

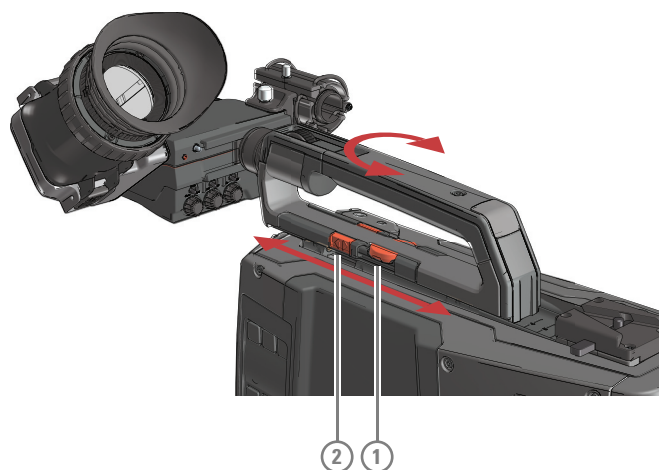
### Angular

Hold the viewfinder eyepiece with your hand and rotate it to the desired angle.

### Laterally

The viewfinder can be positioned backwards and forwards along the camera axis (lateral):

- Loosen the locking disc **(1)** by turning it counterclockwise using your thumb and index finger.
- Press both sides of the handgrip clip **(2)** using your thumb and index finger and with the lever pressed in, move the handgrip (with viewfinder) back or forth.
- When the desired position is reached release the clip. Note: the rail on the camera body has indents so make sure to place the handgrip is placed at a fixed position.
- Tighten the locking disc **(1)** by turning it clockwise.





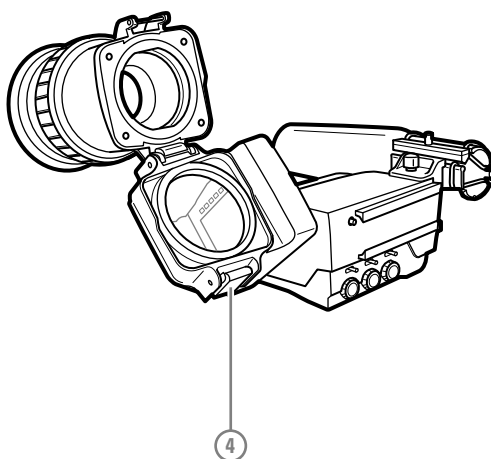
**Note**

Moving the handgrip also changes the weight balance of the camera. Make sure to balance the camera with the lens mounted and the cables attached.

## Distance viewing

The viewfinder display can also be viewed from a distance:

- Push down the bottom clip **(4)** below the eyepiece and swing it free of the associated clip. The eyepiece can also be swung downwards; push down the top clip to release the eyepiece and swing it downwards.



**Note**

Handle the eyepiece with care when folded back—its position is not secured.

## LDK 5301/10 Tripod adapter plate

To mount the camera on a tripod, the tripod plate must first be attached to the tripod. Follow the tripod manufacturer's instructions to mount the wedge plate supplied with the tripod and the tripod adapter plate firmly onto the tripod. Attach the camera to the tripod adapter plate as follows:

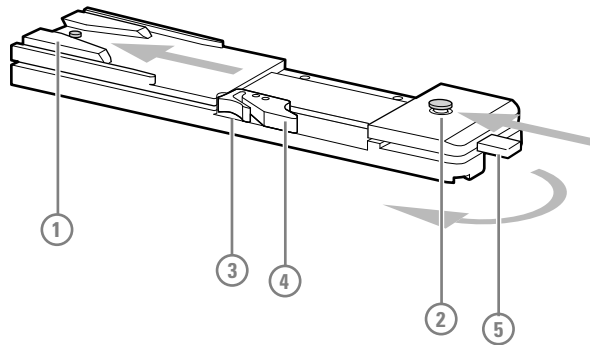
- Slide the camera horizontally along the tripod adapter plate from back to front ensuring that the front of the camera engages the V-slot (1) at the front of the tripod adapter plate, and that the slot on the bottom of the camera engages the stud (2) at the rear of the tripod adapter plate.
- Firmly push the camera forward until it clicks into place.
- When the camera is mounted firmly, the locking lever (5) swings around fully to the rear of the plate. If the lever does not travel the full distance, you should manually lock it into place.



**Caution**

Failure to attach the camera to the tripod adapter plate in the correct manner could result in an unsecured camera. Ensure that the rear stud (2) is engaged and that the camera clicks into place.

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Remove the camera from the tripod as follows:

- Open the locking lever (5) to free the rear stud (2).
- Press and hold the red locking lever (3) against the release handle (4).
- Ensure that you have a firm hold of the camera.
- Pull the release handle (4) forward.
- Move the camera backwards and up.

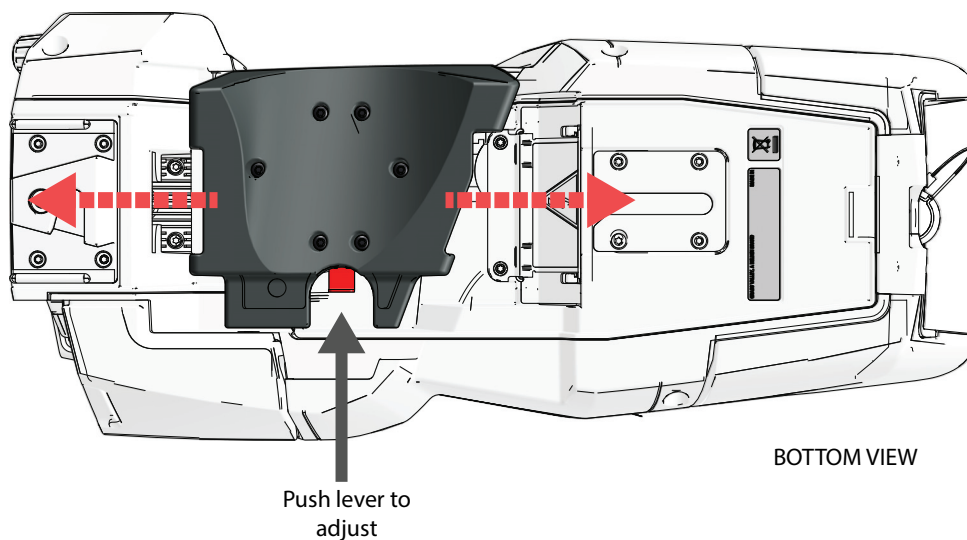
## Adjusting the shoulder pad

To change the position the shoulder pad press and hold the adjustment lever at the bottom left of the camera body, just behind the handgrip. The shoulder pad can now be moved backwards and forwards along the axis of the camera.



### Tip

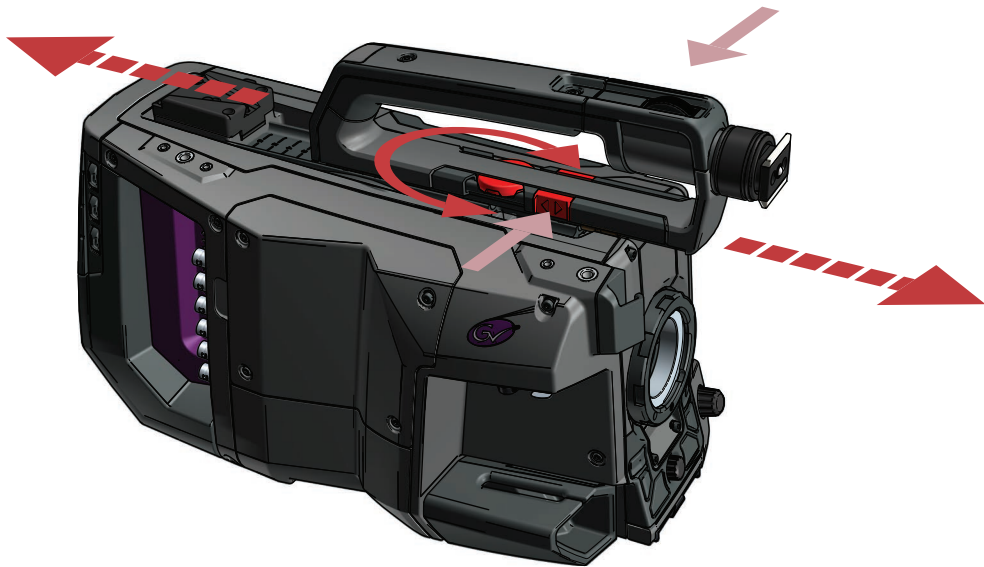
Adjust the shoulder pad after all other units (viewfinder, lens, cables) have been mounted to get the best balanced shoulder position.



