

Apex

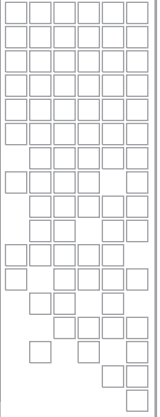
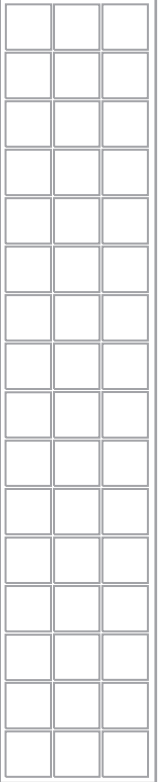
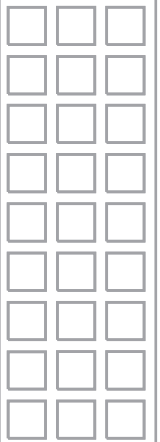
DIGITAL AUDIO ROUTER

Release Notes



SOFTWARE VERSION 3.0

071842601
DECEMBER 2008



Contacting Grass Valley

International Support Centers	France 24 x 7	+800 8080 2020 or +33 1 48 25 20 20 +800 8080 2020 or +33 1 48 25 20 20	United States/Canada 24 x 7	+1 800 547 8949 or +1 530 478 4148
Local Support Centers (available during normal business hours)	Asia	Hong Kong, Taiwan, Korea, Macau: +852 2531 3058 Indian Subcontinent: +91 22 24933476 Southeast Asia/Malaysia: +603 7805 3884 Southeast Asia/Singapore: +65 6379 1313 China: +861 0660 159 450 Japan: +81 3 5484 6868		
		Australia and New Zealand: +61 1300 721 495	Central/South America: +55 11 5509 3443	
		Middle East: +971 4 299 64 40 Near East and Africa: +800 8080 2020 or +33 1 48 25 20 20		
	Europe	Belarus, Russia, Tadzikistan, Ukraine, Uzbekistan: +7 095 2580924 225 Switzerland: +41 1 487 80 02 S. Europe/Italy-Roma: +39 06 87 20 35 28 -Milan: +39 02 48 41 46 58 S. Europe/Spain: +34 91 512 03 50 Benelux/Belgium: +32 (0) 2 334 90 30 Benelux/Netherlands: +31 (0) 35 62 38 42 1 N. Europe: +45 45 96 88 70 Germany, Austria, Eastern Europe: +49 6150 104 444 UK, Ireland, Israel: +44 118 923 0499		

Copyright © Thomson. All rights reserved.

This product may be covered by one or more U.S. and foreign patents.

Grass Valley Web Site

The www.thomsongrassvalley.com web site offers the following:

Online User Documentation — Current versions of product catalogs, brochures, data sheets, ordering guides, planning guides, manuals, and release notes in .pdf format can be downloaded.

FAQ Database — Solutions to problems and troubleshooting efforts can be found by searching our Frequently Asked Questions (FAQ) database.

Software Downloads — Download software updates, drivers, and patches.



END-OF-LIFE PRODUCT RECYCLING NOTICE

Grass Valley's innovation and excellence in product design also extends to the programs we've established to manage the recycling of our products. Grass Valley has developed a comprehensive end-of-life product take back program for recycle or disposal of end-of-life products. Our program meets the requirements of the European Union's WEEE Directive, the United States Environmental Protection Agency, and U.S. state and local agencies.

Grass Valley's end-of-life product take back program assures proper disposal by use of Best Available Technology. This program accepts any Grass Valley branded equipment. Upon request, a Certificate of Recycling or a Certificate of Destruction, depending on the ultimate disposition of the product, can be sent to the requester.

Grass Valley will be responsible for all costs associated with recycling and disposal, including freight. However, you are responsible for the removal of the equipment from your facility and packing the equipment to make it ready for pickup.



For further information on the Grass Valley product take back system please contact Grass Valley at + 800 80 80 20 20 or +33 1 48 25 20 20 from most other countries. In the U.S. and Canada please call 800-547-8949 or 530-478-4148, and ask to be connected to the EH&S Department. Additional information concerning the program can be found at: www.thomsongrassvalley.com/environment



Contents

Applicability	5
Purpose	5
Materials Supplied	6
Upgrade Details	7
1024 X 1024 Expansion	7
Standard Apex Models	7
Notes	7
MADI Support (Standard Apex Only)	11
Fiber Extenders (Standard Apex Only)	12
Fiber Extender Installation	14
CX-34000 Control Crosspoint Board Configuration	16
S34-1/2 - Stereo/Mono Mode Selection	16
S34-8 - Enable Reference/V-fade Master Setting	16
S28 5-6 - AES/Video Reference Selection	18
S28 7-8 - V-fade	18
S30 7-8 MADI AES/Video Reference Settings	18
Output Card Switches	19
Input Card Switches	19
S31 (LIN NUM / VREF)	19
S32 (SR AREF/VREF)	19
AES/Video Reference Notes	19
V-fade (Silent Switching) (Standard Apex Only)	20
Upgrade Procedure	21
For All Systems Receiving Version 3 Upgrade	21

Apex Release Notes

Applicability

This release applies to standard Apex Digital Audio Router units only. It does not apply to Apex Plus systems.

