LDX 90 & LDX C90 SERIES

Overview

Adapting to new circumstances is a constant in live production. In addition to the pace of the action in the event, the camera must rapidly adjust to shooting positions, lighting and weather. Even more critical is the ability quickly reconfigure production formats, picture resolution and frame rates with a minimum of effort and downtime. Designed specifically for these demanding conditions, Grass Valley LDX cameras set the standard for combining picture quality with ease of use in capturing live images.

À La Carte Options

Featuring both standard and compact size camera heads, the LDX 90 camera series includes six models — three full-size cameras and three compact cameras. Their base feature set may be augmented with software options that add just the features you need either perpetually or just for one day by selecting à la carte options from a secure web portal.

![Image](image.png)

Figure 1 – Format support and options available for LDX 90 and LDX C90 Series

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</table>

*1 Compact cameras support 6x speed in 720p and 1080i  
*2 Compact cameras don't support 4K/UHD upconversion
Superb Image Quality with Native HDR
In addition to the LDX 90 series’ high sensitivity for image detail and contrast, many of today’s live productions require image capture in High Dynamic Range. Audiences readily appreciate the uniquely differentiated picture when watching in HDR with much greater brightness, contrast, and better color accuracy than was possible in the past. To simplify matching production formats, the LDX 90 series cameras support natively all three main formats of HDR: HLG, PQ and S-Log3.

DirectIP
LDX 90 series cameras provide many unique alternatives for quick connection between one location and the next. In addition to triax or fiber connections with base stations cradles that remember previous settings, LDX 90 series cameras also support with the XF transmission solutions DirectIP, a direct interface of the complete transmission protocol between the cameras and XCUs over IP networks.

Creative Grading
In a camera system, what happens behind the scenes is just as important as what happens at the camera head. Grass Valley’s Creating Grading camera control provides a camera control panel that can be easily adapted to production requirements with multiple user-definable controls and offers a graphical interface that makes it easy to visualize and share the results of artistic decision-making across multiple cameras. Standardizing the look of a show across multiple cameras using a traditional control system typically takes many hours of configuration time. Creative Grading reduces this setup to minutes, freeing camera shaders to experiment with different looks or store multiple setups so that the same equipment can be rapidly repurposed for pre- and post-event programming.
Camera Heads

The LDX 90 series has both standard and compact models. Compact models offer an identical image performance and a comparable feature set, but in a smaller mechanical package that is ideally suited to remote operation and camera positions that are inaccessible or unsafe for an operator at the camera head.

LDX 90 or LDX C90
The LDX 90 series has both standard and compact models. Compact models offer an identical image performance and a comparable feature set, but in a smaller mechanical package that is ideally suited to remote operation and camera positions that are inaccessible or unsafe for an operator at the camera head.

LDX 92 or LDX C92
The LDX 92 is the entry-level model for the LDX 90 series. Supporting the features you need for shooting under challenging live conditions, LDX 92 also offers upgrade options for 4K UHD and HDR that allow the camera to add new formats and easily mix with other cameras in the LDX 90 series.

LDX 96 or LDX C96
The LDX 96 offers two software-enabled feature sets: high framerate HD/3G cameras or single-speed HD/3G/4K UHD acquisition. This advanced multiformat (HD/3G/4K UHD) and multispeed (1X/3X/6X) content acquisition system is combined with outstanding image performance, excellent light sensitivity and the ability to use standard HD lenses.

LDX 98 or LDX C98
The LDX 98 supports even greater image clarity with native support of 4K UHD as well as native 3G/HD image capture. Whether it’s HD or 3X super slow-motion today, 3G or 6X super slow-motion tomorrow, or 4K UHD down the road, you’ll be ready for whatever your productions demand.
LDX 90 & LDX C90 Series Technical Specifications

**LDX 92 Camera Head**

**General**
- Temperature range: -20° to +45°C (-4° to 113°F) (operating)
- Weight: 2.1 kg (4.6 lbs.) (including shoulder pad)
- Dimensions:
  - Width: 170 mm (6.7 in.)
  - Depth: 200 mm (7.9 in.)
  - Height: 180 mm (7.1 in.)
- Power: supplied through the transmission adapter

**Camera**
- Pick-up device: 3x2/3" Xensium-FT CMOS with global shutter operation
- Picture elements:
  - Total: 2112x1124
  - In image: 1920x1080
- Smear: no vertical smear
- Shutter: no mechanical shutter
- Optical system: F1.4 prism
- Lens mount: 2/3" Bayonet type
- Optical filter wheels: 2x motorized wheels
  - Optical filters on first wheel: clear, 1/4 ND, 1/16 ND, 1/64 ND
  - Optical filters on second wheel: clear, 4P-star, soft focus
- Electronic color correction: 3200°K, 5600°K, 7500°K, FL, 2 AWB presets, Var, continuous auto white
- Exposure: electronic exposure down to 1/1000 sec (depending on video mode)