## Adjusting the handgrip position

The handgrip position can be adjusted along the axis of the camera body.

- Loosen the locking disc by turning it counterclockwise using your thumb and index finger.
- Press both sides of the handgrip clip using your thumb and index finger and with the lever pressed in, move the handgrip back or forth.
- When the desired position is reached release the clip. Note: the rail on the camera body has indents so make sure to place the handgrip at a fixed position.
- Tighten the locking disc by turning it clockwise.



# 3 Configuration

## Camera system configurations

The LDX 150 camera can be used in three different camera modes:

- NativeIP mode<sup>1</sup>
- XCU mode (also called cabled mode or XF mode)
- Local mode

To set or change the camera mode, enter the camera menu, go to the **Installation** menu and use the **Camera Mode** function to select IP (for NativeIP mode), XCU (for XCU mode) or Local (for Local mode).

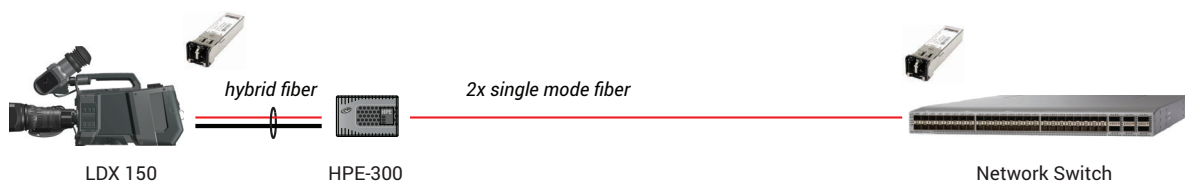
There are multiple options to power the LDX 150, depending on the selected camera mode and system configuration:

- An HPE-300/HPE-300-2AC Hybrid Fiber Extender
- An XCU UXF Series Base Station
- A local Power Supply Unit (>300 W)

### NativeIP mode

#### Using a hybrid power extender

Power is supplied by the HPE-300/HPE-300-2AC while optical transmission is put through from the hybrid fiber cable to single mode fiber:



#### Using a power supply unit and fiber converter

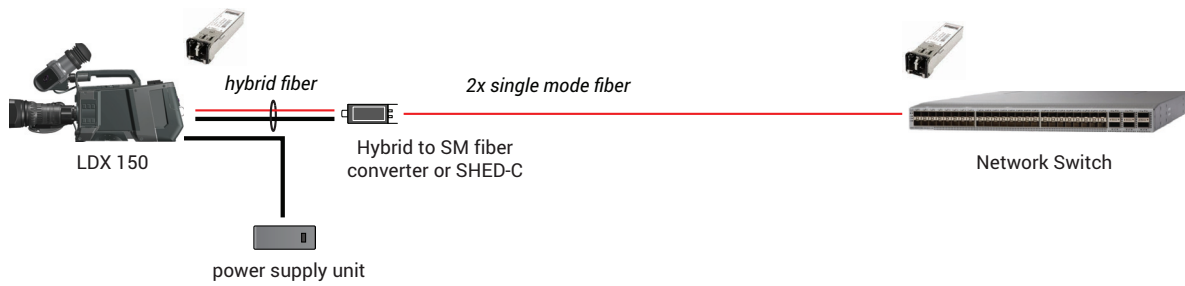
Power is delivered by a power supply unit while optical transmission is put through from the hybrid fiber cable to single mode fiber using a converter:

<sup>1</sup> Requires the NativeIP option to be installed.

## Configuration

### XCU mode

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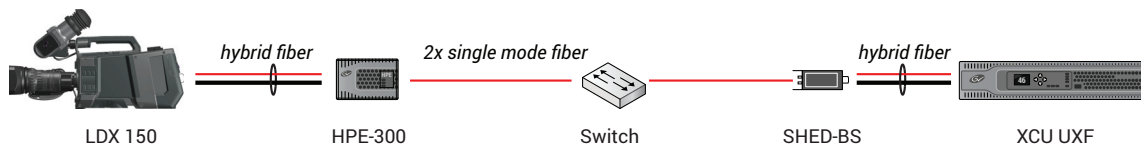
## XCU mode

Power is delivered by the XCU through the hybrid fiber cable:



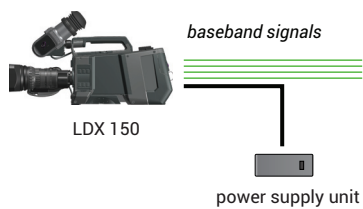
## DirectIP/IP+ with hybrid power extender

Power supply solution is similar to the NativeIP configuration.



## Local mode

Power is delivered by a local power supply unit and all signals are available as local baseband connections on the camera's side and back panels.



## Control network

The LDX 150 is controlled by the Creative Grading camera control system that uses the C2IP network. There are several methods to connect the camera to the C2IP network:

- in NativeIP mode: use a tagged VLAN for the C2IP network on the IP Media network;
- in XCU mode: connect the C2IP network to the C2IP Ethernet connector on the back panel of the XCU;
- In Local mode: connect the C2IP network directly to the C2IP Ethernet connector on the back panel of the camera.



### Note

The LDX 150 can also be controlled by a legacy OCP 400 control panel. Not all options may be available.

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## Locking

The LDX 150 can be locked by one of the following reference signals or sources:

- a network clock using PTP (typically a PTP Grandmaster) over the IP Media Network
- a local reference source (a camera or signal generator) using an SDI input, HD Tri-Level or Composite video.
- an XCU via the XF transmission (in XCU camera mode)
- or it can be in FreeRun mode (not locked)

The LDX 150 can also act as a reference source to synchronize other cameras.

## PTP locking

### PTP in NativeIP mode

The camera is synchronized (locked) over the IP Media Network to a PTP grandmaster clock using the Precision Time Protocol (PTP).



### Tip

Many PTP settings and detailed diagnostics on PTP can be monitored in camera menu: go the **Diagnostics > PTP** menu to view them.

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### PTP in XCU mode

The camera is synchronized by the XCU which is connected (over the IP Media Network) to a PTP grandmaster clock using the Precision Time Protocol (PTP).

In the XCU menu, go to the **Install > Reference Source > Source** function and select **PTP**.





#### Tip

Many PTP settings and detailed diagnostics on PTP can be monitored in the XCU menu: go to the **Diagnostics > Media Network > PTP** menu to view them.

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## PTP setup

(this section is valid both in NativeIP and XCU mode)

- Status — shows PTP locking status. The following indications are possible:
  - locked XCU is locked to the PTP grandmaster clock.
  - Calibrating — a PTP Grandmaster is found and the camera system is calibrating to the PTP Grandmaster;
  - Listening — system is searching for a PTP Grandmaster on the IP Media Network;
  - Disabled — PTP is switched off;
  - Off — system is not connected to the IP Media Network.
- Profile — select the PTP protocol/domain used for locking to the PTP Grandmaster:
  - SMPTE2059 — used for synchronization of broadcast media systems;
  - AES67 — media profile of AES67;
  - AES-SMPTE — combination of AES67 and SMPTE2059;
  - User — User defined PTP settings. The parameters Domain Nr, Delay Req Interval and Receipt Timeout must be set. For more information about these parameters, refer to the IEEE1588 PTP (Precision Time Protocol) specification.

## Local reference

### Camera

The locking source is connected directly to the camera's Reference Input BNC connector (see [REF/AES connector](#), on page 138).

