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## LDX Advanced Imaging Camera Platform

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## 1. **How does the upgrade licensing (GV-eLicense) structure work?**

A GV-eLicense will temporarily or perpetually upgrade an LDX camera from Grass Valley, a Belden Brand, to a more advanced model. There are perpetual and 7-day GV-eLicenses available. Each step up the LDX series requires a separate license. If a user moves up one model, they need one license; moving up two models (where possible) requires two licenses, etc. To increase the duration of a 7-day upgrade, an additional 7-day license must be acquired.

Once the user decides their license requirements, they supply Grass Valley with the serial number of the camera(s) to which the GV-eLicense(s) should be applied. For 7-day licenses, the user also supplies the start date for the license to begin.

Once the order is placed, the Grass Valley order desk will send an e-mail to the user with a link to a unique and secured website, which will provide an activation code. The code enables a file download. After inserting a USB memory device into the camera, the installation process is completed using menus.

With the B.O.W.L. licensing option (simply, a bunch of weekly licenses), users can also preorder any number of 7-day term GV-eLicenses which then can be activated on demand one-by-one without the need to go through a number of individual order processes.

## 2. **Is there a rolling shutter with LDX cameras as there can be with CMOS-based cameras?**

No. The Xensium-FT CMOS imagers used in LDX cameras do not exhibit rolling shutter behavior. They offer the same global shutter behavior as any CCD camera on the market.

## 3. **Are the 3G-capable LDX models the only cameras that offers the same sensitivity when used in 1080i and 1080p modes?**

Yes. Only the 3G-capable LDX models (with Xensium-FT CMOS imagers) offers the same sensitivity in 1.5G formats as in 3G formats. Every other CCD camera on the market will lose one F-stop when switched from 1.5G formats to 3G formats.

## 4. **Are the PsF-capable LDX models the only cameras that offer double sensitivity in 1080PsF when compared to 1080i?**

Yes. Only the PsF-capable LDX models (with Xensium-FT CMOS imagers) offer double the sensitivity in 1080PsF. This is possible as the imager is always working in full resolution and progressive mode. The longer exposure times of 1080PsF formats permits capturing more light.

## 5. **Can LDX cameras be used in combination with LDK 8300, LDK 8000 and LDK 3000 cameras?**

Yes. LDX cameras include tools to match the look of LDK 8300, LDK 8000 and LDK 3000 cameras.

## 6. **Are all the cameras fully compatible with the C2IP control system?**

Yes. Every component or function which is supported by the C2IP camera control system including the Connect Gateway, the OCP 400 and the MCP 450 are fully compatible with all the LDX cameras.

## LDX Series Cameras

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- 1. Can lower LDX Series models be upgraded to any of the higher LDX Series models (e.g., LDX Flex to LDX WorldCam)?**

Yes. An upgrade is possible from every LDX Series model to the next, with the exception of LDX WorldCam. LDX Flex to LDX Première, LDX Première to LDX Elite, LDX Elite to LDX WorldCam. Every single feature of the higher model will be available after the upgrade. Note that the side grip is not available for the LDX Flex.
- 2. Can the ComfortPad be mounted on all the LDX Series cameras from LDX Flex to LDX WorldCam?**

Yes. The ComfortPad is an option for all LDX Series cameras.
- 3. Can LDX Series camera heads be swapped with LDK 8000 camera heads when using an existing Grass Valley 3G Transmission adapter?**

Yes. The LDK 8000 camera head can be replaced by a new LDX Series camera head when using an existing 3G Transmission adapter. However, the docking connector on the 3G Transmission adapter must be changed. Two converter kits are available for both types of 3G Transmission adapters (triax and fiber).