**Video Modes**
- Standard: 1080i50/59.94, 720p50/59.94, 1080p50/59.94
- Optional: 1080PsF23.98/24/25/29.97, 1080i150/179.82, 720p150/179.82, 1080p150/179.82, 1080i 300/359.64, 720p300/359.64, 1080p 300/359.64, 3840x2160p50/59.94
- Sensitivity at 2000 lux:
  - F12.0 (1080i50, 720p50, 1080p50)
  - F11.0 (1080i59.94, 720p59.94, 1080p59.94)
  - F6.9 (1080i150, 720p150, 1080p150)
  - F6.3 (1080i179.82, 720p179.82, 1080p179.82)
  - F4.9 (1080i300, 720p300, 1080p300)
  - F4.5 (1080i359.64, 720p359.64, 1080p359.64)
  - F18.0 (1080PsF25)
  - F16.0 (1080PsF29.97)
  - F12 (3840x2160p50)

**S/N ratio:** 62 dB typical

**Aspect ratio:** 16:9

**Modulation depth:** 60% (typical) at 800 TV lines (27 MHz) in 1080i50/59.94 & 720p50/59.94 modes

**Digital resolution:** Floating point A/D-conversion with 16-bit performance and with 34-bit processing in RGB

**Horizontal resolution:** >1,000 TV lines

**Gain selection:** -6 dB to +18 dB in 3 dB steps (user-definable presets) or continuous master gain

**Connectivity**
- Front microphone input: XLR-3 female, balanced, phantom +48V selectable
- USB
- Ethernet RJ-45
- Lens connector: Hirose 12-pin
- Viewfinder connector: 20-pin and HDMI

**Control Buttons**
- PickMe
- Info
- Menu control
- Return A / Return B
- Intercom production/engineering
- Filter wheel selection
- Standard file recall
- 4 user assignable

**Control Switches**
- On/off
- Color bar
- Gain selection
- Color temperature
- Exposure time
- White balance

**Accessories**
- 2" LCD viewfinder
- 7" LCD viewfinder (economic)
- 7" LCD viewfinder (native HD)
- 7.4" OLED viewfinder

**LDX 96 Camera Head**

**General**
- Temperature range: -20° to +45°C (-4° to 113°F) (operating)
- Weight: 2.1 kg (4.6 lbs.) (including shoulder pad)
- Dimensions:
  - Width: 170 mm (6.7 in.)
  - Depth: 200 mm (7.9 in.)
  - Height: 180 mm (7.1 in.)
- Power: supplied through the transmission adapter

**Camera**
- Pick-up device: 3x2/3" Xensium-FT CMOS with global shutter operation
- Picture elements:
  - Total: 2112x1124
  - In image: 1920x1080
- Smear: no vertical smear
- Shutter: no mechanical shutter
- Optical system: F1.4 prism
- Lens mount: 2/3" Bayonet type
- Optical filter wheels: 2x motorized wheels
  - Optical filters on first wheel: clear, 1/4 ND, 1/16 ND, 1/64 ND
  - Optical filters on second wheel: clear, 4P-star, soft focus
- Electronic color correction: 3200°K, 5600°K, 7500°K, FL, 2 AWB presets, Var, continuous auto white
- Exposure: electronic exposure down to 1/1000 sec (depending on video mode)

**Video Modes**
- Standard: 1080i50/59.94, 720p50/59.94, 1080p50/59.94
- Optional: 1080PsF23.98/24/25/29.97, 1080i150/179.82, 720p150/179.82, 1080p150/179.82, 1080i 300/359.64, 720p300/359.64, 1080p 300/359.64, 3840x2160p50/59.94
- Sensitivity at 2000 lux:
  - F12.0 (1080i50, 720p50, 1080p50)
  - F11.0 (1080i59.94, 720p59.94, 1080p59.94)
  - F6.9 (1080i150, 720p150, 1080p150)
  - F6.3 (1080i179.82, 720p179.82, 1080p179.82)
  - F4.9 (1080i300, 720p300, 1080p300)
  - F4.5 (1080i359.64, 720p359.64, 1080p359.64)
  - F18.0 (1080PsF25)
  - F16.0 (1080PsF29.97)
  - F12 (3840x2160p50)

**S/N ratio:** 62 dB typical

**Aspect ratio:** 16:9

**Modulation depth:** 60% (typical) at 800 TV lines (27 MHz) in 1080i50/59.94 & 720p50/59.94 modes

**Digital resolution:** Floating point A/D-conversion with 16-bit performance and with 34-bit processing in RGB

**Horizontal resolution:** >1,000 TV lines

**Gain selection:** -6 dB to +18 dB in 3 dB steps (user-definable presets) or continuous master gain

**Connectivity**
- Front microphone input: XLR-3 female, balanced, phantom +48V selectable
- USB
- Ethernet RJ-45
- Lens connector: Hirose 12-pin
- Viewfinder connector: 20-pin and HDMI

**Control Buttons**
- PickMe
- Info
- Menu control
- Return A / Return B
- Intercom production/engineering
- Filter wheel selection
- Standard file recall
- 4 user assignable