- 1 Select the reference signal. Go to the **Configuration > Reference** function and select one of the following options:
  - <SDI Input> camera locks to an SDI video signal applied to BNC-D. Note: this option is not
  - <PTP> the camera locks to a PTP signal on the IP Network (in NativeIP mode)
  - <TriLvl> (= HD Tri-Level sync): the camera locks to the (expected) TriLvl input on the REF/AES connector
  - <Composite> (SD Black Burst): the camera locks to the (expected) Composite input on the REF/AES connector
  - <FreeRun> not locked (reference signals are ignored)
- 2 If you selected <SDI Input> or <PTP> as reference signal, the REF/AES BNC connector can be programmed. Go to the **Configuration > Signals > BNC Ref/AES** function and select one of the following options:
  - <Ref In> Reference input

- <AES> BNC connector is used as a Digital Audio AES input (this audio source can be selected in the audio section of the camera)
- <TriLvl> HD Tri-Level reference output, can be used as a locking source for a second camera.
- <Composite> Composite (SD Black Burst) reference output, can be used as a locking source for a second camera.



**Tip**

Locking diagnostics can be monitored in the **Diagnostics > Reference** menu.

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## XCU

(only valid when camera is in XCU mode)

The locking source is directly connected to the Reference Input BNC connector on the XCU backpanel: it can be either a HD Tri-Level sync or Composite (SD Black Burst) signal.

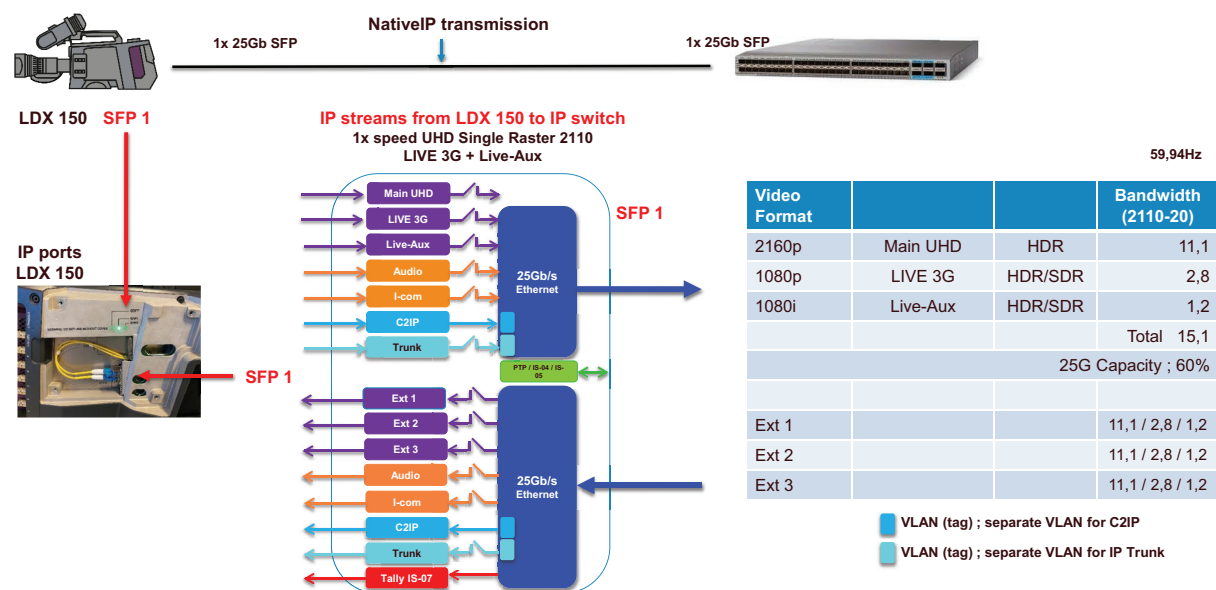
In the XCU menu, go to the **Install > Reference Source > Source** function and select *RefVideoIn*. The XCU accepts and detects both HD Tri-Level and SD Black Burst reference signals.

## Free running

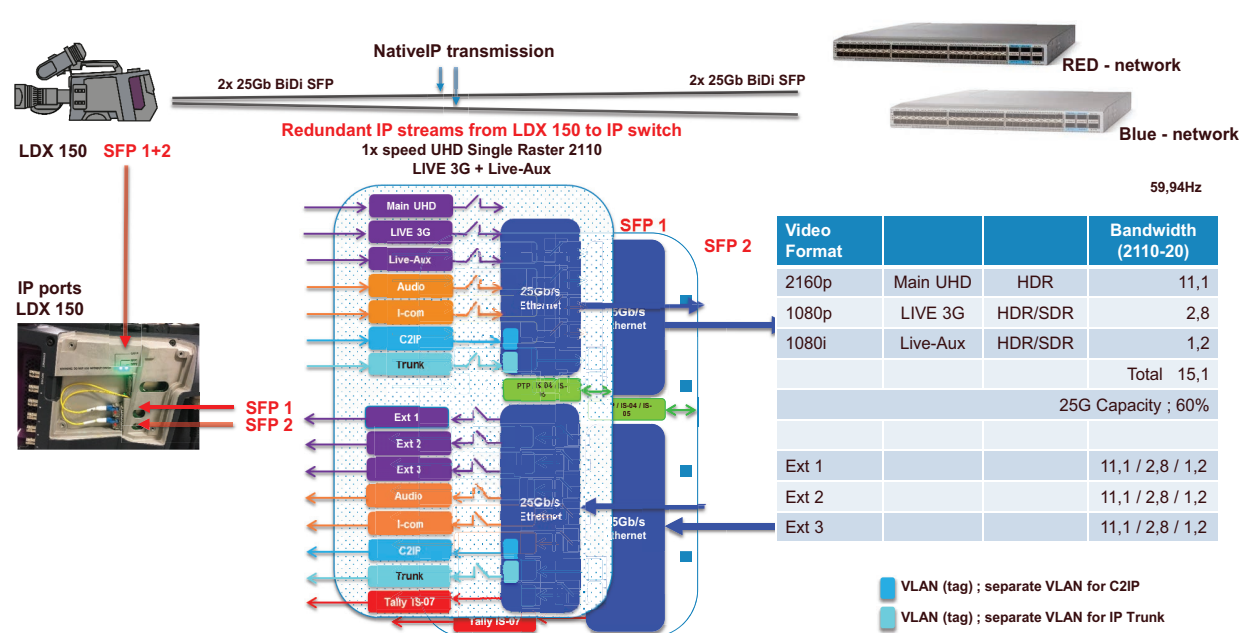
The camera is not locked. Go to the **Configuration > Reference** function and select FreeRun.

# Main video workflows

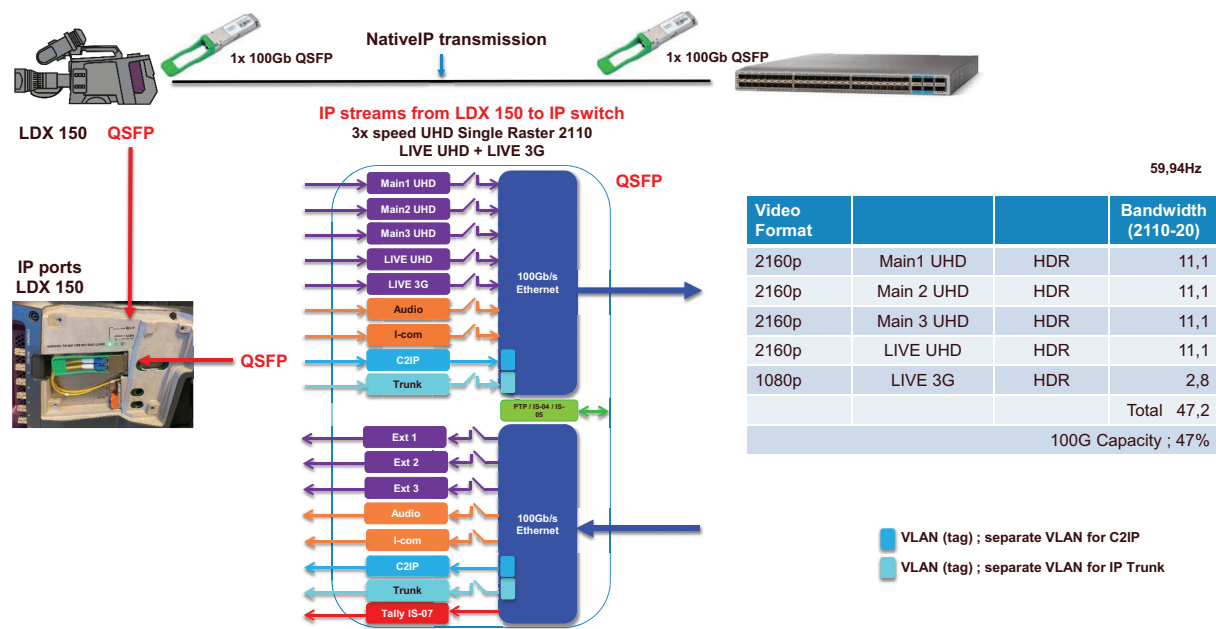
## NativeIP mode: 1X speed UHD 2110-20 single raster



