

LDX 90 & LDX C90 Series

December 2021



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.



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

Model			LDX 92 & LDX C92	LDX 96 & LDX C96	LDX 98 & LDX C98	Options			
Requirement	Details	Shutter				Item Number	Commercial Reference	Points	
720p	50, 59.94	Global	✓	✓	✓				
1080i	50, 59.94		✓	✓	✓				
1080PsF	23.98, 24, 24, 29.97		○	○	○	9-0210000120-9	Opt-PsF-LDX 90 Series	1	
1080p	50, 59.94		○	✓	✓	9-0210000121-9	Opt-3G-4-LDX 92	2	
3X Speed	720p, 1080i, 1080p		✗	○	○	9-0210000123-9	Opt-3X-4-LDX 90 Series	4	Sports Bundle 7
6X Speed	720p, 1080i, 1080p		✗	○ ^{*1}	○ ^{*1}	9-0210000124-9	Opt-6X-4-LDX 90 Series	6	
4K UHD	Upconverted		○ ^{*2}	○ ^{*2}	✗	9-0210000125-9	Opt-UHD-4-LDX 90 Series	4	
4K UHD	Native	Rolling	✗	✗	○				
HDR	PQ, HGL, S-Log3	–	○	✓	✓	9-0210000122-9	Opt-HDR-4-LDX 92	1	
WCG	BT.2020	–	✓	✓	✓				

✓ Standard ○ Optional ✗ Not supported

*1 Compact cameras support 6x speed in 720p and 1080i

*2 Compact cameras don't support 4K/UHD upconversion

Key Features

- *À la carte* software options from a secure web portal
- Native HDR in HLG, PQ and S-Log3
- Wide Color Gamut supporting the ITU-R BT.2020 standard
- DirectIP complete transmission protocol over IP networks
- 3X speed camera with an upgrade path to 6X super slow-motion
- 1X standard-speed live output in addition to the high-speed output
- 4K camera system via software options
- Highest sensitivity and image performance across all of the different acquisition speeds
- AnyLightXtreme flicker reduction system
- Extensive (analog/digital) audio connectivity with embedded audio
- Unique cradle connectivity to support dockable XCU (eXchangeable Control Unit)
- XCU cradle stores settings in built-in memory
- Full integration with LDX 80, 82, 86 series cameras allows use of the same camera accessories and control system, including full support with the C2IP for the best possible integration into external control systems

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.

Easily recognized and managed by network orchestration software, DirectIP is an ideal solution for the most demanding remote camera applications. By connecting the cameras and the XCUs through COTS switches with 10 GbE ports to a high-bandwidth IP network, any camera can be assigned to any XCU via the GV Connect Gateway. In this way, one central command/control center can be used to manage several different production facilities. When a production is finished, the cameras and the XCUs can easily be re-routed for the next production. This saves production costs as control room staff do not have to be on location while still maintaining a high-quality production.



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.



TECHNICAL SPECIFICATIONS — LDX 90 SERIES CAMERA HEADS

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

Video Modes

Standard: 1080i50/59.94, 720p50/59.94

Optional: 1080PsF23.98/24/25/29.97, 1080p50/59.94, 3840x2160p50/59.94

Sensitivity at 2000 lux:

F12.0 (1080i50, 720p50 and 1080p50)

F11.0 (1080i59.94, 720p59.94 and 1080p59.94)

F18.0 (1080PsF25)

F16.0 (1080PsF29.97)

F12 (3840x2160p50)

F11 (3840x2160p59.94)

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)

F11 (3840x2160p59.94)

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)

TECHNICAL SPECIFICATIONS — LDX 90 SERIES CAMERA HEADS (cont.)

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 Xensium^{HAWK} CMOS imagers with DPM^{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: 1080PsF23.98/24/25/29.97, 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:

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 & 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