**Control Switches**
- On/off
- Color bar
- Gain selection
- Color temperature
- Exposure time
- White balance

**Accessories**
- 2" LCD viewfinder
- 7" LCD viewfinder (economic)
- 7" LCD viewfinder (native HD)
**LDX 98 Camera Head**

**General**
- **Temperature range:** -20° to +45°C (-4° to 113°F) (operating)
- **Weight:** 2.1 kg (4.6 lbs.) (including shoulder pad)
- **Dimensions:**
  - **Width:** 170 mm (6.7 in.)
  - **Depth:** 200 mm (7.9 in.)
  - **Height:** 180 mm (7.1 in.)
- **Power:** Supplied through the transmission adapter

**Camera**
- **Pick-up device:** 3x 2/3” 4K XensiumHawk CMOS imagers with DPM
- **Picture elements:**
  - **Total:** 4224x2248
  - **In image:** 3840x2160
- **Smear:** no vertical smear
- **Shutter:** no mechanical shutter
- **Optical system:** F1.4 prism
- **Lens mount:** 2/3” Bayonet type
- **Optical filters:** 2x motorized wheels
- **Optical filters on first wheel:** clear, 1/4 ND, 1/16 ND, 1/64 ND
- **Optical filters on second wheel:** clear, 4P-star, 5μ OLPF, cap-filter
- **Electronic color correction:** 3200°K, 5600°K, 7500°K, FL, 2 AWB presets, Var, continuous auto white

**Video Modes**
- **Standard:** 1080i50/59.94, 720p50/59.94, 1080p50/59.94
- **Optional:** 1080PsF23.98/24/25/29.97, 1080i50/179.82, 720p50/179.82, 1080p50/179.82, 1080i 300/359.64, 720p300/359.64, 1080p 300/359.64, 3840x2160p50/59.94

**Sensitivity at 2000 lux:**
- F10.0 (1080i50, 720p50 & 1080p50)
- F9.0 (1080i59.94, 720p59.94 & 1080p59.94)
- F6.0 (1080i50, 720p50 & 1080p50)
- F5.2 (1080i179.82, 720p179.82 & 1080p179.82)
- F4.3 (1080i300, 720p300 & 1080p300)
- F3.7 (1080i359.64, 720p359.64 & 1080p359.64)
- F14.0 (1080PsF23.98/24/25)
- F13.0 (1080PsF29.97)
- F10.0 to 5.0 (3840x2160p50)**
- F9.0 to 4.5 (3840x2160p59.94)**

**S/N ratio:** 60 dB typical

**Aspect ratio:** 16:9

**Modulation depth:** 60% (typical) at 800 TV lines (27 MHz) in 1080i50/59.94 & 720p50/59.94 modes

**Horizontal resolution:** >1,000 TV lines (HD), >2,000 TV lines (4K UHD)

**Gain selection:** -6 dB to +12 dB in 3 dB steps (user-definable presets) or continuous master gain

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**Connectivity**
- **Front microphone input:** XLR-3 female, balanced, phantom +48V selectable
- **USB**
- **Ethernet RJ-45**
- **Lens connector:** Hirose 12-pin
- **Viewfinder connector:** 20-pin and HDMI

**Control Buttons**
- **PickMe**
- **Info**
- **Menu control**
- **Return A / Return B**
- **Intercom production/engineering**
- **Filter wheel selection**
- **Standard file recall**
- **4 user assignable**

**Control Switches**
- **On/off**
- **Color bar**
- **Gain selection**
- **Color temperature**
- **Exposure time**
- **White balance**

**Accessories**
- **2” LCD viewfinder**
- **7” LCD viewfinder (economic)**
- **7” LCD viewfinder (native HD)**

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*Specifications depend on the selected sensitivity mode*
**XCU WorldCam Triax/XCU WorldCam Fiber**

**Video**
- 720p: 50/59.94 Hz
- 1080i: 50/59.94 Hz
- 1080PsF: 23.98/24/25/29.97 Hz
- 1080p: 50/59.94 Hz

**Compatible Cameras**
All LDX Series cameras running HD formats

**General (incl. cradle)**
- Dimensions XCU + cradle (HxWxL, approx.): 438 x 88 x 510 mm (19” rack, 2 RU) (17.2 x 3.5 x 20.1 in.)
- Operating temperature: 0 to +45°C (+32 to +113°F)
- Storage temperature: -20 to +70°C (-4 to +158°F)
- Operation humidity: Max. 90% (non-condensing)
- Shock resistance: Max. 10G (transport, Max. 2G (operating)
- Altitude: Max. 15,420m (50,000 ft.)
- Weight XCU + cradle: 11.8-12.2 kg (26.0-26.9 lbs.) (depending on version) full-option equipped
- Weight XCU: 7.3-7.7 kg (16.1-16.9 lbs.) (depending on version) full-option equipped
- Power requirement: AC 100V/240V, 47 to 63 Hz
- Power connector: IEC type, 3-pin male
- Power consumption: Total power (Cam + XCU) 450W max.