Purpose

The primary purpose of this firmware (gateway) release is to provide the following for Standard Apex systems:

- 1024 x 1024 support ([page 7](#)).
- MADI support – Input cards can now accept both AES and MADI formatted audio and the output cards stream both AES and MADI formatted audio ([page 11](#)).
- Remote frame location (up to 5 km) using Apex Fiber Extenders ([page 12](#))
- Redundant CX-34000 Control Crosspoint board support ([page 16](#))
- V-Fade support – provides click-less switching of AES signals ([page 20](#)).
- Lock to video reference – allows users to synchronize audio switching to NTSC or PAL.
- Dolby E support - switching of Dolby E signals is now aligned properly resulting in clickless switching.

For a detailed list of problems fixed and known limitations, see Apex Release Notes Addendum, Release 3.0, part number 071842701.

Materials Supplied

The materials supplied for this release are given in [Table 1](#).

Table 1. Materials Supplied With This Release

Qty	Description	Part Number
1 per frame	License Configuration Board	Depends on Frame Type*
1	Release Notes	071842601
1	Release Notes Addendum	071842701

* License Boards vary according to the rear panel main connector type (75 or 110 ohm). Refer to [Table 2](#).

Table 2. Apex License (Configuration) Boards

Nomenclature	Description	U2 Firmware Part Number
APX-CL-34075	Apex 75 ohm License board	080835403
APX-CL-34110	Apex 110 ohm License board	080835503

These items are obtained through Technical Support. For contact information, see [page 2](#).

Upgrade Details

1024 X 1024 Expansion

Refer to [Figure 1 on page 8](#) for an illustration of the Apex frame module locations (no front door installed).

Standard Apex Models

With this release, five Standard Apex 256 x 256 frames can be connected to form 1024 x 1024 systems. The frames are connected by four-meter (13-foot) InfiniBand cables.

[Figure 3 on page 10](#) shows a fully expanded (1024 x 1024) system with 6 InfiniBand expansion cables. Smaller systems will require fewer cables (see [Table 3 on page 10](#)); the connector numbering scheme remains the same as that shown for the large system. Each group of four Expansion (InfiniBand) connectors correspond to one MX-34000 Matrix board.

In addition to the InfiniBand cables, expanded Apex systems with more than one chassis require RG-59 Master Clock connections. The three Master Clock Out connectors are functionally identical, i.e., they can be connected to any chassis. See [Figure 4 on page 10](#). As shown in [Figure 2 on page 9](#), each group of four Master Clock BNC connectors correspond to a Matrix board.

If two or more frames of a multi-frame standard Apex system must be located more than four meters apart, 2 each model APX-FBR-EXT Apex Fiber Extenders must be ordered for each remote chassis. For more information, see [page 12](#).

Notes

Redundant InfiniBand cables (not shown in the drawings) can be added if each chassis is equipped with a secondary matrix board. In this case the Expansion B connectors shown in [Figure 2 on page 9](#) would be used.

Only one CX-34000 Control Crosspoint board is needed per system, regardless of expansion.

Figure 1. Apex Digital Audio Router, Showing Standard-type 75 and 110 Ohm Rear Panels

