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Applications for the LDX Compact Series

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APPLICATION NOTE



The Grass Valley LDX Compact series of advanced imaging cameras is an extension to the revolutionary LDX Series of cameras — built for tight spaces, remote pan/tilt heads, Steadicam and POV applications — with superior imaging, processing and performance. LDX Compact is available in three different versions which offer different format support and feature sets optimized for different applications. All versions offer a new level of business flexibility with the introduction of the GV-eLicensing system providing an easy upgrade path from any lower model of the range into any higher model. LDX Compact provides the same image performance and all of the control features of the LDX Series of high-quality broadcast system cameras in a smaller mechanical package. This implementation produces the same high level of image acquisition quality in areas and from angles that can be very space constrained.

Overview

The LDX Compact Series is a subset of the LDX Series of system cameras designed with a smaller footprint to provide the same outstanding feature set and performance level. The LDX Compact series shares the same basic hardware platform as the other cameras in the LDX Series, but it is built into a more compact and fully self-contained package for specialized applications.

Implementation

In addition to establishing a new standard for compact image acquisition, the design of the LDX Compact series focuses strongly on the specific requirements for cameras with a smaller form factor. They have been developed to offer a perfect companion to LDX Series system cameras for all applications where a more compact form factor offers a cost/efficiency advantage for users, or where they are needed for artistic reasons.

These applications include cameras on robotic heads in studios, for fixed mounted camera positions, cameras on Steadicam systems, camera cranes, 3D rigs, remote heads, on camera rail systems, as Spidercams, and in combination with gyroscopic stabilizing systems. All of the typical interfaces which are required are available directly on the camera head. Additionally, LDX Compact series offers several new interfaces which include a USB connection for the management of GV-eLicenses, firmware upgrades and scene file storage. The camera also offers an HDMI interface for connecting to HD displays to be used as a camera viewfinder or monitoring display.

Benefits

The camera heads of the LDX Compact series are available in three different versions which offer a different level of format support and a feature set optimized for different applications. The entire range of LDX Series cameras uses the new Grass Valley Xensium-FT imagers which offer an exceptional level of image performance — especially in all progressive video formats. This makes the LDX Series of cameras a forward thinking solution that protects initial capital investment.

The LDX Compact series offers the flexibility to adjust capital expenses and operating expenses to match a variety of business goals and factors. But LDX Compact is about more than just pretty pictures!

LDX Compact is built to face the realities of live production and broadcast — today and tomorrow — with the unique LDX Series GV-eLicense program. Now users have the ultimate flexibility in format sup-

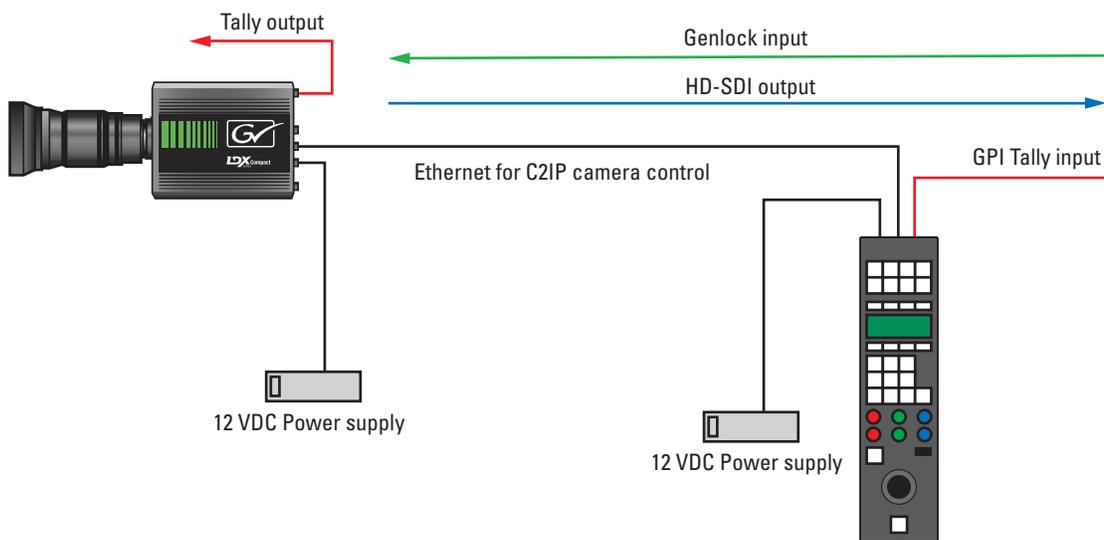
port and feature set availability. With GV-eLicense, LDX Series users have the choice of upgrading their cameras in two different ways. A perpetual upgrade license provides an upgrade from any lower model of the range to the next higher model of the range. With a 7-day term upgrade license, the same flexibility is available, but for a lower cost. Multiple licenses may be purchased to upgrade cameras by more than one level (e.g., LDX Compact Première to LDX Compact World-Cam) or to extend 7-day term upgrade licenses. An enhancement to the 7-day term license is the B.O.W.L. licensing option (simply, a bunch of weekly licenses) where users can preorder any number of 7-day licenses and activate them whenever required — without the need to go through an order process.

