920x1080i	4:2:2	29.97, 25	25 Mbps	
AVC-LongG25 1280x720p	4:2:2	59.94, 50	25 Mbps	
AVC-LongG50 1920x1080i	4:2:2	29.97, 25	50 Mbps	
AVC-LongG50 1280x720p	4:2:2	59.94, 50	50 Mbps	

Related Topics

K2 Summit formats, models, licenses, and hardware support on page 12

Avid DNxHD formats

The following formats are for Avid DNxHD content. These are supported for record input (encode) and play output (decode). A Summit 3G Codec board with a K2-XDP2-DNX-2CH license is required.

Format	Frame Rate	Data Rate	Bits	Other
1920x1080i	29.97	220 Mbps	10	Avid DNxHD 220x
	29.97	220 Mbps	8	Avid DNxHD 220
	29.97	145 Mbps	8	Avid DNxHD 145
	25	184 Mbps	10	Avid DNxHD 185x
	25	184 Mbps	8	Avid DNxHD 185
	25	121 Mbps	8	Avid DNxHD 120
1280x720p	59.94	220 Mbps	10	Avid DNxHD 220x
	59.94	220 Mbps	8	Avid DNxHD 220
	59.94	145 Mbps	8	Avid DNxHD 145
	50	175 Mbps	10	Avid DNxHD 175x
	50	175 Mbps	8	Avid DNxHD 175
	50	116 Mbps	8	Avid DNxHD 115

Apple ProRes formats

The following formats are for Apple ProRes content with a chroma sampling rate of 4:2:2. These are supported for record input (encode) and play output (decode). A Summit 3G Codec board with a K2-XDP2-PRORES-2CH license is required.

Table 10:

Broadcast Format	Format	Frame Rate	Data Rate
NTSC	ProRes 422 (Proxy) 1920x1080i	29.97	45 Mbps
	ProRes 422 (LT) 1920x1080i	29.97	102 Mbps
	ProRes 422 1920x1080i	29.97	147 Mbps
	ProRes 422 (HQ) 1920x1080i	29.97	220 Mbps
	ProRes 422 (Proxy) 1280x720p	59.94	45 Mbps
	ProRes 422 (LT) 1280x720p	59.94	101 Mbps
	ProRes 422 1280x720p	59.94	147 Mbps
	ProRes 422 (HQ) 1280x720p	59.94	220 Mbps
PAL	ProRes 422 (Proxy) 1920x1080i	25	38 Mbps

Broadcast Format	Format	Frame Rate	Data Rate
	ProRes 422 (LT) 1920x1080i	25	85 Mbps
	ProRes 422 1920x1080i	25	122 Mbps
	ProRes 422 (HQ) 1920x1080i	25	184 Mbps
	ProRes 422 (Proxy) 1280x720p	50	38 Mbps
	ProRes 422 (LT) 1280x720p	50	84 Mbps
	ProRes 422 1280x720p	50	122 Mbps
	ProRes 422 (HQ) 1280x720p	50	184 Mbps

Proxy/live streaming formats and specifications

The proxy files and streams created by a K2 Summit system conform to industry standards, as follows.

Video: MPEG-4 Part 2

Format	Frame Rate	Data Rate (Mbps)	Other
320x240p	29.97, 25	1.5 Mbps	GOP 1 second
384x288p	29.97, 25	1.5 Mbps	GOP 1 second
512x288p	29.97, 25	1.5 Mbps	GOP 1 second

Audio: MPEG-4 Part 3 AAC-LC, 64 kbps, 48 kHz

Proxy file: MPEG-4 Part 12 Fragmented MP4 Movie

Live streaming: SDP files and RTP/RTCP streams are compliant with the following RFCs:

- RFC 3550, RFC 4566, RFC 3016, RFC 3640, RFC 5484, MPEG-4 Part 8

The K2 Summit system can also generate low-latency streaming media for use by DynoZoom and live monitoring. Refer to related topics in the "Configuring the K2 System" section of this Topic Library.

Related Topics

DynoZoom, live monitoring, and GV STRATUS streaming on page 356

Playout of multiple formats

The K2 Summit system automatically handles material of various types and formats as specified in the following sections:

Playout on K2 Summit system

For a given frame rate, you can play SD clips of any format back-to-back on the same timeline. Both 16:9 and 4:3 SD aspect ratio formats can be played on the same timeline. Refer to video codec description earlier in this section for a list of the supported formats.

On channels with the XDP (HD) license, for similar frame rates (25/50 fps or 29.97/59.95 fps), SD material transferred or recorded into the K2 Summit system along with its audio is up-converted when played on a HD output channel. Likewise, HD material is down-converted along with its audio when played on an SD output channel. HD and SD clips can be played back-to-back on the same timeline, and aspect ratio conversion is user configurable.

The K2 Summit system supports mixed clips with uncompressed and compressed (PCM, AC3, and Dolby) audio on the same timeline.

Related Topics

Aspect ratio conversions on HD K2 client on page 372

25/50 fps conversions on HD K2 Summit system models

The following specifications apply to K2 Summit system channels with the XDP (HD) license.

		Converted SD format	**Converted HD format**	**Converted HD format**
		625 at 25 fps	**1080i at 25 fps**	**720p at 50 fps**
Source SD format	**625 at 25 fps**	No conversion	Up-convert SD to HD	Up-convert SD to HD
Source HD format	**1080i at 25 fps**	Down-convert HD to SD	No conversion	Cross-convert from 1080i to 720p
	720p at 50 fps	Down-convert HD to SD	Cross-convert from 720p to 1080i	No conversion

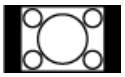
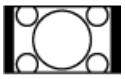
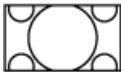
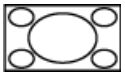
29.97/59.95 fps conversions on HD K2 Summit system models

The following specifications apply to K2 Summit system channels with the XDP (HD) license.

		Converted SD format	**Converted HD format**	**Converted HD format**
		525 at 29.97 fps	**1080i at 29.97 fps**	**720p at 59.94 fps**
Source SD format	**525 at 29.97 fps**	No conversion	Up-convert SD to HD	Up-convert SD to HD
Source HD format	**1080i at 29.97 fps**	Down-convert HD to SD	No conversion	Cross-convert HD to HD
	720p at 59.94 fps	Down-convert HD to SD	Convert HD to HD	No conversion

Aspect ratio conversions on HD K2 client

The following specifications apply to K2 Summit system channels with the XDP (HD) license.

Source aspect ratio	Source image	Conversion option	Conversion description	Converted aspect ratio	Converted image
4:3		Bar	The 4:3 aspect ratio is maintained, centered on the screen, with black bars filling the left and right portions of the 16:9 display.	16:9	
		Half Bar	The picture aspect ratio is maintained, but the image is slightly enlarged. The top and bottom of the image are slightly cropped, and thin black bars fill the left and right portions of the 16:9 display.	16:9	
		Crop	The picture aspect ratio is maintained, but the image is enlarged so that it horizontally fills the HD display. The top and bottom of the 4:3 SD image are cropped to fit in the 16:9 display.	16:9	
		Stretch	The picture aspect ratio is distorted. The image fills the screen vertically without cropping, and is stretched horizontally to fill the 16:9 display. This conversion up-converts Full Height Anamorphic (FHA) 16:9 SD material.	16:9	
16:9		Bar	The 16:9 aspect ratio is maintained, centered on the screen, with black bars filling the top and bottom portions of the 4:3 display.	4:3	
		Half Bar	The picture aspect ratio is maintained, but the image is slightly enlarged. The left and right sides the image are slightly cropped, and thin black bars fill the top and bottom portions of the 4:3 display.	4:3	
		Crop	The picture aspect ratio is maintained, but the image is enlarged so that it vertically fills the SD display. The left and right sides of the 16:9 HD image are cropped to fit in the 4:3 SD display	4:3	

Source aspect ratio	Source image	Conversion option	Conversion description	Converted aspect ratio	Converted image
		Stretch	The picture aspect ratio is distorted. The image fills the screen horizontally without cropping, and is stretched vertically to fill the 4:3 display. This conversion generates Full Height Anamorphic (FHA) 16:9 SD material.	4:3	

Active Format Description (AFD) specifications

NOTE: This topic applies to* K2 Summit system *systems.

Active Format Description (AFD) settings automatically determine the proper aspect ratio to use for up- and down-conversions, based on the AFD information embedded in the clip metadata. If no AFD was set on the incoming SDI input, you can assign the AFD setting in K2 AppCenter. A related setting, aspect ratio conversion (ARC), makes settings in K2 AppCenter on a clip-by-clip basis or per channel basis but does not embed settings in clip metadata.

Related Topics

About video scaling settings on page 172

About Active Format Description

The AFD is defined during production. By inserting metadata about the aspect ratio into the vertical ancillary data, AFD can define the aspect ratio of the signal as it progresses through ingest, editing, up/down conversion and playout. If the aspect ratio is altered during processing, then the AFD passed on downstream might need to be modified to ensure the correct aspect ratio is obtained.

NOTE: If ARC leads to unsupported active video format (postage stamp), the new AFD code will be the 'undefined' value of 0000.

The playback Aspect Ratio Conversion (ARC) is prioritized according to the following table:

Playback aspect ratio conversion priority	
1	Clip property (ARC or AFD-based conversion rules)
2	Output channel (ARC configuration property)

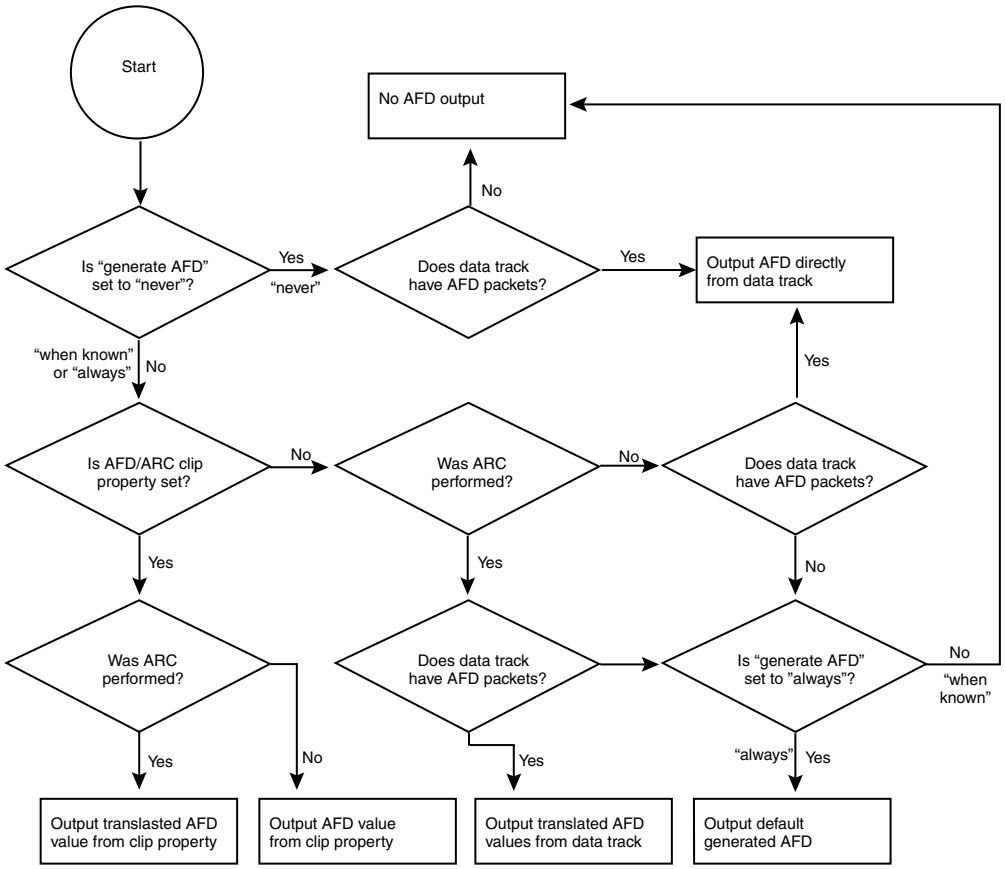
NOTE: Bar data is not supported on the K2 system.

Related Topics

Supported conversions from SD to HD using AFD on page 377
Supported conversions from HD to SD using AFD on page 378
Default generated AFD values on page 376

AFD output flowchart

The K2 Summit system determines AFD code values in output as illustrated by the following flowchart.



Storing AFD on K2 Summit system systems

The K2 Summit system system stores clip metadata in clip properties and uses this data throughout the workflow. You can modify the AFD setting in AppCenter.

You can store AFD in a data track. Grass Valley recommends selecting this for HD clips; if using SD, this is optional. This method takes more storage (it is approximately equal to four tracks of audio) but this method enables AFD and CC/Teletext support for HD.

Ingesting SDI

An SDI video signal stores AFD in the vertical ancillary data. The K2 Summit system processes the signal as follows:

- If present, the AFD setting from two seconds into the file is copied into the clip properties. This is the default K2 system behavior and occurs unless you set it to **No** in Configuration Manager.
- If selected, the ANC data is copied into the K2 data track.

Using AFD with file transfers

The following tables describe the AFD file priorities and the AFD behavior with GXF and MXF transfers.

File transfer AFD priority	
1	AFD from the MXF or GXF metadata is copied to the K2 clip properties.
2	If the MXF stream contains an ancillary data track with AFD ancillary data packets and Active Format Descriptor attribute of the Generic Picture Essence descriptor in the MXF header metadata is absent, then the AFD value for the K2 clip is derived from the AFD ancillary data packet located around 2 seconds into the material. That AFD value is then copied to the K2 clip properties.
3	If there is no AFD in the MXF, the GXF, or the data track, then no AFD is set.

GXF Export: (both AFD and ARC values inserted into XML of stream)	
Condition	**Description**
Exported to K2 system that does not support AFD	AFD setting is ignored, but setting is retained with clip ARC settings apply
Exported to K2 system that supports AFD	AFD overrides ARC settings

GXF Import	
Condition	**Description**
Imported from K2 system that does not support AFD	ARC converted to AFD
Imported from K2 system that supports AFD	AFD overrides ARC settings

MXF Export	
Condition	**Description**
AFD from clip property added to properties of the video in the header metadata	If clip property is not set, do not add property in stream
AFD from data track in stream's ancillary data	No change required

ARC is K2 specific and therefore not included in MXF transfers.

MXF Import	
Imported stream has AFD in the header metadata	AFD is stored in the clip property setting of the clip
Imported stream has AFD in the data track	AFD is stored in the clip property setting of the clip. (AFD is taken from the ancillary data two seconds from the beginning, or, if the clip is less than 2 seconds long, from the last valid AFD.)
Imported stream has no AFD	No AFD

ARC is K2 specific and therefore not included in MXF transfers.

Default generated AFD values

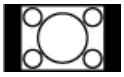
Default AFD values are generated when the three following conditions are met:

- The AFD output setting in the Configuration Manager is set to **Always**
- The clip does not have AFD in the data track, and
- The clip does not have AFD specified in its clip properties

Under these conditions, default AFD is generated and inserted, based on ARC performed and the source material format. Default generated AFD settings are described in the table below.

Default generated AFD values when up-converting to HD

Source image is presumed based on the conversion that has been selected.

Source aspect ratio	Presumed source image	Conversion option	Converted AFD and aspect ratio	Converted image
16:9 HD		No conversion	AFD = 1010 AR = 16:9 HD	
16:9 SD		Scale up Crop vertical	AFD = 1010 AR = 16:9 HD “crop”	
		Scale up	AFD = 1010 AR = 16:9 HD	
		Scale up Crop vertical Pillarbox	AFD = 1011 AR = 16:9 HD “half bars”	
4:3 SD		Scale up Pillarbox	AFD = 1011 AR = 16:9 HD “bars”	

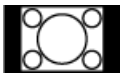
Default generated AFD values when down-converting to SD

Source image is presumed based on the conversion that has been selected.

Source aspect ratio	Presumed source image	Conversion option	Converted AFD and aspect ratio	Converted image
4:3 SD not widescreen		No conversion	AFD = 1001 AR = 4:3 SD	
16:9 SD widescreen		No conversion (only if ARC set to ‘stretch’)	AFD = 1010 AR = 16:9 SD	

Source aspect ratio	Presumed source image	Conversion option	Converted AFD and aspect ratio	Converted image
16:9 HD		Scale down letterbox	AFD = 1010 AR = 4:3 SD “bars”	
		Scale down Crop horizontal	AFD = 1001 AR = 4:3 SD “crop”	
		Scale down	AFD = 1010 AR = 16:9 SD “stretch”	
		Scale down Crop horizontal Letterbox	AFD = 1011 AR = 4:3 SD “half bars”	

Supported conversions from SD to HD using AFD

Source AFD and aspect ratio	Source image	Conversion performed	Converted AFD and aspect ratio	Converted image
AFD = 1010 AR 4:3 SD		Scale up crop vertical	AFD = 1010 AR 16:9 HD	
AFD = 1000 or 1001 AR 4:3 SD		Scale up pillarbox	AFD = 1001 AR 16:9 HD	
AFD = 1010 AR 16:9 SD		Scale up	AFD = 1010[3] AR 16:9 HD	
AFD = 1011 AR = 4:3 SD		Scale up Crop vertical pillarbox	AFD = 1011 AR 16:9 HD	

Related Topics

Configuring play channel video settings on page 180

[3] You can change the default converted value of AFD = 1010 to be AFD = 1001. This setting is in K2 AppCenter Configuration Manager play channel video settings.

Supported conversions from HD to SD using AFD

Source AFD and aspect ratio	Source image	Conversion performed	Converted AFD and aspect ratio	Converted image
AFD = 1000 or 1010 AR = 16:9		Scale down letterbox	AFD = 1010 AR = 4:3[4]	
AFD = 1001 AR = 16:9		Scale down crop horizontal	AFD = 1001 AR = 4:3	
AFD = 1010 AR = 16:9		Scale down	AFD = 1010 AR = 16:9[5]	
AFD = 1011 AR = 16:9		Scale down Crop horizontal letterbox	AFD = 1011 AR = 4:3	
AFD = 1111 AR = 16:9		Scale down crop horizontal	AFD = 1001 AR = 4:3	

Related Topics

Configuring play channel video settings on page 180

VBI/Ancillary/data track specifications

This section contains topics about data carried in the media file.

VBI/Ancillary/data track definitions

Terms in this section are defined as follows:

Ancillary data	Ancillary data (ANC data) as specified in this section is primarily a means by which timecode, Closed Captioning, and Teletext information is embedded within the serial digital interface. Other Type 2 ancillary data packets are stored and played back without modification. Ancillary data is standardized by SMPTE 291M.
Closed Captioning (CC)	Line 21 NTSC Closed Captioning as defined in EIA-608 and used as a subset of EIA-708. EIA-708 has been updated and renamed to CEA-708. Includes other Line 21 services such as V-Chip.

[4] When play channel video settings Aspect Ratio is set to "Standard (4:3)"
[5] When play channel video settings Aspect Ratio is set to "Widescreen (16:9)"

Teletext (TT)	Teletext System B subtitles as defined ETSI EN 300 706 and other documents. The Australian standard for digital TV is Free TV Operational Practice OP-47. It has been ratified as SMPTE RDD 8.
Captioning	Denotes both NTSC Closed Captioning and Teletext subtitling.

Luma/Chroma VBI support on K2 Summit system

Record and playout of VBI is supported for both Luma and Chroma. However, a given line of VBI data can be stored as either Luma or Chroma, but not both.

VBI data support on K2 Summit system

The following table applies when in Configuration Manager, the Data Track settings are configured as:

- Record ancillary data: No

Or as:

- Record ancillary data: Yes
- Record Uncompressed VBI and captioning data to track: No

Use these Data Track settings to retain compatibility with legacy systems, such as the Profile XP Media Platform.

Video format	Compressed VBI	Uncompressed VBI	Captioning	Comments
DVCPRO25 525 line (NTSC)	Not supported	Not supported by DVCPRO25 format	CC supported, as native to DVCPRO25. VCHIP data supported.	—
DVCPRO25 625 line (PAL)	Not supported	Not supported by DVCPRO25 format	TT not supported as VBI data.	
DVCPRO50 525 line (NTSC)	Supported for playout	Not supported by DVCPRO50 format	CC supported, as native to DVCPRO50 (compressed VBI). VCHIP data supported.	—
DVCPRO50 625 line (PAL)	Supported for playout	Not supported by DVCPRO50 format	TT supported, as native to DVCPRO50 (compressed VBI).	—
DVCAM 525 line (NTSC)	Not supported	Not supported by DVCAM format	CC supported, as native to DVCAM.	—

Video format	Compressed VBI	Uncompressed VBI	Captioning	Comments
DVCAM 625 line (PAL)	Not supported	Not supported by DVCAM format	TT not supported as VBI data.	—
MPEG-2 525 line (NTSC)	Supported as 16 lines per field. Range: 7–22	Supported for record. Not supported for playout.	CC supported and always on. Not selectable.	—
MPEG-2 625 line (PAL)	Supported as 16 lines per field. Range: 7–22	Supported for record. Not supported for playout.	TT supported only as compressed or uncompressed VBI.	—
MPEG-D10 525 line (NTSC)	Supported	Not supported by D10 format.	CC supported, as native to D10.	—
MPEG-D10 625 line (PAL)	Supported	Not supported by D10 format.	TT supported, as native to D10.	—

Data track support on K2 Summit system SD channels

The following table applies to SD channels when in Configuration Manager the Data Track settings are configured as follows:

- Record ancillary data: Yes
- Record Uncompressed VBI and captioning data to track: Yes

Video format	Data	Supported as follows:
525 line (NTSC)	Closed Captioning	Stored in EIA-708 packets. On playback, modulate to VBI line 21.
625 line (PAL)	Teletext	Stored in OP-47 packets. On playback, modulate to VBI line specified in OP-47 packet.
All supported SD formats	Uncompressed VBI	Selectable per line. Limited to 5 lines. The 5 line limit does not include any lines used for CC or TT. Can select either Luma or Chroma for each line, but not both.
	Ancillary timecode	Ancillary timecode is preserved only. No timecode track is constructed from ancillary timecode data. The timecode track is not inserted as ancillary timecode on playout.

Data track support on K2 Summit system HD channels

On channels with the XDP (HD) license, the data track can contain ancillary data and other types of data. Luma ancillary data packets are stored. Chroma ancillary data packets are not supported.

Data	Supported as follows:
Ancillary timecode	For record, selectable to use VITC or LTC ancillary timecode as timecode source. For playout, selectable to insert recorded timecode track as ancillary data VITC or LTC timecode packets. If the recorded timecode track is inserted as VITC ancillary timecode and VITC ancillary timecode packets are already stored on the data track, then the recorded timecode track overrides the stored VITC ancillary timecode packets. If the recorded timecode track is inserted as LTC ancillary timecode and LTC ancillary timecode packets are already stored on the data track, then the recorded timecode track overrides the stored LTC ancillary timecode packets.
Vertical interval ancillary data packets	Extracted at input and stored on an ancillary data track. Upon playout, the data packets are inserted into the video stream on specified lines. Maximum 8 packets per field. CC and TT supported as native to format.

Captioning system support

An API is provided for access to captioning data, allowing Closed Captioning and Teletext systems to produce timecode correlated captions for an existing K2 clip.

CEA 608 to CEA 708 DTV CC Transcoder and FCC requirements

Federal Communications Commission (FCC) rules incorporate sections of industry standards EIA-708 and EIA-608. The K2 Summit system system fulfills the requirement for older materials that do not have DTV CC. If SD material has EIA-608 CC present, the K2 Summit system system can be configured so that when it up-converts the material the EIA-708 packet contains the EIA-608 data plus the DTV CC transcoded from EIA-608.

DTV CC transcoding is enabled on a per channel basis in the Configuration Manager under **Channel Configuration**. By default, transcoding is disabled and the behavior is the same as prior software releases that did not support this transcoding. When enabled, transcoding is applied to any CEA 708 packets played out to either 1080i or 720p outputs (NTSC timing only). Transcoding happens for the following cases:

- SD clips are recorded with CC on the data track.
- SD MPEG clips with CC in the MPEG user data.
- DVCPRO25 clips with CC in the DV frame.
- HD clips with CEA 708 packets on the data track that have Line 21 data is present and DTV CC is absent.

CEA 608 commands from the above sources are converted to CEA 708 DTV CC commands that generate caption presentations that are similar to the original CEA 608 captions. The appearance is similar but not the same due to the differences in fonts, text positioning, etc.

This applies to up-conversion only. HD material should already have compliant EIA-708 packets.

Related Topics

Configuring data track settings on page 183

About privately defined data packets

In ancillary data, the K2 Summit system supports data defined by a private organization. This is data that is not defined and registered with SMPTE.

For example, if a facility puts privately defined data as special "triggers" in their stream for downstream devices, these triggers are preserved on record and transfer and played with field accuracy when needed. SMPTE standard data is supported as well as the privately defined data, for fully compliant, field accurate data track support.

Data bridging of VBI information on K2 Summit system HD channels

On channels with the XDP (HD) license, data is bridged as follows:

Source format	Source data	Conversion ——>	Converted format	Converted data
SD 525 line	Closed-captioning (CC) on line 21 (EIA-608) can be stored as UserData[6] CC packets or UserData VBI Line21 (Uncompressed VBI Line21)	Up-convert	HD	Ancillary Closed Caption EIA-708-B packets
	EIA-708	Up-convert	HD	EIA-708
SD 625 line	Teletext (except as below)	No up-conversion to HD		
	5 lines of VBI Teletext in OP-47 packets	Up-convert	HD	OP-47 ancillary data packet in SD data track file. SD Teletext is in ancillary data location as specified in OP-47 packet.
SD 625 line 525 line	Ancillary data	Up-convert	HD	Moved to valid lines
HD	EIA-708 & 608 Ancillary data packets	Down-convert	SD	Closed-captioning on line 21 (EIA-608 standard).
HD	Teletext as OP-47 packets	Down-convert	SD	Output as VBI waveforms on lines specified in OP-47 packet or as specified by "Teletext Output Lines" data track settings in AppCenter Configuration Manager.
HD 1080i	Ancillary data	Cross-convert	HD 720p	Moved to valid lines.

[6] UserData CC packets always on. If CC exists, it is recorded and played back. MPEG UserData can be played out but not recorded.

Source format	Source data	Conversion ——>	Converted format	Converted data
HD 720p	Ancillary data	Cross-convert	HD 1080i	Moved to valid lines. Any data on lines 21-25 is moved to line 20 on 1080i output.

Related Topics

Configuring data track settings on page 183

Line mapping of ancillary data packets on K2 Summit system HD channels

On channels with the XDP (HD) license, you can use "Output OP-47 packet on line" data track settings in AppCenter Configuration Manager to specify that all OP-47 packets are output on the selected video line during playout.

Source format	Source data	Line mapping ——>	Playout format	Converted data
HD 1080i	OP-47 packets, as specified by DID and SID, on a line valid for 1080i	Maps to	HD 1080i (same as source)	OP-47 packets on a different line valid for 1080i.
HD 720p	OP-47 packets, as specified by DID and SDID, on a line valid for 720p	Maps to	HD 720p (same as source)	OP-47 packets on a different line valid for 720p.

Related Topics

Configuring data track settings on page 183

PitchBlue/H.264 ancillary data and timecode

The K2 Summit system system extracts captioning as defined by ATSC a/72 embedded in the video information of H.264 material during ingest. The system plays this information during H.264 playout.

Timecode for a PitchBlue import is striped timecode (continuous timecode) that starts at 00:00:00:00 as required for a PitchBlue workflow.

This functionality supports the PitchBlue workflow. However, the functionality applies to all H.264 material, not only PitchBlue material.

Internationalization

When you enable internationalization on a K2 Summit system, you can name your media assets in a local language. The K2 Summit system supports the local language name as specified in the following table.

System	Internationalization support
Keyboard input and display	• English • Chinese • Japanese • French • German • Spanish • Cyrillic (Russian) • Portuguese • Korean
Media database	• All external views of movie assets can be represented as wide-file names. • AppCenter runs in Unicode. • Only movie assets and searchable User Data keys are Unicode.
Media file system	• Support for Kanji and wide-character file and folder names. • File-folder representation of movie are internationalized, as well as the QuickTime reference file it contains. • Key names (V:\media) remain unchanged, but are Unicode.
K2 Summit system applications	• Movie assets are described in Unicode. • Application user interfaces are Unicode compliant.
Protocols	Refer to "Remote control protocols" in the "Configuring the K2 System" section of this Topic Library.
FTP transfers	Refer to "FTP internationalization" in the "Configuring the K2 System" section of this Topic Library.

Names of media assets and bins must conform to the naming specifications for assets and bins.

Related Topics

About remote control protocols on page 356
About FTP internationalization on page 262
About remote control protocols on page 356

Limitations for creating and naming assets and bins

Media assets and bins must conform to the following specifications.

Characters not allowed in asset and bin names

Position	Character	Description
Anywhere in name	\	backward slash

Position	Character	Description
	/	forward slash
	:	colon
	*	asterisk
	?	question mark
	<	less than
	>	greater than
	%	percent sign
	|	pipe
	"	double quote
At beginning of name	~	tilde
		space
At the end of name		space

Asset and bin name limitations

The maximum number of characters in an asset path name, including the bin name, is 259 characters. This includes separators such as "\" and parts of the path name that are not visible in AppCenter. The file system limits the number of bytes in a name as well as the number of characters. The values in this table apply to names in English and other languages referred to in ISO 8859-1. The full count of 259 characters might not be available with some other character sets.

	Asset name, bin name, and path			
Sections of an asset/path name	**The rest of the path name** (i.e. everything apart from the bin and asset names)	Bin name	Asset media directory and extension	Asset name and extension
Naming limitation	This part of the path name is not visible in AppCenter.	The bin name can be up to 227 characters (which would leave room for only a 1-character asset name)	This part of the path name is not visible in AppCenter. The directory name is the same as the asset name. 4 characters are reserved for the extension.	The extension is not visible in AppCenter. At least 25 characters are reserved for the asset name and extension, even if they are not all used.
Example	`\media`	`\mybin1\mybin2`	`\MyVideo.cmf`	`\MyVideo.xml`

The following examples show how a path name would appear in AppCenter and in the file system.

In AppCenter:

```
V:\mybin1\mybin2\MyVideo
```

In the file system:

```
V:\media\mybin1\mybin2\MyVideo.cmf\MyVideo.xml
```

Bin nesting limitations

The K2 media database supports nine levels of nested bins. This includes the top level (first) bin. Exceeding this specification results in a database error. When creating a bin do not create a bin at level ten or deeper.

For example:

- The following is supported:
  ```
  default\en\fr\es\de\it\be\dk\cn
  ```
- The following is not supported:
  ```
  default\en\fr\es\de\it\be\dk\cn\jp
  ```

Video network performance

K2 systems support streaming transfers to and from K2 Summit system, or any device that supports General Exchange Format (GXF) as described in SMPTE 360M.