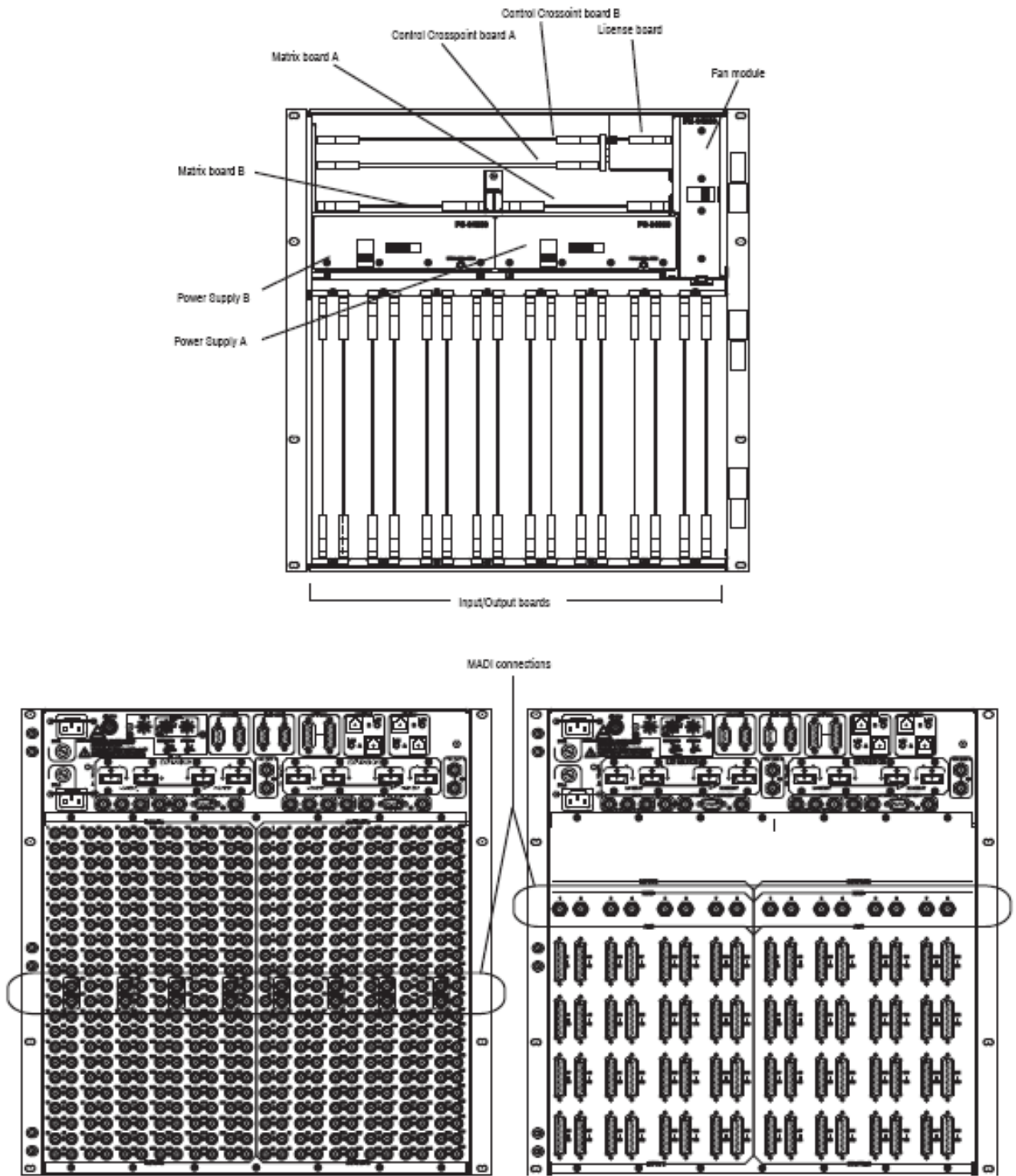


Figure 2. Auxiliary Panel

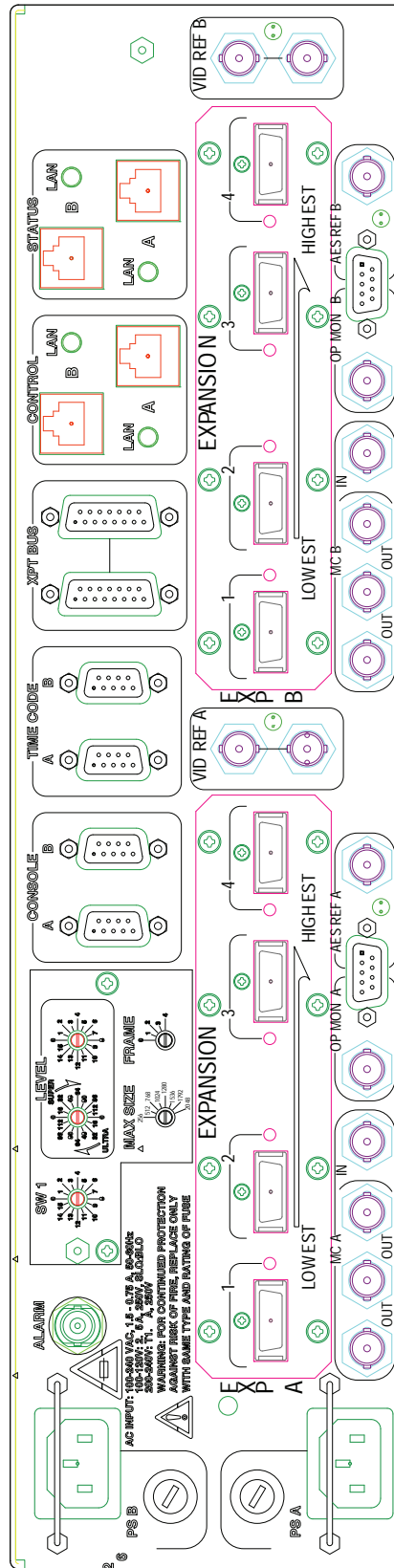


Figure 3. Standard Apex Expansion InfiniBand Cabling (optional redundant cables not shown)