Benefits (Cont.)

LDX Compact – In News Presentation Studios

In news presentation studios, cameras on robotic heads can be found quite often. Up until now, those cameras have been system cameras with a triax or fiber transmission system. These configurations offer the advantage of a minimized number of cables between the camera head and the equipment room and permits using these cameras for other purposes as well.

On the other hand, the additional hardware needed for the signal transmission adds additional weight and cost to the camera system. However, in cases where cameras will be fixed mounted onto a compact and cost-efficient remote head, LDX Compact cameras offer a very good alternative to LDX Series system cameras. All the signal I/Os needed for these applications can be found directly on the rear of the LDX Compact camera, including HD-SDI video out, genlock input, 12 VDC power input, Ethernet or RS-232/RS-422 for control, remote menu control and a tally output. For controlling the tally, the Grass Valley OCP 400 camera control panel is one of the smallest available and offers a GPI input for the tally on/off input, the tally signal can then be extracted from a multi-pin connector on the rear of the camera head. Many commercially available external tally lights can be adapted to this output to offer a complete and cost-effective solution with the highest possible image quality for all the typical applications in news environments.



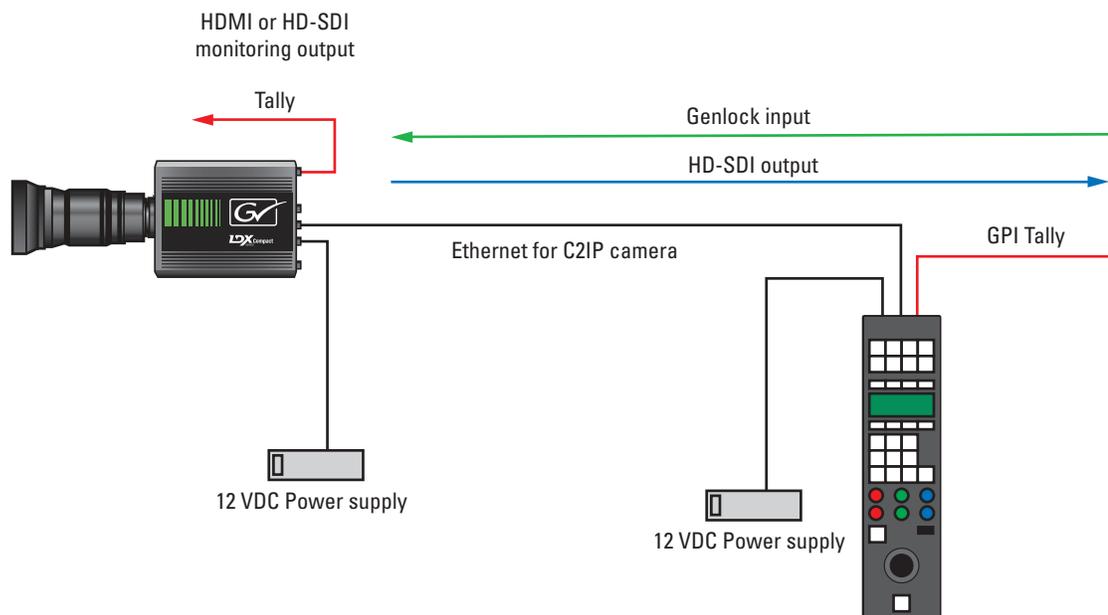
Benefits (Cont.)