**Connectors**
- Fiber (Hybrid): Lemo Hybrid fiber connector acc. SMPTE ST 304
- Triax: Fischer, other Triax connectors on request

**Video**
- Teleprompter in: BNC 1x (loop-through output), (C) VBS, 1.0 Vp-p, 75Ω
- Reference in: 1x (loop-through output), 1.0 Vp-p, 75Ω
- HD tri-level sync or SD black-burst
- HD-SDI out: BNC 6x 0.8 Vp-p, 75Ω, SMPTE ST 292, 1080i/720p at 50/59.94 Hz or BNC 6x 0.8 Vp-p, 75Ω, SMPTE ST 425A, 425B, 1080p at 50/59.94 Hz
- HD-SDI out (live/effect): BNC 2x 0.8 Vp-p, 75Ω, SMPTE ST 292, 1080i/720p at 50/59.94 Hz
- HD-SDI monitoring out: BNC 1x 0.8 Vp-p, 75Ω, SMPTE ST 292, 1080i/720p at 50/59.94 Hz
- HD-SDI out: BNC 2x 0.8 Vp-p, 75Ω, SMPTE ST 259 ITU-R, BT.601 SD-SDI monitoring out: BNC 1x 0.8 Vp-p, 75Ω, SMPTE ST 259 ITU-R, BT.601
- Composite Video monitoring output: BNC 1x 1.0 Vp-p, 75Ω (CVBS text with video, for viewing purposes)
- External video in: HD-SDI (1.5 Gb/3.0 Gb) or SD-SDI in 1, (loopthrough output), 0.8 Vp-p, 75Ω/HD-SDI (1.5 Gb/3.0 Gb) or SD-SDI in 2, 0.8 Vp-p, 75Ω/HD-SDI (1.5 Gb/3.0 Gb) or SD-SDI in 3, 0.8 Vp-p, 75Ω

**Signaling and Control**
- Signaling in/out: D-sub 15-pin, male; preview, green tally (call), dry contact; yellow tally (iso), dry contact; red tally (on air), dry contact; remote audio level control (22-64 dB), DC
- Auxiliary in/out: D-sub 9-pin, female; private data in/out; 100 kb TTL (RS-232)
- Control data: RJ-45 connector for C2IP (camera control)

**Audio**
- 2-ch. audio: Audio out, XLR-3 2x ; 0/+6 dBu (±1.5 dB, max. 18 dBu, 600Ω, gain max. 70 dB)
- Frequency response: 40 Hz to 15 kHz, (+1/-3 dB, 1 kHz, -10 dBu output level)
- Distortion: less than 0.5% (100 Hz/1 kHz, +6 dBu out, 600Ω)
- S/N ratio: 58 dB (unweighted RMS)
- AES-EBU 1+2: BNC 75Ω, Dig audio output Audio 1 and 2
- AES-EBU 3+4: BNC 75Ω, Dig audio output Audio 3 and 4
- Intercom in/out (2/4-wire intercom): D-sub 15-pin, female (program in, production in/out, engineering in/out), in: 0 or 6 dBu; out: 0 or 6 dBu (±2 dB, max. 12 dBu)
- Frequency response: 150 Hz to 6 kHz (1 kHz, -10 dBu output level)
- Distortion: less than 2% (1 kHz, +12 dBu level)
LDX 3G Triax Adapter (LDX 5640)

- **Power requirements:** Triax powered or 12 VDC (local)
- **Operating temperatures:** -20 to +45°C (-4 to +113°F)
- **Storage temperatures:** -25 to +70°C (-13 to +158°F)
- **Weight (approx.):** 2.1 kg (4.6 lbs.)
- **Dimensions (L x W x H):** 222.1 x 132.7 x 212.1 mm (8.7 x 5.2 x 8.4 in.)
- **Triax connection:** Swivel Triax connector (Fischer, other connectors available on request)
- **Triax cable length:** 1,500m (5,000 ft.) max. with 14 mm (0.55") cable (specified for Draka Triax cable)
- **Analog VF output or AES/EBU audio input:** BNC connector 1.0 Vp-p; 75Ω
- **VF output or main output:** BNC connector 1.0 Vp-p; 75Ω
- **Reference input:** BNC connector 0.6 Vp-p; 75Ω HD tri-level reference signal
- **EXT video output connector:** BNC connector 1.0 Vp-p; 75Ω
- **Teleprompter output or analog ref input:** BNC connector 1.0 Vp-p; 75Ω
- **Auxiliary:** 20-pin data connector with Tracker intercom, remote control lines and studio signaling
- **Rear microphone inputs:** 2x XLR-3, balanced, +48V phantom power
- **Intercom:** XLR-5 with 3 channels (engineering, production and program)
- **DC power input:** 12V/7A max. (11 to 17V), XLR-4 male
- **Script light power output:** 12V (100 mA), 4-pin Hirose
- **DC power output:** 12V/4A, XLR-4 female

LDX 3G Fiber Adapter (LDX 5650)