Parameter	Specification	Comments
Transfer bandwidth per internal storage K2 Summit system	Up to 50 MBytes per second	—
Transfer bandwidth per K2-SVR-100	Up to 90Mbytes per second	Depending on system design
Transfer bandwidth per K2-SVR-NH10GE	Up to 600Mbytes per second	Depending on system design
Maximum concurrent transfers per transfer engine	4 to 10	Additional transfers are queued.
Minimum delay from start of record to start of transfer	20 seconds in actual time (not content duration)	This applies to both 60Hz timing and 50Hz timing.
Minimum delay between start of transfer into destination and start of play on destination	20 seconds in actual time (not content duration)	—

About file interchange mechanisms on K2 systems

K2 Summit systems can send and receive files as follows:

- File based import/export — This is based on a file that is visible from the operating system. For example, AppCenter import/export features are file based.
- HotBin import/export — This is file based import/export, with automated features that are triggered when a clip is placed in a bin. Some HotBin functionality requires licensing.
- FTP stream — This is file interchange via File Transfer Protocol (FTP).

GXF interchange specification

This specification applies to GXF file transfer, import, and export on K2 Summit systems.

Streaming between online K2 systems supports complex movies and agile playlists of mixed format.

Formats are supported are as follows:

Supported formats		Notes
Video	DVCPRO25	—
	DVCPRO50	—
	DVCPRO HD	Super Slo-Mo requires software version 7.1.x or higher
	DVCAM	—
	MPEG-2	Includes all MPEG-2 formats (IMX, XDCAM, etc.) that can be stored on a K2 system
	AVC-Intra	—
	H.264	Playable on K2 Summit 3G system only. Can transfer to systems with K2 software version 8.x and higher.
	Avid DNxHD	Playable on K2 Summit 3G system only. Can transfer to systems with K2 software version 8.x and higher.
	Apple ProRes	Supported systems: K2 Summit 3G system, K2 Summit IP client SDI I/O and K2 Summit IP client IP I/O. Can transfer to systems with K2 version 9.8 and higher.
Audio	48 kHz	—
	16 bit, 24 bit	—
	PCM, Dolby-E, AC-3	—
Data	VBI	—
	Ancillary	—

Interchange mechanisms are supported as follows:

Mechanism		Support
File based	Import	Yes
	Export	Yes
FTP stream	Import	Yes

Mechanism		Support
	Export	Yes

Related Topics

Limitations with complex media types on page 259

MXF interchange specification

This specification applies to MXF file transfer, import, and export on K2 Summit systems.

MXF supports simple clips with a single video track only.

Formats are supported are as follows:

Supported formats		Notes
Video	DVCPRO25	—
	DVCPRO50	—
	DVCPRO HD	Super Slo-Mo requires software version 7.1.x or higher
	DVCAM	—
	D10	See MXF export behavior for eVTR style D10AES3.
	MPEG-2	Includes all MPEG-2 formats (IMX, XDCAM, etc.) that can be stored on a K2 system
	AVC-Intra	—
	Avid DNxHD	Playable on K2 Summit 3G system only. Can transfer to systems with K2 software version 8.x and higher.
	Apple ProRes	Supported systems: K2 Summit 3G system, K2 Summit IP client SDI I/O and K2 Summit IP client IP I/O. Can transfer to systems with K2 version 9.8 and higher.
Audio	48 kHz	—
	16 bit, 24 bit	—
	PCM, Dolby-E, AC-3	—
Data	VBI	MXF supports either ancillary data packets or VBI lines in the data track but not both, so if ancillary data packets and VBI lines have been recorded into the K2 clip's data track, then the VBI lines will be dropped from the MXF data track on an MXF export.
	Ancillary	—

Interchange mechanisms are supported as follows:

Mechanism		Support
File based	Import	Yes
	Export	Yes
FTP stream	Import	Yes
	Export	Yes

With a special export option, you can export a completed continuous (loop) record clip as MXF or QuickTime, with the result being a flattened stream file. Recording must be complete before you export the clip, however you can make subclips while record is underway and export the subclips. For this feature, MPEG-2 long GoP is not supported.

Related Topics

Limitations with complex media types on page 259

MXF export behavior on K2 systems

Upon MXF export the K2 system checks clip structure for specifications as they apply to industry standard formats such as Sony XDCAM (SMPTE RDD-09) and Sony eVTR style (SMPTE ST 386). If specifications match, the media is exported as the appropriate format.

The K2 system allows you to override the MXF export behavior so that the exported MXF file no longer match the specifications for the industry-standard format. For example, you can export a clip containing more audio tracks than constrained by the specific MXF standard for the maximum number of audio tracks in a D10AES3 channel. If you export a clip with such an override, the K2 will generate a generic MXF op1a file (instead of the default D10 or XDCAM constrained MXF file).

Enabling audio tags in MXF export

Do this task if:

- You are exporting MXF files into a K2 system earlier than the 9.7 (SP3) release.

Do not do this task if:

- You are exporting MXF files into a K2 system version 9.7 (SP3) and above.

Enable the creation of audio tags before exporting your MXF files with the procedure below.

1. Add a registry entry to the FTP Server at the following location :

```
HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Grass Valley Group\Streaming\MXF
```

2. Create the following registry value:

```
REG_DWORD "377-4BasedAudioTag" = 0
```

   - If set to 1, it will use the SMPTE 377-4 track naming convention and previous K2 Summit systems will not be able to see those MXF audio tracks.
   - If set to 0, it will use the GV audio tag convention and previous K2 Summit systems will retain those audio track labels after the MXF export.

   NOTE: If registry entry is not present with K2 system version 9.7 (SP3) or later, it will use the SMPTE 377-4 track naming convention and previous K2 Summit systems will not be able to see those MXF audio tracks.

About MXF with DIDs and SDIDs

You can import and export MXF containing ANC packets and VBI lines as specified in SMPTE ST 436. The K2 system extracts the ANC packets or VBI lines to the K2 clip's data track.

MXF Export Type

When importing and exporting MXF the K2 system behaves as follows, in relation to the MXF Export Type setting in K2Config or in K2 AppCenter:

- The MXF Export Type setting applies to all MXF exports on the K2 system. There is one setting for one K2 system.
- For export, the K2 system must be set to one of the following MXF Export Types:
  - **377M**: SMPTE ST 377:2004 compliant. Ensures compatibility with older products.
  - **377-1**: SMPTE ST 377-1:2009 compliant.
  - **ARD and 377-1**: ARD is only for AVC-Intra Class 100 (720p and 1080i PAL only) and XDCAMHD-422 (1080i PAL only).
- By default the K2 system is set to SMPTE ST 377:2004. This setting is only applicable to the MXF op1a import and export.
- The SMPTE ST 377:2004 setting is recommended for compatibility with older systems which do not support SMPTE ST 377-1:2009.
- The following format does not support SMPTE ST 377-1:2009 export. Therefore the format is always exported as SMPTE ST 377:2004, regardless of the MXF Export Type setting:
  - D10 media
- ARD profile is the MXF profile based only on AVC-Intra Class 100 and XDCAMHD-422 formats for compliance with ARD consortium.
- The following format does not support ARD export. Therefore the format is always exported as SMPTE ST 377-1:2009, when **ARD and 377-1** option is selected:
  - DV media
  - Avid DNxHD media
  - Media in NTSC format

- For import, both SMPTE ST 377:2004 and SMPTE ST 377-1:2009 are supported, regardless of the MXF Export Type setting. The MXF Export Type setting affects export only.

Related Topics

Configuring MXF Export Type on a standalone K2 Summit system system on page 176
Configuring MXF Export Type on a K2 SAN system
MXF export behavior on K2 systems on page 389

AMWA AS-02 interchange

The K2 system behaves as follows in relation to the Advanced Media Workflow Association (AMWA) AS-02 version 1.0: 2011 MXF Versioning Specification:

- The K2 system supports the AS-02 specification with no customizations
- Supports import of AS-02 content
- Plays media imported with AS-02
- Exports media to AS-02 content
- Requires license K2-ExtendedFileServices.

Related Topics

Limitations with complex media types on page 259

QuickTime interchange specification

This specification applies to QuickTime file transfer, import, and export on K2 Summit systems.

The following are not supported:

- Sequences and lists
- Lists of mixed formats or containing empty tracks, such as tracks that do not contain recorded media

Formats are supported are as follows:

Supported formats		Notes
Video	DVCPRO25	—
	DVCPRO50	—
	DVCPRO HD	Super Slo-Mo requires software version 7.1.x or higher
	DVCAM	—
	AVC-Intra	—
	D10/IMX	—
	XDCAM-HD	—
	XDCAM-EX	—
	XDCAM-HD422	—

Supported formats		Notes
	H.264	Playable on K2 Summit 3G system only. Can transfer to systems with K2 software version 8.x and higher.
	Avid DNxHD	—
	Apple ProRes	—
Audio	48 kHz	
	16 bit, 24 bit PCM	
Data	None	—

Interchange mechanisms are supported as follows:

Mechanism		Support	
File based	Import	Yes	
	Export	Yes	
FTP stream	Import	Yes	FTP import (FTP put) of a QuickTime file is internally handled in two stages. The FTP put will result in the QuickTime file being internally copied and the FTP status will reflect the status of this copy. When the entire QuickTime file is copied, the K2 will internally import the copied QuickTime file and the imported file will then become available as a K2 clip.
	Export	Yes	***NOTE: FTP get of a growing K2 clip (a K2 clip being recorded or imported) is not supported.***

With a special export option, you can export a completed continuous (loop) record clip as MXF or QuickTime, with the result being a flattened stream file. Recording must be complete before you export the clip, however you can make subclips while record is underway and export the subclips. For this feature, MPEG-2 long GoP is not supported.

Related Topics

Limitations with complex media types on page 259

QuickTime video and key import specification

This specification applies to importing a QuickTime file with an alpha channel. This is a licensed feature.

The imported file must be QuickTime 32 with alpha RLE 32-bit raster encoding, as produced by the Apple Animation Codec.

Supported video formats for import are as follows:

Format		Scan	Frame Rate
SD video	720 x 480	Interlaced	29.97
	720 x 512	Interlaced	29.97
	720 x 576	Interlaced	25
	720 x 608	Progressive	25
HD video	1920 x 1080	Interlaced	29.97, 25
	1280 x 720	Progressive	59.94, 50

Supported audio formats for import are as follows:

Format		
Audio tracks (if present)	48 kHz	Mono or stereo
	16 bit, 24 bit	
	PCM	

Interchange mechanisms are supported as follows:

Mechanism		Support	
File based	Import	Yes	
	Export	No	
FTP stream	Import	Yes	FTP import (FTP put) of a QuickTime file is internally handled in two stages. The FTP put will result in the QuickTime file being internally copied and the FTP status will reflect the status of this copy. When the entire QuickTime file is copied, the K2 will internally import the copied QuickTime file and the imported file will then become available as a K2 clip.
	Export	Yes	***NOTE: FTP get of a growing K2 clip (a K2 clip being recorded or imported) is not supported.***

When K2 software imports a file that meets the above requirements, it creates a K2 clip with two video tracks, in formats as follows:

Format			Frame Rate	Data Rate
SD video	D10/IMX	720 x 512	29.97	50 CBR
	D10/IMX	720 x 608	25	50 CBR
HD video	AVC-Intra Class 100	1920 x 1080	29.97, 25	100 Mbps
	AVC-Intra Class 100	1280 x 720	29.97, 25	100 Mbps

Audio tracks, if present are imported.

Timecode data is imported as K2 striped timecode. The first timecode value is the starting value and subsequent timecode is continuous.

The import process consumes system resource since this involves video transcoding. Be aware of this if running other resource intensive processes during import.

QuickTime reference files

The following formats are supported as QuickTime reference files:

- DV
- AVC-Intra
- XDCAM-EX
- XDCAM-HD
- XDCAM-HD 422
- IMX
- Avid DNxHD
- Apple ProRes

MPEG interchange specification

This specification applies to MPEG import on K2 Summit systems.

Formats are supported are as follows:

Supported formats		Notes
Video	MPEG-2	Supports import of MPEG-2 program and transport streams. If the transport stream contains multiple programs, the first detected program in the transport stream is imported as a K2 clip.
	H.264	AVCHD /H.264 is K2 Summit 3G system only. Import only supported.
Audio	48kHz	—
	MPEG-1 (layer 1 & 2)	—
	SMPTE 302M AES3 LPCM	—
	AC-3	—
	AVCHD DVD VOB LPCM	AVCHD /H.264 is K2 Summit 3G system only. Import only supported.
	DVD/VOB AC-3	—
Data	ATSC a/53 captions	For MPEG-2 imports.
	ATSC a/72 captions	For H.264 imports.

Supported formats		Notes
	SMPTE RDD-11 ancillary data	—

Interchange mechanisms are supported as follows:

Mechanism		Support
File based	Import	Yes
	Export	No
FTP stream	Import	Yes
	Export	No

Related Topics

Limitations with complex media types on page 259

P2 interchange specification

This specification applies to P2 file transfer, import, and export on K2 Summit systems.

Formats are supported are as follows:

Supported formats		Notes
Video	AVC-LongG	
	AVC-Intra	
	DVCPRO25	
	DVCPRO50	
	DVCPRO HD	
	DVCAM	
Audio	48 kHz	All audio tracks on the clip being exported have to be of the same type to comply with the P2 file format. For instance, exporting a clip with some PCM 16 audio tracks and others PCM 24 is not supported.
	16 bit, 24 bit PCM	

Interchange mechanisms are supported as follows:

Mechanism		Support	
File based	Import	Yes	Directory structure as specified by P2
	Export	Yes	
FTP stream	Import	Yes	For AVC – LongG MXF file format only
	Export	No	

Related Topics

Limitations with complex media types on page 259

WAV audio interchange specification

This specification applies to WAV import on K2 Summit systems.

Formats are supported are as follows:

Supported formats		Notes
Video	NA	—
Audio	48 kHz	—
	16 bit stereo PCM	
Data	NA	—

Interchange mechanisms are supported as follows:

Mechanism		Support
File based	Import	Yes
	Export	No
FTP stream	Import	No
	Export	No

Media file system performance on K2 systems

This section specifies media operations on K2 systems. Performance on larger systems is not tested.

Record-to-play specifications

The following tables specify the minimum length of time supported between recording on one channel and cueing the same clip for playout on another channel. Live play mode is available only on a K2 Summit system system with the AppCenter Pro license.

Standalone K2 Summit system

Formats	Live play	Normal play
DV	0.5 seconds	6.0 seconds
MPEG-2 I-frame, AVC-Intra	0.75 seconds	6.25 seconds
MPEG-2 long GoP, XDCAM	1.0 seconds	6.50 seconds

Other media file system specifications

Parameter	Stand-alone K2 Summit system	K2 SAN (not applicable in this release)
Maximum number of clips[7]	20,000	50,000
Maximum length continuous record	24 hours	24 hours
Off-speed play range for audio scrub[8]	-2x to +2x	-1.5x to +1.5x
Off-speed play range for insertion of MPEG user data and/or ancillary data on playout	0 to +1.2	0 to +1.2
Minimum duration between recordings	10 seconds	10 seconds
Minimum duration between start of clip import and clip play	10 seconds	10 seconds

RTIO specifications for standalone K2 Summit 3G system

Use	RTIO
Default for Hard Disk Drives (HDD)	425
K2 Summit 3G Transmission Client with eight HDD	370
Default for Solid State Drives (SSD)	800
Two 6x SSM Recorder Channels (1080i or 720p), two 1080i Player Channels. SSD.	800
Two 3x SSM 1080p Recorder Channels, two 1080p Player Channels. SSD.	800
One 4K Recorder Channel, one 4K Player Channel. SSD.	900
Four Video + Key 1080p Player Channels. SSD.	1100

The information in the table above is based on Intel SSDs, not SanDisk. Any SanDisk SSD using a RAID 5 AIC controller in a configuration with 2 RAID 5 LUNs with 5 drives each (for a total of 10 drives) has an RTIO of 1200.

Related Topics

Modifying the media file system on a K2 Summit system on page 311

Transition effects formats and limitations

Transition (mix) effects are supported on K2 Summit system as follows.

[7] The maximum number of clips is based on clips with 16 or less audio tracks. Large quantities of clips with more than 16 audio tracks proportionally reduce the maximum number of clips.

[8] Dolby audio tracks muted during off-speed play

Transition effects on first generation K2 Summit system

	DV	AVC-Intra	MPEG-2 I-frame	MPEG-2 long GoP
DV	Yes	No	No	No
AVC-Intra	No	Yes	No	No
MPEG-2 I-frame	No	No	Yes	No
MPEG-2 long GoP	No	No	No	No

When adding transitions to all events in a playlist for an on-the-fly (the **Go To** feature) pause or transition, limitations on the time for the length of the transition are as follows:

- 0.5 second or less on first generation K2 Summit system

Transition effects on K2 Summit 3G system

	DV	AVC-Intra	AVCHD/H.264	MPEG-2 I-frame	MPEG-2 long GoP	Avid DNxHD	AVC-LongG	Apple ProRes
DV	Yes	No	No	No	No	No	No	No
AVC-Intra	No	Yes	Yes	No	No	No	No	No
AVCHD/H.264	No	Yes	Yes	No	No	No	No	No
MPEG-2 I-frame	No	No	No	Yes	No	No	No	No
MPEG-2 long GoP	No	No	No	No	Yes	No	No	No
Avid DNxHD	No	No	No	No	No	Yes	No	No
Apple ProRes	No	No	No	No	No	No	No	Yes
AVC-LongG	No	No	No	No	No	No	Yes	No

When adding transitions to all events in a playlist for an on-the-fly (the **Go To** feature) pause or transition, limitations on the time for the length of the transition are as follows:

- 0.5 second or less on first generation K2 Summit 3G systems.

Protocols supported

AMP, VCDP, and BVW protocols are supported.

Related Topics

About remote control protocols on page 356

Transfer compatibility with K2 Summit system

When transferring material between a K2 Summit system and other Grass Valley products, you must consider the specifications of the different products. The following tables illustrate some of

these considerations. In these tables, source material is assumed to have been recorded on the source device.

Transfer compatibility with K2 Media Client

Transfer	Material transferred	Compatibility
From K2 Summit system to K2 Media Client	DVCPRO25, DVCPRO50	Playout supported.
	DVCPRO HD	Not supported
	MPEG	Supported
	AVC-intra	Not supported
	H.264	Not supported
	Avid DNxHD	Not supported
	Apple ProRes	Not supported
From K2 Media Client to K2 Summit system	All types of material supported, according to the SD and/or HD capability.	

Transfer compatibility with Profile XP Media Platform

Transfer	Material transferred	Compatibility
From K2 Summit system to Profile XP Media Platform	DVCPRO25, DVCPRO50	Playout supported.
	DVCPRO HD	Not supported
	MPEG-2 HD 4:2:0 80 Mb or less MPEG-2 SD 4:2:2, XDCAM-HD422, XDCAM-EX	Supported. Can be played out.
	MPEG-2 720p MPEG-2 HD 4:2:2 XDCAM-HD HDV 1440x1080	Supported for storage only. Transfer is successful but playout not supported.
	AVC-intra	Not supported
	H.264	Not supported
	Avid DNxHD	Not supported
	Apple ProRes	Not supported
From Profile XP Media Platform to K2 Summit system	All types of material supported, according to the SD and/or HD capability of the model.	

Data compatibility between K2 Summit system and PVS models

When material is transferred between a PVS Profile XP Media Platform and a K2 Summit system, data is supported as follows:

Transferring from PVS (source) to* K2 Summit system *with HD license (destination)

Source format	Source data	SD playout data support on destination	HD playout data support on destination
DVCPRO25	Closed captioning	Yes	Yes
	Ancillary data	No	No
DVCPRO50	Closed captioning in compressed VBI	Yes	No
	Ancillary data	Yes	Yes
DVCPRO50	Compressed VBI	Yes	No
SD MPEG-2	Uncompressed VBI	Yes	Yes, with data bridging for CC only. Other VBI lines are discarded.
	Closed captioning	Yes	Yes. Ancillary data packets
	Compressed VBI	Yes	Yes, if enabled
	Ancillary data	Yes	Yes
HD MPEG-2	Ancillary data	Yes	Yes

Transferring from* K2 Summit system *(source) to PVS (destination)

Source format	Source data	SD playout data support on destination	HD playout data support on destination
DVCPRO25, DVCPRO50	Any supported on K2 Summit system	Yes	NA
DVCPRO HD	Any supported on K2 Summit system	NA	NA
AVC-Intra	Any	NA — AVC-Intra not supported on PVS	
H.264	Any	NA — H.264 not supported on PVS	
Avid DNxHD	Any	NA — Avid DNxHD not supported on PVS	
Apple ProRes	Any	NA - Apple Pro Res not supported on PVS	

Source format	Source data	SD playout data support on destination	HD playout data support on destination
SD MPEG-2	Any data recorded with Profile compatible setting[9].	All supported	Yes
	Uncompressed VBI and captioning on data track	Not supported. Do not attempt to transfer to PVS.	
	Compressed VBI	Yes	Yes, with data bridging for CC only. Other VBI lines are discarded.
	Uncompressed VBI	Yes	No, except for bridging of CC data, which requires Profile software v5.4.9.
HD MPEG-2	Ancillary data	Yes. CC bridging requires data-bridging SDI board.	Yes.

Control Point PC system requirements

If you are building your own Control Point PC, the machine you choose must meet the following requirements. These requirements assume that the PC is dedicated to its function as the host for Grass Valley product control and configuration applications. You should not run other applications on the PC that could interfere with system performance.

Control Point PC system requirements are as follows:

Requirements	Comments
Operating System	Microsoft Windows (Must be a U.S. version) 64-bit: • Windows 10 • Server 2012 R2
RAM	Minimum 512 MB, 1 GB recommended
Graphics acceleration	Must have at least 128 MB memory
Processor	Pentium 4 or higher class, 2 GHz or greater
Hard disk space	400 MB
Microsoft .NET Framework	Version 4.6.2
Sun Java 2 Runtime Environment	Version 1.5.0_11, Version 1.6.0 or higher.
XML	Microsoft XML 4 Service Pack 2 is required. You can install it from the `msxml4sp2` file on the K2 system's USB Recovery Flash Drive.

[9] When Record ancillary data = No or when Record Uncompressed VBI and captioning data to track = No

Requirements	Comments
Quicktime	Version 7 or higher
Acrobat Reader	Version 8 or higher

Find software at Internet locations such as the following:

- http://msdn.microsoft.com/en-us/netframework/default.aspx
- http://java.sun.com/javase/downloads/index.jsp
- http://www.microsoft.com/downloads/details.aspx?FamilyId=3144B72B-B4F2-46DA-B4B6-C5D7485F2B42&displaylang=en
- http://www.apple.com/quicktime/download/
- http://get.adobe.com/reader/

Super Slo-Mo camera formats

Formats specified for output by Super Slo-Mo cameras are supported as follows:

Camera	Format	Frame Rate (Hz)	Speed support
Grass Valley LDK8000 SportElite HD Camera	• 720p • 1080i	• 50/59.94/100/119.88 • 50/59.94/100/119.88	2x;
Grass Valley LDK8300 Camera	• 720p • 1080i	• 50/59.94/100/119.88/150/179.82 • 50/59.94/100/119.88/150/179.82	2x; 3x
Grass Valley LDX HiSpeed Camera	• 720p • 1080i	• 50/59.94/150/179.82 • 50/59.94/150/179.82	3x
Grass Valley LDX XtremeSpeed Camera	• 720p • 1080i • 1080p	• 50/59.94/150/179.82/300/359.64 • 50/59.94/150/179.82/300/359.64 • 50/59.94/150/179.82	• 3x in 720p; 1080i; 1080p • 6x in 720p; 1080i
Sony 3300	• 720p • 1080i	• 50/59.94/150/179.82 • 50/59.94/150/179.82	3x

MIB specifications

This section specifies Management Information Base (MIB) information for monitoring K2 devices with the Simple Network Management Protocol (SNMP). The Grass Valley GV Guardian product uses this protocol. This information is intended for SNMP developers. MIB files can be obtained from the Grass Valley Developers website.

In addition to the MIBs specified in this section, a K2 device might support other MIBs based on third party software/hardware. To determine whether other MIBs are supported by the operating system or independent hardware/software vendors, perform a “MIB walk” operation on the K2 device using conventional SNMP utilities and determine MIBs supported.

Refer to related topics about Grass Valley recommended deployment and monitoring solutions in K2 Topic Library.

Related Topics

K2 client MIBs on page 403

K2 Media Server MIBs on page 404

K2 Appliance (Generic Windows computer based) MIBs on page 405

K2 client MIBs

Grass Valley MIBs

MIB	Description
gvg-reg.mi2 (GVG-REG)	Grass Valley SMI enterprise namespace
gvg-element.mi2 (GVG-ELEMENT-MIB)	Common object definitions for a Grass Valley device. • Generic device tracking information • SNMP trap target configuration • Generic IO/signal status information
gvg-prod.mi2 (GVG-PROD-REG)	Product sysObjectOID registrations for the Grass Valley devices
gvg-drs.mi2 (GVG-DRS-MIB)	Video disk recorder/server status information
gvg-tcm.mi2 (GVG-TCM-MIB)	Media transfer (import/export) statistical information

Other MIBs

MIB	Description
RFC1213-MIB.mib (RFC1213-MIB)	MIB-2 support as implemented by Microsoft for the Windows operating system.
hostmib.mib (HOST-RESOURCES-MIB)	Generic system information as implemented by Microsoft for the Windows operating system

MIB	Description
lmmib2.mib (LanMgr-Mib-II-MIB)	Generic Windows networking, user account and service information as implemented by Microsoft for the Windows operating system
SUPERMICRO-SMI.my (SUPERMICRO-SMI)	Motherboard electromechanical sensor information (motherboard temperature hotspots, CPU fan, voltages, etc.)
SUPERMICRO-HEALTH-MIB.my (SUPERMICRO-HEALTH-MIB)	
MEGARAID.mib (RAID-Adapter-MIB)	Internal RAID-1 SCSI drive and controller information

K2 Media Server MIBs

Grass Valley MIBs

MIB	Description
gvg-reg.mi2 (GVG-REG)	Grass Valley SMI enterprise namespace
gvg-element.mi2 (GVG-ELEMENT-MIB)	Common object definitions for a Grass Valley device. • Generic device tracking information • SNMP trap target configuration
gvg-prod.mi2 (GVG-PROD-REG)	Product sysObjectOID registrations for the Grass Valley devices
gvg-ssr.mi2 (GVG-SSR-MIB)	K2 Storage roles configured for the server by the K2 System Configuration application and their status information
gvg-sbs.mi2 (GVG-SBS-MIB)	K2 iSCSI Bridge and TOE (TCP Offload Engine) related status information. Available only if the K2 Media Server has the iSCSI Bridge role.
gvg-manfsm.mi2 (GVG-MANFSM-MIB)	Video File System and Clip Database (FSM) related status information. Available only if the K2 Media Server has role(s) of media file system server and/or database server.
gvg-tcm.mi2 (GVG-TCM-MIB)	Media transfer (import/export) statistical information. Available only if the K2 Media Server is configured to be a transfer/FTP/hotbins server.

Other MIBs

MIB	Description
RFC1213-MIB.mib (RFC1213-MIB)	MIB-2 support as implemented by Microsoft for the Windows operating system.
hostmib.mib (HOST-RESOURCES-MIB)	Generic system information as implemented by Microsoft for the Windows operating system
lmmib2.mib (LanMgr-Mib-II-MIB)	Generic Windows networking, user account and service information as implemented by Microsoft for the Windows operating system
mssql.mib (MSSQLSERVER-MIB)	Microsoft SQL Server information
10892.mib (MIB-Dell-10892)	Dell PowerEdge chassis related electro-mechanical status information
arymgr.mib (ArrayManager-MIB)	Dell RAID1 system disk (PERC) and controller information

K2 Appliance (Generic Windows computer based) MIBs

For details on the hardware/chassis running the K2 Appliance, check the chassis vendor's MIBs.

Grass Valley MIBs

MIB	Description
gvg-reg.mi2 (GVG-REG)	Grass Valley SMI enterprise namespace
gvg-element.mi2 (GVG-ELEMENT-MIB)	Common object definitions for a Grass Valley device. • Generic device tracking information • SNMP trap target configuration
gvg-prod.mi2 (GVG-PROD-REG)	Product sysObjectOID registrations for the Grass Valley devices
gvg-ssr.mi2 (GVG-SSR-MIB)	K2 Storage roles configured for the server by the K2 System Configuration application and their status information
gvg-tcm.mi2 (GVG-TCM-MIB)	Media transfer (import/export) statistical information. Available only if the K2 Media Server is configured to be a transfer/FTP/hotbins server.

Other MIBs

MIB	Description
RFC1213-MIB.mib (RFC1213-MIB)	MIB-2 support as implemented by Microsoft for the Windows operating system.
hostmib.mib (HOST-RESOURCES-MIB)	Generic system information as implemented by Microsoft for the Windows operating system
lmmib2.mib (LanMgr-Mib-II-MIB)	Generic Windows networking, user account and service information as implemented by Microsoft for the Windows operating system

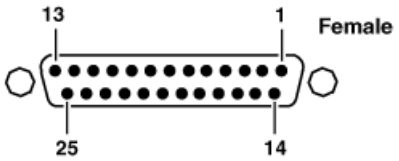
Connector pinouts

K2 Summit system connector pinouts

The following sections describe K2 Summit system rear panel connector pinouts.

AES Audio

Pinouts for each channel's AES Audio DB25 connector are as follows:



Pin #	Signal	Description
1	IN_P<0>	Channel Input 1&2 positive
2	IN_P<1>	Channel Input 3&4 positive
3	IN_P<2>	Channel Input 5&6 positive
4	IN_P<3>	Channel Input 7&8 positive
5	OUT_P<0>	Channel Output 1&2 positive
6	OUT_P<1>	Channel Output 3&4 positive
7	OUT_P<2>	Channel Output 5&6 positive
8	OUT_P<3>	Channel Output 7&8 positive
9	NO_C	NO_C
10	GND	GND

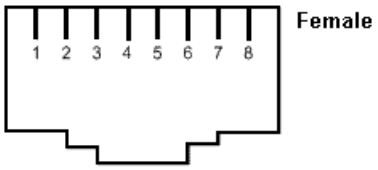
Pin #	Signal	Description
11	NO_C	NO_C
12	GND	GND
13	GND	GND
14	IN_N<0>	Channel Input 1&2 negative
15	IN_N<1>	Channel Input 3&4 negative
16	IN_N<2>	Channel Input 5&6 negative
17	IN_N<3>	Channel Input 7&8 negative
18	OUT_N<0>	Channel Output 1&2 negative
19	OUT_N<1>	Channel Output 3&4 negative
20	OUT_N<2>	Channel Output 5&6 negative
21	OUT_N<3>	Channel Output 7&8 negative
22-25	GND	GND

The optional audio cable has connections as follows:

RS-422 connector pinouts K2 Summit 3G

The K2 Summit 3G Production Client RS-422 interface conforms to ANSI/SMPTE 207M-1997 standard (SMPTE 422).