LDX Compact – In remote camera applications, on sliding rail systems, or on camera cranes

Most of what is valid for the previously described application in news presentation studios is also valid for applications where the cameras need to be mounted on compact remote heads, on sliding rails, or for crane mounted applications. One additional feature required for all applications where the camera images need be seen at the camera position is the availability of a viewfinder/monitoring output. To satisfy this requirement, there are two different outputs available which include all the specific viewfinder information such as safe area, menu text information and more.



One output uses HDMI as a permanent monitoring output and the second one uses HD-SDI as the interface. This HD-SDI output can be reconfigured to act as a second camera output when such a function is needed.

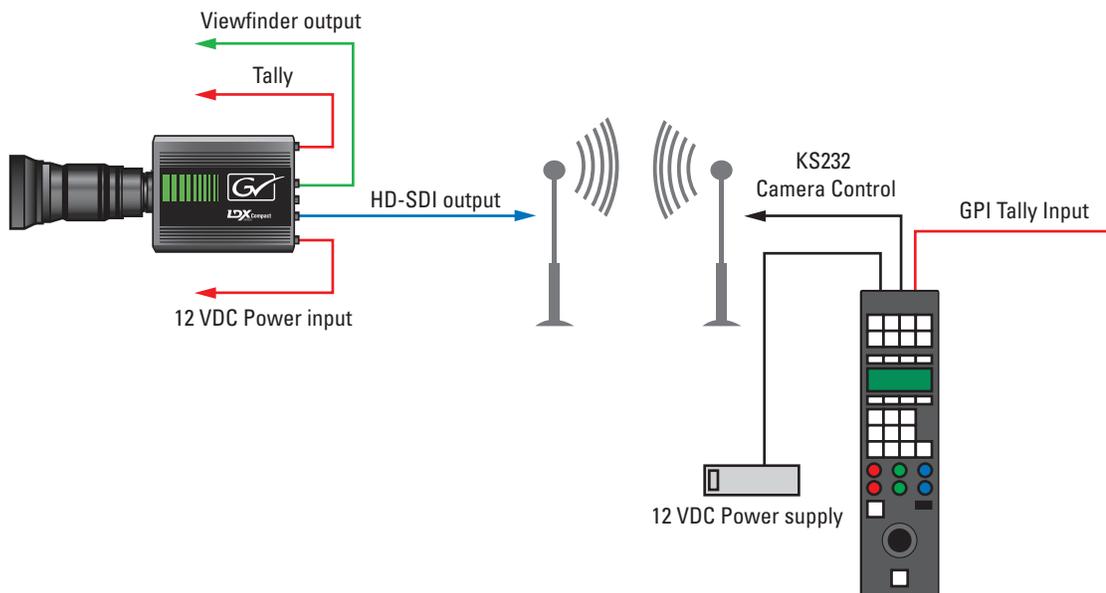


Benefits (Cont.)