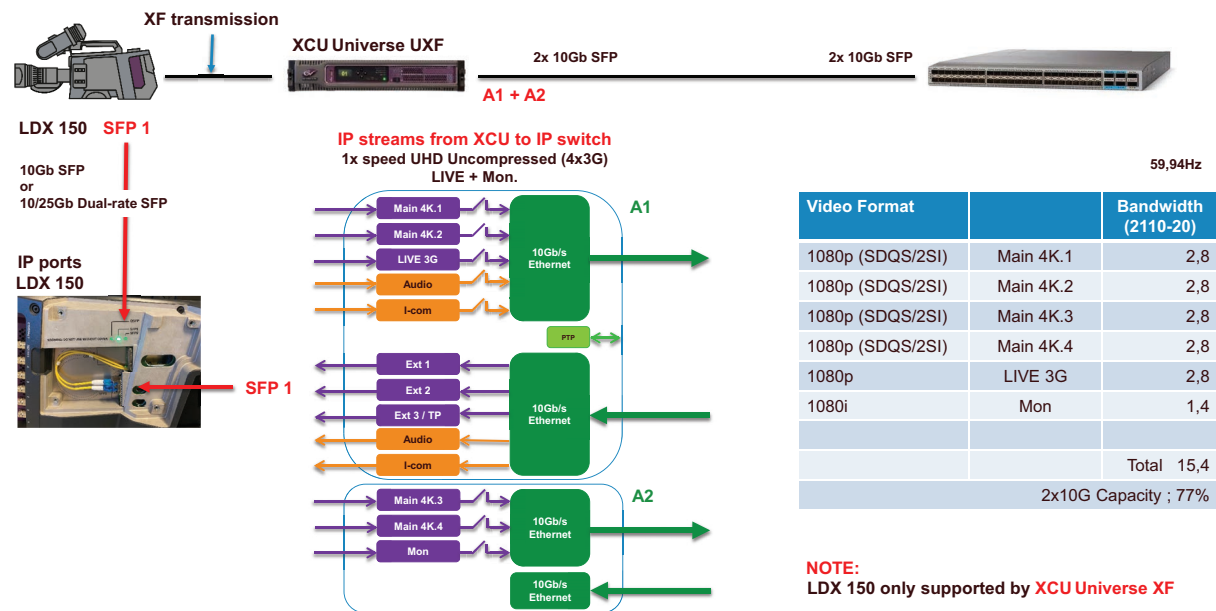
## NativeIP mode: redundant 1X speed UHD 2110-20 single raster



NativeIP mode: 3X speed UHD 2110-20 single raster



XCU mode: 1X speed UHD with XCU Universe UXF



## Configuration

XCU mode: 1X speed UHD with XCU Universe UXF

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# 4

## IP Media setup

### Camera Connect



#### Note

Make sure the version of Camera Connect 1.64 or higher.

Camera Connect is Grass Valley's configuration and setup tool for camera systems. The software comes pre-installed on the CCS-One Cameras Control Server and can be accessed through the C2IP network by a web-browser that runs on a PC or tablet computer.

- Make sure you are connected to the C2IP network. Open the web-browser on your device and enter one of the following links:
  - <http://10.127.44.32/camconnect>
  - <http://169.254.0.201/camconnect>
- The Camera Connect login window is shown:

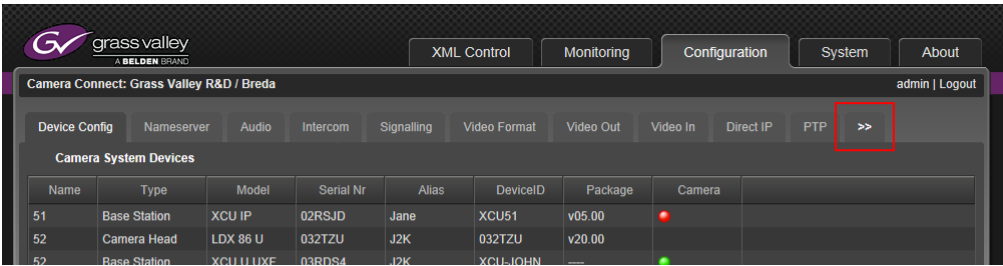
- Enter user name and password. The default login name is **admin** and the password **admin** (these can be changed after login).
- Click or tap Login. The Camera Connect user interface is shown.




#### Note

All user entries in the Camera Connect application are case sensitive.

Click the IP tab at the top of the page; a row of sub tabs appears. The following sub tabs are used to configure the IP Media Network: Network Ports, NMOS, Main Video, Highspeed Video, Live | Mon, Extern Video, Audio, Intercom, PTP, DirectIP and DirectIP+:

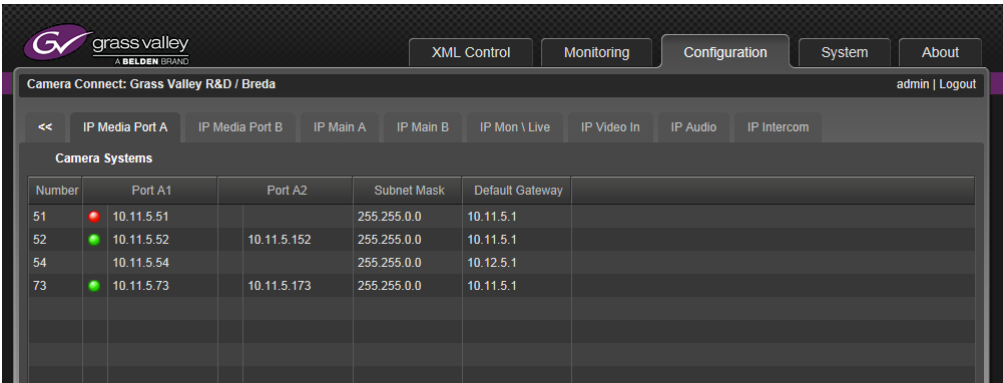


 **Note**  
The IP tab only list camera systems that are IP enabled.



## IP Media Network setup

### Local ports setup

The list of camera systems is shown, sorted by camera number. Click the IP Media Port A tab: here you can configure (local) IP addresses, subnet mask and default gateway for Port A.



The indicator(s) in front of the IP addresses for port A1 and port A2 show the status of the physical IP network connection:

Off	port is not in use.
	indicates a connection between the port and a 10 G IP device (e.g. a switch)
	no connection



#### Note

A green light does not indicate a *correct* communication link between XCU and the 10 G IP device.

Click the camera system you want to set up. A popup window appears and you can edit the following parameters:

Parameter	Value
Camera System	73
Port A1 IP	10.11.5.73
Port A2 IP	10.11.5.92
Subnet Mask	255.255.0.0
Default Gateway	10.11.5.1

Port A1 IP — this is the local IP address of Port A1 in the IP Media Network. It is recommended to use an IP address in the 10.11.5.xxx range.

Port A2 IP — this is the local IP address of Port A2 in the IP Media Network. It is recommended to use an IP address in the 10.11.5.xxx range.

Subnet mask — for most situations the subnet mask is set to 255.255.0.0. This is also the default value.

Default gateway — for most situations the default gateway is set to 10.11.5.1. This is also the default value.