To ensure full camera functionality, we recommend that Grass Valley service staff perform the conversion.
- 4. Can LDX cameras be used with the Reflex SuperXpander?**

Yes. Since the 3G Transmission adapters for LDX Series cameras have the hot shoe on the bottom, they will be fully compatible with the Reflex SuperXpander.
- 5. Can LDX Series cameras be used with the old LDK 4482 or LDK 4488 SuperXpander, or the LDK 4489 Xpander?**

No. These expanders are not compatible with 3G Transmission systems used by the LDX Series cameras.
- 6. Can the 3G triax base station (LDK 4400) be used in combination with the new 3G triax adapter for the LDX Series cameras?**

Yes. This base station can be used.
- 7. Can the 3G fiber base station (LDK 4410) be used in combination with the new 3G fiber adapter for the LDX Series cameras?**

Yes. This base station can be used.
- 8. Are the XCU WorldCam eXchangeable Control Unit base stations and the 3G base stations fully compatible for the LDX Series and the LDK Series?**

Yes. These base stations can be used in any combination with all of the LDX Series cameras and many of the LDK Series cameras. The new XCU base stations and the previous 3G base stations offer the same number of inputs and outputs on pin-compatible connectors.
- 9. Can LDX Series camera heads be connected to an analog triax adapter?**

No. The LDX Series camera heads can ONLY be used with the Grass Valley 3G Transmission systems. There is no converter kit for the analog triax transmission adapters.
- 10. Can LDX Series camera heads be used together with a LDK 5490 compact adapter?**

No. The LDX Series camera heads cannot be used with this adapter.
- 11. Can LDX Series camera heads be used together with a Grass Valley HD Wireless System?**

No. The LDX Series camera heads cannot be used with the Grass Valley HD Wireless System.
- 12. Are there any other HD wireless transmission solutions for the LDX Series camera heads?**

Yes. There are several solutions available from different RF technology providers which are specially made for the LDX Series camera heads. They all use the LDX docking interface and they are fully integrated into a housing which is similar in size and weight to the Grass Valley 3G transmission adapters.

## LDX Compact Series

**1. Are there any differences or limitations in the image quality or in the feature set of the LDX Compact series cameras, as compared to the LDX Series system cameras?**

No, absolutely not. The LDX Compact series offers identical performance and feature set to the comparable versions of the LDX Series system cameras.

**2. Can lower LDX Compact models be upgraded to any of the higher LDX Compact models (e.g., LDX Compact Première to LDX Compact WorldCam)?**

Yes. An upgrade is possible from every LDX Compact model to the next, with the exception of LDX Compact WorldCam. LDX Compact Première to LDX Compact Elite, LDX Compact Elite to LDX Compact WorldCam. Every single feature of the higher model will be available after the upgrade.

**3. Can the LDX Compact cameras be used with any Grass Valley 3G Transmission equipment?**

No. The LDX Compact includes all I/Os directly on the camera head and is not compatible with the 3G Transmission solutions.

**4. Can the LDX Compact cameras be used with any of the Grass Valley SuperXpanders?**

No. The LDX Compact cameras are not compatible with any of the SuperXpanders.

**5. Are the LDX Compact cameras compatible with the viewfinders from the LDX Series?**

No. On the LDX Compact cameras there are no connectors for the Grass Valley camera viewfinders.

**6. Is there any viewfinder solution for the LDX Compact cameras?**

Yes. On the LDX Compact cameras there is a HDMI connection for the viewfinder output signals and any display with a HDMI or DVI input can be used.

**7. What makes the LDX Compact a good choice for 3D productions?**

For many 3D applications it is necessary to mirror the output signals on one of the two cameras in a 3D rig. With CCD cameras this is done by using digital memory inside the camera processing and read it out in a different direction. This process takes time and adds a latency which needs to be compensated for from the other camera. The Xensium-FT imagers from the LDX Compact cameras offers the unique possibility to directly read out the imager in different directions. This means that horizontal and/or vertical mirroring can be done without adding any latency.

In addition, the C2IP camera control system for all Grass Valley cameras offers a master/slave mode for a fast and easy way to control two cameras within a 3D rig.



## LDX HiSpeed and LXD XtremeSpeed

**1. Do the LDX HiSpeed and LDX XtremeSpeed cameras offer a 1X standard speed “live” output during high-speed operation?**

Yes. The LDX HiSpeed (LDX HS) and LDX XtremeSpeed (LDX XS) offer a standard output in addition to the multiple high-speed output phases in all high-speed modes.