- **Power requirements:** Hybrid fiber powered or 12 VDC (local)
- **Operating temperatures:** -20 to +45°C (-4 to +113°F)
- **Storage temperatures:** -25 to +70°C (-13 to +158°F)
- **Weight (approx.):** 2.1 kg (4.6 lbs.)
- **Dimensions (L x W x H):** 222.1 x 132.7 x 212.1 mm (8.7 x 5.2 x 8.4 in.)
- **Fiber connector:** Swivel hybrid fiber connector SMPTE ST 304 Lemo
- **Cable length:** 3,000 m (10,000 ft.) max. using SMPTE ST 311 hybrid fiber cable
- **Analog VF output or AES/EBU audio input:** BNC connector 1.0 Vp-p; 75Ω
- **VF output or main output:** BNC connector 1.0 Vp-p; 75Ω
- **Reference input:** BNC connector 0.6 Vp-p; 75Ω HD tri-level reference signal
- **EXT video output connector:** BNC connector 1.0 Vp-p; 75Ω
- **Teleprompter output or analog ref input:** BNC connector 1.0 Vp-p; 75Ω
- **Auxiliary:** 20-pin data connector with Tracker intercom, remote control lines and studio signaling
- **Rear microphone inputs:** 2x XLR-3, balanced, +48V phantom power
- **Intercom:** XLR-5 with 3 channels (engineering, production and program)
- **DC power input:** 12V/7A max. (11 to 17V), XLR-4 male
- **Script light power output:** 12V (100 mA), 4-pin Hirose
- **DC power output:** 12V/4A, XLR-4 female
**TECHNICAL SPECIFICATIONS — XF TRANSMISSION**

**XCU XF/UXF**

**Video (specific format support depends on the camera model)**
- 720p: 50/59.94/150/179.82/300/359.64 Hz
- 1080i: 50/59.94/150/179.82/300/359.64 Hz
- 1080p: 50/59.94/150/179.82 Hz
- 4K UHD: 3840x2160p50/59.94

**Compatible Cameras**
LDX 80 Series, LDX 90 Series and LDX 100 Series

**General (incl. cradle)**
Dimensions XCU + cradle (HxWxL, approx.):
- UXF: 448 x 86.5 x 533 mm (19” rack, 2 RU) (17.6 x 3.4 x 21.0 in.)
- XF: 438 x 88 x 510 mm (19” rack, 2 RU) (17.2 x 3.5 x 20.1 in.)

Operating temperature: 0 to +45°C (+32 to +113°F)
Storage temperature: -20 to +70°C (-4 to +158°F)
Operation humidity: Max. 90% (noncondensing)
Shock resistance: Max. 10G (transport), max. 2G (operating)
Altitude: Max. 15,420m (50,000 ft.)

**Weight:**
- XCU + cradle: 12.5 kg (27.6 lbs.)
- XCU: 7.8 kg (17.2 lbs.)

Power requirement: AC 100V/240V, 47 to 63 Hz
Power connector: IEC type, 3-pin male
Power consumption: Total power (Camera + XCU) 450W max.

<table>
<thead>
<tr>
<th>Connectors (4K mode)</th>
<th>XCU Universe XF</th>
<th>XCU Enterprise UXF</th>
<th>XCU Universe UXF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teleprompter: in: BNC 1x (loop-through output), (C) VBS, 1.0 Vp-p, 75Ω</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Reference in: 1x (loop-through output), 1.0 Vp-p, 75Ω HD tri-level sync or SD blackburst</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4K UHD: 2x / 3G HD-SDI: 4x, BNC 0.8 Vp-p, 75Ω Quad or 2SI, Level-A</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>HD-SDI out: BNC 1x 0.8 Vp-p, 75Ω, SMPTE ST 292, 1080i/720p at 50/59.94 Hz or SMPTE ST 425A, 425B, 1080p at 50/59.94 Hz</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Signaling in/out: D-sub 15-pin – male, preview, green tally (call—dry contact), yellow tally (iso—dry contact), red tally (on air – dry contact), remote audio level control (22-64 dB), DC</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Auxiliary in/out: D-sub 9-pin – female, private data in/out – 100 kb TTL (RS-232)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Control data: RJ-45 connector for C2IP (camera control)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Control data: RJ-45 connector for IP trunk up to 1 GbE Hybrid fiber connector: LEMO hybrid acc. SMPTE ST 304</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>External video in: 3x HD-SDI (1.5 Gb/3.0 Gb) or SD-SDI 0.8 Vp-p, 75Ω</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Input 1 (loop-through output)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Inputs 2 and 3 (no loop-through output)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