Pinouts for the individual RJ45 connectors are as follows:



Pin #	Signal	Description
1	+TXD	Differential Transmit Data (high) (out TXB)
2	-TXD	Differential Transmit Data (low) (out TXA)
3	+RXD	Differential Receive Data (high) (in RXB)

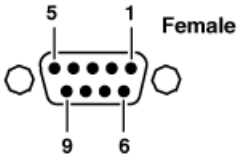
Pin #	Signal	Description
4	GND	Signal Ground
5	GND	Signal Ground
6	-RXD	Differential Receive Data (low) (in RXA)
7	GND	Signal Ground
8	GND	Signal Ground

Balanced signals are placed on twisted wire pairs within a standard CAT5 or CAT3 cable.

RS-422 connector pinouts first generation K2 Summit system

The first generation K2 Summit system RS-422 interface conforms to ANSI/SMPTE 207M-1997 standard (SMPTE 422).

Pinouts for the individual DB9 connectors are as follows:

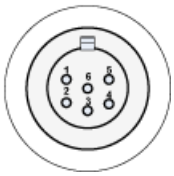


Pin #	Signal	Description
1	GND	Frame Ground
2	-TXD	Differential Transmit Data (low)
3	+RXD	Differential Receive Data (high)
4	GND	Transmit Signal Common
5	NC	Spare
6	GND	Receive Signal Common
7	+TXD	Differential Transmit Data (high)
8	-RXD	Differential Receive Data (low)
9	GND	Signal Ground

LTC connectors pinouts

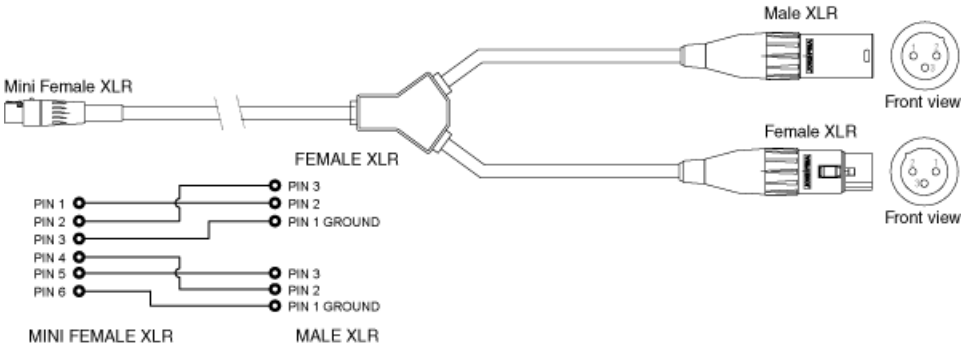
The K2 Summit system LTC panel connector provides balanced linear timecode input and output connections. The interface conforms to SMTPE 12M Linear Timecode.

On the K2 Summit system there is one 6 pin Switchcraft TRA6M Mini-XLR male connector for each channel. Pinouts are as follows:

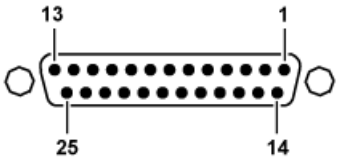


Pin #	Signal	Description
1	IN_P<0>	
2	IN_N<0>	
3	GND	Frame Ground
4	OUT_P<0>	
5	OUT_N<0>	
6	GND	Frame Ground

The mini-XLR to XLR LTC cable has connections as follows:



GPI I/O connector pinouts



Pin	Signal
1	Output 1
2	Output 2
3	Output 3

Pin	Signal
4	Output 4
5	Output 5
6	Output 6
7	Output 7
8	Output 8
9	Output 9
10	Output 10
11	Output 11
12	Output 12
13	Ground
14	Input 1
15	Input 2
16	Input 3
17	Input 4
18	Input 5
19	Input 6
20	Input 7
21	Input 8
22	Input 9
23	Input 10
24	Input 11
25	Input 12

K2 Media Server connector pinouts

The following sections describe K2 Media Server rear panel connector pinouts.

Redundant server heartbeat serial cable

Take care to use the proper serial cable to interconnect redundant K2 Media Servers that take the role of file system/database servers. This cable supports the heartbeat mechanism whereby the servers monitor each other's health. It is a 9 pin serial cable, but it is not a standard RS-232 null modem cable. The heartbeat cable is supplied with your system (Grass Valley part number 174-8137-00) and has a pin configuration as follows:

1 – 4

2 – 3

3 – 2

4 – 1&6

5 – 5

6 – 4

7 – 8

8 – 7

9 – No Connect

Rack mounting

Rack-mount considerations

When planning the placement of equipment in your equipment rack, bear in mind the following:

- Ensure adequate air flow around the chassis to provide sufficient cooling. Operating ambient temperature will affect the amount of air circulation required to keep the K2 system within its temperature limitations.
- Ensure that safety labels located on the top of the unit are visible after installation. This requires sufficient open space over the unit without cables or other devices impeding the view.
- If the system is installed with its ventilation intakes near another system's exhaust or in a closed or multi-unit rack assembly, the operating ambient temperature inside the chassis may be greater than the room's ambient temperature. Install the system in an environment compatible with this recommended maximum ambient temperature.
- Ensure that the power socket-outlet is installed near the equipment and is easily accessible.
- Ensure the rack is anchored to the floor so that it cannot tip over when the K2 system is extended out of the rack.
- Be sure to mount the K2 system in a way that ensures even weight distribution in the rack. Uneven mechanical loading can result in a hazardous condition. Secure all mounting bolts when installing the chassis to the rack.

The following sections describe installing the K2 Summit Production Client step-by-step.

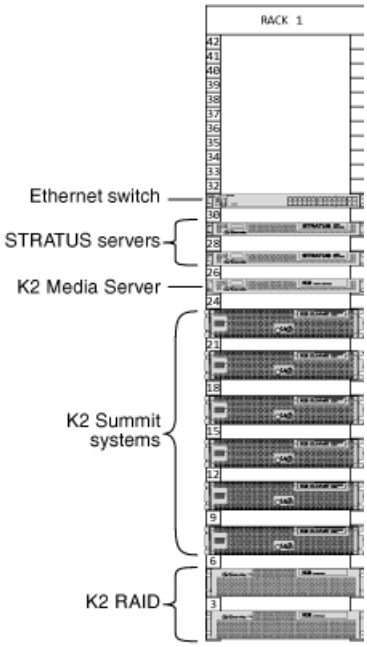
Related Topics

Environmental specifications on page 358

Rack-mount devices

All systems require this process.

Follow the instructions you received with the rack-mount hardware to install each component of the system. One rack-unit spacing is recommended between components for ventilation. The recommended arrangement of devices is as follows:



HP ProCurve Switch Rack specifications

Use the following specifications to determine load, spacing, power, and other factors when planning system racks.

Table 11: Mechanical specifications

Characteristic	Specification
Cabinet Type	Rack-mount
Rack units	1
External Dimensions	443 (w) x 44 (h) x 392 (d) mm
Weight	Maximum 7 kg

Table 12: Power specifications

Characteristic	Specification
Type	100-127 VAC/200-240 VAC; 50/60 Hz
Power Consumption	4.0/2.0 A, 200W

Dell R620 Rack specifications

Use the following specifications to determine load, spacing, power, and other factors when planning system racks.

Table 13: Mechanical specifications

Characteristic	Specification
Cabinet Type	Rack-mount
Rack units	1
External Dimensions	482.4 (w) x 42.8 (h) x 683.7 (d) mm
Weight	Maximum 18.6kg , 40.96 lbs

Table 14: Power specifications

Specification	1100W DC	1100W AC	750W AC	495W AC
Current consumption	32A	12A-6.5A	10A-5A	6.5A-3A
Supply voltage	-48V to -60V DC	100-240VAC	100-240VAC	100-240VAC
Frequency	N/A	50/60Hz	50/60Hz	50/60Hz
Heat dissipation (BTU/hr max)	4416	4100	2843	1908
Maximum inrush current	55A	55A	55A	55A

Related Topics

K2 Media Server specifications

NH K2 Media Server specifications

Dell R630 Rack specifications

Use the following specifications to determine load, spacing, power, and other factors when planning system racks.

Table 15: Mechanical specifications

Characteristic	Specification
Cabinet Type	Rack-mount
Rack units	1
External Dimensions	482.4 (w) x 42.8 (h) x 683.7 (d) mm
Weight	Maximum 18.6kg , 40.96 lbs

Table 16: Power specifications

Specification	1100W DC	1100W AC	750W AC	495W AC
Current consumption	32A	12A-6.5A	10A-5A	6.5A-3A

Specification	1100W DC	1100W AC	750W AC	495W AC
Supply voltage	-48V to -60V DC	100-240VAC	100-240VAC	100-240VAC
Frequency	N/A	50/60Hz	50/60Hz	50/60Hz
Heat dissipation (BTU/hr max)	4416	4100	2843	1908
Maximum inrush current	55A	55A	55A	55A

K2 Summit 3G Rack specifications

Use the following specifications to determine load, spacing, power, and other factors when planning system racks. These specifications apply to K2 Summit 3G chassis.

Table 17: Mechanical specifications

Characteristic	Specification
Cabinet Type	Rack-mount
Rack units	2
External Dimensions	447 x 617 x 89 mm
Weight	25.0 kg maximum

Table 18: Power specifications

Characteristic	Specification
Power conditions	Dual, redundant
Mains Input Voltage	90 to 260V auto-range, 47-63Hz
Maximum power consumption (when operating in a 25° C environment)	450W typical (standalone) Maximum AC current 8A @ 115VAC, 4A @ 230VAC

K2 RAID Rack specifications

Use the following specifications to determine load, spacing, power, and other factors when planning system racks. These specifications apply to K2 10Gv3 RAID (M110) chassis.

Table 19: Mechanical specifications

Characteristic	Primary chassis	Expansion chassis
Cabinet Type	Rack-mount	Rack-mount
Rack units	2	2

Characteristic	Primary chassis	Expansion chassis
External Dimensions	482 x 556.0 x 87.4 mm (no front bezel)	482 x 556.0 x 87.4 mm (no front bezel)
Weight	33 kg maximum	33 kg maximum

Table 20: Power specifications

Characteristic	Primary chassis	Primary chassis
Power conditions	100 to 240 VAC, single-phase 50/60 Hz	100 to 240 VAC, single-phase 50/60 Hz

Related Topics

K2 RAID storage description

FT Server Rack specifications

Use the following specifications to determine load, spacing, power, and other factors when planning system racks.

Table 21: Mechanical specifications

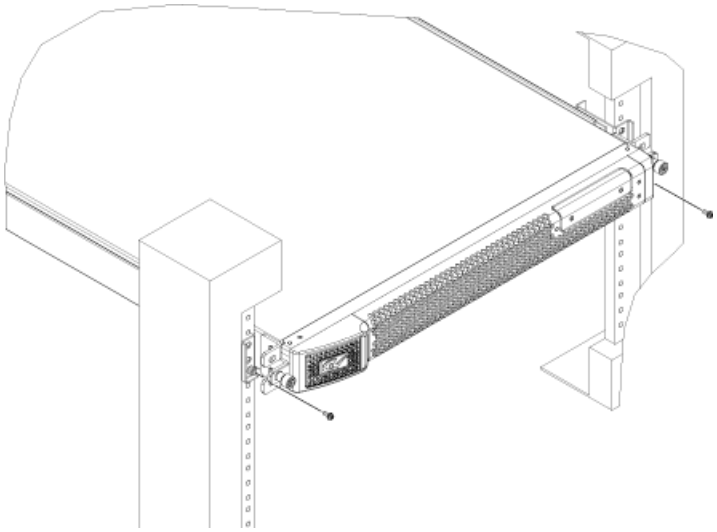
Characteristic	Type I and Type II Specification
Cabinet Type	Rack-mount
Rack units	4
External Dimensions	483 (w) x 178 (h) x 736 (d) mm, 19.0 in. (w) x 7.0 in. (h) x 28.9 in. (d)
Rack clearance	40 cm or more on top, 1 m or more on the front and rear, 60 cm or more on the right and left.
Weight	Maximum 51.5kg , 113.3 lbs

Table 22: Power specifications

Power Supply	Type I Specifications	Type II Specifications
Type	AC 100V-240V +/- 10%, 50/60Hz +/- 3Hz	AC 100V-240V +/- 10%, 50/60Hz +/- 3Hz
Power Consumption	1400VA, 1390W	1300VA, 1290W

Securing a server to a rack

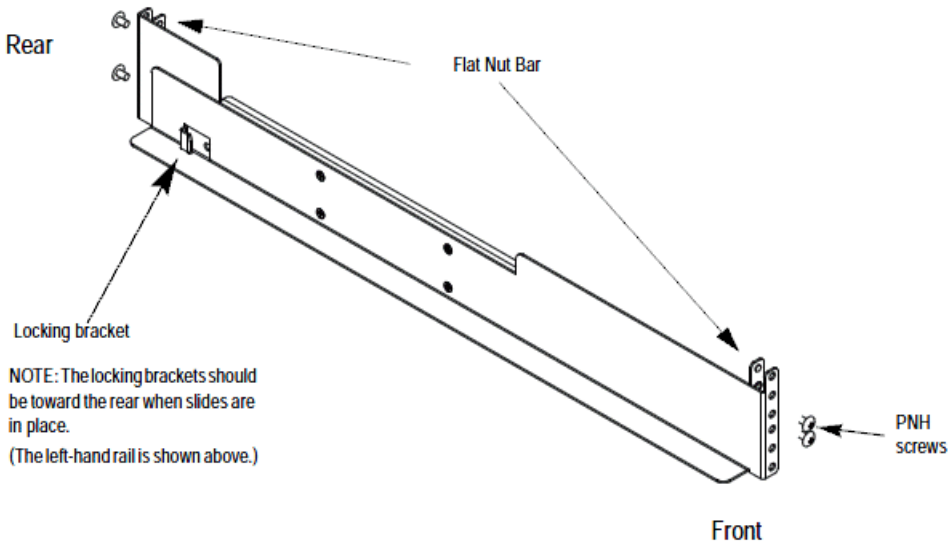
Follow the instructions provided in the shipping box to install the rack rails and position the server in the rack. For the Dell 1RU PowerEdge Server, follow the illustration below to secure the system to the rack.



Install a screw in the bottom hole of the bracket on each side. Do not attempt to install a screw in the top hole of the bracket.

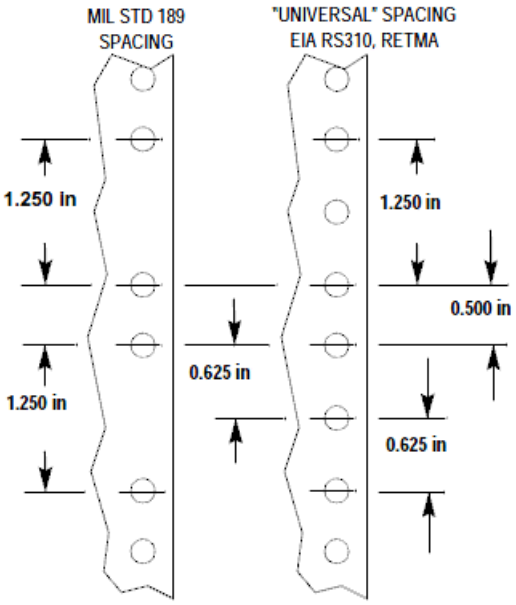
Rack mount hardware shipped with the K2 system

Your K2 system rack mount kit comes with rack mounting hardware as shown.

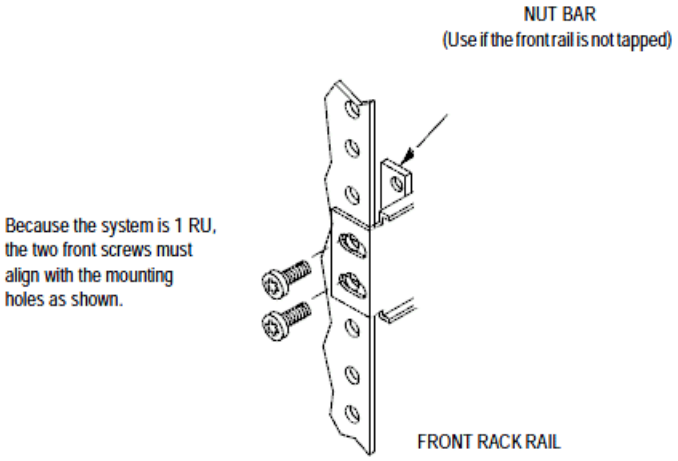


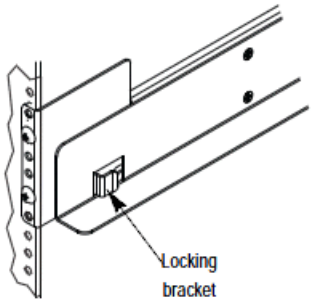
Mounting the Rack Slides

Choose the proper set of rail mounting holes on the rack. Notice that the hole spacing can vary with the rack type. When mounting the slides in racks with EIA spacing, make sure that the slides are attached to the 0.5-inch spaced holes.



Front and rear rack rail mounting hardware is provided with the rack mount kit. Mount the rails using the enclosed hardware. Make sure the stationary sections are horizontally aligned and are level, as well as parallel to each other.





REAR RACK RAIL (Nut bar not visible)

Installing the K2 system on the rack mount rails

1. Pull the slide-out track section to the fully extended position.

   ⚠ ***WARNING: To prevent injury, two people are required to lift the K2 system. It is too heavy for one person to install in the rack.***

   ⚠ ***WARNING: To prevent serious injury, ensure that the rack is anchored to the floor so that it cannot tip over when the K2 system is extended out of the rack.***

2. Push the chassis toward the rack until the chassis sections meet the locking bracket.
3. Verify the cabinet is pushed fully into the rack.
4. Insert and tighten the front panel retaining screws as shown in the previous diagram.

Making Rack Slide Adjustments

After installation, binding may occur if the slide tracks are not properly adjusted. To adjust the tracks:

1. Slide the chassis out approximately 10 inches.
2. Slightly loosen the mounting screws holding the tracks to the front of the rails and allow the tracks to seek an unbound position.
3. Tighten the mounting screws and check the tracks for smooth operation by sliding the chassis in and out of the rack several times.
4. Tighten the front panel retaining screws once the cabinet is in place within the rack to complete the installation.

Servicing the K2 Summit system

Product description

Overview description

The K2 Summit system is a cost-effective media platform that incorporates IT and storage technologies. It delivers a networked solution to facilities for replay in sports, news, live, and live-to-tape applications, as well as ingest, playout, and media asset management. It is a comprehensive platform that provides a suite of user applications, system tools, and the largest range of third party interactivity in the industry.

Refer to the the "Configuring the K2 System" section of this Topic Library for other high-level descriptions of features, controls, applications, and subsystems.

K2 Summit 3G+ system features

The following features apply to the K2 Summit 3G+ Production Client:

- Windows 10 IoT LTSB.
- MS Server 2012.
- Embedded Security for protection against viruses and other unauthorized programs.
- Bidirectional channels (channel can be either an input channel or it can be an output channel).
- Two or four channels per chassis. Configurations include:
  - SD : DV, IM X and MPEG-2 I-Frame and Long GOP
  - HD: DV, XDCAM HD, XDCAM EX, MPEG-2 I-Frame and Long GOP, DVCPRO HD, AVC-Intra, DNxHD andApple ProRes
- Play different formats back-to-back:
  - SD and HD clips
  - 720p/1080i
  - 1080p 3G
  - DV/MPEG/AVC-Intra/H.264/AVCHD
- Instant replay capability
- ChannelFlex – part of AppCenter Elite:
  - Multicam mode
  - Synchronized multichannel record and play to support UHD/4K
  - Super Slo-Mo mode
  - 3D mode
  - Video+key mode
  - HD/SD-SDI monitor output with timecode burn-in and custom text overlays
  - Multiviewer monitor mode with custom text overlays
- Fast boot times with embedded OS on M.2 solid state drive (SSD)
- Option for up to 16 TB of internal hard disk storage

- Built-in mix effects on each channel:
  - Video dissolves and audio crossfades supported via APIs and AppCenter Pro playlist
- Import/export all formats as MXF OP1a, SMPTE 360M (GXF) or QuickTime
- File system enables edit-in-place of QuickTime files
- Expanded internal storage capacity – 16 TB
- Software-based codecs for agile playback and easy configuration
- Increased bandwidth to support more channels, higher bit rates, faster file transfers
- Super slow-motion support in DVCPRO HD, AVC-Intra and DNxHD formats
- Full XDCAM HD workflow support including multicam mode
- 1080p50/60 Level A support using AVC-Intra
- Embedded operating system on M.2 solid state drive (SSD)
- Automatic up/down conversion, user-definable aspect ratio conversion, and closed caption preservation
- ANC data preserved and full AFD processing
- Full multichannel audio support – 16 SDI audio tracks per video channel (32 audio tracks per clip on disk)
- SDI video inputs and outputs.
- AES/EBU or embedded audio inputs and outputs.
- Standard Definition (SD) video formats and High Definition (HD) video formats.
- Support for DV, MPEG-2, AVCHD/H.264, AVC-Intra, AVC-LongG, and Avid DNxHD. For details regarding licenses, hardware support, and video codec specifications, refer to related topics in the "Using K2 AppCenter" section of the K2 Topic Library.
- 3G codec module hosts codec option cards that are programmable for multiple formats and functions.
- Mixed format playback of SD or HD clips on the same timeline.
- Up/down/cross HD/SD conversion (e.g. SD and HD clips ingested, then played back as SD or HD clips) or as a different SD or HD format (e.g. 720p to 1080i).
- 4K, Super Slo-Mo, Multi-cam, and 3D/Video + Key features are available as part of the ChannelFlex Suite.
- 4K/UHD workflow and 4K/UHD Pan & Zoom using the GV DynoZoom software.
- High endurance SSD internal storage for 6-in/2-out configuration, 6x Super Slow Motion (SSM), and 4K/UHD workflow.
- Redundant power supply, cooling fans for reliability.
- 2.5 inch media storage drives.
- M.2 SSD system drive.
- Type IV CPU carrier module with 8 GB RAM.
- USB 3.0 interface for file exchange.
- Ability to create nested bins, i.e. sub-bins within bins.
- Freeze mode can be frame or field.
- Various video mix effects (e.g. dissolves between two video and audio tracks on the same channel, or fade thru matte color).
- Remote operation and configuration via AppCenter.
- 1/10 Gigabit Ethernet ports.

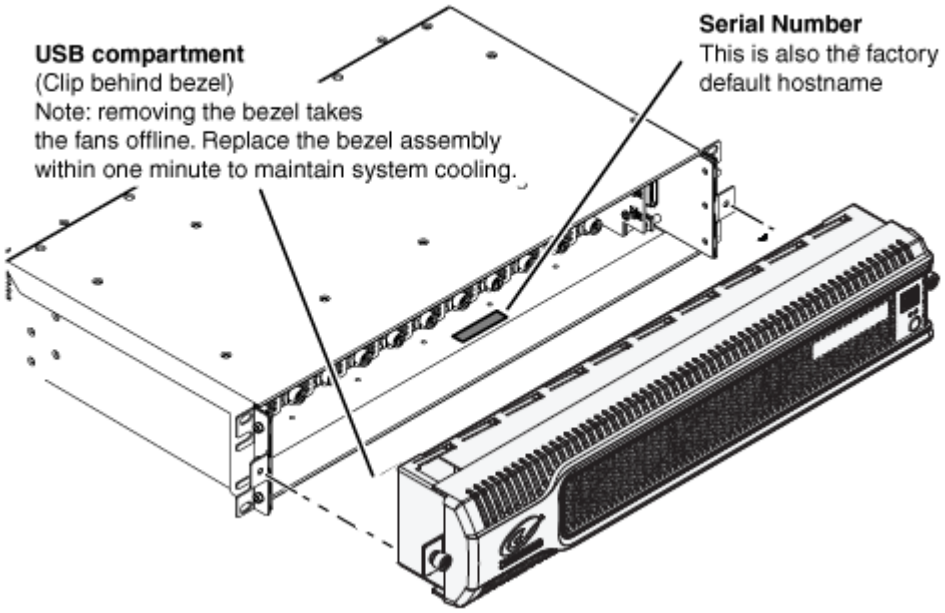
- Remote control over RS-422 or Ethernet.
- Stand-alone internal storage.
- Internal multi-viewer output provides a display of up to eight channels in real time when used with ChannelFlex.

Audio and Closed Caption/ Teletext Multilingual Support

Audio and Closed Caption/Teletext Multilingual Support Each video channel has up to eight AES/EBU or 16 embedded channels of PCM or compressed audio. For easy track management, each audio track can be identified with a language descriptor (requires AppCenter Pro or Elite). Additional audio features include scrub audio up to 2X, audio meters for each channel, an internal audio delay capability and the ability to adjust levels during recording or playback. It also performs an audio ramp down/ ramp up between clips to eliminate audio clicks and/or pops. Additional audio tracks can be imported into a clip to easily add additional languages (requires AppCenter Pro or Elite). In addition multiple closed captions or teletext files can be imported from third-party captioning editors for additional language support (requires AppCenter Pro or Elite).

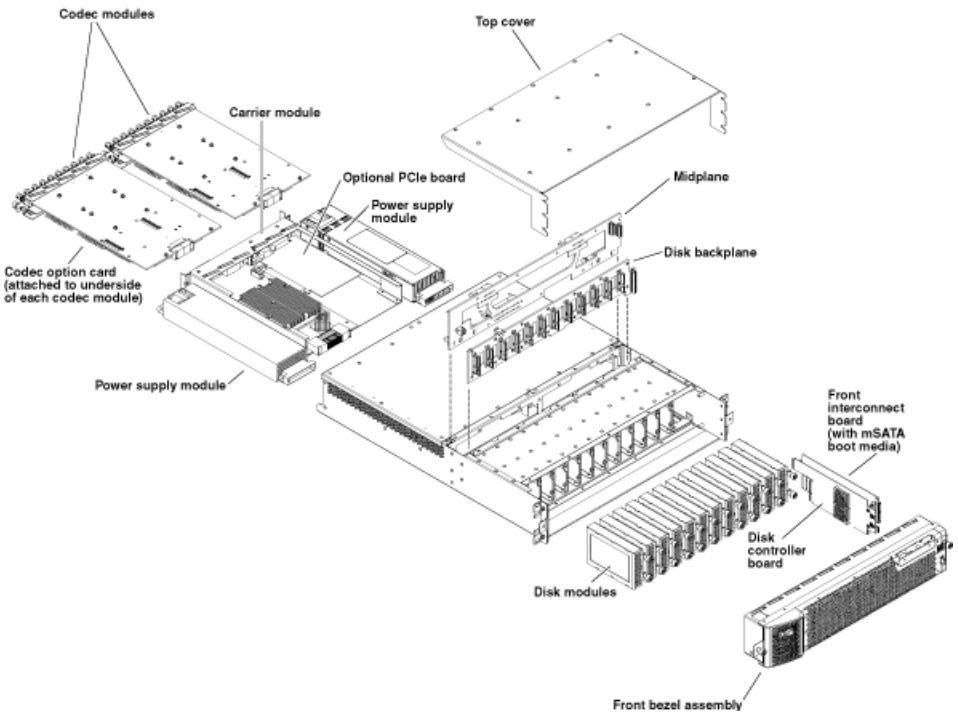
Product identification K2 Summit 3G+

The K2 Summit 3G system+ has labels affixed to the chassis that provide product identification as illustrated:



K2 Summit 3G system orientation

The following illustration shows the location of Field Replaceable Units (FRUs) and other components in the K2 Summit 3G system.



FRU functional descriptions

K2 Summit system Field Replaceable Units (FRUs) are described in this section.

Front bezel assembly

The front bezel assembly includes the bezel, fans, and fan status board. The assembly has four fans and provides cooling for the K2 Summit system chassis. Air intake is from the front of the K2 Summit system and outflow is through the rear. The assembly connects to the front interconnect board and is secured to the chassis by two thumbscrews.

Disk modules

There are slots for disk modules in the K2 Summit system. The slots are located behind the front bezel assembly in the front of the chassis. Each slot can contain one disk module, and each module contains one hard drive. Depending on storage options, a K2 Summit system can be fully populated, partially populated, or can contain no disk modules. Disk modules plug into the disk backplane board.

Data is written or “striped” across the disks in a continuous fashion, which makes the disks a “stripe group”. This stripe group appears as the V: drive to the Windows operating system.

The V: drive stores media. It also stores media file system, database, and configuration information. K2 Summit systems with direct-connect storage or shared SAN storage do not contain disk modules, as the V: drive is on the external RAID storage devices.

When configured as RAID 1, you can remove and replace a disk module while the K2 Summit system is operational.

Related Topics

Disk module removal
Disk module removal on page 477

M.2 boot media

The M.2 SSD boot media contains the system drive, also known as the C: drive. The C: drive contains application and operating system files. The M.2 media is hosted by the front interconnect board.

Power supply modules

The K2 Summit system has redundant (two) power supplies. You should connect a power cable to each power supply, but both power supplies remain operational if only one cable is connected. The power supplies can be accessed from the rear of the unit. You can remove and replace a power supply while the K2 Summit system is operational. Each power supply has a fan with automatic speed control and status LEDs that indicate current state and health. The power supply has protection for over voltage, over current, and short circuits. The power supply modules plug into the midplane board.

Related Topics

Power supply problems on page 468
Power supply module removal on page 479
Power supply problems on page 468
Power supply module removal on page 479

Codec module

The K2 Summit system has slots for two codec modules. Each codec module hosts two media input/output channels. The codec modules are oriented horizontally across the rear of the K2 Summit system chassis. They provide the majority of the K2 Summit system's media-related input and output connectors on the rear panel. The codec modules plug into the midplane board.

A codec module can host a codec option card. The codec option card provides extended functionality to the channels hosted by the codec module.

Related Topics

Codec module removal on page 480

Codec option card

There is one type of codec option card available for the K2 Summit system. The codec module hosts the codec option card. The single codec option card provides functionality for both of the codec module's channels.

Related Topics

Codec option card removal on page 481

Disk controller board

The disk controller board provides the RAID functionality for the internal disks. It is mounted in the front of the unit. The disk controller board plugs into the disk backplane board and the midplane board. K2 Summit systems with direct-connect storage do not contain a disk controller board, as RAID disks are in the external RAID storage devices.

Related Topics

Disk controller board removal

Disk controller board removal on page 478

Front interconnect board

The front interconnect board has the control and speed monitoring circuit for the fans and incorporates a PCIE to dual USB 3.0 controller circuit. It hosts the boot media, standby switch, Power LED and Service LED. The LEDs are driven by circuitry on the carrier module. The front interconnect board is mounted in the front of the unit and plugs into the midplane board.

Disk backplane unit

The disk backplane unit includes the disk backplane board. The disk backplane board provides the connections for the disk modules and hosts the disk status LEDs. It is mounted in the front center of the chassis. It plugs into the disk controller board. A power cable connects the midplane board and the disk backplane board.

Midplane board

The midplane board provides connections for the rear modules. The disk controller board and the front interconnect board also plug into the midplane board. It is mounted in the center of the unit. A power cable connects the midplane board and the disk backplane board, if present.