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

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

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

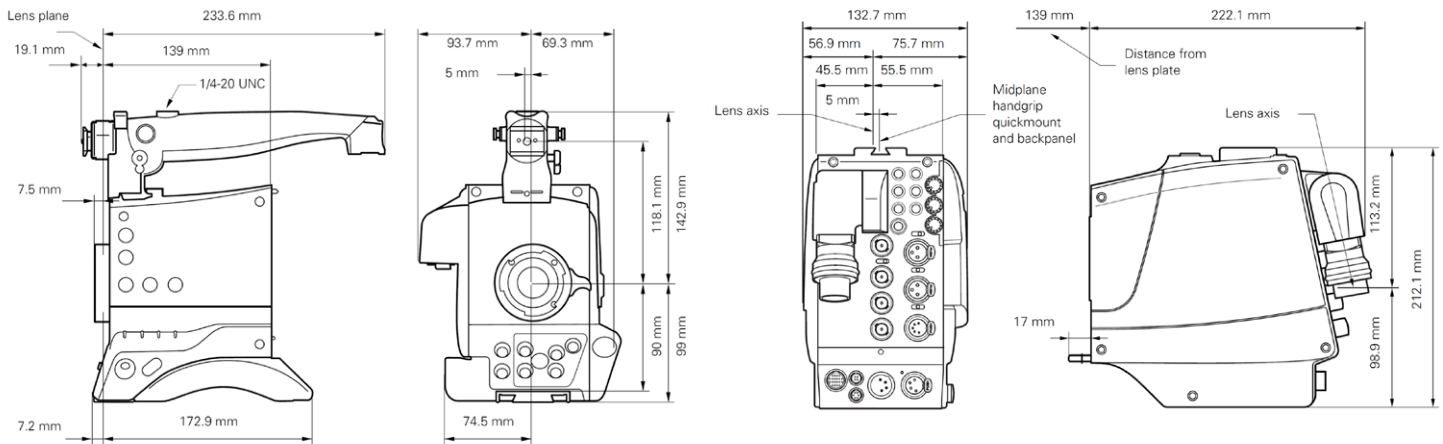
Accessories

2" LCD viewfinder

7" LCD viewfinder (economic)

7" LCD viewfinder (native HD)

* Specifications depend on the selected sensitivity mode



TECHNICAL SPECIFICATIONS — 3G TRANSMISSION

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

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 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

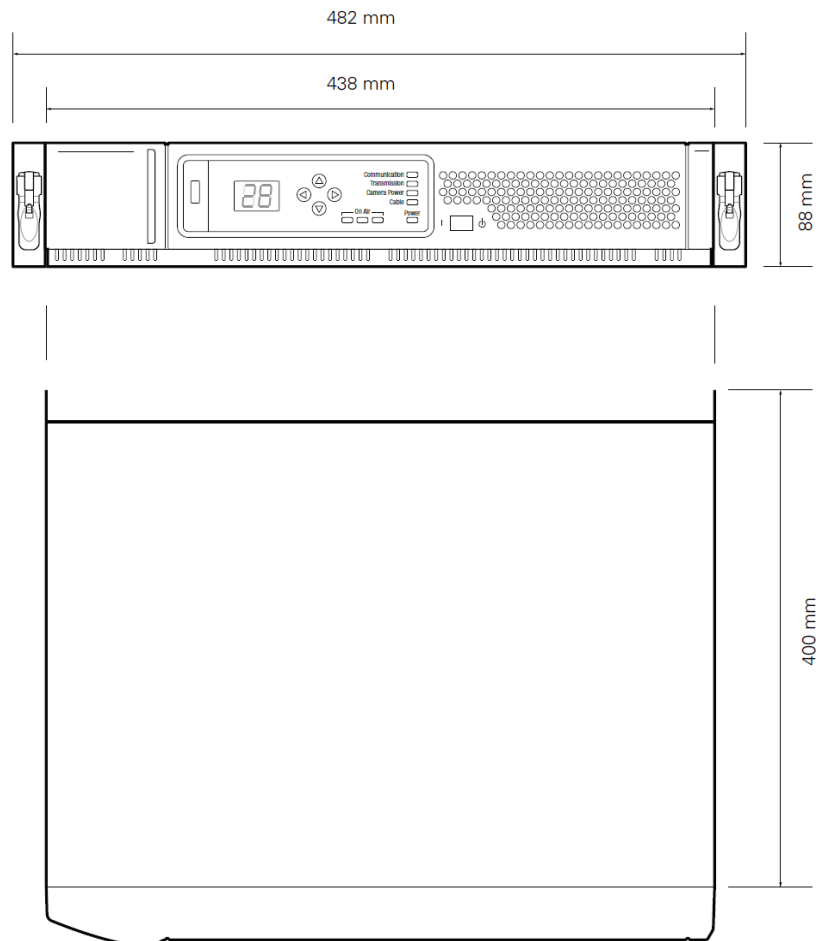
AES-EBU 3+4: BNC 75Ω, Dig audio output Audio 3 and 4

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)

Dimensions for all 3G XCUs and XCU XF



TECHNICAL SPECIFICATIONS — 3G TRANSMISSION (cont.)