LDX Compact – With wireless signal transmission on Steadicam systems

For applications with Steadicam systems or similar camera stabilization systems, the lowest possible weight of the camera in combination with high image performance is required. This is especially true for applications where a universal wireless signal transmission system is used — a compact camera system typically offers a much better solution when compared to a portable system camera. In these particular applications, items such as the shoulder pad, the camera hand grip and the tripod adapter plate — which are included or needed with a portable system camera head — increases the weight and reduces the mechanical stability of the system without adding any benefit for the application.

Up until now, compact camera systems often did not offer the level of performance, the feature set and the flexible format support required for demanding applications, but with the LDX Compact series exactly the same level of performance as found on the LDX Series system cameras can be expected. All the signal I/Os needed for various applications can be found directly on the rear of the LDX Compact camera, including HD-SDI video out, HDMI or HD-SDI VF outputs, 12 VDC power input, Ethernet for control and a tally output. For controlling the tally, the Grass Valley OCP 400 camera control panel is one of the smallest available and offers a GPI input for the tally on/off input, the tally signal can then be extracted from a multi-pin connector on the rear of the camera head. The combination of the LDX Compact with a universal HD wireless transmission system offers a lightweight and cost-efficient solution with the highest possible image quality for many typical Steadicam applications.



Benefits (Cont.)

LDX Compact – For 3D applications

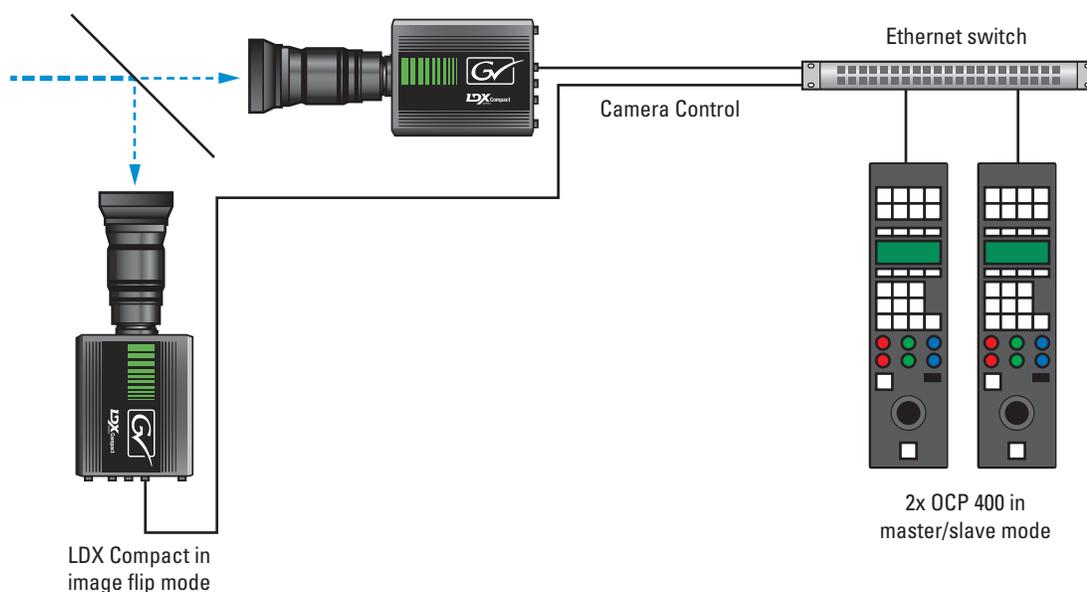
For 3D applications, compact cameras with the lowest possible weight in combination with highest image performance are required. In combination with mirror rigs, which are mostly used for portable configurations, high sensitivity is required since the half-transparent mirror will divide the incoming light to both cameras. At the same time, the mirror will apply an image flip to the camera which receives the reflected light from the front of the half transparent mirror.

The Grass Valley Xensium-FT imagers used in the LDX Compact cameras provides the unique ability to read out the image from the imager in different directions. Therefore, compensation of the image flip which is caused by the mirror can be done inside the camera without any additional signal latency as is experienced with all CCD cameras where the image flip needs to be done in the camera signal processor or an external processing unit.