Related Topics

Midplane board removal

Midplane board removal on page 486

Carrier module

The carrier module provides the functionality typically associated with a motherboard in a PC. It hosts the CPU, one optional PCIe board, and provides rear panel connections for Gigabit Ethernet, USB, VGA, and IEEE 1394a (Firewire). The IEEE 1394a port is for debugging purposes only. It is not supported for customer use. Do not attempt to configure or otherwise use this port. The carrier module also provides a GPI connection and connections for reference. It plugs into the midplane board.

Related Topics

Carrier module removal on page 482

Carrier module removal on page 482

Optional PCIe board

An optional PCIe board, such as a Fibre Channel board or a DynoZoom board, is hosted by the carrier module.

Related Topics

Optional PCIe board removal on page 483
Optional PCIe board removal on page 483

System Overview

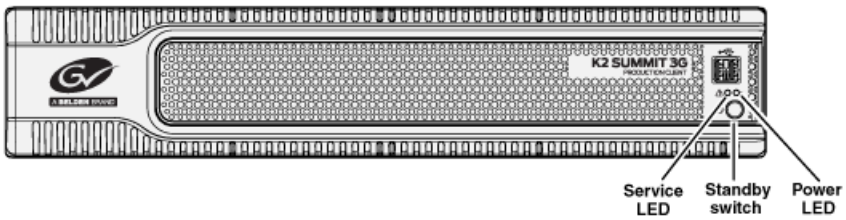
The K2 Summit system is a PCIe bus-based Windows computer with extensive enhancements to provide the video disk recorder functionality. This section explains the major architectural blocks.

Status indicators

The following sections describe the visual and audible indicators that communicate the current operating status and system health of the K2 Summit system.

Front panel indicators

The front bezel assembly must be installed for front panel LEDs to provide status.



Power LED

The Power LED indicates status as follows::

LED behavior	Status Condition
Off	The standby switch is set to Off and the K2 Summit system is not operational.
Green steady on	The standby switch is set to On and the K2 Summit system is either in the startup process or has completed the startup process and is operational.

⚠ ***WARNING: The power standby switch does not turn off power to the system. To turn power off both power supplies must be disconnected from the power source.***

Service LED

The following table explains the status conditions indicated by the different Service LED behaviors. If two or more status conditions occur simultaneously, the LED displays the behavior for the highest priority condition.

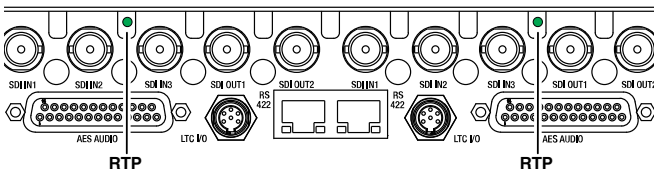
LED behavior	Status Condition	Priority
Flashing pattern alternating Yellow/Green/Red/Off twice a second	Identify — The K2 Summit system is being directed to identify itself by a monitoring application.	1
Solid Red	Global failure — The K2 Summit system software has detected a critical error or failure that impacts record/play operations.	2
Solid Yellow	Warning — The K2 Summit system software has detected a problem that requires attention but does not immediately impact record/play operations. For example, a fan or power supply has failed but its redundant partner is maintaining functionality.	3
Flashing Yellow pattern three times a second.	Drive failure — An internal RAID drive has failed. If RAID 1, the failure does not immediately impact record/play operations. The redundant partner RAID drive is maintaining functionality.	4
Flashing pattern alternating Yellow/Green once a second.	Drive rebuild — If RAID 1, an internal RAID drive is rebuilding.	5
Off	Normal — The K2 Summit system is healthy and operating normally.	5

Rear panel indicators

The following indicators are visible from the rear panel view.

Codec board indicator

Each channel has a green/red LED that indicates the status of the Real Time Processor (RTP).



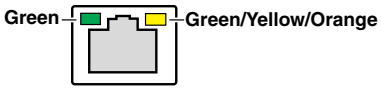
Codec board indicator codes

Interpret the RTP LED as follows:

LED behavior	Status condition
Green flashing at approximately 1 second intervals	RTP is up and connected to the host
Green flashing at greater than 1 second intervals	RTP is not connected to the host.
Red	RTP error condition. Real Time OS is not running.
Off	Real Time OS is not running.

LAN connector indicator codes

The motherboard has four RJ-45 LAN connectors that include integrated status LEDs. The LEDs are oriented as follows:



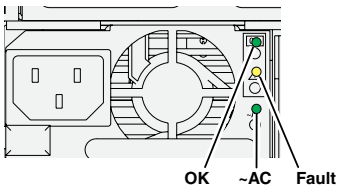
The meanings of the LED states are described in the following table:

LED	LED state	Status Condition
Green	Green On	The adapter is connected to a valid link partner
	Green flashing	Data activity
	Off	No link
Green/Yellow/Orange	Off	10 Mbps
	Green	100 Mbps
	Yellow	1000 Mbps
	Orange flashing	Identify

If a LAN connector is faulty, you must replace the carrier module.

Power supply indicators

Each power supply has LEDs that indicates status.



Interpret the power supply LEDs as follows:

LED	LED state	Status Condition
OK	Green On	The power supply is operating normally.
Fault	Yellow On	There is a power supply fault.
~AC	Green On	The electrical current available to the power supply meets power supply requirements. Input > 85 VAC.

Another indicator of power supply operation is the audible fan noise. If a power cable is connected to either power supply, the fan should stay on continuously on both power supplies. This is the case even if the K2 Summit system is shut down or restarting via the standby switch or the Windows operating system.

The Service LED on the front of the K2 Summit system also indicates power supply status.

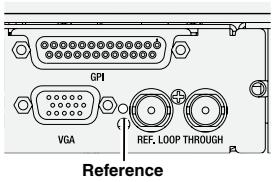
If the power source and the power cord are OK yet there is still a power supply problem, the status lights on the power supply indicate the problem.

Related Topics

Service LED on page 426
Power supply problems on page 468
Service LED on page 426
Power supply problems on page 468
Service LED on page 426
Power supply problems on page 468

Reference indicator

There is a small hole in the carrier module next to the “REF. LOOP THROUGH” BNC connectors.



Through this hole a LED is visible. When the LED is lit, the reference signal is present and locked.

Internal indicators

You must remove one or more modules to expose the following indicators for viewing.

Disk module indicators (LSI RAID controller)

You must remove the front bezel assembly to see these LEDs. Each disk module has LEDs that indicate status. The LEDs are located on the disk backplane. Flexible light pipes transmit the light so that it appears on the disk pillar next to the disk module. The following table explains the status conditions indicated by the different LED behaviors. If two or more status conditions occur

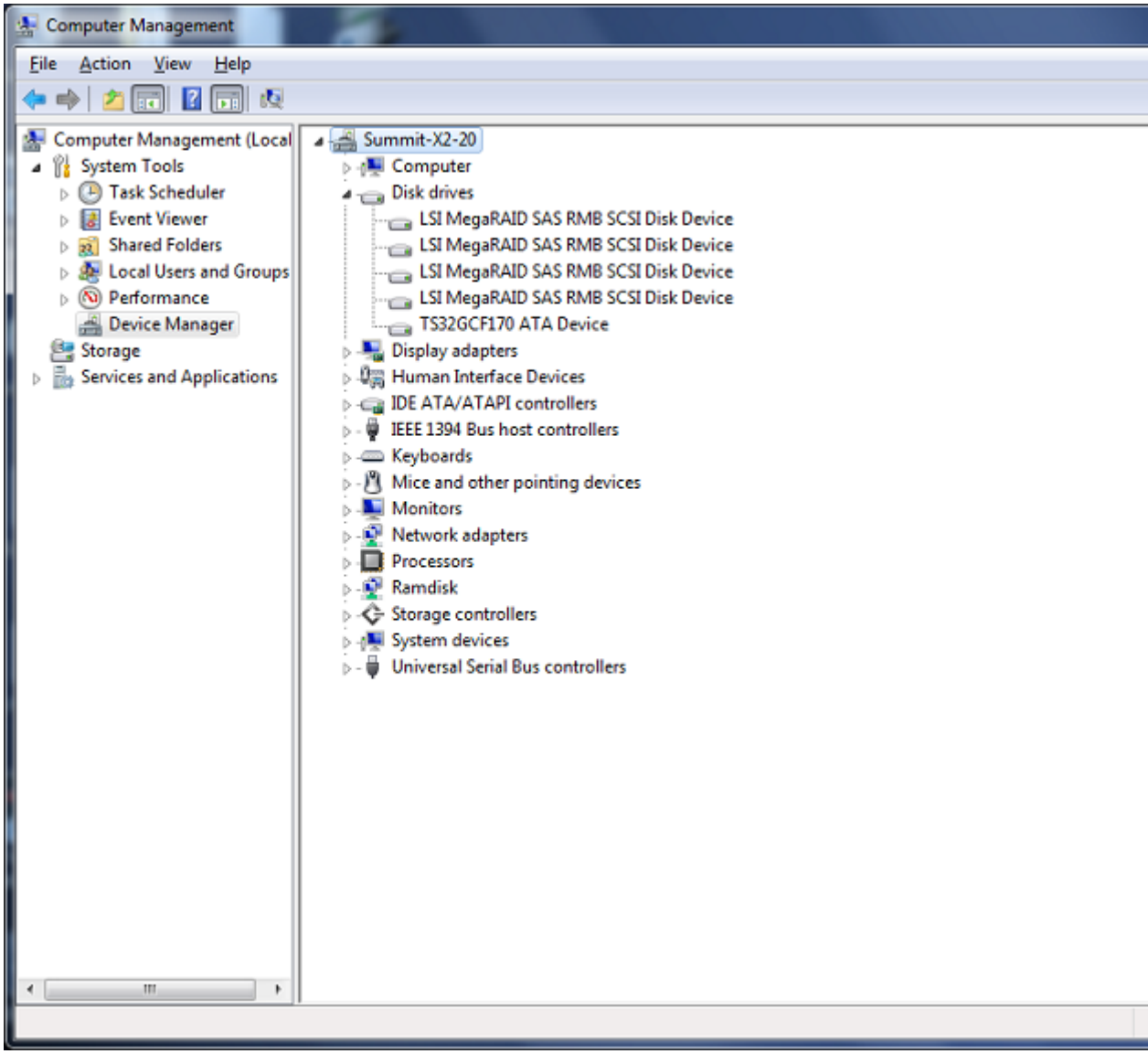
simultaneously, the LED displays the behavior for the highest priority condition. Priority number 1 is the highest priority.

Use the Device Manager on your computer to identify the RAID controller:

1. From the **Start** menu, type:

   ```
   Device Manager
   ```

   The **Device Manager** window displays.



2. Select **Disk drives** to expand and view the drive information. LSI MegaRAID displays and identifies the RAID controller as LSI.
3. Close **Device Manager**.

LED behavior	Status Condition	Priority
Amber flashing pattern.	Identify — The drive is being directed to identify itself by Storage Utility or some other application.	1

LED behavior	Status Condition	Priority
Green flashing pattern twice a second.	Rebuild — The RAID controller has marked the drive as rebuilding.	3
Red ON solid.	Fault — The RAID controller has marked the drive as faulty.	3
Amber ON solid.	Offline — The drive is unbound.	3
Green flashing pattern ten times a second.	Normal drive activity — The drive is healthy and disk access is underway.	3
Green ON solid.	Normal drive activity — The drive is healthy and no disk access is currently underway.	3
OFF	No drive — Drive is not present or is not fully engaged in slot.	—

Disk module indicators (AIC RAID controller)

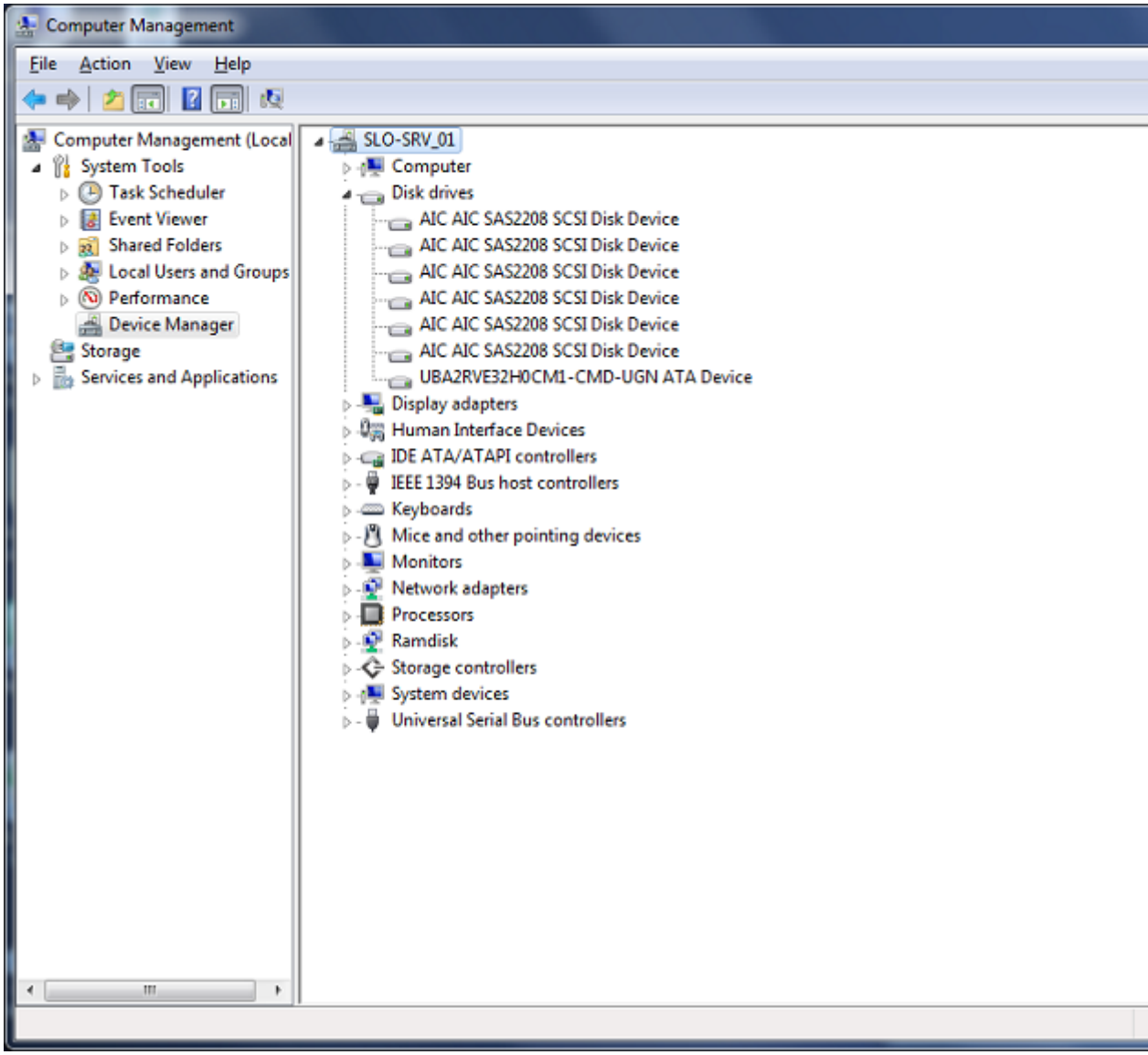
You must remove the front bezel assembly to see these LEDs. Each disk module has LEDs that indicate status. The LEDs are located on the disk backplane. The following table explains the status conditions indicated by the different LED behaviors. If two or more status conditions occur simultaneously, the LED displays the behavior for the highest priority condition. Priority number 1 is the highest priority.

Use the Device Manager on your computer to identify the RAID controller:

1. From the **Start** menu, type:

   ```
   Device Manager
   ```

   The **Device Manager** window displays.



2. Select **Disk drives** to expand and view the drive information. AIC displays and identifies the RAID controller as AIC.
3. Close **Device Manager**.

LED behavior	Status Condition	[illegible]
Amber flashing pattern.	Disk is being accessed while rebuilding the drive.	3
Amber flashing in a periodic pattern.	Identify — The drive is being directed to identify itself by Storage Utility or some other application.	1
Amber ON solid.	Offline — The drive is offline and unbound.	3
Green flashing pattern.	Normal disk access/normal drive activity.	3

LED behavior	Status Condition	[illegible]
Red ON solid.	Fault — The RAID controller has marked the drive as faulty.	3
Green ON solid.	Normal drive activity — The drive is healthy and no disk access is currently underway.	3
Red and alternating green flashing pattern.	Disk access — The drive is being accessed for information used to build another drive.	3
Green and alternating amber flashing pattern.	Unconfigured — The drive is unconfigured.	3
OFF	No drive — Drive is not present or is not fully engaged in slot.	—

System beep codes

When you start up the K2 Summit system by pressing the standby switch or by doing a Windows operating system restart, the CPU module might emit two short beeps. Otherwise, if there are no errors present, the K2 Summit system does not emit any audible beeps.

When an error occurs during Power On Self Test (POST), the BIOS displays a POST code that describes the problem. The BIOS might also issue one or more beeps to signal the problem. This indicates a serious error and it is likely that the carrier module must be replaced. Contact Grass Valley Support.

System Messages

About system messages

The following messages are displayed to indicate system status:

- Normal BIOS messages — These messages can be observed on a locally connected VGA monitor during normal startup processes.
- BIOS POST error messages — If there is a problem these messages are displayed on a locally connected VGA monitor. During the Power On Self Test (POST), the BIOS checks for problems and displays these messages.
- AppCenter startup messages — As AppCenter opens the system determines if health is adequate by checking critical subsystems. A dialog box is displayed that indicates progress and displays messages.
- Status bar and StatusPane messages — During normal operation AppCenter displays system status messages on the status bar. From the status bar you can open the StatusPane to see both current and previous messages. You can observe these messages in AppCenter on a locally connected VGA monitor or on a network connected control point PC.
- Storage Utility messages — While you are using Storage Utility, pop-up message boxes inform you of the current status of the storage system.

Related Topics

Viewing AppCenter system status messages on page 64

Critical system startup messages on page 63

Viewing AppCenter system status messages on page 64
Critical system startup messages on page 63
Viewing AppCenter system status messages on page 64
Critical system startup messages on page 63
Viewing AppCenter system status messages on page 64
Critical system startup messages on page 63

Critical system startup messages

The following messages appear in the AppCenter system startup message box as critical subsystems are checked during startup processes. If a critical failure is detected, the K2 Summit system is rendered inoperable and the failure message appears.

Critical subsystem check messages	Failure messages
System Startup	Startup error
	Missing or bad hardware
	A real time processor is not functioning correctly
Checking hardware…	Hardware fault
Checking media disks…	One or more media disks failed to initialize
	Missing or bad hardware
	Missing or bad database
Checking file system…	No file system is running
Checking database…	Database fault
Checking real-time system status…	A real-time system failed to initialize
Updating configuration…	Failed to synchronize configurations
Starting services…	Unable to communicate with <service name>

AppCenter startup errors

If you start AppCenter and the K2 Summit system is not running, or your login information is not correct, you will see a Startup Error message.

The following table describes the two most common startup error messages.

Startup Error	Description
Log on failed	Your user name or password is not valid for this K2 Summit system. Remember that the password is case sensitive. • Click **Ignore** to view the AppCenter channels. If working remotely, you will see the channels from the last-used channel suite. Or, • Click **Retry** to enter the login information again. Or, • Click Abort. If you are accessing AppCenter through a network-connected Control Point PC, **Abort** lets you try to create a new channel suite. If you are accessing AppCenter locally, it lets you exit to Windows. For assistance with your user name or password, consult your Windows administrator.
<K2 system>:<error>	The K2 Summit system might be offline or have had difficulty with the start up checks. There are various reasons why AppCenter is having difficulty connecting to the K2 Summit system; for example, the error might say there is no file system or that the K2 Summit system has been taken offline for maintenance. • Verify that the host name or IP address is correct and see if you can correct the problem. • If working locally, reboot the K2 Summit system. If working from a network-connected Control Point PC, select **System | Reconnect** from the AppCenter **System** menu.

Viewing AppCenter system status messages

System status messages are displayed in the AppCenter status bar. There are two types of system status messages, as follows:

- Channel status messages — In normal operation, this type of message displays the current operating status of the selected channel.
- System error messages — If a problem develops with the system software or a hardware subsystem, this type of message is displayed for approximately 5 seconds. Afterward, the display returns to the channel status message and the error message is written to the status log file. When a message is written to the status log, a *Status Icon* indicates the severity of the message.

Related Topics

Troubleshooting problems

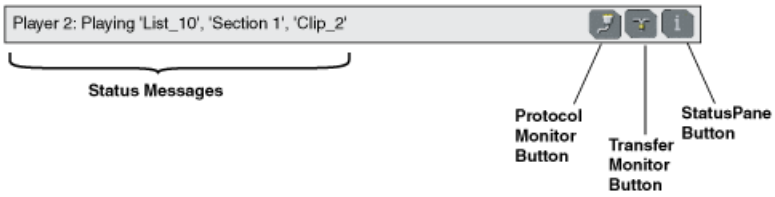
Troubleshooting problems

Troubleshooting problems

Status bar

System status messages appear in the AppCenter status bar, which is located across the bottom of the AppCenter window, and consists of a message area, several tool buttons, and a status icon. The

button icons appear only when the related function is active. In the position of the StatusPane button, status icons appear.



The status bar displays information about the state of the delegated channel as well as low-level error messages. (High priority error messages are displayed in pop-up windows.)

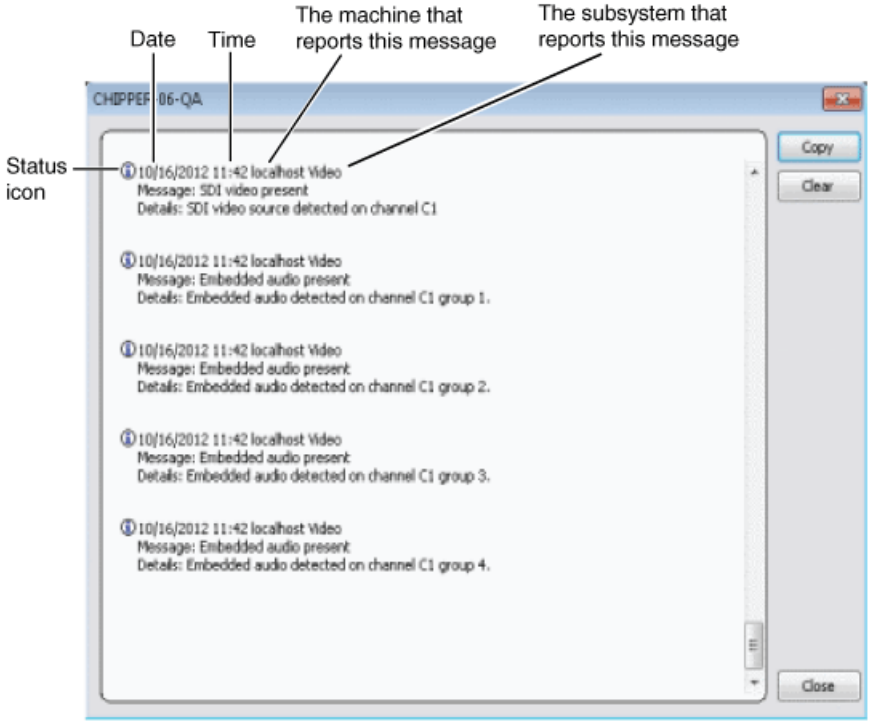
If you select a channel, a status message appears on the left-hand side of the status bar. If a potential error arises while an application is running in a channel, a status message flashes briefly on the left-hand side of the status bar, and an icon displays on the right-hand side. Double click on the icon to open the status pane to view a more detailed message about the channel's status.

The status icon changes depending on the status of the current status message.

Icon	Name	Description
	Information	A recent information message is present.
	Warning	There is at least one warning message, and no alert messages.
	Alert	There is at least one uncleared alert message.

Status pane

Current and previous system status messages can be viewed in the StatusPane. The system status pane also displays general information such as the video and audio settings on the channels. To open the StatusPane, click **Help | System Status**.



The StatusPane is used to view detailed system messages including status, warning, and error messages. System status messages provide status icons and a description of the status event reported by the message. If there is a problem, a corrective action is indicated. Use these messages along with troubleshooting problems to determine if a service procedure is necessary.

If you have a remote AppCenter Channel Suite with channels from multiple K2 systems, the messages from the different machines are combined in the StatusPane that you view from the Channel Suite. To help you determine which machine is generating a message, each message lists the machine name.

NOTE: If the Clear button is grayed out, you do not have the necessary privileges to perform this action, based on the type of user account with which you are currently logged on.

Related Topics

Passwords and security on Grass Valley systems on page 15

Copying StatusPane messages to the clip board

1. Select the message or messages in the StatusPane.
2. Click **Copy**.

After copying the message, it can be pasted using standard Windows techniques.

Clearing messages

Clearing messages from the StatusPane removes them from the logging database and the StatusPane. This also clears the state of the subsystem indicators so they no longer display the alert and warning symbols.

1. Open the StatusPane, then click **Clear**.
2. When a message prompts you to confirm, click **Yes**.

All messages are removed from the StatusPane and logging database.

Exporting log files

This topic describes how to export log files from the K2 Summit system. The log files include the following:

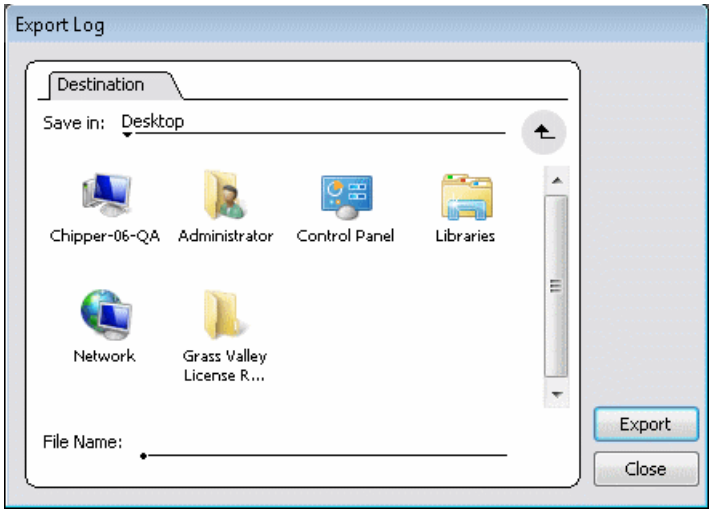
- All application and media database messages
- Version information
- Configuration file, from Configuration Manager

The exported files are combined in a ZIP file. The ZIP file can be sent to Grass Valley product support where they can analyze the logs to determine the operational status of your system.

NOTE: ExportLog does not export StatusPane messages. To capture StatusPane messages, you can copy StatusPane messages to the clip board.

1. Log in as Administrator.
2. Do one of the following to open the Export Log dialog box.
   - In AppCenter click **System | Export Log**.
   - From the Windows desktop, click **Start | All Programs | Grass Valley| Export logs**.
   - From the Windows desktop, click **Start | Run**, type `c:\profile\exportlog` in the Run dialog box, then click **OK**.

   The Export Log dialog box opens.



3. Browse to `C:\Logs` to save the log file.
4. Name the log file.
5. Click **Export**. A progress bar appears.
6. When the export process is complete, and message confirms success. Click **OK** and close the Export Log dialog box to continue.
7. Find the log file at the specified location.

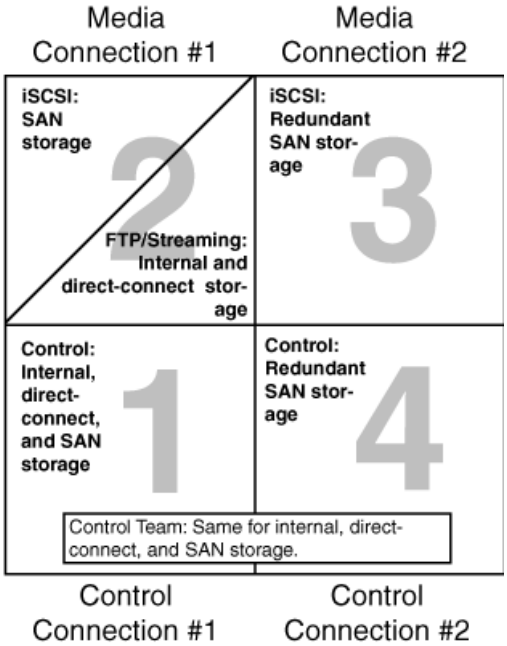
Related Topics

Copying StatusPane messages to the clip board on page 66
Copying StatusPane messages to the clip board on page 66
Copying StatusPane messages to the clip board on page 66

Service procedures

About networking

When you receive a K2 Summit system from the factory, it has a specific network configuration, including a loopback adapter and two of the four Gigabit Ethernet ports configured as a teamed pair. The Gigabit Ethernet ports, as viewed when looking at the rear panel, are represented in the following illustration.



Restoring network configuration

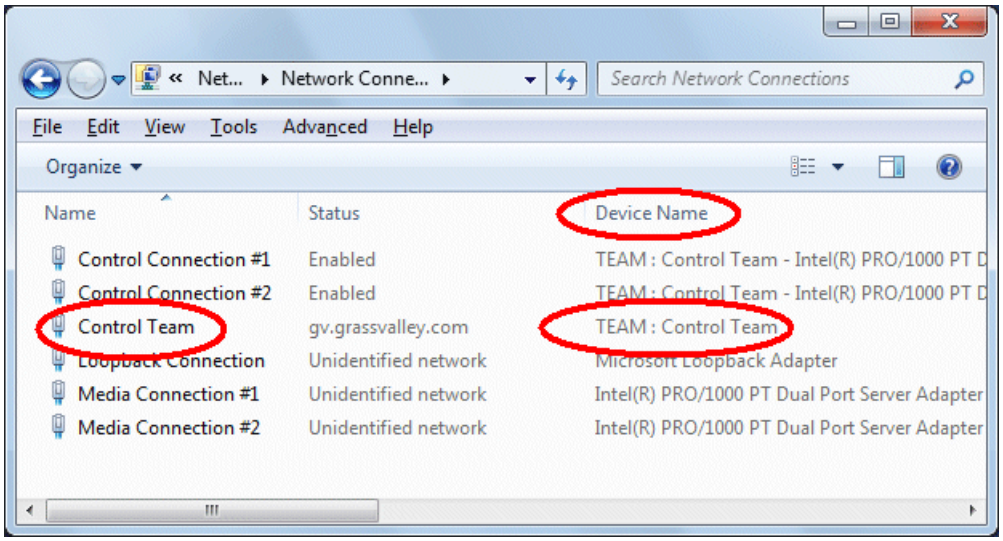
When you restore a system from its system specific image, network configuration is also restored to the factory default settings. This is the recommended method of restoring network configuration.

However, if for some other reason you must configure network settings manually, use the tasks in this section to restore the default network configuration.

Name team and loopback

- Adapters must be named

1. On the Windows desktop right-click **Start | Control Panel | Network and Sharing Center | Change adapter settings**. The Network Connections window opens.



2. For the loopback, select adapter names in the “Device Name” column and rename them as follows:
   a) Select the adapter name.
   b) Select **File | Rename** to enter rename mode, and type the new name.