**Connectors (HD/3G 1X/3X/6X modes)**
- Teleprompter in: BNC 1x (loop-through output), (C) VBS, 1.0 Vp-p, 75Ω
- Reference in: 1x (loop-through output), 1.0 Vp-p, 75Ω HD tri-level sync or SD blackburst
- HD-SDI out*: BNC 6x 0.8 Vp-p, 75Ω, SMPTE ST 292, 1080i/720p at 50/59.94 Hz
- HD-SDI out (live/effect)*: BNC 2x 0.8 Vp-p, 75Ω, SMPTE ST 292, 1080i/720p at 50/59.94 Hz
- HD-SDI monitoring out: BNC 1x 0.8 Vp-p, 75Ω, SMPTE ST 292, 1080i/720p at 50/59.94 Hz
- SD-SDI out: BNC 2x 0.8 Vp-p, 75Ω, SMPTE ST 259 ITU-R, BT.601
- SD-SDI monitoring out: BNC 1x 0.8 Vp-p, 75Ω, SMPTE ST 259 ITU-R, BT.601
- Composite video monitoring output: BNC 1x 0.8 Vp-p, 75Ω (CVBS text with video, for viewing purposes)
- Signaling in/out: D-sub 9-pin – male, preview, green tally (call—dry contact), yellow tally (iso—dry contact), red tally (on air – dry contact), remote audio level control (22-64 dB), DC
- Auxiliary in/out: D-sub 9-pin – female, private data in/out – 100 kb TTL (RS-232)
- Control data: RJ-45 connector for C2IP (camera control)
- Control data: RJ-45 connector for IP trunk up to 1 GbE Hybrid fiber connector: LEMO hybrid acc. SMPTE ST 304
- External video in: 3x HD-SDI (1.5 Gb/3.0 Gb) or SD-SDI 0.8 Vp-p, 75Ω
- Input 1 (loop-through output)
- Inputs 2 and 3 (no loop-through output)

*Notes:
- 8x 1.5G video outputs (in 1X speed 720p, 1080i)
- 6x 3G and 2x 1.5G video outputs (in 1X speed 1080p)
- 2x three phases on 6x 1.5G and 2x 1.5G live (in 3X speed 720p, 1080p)
- 2x three phases on 6x 3G and 2x 6G live (in 3X speed 1080p)
- 2x six phases on 6x 3G (dual-link) and 2x 1.5G live (in 6X speed 720p, 1080p)
- During single-speed HDR operation, some of the signals will be with SDR mapping and some of the signals will be with HDR mapping

<table>
<thead>
<tr>
<th>Feature</th>
<th>XCU Universe XF</th>
<th>XCU Enterprise UXF</th>
<th>XCU Universe UXF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full baseband connectivity</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Full IP connectivity</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>12G SDI support (optional)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>HD/3G/4K UHD support in single speed</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>High-speed support</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3x HD, 6x HD, 3x 3G</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>6x 3G</td>
<td>✓</td>
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<tr>
<td>Direct IP support</td>
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<td>HDR support</td>
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<tr>
<td>In single speed</td>
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<td>✓</td>
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<tr>
<td>In high speed</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Simultaneous outputs in: 4K HDR, 3G/HD HDR, 3G/HD SDR</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>LDX 100 support</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Delivered with cradle</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Delivered with UXF cradle with 4x SFP+ slots</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
TECHNICAL SPECIFICATIONS — XF TRANSMISSION (cont.)

Signaling and Control
Signaling in/out: D-sub 15-pin, male; preview, green tally (call), dry contact; yellow tally (iso), dry contact; red tally (on air), dry contact; remote audio level control (22-64 dB), DC
Auxiliary in/out: D-sub 9-pin, female; private data in/out; 100 kb TTL (RS-232)
Control data: RJ-45 connector for C21P (camera control)

Audio
2-ch. audio: Audio out, XLR-3 2x; 0/+6 dB, max. 18 dBu, 600Ω; gain max. 70 dB
Frequency response: 40 Hz to 15 kHz, (+0/-3 dB, 1 kHz, -10 dB output level)
Distortion: Less than 0.5% (100 Hz/1 kHz, +6 dB out, 600Ω) S/N ratio: 58 dB (unweighted RMS)
AES-EBU 1+2: BNC 75Ω, Dig audio output Audio 1 and 2
AES-EBU 3+4: BNC 75Ω, Dig audio output Audio 3 and 4
Intercom in/out (2/4-wire intercom): D-sub 15-pin, female (program in, production in/out, engineering in/out, in: 0 or 6 dBu; out: 0 or 6 dBu (±2 dB, max. 12 dBu)
Frequency response: 150 Hz to 6 kHz (1 kHz, -10 dB output level)
Distortion: Less than 2% (1 kHz, +12 dBu level)

XF Universe Adapter
Power requirements: Hybrid fiber powered or 12 VDC (local)
Operating temperatures: -20 to +45°C (-4 to +113°F)
Storage temperatures: -25 to +70°C (-13 to +158°F)
Weight (approx.): 2.1 kg (4.6 lbs.)
Dimensions (L x W x H): 222.1 x 132.7 x 212.1 mm (8.7 x 5.2 x 8.4 in.)
Fiber connector: Swivel hybrid fiber connector SMPTE ST 304 Lemo
Cable length: 3,000 m (10,000 ft.) max. using SMPTE ST 311 hybrid fiber cable
Analog VF output or AES/EBU audio input: BNC connector 1.0 Vp-p; 75Ω
VF output or main output: BNC connector 1.0 Vp-p; 75Ω
Reference input: BNC connector 0.6 Vp-p; 75Ω HD tri-level reference signal
EXT video output connector: BNC connector 1.0 Vp-p; 75Ω
Teleprompter output or analog ref input: BNC connector 1.0 Vp-p; 75Ω
Auxiliary: 20-pin data connector with Tracker intercom, remote control lines and studio signaling
Rear microphone inputs: 2x XLR-3, balanced, +48V phantom power
Intercom: XLR-5 with 3 channels (engineering, production and program)
DC power input: 12V/7A max. (11 to 17V), XLR-4 male
Script light power output: 12V (100 mA), 4-pin Hirose
DC power output: 12V/4A, XLR-4 female