**2. Do the LDX XS cameras need six HD-SDI outputs for 6X speed operation?**

No. The three or six high-speed output phases of the LDX XS are always transferred over three physical HD-SDI connections. In the case of 3X 720p or 3X 1080i operations, they consist of three 1.5G HD-SDI signals and in the case of 3X 1080p, 6X 720p or 6X 1080i they consist of three 3G HD-SDI signals.

**3. Can the LDX HS and LDX XS cameras be used in full performance in standard frame rate speed operation?\***

Yes. The LDX HS camera can be switched to support the same formats and same feature set as the LDX Elite. The LDX XS camera supports the same formats and same feature set as the LDX WorldCam.\*\*

**4. Can the LDX Series camera heads be upgraded to LDX HS or LDX XS?**

No. The LDX HS and LDX XS camera heads have different hardware compared to the other LDX Series cameras and they cannot be upgraded to high-speed functionality.

- 5. Can the LDX HS camera heads be upgraded to LDX XS?**

Yes. The LDX HS cameras can be upgraded via GV-eLicenses to LDX XS using 7-day or perpetual licenses, as well as the B.O.W.L. (bunch of weekly licenses) licensing option.
- 6. Can the ComfortPad be mounted on the LDX HiSpeed and LDX XtremeSpeed cameras?**

Yes. The ComfortPad is an option with the LDX HS and LDX XS cameras.
- 7. Is there multiphase light flicker correction system?**

Yes. The unique AnyLight system from the LDK 8300 cameras has been further improved for the LDX HS and LDX XS cameras. AnyLightXtreme is a built-in capability which works in every operational speed including the new 6X times speed operation of the LDX XS.
- 8. Can the LDX HS or LDX XS camera heads be swapped with LDX Series camera heads when using an existing Grass Valley 3G Transmission adapter?**

No. The LDX HS and LDX XS use the XF Fiber transmission system which is not compatible with the 3G transmission solutions.
- 9. Can the LDX HS or LDX XS cameras be used with the LDK 8300 transmission system and/or base stations?**

No. The LDX HS and LDX XS cameras are not compatible with the LDK 8300 transmission system or base stations.
- 10. Is there a triax transmission system available for the LDX HS or LDX XS cameras?**

No. The high-speed formats of the LDX HS and LDX XS require very large bandwidth for transmission, and they are only compatible with the XCU XtremeSpeed XF Fiber base station and camera adapter.
- 11. Are the current XCU WorldCam and XCU Elite eXchangeable Control Units (XCUs) compatible with the LDX HS and LDX XS cameras?**

No. These base stations support 3G transmission systems and they are not compatible with the XCU XtremeSpeed XF Fiber base station and camera adapter which is used with the LDX HS and LDX XS cameras.
- 12. Are the XCU cradles from the current XCU WorldCam and XCU Elite fully compatible with the XF Fiber XCUs?**

Yes. The XCU cradles are identical for all XCU type of camera base stations and offer the same number of inputs and outputs on pin-compatible connectors. Any LDX Series camera position can be easily converted into a high-speed camera position by easily swapping the 3G XCU base station and camera adapter with a XCU XtremeSpeed XF Fiber base station and camera adapter and vice versa.
- 13. Are the 3G converter boxes usable with the LDX HS and LDX XS cameras?**

In most cases they are not compatible. Since the LDX HS and LDX XS cameras use the XF Fiber transmission system they are not compatible with the 3G transmission components such as the 3G converter boxes. There is however one exception; the LDK 4425 3G Fiber Power converter is also usable with the LDX high-speed camera systems and provide for the use of dark fiber cables over long distances.
- 14. Are there any HD wireless transmission solutions available for the LDX high-speed camera heads?**

No. There are currently no wireless solutions available for the LDX HS and LDX XS heads. Because of the LDX docking interface, highly integrated wireless solutions should become available in the future.
- 15. Can LDX HS and LDX XS cameras be used with the Reflex SuperXpander?**

Yes. Since the XF Fiber transmission adapters for LDX high-speed cameras have the hot shoe on the bottom, they will be fully compatible with the Reflex SuperXpander.
- 16. Can LDX Series cameras be used with the old LDK 4482 or LDK 4488 SuperXpander, or the LDK 4489 Xpander?**