If continuing with network configuration, your next task is to reorder adapters.

Enhance network bandwidth

On K2 Summit system systems with K2 system software 9.x, the on-board network adapters have a performance limitation that causes them to function at half the expected bandwidth. On most systems, there are no symptoms related to this limitation, as network traffic is below the limitation. Systems using ShareFlex or having other requirements for high network bandwidth might be impacted to some degree. Symptoms include general network bandwidth restrictions, slow iSCSI I/O performance, slower than expected FTP traffic, and other slowness not caused by other factors.

Grass Valley requires that you remove the limitation and enhance the network performance. Once the limitation is removed, the change persists throughout normal software upgrades. However, if you reimage the K2 Summit system system you must check and reapply the change if necessary.

To remove the limitation, disable "Large Send Offloads" on the network adapters and disable "CPU Power Technology" in the BIOS.

Refer to Grass Valley Knowledge Base Article *#000011688* for more information.

Disable Large Send Offloads

1. From the Windows operating **Start** menu, open **Control Panel**.
2. In **Control Panel**, open **Network and Internet** and **Network and Sharing Center** .
3. In **Network and Sharing Center**, select **Change adapter settings**.
   Network Connections opens and displays network adapters, including the following:
   - Control Connection #1
   - Control Connection #2
   - Media Connection #1
   - Media Connection #2
4. For each Control Connection and each Media Connection, do the following:
   a) Right-click the connection and select **Properties**.
   The **Connection Properties** dialog box opens.
   b) In the **Connection Properties** dialog box, click **Configure**.
   The **Adapter Properties** dialog box opens.
   c) In the **Adapter Properties** dialog box, click the **Advanced** tab.
   d) On the Advanced tab, in the Settings list select **Large Send Offload v2 (IPv4)** and then in the Value drop-down list select **Disabled**.
   e) Click **OK** to save settings and close.
   f) Repeat these steps for each Control Connection and each Media Connection.

Next, disable CPU power technology.

Disable CPU Power Technology

1. Restart the K2 Summit system system.
2. During the BIOS startup screen, press **F2** repeatedly until `Entering Setup...` appears.
   The BIOS screen opens.
3. On the BIOS screen, use arrow keys and select the **Advanced** tab.
4. On the Advanced tab select **CPU Core Configuration** and then press **Enter**.
   The CPU Core Configuration screen opens.
5. On the CPU Core Configuration screen, select **Power Technology** and then press **Enter**.
   A **Power Technology** dialog box opens.
6. In the **Power Technology** dialog box select **Disable** and then press **Enter**.
7. Press **F4** to save and exit.
   A **Save & Exit Setup** dialog box opens.
8. In the **Save & Exit Setup** dialog box, select **Yes** and then press **Enter**.
9. The K2 Summit system system restarts.

Next, install the SiteConfig Discovery Agent.

Checking services

Depending on storage type (standalone or shared) of the K2 Summit system, various services are turned off or on or set to different startup types. These services are automatically set by the K2 Summit system software installation program and by the Status Server service whenever the K2 Summit system starts up.

***NOTE: Do not manually change the way services run on a* K2 Summit system.**

If you suspect that services have been tampered with or for any reason are not set correctly, you can check their current settings in the Windows Services Control Panel. The table below provides the settings for the services that are critical to a correctly operating K2 Summit system.

Services on a standalone storage K2 Summit 3G system

When a standalone K2 Summit system with internal storage or a K2 Summit system with direct-connect storage is operating normally, in the Services control panel services appear as follows:

Table 23: Standalone storage K2 Summit 3G system services

Service	Status	Startup Type	Comments
CvfsPM[10]	Started	Automatic	—
Grass Valley AppService	Started	Automatic	Depends on Status Server service.
Grass Valley Extent Manager Service	Started	Manual	Used to consolidate unused space (extents) at the end of proxy clips on an SNFS file system. Does not apply to non-SNFS file systems.
Grass Valley FTP Daemon	Started	Manual	Started by Status Server service on standalone storage models.
Grass Valley Host File Service	Started	Automatic	—
Grass Valley HTTP File Server	Started	Manual	Provides access to live streaming configuration (SDP) files.

[10] With SNFS version 3.5, this is the only service. Previous versions had StorNext File System service and StorNext File System RPC Port Mapper service.

Service	Status	Startup Type	Comments
Grass Valley Import Service	—	Manual	This is the service that provides the functionality for a K2 capture service. It is the service that automatically creates the K2 clip from the media files in the watched folder (source directory) and puts the K2 clip in the K2 media storage (destination bin).
Grass Valley K2 Config	Started	Automatic	Not used on standalone storage K2 Summit/Solo system.
Grass Valley MegaRaid Server	—	Manual	—
Grass Valley MetaDataService	Started	Manual	—
Grass Valley RTS Config Service	Started	Manual	—
Grass Valley SabretoothWS	—	Manual	Allows Macintosh systems to remotely check out a license.
Grass Valley Storage Utility Host	Started	Automatic	—
Grass Valley System Status Server	Started	Automatic	At startup the Status Server service makes sure the following services are started: AMP TCP Service; AppService; FTP Daemon.
GV STRATUS Summit Services	Started	Automatic	Required if part of a GV STRATUS system.
Microsoft iSCSI Initiator Service	Started	Automatic	Not used on a standalone storage K2 Summit/Solo system.
ProductFrame Discovery Agent Service	Started	Automatic	—
Sabretooth License Server	Started	Manual	—
Sabretooth Protocol Service	—	Manual	—

Checking pre-installed software

Software is pre-installed on K2 products when you receive them from the factory. This load of pre-installed software is referred to as the “golden drive”. The following list is an example of the software pre-installed. Check the "About This Release" section of the K2 Topic Library for the most up-to-date list with version information.

If you suspect that pre-installed software is not correct, use the recovery process to re-load the software. Do not attempt to un-install, install, or repair pre-installed software without guidance from your Grass Valley Support representative.

K2 Summit system pre-installed software

- Intel Pro Software
- QuickTime
- Microsoft iSCSI Initiator
- MS XML
- .NET Framework
- MegaRAID — Do not use this utility on a K2 Summit system. This utility is for use by qualified Grass Valley Service personnel only. When this utility is opened it scans the SCSI bus and interferes with record and play operations.
- J2SE Runtime Environment
- StorNext software
- Windows PowerShell
- Windows 10 IoT LTSB

Making CMOS settings

NOTE: This procedure is intended for use by Grass Valley Service personnel or under the direct supervision of Grass Valley Service personnel.

1. Connect keyboard, monitor, and mouse to the K2 Summit system.
2. Restart the K2 Summit system.
3. During the BIOS startup screen, watch the keyboard lights (capslock, numlock, etc.). When the lights flash, press **Delete** to enter Setup.
4. Press **F3** and then press **Enter**. This loads optimal default values for all the setup questions.
5. Press **F4** and then press **Enter** to save settings and restart.

Restoring disk controller configuration

Do this task when replacing the disk controller board.

This task can be used on any K2 Summit system, but it is required on any system that has a Type II (ADLINK) CPU carrier module. This includes the first generation K2 Summit system, which can have a Type II CPU carrier module that was installed in the factory or that was upgraded in the field.

NOTE: This procedure is intended for use by Grass Valley Service personnel or under the direct supervision of Grass Valley Service personnel.

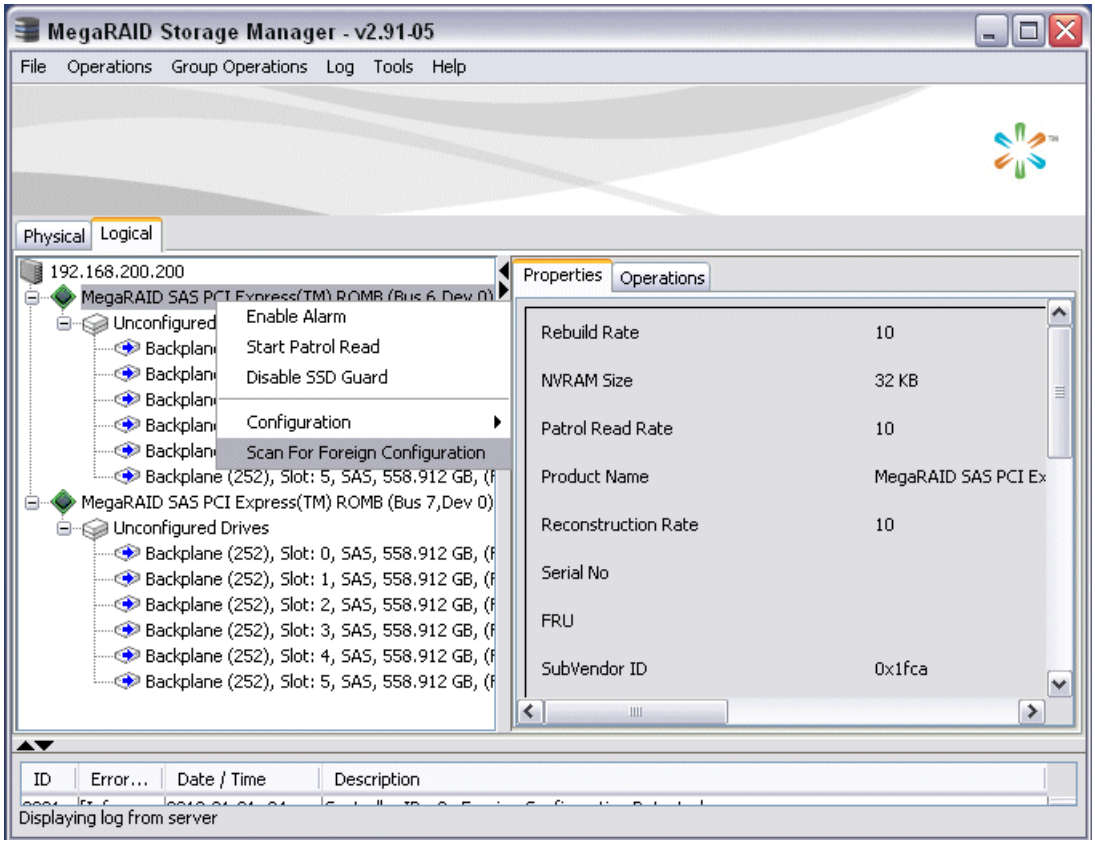
After you replace a disk controller board, you must import the configuration information from the existing disks. This allows the new board to see the LUNs as previously configured.

1. After replacing the disk controller board, power up the K2 Summit system.

   Ignore SNFS messages that can open at any time during this procedure.

2. On the Windows desktop, open the **MegaRAID Storage Manager** icon.
3. When prompted, enter administrator credentials.

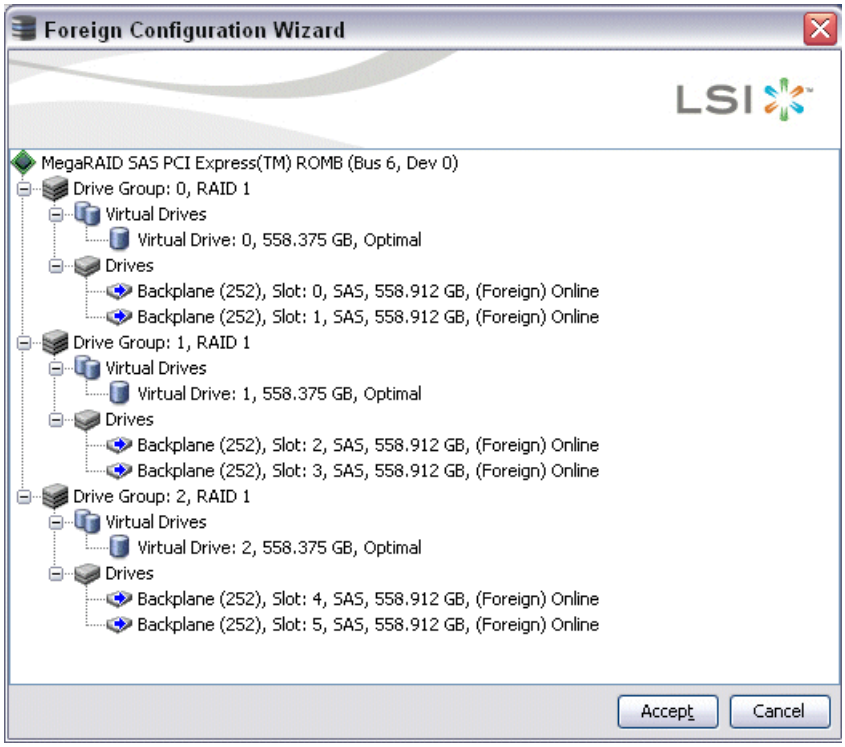
   The MegaRAID Storage Manager main window opens.



4. In the MegaRAID Storage Manager main window tree-view, verify that drives are reported as "Unconfigured Drives".

5. In the tree-view, right-click the top controller and select **Scan For Foreign Configuration**.
   A Foreign Configuration Detected dialog box opens.

6. Make sure **Import** is selected and click **OK**.
   A Foreign Configuration Wizard opens.



7. Click **Accept**.
8. When prompted "...import?", click **Yes**.
9. When informed "...imported successfully", click **Yes**.

10. In the MegaRAID Storage Manager main window tree-view, verify that one controller reports configured drives and one controller reports unconfigured drives.
11. For the controller with unconfigured drives, repeat previous steps to import the foreign configuration.
12. When you have imported the foreign configuration for both controllers, click **File | Exit** to close MegaRAID Storage Manager.
13. Restart the K2 Summit system.

Related Topics

Disk controller board removal
Disk controller board removal on page 478

Recovering the media database

This section provides topics about recovering the media database.

About the automatic database backup process

Every 15 minutes the K2 system checks to see if any media operations have changed the media database. If a change has occurred, the K2 system creates a backup file of the media database. The backup file is saved in the same directory as the media database using a rotating set of three file names. These files are named *media.db_bakX* where X is the number in the rotation. Each time a backup occurs, the oldest backup file is overwritten. If some condition renders one of the backup files un-writable, the backup file following that in the rotation is subsequently used for every backup until the condition is resolved.

Identifying a corrupt media database

The following symptoms could indicate a corrupt media database:

- On startup, the Grass Valley MetaDataService is unable to start. This is indicated in the Services control panel if the Grass Valley MetaDataService does not display as Started.
- The K2 log displays a "…file is encrypted or is not a database…" error.

As soon as you suspect a corrupt media database, stop all media access and take the K2 system offline.

Restoring the media database

1. Stop all media access and take the K2 system offline.
2. Navigate to the V:\media directory.
3. Make a copy of the media.db and media.db_bak* files and store them in a secure location.
4. Stop the Grass Valley MetaDataService as follows:

   For the standalone K2 system, use the Services control panel to stop the service.
5. Determine which backup file is the most recent good file by examining the file modification date on each backup file.
6. Rename the current *media.db* file (which is assumed to be corrupt) to another name, and rename the most recent good *media.db_bakX* file to *media.db*.

7. Restart the K2 system following normal procedures.
8. Confirm that the systems come up correctly with the restored database now in place.
9. Use Storage Utility **Clean Unreferenced Files** and **Clean Unreferenced Movies** to repair any inconsistencies between the contents of the database and the file system.

Using recovery images

This section provides topics about using recovery images.

About the recovery image process

An image of the K2 Summit system system drive is provided with the product package. You can restore the K2 Summit system from this image. This simplifies the process of rebuilding a system in a disaster recovery scenario.

NOTE: This process is not intended as a means to backup and restore media.

When you receive your K2 Summit system new from the factory, you receive a system-specific image for that particular K2 Summit system. This factory image is stored on a bootable USB Recovery Flash Drive. Also on the Recovery Flash Drive is the Acronis True Image software necessary to create and restore an image. You can find the Recovery Flash Drive in a holder in the front bezel assembly.

After your K2 Summit system is installed, configured, and running in your system environment, you should create a new recovery image to capture settings changed from default. This “first birthday” image is the baseline recovery image for the K2 Summit system in its life in your facility. There is enough space on the Recovery Flash Drive to store the first birthday image along with the factory image.

You should likewise create a new recovery image after completing any process that changes system software or data, such as a software upgrade. In this way you retain the ability to restore your K2 Summit system to a recent “last known good” state.

NOTE: The recovery image process is an “off-line” process. Do not attempt this process while media access is underway.

The recovery image process that you should follow is summarized in the following steps.

- **At the K2 Summit system first birthday…**

  Boot from the Recovery Flash Drive.

  Create a recovery image for the K2 Summit system.

  Create a recovery image for the Control Point PC.

- **At milestones, such as software upgrades…**

  Boot from the Recovery Flash Drive.

  Create a recovery image for the K2 Summit system.

- **If you need to restore the K2 Summit system…**

  Boot from the Recovery Flash Drive.

  Read the image from the Recovery Flash Drive or from the location that you stored the image.

- **If you need to restore the Control Point PC…**

  Boot from the Recovery Flash drive.

  Read the image from the location that you stored the image.

Use the following procedures to implement the recovery image process as necessary.

Creating a recovery image

Before creating a recovery image, determine the storage location for the image. Grass Valley recommends that you store the recovery image on the Recovery Flash Drive that you received, and this task provides instructions for that location. If you use a different location, such as a network connected drive or another connected USB drive, alter the steps in this task as appropriate.

1. Make sure that media access is stopped and that the system on which you are working is not being used.
2. If you have not already done so, connect keyboard, monitor, and mouse.
3. Do the following:
   a) Insert the Recovery Flash Drive into a USB port.
   b) Restart the machine, or power on if currently shut down.

      The machine boots from the Recovery Flash Drive, into a version of Windows stored on the drive.

      A MS-DOS command window opens.

   c) Press the **F11** key to enter Boot options.
   d) When prompted with a list of options, select the Acronis option and then press **Enter**.

   The Acronis program loads.
4. In the Acronis main window, click **Backup**.

   The Create Backup Wizard opens.
5. On the Welcome page, click **Next**.
6. On the Partitions Selection page, do the following:
   a) Select the **(C:)** partition and then click **Next**.

      NOTE: Verify capacity to make sure you select the boot media card (CompactFlash or mSATA) and not a media drive. The boot media has a much smaller capacity.

      If a "…choose full backup mode…" message appears, click **OK**.

7. On the Backup Archive Location page, do the following:
   a) in the tree view select **Removable Disk (D:)** and enter the name of the image file you are creating.

      Create the file name using the machine hostname and the date. Name the file with the .tib extension.

      For example, if the hostname is MySystem1, in the File name field you enter `A:\MySystem1_20180827.tib`.

   b) Click **Next**.
8. On the Select Backup Mode page, select **Create a new full backup archive** and then click **Next**.
9. On the Backup Options page, do not change any settings. Click **Next**.
10. On the Archive Comment page, if desired, enter image comments such as the date, time, and software versions contained in the image you are creating. Click **Next**.
11. On the "…ready to proceed…" page, do the following:
    a) Verify that you are creating an image from the C: drive and writing to the D:\ drive, then click **Proceed**.

       If a "...insert next volume..." message appears, click **OK**.
12. On the Operation Progress page, observe the progress report.
13. When a message appears indicating a successful backup, click **OK**.
14. Click **Operations | Exit** to exit the Acronis True Image program.

    The machine restarts automatically.
15. Remove the recovery media while the machine is shutting down.

Restoring from a system-specific recovery image

Use this task to restore a K2 Summit system using an image made from that particular K2 Summit system. If restoring from a generic factory default image, use the appropriate task.

Before restoring from a recovery image, make sure that the K2 Summit system has access to the image from which you are restoring. This task provides instructions for accessing an image on the Recovery Flash Drive. If you access an image from a different location, such as a network connected drive or another connected USB drive, alter the steps in this task as appropriate.

1. Make sure that media access is stopped and that the system on which you are working is not being used.
2. If you have not already done so, connect keyboard, monitor, and mouse.
3. Do the following:
   a) Insert the Recovery Flash Drive into a USB port.
   b) Restart the machine, or power on if currently shut down.

      The machine boots from the Recovery Flash Drive, into a version of Windows stored on the drive.

      A MS-DOS command window opens.

   c) Press the **F11** key to enter Boot options.
   d) When prompted with a list of options, select the Acronis option and then press **Enter**.

   The Acronis program loads.

4. In the Acronis main window, click **Recovery**.

   The Restore Data Wizard opens.

5. On the Welcome page, click **Next**.
6. On the Backup Archive Selection page, in the tree view expand the node for **Removable Disk (D:)** and select the image file, then click **Next**.
7. On the Restoration Type Selection page, select **Restore disks or partitions** and then click **Next**.
8. On the Partition or Disk to Restore page, select **MBR and Track 0** and then click **Next**.
9. On the Disk Selection page, select **Disk 1** and then click **Next**.

   NOTE: Verify capacity to make sure you select the boot media card (CompactFlash or mSATA) and not a media drive. The boot media has a much smaller capacity and has an interface identified as "IDE (0) Primary Master".

10. On the Next Selection page, select **Yes, I want to restore another partition or hard disk drive** and then click **Next**.
11. On the Partition or Disk to Restore page, select **(C:)** and then click **Next**.
12. On the Restored Partitions Resizing page, select **Yes, I want to resize partitions** and then click **Next**.
13. On the Restored Location page, select **(C:)** and then click **Next**.

    NOTE: Verify capacity to make sure you select the boot media card (CompactFlash or mSATA) and not a media drive. The boot media has a much smaller capacity and has an interface identified as "IDE (0) Primary Master".

14. On the Restored Partition Type page, select **Active** and then click **Next**.
15. Do one of the following:

    - If the Restored Partition Size page does not appear. Skip ahead to the Next Selection page.
    - If the Restored Partition Size page appears. Continue with the next step.

16. On the Restored Partition Size page, do one of the following:

    - If **Free space after** reports 0 bytes, leave settings as they are. Click **Next**.
    - If **Free space after** does not report 0 bytes, increase **Partition size** until **Free space after** reports 0 bytes. Click **Next**.

17. On the Next Selection page, select **No, I do not** and then click **Next**.
18. On the Restoration Options page, do not make any selections. Click **Next**.
19. On the "…ready to proceed…" page, verify that you are restoring the correct image to the correct location. Click **Proceed**.
20. On the Operation Progress page, observe the progress report.
21. When a message appears indicating a successful recovery, click **OK**.
22. Click **Operations | Exit** to exit the Acronis True Image program.

    The machine restarts automatically.

23. Remove the recovery media while the machine is shutting down.

24. When prompted, enter the K2 Summit system machine name.

    Make sure the name is identical to the name it previously had.

    After start up, one or more device discovery windows can open. Allow processes to complete without interference. Refer to Release Notes for informaion on compatible driver versions. If a Fibre Channel card driver, ignore until instructed later in this process.

    At first start up after reimage, the system is in Embedded Security Update mode by default.

Next, check the adapter names and order. If adapter names and order are not as documented, restore network configuration.

Related Topics

Reorder adapters

Restoring network configuration on page 438

Reorder adapters

Restoring network configuration on page 438

Reorder adapters

Restoring network configuration on page 438

Restoring to blank mSATA

This task is for a K2 Summit 3G system that has had its mSATA boot media replaced with a new blank mSATA card. This means the mSATA card has never been initialized and has never before contained a disk image.

You can use this task to restore from a system-specific image or from a generic image. This task provides instructions for accessing an image on the Recovery Flash Drive. If you access an image from a different location, such as a network connected drive or another connected USB drive, alter the steps in this task as appropriate. There can be multiple versions of the generic recovery disk image on the Recovery Flash Drive. Refer to related topics in the "About This Release" section of the K2 Topic Library to determine which version you should use.

NOTE: If restoring using a generic image, the* K2 Summit system *is returned to its factory default condition. Passwords and other site-specific configurations are reset to factory defaults.

1. Make sure that media access is stopped and that the system on which you are working is not being used.
2. If you have not already done so, connect keyboard, monitor, and mouse.
3. Do the following:
   a) Insert the Recovery Flash Drive into a USB port.
   b) Restart the machine, or power on if currently shut down.

      The machine boots from the Recovery Flash Drive, into a version of Windows stored on the drive.

      A MS-DOS command window opens.

   c) Press the **F11** key to enter Boot options.
   d) When prompted with a list of options, select the Acronis option and then press **Enter**.

   The Acronis program loads.
4. In the Acronis main window, click **Recovery**.

   The Restore Data Wizard opens.

5. On the Welcome page, click **Next**.
6. On the Backup Archive Selection page, in the tree view expand the node for **Removable Disk (D:)** and select the image file, then click **Next**.
7. On the Restoration Type Selection page, select **Restore disks or partitions** and then click **Next**.
8. On the Partition or Disk to Restore page, select **MBR and Track 0** and then click **Next**.
9. On the Disk Selection page, select **Disk 1** and then click **Next**.

   NOTE: Verify capacity to make sure you select the boot media card (CompactFlash or mSATA) and not a media drive. The boot media has a much smaller capacity and has an interface identified as "IDE (0) Primary Master".

10. On the Next Selection page, select **Yes, I want to restore another partition or hard disk drive** and then click **Next**.
11. On the Partition or Disk to Restore page, select **(C:)** and then click **Next**.
12. On the Restored Partitions Resizing page, select **Yes, I want to resize partitions** and then click **Next**.
13. On the Restored Location page, select **(C:)** and then click **Next**.

    NOTE: Verify capacity to make sure you select the boot media card (CompactFlash or mSATA) and not a media drive. The boot media has a much smaller capacity and has an interface identified as "IDE (0) Primary Master".

14. On the Restored Partition Type page, select **Active** and then click **Next**.
15. Do one of the following:

    - If the Restored Partition Size page does not appear. Skip ahead to the Next Selection page.
    - If the Restored Partition Size page appears. Continue with the next step.

16. On the Restored Partition Size page, do one of the following:

    - If **Free space after** reports 0 bytes, leave settings as they are. Click **Next**.
    - If **Free space after** does not report 0 bytes, increase **Partition size** until **Free space after** reports 0 bytes. Click **Next**.

17. On the Next Selection page, select **No, I do not** and then click **Next**.
18. On the Restoration Options page, do not make any selections. Click **Next**.
19. On the "…ready to proceed…" page, verify that you are restoring the correct image to the correct location. Click **Proceed**.
20. On the Operation Progress page, observe the progress report.
21. When a message appears indicating a successful recovery, click **OK**.
22. Click **Operations | Exit** to exit the Acronis True Image program.

    The machine restarts automatically.

23. Remove the recovery media while the machine is shutting down.
24. When prompted, enter the machine name.

    Make sure the name is identical to the name it previously had.

    At first start up after reimage, the system is in Embedded Security Update mode by default.

Depending on whether you restored from a system-specific image or from a generic image, refer to the appropriate disk image recovery task for next steps.

About saving and restoring settings while reimaging

If you are reimaging a K2 Summit system with a generic disk image, you can run scripts to save the media file system and other settings before the reimage, then restore the settings after the reimage. Setting are saved and restored as follows:

- Media file system (SNFS): You run scripts to save and restore these settings. After the settings are restored, on a standalone system you can access the media in the local media storage.
- SID, computer name, and network settings: You run the script to save settings to a text file, so you can manually reconfigure as desired after the reimage.

If the media file system and settings are valid (not corrupt) on the K2 Summit system before the reimage, it is recommended that you use the save/restore scripts to save your media and settings, thus saving time in the reimage process. However, if the media file system or settings are corrupt and your purpose for reimaging is to remove the corruption, it is likely that you do not want to use the save/restore scripts.

Saving settings before generic reimage

1. Make sure you are logged in to the K2 Summit system with administrator privileges.
2. Connect the USB Recovery Flash Drive to a USB port on the K2 Summit system.
3. On the USB Recovery Flash Drive, navigate to the following location:

   `\tools\SaveRestoreScripts.`

   NOTE: Do not attempt to use the same Recovery Flash Drive on multiple systems.

4. Run the following and wait for the process to complete:

   `psave.bat`

   This saves current settings onto the USB Recovery Flash Drive in the `\settings` directory.

5. Disconnect the USB Recovery Flash Drive.

Restoring from a generic image

This task can be used on a K2 Summit system that needs to be restored to its factory default state. For example, if you neglected to make a first birthday image, you might need to use this procedure. If the image from which you are restoring was made from the specific machine, refer to the appropriate procedure.

This task provides instructions for accessing an image on the Recovery Flash Drive. If you access an image from a different location, such as a network connected drive or another connected USB drive, alter the steps in this task as appropriate. There can be multiple versions of the generic recovery disk image on the Recovery Flash Drive. Refer to related topics in the "About This Release" section of the K2 Topic Library to determine which version you should use.

NOTE: This procedure restores the* K2 Summit system *to its factory default condition. Passwords and other site-specific configurations are reset to factory defaults.

1. Make sure that media access is stopped and that the system on which you are working is not being used.

2. If you have not already done so, connect keyboard, monitor, and mouse.
3. Do the following:
   a) Insert the Recovery Flash Drive into a USB port.
   b) Restart the machine, or power on if currently shut down.

      The machine boots from the Recovery Flash Drive, into a version of Windows stored on the drive.

      A MS-DOS command window opens.
   c) Press the **F11** key to enter Boot options.
   d) When prompted with a list of options, select the Acronis option and then press **Enter**.

   The Acronis program loads.
4. In the Acronis main window, click **Recovery**.

   The Restore Data Wizard opens.
5. On the Welcome page, click **Next**.
6. On the Backup Archive Selection page, in the tree view expand the node for **Removable Disk (D:)** and select the image file, then click **Next**.
7. On the Restoration Type Selection page, select **Restore disks or partitions** and then click **Next**.
8. On the Partition or Disk to Restore page, select **MBR and Track 0** and then click **Next**.
9. On the Disk Selection page, select **Disk 1** and then click **Next**.

   NOTE: Verify capacity to make sure you select the boot media card (CompactFlash or mSATA) and not a media drive. The boot media has a much smaller capacity and has an interface identified as "IDE (0) Primary Master".
10. On the Next Selection page, select **Yes, I want to restore another partition or hard disk drive** and then click **Next**.
11. On the Partition or Disk to Restore page, select **(C:)** and then click **Next**.
12. On the Restored Partitions Resizing page, select **Yes, I want to resize partitions** and then click **Next**.
13. On the Restored Location page, select **(C:)** and then click **Next**.

    NOTE: Verify capacity to make sure you select the boot media card (CompactFlash or mSATA) and not a media drive. The boot media has a much smaller capacity and has an interface identified as "IDE (0) Primary Master".
14. On the Restored Partition Type page, select **Active** and then click **Next**.
15. Do one of the following:
    - If the Restored Partition Size page does not appear. Skip ahead to the Next Selection page.
    - If the Restored Partition Size page appears. Continue with the next step.
16. On the Restored Partition Size page, do one of the following:
    - If **Free space after** reports 0 bytes, leave settings as they are. Click **Next**.
    - If **Free space after** does not report 0 bytes, increase **Partition size** until **Free space after** reports 0 bytes. Click **Next**.
17. On the Next Selection page, select **No, I do not** and then click **Next**.

18. On the Restoration Options page, do not make any selections. Click **Next**.
19. On the "…ready to proceed…" page, verify that you are restoring the correct image to the correct location. Click **Proceed**.
20. On the Operation Progress page, observe the progress report.
21. When a message appears indicating a successful recovery, click **OK**.
22. Click **Operations | Exit** to exit the Acronis True Image program.