One additional specific requirement for these applications is the possibility to control two cameras together at the same time but still offer the possibility to compensate for some differences between the cameras. For that reason the Grass Valley OCP 400 camera control panel can be set into a multicamera (master/slave) mode where one of the OCPs (the master) controls both cameras at the same time, and the other OCP (the slave) only adjusts the differences of the second camera.

Typically, the rolling shutter effect that is inherent in all CMOS cameras — except the LDX Series — is magnified when using a 3D mirror rig. This is because the two cameras will “see” the image in a different direction and will generate a skewing in the opposite direction. This means the skewing effect gets doubled in size when compared to a single camera shoot. The LDX Series camera with its Xensium-FT imagers are the first CMOS-based cameras which offer a global shutter behavior similar to CCD cameras, but with much better image performance in terms of sensitivity and signal-to-noise performance — especially in the progressive video formats used in many 3D shoots.

All of these features make the LDX Compact camera an outstanding choice for all demanding 3D applications.



LDX Compact Series

	LDX <small>COMPACT</small> Première can be upgraded to LDX Compact Elite*	LDX <small>COMPACT</small> Elite can be upgraded to LDX Compact WorldCam	LDX <small>COMPACT</small> WorldCam
Imager	Next-generation Xensium-FT		
Sensitivity @ 2000 lux	F12 typical (all 50 Hz modes) / F11 typical (all 59.94 Hz modes)		
S/N ratio	60 dB (typical)		
Increased sensitivity	✓	✓	✓
Improved digital noise reduction	✓	✓	✓
TrueTexture: texture is preserved throughout all processing parameters	✓	✓	✓
Switchable video formats: 1080i50/59.94 and 720p50/59.94	✓		
Switchable video formats: 1080PsF23.98/24/25/29.97 (artistic), 1080i50/59.94, 720p50/59.94		✓	
Switchable video formats: 1080p50/59.94 (3G), 1080PsF23.98/24/25/29.97 (artistic), 1080i50/59.94, 720p50/59.94			✓
Effortless 1080p50/59.94 acquisition with no increased lighting requirement			✓
Optional RGB 4:4:4 1080i outputs		✓	✓
Suitability for 3D productions	✓	✓	✓
ArtTouch: smart coupling of video control functions	✓	✓	✓
Perfect picture matching across the complete LDX Series as well as the LDK installed base	✓	✓	✓
Camera head with easy access to control buttons, including the new PickMe button	✓	✓	✓
CLASS: advanced electronic lens error correction	✓	✓	✓
Standard secondary color corrector (two-color)	✓		
Advanced secondary color corrector (up to six sets for color hue, saturation and luminance adjustment)		✓	✓
Compatible with C2IP control systems	✓	✓	✓
Second motorized optical filter wheel with 4P-star and soft focus	✓	✓	✓
Dynamic aperture correction	✓	✓	✓
Dynamic contour equalizer	✓	✓	✓
Power curve gamma control		✓	✓
Depth of field indicator		✓	✓

*Multiple licenses may be purchased to upgrade more than one level (e.g., LDX Compact Première to LDX Compact WorldCam), on a perpetual or 7-day term basis. The B.O.W.L. (bunch of weekly licenses) licensing option allows users to preorder any number of 7-day licenses and activate them as needed.