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.

Connectors (4K mode)

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

4K UHD: 2x / 3G HD-SDI: 4x, BNC 0.8 Vp-p, 75Ω Quad or 2SI, Level-A

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

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)

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)

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 1.0 Vp-p, 75Ω (CVBS text with video, for viewing purposes)

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)

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, 1080i)
- 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, 1080i, 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

	XCU Universe XF	XCU Enterprise UXF	XCU Universe UXF
Full baseband connectivity	✓	✓	✓
Full IP connectivity	✗	✓	✓
12G SDI support (optional)	✗	✓	✓
HD/3G/4K UHD support in single speed	✓	✓	✓
High-speed support	3x HD, 6x HD, 3x 3G	✓	✓
	6x 3G	✗	✓
Direct IP support	✓	✓	✓
HDR support	In single speed	✓	✓
	In high speed	✗	✓
Simultaneous outputs in: 4K HDR, 3G/HD HDR, 3G/HD SDR	✗	✓	✓
LDX 100 support	✗	✗	✓
Delivered with cradle	✓	✗	✗
Delivered with UXF cradle with 4x SFP+ slots	✗	✓	✓

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 C2IP (camera control)

Audio

2-ch. audio: Audio out, XLR-3 2x ; 0/+6 dBu (± 1.5 dB, max. 18 dBu, 600 Ω , gain max. 70 dB)

Frequency response: 40 Hz to 15 Hz, (+1/-3 dB, 1 kHz, -10 dBu output level)

Distortion: Less than 0.5% (100 Hz/1 kHz, +6 dBu out, 600 Ω) S/N ratio: 58 dB (unweighted RMS)

AES-EBU 1+2: BNC 75 Ω , Dig audio output Audio 1 and 2

AES-EBU 3+4: BNC 75 Ω , 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)

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; 75 Ω

VF output or main output: BNC connector 1.0 Vp-p; 75 Ω

Reference input: BNC connector 0.6 Vp-p; 75 Ω HD tri-level reference signal

EXT video output connector: BNC connector 1.0 Vp-p; 75 Ω

Teleprompter output or analog ref input: BNC connector 1.0 Vp-p; 75 Ω

Auxiliary: 20-pin data connector with Tracker intercom, remote control lines and studio signaling

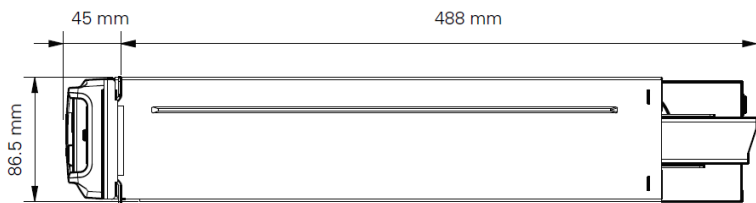
Rear microphone inputs: 2x XLR-3, balanced, +48V phantom power

Intercom: XLR-5 with 3 channels (engineering, production and program)

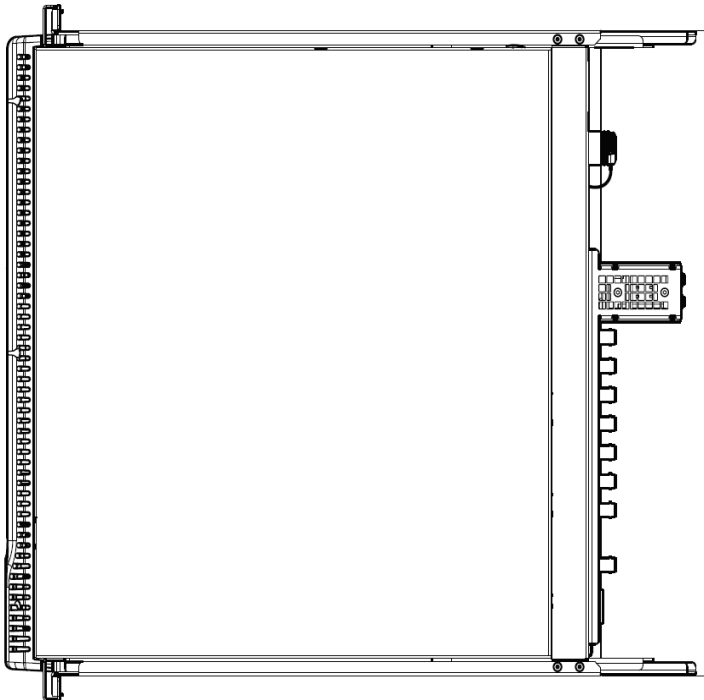
DC power input: 12V/7A max. (11 to 17V), XLR-4 male