    The machine restarts automatically.
23. Remove the recovery media while the machine is shutting down.
24. Upon startup, wait for initialization processes to complete. This can take several minutes, during which time USB keyboard/mouse input is not operational. The system might automatically restart. Do not attempt to shutdown or otherwise interfere with initialization processes.
25. When prompted, enter the K2 Summit system machine name.

    Make sure the name is identical to the name it previously had.

    After start up, one or more device discovery windows can open. Allow processes to complete without interference. Refer to Release Notes for informaion on compatible driver versions. If a Fibre Channel card driver, ignore until instructed later in this process.

    At first start up after reimage, the system is in Embedded Security Update mode by default.

Next, check the adapter names and order. If adapter names and order are not as documented, restore network configuration.

Restoring settings after generic reimage

Settings must be saved using `psave.bat` before reimaging the K2 Summit system, and the reimage (Acronis) process must be complete.

1. If you have not already done so, start up the K2 Summit system and log on with administrator privileges.
2. Connect the USB Recovery Flash Drive to a USB port on the K2 Summit system.
3. From the USB Recovery Flash Drive, run the following and wait for the process to complete:

   ```
   Tools\SaveRestoreScripts\prestore.bat
   ```

Next, do the following as appropriate to restore your K2 Summit system. Refer to related topics in this document or as otherwise indicated.

1. Restore network configuration. If you saved settings with `psave.bat`, refer to `C:\ipconfig.txt` for the complete listing of the network settings that the K2 Summit system had before reimaging.
2. Enhance network bandwidth.
3. Install the SiteConfig Discovery Agent.
4. If you install software with SiteConfig, do the following:
   - Take Embedded Security out of Update mode.
   - Install SNFS software and K2 software using SiteConfig.
   - Restore SabreTooth licenses.

5. If you install software manually (without SiteConfig), do the following:
   - Install SNFS software and K2 software manually.
   - Take Embedded Security out of Update mode.
   - Restore SabreTooth licenses.

   If you saved/restored settings with `psave.bat` and `prestore.bat`, SNFS uses the restored settings.
6. If a K2 Summit system with a Fibre Channel card, install the Fibre Channel Card driver. Refer to related topics in "K2 Summit Production Client Service Manual".
7. Check the Windows operating system clock, and if necessary, set it to the correct time.
8. Activate Windows within 30 days.

Installing the Discovery Agent on a K2 Summit system

If the device that you plan to manage with SiteConfig does not have a SiteConfig Discovery agent installed, use this topic to verify and, if necessary, manually install SiteConfig support software. Doing so allows SiteConfig to discover and manage the device. If the device has any version of the SiteConfig Discovery Agent currently installed, you should use SiteConfig to upgrade the Discovery Agent, rather than installing it manually.

1. On the device you plan to manage with SiteConfig, open the Windows Services Control Panel and look for the following required item:
   - SiteConfig Discovery Agent
2. Proceed as follows:
   - If you find the required items, no further steps are necessary. SiteConfig support software is installed.
   - If a required item is not present, navigate to your SiteConfig files. If you do not already have these files in convenient location, you can find them on the PC that hosts SiteConfig, in the SiteConfig install location. Then continue with next steps as appropriate.
3. To launch the program that installs the ProductFrame Discovery Agent Service do the following:
   a) Copy the `Discovery Agent Setup` directory to the device.
   b) In the directory, double-click the `DiscoveryAgentServiceSetup.msi` file.

      The setup program launches to install the SiteConfig Discovery Agent.
   c) Follow the setup wizard.
4. When presented with a list of device types, select one of the following as appropriate:
   - K2SummitSanClient
   - K2SummitStandaloneClient
5. Complete the setup wizard and restart the device.

   The restart is required after the installation.

Updating the K2 Plus Carrier Board driver

Early shipments of K2 Summit 3G+ systems with disk image 20171019-K2Plus-Win10 exhibit Known Problems with IDs KT-10120 and KT-10240 where the system will not function as expected with a Tri-Level Sync signal connected to the system's Genlock Reference input. If the system was

shipped with the 20171019-K2Plus-Win10 base image or was restored to the 20171019-K2Plus-Win10 base image, this procedure should be followed in order to allow the system to function with Tri-Level Sync. The system will function with Black Burst Sync whether or not the update is performed.

Prerequisite: Download *ftp://ftp.grassvalley.com/K2/software/KT-10240/KT-10240.zip* and extract the contents to a temporary location on the K2 Summit 3G+ system such as "C:\K2PlusCB".

1. Uninstall and delete the existing K2 Plus Carrier Board driver.
   a) Right-click on the Windows Start Button in the lower left corner of the Windows tray and select **Device Manager**.

      The **Device Manager** window opens.

   b) Click to expand the **System devices** node.
   c) Right-click on **Grass Valley K2PlusCB Device** and select **Uninstall**.

      The **Confirm Device Uninstall** dialog box appears.

   d) Select the **Delete the driver software for this device** check-box and click **OK**.

      The uninstall process begins.

      Once the process completes, the **System Settings Change** dialog box appears.

   e) Click **Yes** to restart the system.
2. Install the updated K2 Plus Carrier Board driver.
   a) Right-click on the Windows Start Button in the lower left corner of the Windows tray and select **Device Manager**.

      The **Device Manager** window opens.

   b) Click to expand the **Other devices** node.
   c) Right-click on **PCI Device** and select **Update Driver Software**.

      The **Update Driver Software - PCI Device** dialog box appears.

   d) Select **Browse my computer for driver software**.
   e) Click the **Browse** button and navigate to the location of the driver software, such as "C:\K2PlusCB".
   f) Ensure the **Include subfolders** check-box is selected and click **Next**.

      The installation process begins.

      Once the process completes, the **Windows has successfully updated your driver software** message appears.

   g) Click **Close**.
3. Reboot the K2 Summit 3G+ system to reinitialize the system with the updated driver in place.

Installing the ATTO Fibre Channel card driver

If your K2 Summit system has the optional Fibre Channel card, the driver for the Fibre Channel card is not installed on the recovery image provided by Grass Valley for that K2 Summit system. Therefore, after restoring the image, you must install the Fibre Channel card driver.

1. Open Device Manager.

2. Right-click on **K2 Summit Client** and select **Manage.**
3. Click **Device Manager**
4. Install the first Fibre Channel driver as follows:
   a) Right click on the upper Fibre Channel Controller and select **Update Driver…**
   b) On the Welcome page, select **No, not this time** and then click **Next**.
   c) Select **Install from a list or specific location** and then click **Next**.
   d) Browse to `C:\Profile\Drivers\ Atto 8Gb HBA Drivers\x86`.
   e) Click **OK**.
   f) Click **Next**.
   g) Click **Finish** when prompted.
   h) In the Found new hardware wizard that will open for the ATTO Phantom device, select **No, not this time**.
   i) Select **Install from a list or specific location** and then click **Next**.
   j) Browse to `C:\Profile\Drivers\ Atto 8Gb HBA Drivers` and select the `x86` directory if installing on a 32-bit computer or the `x64` directory if installing on a 64-bit computer.
   k) Click **OK** .
   l) Click **Next.**.
   m) Click **Finish** when prompted.
5. Repeat the process for the second Fibre Channel Controller as follows:
   a) Right-click on the remaining Fibre Channel Controller and select **Update Driver…**
   b) On the Welcome page, select **No, not this time** and then click **Next**.
   c) Select **Install from a list or specific location** and then click **Next**.
   d) Browse to `C:\Profile\Drivers\ Atto 8Gb HBA Drivers` and select the `x86` directory if installing on a 32-bit computer or the `x64` directory if installing on a 64-bit computer..
   e) Click **OK**.
   f) Click **Next**.
   g) Click **Finish** when prompted.
6. Verify that the two "ATTO" devices are now listed under the SCSI and RAID Controllers
7. Close the Device Manager and System windows

Using diagnostic tools

Use the following sections as necessary to identify problems.

Running Check Disk

If your K2 Summit system has a critical system fault, you should run Check Disk to identify and remove any corrupted files.

1. Make sure the K2 Summit system has no media access currently underway.
2. At the MS-DOS command prompt, enter the following and press **Enter**.

   `chkdsk`

   Check Disk reports file system information and lists any problem found.

3. Do one of the following:
   - If Check Disk does not report any problems, close the command prompt window. Do not complete the remaining steps of this procedure.
   - If Check Disk reports a problem and prompts you to repair, continue with this procedure.
4. When prompted to repair problems, do the following:
   a) Press the **Y** key and then press **Enter**.
   b) Enter the following and press **Enter**.

      ```
      chkdsk /F
      ```

      The screen displays a message similar to the following:

      ```
      ...Cannot lock current drive. Chkdsk cannot run because the volume
      is in use by another process. Would you like to schedule this volume
      to be checked the next time the system restarts? (Y/N)
      ```

   c) Press the **Y** key and then press **Enter**.
5. Restart the K2 Summit system.

Running diagnostics for K2 Summit system

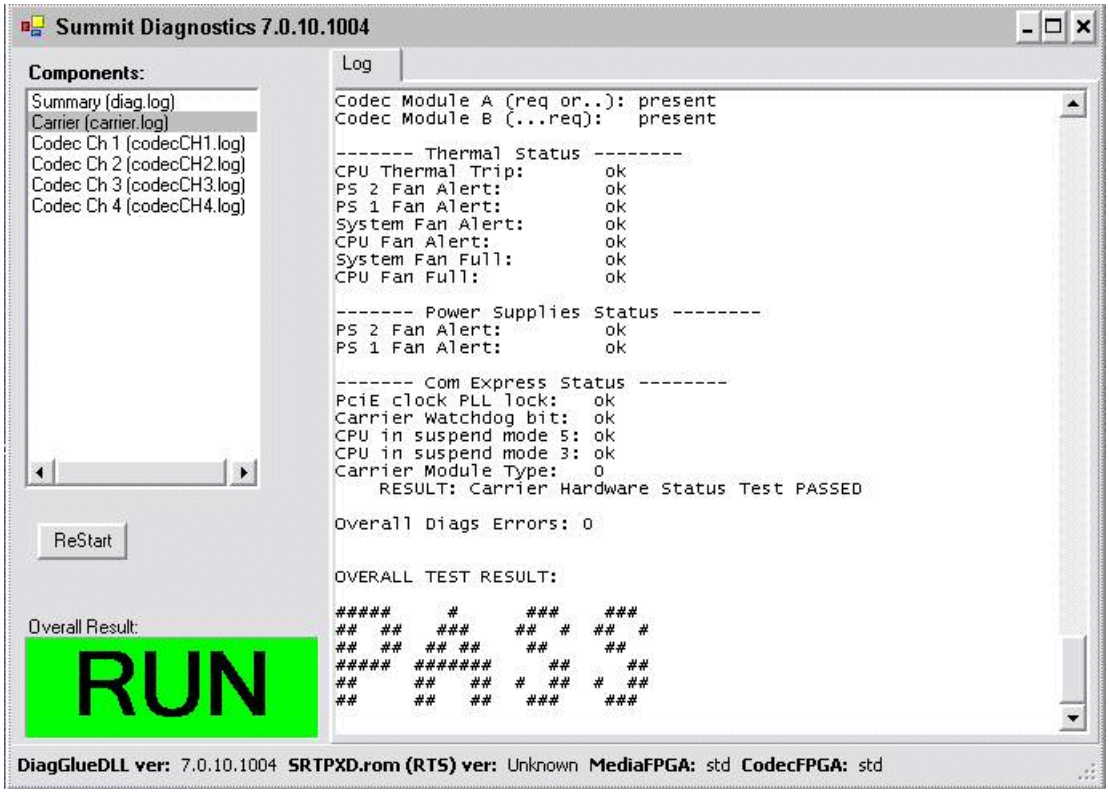
If you suspect a problem with K2 Summit system hardware, you can run diagnostics and check for errors.

1. Make sure all media access is stopped on the K2 Summit system. Also make sure that there is nothing preventing a restart, as it is required after you run diagnostics.
2. From the Windows desktop, click **Start | All Programs | Grass Valley | Diagnostics**.

   The Summit Diagnostics application opens.

3. Click **Start**.

   The Overall Result indicator displays RUN while diagnostics are underway.



   When diagnostics complete, the Overall Result indicator reports results as follows:

   - PASS – There are no problems reported in the diagnostic logs.
   - FAIL – There are one or more problems reported in one or more diagnostic logs.

4. To view a diagnostic log, in the Components list, select a log.

   The log's contents appear in the Log pane.

5. To close the Summit Diagnostics application, allow any currently running diagnostics to complete, then click the window close button (**X**) in the upper right corner of the application window.

   A "...should be restarted..." message appears.

6. Click **OK** and then restart the K2 Summit system.

   You must restart before you can use the K2 Summit system. Running diagnostics puts the real time processor and other services in a non-production state.

Troubleshooting problems

Step 1: Check configurations

Many times what appears to be a K2 Summit system fault is actually an easy-to-fix configuration problem. Check settings in Configuration Manager and verify that the system is configured as you expect. Refer to related topics in the "Using K2 AppCenter" section of the K2 Topic Library and the "Configuring the K2 System" section of this Topic Library.

Step 2: Check connections and external equipment

Loose or improperly connected cables are the most likely source of problems for the system. A quick check of all the cable connections can easily solve these problems. Refer to related topics in the "Configuring the K2 System" section of this Topic Library for help with making connections. Check external equipment if you suspect a failure in a device connected to the K2 Summit system.

Related Topics

Checking external equipment on page 464

Checking external equipment on page 464

Checking external equipment on page 464

Step 3: Check system status messages

While the K2 Summit system is in operation, some problems are detected and reported in system status messages. To view system status messages, in AppCenter select **Help | System Status**.

When connecting to a K2 Summit system from a control point PC using remote AppCenter, if there is an AppCenter system startup error, the error is reported during the connection attempt.

If the system status message indicates a problem, refer to related topics in "K2 Summit Production Client Service Manual".

NOTE: Do not use the MegaRAID utility on a* K2 Summit system*. This utility is for use by qualified Grass Valley Service personnel only. When this utility is opened it scans the SCSI bus and interferes with record and play operations.

Related Topics

Viewing AppCenter system status messages on page 64

Viewing AppCenter system status messages on page 64

Viewing AppCenter system status messages on page 64

Step 4: Identify problems using the startup sequence

The startup sequence is your primary tool for identifying a K2 Summit system fault. As the different levels of the K2 Summit system system become operational in the startup process, the primary components of the system are checked. You can identify most problems by evaluating the messages and other indicators that occur during the startup sequence.

NOTE: This procedure assumes that the* K2 Summit system *is not in Storage Utility's "offline" mode.

To identify problems using the startup sequence, do the following:

1. Connect mouse, keyboard, and monitor. You must observe the VGA screen and be able to interact with the system via keyboard and mouse to fully identify problems.
2. Restart the K2 Summit system.

3. Once the startup sequence begins, observe the progression of behaviors as listed in the following table. These are the behaviors you should expect for a normally operating K2 Summit system. If you observe behaviors other than those listed, refer to the indicated troubleshooting topics to identify problems.

   NOTE: You can press the Pause/Break key on the keyboard to keep startup text on the screen for longer viewing.

At about this time…	This behavior should occur…	If not, refer to the following:
—	Pressing the standby button starts the K2 Summit system.	*Shutdown/restart problems* on page 464
0 seconds	Power on LED goes on and stays on.	*Power supply problems* on page 468
	Service LED stays off.	*Shutdown/restart problems* on page 464
	Front bezel assembly and processor fan start.	*Windows startup problems* on page 467
10 seconds	System BIOS screen appears.	*BIOS startup* on page 465
35 seconds	Grass Valley logo screen appears.	—
70 seconds	Windows logon screen appears.	*Windows startup* on page 465

Logon to Windows to continue the startup sequence.

After Windows logon:

At about this time…	This behavior should occur…	If not, refer to the following:
0 seconds	Grass Valley logo desktop appears.	*K2 Summit system startup* on page 466
5 seconds	Service LED goes on for a few seconds, then off.	
20 seconds	Desktop icons, startbar, and AppCenter logon box appear.	*Windows startup* on page 465, *K2 Summit system startup* on page 466

Logon to AppCenter to continue the startup sequence.

After AppCenter logon:

At about this time…	This behavior should occur…	If not, refer to the following:
0 seconds	System Startup messages appear.	*K2 Summit system startup* on page 466

At about this time…	This behavior should occur…	If not, refer to the following:
Time varies. Between 30 seconds and 2 minutes.	All system components check out as OK and AppCenter opens. Media operations are functional.	*Operational problems* on page 470

Shutdown/restart problems

If the K2 Summit system is inoperable due to an error it can affect the operation of the standby button. If pressing the standby button does not shut down the K2 Summit system, press and hold the button for five seconds. This forces the K2 Summit system to execute a hard power down. If that doesn't work or if after the hard power down the system does not boot, disconnect then reconnect the power cable(s).

The K2 Summit system is set to attempt to boot from a USB drive first, before it boots from the boot media card. If you have a drive connected to a USB port that does not contain an appropriate operating system and you start up the K2 Summit system, an error message is displayed and the boot up process halts.

Checking external equipment

This section provides troubleshooting procedures for external devices that connect to the K2 Summit system. Before using these procedures, first check connections.

Related Topics

Step 2: Check connections and external equipment on page 461

Step 2: Check connections and external equipment on page 461

Step 2: Check connections and external equipment on page 461

VGA display problems

Problem	Possible Causes	Corrective Actions
Screen turns on, but nothing from K2 Summit system is displayed.	VGA connector or cable is not connected or is faulty.	Replace VGA monitor.
	K2 Summit system system settings have been tampered with.	Restore default settings by restoring the system drive image from a recent backup image.

Keyboard and mouse problems

The keyboard and mouse are detected during BIOS startup. There should be a very brief message displayed indicating detection of input devices connected to USB ports

Problem	Possible Causes	Corrective Actions
The K2 Summit system does not respond correctly when one or more of the keys on the keyboard are pressed or the mouse is used.	The keyboard or mouse is faulty.	Replace the keyboard or mouse.
	K2 Summit system system settings have been tampered with.	Restore default settings by restoring the system drive image from a recent backup image.

Power connection sequence

The following table lists the sequence of behaviors you should expect to see and/or hear as you connect the first power cable to a normally operating K2 Summit system. If you observe behaviors other than those listed, refer to related topics in "K2 Summit Production Client Service Manual" to investigate potential problems.

In this time…	On the K2 Summit system front panel or chassis, look/listen for the following…	If not, refer to the following.
0 seconds	Power supply fans go on and stay on.	*Power supply problems* on page 468
	Power on LED goes on and stays on.	
	Drive busy LED goes on then off.	*Media disk problems* on page 472

This power connection sequence assumes that before power was removed, the K2 Summit system was properly shut down from AppCenter, from the Windows operating system, or from the standby button. If the power was removed without a proper shutdown, when the first power cord is connected the K2 Summit system might go directly to the startup sequence.

Related Topics

Shutdown/restart problems on page 464

Shutdown/restart problems on page 464

Shutdown/restart problems on page 464

BIOS startup

A few seconds after startup, on the VGA monitor a screen displays BIOS information, with instructions about how to access settings. While this information is displayed, press the key on the keyboard as instructed to enter the BIOS settings pages. When the BIOS completes the Windows operating system begins to load.

If during the BIOS time a message appears that requires your input or if the K2 Summit system does not progress to Windows startup, it indicates a problem at the motherboard level. To correct problems of this nature, contact Grass Valley Support.

Windows startup

After the host startup processes complete the Windows operating system starts up. Normally the Windows operating system completes its processes automatically without the need to press keys or

respond to messages. When the Windows startup is complete the Windows logon dialog box is displayed.

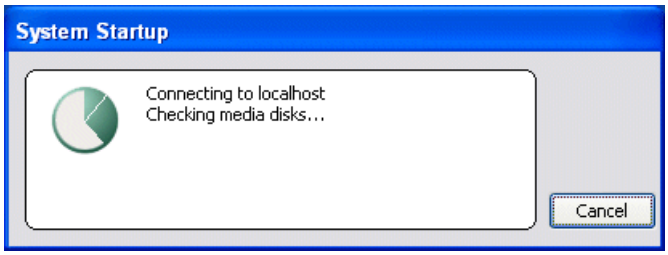
If the Windows startup screen does not proceed automatically or if a message appears that requires your input, it indicates a problem at the operating system level. If the problem cannot be corrected with a supported procedure (such as networking), the Windows operating system is not operating as it should. To correct problems of this nature, restore the system drive image.

Related Topics

Windows startup problems on page 467
Using recovery images on page 447
Windows startup problems on page 467
Using recovery images on page 447
Windows startup problems on page 467
Using recovery images on page 447

K2 Summit system startup

After the Windows operating system startup processes complete, you must log in to AppCenter to trigger K2 Summit system startup processes to begin. The K2 Summit system determines that system health is adequate by checking critical subsystems. Critical subsystems are those upon which the K2 Summit system depends for core media functionality. Critical subsystem checks are displayed in the System Startup message box.



When all critical subsystem checks are successful, AppCenter opens. If a critical error occurs, a message appears and AppCenter does not open. You can check the list of the messages that can appear.

To correct problems revealed at system startup, use the indicated troubleshooting information from the following sections.

Related Topics

Critical system startup messages on page 63
Critical system startup messages on page 63
Critical system startup messages on page 63

Windows startup problems

Problem	Possible Causes	Corrective Actions
A “Non-system disk or disk error. Replace and press any key to restart” message appears.	A non-bootable USB drive is connected.	Remove the USB drive, then press any key to continue.
	The boot media is corrupted.	Restore from the USB Recovery Flash Drive.

Thermal problems

Problem	Possible Causes	Corrective Actions
The K2 Summit system overheats. This can be accompanied by a StatusPane message indicating a temperature or fan problem.	Airflow is blocked. The fan module is not operating correctly.	Ensure adequate airflow around the K2 Summit system. Inspect the fans in the front bezel assembly and its connections for proper operation. If the fans are not operating correctly, replace the front bezel assembly.

Related Topics

Front bezel assembly removal K2 Summit

Front bezel assembly removal on page 477

Codec board problems

Investigate the problem further as described in the following table. If the problem persists, contact Grass Valley Support.

Problem	Possible Causes	Corrective Actions
A system status message indicates a problem with the codec board.	The codec module is not connected properly or is faulty.	Check the codec board indicator (LED) on the rear panel. Visually inspect codec module. Make sure it is connected properly and there is no sign of physical damage. Restart the K2 Summit system. If the problem persists, replace the codec module.

Related Topics

Codec module removal on page 480

Codec module removal on page 480

Power supply problems

Problem	Possible Causes	Corrective Actions
The K2 Summit system will not power on or power fails while the K2 Summit system is in operation. This can be accompanied by a StatusPane message indicating a power supply problem prior to the failure.	The power source is faulty.	Make sure your power source is reliable.
	A power cord is faulty.	Both power supplies run and the K2 Summit system can operate with just one power cord connected. Connect one power cord at a time and test with a replacement cord.
	The K2 Summit system is too hot. The built-in overtemperature protection can shut down the power supply.	Check for thermal problems. Cool the K2 Summit system.
	The power supply is faulty. This is indicated if the front panel power indicator does not come on.	Replace the power supply.
Power supply “~AC” LED is amber	Over temperature due to air flow restriction.	Check for and remove any air flow blockage around the power supply.
	Over temperature due to power supply fan failure.	Visually inspect fan. Listen for fan noise. If faulty, replace power supply.
	Over current, under voltage, over voltage. These conditions could be caused by a faulty FRU module.	Disengage all FRU modules, then re-engage one at time. If one module causes the amber LED to go on, replace the module. If both power supplies have the amber LED, disengage one, then the other. If doing so results in just one power supply having the amber LED, replace that power supply.

Related Topics

Power supply module removal on page 479
Power supply module removal on page 479
Power supply module removal on page 479

Video problems

For the corrective actions in this section, refer to related topics in the "Using K2 AppCenter" section of the K2 Topic Library for detailed instructions.

Problem	Possible Causes	Corrective Actions
The picture level modulates at a particular frequency.	There is distortion in the video input signal.	Check the video input signal for distortion. Compare with test color bars and audio test tone.
In stop mode the still-play video shows some motion jitter.	Two fields are displayed in still play mode.	Switch the still-play mode setting to Field.
The video displays erratically moving green lines.	K2 Summit system is not locked to a video reference.	Lock the K2 Summit system to a video reference.

Audio problems

For the corrective actions in this section, refer to related topics in the "Using K2 AppCenter" section of the K2 Topic Library for detailed instructions.

Problem	Possible Causes	Corrective Actions
No record audio.	Wrong audio input selected.	Select the correct audio input.
No embedded audio.	Video source does not have embedded audio.	Check your video source for embedded audio.
Playback audio output is distorted.	Audio input signal clipping caused by excessive audio input level.	Check for input audio clipping. Adjust the audio input trim. Adjust the Player audio level. Reduce the source audio input level.
Audio level is too low.	Audio level needs to be adjusted.	Adjust the Player or Recorder audio level. Increase the source audio input level.
The audio level is not correct only when playing a particular clip.	The clip's audio level is out of adjustment.	Load the clip in Player and adjust its playback audio level.
Audio level meters do not display the correct reference level on connected equipment.	Incorrect audio reference level.	Select the correct audio reference level.
Audio meters do not appear in the AppCenter Monitor Pane.	The Monitor Pane configured to not display audio meters.	Configure the Channel Monitoring setting to display audio meters.

Timecode problems

For the corrective actions in this section, refer to related topics in the "Using K2 AppCenter" section of the K2 Topic Library for detailed instructions.

Problem	Possible Causes	Corrective Actions
Recorded timecode reads xx.xx.xx.xx.	During recording, the channel had no timecode source.	Check that you have the right record channel timecode source selected, verify that timecode is present in the source, and record the clip again. You can also stripe the timecode on an existing clip.
A clip shows no mark-in/mark-out timecode, the current timecode display shows XX:XX:XX:XX, or the last valid timecode is displayed.	The selected timecode source was missing or intermittent during recording.	

Operational problems

For the corrective actions in this section, refer to related topics in the "Using K2 AppCenter" section of the K2 Topic Library for detailed instructions.

Problem	Possible Causes	Corrective Actions
Moving video in AppCenter does not operate.	The K2 Summit system is not licensed for AppCenter Pro.	Obtain an AppCenter Pro license.
	The VGA monitor resolution is less than 1024x768x32.	Configure VGA monitor resolution. The resolution must be at least 1024x768x32 to support live video.
	Another user is connected via Remote Desktop.	Restart AppCenter.
The K2 Summit system is not operating as expected in relation to a setting displayed in Configuration Manager.	The setting was changed in Configuration Manager but not saved to the database.	Verify the setting you want in Configuration Manager and then select OK. When prompted to change the system settings, select Yes.
AppCenter displays different buttons than those expected.	Assignable buttons have been changed.	Assign buttons to the interface as desired.
A clip does not play, even though other clips play on the same channel.	The clip does not match current K2 Summit system settings or the clip is corrupt.	If the clip appears grayed-out it means it doesn’t match current settings. Check the clip’s properties and verify they are correct for the standard, compression, and other current settings. Compare properties with those of a clip that plays correctly. If properties are correct the clip is corrupt. Delete and re-record the clip.
	The K2 system is not licensed for the format of the clip.	Verify licensing.
A clip can not be edited.	The clip is locked.	Unlock the clip.

Problem	Possible Causes	Corrective Actions
Can’t rename a clip or modify mark-in/mark-out points	The clip loaded or playing is still being recorded. In this case, “Read-Only” is displayed in the StatusBar.	Wait until recording is complete.
Cannot load and play a list.	The list contains invalid clips.	Check format, licensing, and security setting of the clips in the list.
On setting mark-out, the subclip is automatically generated and ejected, and a new subclip name is loaded in the subclip pane.	Auto Subclip mode is enabled.	Disable Auto Subclip mode.
Can’t change what information is displayed in the Monitor Pane for Playlist.	You are attempting to use Configuration Manager to change what information is displayed in Monitor Pane for Playlist.	Use the Playlist Options dialog instead.
Can’t control a channel from AppCenter. Controls are disabled.	The channel is configured for control by a remote control protocol.	Set the control mode for limited local control.

System problems

For the corrective actions in this section, refer to related topics in the "Using K2 AppCenter" section of the K2 Topic Library for detailed instructions.

Problem	Possible Causes	Corrective Actions
One of the record channels does not record or video is jumpy.	The K2 Summit system is configured for PAL, yet the video input is NTSC	Check the current setting for video standard. Verify that the video input signal is the correct standard.
A scheduled event, such as an automatic play or record event, does not occur at the proper time.	The time-of-day source for event scheduling is not accurate.	Verify the time-of-day source. Verify the source’s time accuracy.

Storage problems

Use the following sections if you suspect problems with your K2 Summit system’s storage. Refer to related topics in the "Configuring the K2 System" section of this Topic Library for Storage Utility procedures.

Media File System problems

Problem	Possible Causes	Corrective Actions
One or more clips do not play or record correctly. This can be accompanied by a StatusPane message indicating a fault in the media file system.	The media database is out of sync with the media files or there is a corrupt media file. Also check the storage system for causes related to certain usage patterns.	1. If the problem is only associated with a specific clip or clips, delete the problem clips. If the problem persists, proceed with the next step. 2. Use Storage Utility and Check File System. If the file system fails the check process you must make a new file system. When you do so you lose all media.
During K2 Summit system startup a "…no file system running…" message appears.	The file system is corrupt or disks are faulty/missing such that they are not part of a stripe group.	Use Storage Utility and Check File System. If the file system fails the check process you must make a new file system. When you do so you lose all media.

Related Topics

Checking the storage system on page 473
Checking the storage system on page 473
Checking the storage system on page 473

Media disk problems

On the Windows desktop open the "My Computer" for you K2 system and do a quick check of the drives. You should see C: and V: drives.

Problem	Possible Causes	Corrective Actions
No clips appear in the Clips pane. This may be accompanied by a startup message or a StatusPane message regarding media disks being unavailable.	A media disk is bad or there has been a hardware failure.	Open Storage Utility and identify faulty disks. Replace faulty disks.
The StatusPane message "Media disks getting full…" appears or a "FSS 'default(0)'" message appears.	The media disks are reaching maximum capacity.	In Recorder, select the Time Dome and choose **Available Storage**. If the Time Dome is filled it confirms that your K2 Summit system is out of space. Make space on the media drives by doing the following: - Delete unused clips and empty the Recycled Bin.

Problem	Possible Causes	Corrective Actions
When streaming to another K2 Summit system the operation fails. In Transfer Monitor the streaming operation shows “Status:Error”.	There is a network connection error or the media disks at the destination are reaching maximum capacity.	Check network connections and configuration. Check available storage on the destination K2 Summit system. In Recorder, select the Time Dome and choose **Available Storage**. If the Time Dome is filled it confirms that the destination K2 Summit system is out of space. Make space on the media drives by deleting unused clips and emptying the Recycle Bin.
System status message “File system…is fragmented”.	Extended record/play activity has fragmented the disks.	Use the Storage Utility to check the file system.