#### Note

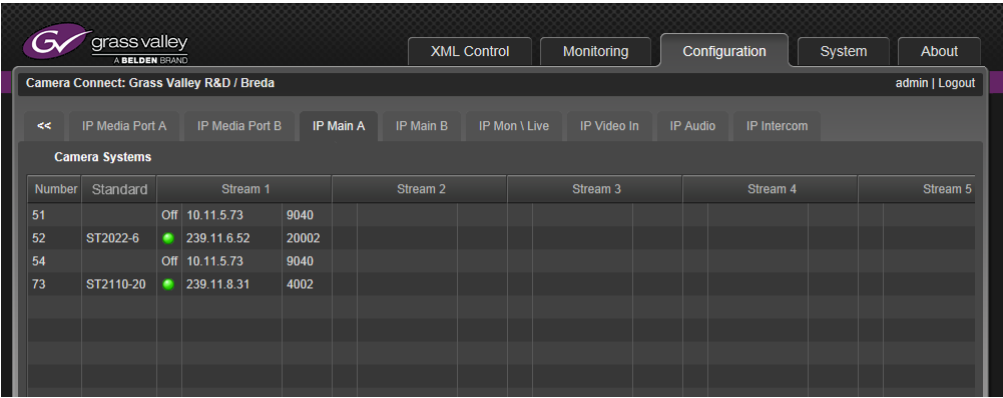
Do not use IP address 10.11.5.1 as it is already in use for the Default Gateway. If you still want to use this address then you must enter a different default gateway.

Make sure to set unique IP addresses for each camera system in the IP Media Network to avoid network conflicts.



## Main video

In the IP Main A tab you can set up IP address and port number for the Main video outgoing stream for the primary IP Media Network Port. The transport standard for Main video is also selected in this tab.

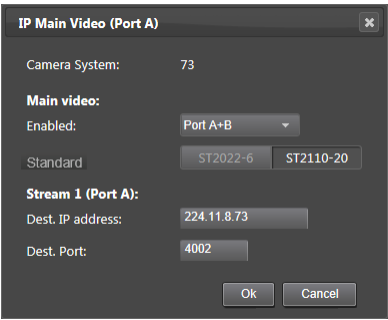


Present indicator for Main video (sub) stream:

Off	(Sub) stream is disabled
	(Sub) stream is enabled and stream is active.
	(Sub) stream is enabled but stream is not active.

Normally, Main video is sent as a single IP stream but with uncompressed 4K the signal is split into four (sub)streams.

Click the camera system you want to configure. A popup window appears in which you can set the following parameters:



### Main Video

Enabled — selects whether the Main video is included in the IP Media Network stream and to which port the stream is sent:

- *Port A*: Main video is routed to Port A (default setting).

- *Port A+B*: Main video is routed to both Port A and B to enable redundant network operation.
- *Off*: Main video is NOT inserted into the IP Media Network stream (this is also indicated with the indication *off* in front of stream 1).

Standard — this is the transport standard for Main video. Select either *ST2022-6* ('embedded SDI with audio and ancillary data over IP') or *ST2110-20* ('Video essence over IP').

**Stream 1 (port A):**

Dest. IP address — the destination IP address to which the stream is sent.

Dest. Port — the destination port number for the stream.



**Note**

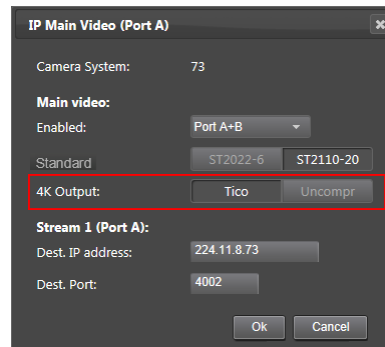
When the same IP address is used for the Main video, Monitoring video and/or Live video streams, the port numbers for each stream **MUST** be set to different values.

**Main video in 4K uncompressed mode**

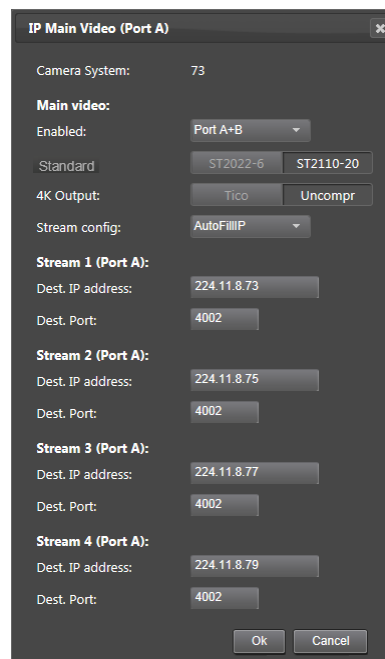
In the IP Main A tab you can set up IP addresses and port numbers for the four (sub)streams of the 4K uncompressed Main video outgoing stream. The transport standard for Main video is also selected in this tab.

Camera Systems		Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
51		Off 10.11.5.73	9040			
52	ST2022-6	On 239.11.6.52	20002			
54		Off 10.11.5.73	9040			
73	ST2110-20	On 224.11.8.73	4002	On 224.11.8.75	4002	Off 224.11.8.77
						Off 224.11.8.79
						4002

When the window does not display the four (sub)streams as indicated in the example above, the compression mode needs to be set to *Uncompressed* first. To do this, click the camera system you want to configure. A popup windows appears. Set the 4K Output item to *Uncompr* (indicated in red below) and click OK to activate the changes.



With the 4K Output compression mode set to *Uncompr*, click the camera system you want to configure. A popup window appears in which you can set the following parameters:



## Main Video

Enabled — selects whether the Main video is included in the IP Media Network stream and to which port the stream is sent:

- *Port A*: Main video is routed to Port A (default setting).
- *Port A+B*: Main video is routed to both Port A and B to enable redundant network operation.
- *Off*: Main video is NOT inserted into the IP Media Network stream (this is also indicated with the indication *off* in front of stream 1).

Standard — this is the transport standard for IP Main Video. Select either *ST2022-6* ('embedded SDI with audio and ancillary data over IP') or *ST2110-20* ('Video essence over IP').

4K Output — in this case *Uncompr* is selected.

Stream config — defines how streams 2,3, 4 are configured, based on settings for stream 1:

- *AutofillIP*: the IP addresses for stream 2, 3 and 4 are automatically filled in based on the entered IP address for stream 1. The last digit of the IP address for Stream 1 is increased by 2 for the subsequent streams.
- *AutofillPrt*: the port numbers for streams 2, 3 and 4 are filled in based on the port number entered for stream 1. The port number is subsequently raised by 1. In case of a single destination unicast/multicast address, the port number of the first stream is entered and the port number for the subsequent streams is increased by 1.



**Note**

This is not applicable for receivers with two 10G ports. A single IP destination address causes the Ethernet switch to flood both ports with all four streams. This can only be used for 25G and 40G port receivers.

- 
- When *Manual* (default setting) is selected you can enter the IP addresses and port numbers manually for all four (sub)streams.

**For streams 1 to 4**

IP address — the destination IP address to which the stream is sent. By default, use four different multicast IP addresses.

Port — the destination port number for the stream.



**Note**

When the same IP address for Main Video, Monitoring video and or Live video is used, the port numbers for each stream MUST be set to different values.

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IP Mon\Live tab

The list of camera systems is shown, sorted by camera number. In this tab Monitoring video and/or Live video outputs can be set up.