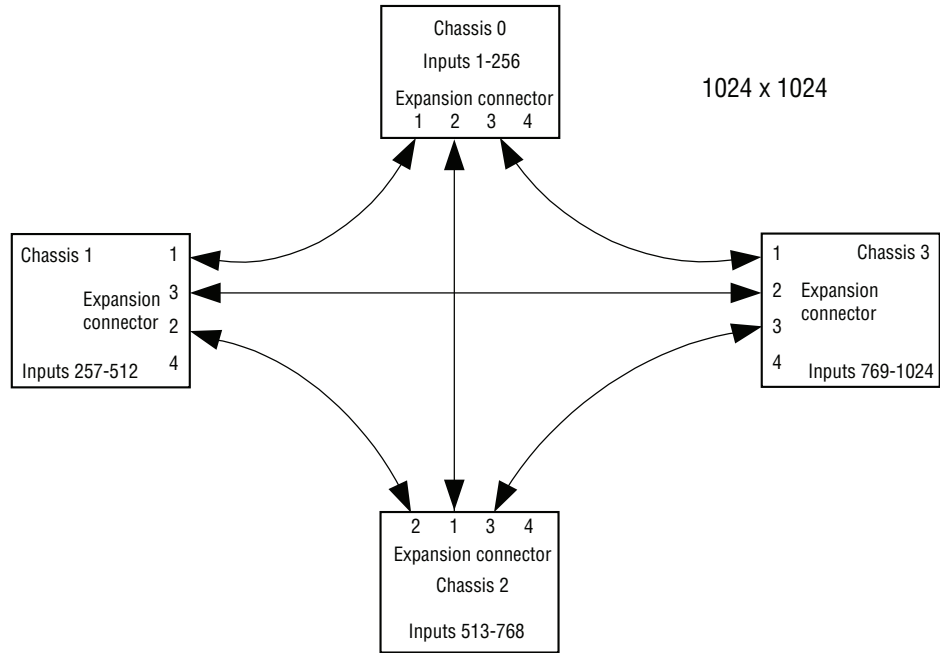


Figure 4. Standard Apex Expansion Master Clock Cabling (optional redundant cables not shown)

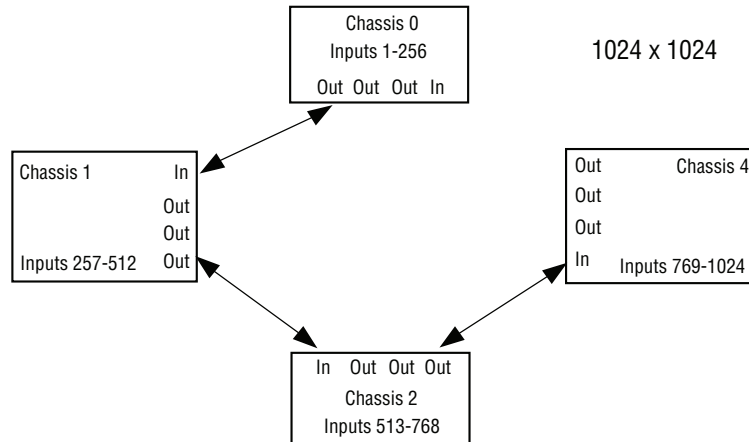


Table 3. Standard Apex InfiniBand and Master Clock Cable Requirements

Switcher size	# of Chassis	InfiniBand cables needed		Master Clock cables needed	
		Non-redundant (1 Matrix board per chassis)	Redundant (2 Matrix boards per chassis)	Non-redundant (1 Matrix board per chassis)	Redundant (2 Matrix boards per chassis)
256 x 256	1	0	0	0	0
512 x 512	2	1	2	1	2
768 x 768	3	3	6	2	4
1024 x 1024	4	6	12	3	6

MADI Support (Standard Apex Only)

Standard Apex I/O boards are presently supplied with a BNC MADI hardware port. With this release, the MADI port operates as follows:

- When a MADI signal is connected to an input board, signals arriving on the other input connectors are ignored.
- The signal present at the MADI connector on an output board consists of a multiplexed stream of all 64 channels (32 pairs) on the board. All 32 pairs will also be present on the corresponding 75 ohm (or 110 ohm) connectors.
- The input cards' reference can be switched to match the input MADI reference via the configuration switches on the Control Crosspoint Board. See [Figure 8 on page 17](#).

Fiber Extenders (Standard Apex Only)

If two or more frames of a multi-frame standard Apex system must be located more than four meters apart, 2 each model APX-FBR-EXT Apex Fiber Extenders must be installed for each remote chassis. For example, if four frames were in one equipment rack and a fifth frame was located in another room, then two extenders would be needed. See [Figure 6 on page 13](#).

Two lengths of fiber optic cable are available: 300 meters (984 feet) and 5000 meters (16,400 feet or 3.1 miles). If the 300 meter cables are used, then the Fiber Extenders should be ordered with APX-SFP-M300 small form-factor plug-in multi-mode transceivers; if 5 km cables are used, then APX-SFPS5000 small form-factor plug-in single-mode transceivers should be ordered. Each optical cable pair requires two transceivers (which are plugged into the Fiber Extender ports). In the example shown in [Figure 6 on page 13](#), a total of 16 transceivers would be needed; i.e., one transceiver for each end of each fiber optic cable pair. If redundant cables were installed, a total of 32 transceivers would be needed for this system.

Each Fiber Extender is 1 RU high, approximately 12 inches (30 mm) deep, and includes I/O ports for fiber optic cable connection to the remote module and InfiniBand ports for connection to a local frame. Each module also includes redundant power supplies and all rear panel ports needed for redundant cabling. See [Figure 5](#).

Note Master Clock cabling is not required for the remote frame(s) connected using fiber extenders. The clock signal is recovered internally in this application.