LDX Compact Series Specifications

General

Power: approx. 30W

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: 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

LDX Compact Première switchable formats: 1080i50/59.94 & 720p50/59.94

LDX Compact Elite switchable formats: 1080PsF23.98/24/25/29.97, 1080i50/59.94 & 720p50/59.94

LDX Compact WorldCam switchable formats: 1080p50/59.94, 1080PsF23.98/24/25/29.97, 1080i50/59.94 & 720p50/59.94

Sensitivity at 2000 lux:

- F12 (1080i50, 720p50 and 1080p50)
- F11 (1080i59.94, 720p59.94 and 1080p59.94)
- F18 (1080PsF23.98/24/25)
- F16 (1080PsF29.97)

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

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

HD-SDI main output: BNC 0.8 Vp-p, 75Ω, SMPTE 292M, 424/425M

HD-SDI viewing output: BNC 0.8 Vp-p, 75Ω, SMPTE 292M, 424/425M

Genlock input: BNC CVBS/BB/tri-level

Power input: XLR-4 male (10.5-17 VDC)

Control Buttons and LED Indications

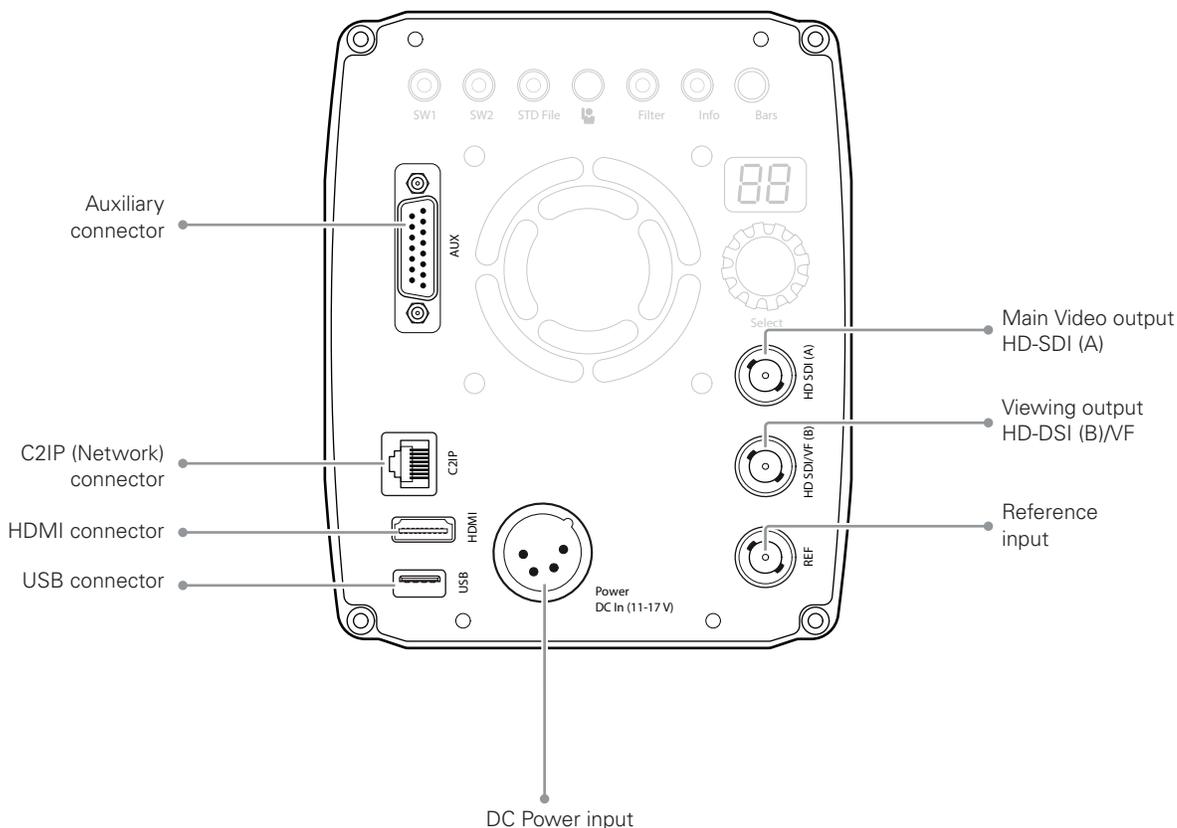
- PickMe
- Menu control: menu select, rotary control
- Color bar button
- Info button
- Filter wheel selection
- Standard file recall
- 2 user assignable buttons
- 2 digit display: Power on, camera number
- Tally LEDs: On Air; ISO; Call