**Note**  
Live video is available as a selectable stream. In HD SDR operation the video mode is the same as Main video.

grass valley  
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XML ControlMonitoringConfigurationSystemAbout

Camera Connect: Grass Valley R&D / Bredaadmin | Logout

<<

IP Media Port AIP Media Port BIP Main AIP Main BIP Mon \ LiveIP Video InIP AudioIP Intercom

Camera Systems

Number	Monitoring	Monitoring (Port A)		Monitoring (Port B)		Live	Live (Port A)		Live (Port B)	
51		Off	10.11.5.5220005	Off						
52	ST2110-20		239.11.5.5220002	Off	10.12.8.3620012	ST2022-6	Off	10.11.5.1220009	Off	255.255.255.25565535
54		Off	224.11.8.809040	Off						
73	ST2110-20	Off	239.11.8.7420007	Off	239.12.9.7420007	ST2022-6	Off	239.11.8.7620008	Off	239.12.9.7520008

Click the camera system you want to set up. The edit popup window appears in which you can edit the following parameters:

Edit IP Mon Live

Camera System:73

Monitoring:  
Enabled:Off  
StandardST2022-6ST2110-20

Port A output:  
Dest. IP address:224.11.5.73  
Dest. Port:9040

Port B output:  
Dest. IP address:10.12.5.10  
Dest. Port:20007

Live video:  
Enabled:Port A  
Protocol:ST2022-6ST2110-20

Port A output:  
Dest. IP address:224.11.8.81  
Dest. Port:9040

Port B output:  
Dest. IP address:10.12.5.11  
Dest. Port:20008

OkCancel

## Monitoring

Enabled — selects whether the Monitoring video is included in the IP Media Network stream and to which port the stream is sent:

- *Port A*: Monitoring video is routed to Port A (default setting).
- *Port A+B*: Monitoring video is routed to both Port A and B to establish a redundant network connection.
- *Off*: Monitoring video is NOT inserted into the IP Media Network stream (this is also indicated with the indication *off* in front of Stream 1).

Standard — this is the transport standard for Monitoring video. Select either *ST2022-6* (embedded SDI with audio and ancillary data over IP) or *ST2110-20* (Video essence over IP).

## Port A output

Dest. IP address — the destination IP address for Port A to which Monitoring video is sent.

Dest. Port — the destination port number for Port A for Monitoring video.

Port B output



### Note

Port B is only used when redundant operation is enabled.

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Dest. IP address — the destination IP address for port B to which Monitoring video is sent.

Dest. Port — the destination port number for Port A for Monitoring video.

## Live video



### Note

Live video is only present when HDR is enabled and/or when the XCU is running in a 4K video mode.

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Enabled — selects whether the Live video is included in the IP Media Network stream and to which port the stream is sent:

- *Port A*: Live video is routed to Port A (default setting).
- *Port A+B*: Live video is routed to both Port A and B to establish a redundant network connection.
- *Off*: Live video is NOT inserted into the IP Media Network stream.

Standard — this is the transport standard for Live video. Select either *ST2022-6* (embedded SDI with audio and ancillary data over IP) or *ST2110-20* (Video essence over IP).

## Port A output

Dest. IP address — the destination IP address for Port A to which Live video is sent.

Dest. Port — the destination port number for Port A for Live video.

Port B output



**Note**  
Port B is only used when IP Redundancy is in operation.

Dest. IP address — the destination IP address for port B to which Live video is sent.  
Dest. Port — the destination port number for Port B for Live video.

IP Video In tab

The list of camera systems is shown, sorted by camera number. In this tab the incoming External 1, External 2 and Teleprompter video inputs can be set up.

Number	Extern 1	Port	Multicast	Extern 2	Port	Multicast	Teleprompter	Port	Multicast
51		20001	No		20005	No		20004	No
52		ST2022-6	No		ST2022-6	No		ST2022-6	No
54		4002	No		4100	No		20006	No
73		ST2110-20	239.11.5.52		ST2110-20	239.11.6.52		ST2022-6	239.26.123.70





The Extern 1, Extern 2 and Teleprompter columns show the present indicator, transport standard, port number and Multicast IP address for each incoming video stream.

Click the camera system you want to set up. The edit popup window appears in which you can edit the following parameters:

The screenshot shows a dark-themed window titled "Edit IP Video In". At the top, "Camera System:" is set to "73". Below this, there are three sections: "Extern 1:", "Extern 2:", and "Teleprompter:". Each section has a "Present:" status indicator (a colored circle), a "Standard" dropdown menu, a "Port:" text field, a "Multicast:" toggle button, and a "Multicast IP:" text field. For Extern 1, Present is "No" (red circle), Standard is "ST2022-6", Port is "9040", Multicast is "No", and Multicast IP is "239.25.123.71". For Extern 2, Present is "Yes" (green circle), Standard is "ST2022-6", Port is "9040", Multicast is "Yes", and Multicast IP is "239.25.123.70". For Teleprompter, Present is "No" (red circle), Standard is "ST2022-6", Port is "8200", Multicast is "No", and Multicast IP is empty. At the bottom right are "Ok" and "Cancel" buttons.

**For Extern 1, Extern 2 and Teleprompter:**

Present — the present indicator can have the following status indications:

 no indication	Steam is not present or not available.
 Yes	Steam is present.
 Unsupported format	Stream is present but audio has an unsupported format.
 No	Stream is not present or an error has occurred.

Standard — this is the expected transport standard for the incoming video stream. Select either *ST2022-6* or *ST2110-20*;

Port — the receiving port number for the video stream.

Multicast — Yes or No. Select whether you want to use multicast or not.

Multicast IP — the receiving multicast IP address (when Multicast = Yes)



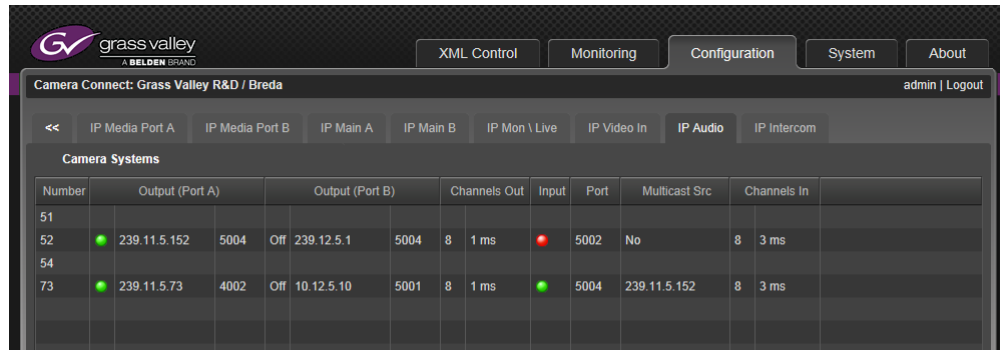
**Tip**

It is recommended to use port numbers in the 1000 .. 49152 range.



## IP Audio tab

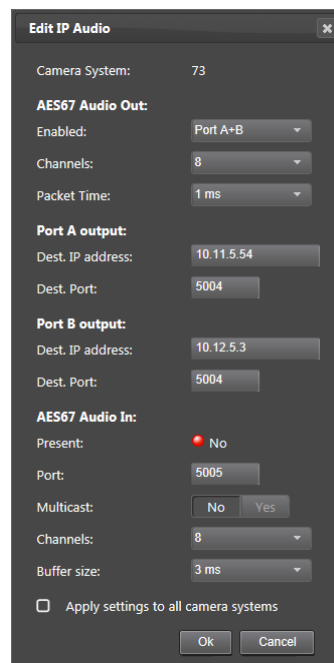
The list of camera systems is shown, sorted by camera number. In this tab the outgoing and incoming IP Audio streams can be set up.



Number	Output (Port A)	Output (Port B)	Channels Out	Input	Port	Multicast Src	Channels In
51	239.11.5.152	5004	Off	239.12.5.1	5004	8	1 ms
52	239.11.5.152	5004	Off	239.12.5.1	5004	No	8 3 ms
54	239.11.5.73	4002	Off	10.12.5.10	5001	8	1 ms
73	239.11.5.73	4002	Off	10.12.5.10	5001	8	1 ms

The columns show relevant information for both outgoing (on Ports A and B) and incoming streams.

Click the camera system you want to set up. The edit popup window appears in which you can edit the following parameters:



**Edit IP Audio**

Camera System: 73

**AES67 Audio Out:**

Enabled: Port A+B

Channels: 8

Packet Time: 1 ms

**Port A output:**

Dest. IP address: 10.11.5.54

Dest. Port: 5004

**Port B output:**

Dest. IP address: 10.12.5.3

Dest. Port: 5004

**AES67 Audio In:**

Present: No

Port: 5005

Multicast: No Yes

Channels: 8

Buffer size: 3 ms

☐ Apply settings to all camera systems

Ok Cancel

### AES67 Audio Out

Enabled — selects whether AES67 Audio output is included in the IP Media Network stream and to which Port the stream is sent:

- *Port A:* AES67 Audio is routed to Port A (default setting).
- *Port A+B:* AES67 Audio is routed to both Port A and B to establish a redundant network connection.