Figure 5. Apex Fiber Extender

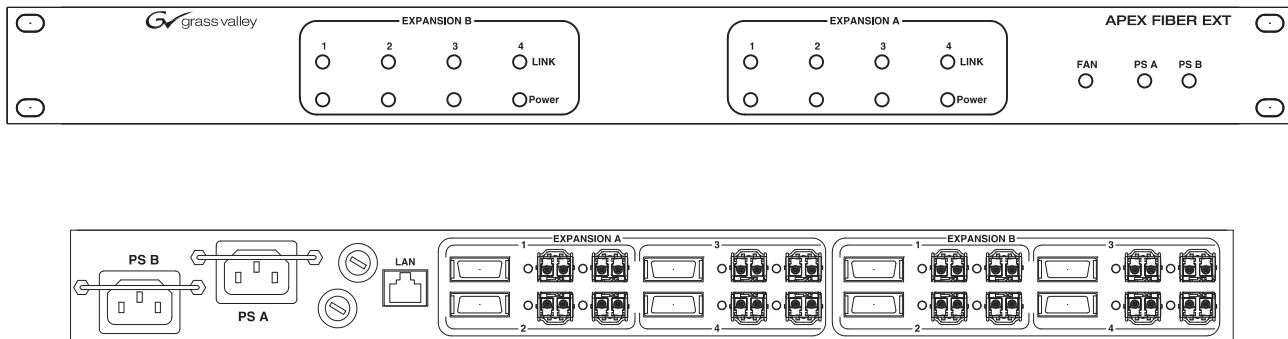
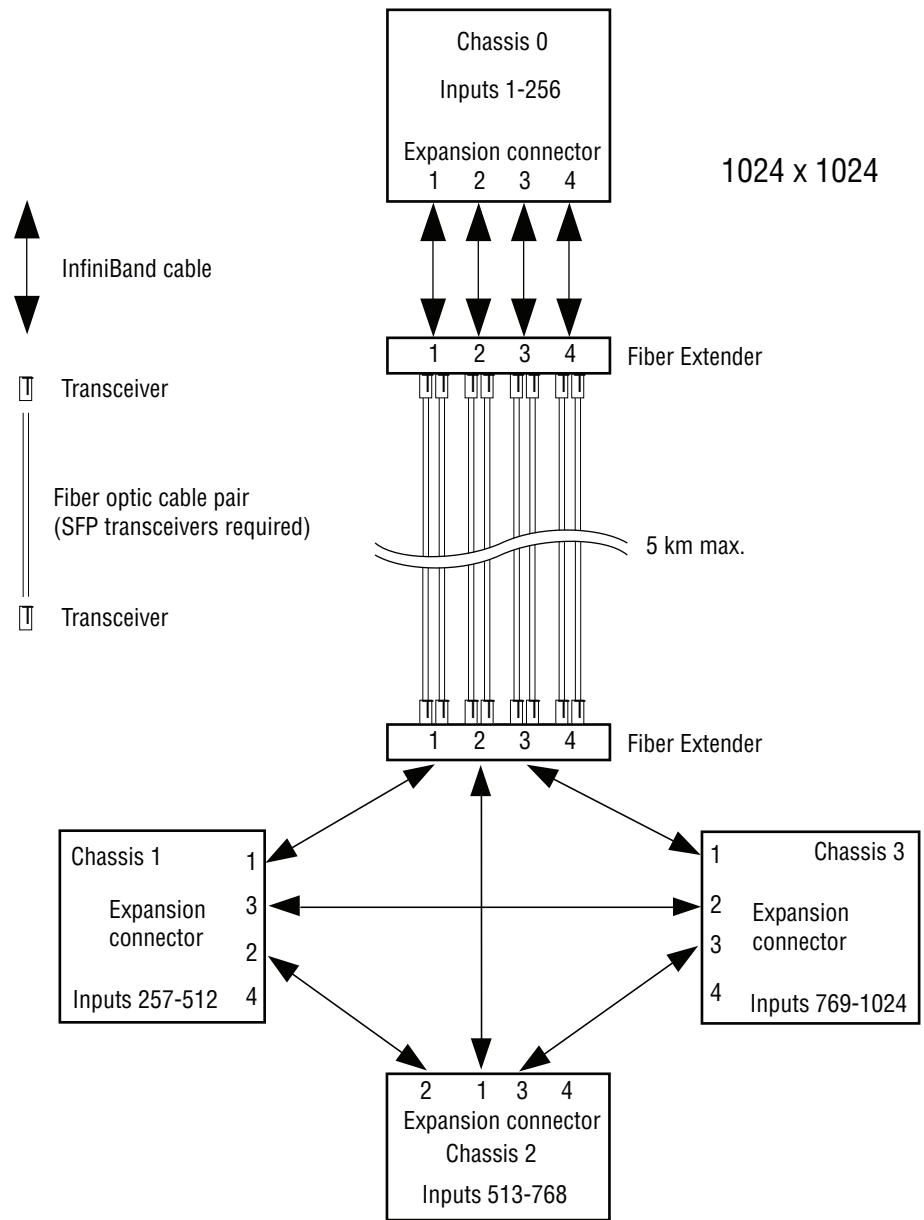


Figure 6. Example of Standard Apex Expansion InfiniBand Cabling with Fiber Extenders



Fiber Extender Installation

Rack Mounting

The Apex Fiber Extender is mounted in a standard 483 mm (19-inch) rack. Rear frame support is not required. Position the unit in the rack and secure the panel in place using rack screws or bolts and nuts (depending on your equipment rack type). Cooling is provided by an internal fan and vent opening located on the sides of the unit; these areas must be kept clear of obstructions.