Related Topics

Replacing a RAID 0 drive

Replacing a RAID 1 drive

Checking the storage system

The following section provides guidelines for investigating problem areas related to the storage system. Use this section if you have problems with media input and/or output that are intermittent or seem to be related to certain usage patterns.

Problem	Possible Causes	Corrective Actions
Symptoms can include black video recorded or at playout, frozen video, slow performance, or inconsistent media access. These symptoms can be accompanied by StatusPane messages regarding disk problems or overrun/underrun conditions for encoders, decoders, or timecode.	The following causes can occur on their own or in combination to produce the problem: • Disk oversubscription — This occurs when requests to the media disk exceed the disk's bandwidth capabilities. This generally occur in extreme cases when a combination of high-bandwidth operations are taking place, such as jog/shuttle, record/play on multiple channels, or streaming multiple clips. • High CPU activity in Windows — This occurs when activities on the Windows operating system over-tax the capabilities of the CPU. This commonly happens when unsupported software has been installed that competes with K2 Summit system applications. Virus scanners and screen savers can cause this type of problem, since they can start automatically and consume system resources. • Encoder overrun — This occurs when an encoder is flooded with more data than it can process within its real-time requirements for recording. • Decoder underrun — This occurs when a decoder is starved for data and cannot deliver enough to satisfy real-time requirements for playout. • Disk faults — This occurs when a media disk is severely fragmented or has a bad blocks that interfere with some, but not all, media operations. For example, a particular clip can be written on a bad block, so the problem occurs only on that clip.	Try to re-create the problem. Identify all the interactions that affected the system and run all the same operations as when the error occurred. Record/play/stream the same clips. Investigate the functions that seem to push the system into the error state. If you determine that certain simultaneous operations cause the problem, re-order your workflow to avoid those situations. If you determine that the problem is only on certain clips, investigate disk faults.

Network, transfer, and streaming problems

Problem	Possible Causes	Corrective Actions
When importing or exporting (sending) between K2 Summit systems a "…failed to connect…" message appears and the operation fails.	There is a problem with Windows networking or there is a mis-spelling with the host name as entered in Configuration Manager.	Check networking as follows: - Check basic Windows networking. Use Windows Explorer to test a basic copy operation to the machine to which you are trying to connect. If basic networking fails, use standard Windows procedures to troubleshoot and correct your network. - If the Windows network is working properly, in AppCenter select **System | Configuration | Remote** and verify that the name of the machine to which you are trying to connect is spelled correctly and has no extra spaces or characters.
	The K2 Summit system to which you are trying to connect is not operating or the network is mis-configured.	Verify that the K2 Summit system to which you are trying to connect is operational and that the network is configured correctly. Verify that the name of the K2 Summit system is entered correctly in the Configuration Manager Hosts page. Refer to networking topics in the "Configuring the K2 System" section of this Topic Library.
A networked device does not appear in the "Import" and "Send to" dialog boxes, even though it is present on the Windows network.	The device is not entered as a host.	In AppCenter select **System | Configuration | Remote | Add** and enter the name of the machine to which you are trying to connect. Make sure it is spelled correctly and has no extra spaces or characters. Also check the hosts file. Refer to networking topics in the "Configuring the K2 System" section of this Topic Library.
Files do not appear in" Send To" or "Export" dialogs.	File names do not have proper extensions.	Rename files with proper extensions.

Removing and replacing FRUs

Removing and replacing FRUs

Field Replaceable Units (FRUs) are modular hardware components that can be serviced without disturbing other components in the system.

The pictures in the following topics show how to disassemble. Unless otherwise documented, re-assembly is the reverse.

Unless otherwise indicated, you need only a Torx tool with T15 magnetic tip to remove and replace parts in the K2 Summit system.

NOTE: Only Grass Valley components are supported. Do not attempt to use components procured from a different source.

NOTE: Do not discard any hardware unless specifically instructed to do so.

⚠ ***WARNING: To avoid serious injury from high currents, ensure that both power cords are disconnected prior to removing or replacing any parts.***

⚠ ***CAUTION: This system contains board-level components that must be protected from static discharge and physical shock. Wear a wrist strap grounded to the system chassis when handling system components.***

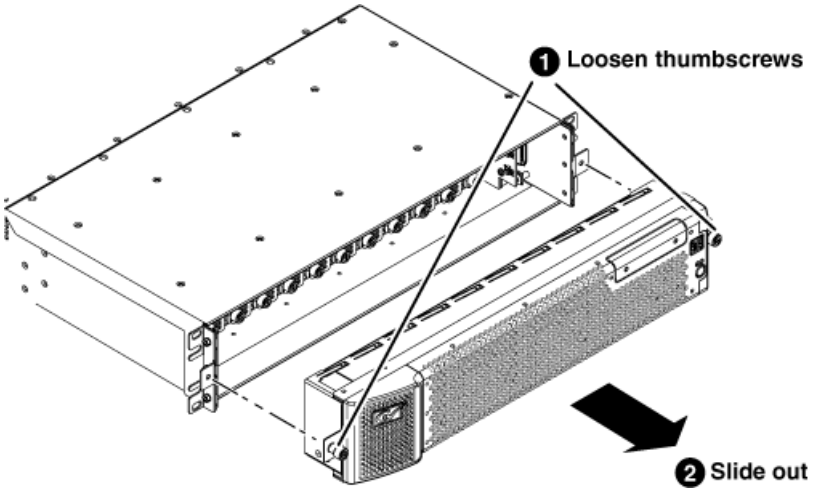
External Parts Removal

All the parts in this category can be removed and replaced without opening the K2 Summit system cabinet.

Front bezel assembly removal

You can remove the bezel assembly while the K2 Summit system is operating. If you do so, make sure you replace it within three minutes to ensure that the correct operating temperature is maintained.

1. To remove the front bezel assembly, proceed as illustrated.



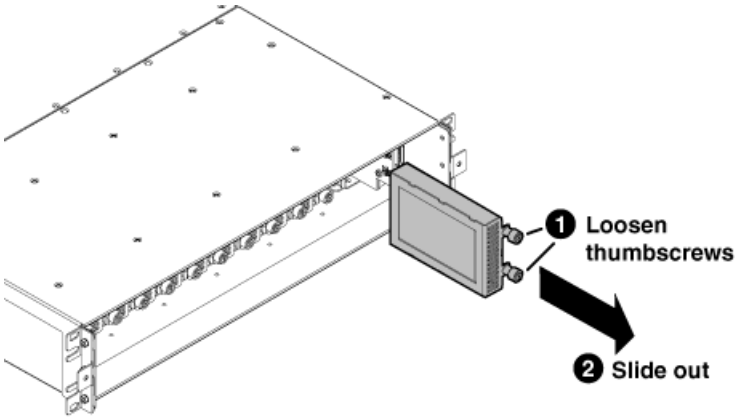
2. When installing, avoid pressing the standby switch and accidentally turning the system on or off.

Disk module removal

Before doing this task, do the following:

- Make sure you have identified the proper disk module. In some cases you must also perform operations with Storage Utility.
- Remove the front bezel assembly.

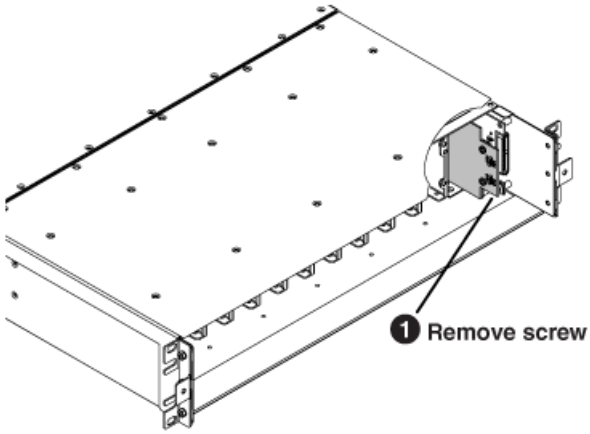
To remove a disk module, proceed as illustrated.

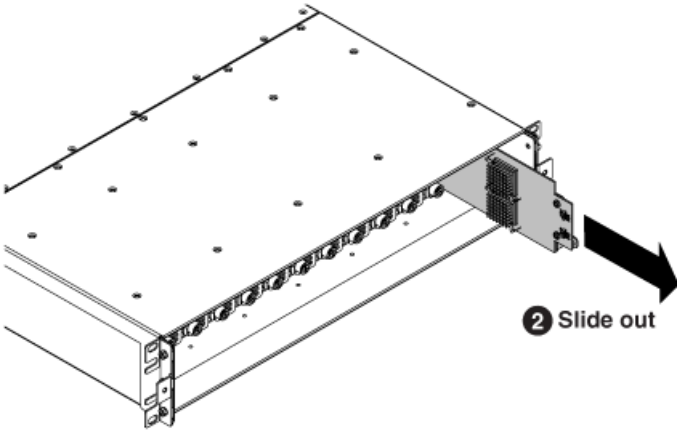


Disk controller board removal

Before doing this task, remove the front bezel assembly.

1. To remove the disk controller board, proceed as illustrated.





2. When installing, do the following:
   a) Make sure the board engages with the top and bottom guides.
   b) Make sure the board engages with the connectors on the disk backplane and midplane board.

After replacing the disk controller board on a K2 Summit 3G system or on any system that has a Type II (ADLINK) CPU carrier module, you must restore disk controller configuration. This includes the first generation K2 Summit system, which can have a Type II CPU carrier module that was installed in the factory or that was upgraded in the field.

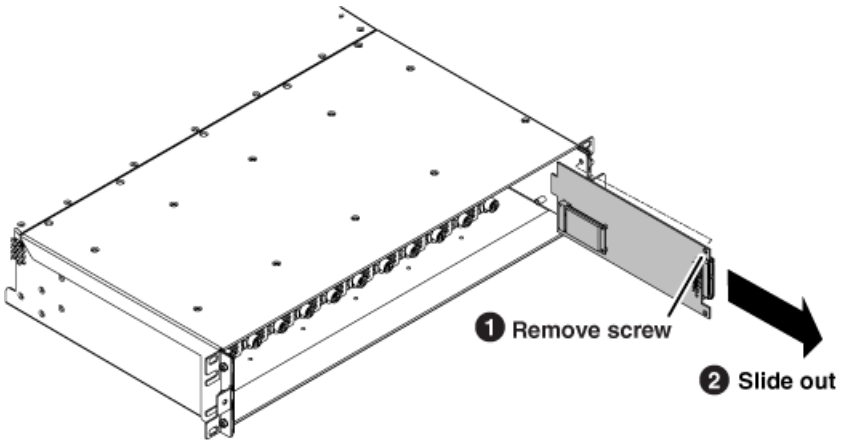
Related Topics

Restoring disk controller configuration on page 443

Front interconnect board removal

Before doing this task, remove the front bezel assembly and disk controller board.

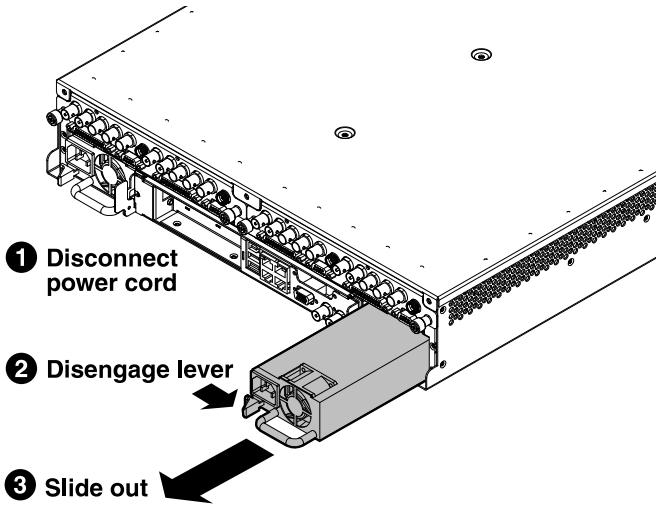
1. To remove the front interconnect board, proceed as illustrated.



2. When installing, do the following:
   a) Make sure the board engages with the top and bottom guides.
   b) Make sure the board engages with the connector on the midplane board.

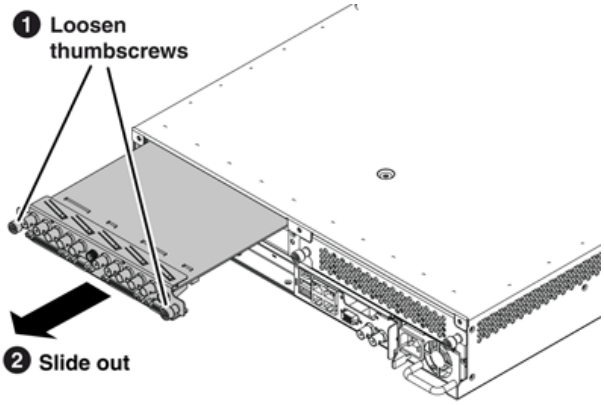
Power supply module removal

Access the power supply module from the rear panel. Remove as illustrated.



Codec module removal

Access the codec module from the rear panel. Remove as illustrated.



NOTE: With a firm grip on the metal (EMI) bracket, ensure the board is level and parallel to the card guides to avoid damage to the components on the edge opposite the rear panel.

⚠ ***CAUTION: Improper handling can damage components on the board. Do not allow the board to come in contact with the chassis sheet metal during removal or installation. The components on the edge opposite the rear panel are the most susceptible to damage.***

You must also remove any codec option (mezzanine) cards from the faulty codec module and install them on the replacement codec module.

After installing the replacement codec module, install the current version of K2 software. An over-install is all that is required. You do not need to first un-install the software. This ensures that the board is flashed with the proper version to be compatible with K2 software.

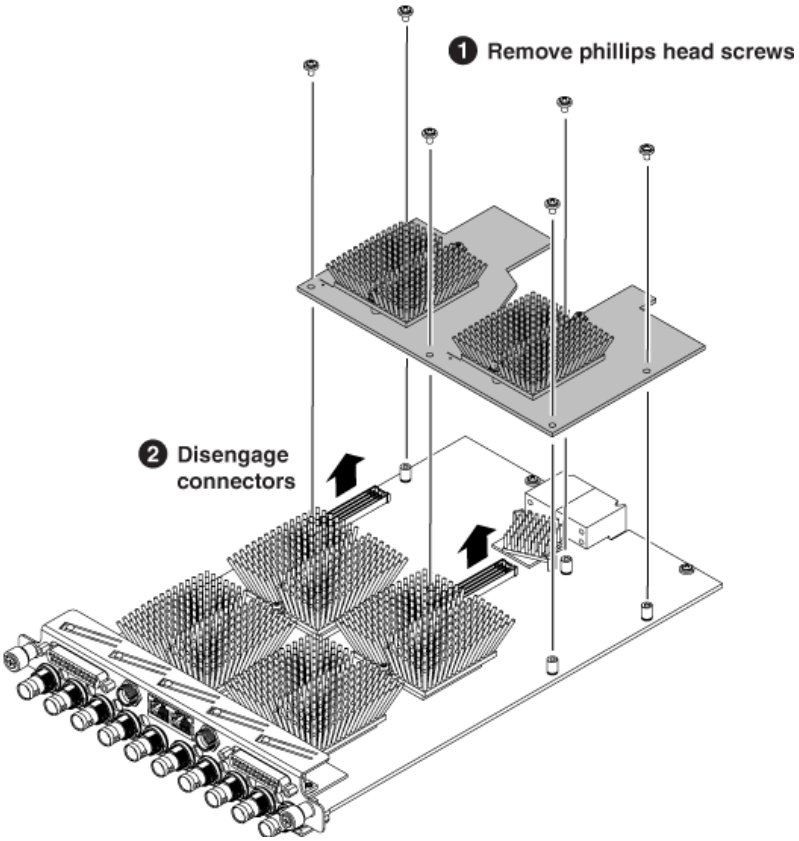
Related Topics

Compatible K2 systems hardware

Codec option card removal

Before doing this task, remove the codec module.

To remove a codec option card from the codec module, proceed as illustrated.



Use a #1 Phillips screwdriver to remove the screws.

After installing the replacement card, install the current version of K2 software. An over-install is all that is required. You do not need to first un-install the software. This ensures that the card is flashed with the proper version to be compatible with K2 software.

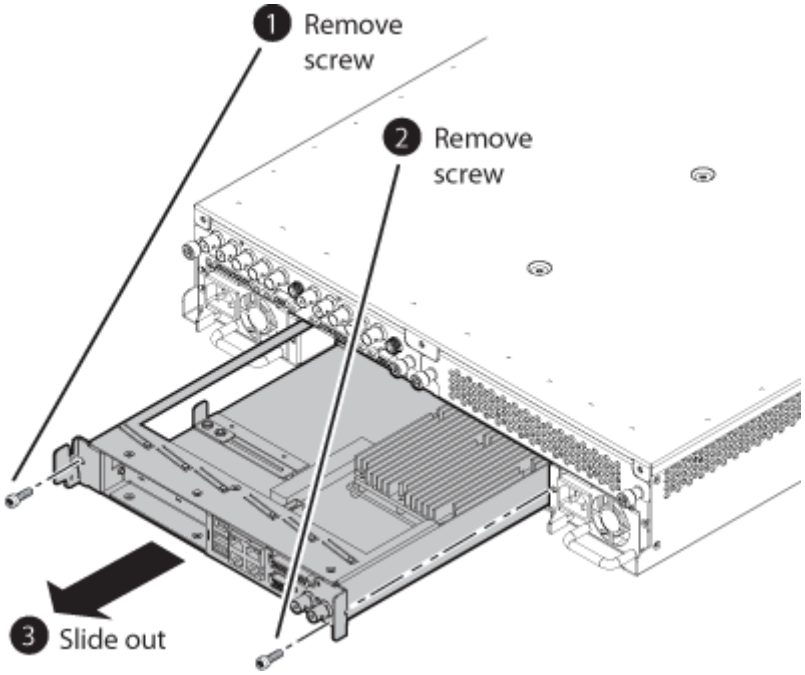
NOTE: Once a channel is operational with MPEG-2 or AVC-Intra, if you then remove the cards from the codec module you must also delete `C:/profile/config/config.xml`. Failure to do so causes errors in Configuration Manager.

Related Topics

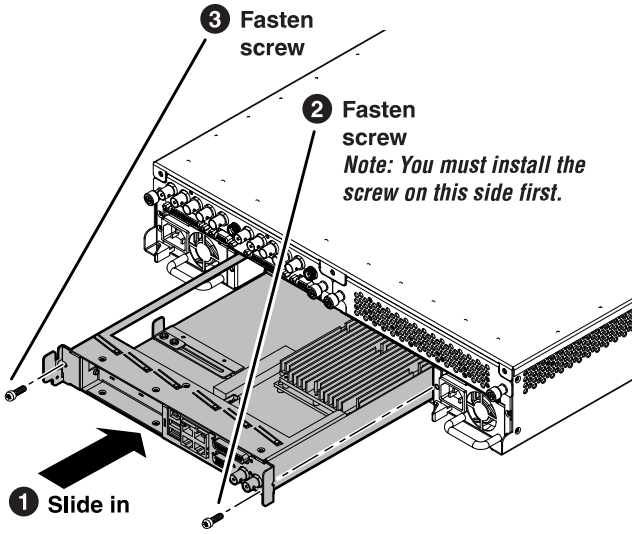
Compatible K2 systems hardware

Carrier module removal

1. When removing the carrier module, access it from the rear panel. Remove as illustrated.



2. When replacing the carrier module, the screw attachment sequence is critical, as illustrated.

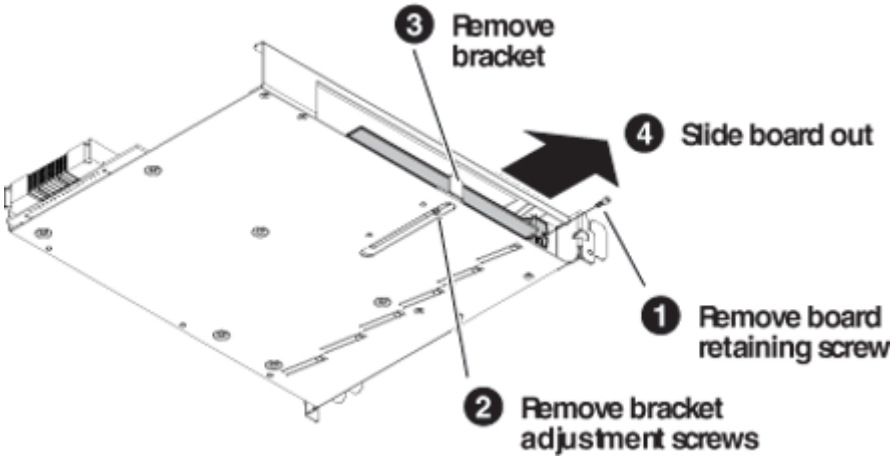


Optional PCIe board removal

Before doing this task, remove the carrier module.

This task applied to optional PCIe boards, such as a Fibre Channel board or a DynoZoom board.

To remove an optional PCIe board, disassemble the carrier module as illustrated.



Internal Parts Removal

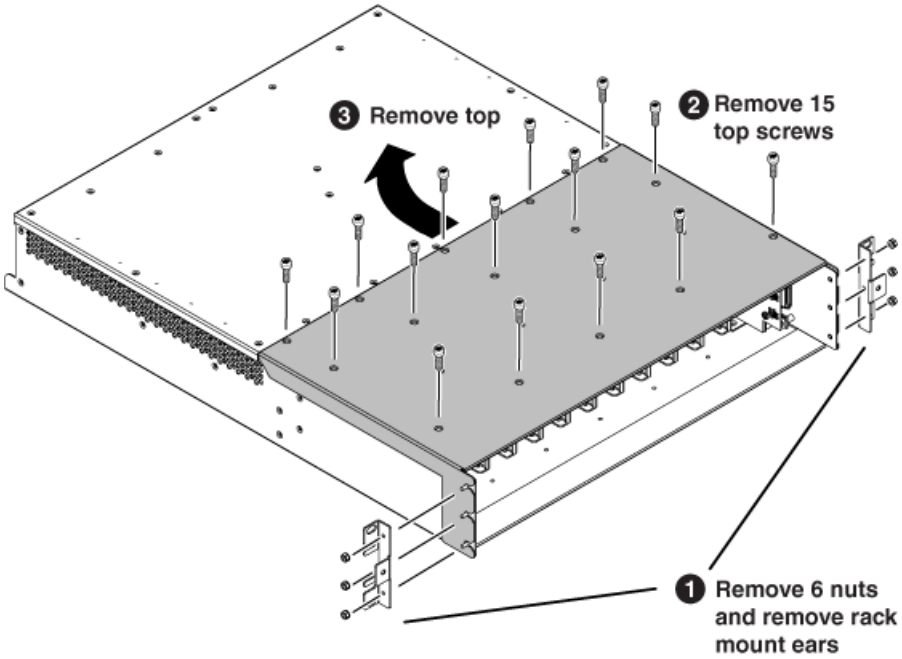
The sections that follow show how to remove internal parts from the K2 Summit system.

⚠ ***CAUTION: To avoid possible damage to circuit boards and other sensitive parts, turn off the* K2 Summit system *and disconnect both power cords before opening the top cover or removing any internal parts.***

Top cover removal

Before doing this task, remove the front bezel assembly.

To remove the top cover, proceed as illustrated.



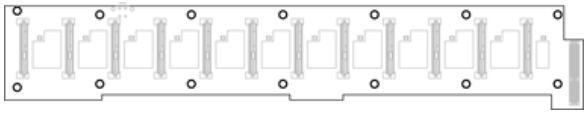
Use a #2 Phillips screw driver to remove the top screws.

Use a 1/4" nut driver to remove the rack mount ear nuts.

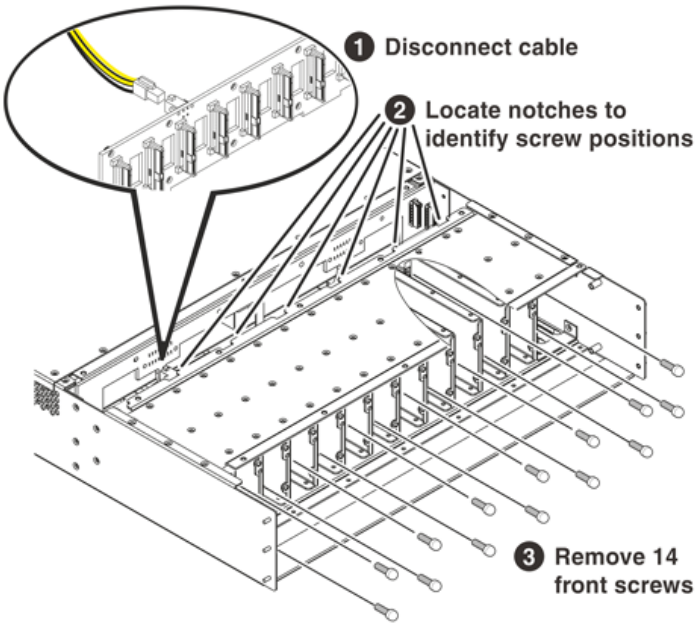
Disk backplane unit removal

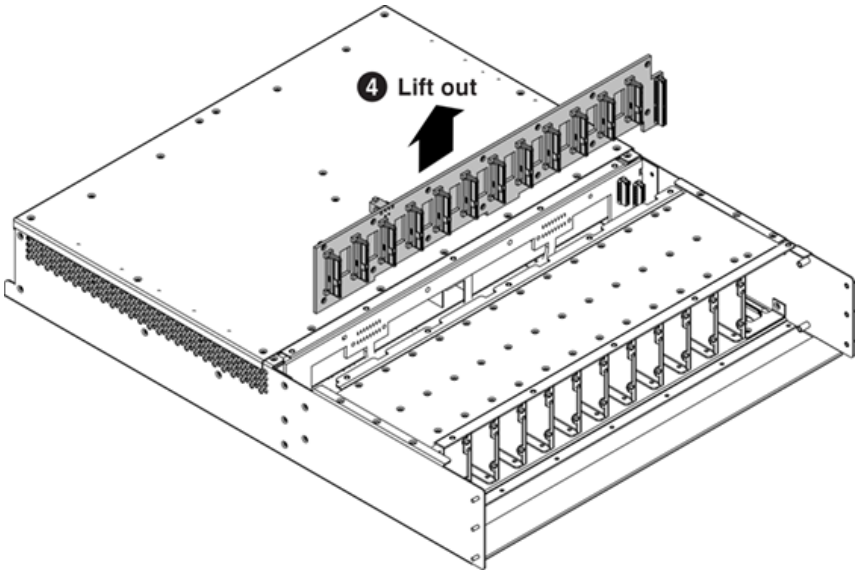
Before doing this task, remove the front bezel assembly, top cover, disk controller board, front interconnect board, and disk modules.

A screwdriver with a shaft at least 7 inches long is recommended. Use the following view of the disk backplane to help you locate screws.



To remove the disk backplane unit, proceed as illustrated.





Disk backplane unit installation

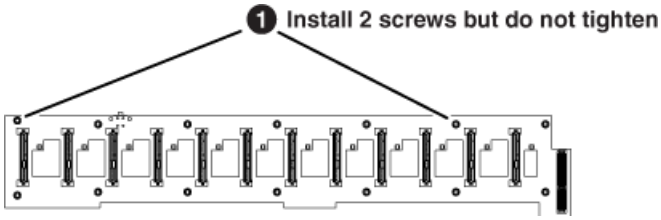
Before doing this task, install the midplane board, if it is not already installed.

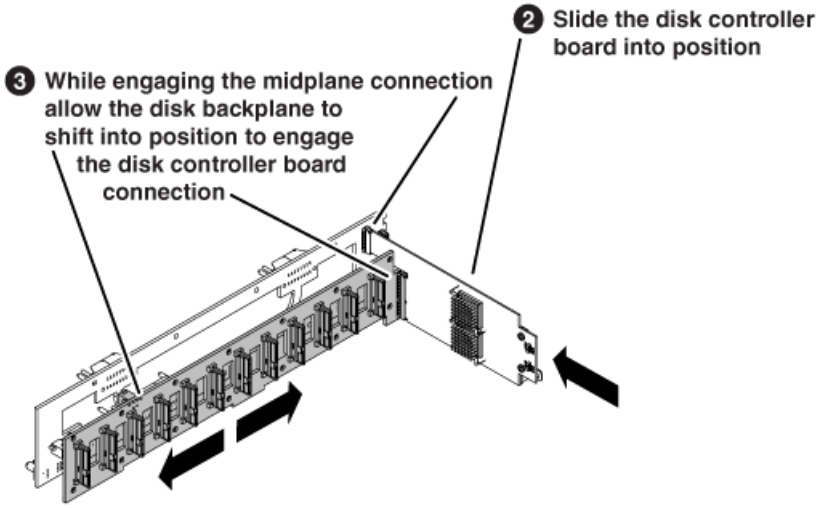
Installation of the diskplane unit is the reverse of removal except as follows:

- When installing screws, use the disk controller board to index the position of the disk backplane unit.

Refer to the removal procedure for other installation steps.

Index the position of the disk backplane unit as illustrated.





4 Tighten the 2 disk backplane screws

5 Remove the disk controller board

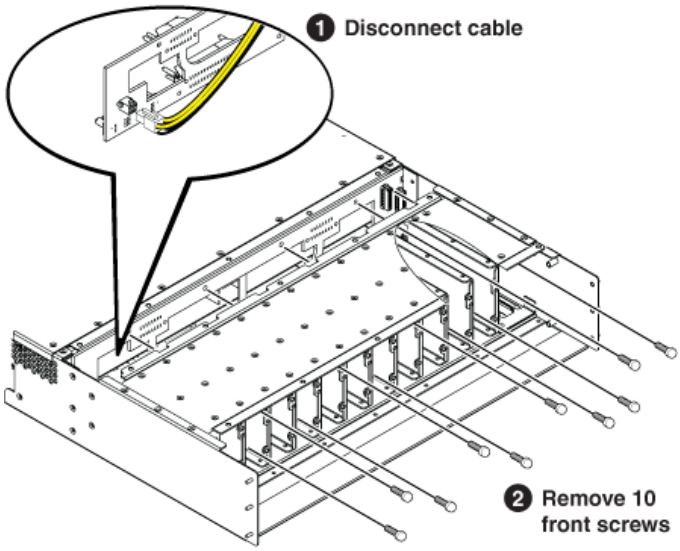
6 Install and tighten remaining disk backplane screws

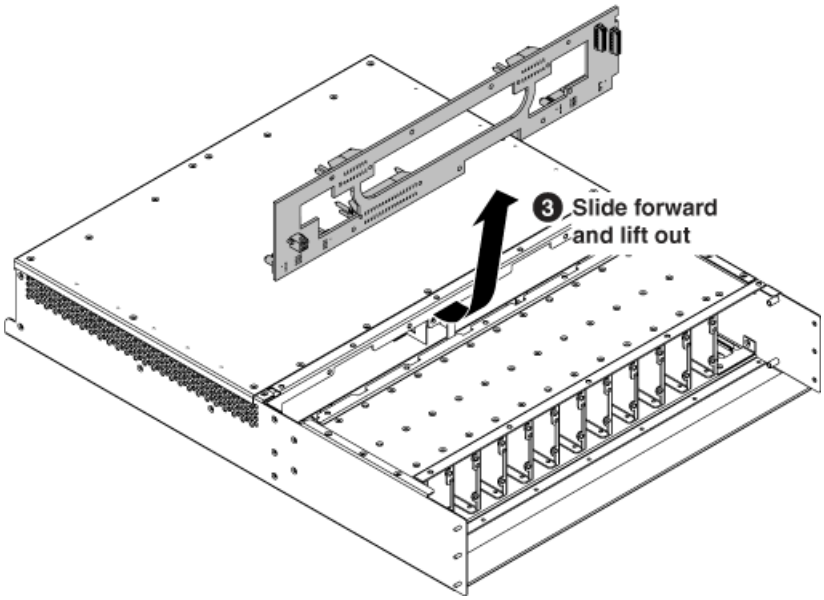
Midplane board removal

Before doing this task, remove the front bezel assembly, top cover, disk controller board, front interconnect board, disk modules, and disk backplane unit.