- *Off*: AES67 Audio is NOT inserted into the IP Media Network stream.

Channels — Number of audio channels that is inserted into AES67 Audio output. Can be 2,4,6, 8 or 16 channels.

Packet Time — Selects packet time of the AES67 Audio packets.

### Port A output

Dest. IP address — the destination IP address for Port A to which AES67 Audio output is sent.

Dest. Port — the destination port number for Port A for AES67 Audio output.

### Port B output



#### Note





Port B is only used when redundant operation is enabled.

Dest. IP address — the destination IP address for port B to which AES67 Audio output is sent.

Dest. Port — the destination port number for Port B for AES67 Audio output.

### AES67 Audio In

Present — indicates whether an AES67 Audio input is present on the IP Media Network. It can have the following status indications:

 no indication	Steam is not present or not available.
 Yes	Steam is present.
 Unsupported format	Stream is present but audio has an unsupported format.
 No	Stream is not present or an error has occurred.

Multicast — Yes or No. Select whether you want to use multicast or not.

Multicast IP — the receiving multicast IP address, when Multicast = Yes.

Channels — Number of audio channels that is inserted into AES67 Audio input. Can be 2,4,6, 8 or 16 channels.

Buffer Size — Selects buffer size for AES67 Audio input. Can be 0.33 ms, 0.67 ms, 1 ms, 2 ms, 3 ms, 4 ms, 8 ms or 15 ms.

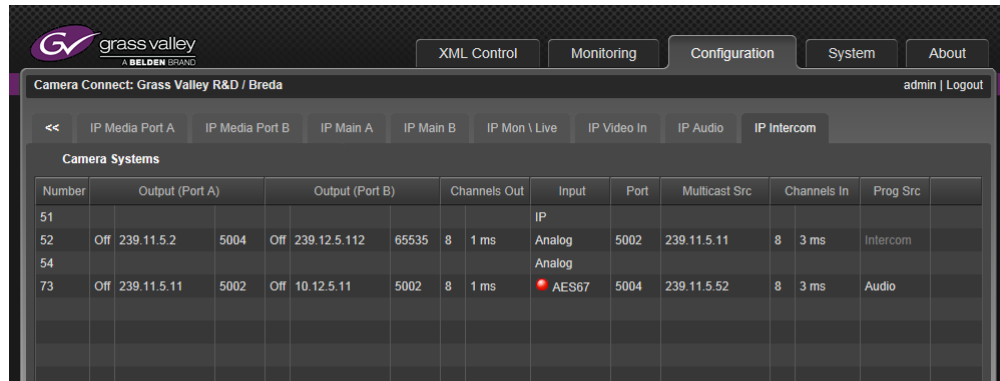


#### Tip

Check the 'Apply settings to all camera systems' box and press OK to apply the (changed) settings in this window to all camera systems (where applicable).

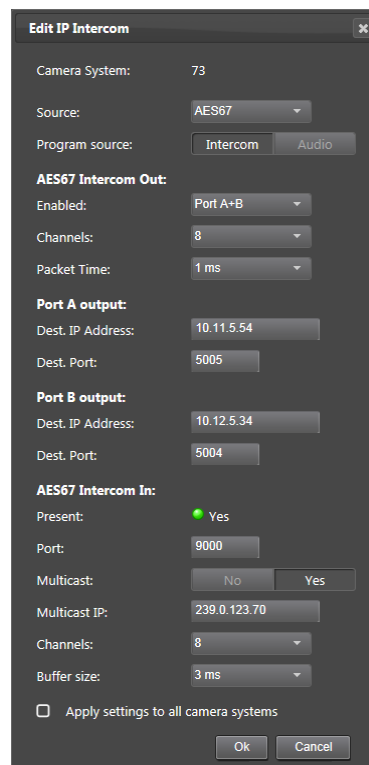
## IP Intercom tab

The list of camera systems is shown, sorted by camera number. In this tab the incoming and outgoing IP Intercom streams can be set up.



Number	Output (Port A)	Output (Port B)	Channels Out	Input	Port	Multicast Src	Channels In	Prog Src
51				IP				
52	Off 239.11.5.2 5004	Off 239.12.5.112 65535	8 1 ms	Analog	5002	239.11.5.11	8 3 ms	Intercom
54				Analog				
73	Off 239.11.5.11 5002	Off 10.12.5.11 5002	8 1 ms	AES67	5004	239.11.5.52	8 3 ms	Audio

Click the camera system you want to set up. The edit popup window appears in which you can edit the following parameters:



**Edit IP Intercom**

Camera System: 73

Source: AES67

Program source: Intercom Audio

**AES67 Intercom Out:**

Enabled: Port A+B

Channels: 8

Packet Time: 1 ms

**Port A output:**

Dest. IP Address: 10.11.5.54

Dest. Port: 5005

**Port B output:**

Dest. IP Address: 10.12.5.34

Dest. Port: 5004

**AES67 Intercom In:**

Present: Yes

Port: 9000

Multicast: No Yes

Multicast IP: 239.0.123.70

Channels: 8

Buffer size: 3 ms

☐ Apply settings to all camera systems

Ok Cancel

Source — Selects input source for intercom Eng and Prod channels. Analog = from intercom subD-connector at backpanel of XCU (Cradle); Ext1 = from embedded SDI audio of external video input 1 (EXT1). AES67 = from AES67 Intercom stream on the IP Media Network.

Program source— Intercom or Audio.

## AES67 Intercom Out

Enabled — selects whether the AES67 intercom output is included in the IP Media Network stream and to which port the stream is sent:

- *Port A*: AES67 intercom is routed to Port A (default setting).
- *Port A+B*: AES67 intercom is routed to both Port A and B to establish a redundant network connection.
- *Off*: AES67 intercom is NOT inserted into the IP Media Network stream (this is also indicated with the indication *off* in front of Stream 1).

Channels — Number of audio channels that is inserted into AES67 intercom output. Can be 2,4,6, 8 or 16 channels.

Packet Time — Selects packet time of the AES67 intercom output audio packets.

## Port A output

Dest. IP address — the destination IP address for Port A to which AES67 intercom output is sent.

Dest. Port — the destination port number for Port A for AES67 intercom output.

## Port B output



### Note

Port B is only used when redundant operation is enabled.

Dest. IP address — the destination IP address for port B to which AES67 intercom output is sent.

Dest. Port — the destination port number for Port B for AES67 intercom output.

## AES67 Intercom In

Present — indicates whether AES67 intercom input is present on the IP Media Network.

Multicast — Yes or No. Select whether you want to use multicast or not.

Multicast IP — the receiving multicast IP address, when Multicast = Yes.

Channels — Number of audio channels that is inserted into AES67 intercom input. Can be 2,4,6, 8 or 16 channels.

Buffer Size — Selects buffer size for AES67 intercom input. Can be 0.33 ms, 0.67 ms, 1 ms, 2 ms, 3 ms, 4 ms, 8 ms or 15 ms.



### Tip

Check the 'Apply settings to all camera systems' box and press OK to apply the (changed) settings in this window to all camera systems (where applicable).