Special Safety Considerations for Rack Mounting

- **Elevated Operating Ambient** – If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum specified ambient temperature of 55 degrees C (130 degrees F).
- **Reduced Air Flow** – Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical Loading** – Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

Power Supplies

Where possible, the two power supply cords should be connected to independent power sources. The supplies are auto sensing from 110 VAC to 240 VAC; power consumption is 30 Watts when fully populated with 16 SFP transceivers.

Special Safety Considerations for Power Connections

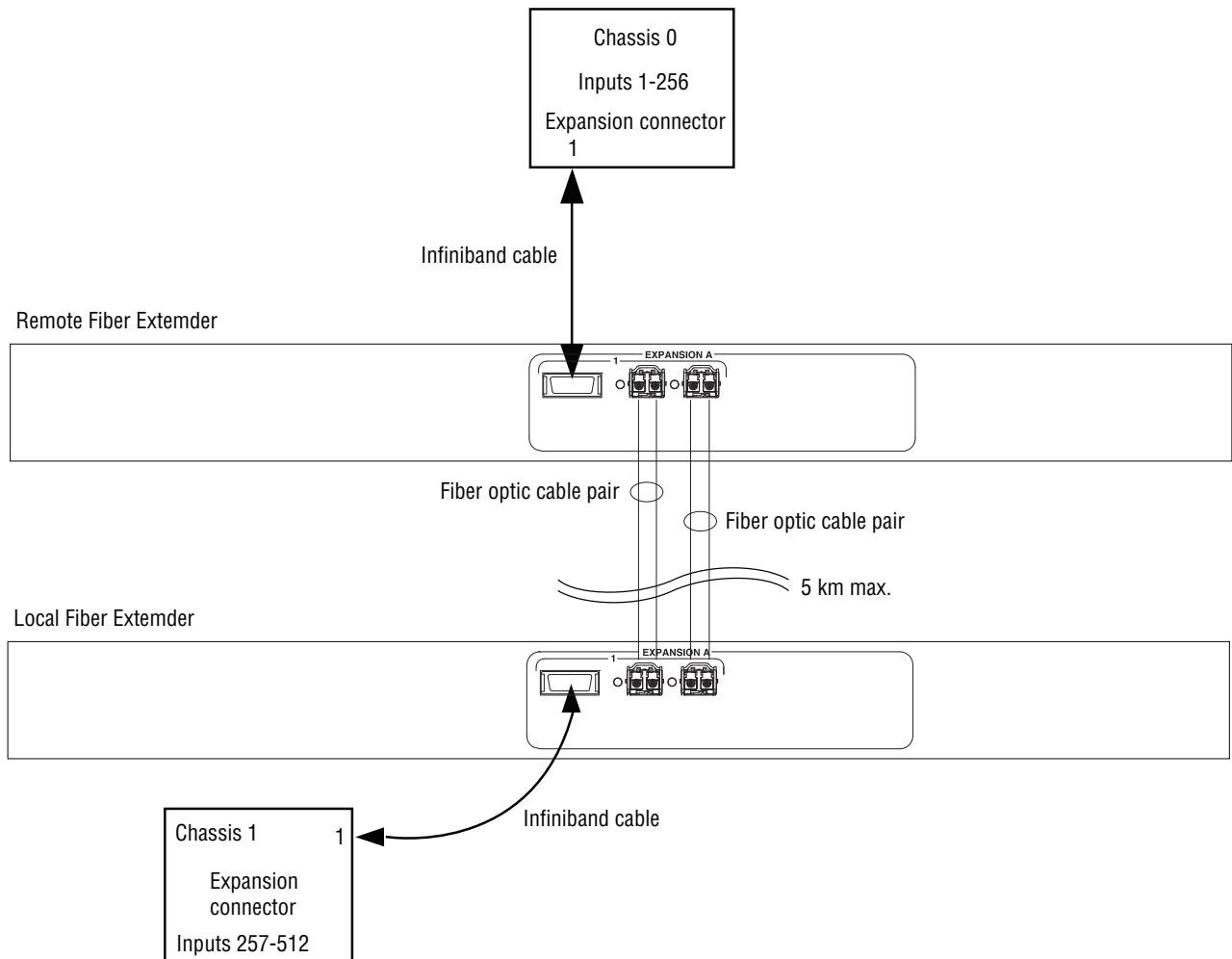
- **Circuit Overloading** – Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- **Reliable Earthing** – Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Cabling

Figure 7 shows the cabling details between a remote chassis (Chassis 0) and a local chassis (Chassis 1). Each chassis is connected to an adjacent Fiber Extender using an InfiniBand cable. The extenders are connected using two fiber optic cables, each of which is actually a pair of cables. In this case a total of four transceivers are installed, i.e., two transceivers in each Fiber Extender. Each transceiver is installed label up in the appropriate slot on the rear panel by sliding the transceiver inward until it locks in place. The protective black plug is then removed to allow insertion of the fiber cable connector. Note that the protective white covers must be removed from the cables before they can be connected; to remove the covers, press the blue tab marked B and A. The wire locking bail on the transceiver must be in the **up** position when the connector is inserted.