Notes:

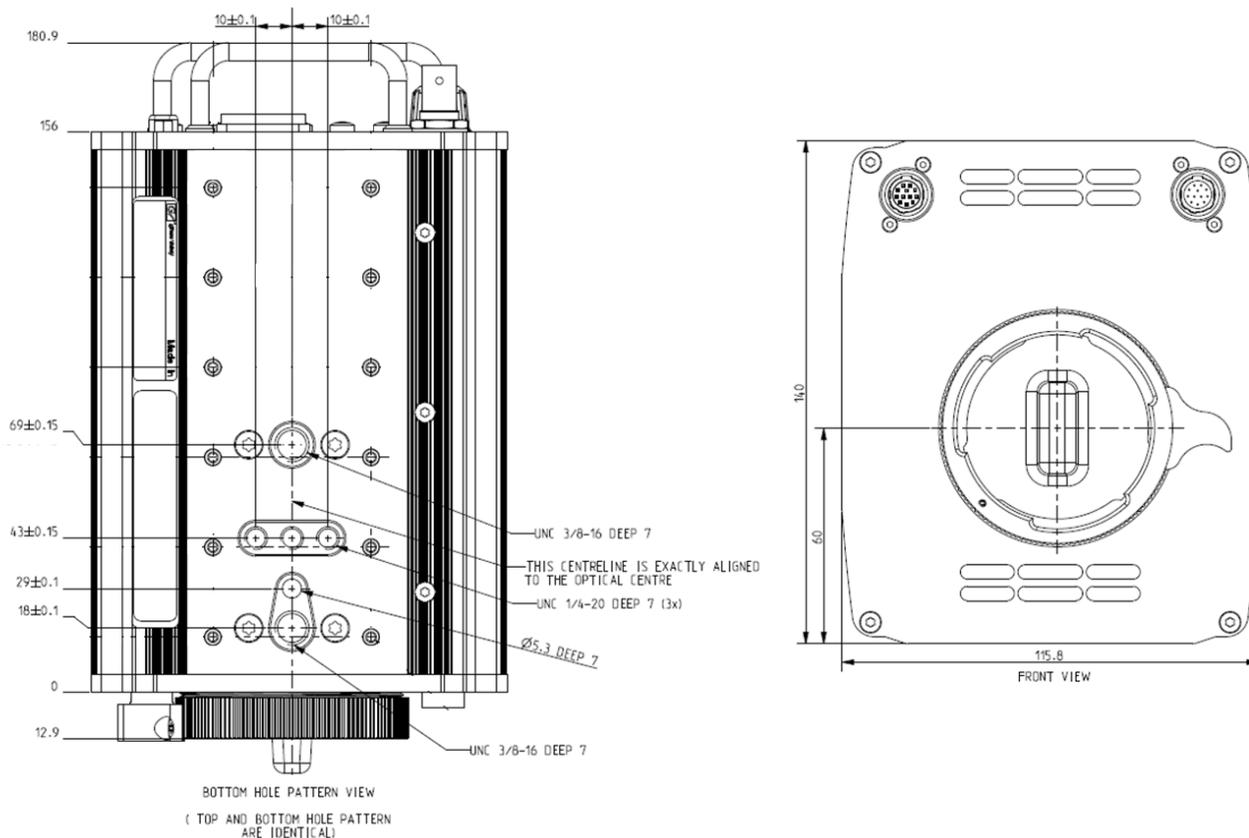
LDX Compact Première is upgradable to LDX Compact Elite.

Upgrades of more than one level may be achieved with multiple licenses.

LDX Compact Elite is upgradable to LDX Compact WorldCam.



LDX Compact Series Specifications



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