Script light power output: 12V (100 mA), 4-pin Hirose

DC power output: 12V/4A, XLR-4 female



Dimensions for all XCU UXF models



TECHNICAL SPECIFICATIONS — LDX C90 SERIES COMPACT CAMERA HEADS

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 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

Video Modes

Standard: 1080i50/59.94 & 720p50/59.94

Optional: 1080p50/59.94, 1080PsF23.98/24/25/29.97

Sensitivity at 2000 lux:

F12.0 (1080i50, 720p50 and 1080p50)

F11.0 (1080i59.94, 720p59.94 and 1080p59.94)

F18.0 (1080PsF23.98/24/25)

F16.0 (1080PsF29.97)

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/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

LDX C96 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-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 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

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

Sensitivity at 2000 lux:

F12.0 (1080i50, 720p50 and 1080p50)

F11.0 (1080i59.94, 720p59.94 and 1080p59.94)

F18.0 (1080PsF23.98/24/25)

F16.0 (1080PsF29.97)

F6.9 (1080i150, 720p150, 1080p150)

F6.3 (1080i179.82, 720p179.82, 1080p179.82)

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/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

TECHNICAL SPECIFICATIONS — LDX C90 SERIES COMPACT CAMERA HEADS (cont.)

LDX C98 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^{HAWK} CMOS imagers with DPM^{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: 1080PsF23.98/24/25/29.97, 1080i150/179.82, 720p150/179.82, 1080p150/179.82, 1080i 300/359.64, 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)

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

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: D-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

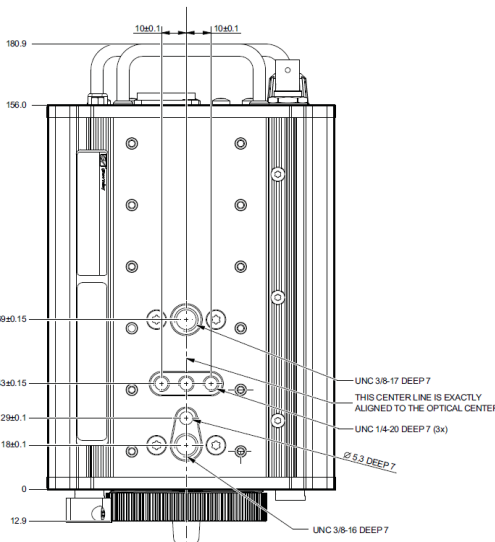
Filter wheel selection

Standard file recall

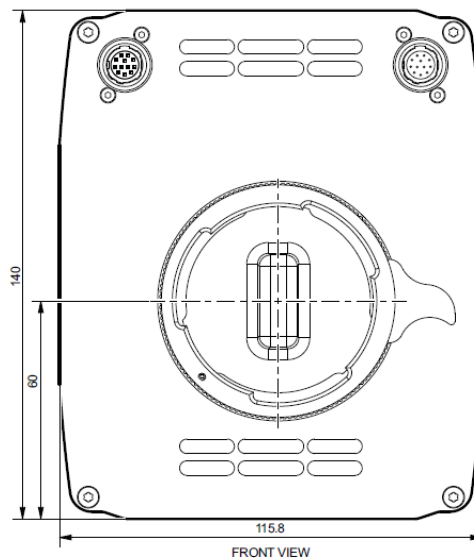
2 user assignable buttons

2 digit display: Power on, camera number

Tally LEDs: On Air; ISO; Call



Compact Camera Mounting Points



FRONT VIEW



This product may be protected by one or more patents. For further information, please visit: www.grassvalley.com/patents

DS-PUB-3-1021D-EN

Grass Valley®, GV® and the Grass Valley logo are trademarks or registered trademarks of Grass Valley USA, LLC, or its affiliated companies in the United States and other jurisdictions. Grass Valley products listed above are trademarks or registered trademarks of Grass Valley USA, LLC or its affiliated companies, and other parties may also have trademark rights in other terms used herein. Copyright © 2022-2023 Grass Valley Canada. All rights reserved. Specifications subject to change without notice.

www.grassvalley.com Join the Conversation at GrassValleyLive on [Facebook](#), [Twitter](#), [YouTube](#) and Grass Valley on [LinkedIn](#)