Redundant (Expansion B) cables are not shown in this example but are connected in a similar manner.

Figure 7. Examples of Connections Between Local and Remote Chassis



CX-34000 Control Crosspoint Board Configuration

This release affects the manner in which the CX-34000 DIP switches are set. For the following discussion, please refer to [Figure 8 on page 17](#).

S34-1/2 - Stereo/Mono Mode Selection

The Apex is normally operated in two-level stereo mode (both switches OFF). This mode, which is also referred to as split stereo, allows for stereo mode switching such as mix, reverse, etc. In this mode the Apex boards are programmed so that the right channel is always 4 physical level numbers higher than the left channel.

With S34-1 **ON** and S34-2 **OFF**, the switcher will operate as one physical level, which is considered standard AES mode. This mode is also referred to as **locked stereo**.

Note **Locked stereo** mode does not apply to Encore-controlled systems.

With S34-2 **ON**, the switcher will operate in **Mono** mode. In this case a 256 x 256 router is configured as a 512 x 512 mono router.

S34-8 - Enable Reference/V-fade Master Setting

Standard Apex

If S34-8 is **ON**:

- The reference and V-fade settings for chassis 0 output card 0 (S28 5-8) will apply to all output boards, and
- The reference settings for chassis 0 input card 0 (S30 7-8) will apply to all input boards, i.e., the settings will apply to all MADI inputs.

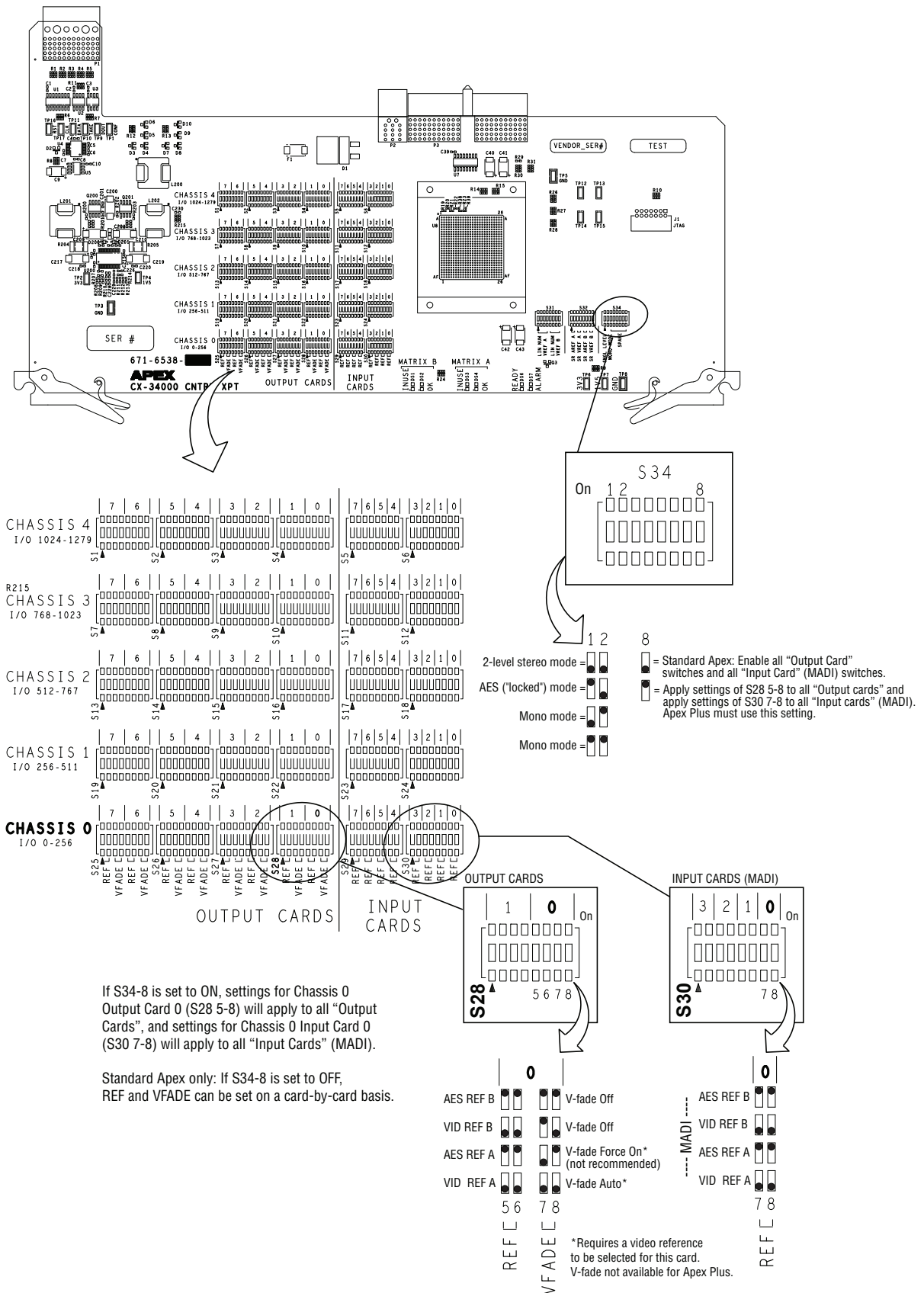
If S34-8 is **OFF**, REF and V-fade can be set on a board-by-board basis using switches S1 through S30 as described below.