Dimensions for all XCU UXF models
**LDX C92 Compact Camera Head**

**General**
- Power: Approx. 30W (typical, depends on operational mode)
- Temperature range: -20° to +45°C (-4° to 113°F) (operating)
- Water protection: Compliant to IPX0
- Weight: approx. 2.5 kg (5.1 lbs.)
- Dimensions (approx.):
  - Width: 113 mm (4.45 in.)
  - Depth: 156 mm (6.14 in.)
  - Height: 140 mm (5.51 in.)

**Camera**
- Pick-up device: 3 x 2/3" Xensium-FT CMOS
- Picture elements:
  - Total: 2112x1124
  - In image: 1920x1080
- Smear: no vertical smear
- Shutter: no mechanical shutter
- Optical system: F1.4 prism
- Lens mount: 2/3" Bayonet type
- Optical filters on second wheel: clear, 4P-star, soft focus
- Electronic color correction: 3200°K, 5600°K, 7500°K
- Optical filter wheels: 2x motorized wheels
- Optical filters on first wheel: clear, 1/4 ND, 1/16 ND, 1/64 ND, 1/2 ND

**Video Modes**
- Standard: 1080i50/59.94, 720p50/59.94, 1080p50/59.94
- Optional: 1080p50F23.98/24/25/29.97, 1080i150/179.82, 720p150/179.82, 1080p150/179.82, 1080i300/359.64, 720p300/359.64
- Sensitivity at 2000 lux:
  - F12.0 (1080i50, 720p50 and 1080p50)
  - F11.0 (1080i50.94, 720p59.94 and 1080p59.94)
  - F16.0 (1080pF29.97)
  - F6.9 (1080i150, 720p150, 1080p150)
  - F6.3 (1080i79.82, 720p79.82, 1080p79.82)
  - F4.9 (1080i300, 720p300)
  - F4.5 (1080i359.64, 720p359.64)
- S/N ratio: 62 dB typical
- Aspect ratio: 16:9

**Connectivity**
- Lens iris connector: 12-pin female Hirose (front)
- Lens zoom/focus connector: 12-pin male Hirose (front)
- USB: GV-eLicense, scene files, service
- HDMI: viewing
- Ethernet RJ-45: C2IP camera control
- Tally control/RS-232/RS-422/Private data:
  - D-connector – 15-pin
  - 4x HD/3G SDI outputs: BNC 0.8 Vp-p, 75Ω, SMPTE ST 292, 424/425
  - HD-SDI monitoring video output: BNC 0.8 Vp-p, 75Ω, SMPTE ST 292, 424/425
- Genlock input: BNC CVBS/BB/ri-level
- Power input: XLR-4 male (10.5-17 VDC)

**Control Buttons and LED Indications**
- PickMe
- Menu control: menu select, rotary control
- Color bar button
- Info button
- Filter wheel selection
- Standard file recall
- 2 user assignable buttons
- 2 digit display: Power on, camera number
- Tally LEDs: On Air; ISO; Call

**Video Modes**
- Standard: 1080i50/59.94, 720p50/59.94, 1080p50/59.94
- Optional: 1080pF23.98/24/25/29.97, 1080i150/179.82, 720p150/179.82, 1080p150/179.82, 1080i300/359.64, 720p300/359.64
- Sensitivity at 2000 lux:
  - F12.0 (1080i50, 720p50 and 1080p50)
  - F11.0 (1080i50.94, 720p59.94 and 1080p59.94)
  - F16.0 (1080pF29.97)
  - F6.9 (1080i150, 720p150, 1080p150)
  - F6.3 (1080i79.82, 720p79.82, 1080p79.82)
  - F4.9 (1080i300, 720p300)
  - F4.5 (1080i359.64, 720p359.64)
- S/N ratio: 62 dB typical
- Aspect ratio: 16:9
- Modulation depth: 60% (typical) at 800 TV lines (27 MHz) in 1080i50/59.94 & 720p50/59.94 modes
- Digital resolution: Floating point A/D conversion with 16-bit performance and with 34-bit processing in RGB
- Horizontal resolution: >1,000 TV lines
- Gain selection: -6 dB to +18 dB in 3 dB steps (user-definable presets) or continuous master gain