No. These expanders are not compatible with XF Fiber transmission systems used by the LDX high-speed cameras.
- 17. Are the LDX HS and LDX XS compatible with all the viewfinders from the LDX Series?**

Yes. Every viewfinder which is compatible with the LDX Series cameras is also compatible with the LDX high-speed cameras.
- 18. Can the LDX HS and LDX XS work with the Grass Valley K2 Dyno Replay System?**

Yes. The LDX HS and LDX XS cameras fully integrate with Grass Valley K2 Dyno Replay Systems which include optimized K2 Dyno AnySpeed technology to provide for smooth playback at any speed from 0% to 200%, dramatically expanding the ability to tell a compelling story during replays.

## LDX Compact HiSpeed and LDX Compact XtremeSpeed

- 1. Do the LDX Compact XS cameras need six HD-SDI outputs for 6X speed operation?**

No. The three or six high-speed output phases of the LDX Compact XS are always transferred over three physical HD-SDI connections. In the case of 3X 720p or 3X 1080i operations, they consist of three 1.5G HD-SDI signals and in the case of 3X 1080p, 6X 720p or 6X 1080i they consist of three 3G HD-SDI signals.
- 2. Do the LDX Compact HiSpeed and LDX Compact XtremeSpeed cameras offer a 1X standard speed “live” output during high-speed operation?**

Yes. The LDX Compact HiSpeed and LDX Compact XtremeSpeed offer a standard output in addition to the multiple high-speed output phases in all high-speed modes.
- 3. Can the LDX Compact HS and LDX Compact XS cameras be used in full performance in standard frame rate speed operation?\***

Yes. The LDX Compact HS camera can be switched to support the same formats\*\* and same feature set as the LDX Elite. The LDX Compact XS camera supports the same formats\*\* and same feature set as the LDX WorldCam.
- 4. Can the regular LDX Compact camera heads be upgraded to LDX Compact HS or LDX Compact XS?**

No. The regular LDX Compact camera heads have different hardware compared to the LDX Compact HS and LDX Compact XS and they cannot be upgraded to high-speed functionality.
- 5. Can the LDX Compact HS camera heads be upgraded to LDX Compact XS?**

Yes. The LDX Compact HS cameras can be upgraded via GV-eLicenses to LDX Compact XS using 7-day or perpetual licenses, as well as the B.O.W.L. (bunch of weekly licenses) licensing option.
- 6. Is there multiphase light flicker correction system?**

No. The unique AnyLightXtreme system is an XCU function and is therefore not available for the LDX Compact HS and LDX Compact XS cameras.
- 7. Can the LDX Compact HS or LDX Compact XS cameras be used with the Grass Valley XF Fiber Transmission equipment?**

No. The LDX Compact HS and LDX Compact XS cameras include all I/Os directly on the camera head and are not compatible with the XF Fiber transmission solutions.
- 8. Can the LDX Compact HS and LDX Compact XS cameras be used with any of the Grass Valley SuperXpanders?**

No. The LDX Compact HS and LDX Compact XS cameras are not compatible with any of the SuperXpanders.
- 9. Are the LDX Compact HS and LDX Compact XS compatible with the viewfinders from the LDX Series?**

No. The LDX Compact HS and LDX Compact XS have no connectors for Grass Valley camera viewfinders.
- 10. Is there any viewfinder solution for the LDX Compact HS and LDX Compact XS cameras?**

Yes. On the LDX Compact HS and LDX Compact XS there is a HDMI connection for the viewfinder output signals and any display with a HDMI or DVI input can be used.
- 11. Can the LDX Compact HS and LDX Compact XS work with the Grass Valley K2 Dyno Replay System?**

Yes. The LDX Compact HS and LDX Compact XS can be fully integrated with the Grass Valley K2 Dyno Replay Systems which includes K2 Dyno AnySpeed technology to provide for smooth playback at any speed from 0 percent to 200 percent, dramatically expanding the ability to tell a compelling story during replays.

\*Note: The full performance 1X single-speed operation (Elite & WorldCam features) will become available by a software update in H2/2014.

\*\*Note: With the exception of the PsF formats



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