## AES67 Channel mapping for audio and intercom

For the audio and intercom audio channel mapping on the IP Media Network, refer to the table below:

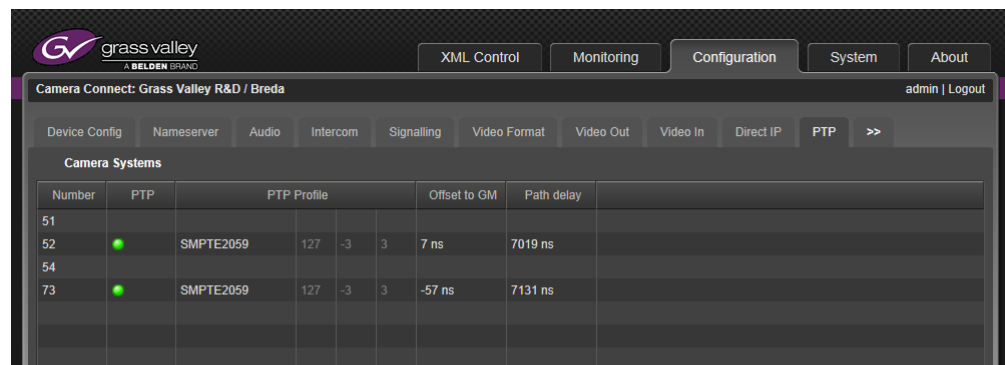
	Ch 1	Ch 2	Ch 3	Ch 4	Ch 5 to 8/16
Output stream					
Audio A1	Cam Audio 1	Cam Audio 2	Cam AES1	Cam AES2	(digital silence)
Intercom A1	Eng	Prod	(digital silence)	(digital silence)	(digital silence)
Input stream					
Audio A1	Prog intercom	Prog spare	(not used)	(not used)	(not used)
Intercom A1	Eng	Prod	Prog intercom	Prog spare	(not used)

## PTP tab

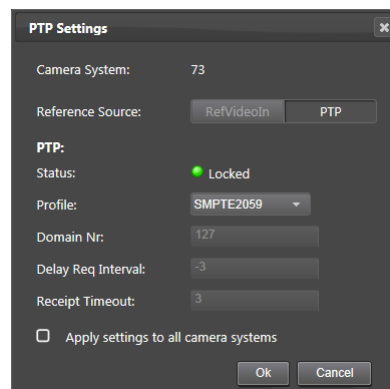
The XCU can be synchronized over the IP Media Network to a PTP grandmaster clock using the Precision Time Protocol (PTP).

- The PTP sub tab can be found by clicking the double arrow (<<) at the left. The PTP sub tab is located in the first group of tabs.

The list of camera systems is shown, sorted by camera number. In this tab you can set up synchronization to a PTP grandmaster.








Click the camera system you want to set up. The edit popup window appears in which you can edit the following parameters:



**Reference Source** — select the source of the video reference to which the camera system locks. When *RefVideoIn* is selected the camera system locks to the Reference input signal on the XCU BNC REF IN connector (can be HD Tri-Level sync or Black Burst), when *PTP* is selected the camera system configured to lock to a PTP grandmaster reference clock on the IP Media Network.

## PTP

**Status** — shows PTP locking status. The following status indications are possible:

 locked	XCU is locked to the PTP grandmaster clock.
 calibrating	XCU has found a PTP grandmaster and is calibrating to the grandmaster.
 listening	XCU is searching for a PTP grandmaster on the IP Media Network
 disabled	PTP is switched off (for example when Reference Source = RefVideoIn)
 off	XCU is not connected to the IP Media Network.

**Profile** — select the PTP protocol/domain used for locking to the PTP grandmaster; either *SMPTE2059*, *AES67*, *AES-SMPTE* or *User*.

When *User* is selected the parameters *Domain Nr*, *Delay Req Interval* and *Receipt Timeout* must be set. For more information about these parameters, refer to the IEEE1588 PTP (Precision Time Protocol) specification.



### Tip

Check the 'Apply settings to all camera systems' box and press OK to apply the (changed) settings in this window to all camera systems (where applicable).



# 5

## Operating instructions

### Using the camera

Attach a lens, viewfinder, microphone and any other accessories to the camera. Attach the hybrid cable (when used) and other necessary cables to the camera. Refer to the Installation chapter for more details.

### Powering the camera

There are several ways of supplying power to the camera, depending on the system configuration:

- by a hybrid power extender such as Grass Valley's HPE-300 or LDK 4425 through the hybrid cable connector (in NativeIP or DirectIP/DirectIP+ modes);
- by an XCU through the hybrid fiber cable and connector (in XCU mode);
- by a DC Power Supply Unit connected directly to the camera (in standalone mode).


The power supply for the camera is normally supplied via the hybrid fiber cable from the base station. The Power On indicator lights when power is supplied and the camera power switch is set to the on position.

When power is supplied via the hybrid fiber cable, an output power socket supplies +12V, 4.0 A maximum for powering accessories. The power overload indicator lights up when maximum power is exceeded.

If excessive current flows into the camera the internal safety circuit shuts off power to all the units. If this happens shut off power and check the units for faults and if necessary take corrective actions before switching on power again.

When an ocular viewfinder is used the BATT indicator in the viewfinder lights if the camera supply voltage is less than 11.5 VDC when using an external power supply.

### Switching on

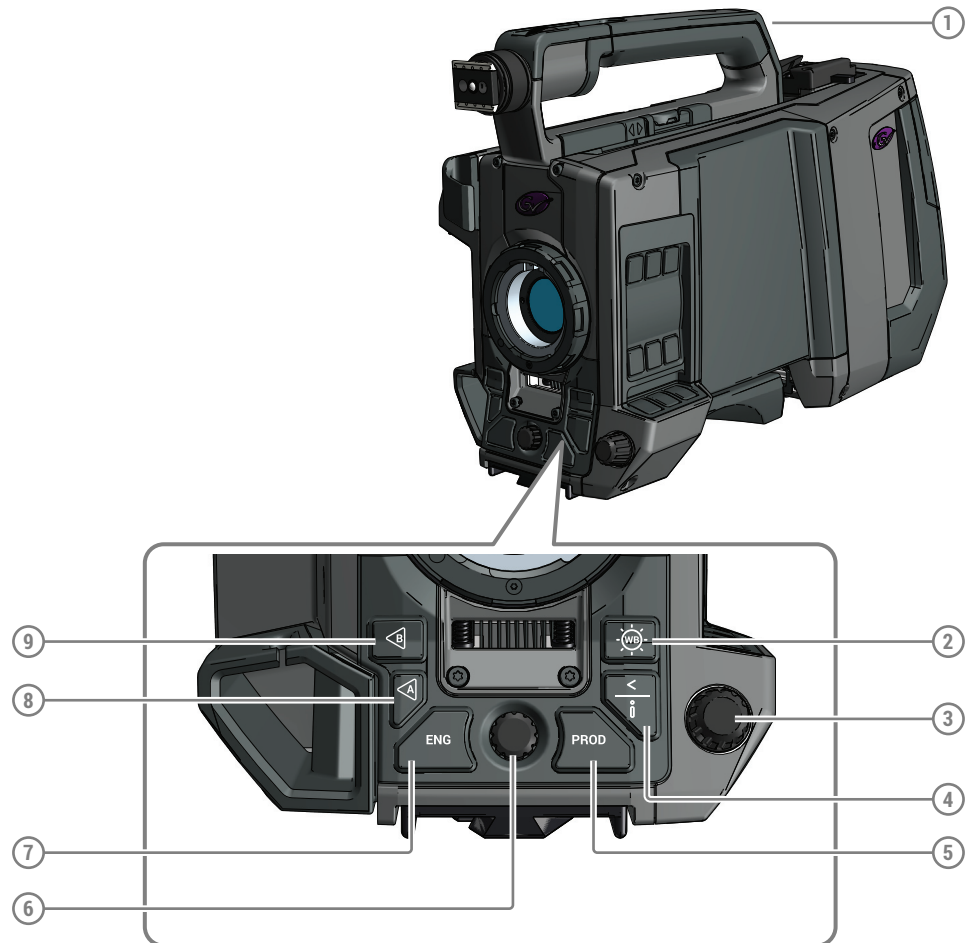
- Switch on power on the power source (HPE-300, LDK 4425, XCU or power supply unit)
- Set the power switch of the camera to the ON  position (lower back panel)
- Allow a few moments for the camera to perform a self-test and for the system to establish communications.

To switch the camera to stand-by, set the power switch of the camera to the  position.



## Location of controls and indicators

### Camera front panel



**(1) Rear Tally lamp**

Lights Red when the camera is On Air.

**(2) White Balance button**

Press and hold two seconds to start the Auto White Balance procedure.

**(3) Menu Rotary and Select**

Turn the rotary to navigate the camera menu and push to select items.

**(4) Back / Info button**

Back: Used when navigating the menu;  
Info: Press and hold to view information on the viewfinder screen.