A screwdriver with a shaft at least 7 inches long is recommended. Use the following view of the midplane board to help you locate screws.

1. Disengage all rear FRU modules so that they are not connected to the midplane board.
2. To remove the midplane board, proceed as illustrated.





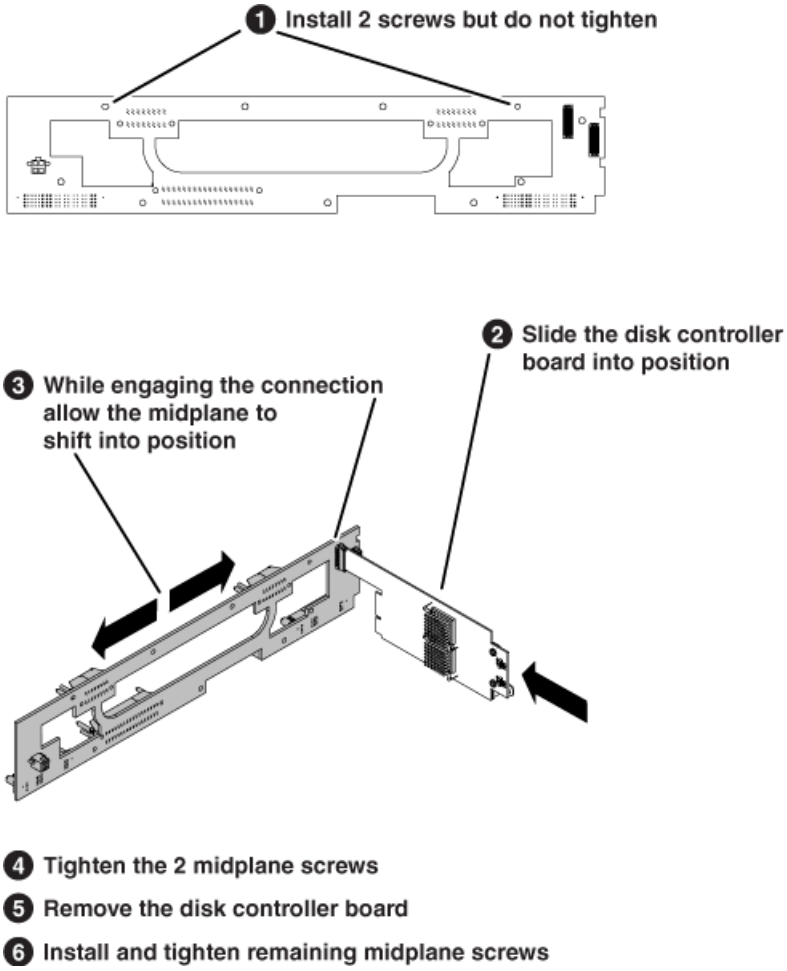
Midplane board installation

Installation of the midplane board is the reverse of removal except as follows:

- When installing screws, use the disk controller board to index the position of the midplane board.

Refer to the removal procedure for other installation steps.

Index the position of the midplane board as illustrated.



Grass Valley Knowledge Base

Visit the Grass Valley Knowledge Base site for technical articles and FAQs (Frequently Asked Questions) about Grass Valley systems and products.

Grass Valley Knowledge Base

Safety Summary

Safety Summary

Read and follow the important safety information below, noting especially those instructions related to risk of fire, electric shock or injury to persons. Additional specific warnings not listed here may be found throughout the manual.

⚠	***WARNING: Any instructions in this manual that require opening the equipment cover or enclosure are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.***

Safety terms and symbols

Terms in this manual

Safety-related statements may appear in this manual in the following form:

⚠	***WARNING: Warning statements identify conditions or practices that may result in personal injury or loss of life.***
⚠	***CAUTION: Caution statements identify conditions or practices that may result in damage to equipment or other property, or which may cause equipment crucial to your business environment to become temporarily non-operational.***

Terms on the product

These terms may appear on the product:

DANGER — A personal injury hazard is immediately accessible as you read the marking.

WARNING — A personal injury hazard exists but is not immediately accessible as you read the marking.

CAUTION — A hazard to property, product, and other equipment is present.

Symbols on the product

The following symbols may appear on the product:

⚠	Indicates that dangerous high voltage is present within the equipment enclosure that may be of sufficient magnitude to constitute a risk of electric shock.
⚠	Indicates that user, operator or service technician should refer to product manual(s) for important operating, maintenance, or service instructions.
⚠	This is a prompt to note fuse rating when replacing fuse(s). The fuse referenced in the text must be replaced with one having the ratings indicated.
⏚	Identifies a protective grounding terminal which must be connected to earth ground prior to making any other equipment connections.

⏚	Identifies an external protective grounding terminal which may be connected to earth ground as a supplement to an internal grounding terminal.
⚡	Indicates that static sensitive components are present which may be damaged by electrostatic discharge. Use anti-static procedures, equipment and surfaces during servicing.

Warnings

The following warning statements identify conditions or practices that can result in personal injury or loss of life.

Dangerous voltage or current may be present — Disconnect power and remove battery (if applicable) before removing protective panels, soldering, or replacing components.

Do not service alone — Do not internally service this product unless another person capable of rendering first aid and resuscitation is present.

Remove jewelry — Prior to servicing, remove jewelry such as rings, watches, and other metallic objects.

Avoid exposed circuitry — Do not touch exposed connections, components or circuitry when power is present.

Use proper power cord — Use only the power cord supplied or specified for this product.

Ground product — Connect the grounding conductor of the power cord to earth ground.

Operate only with covers and enclosure panels in place — Do not operate this product when covers or enclosure panels are removed.

Use correct fuse — Use only the fuse type and rating specified for this product.

Use only in dry environment — Do not operate in wet or damp conditions.

Use only in non-explosive environment — Do not operate this product in an explosive atmosphere.

High leakage current may be present — Earth connection of product is essential before connecting power.

Dual power supplies may be present — Be certain to plug each power supply cord into a separate branch circuit employing a separate service ground. Disconnect both power supply cords prior to servicing.

Double pole neutral fusing — Disconnect mains power prior to servicing.

Use proper lift points — Do not use door latches to lift or move equipment.

Avoid mechanical hazards — Allow all rotating devices to come to a stop before servicing.

Cautions

The following caution statements identify conditions or practices that can result in damage to equipment or other property

Use correct power source — Do not operate this product from a power source that applies more than the voltage specified for the product.

Use correct voltage setting — If this product lacks auto-ranging power supplies, before applying power ensure that the each power supply is set to match the power source.

Provide proper ventilation — To prevent product overheating, provide equipment ventilation in accordance with installation instructions.

Use anti-static procedures — Static sensitive components are present which may be damaged by electrostatic discharge. Use anti-static procedures, equipment and surfaces during servicing.

Do not operate with suspected equipment failure — If you suspect product damage or equipment failure, have the equipment inspected by qualified service personnel.

Ensure mains disconnect — If mains switch is not provided, the power cord(s) of this equipment provide the means of disconnection. The socket outlet must be installed near the equipment and must be easily accessible. Verify that all mains power is disconnected before installing or removing power supplies and/or options.

Route cable properly — Route power cords and other cables so that they ar not likely to be damaged. Properly support heavy cable bundles to avoid connector damage.

Use correct power supply cords — Power cords for this equipment, if provided, meet all North American electrical codes. Operation of this equipment at voltages exceeding 130 VAC requires power supply cords which comply with NEMA configurations. International power cords, if provided, have the approval of the country of use.

Use correct replacement battery — This product may contain batteries. To reduce the risk of explosion, check polarity and replace only with the same or equivalent type recommended by manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Troubleshoot only to board level — Circuit boards in this product are densely populated with surface mount technology (SMT) components and application specific integrated circuits (ASICS). As a result, circuit board repair at the component level is very difficult in the field, if not impossible. For warranty compliance, do not troubleshoot systems beyond the board level.

Sicherheit – Überblick

Lesen und befolgen Sie die wichtigen Sicherheitsinformationen dieses Abschnitts. Beachten Sie insbesondere die Anweisungen bezüglich

Brand-, Stromschlag- und Verletzungsgefahren. Weitere spezifische, hier nicht aufgeführte Warnungen finden Sie im gesamten Handbuch.

⚠ ***WARNUNG: Alle Anweisungen in diesem Handbuch, die das Abnehmen der Geräteabdeckung oder des Gerätegehäuses erfordern, dürfen nur von qualifiziertem Servicepersonal ausgeführt werden. Um die Stromschlaggefahr zu verringern, führen Sie keine Wartungsarbeiten außer den in den Bedienungsanleitungen genannten Arbeiten aus, es sei denn, Sie besitzen die entsprechende Qualifikationen für diese Arbeiten.***

Sicherheit – Begriffe und Symbole

In diesem Handbuch verwendete Begriffe

Sicherheitsrelevante Hinweise können in diesem Handbuch in der folgenden Form auftauchen:

⚠ ***WARNUNG: Warnungen weisen auf Situationen oder Vorgehensweisen hin, die Verletzungs- oder Lebensgefahr bergen.***

⚠	***VORSICHT: Vorsichtshinweise weisen auf Situationen oder Vorgehensweisen hin, die zu Schäden an Ausrüstungskomponenten oder anderen Gegenständen oder zum zeitweisen Ausfall wichtiger Komponenten in der Arbeitsumgebung führen können.***

Hinweise am Produkt

Die folgenden Hinweise können sich am Produkt befinden:

GEFAHR – Wenn Sie diesen Begriff lesen, besteht ein unmittelbares Verletzungsrisiko.

WARNUNG – Wenn Sie diesen Begriff lesen, besteht ein mittelbares Verletzungsrisiko.

VORSICHT – Es besteht ein Risiko für Objekte in der Umgebung, den Mixer selbst oder andere Ausrüstungskomponenten.

Symbole am Produkt

Die folgenden Symbole können sich am Produkt befinden:

⚠	Weist auf eine gefährliche Hochspannung im Gerätegehäuse hin, die stark genug sein kann, um eine Stromschlaggefahr darzustellen.
⚠	Weist darauf hin, dass der Benutzer, Bediener oder Servicetechniker wichtige Bedienungs-, Wartungs- oder Serviceanweisungen in den Produkthandbüchern lesen sollte.
⚠	Dies ist eine Aufforderung, beim Wechsel von Sicherungen auf deren Nennwert zu achten. Die im Text angegebene Sicherung muss durch eine Sicherung ersetzt werden, die die angegebenen Nennwerte besitzt.
⏚	Weist auf eine Schutzerdungsklemme hin, die mit dem Erdungskontakt verbunden werden muss, bevor weitere Ausrüstungskomponenten angeschlossen werden.
⏚	Weist auf eine externe Schutzerdungsklemme hin, die als Ergänzung zu einem internen Erdungskontakt an die Erde angeschlossen werden kann.
⚡	Weist darauf hin, dass es statisch empfindliche Komponenten gibt, die durch eine elektrostatische Entladung beschädigt werden können. Verwenden Sie antistatische Prozeduren, Ausrüstung und Oberflächen während der Wartung.

Warnungen

Die folgenden Warnungen weisen auf Bedingungen oder Vorgehensweisen hin, die Verletzungs- oder Lebensgefahr bergen:

Gefährliche Spannungen oder Ströme – Schalten Sie den Strom ab, und entfernen Sie ggf. die Batterie, bevor sie Schutzabdeckungen abnehmen, löten oder Komponenten austauschen.

Servicearbeiten nicht alleine ausführen – Führen Sie interne Servicearbeiten nur aus, wenn eine weitere Person anwesend ist, die erste Hilfe leisten und Wiederbelebungsmaßnahmen einleiten kann.

Schmuck abnehmen – Legen Sie vor Servicearbeiten Schmuck wie Ringe, Uhren und andere metallische Objekte ab.

Keine offen liegenden Leiter berühren – Berühren Sie bei eingeschalteter Stromzufuhr keine offen liegenden Leitungen, Komponenten oder Schaltungen.

Richtiges Netzkabel verwenden – Verwenden Sie nur das mitgelieferte Netzkabel oder ein Netzkabel, das den Spezifikationen für dieses Produkt entspricht.

Gerät erden – Schließen Sie den Erdleiter des Netzkabels an den Erdungskontakt an.

Gerät nur mit angebrachten Abdeckungen und Gehäuseseiten betreiben – Schalten Sie dieses Gerät nicht ein, wenn die Abdeckungen oder Gehäuseseiten entfernt wurden.

Richtige Sicherung verwenden – Verwenden Sie nur Sicherungen, deren Typ und Nennwert den Spezifikationen für dieses Produkt entsprechen.

Gerät nur in trockener Umgebung verwenden – Betreiben Sie das Gerät nicht in nassen oder feuchten Umgebungen.

Gerät nur verwenden, wenn keine Explosionsgefahr besteht – Verwenden Sie dieses Produkt nur in Umgebungen, in denen keinerlei Explosionsgefahr besteht.

Hohe Kriechströme – Das Gerät muss vor dem Einschalten unbedingt geerdet werden.

Doppelte Spannungsversorgung kann vorhanden sein – Schließen Sie die beiden Anschlußkabel an getrennte Stromkreise an. Vor Servicearbeiten sind beide Anschlußkabel vom Netz zu trennen.

Zweipolige, neutrale Sicherung – Schalten Sie den Netzstrom ab, bevor Sie mit den Servicearbeiten beginnen.

Fassen Sie das Gerät beim Transport richtig an – Halten Sie das Gerät beim Transport nicht an Türen oder anderen beweglichen Teilen fest.

Gefahr durch mechanische Teile – Warten Sie, bis der Lüfter vollständig zum Halt gekommen ist, bevor Sie mit den Servicearbeiten beginnen.

Vorsicht

Die folgenden Vorsichtshinweise weisen auf Bedingungen oder Vorgehensweisen hin, die zu Schäden an Ausrüstungskomponenten oder anderen Gegenständen führen können:

Gerät nicht öffnen – Durch das unbefugte Öffnen wird die Garantie ungültig.

Richtige Spannungsquelle verwenden – Betreiben Sie das Gerät nicht an einer Spannungsquelle, die eine höhere Spannung liefert als in den Spezifikationen für dieses Produkt angegeben.

Gerät ausreichend belüften – Um eine Überhitzung des Geräts zu vermeiden, müssen die Ausrüstungskomponenten entsprechend den Installationsanweisungen belüftet werden. Legen Sie kein Papier unter das Gerät. Es könnte die Belüftung behindern. Platzieren Sie das Gerät auf einer ebenen Oberfläche.

Antistatische Vorkehrungen treffen – Es gibt statisch empfindliche Komponenten, die durch eine elektrostatische Entladung beschädigt werden können. Verwenden Sie antistatische Prozeduren, Ausrüstung und Oberflächen während der Wartung.

CF-Karte nicht mit einem PC verwenden – Die CF-Karte ist speziell formatiert. Die auf der CF-Karte gespeicherte Software könnte gelöscht werden.

Gerät nicht bei eventuellem Ausrüstungsfehler betreiben – Wenn Sie einen Produktschaden oder Ausrüstungsfehler vermuten, lassen Sie die Komponente von einem qualifizierten Servicetechniker untersuchen.

Kabel richtig verlegen – Verlegen Sie Netzkabel und andere Kabel so, dass Sie nicht beschädigt werden. Stützen Sie schwere Kabelbündel ordnungsgemäß ab, damit die Anschlüsse nicht beschädigt werden.

Richtige Netzkabel verwenden – Wenn Netzkabel mitgeliefert wurden, erfüllen diese alle nationalen elektrischen Normen. Der Betrieb dieses Geräts mit Spannungen über 130 V AC erfordert Netzkabel, die NEMA-Konfigurationen entsprechen. Wenn internationale Netzkabel mitgeliefert wurden, sind diese für das Verwendungsland zugelassen.

Richtige Ersatzbatterie verwenden – Dieses Gerät enthält eine Batterie. Um die Explosionsgefahr zu verringern, prüfen Sie die Polarität und tauschen die Batterie nur gegen eine Batterie desselben Typs oder eines gleichwertigen, vom Hersteller empfohlenen Typs aus. Entsorgen Sie gebrauchte Batterien entsprechend den Anweisungen des Batterieherstellers.

Das Gerät enthält keine Teile, die vom Benutzer gewartet werden können. Wenden Sie sich bei Problemen bitte an den nächsten Händler.

Consignes de sécurité

Il est recommandé de lire, de bien comprendre et surtout de respecter les informations relatives à la sécurité qui sont exposées ci-après, notamment les consignes destinées à prévenir les risques d'incendie, les décharges électriques et les blessures aux personnes. Les avertissements complémentaires, qui ne sont pas nécessairement repris ci-dessous, mais présents dans toutes les sections du manuel, sont également à prendre en considération.

⚠ ***AVERTISSEMENT: Toutes les instructions présentes dans ce manuel qui concernent l'ouverture des capots ou des logements de cet équipement sont destinées exclusivement à des membres qualifiés du personnel de maintenance. Afin de diminuer les risques de décharges électriques, ne procédez à aucune intervention d'entretien autre que celles contenues dans le manuel de l'utilisateur, à moins que vous ne soyez habilité pour le faire.***

Consignes et symboles de sécurité

Termes utilisés dans ce manuel

Les consignes de sécurité présentées dans ce manuel peuvent apparaître sous les formes suivantes :

⚠ ***AVERTISSEMENT: Les avertissements signalent des conditions ou des pratiques susceptibles d'occasionner des blessures graves, voire même fatales.***

⚠ ***MISE EN GARDE: Les mises en garde signalent des conditions ou des pratiques susceptibles d'occasionner un endommagement à l'équipement ou aux installations, ou de rendre l'équipement temporairement non opérationnel, ce qui peut porter préjudice à vos activités.***

Signalétique apposée sur le produit

La signalétique suivante peut être apposée sur le produit :

DANGER — risque de danger imminent pour l'utilisateur.

AVERTISSEMENT — Risque de danger non imminent pour l'utilisateur.

MISE EN GARDE — Risque d'endommagement du produit, des installations ou des autres équipements.

Symboles apposés sur le produit

Les symboles suivants peut être apposés sur le produit :

	Signale la présence d'une tension élevée et dangereuse dans le boîtier de l'équipement ; cette tension peut être suffisante pour constituer un risque de décharge électrique.
	Signale que l'utilisateur, l'opérateur ou le technicien de maintenance doit faire référence au(x) manuel(s) pour prendre connaissance des instructions d'utilisation, de maintenance ou d'entretien.
	Il s'agit d'une invite à prendre note du calibre du fusible lors du remplacement de ce dernier. Le fusible auquel il est fait référence dans le texte doit être remplacé par un fusible du même calibre.
	Identifie une borne de protection de mise à la masse qui doit être raccordée correctement avant de procéder au raccordement des autres équipements.
	I dentifie une borne de protection de mise à la masse qui peut être connectée en tant que borne de mise à la masse supplémentaire.
	Signale la présence de composants sensibles à l'électricité statique et qui sont susceptibles d'être endommagés par une décharge électrostatique. Utilisez des procédures, des équipements et des surfaces antistatiques durant les interventions d'entretien.

Avertissements

Les avertissements suivants signalent des conditions ou des pratiques susceptibles d'occasionner des blessures graves, voire même fatales :

Présence possible de tensions ou de courants dangereux — Mettez hors tension, débranchez et retirez la pile (le cas échéant) avant de déposer les couvercles de protection, de défaire une soudure ou de remplacer des composants.

Ne procédez pas seul à une intervention d'entretien — Ne réalisez pas une intervention d'entretien interne sur ce produit si une personne n'est pas présente pour fournir les premiers soins en cas d'accident.

Retirez tous vos bijoux — Avant de procéder à une intervention d'entretien, retirez tous vos bijoux, notamment les bagues, la montre ou tout autre objet métallique.

Évitez tout contact avec les circuits exposés — Évitez tout contact avec les connexions, les composants ou les circuits exposés s'ils sont sous tension.

Utilisez le cordon d'alimentation approprié — Utilisez exclusivement le cordon d'alimentation fourni avec ce produit ou spécifié pour ce produit.

Raccordez le produit à la masse — Raccordez le conducteur de masse du cordon d'alimentation à la borne de masse de la prise secteur.

Utilisez le produit lorsque les couvercles et les capots sont en place — N'utilisez pas ce produit si les couvercles et les capots sont déposés.

Utilisez le bon fusible — Utilisez exclusivement un fusible du type et du calibre spécifiés pour ce produit.

Utilisez ce produit exclusivement dans un environnement sec — N'utilisez pas ce produit dans un environnement humide.

Utilisez ce produit exclusivement dans un environnement non explosible — N'utilisez pas ce produit dans un environnement dont l'atmosphère est explosible.

Présence possible de courants de fuite — Un raccordement à la masse est indispensable avant la mise sous tension.

Deux alimentations peuvent être présentes dans l'équipement — Assurez vous que chaque cordon d'alimentation est raccordé à des circuits de terre séparés. Débranchez les deux cordons d'alimentation avant toute intervention.

Fusion neutre bipolaire — Débranchez l'alimentation principale avant de procéder à une intervention d'entretien.

Utilisez les points de levage appropriés — Ne pas utiliser les verrous de la porte pour lever ou déplacer l'équipement.

Évitez les dangers mécaniques — Laissez le ventilateur s'arrêter avant de procéder à une intervention d'entretien.

Mises en garde

Les mises en garde suivantes signalent les conditions et les pratiques susceptibles d'occasionner des endommagements à l'équipement et aux installations :

N'ouvrez pas l'appareil — Toute ouverture prohibée de l'appareil aura pour effet d'annuler la garantie.

Utilisez la source d'alimentation adéquate — Ne branchez pas ce produit à une source d'alimentation qui utilise une tension supérieure à la tension nominale spécifiée pour ce produit.

Assurez une ventilation adéquate — Pour éviter toute surchauffe du produit, assurez une ventilation de l'équipement conformément aux instructions d'installation. Ne déposez aucun document sous l'appareil – ils peuvent gêner la ventilation. Placez l'appareil sur une surface plane.

Utilisez des procédures antistatiques - Les composants sensibles à l'électricité statique présents dans l'équipement sont susceptibles d'être endommagés par une décharge électrostatique. Utilisez des procédures, des équipements et des surfaces antistatiques durant les interventions d'entretien.

N'utilisez pas la carte CF avec un PC — La carte CF a été spécialement formatée. Le logiciel enregistré sur la carte CF risque d'être effacé.

N'utilisez pas l'équipement si un dysfonctionnement est suspecté — Si vous suspectez un dysfonctionnement du produit, faites inspecter celui-ci par un membre qualifié du personnel d'entretien.

Acheminez les câbles correctement — Acheminez les câbles d'alimentation et les autres câbles de manière à ce qu'ils ne risquent pas d'être endommagés. Supportez correctement les enroulements de câbles afin de ne pas endommager les connecteurs.

Utilisez les cordons d'alimentation adéquats — Les cordons d'alimentation de cet équipement, s'ils sont fournis, satisfont aux exigences de toutes les réglementations régionales. L'utilisation de cet équipement à des tensions dépassant les 130 V en c.a. requiert des cordons d'alimentation qui satisfont aux exigences des configurations NEMA. Les cordons internationaux, s'ils sont fournis, ont reçu l'approbation du pays dans lequel l'équipement est utilisé.

Utilisez une pile de remplacement adéquate — Ce produit renferme une pile. Pour réduire le risque d'explosion, vérifiez la polarité et ne remplacez la pile que par une pile du même type, recommandée par le fabricant. Mettez les piles usagées au rebut conformément aux instructions du fabricant des piles.

Cette unité ne contient aucune partie qui peut faire l'objet d'un entretien par l'utilisateur. Si un problème survient, veuillez contacter votre distributeur local.

Certifications and compliances

Canadian certified power cords

Canadian approval includes the products and power cords appropriate for use in the North America power network. All other power cords supplied are approved for the country of use.

FCC emission control

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by Grass Valley can affect emission compliance and could void the user's authority to operate this equipment.

Canadian EMC Notice of Compliance

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A préscrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

EN55103 1/2 Class A warning

This product has been evaluated for Electromagnetic Compatibility under the EN 55103-1/2 standards for Emissions and Immunity and meets the requirements for E4 environment.

This product complies with Class A (E4 environment). In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC emission limits

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable operation.

Laser compliance

Laser safety requirements

This product may contain a Class 1 certified laser device. Operating this product outside specifications or altering its original design may result in hazardous radiation exposure, and may be considered

an act of modifying or new manufacturing of a laser product under U.S. regulations contained in 21CFR Chapter 1, subchapter J or CENELEC regulations in HD 482 S1. People performing such an act are required by law to recertify and reidentify this product in accordance with provisions of 21CFR subchapter J for distribution within the U.S.A., and in accordance with CENELEC HD 482 S1 for distribution within countries using the IEC 825 standard.

Laser safety

Laser safety in the United States is regulated by the Center for Devices and Radiological Health (CDRH). The laser safety regulations are published in the "Laser Product Performance Standard," Code of Federal Regulation (CFR), Title 21, Subchapter J.

The International Electrotechnical Commission (IEC) Standard 825, "Radiation of Laser Products, Equipment Classification, Requirements and User's Guide," governs laser products outside the United States. Europe and member nations of the European Free Trade Association fall under the jurisdiction of the Comité Européen de Normalization Electrotechnique (CENELEC).

Safety certification

This product has been evaluated and meets the following Safety Certification Standards:

Standard	Designed/tested for compliance with:
ANSI/UL 60950-1	Safety of Information Technology Equipment, including Electrical Business Equipment (Second edition 2007).
IEC 60950-1 with CB cert.	Safety of Information Technology Equipment, including Electrical Business Equipment (Second edition, 2005).
CAN/CSA C22.2 No. 60950-1	Safety of Information Technology Equipment, including Electrical Business Equipment (Second edition 2007).
BS EN 60950-1	Safety of Information Technology Equipment, including Electrical Business Equipment 2006.

ESD Protection

Electronics today are more susceptible to electrostatic discharge (ESD) damage than older equipment. Damage to equipment can occur by ESD fields that are smaller than you can feel. Implementing the information in this section will help you protect the investment that you have made in purchasing Grass Valley equipment. This section contains Grass Valley's recommended ESD guidelines that should be followed when handling electrostatic discharge sensitive (ESDS) items. These minimal recommendations are based on the information in the *Sources of ESD and Risks* on page 500 area. The information in *Grounding Requirements for Personnel* on page 500 is provided to assist you in selecting an appropriate grounding method.

Recommended ESD Guidelines

Follow these guidelines when handling Grass Valley equipment:

- Only trained personnel that are connected to a grounding system should handle ESDS items.

- Do not open any protective bag, box, or special shipping packaging until you have been grounded.

  NOTE: When a Personal Grounding strap is unavailable, as an absolute minimum, touch a metal object that is touching the floor (for example, a table, frame, or rack) to discharge any static energy before touching an ESDS item.
- Open the anti-static packaging by slitting any existing adhesive tapes. Do not tear the tapes off.
- Remove the ESDS item by holding it by its edges or by a metal panel.
- Do not touch the components of an ESDS item unless it is absolutely necessary to configure or repair the item.
- Keep the ESDS work area clear of all nonessential items such as coffee cups, pens, wrappers and personal items as these items can discharge static. If you need to set an ESDS item down, place it on an anti-static mat or on the anti-static packaging.

Sources of ESD and Risks

The following information identifies possible sources of electrostatic discharge and can be used to help establish an ESD policy.

Personnel

One of the largest sources of static is personnel. The static can be released from a person's clothing and shoes.

Environment

The environment includes the humidity and floors in a work area. The humidity level must be controlled and should not be allowed to fluctuate over a broad range. Relative humidity (RH) is a major part in determining the level of static that is being generated. For example, at 10% - 20% RH a person walking across a carpeted floor can develop 35kV; yet when the relative humidity is increased to 70% - 80%, the person can only generate 1.5kV.

Static is generated as personnel move (or as equipment is moved) across a floor's surface. Carpeted and waxed vinyl floors contribute to static build up.

Work Surfaces

Painted or vinyl-covered tables, chairs, conveyor belts, racks, carts, anodized surfaces, plexiglass covers, and shelving are all static generators.

Equipment

Any equipment commonly found in an ESD work area, such as solder guns, heat guns, blowers, etc., should be grounded.

Materials

Plastic work holders, foam, plastic tote boxes, pens, packaging containers and other items commonly found at workstations can generate static electricity.

Grounding Requirements for Personnel

The information in this section is provided to assist you in selecting a grounding method. This information is taken from ANSI/ESD S20.20-2007 (Revision of ANSI/ESD S20.20-1999).

Product Qualification

Personnel Grounding Technical Requirement	Test Method	Required Limits
Wrist Strap System*	ANSI/ESD S1.1 (Section 5.11)	< 3.5 x 10^7 ohm
Flooring / Footwear System – Method 1	ANSI/ESD STM97.1	< 3.5 x 10^7 ohm
Flooring / Footwear System – Method 2 (both required)	ANSI/ESD STM97. 1ANSI/ESD STM97.2	< 10^9 ohm
	ANSI/ESD STM97.2	< 100 V

Product qualification is normally conducted during the initial selection of ESD control products and materials. Any of the following methods can be used: product specification review, independent laboratory evaluation, or internal laboratory evaluation.

Compliance Verification

Personnel Grounding Technical Requirement	Test Method	Required Limits
Wrist Strap System*	ESD TR53 Wrist Strap Section	< 3.5 x 10^7 ohm
Flooring / Footwear System – Method 1	ESD TR53 Flooring Section and ESD TR53 Footwear Section	< 3.5 x 10^7 ohm
Flooring / Footwear System – Method 2 (both required)	ESD TR53 Flooring Section and ESD TR53 Footwear Section	< 1.0 x 10^9 ohm

* For situations where an ESD garment is used as part of the wrist strap grounding path, the total system resistance, including the person, garment, and grounding cord, must be less than 3.5 x 10^7 ohm.

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Patent Information

This product may be protected by one or more patents.

For further information, please visit: *https://www.grassvalley.com/patents/*

JPEG acknowledgment

This software is based in part on the work of the Independent JPEG Group.