**Connectivity**
- Lens iris connector: 12-pin female Hirose (front)
- Lens zoom/focus connector: 12-pin male Hirose (front)
- USB: GV-eLicense, scene files, service
- HDMI: viewing
- Ethernet RJ-45: C2IP camera control
- Tally control/RS-232/RS-422/Private data:
  - D-connector – 15-pin
  - 4x HD/3G SDI outputs: BNC 0.8 Vp-p, 75Ω, SMPTE ST 292, 424/425
  - HD-SDI monitoring video output: BNC 0.8 Vp-p, 75Ω, SMPTE ST 292, 424/425
- Genlock input: BNC CVBS/BB/ri-level
- Power input: XLR-4 male (10.5-17 VDC)

**Control Buttons and LED Indications**
- PickMe
- Menu control: menu select, rotary control
- Color bar button
- Info button
- Filter wheel selection
- Standard file recall
- 2 user assignable buttons
- 2 digit display: Power on, camera number
- Tally LEDs: On Air; ISO; Call

**Technical Specifications — LDX C90 Series Compact Camera Heads**
### LDX C90 Compact Camera Head

**General**
- **Power:** Approx. 45W (typical, depends on operational mode)
- **Temperature range:** -20° to +45°C (-4° to 113°F) (operating)
- **Water protection:** Compliant to IPX0
- **Weight:** approx. 2.5 kg (5.1 lbs.)
- **Dimensions (approx.):**
  - Width: 113 mm (4.45 in.)
  - Depth: 156 mm (6.14 in.)
  - Height: 140 mm (5.51 in.)

**Camera**
- **Pick-up device:** 3 x 2/3" Xensium\textsuperscript{Hawk} CMOS imagers with DPM\textsuperscript{Ultra}
- **Picture elements:**
  - Total: 4224x2248
  - In image: 3840x2160
- **Smear:** no vertical smear
- **Shutter:** no mechanical shutter
- **Optical system:** F1.4 prism
- **Lens mount:** 2/3" Bayonet type
- **Optical filter wheels:** 2x motorized wheels
  - Optical filters on first wheel: clear, 1/4 ND, 1/16 ND, 1/64 ND
  - Optical filters on second wheel: clear, 4P-star, 5μ OLPF, cap-filter
- **Electronic color correction:** 3200°K, 5600°K, 7500°K, FL, 2 AWB presets, Var, continuous auto white

### Video Modes
- **Standard:** 1080i50/59.94, 720p50/59.94, 1080p50/59.94
- **Optional:** 1080PsF23.98/24/25\textsubscript{9.7}, 1080i150/179.82, 720p150/179.82, 1080p300/359.64, 720p300/359.64, 3840x2160p50/59.94

**Sensitivity at 2000 lux:**
- F10.0 (1080i50, 720p50 & 1080p50)
- F9.0 (1080i59.94, 720p59.94 & 1080p59.94)
- F6.0 (1080i150, 720p150 & 1080p150)
- F5.2 (1080i179.82, 720p179.82 & 1080p179.82)
- F4.3 (1080i300 & 720p300)
- F3.7 (1080i359.64 & 720p359.64)
- F1.4 (1080PsF23.98/24/25)
- F13.0 (1080PsF29.97)
- F10.0 to 5.0 (3840x2160p50)*
- F9.0 to 4.5 (3840x2160p59.94)*

**S/N ratio:** 60 dB typical

**Aspect ratio:** 16:9

**Modulation depth:** 60% (typical) at 800 TV lines (27 MHz) in 1080i50/59.94 & 720p50/59.94 modes

**Digital resolution:** Floating point A/D conversion with 16-bit performance and with 34-bit processing in RGB

**Horizontal resolution:** >1,000 TV lines

**Gain selection:** -6 dB to +12 dB in 3 dB steps (user-definable presets) or continuous master gain

* Specifications depend on the selected sensitivity mode

### Connectivity
- **Lens iris connector:** 12-pin female Hirose (front)
- **Lens zoom/focus connector:** 12-pin male Hirose (front)
- **USB:** GV-eLicense, scene files, service
- **HDMI:** viewing
- **Ethernet RJ-45:** C2IP camera control
- **Tally control/RS-232/RS-422/Private data:** DC-connector – 15-pin
  - 4x HD/3G SDI outputs: BNC 0.8 Vp-p, 75Ω, SMPTE ST 292, 424/425
  - 4K operation they carry 4x 2SI 3G HD-SDI
  - High-speed operation they carry 3x phases of HD/3G SDI and 1x HD/3G SDI for combined live output
- **HD-SDI monitoring video output:** BNC 0.8 Vp-p, 75Ω, SMPTE ST 292, 424/425
- **Genlock input:** BNC CVBS/BB/tri-level
- **Power input:** XLR-4 male (10.5–17 VDC)

### Control Buttons and LED Indications

**PickMe**
- **Menu control:** menu select, rotary control
- **Color bar button**
- **Info button**
- **Filter wheel selection**
- **Standard file recall**
- **2 user assignable buttons**
- **2 digit display:** Power on, camera number
- **Tally LEDs:** On Air; ISO; Call

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