Apex Plus

S34-8 must be **ON** for Apex Plus:

- The reference settings for chassis 0 output card 0 (S28 5-6) will apply to all output boards.

Figure 8. DIP Switch Settings on CX-34000 Crosspoint Board



S28 5-6 - AES/Video Reference Selection

These settings will be assigned to all output boards when S34-8 is **ON**. Otherwise, they will apply only to output board zero in chassis zero.

These two switches are used to select Video Reference A, Video Reference B, AES Reference A, or AES Reference B. For switch setting details, please refer to [Figure 8 on page 17](#).

For more information about reference settings, see [AES/Video Reference Notes on page 19](#).

S28 7-8 - V-fade

Standard Apex

These settings will be assigned to all output boards when S34-8 is **ON**. Otherwise, they will apply only to output board zero in chassis zero.

To enable V-fade in the Auto mode, set S28-7 and S28-8 both to **OFF**. In this case, one of the two Video References must be selected on S28 5-6 (as just described above).

To disable V-fade, set S28-7 to **ON**. In this case, the position of S28-8 doesn't matter.

Note Use of V-fade in the **force on** mode (S28-7 **OFF** and S28-8 **ON**) is not recommended.

For more information about V-fade, see [V-fade \(Silent Switching\) \(Standard Apex Only\) on page 20](#).

Apex Plus

V-fade is under development. S28-7 must be **ON**.

S30 7-8 MADI AES/Video Reference Settings

Standard Apex

These settings will be assigned to the MADI inputs of all input boards when S34-8 is **ON**. Otherwise, they will apply only to output board zero in chassis zero.

The switches are used to select Video Reference A, Video Reference B, AES Reference A, or AES Reference B. For switch setting details, please refer to the assembly drawing on [page 17](#).

For more information about reference settings, see [AES/Video Reference Notes on page 19](#).

Apex Plus

MADI operation is under development. These switches are not used.

Output Card Switches

- S1 through S4
- S7 through S10
- S13 through S16
- S19 through S22
- S25 through S28

These switches, when S34-8 is OFF, can be used to make reference and Vfade selections on a board-by-board basis. The settings are the same as those shown for S28 5-8 in [Figure 8 on page 17](#).

Input Card Switches

- S5 and S6
- S11 and S12
- S17 and S18
- S23 and S24
- S29 and S30

These switches, when S34-8 is OFF, can be used to select the MADI reference on a board-by-board basis. The settings are the same as those shown for S30 7-8 in [Figure 8 on page 17](#).

S31 (LIN NUM / VREF)

These switches are not used.

S32 (SR AREF/VREF)

These switches are not used.

AES/Video Reference Notes

If redundant Matrix boards are installed, the same reference must be presented to both REF A and REF B connectors, the system will automatically operate the Matrix boards as a redundant pair. For more information, refer to the Apex manual.

V-fade (Silent Switching) (Standard Apex Only)

The Apex utilizes a silent-switching design to minimize unwanted clicks and pops. You can turn this feature on or off for each output board (i.e., in blocks of 32 outputs).

Note Output boards must be using a Video (not AES) reference to perform V-fades.

The V-fade starts 20 msec before the start of the frame boundary at which the switch is going to occur. The volume fades down linearly to 0 at the frame boundary, at which instant the switch occurs (early in line 9), then the audio volume is faded back up to full volume linearly over the next 20 msec. Since each output card has its own set of V-fade setting DIP switches, one can enable V-fade on each output card independently. However, all 32 streams on each output card get the same setting.

In **Auto** mode, V-fade does not occur if the audio stream is compressed (e.g., Dolby E). This is the reason why the use of V-fade in the **force on** mode (S28-7 **OFF** and S28-8 **ON**) is not recommended.

Upgrade Procedure

For All Systems Receiving Version 3 Upgrade

CAUTION The next step will interrupt signals passing through the router.

Note Customers using this equipment in a continuous 24/7 environment should consult Technical Support concerning alternate procedures. Possibilities may include patching around the router during the upgrade.

1. Power down all frames by disconnecting the rear power cords.
2. Remove the installed License board(s) and replace it with the one(s) provided.
3. Check the CX-34000 Control Crosspoint Board DIP switch settings as discussed above.
4. Power up the system in frame-number order: frame 0, then frame 1, then frame 2, etc.

The new firmware will be downloaded automatically from the new license board to the other boards; the router will then be refreshed by the control system (i.e., crosspoints will be returned to their state prior to power off). This process will take from 2 to 30 seconds.

5. This completes the upgrade.

