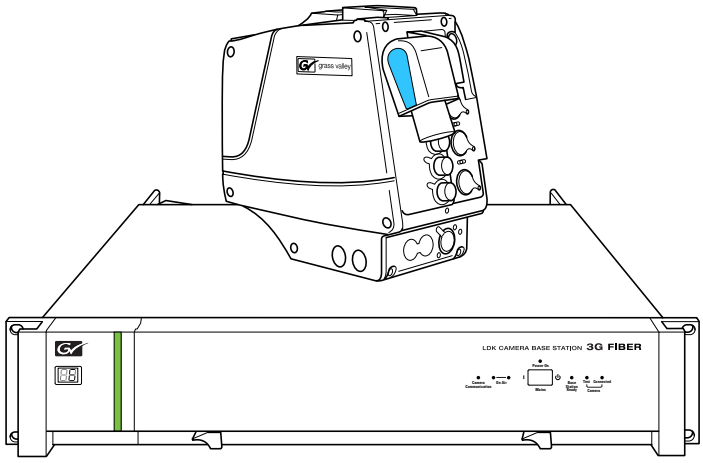
grass valley

User's Guide

3922 496 31761 May 2011 v1.0



LDK 4410 + LDK 5420

3G Fiber Transmission System

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www.grassvalley.com

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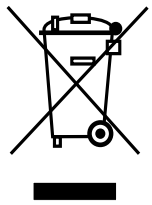


Grass Valley's innovation and excellence in product design also extends to the programs we've established to manage the recycling of our products. Grass Valley has developed a comprehensive end-of-life product take back program for recycle or disposal of end-of-life products. Our program meets the requirements of the European Union's WEEE Directive and in the United States from the Environmental Protection Agency, individual state or local agencies.

Grass Valley's end-of-life product take back program assures proper disposal by use of Best Available Technology. This program accepts any Grass Valley branded equipment. Upon request, a Certificate of Recycling or a Certificate of Destruction, depending on the ultimate disposition of the product, can be sent to the requester. Grass Valley will be responsible for all costs associated with recycling and disposal, including freight, however you are responsible for the removal of the equipment from your facility and packing the equipment ready for pickup.

For further information on the Grass Valley product take back system please contact Grass Valley at + 800 80 80 20 20 or +33 1 48 25 20 20 from most other countries. In the US and Canada please call 800-547-8949 or 530-478-4148. Ask to be connected to the EH&S Department. In addition, information concerning Grass Valley's environmental policy can be found at:

www.grassvalley.com/about/environmental-policy

Packing/unpacking

Inspect the shipping container for evidence of damage immediately after receipt. If the shipping container or cushioning material is damaged, it should be kept until the contents of the shipment have been checked for completeness and the units have been checked mechanically and electrically. The shipping container should be placed upright and opened from the top. Remove the cushioning material and lift out the contents. The contents of the shipment should be checked against the packing list. If the contents are incomplete, if there is mechanical damage or defect, or if the units do not perform correctly when unpacked, notify your sales or service centre within eight days. If the shipping container shows signs of damage or stress, notify the carrier as well.

If a unit is being returned to for servicing, try to use the containers and materials of the original packaging. Attach a tag indicating the type of service required, return address, model number, full serial number and the return number which will be supplied by your service centre. If the original packing can no longer be used, the following general instructions should be used for repacking with commercially available materials:

1. Wrap unit in heavy paper or plastic.
2. Use strong shipping container.
3. Use a layer of shock-absorbing material around all sides of the unit to provide firm cushioning and prevent movement inside container.
4. Seal shipping container securely.
5. Mark shipping container FRAGILE to ensure careful handling.

Declaration of conformity

We, Grass Valley Nederland B.V., Kapittelweg 10, 4827 HG Breda, The Netherlands, declare under our sole responsibility that this product is in compliance with the following standards:

- EN60065 Safety
- EN55103-1:2009 EMC (Emission) for the following environments:

  (E1) Residential;

  (E2) Commercial and light industrial;

  (E3) Urban outdoors;

  (E4) Controlled EMC environment, and the rural outdoors environment.
- The average half-cycle r.m.s. inrush currents for this product are:

  - 16 A (on intial switch-on);

  - 11 A (after a supply interruption of 5 s).
- EN55103-2 EMC (Immunity)

following the provisions of:

- the EMC Directive 2004/108/EC
- the Low Voltage Directive 2006/95/EC

FCC Class A Statement

This product generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause interference to radio communications.

It has been tested and found to comply with the limits for a class A digital device pursuant to part 15 of the FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this product in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Important information

Read these instructions carefully and retain them for future reference.

During installation and operation of this equipment, local building safety and fire protection standards must be observed.

Before connecting the equipment to the power supply of the installation, verify the proper functioning of the protective earth lead.

Whenever it is likely that safe operation is impaired, the apparatus must be made inoperative and secured against any unintended operation. The appropriate servicing authority must then be informed. For example, safety is likely to be impaired if the apparatus fails to perform the intended function or shows visible damage.

Any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Cautions and Warnings

Read and comply with the warning and caution notices that appear in the manual.

- Warnings indicate danger that requires correct procedures or practices to prevent death or injury to personnel.
- Cautions indicate procedures or practices that should be followed to prevent damage or destruction to equipment or property.

Warnings

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not remove covers or panels. Refer servicing to qualified personnel only.

In case of an emergency ensure that the power is disconnected.

Use only fuses of the type and rating specified.

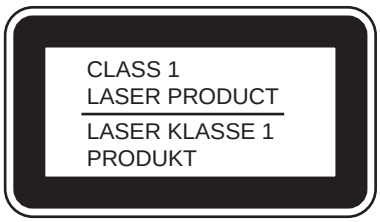
Connect the product only to a power source with the specified voltage rating.

The base station must always be connected to protective earth. Do not interrupt the protection conductor inside or outside the unit. Do not disconnect the protective earth terminal. Intentional interruption is prohibited and is likely to make the unit dangerous.

To prevent risk of overheating, ventilate the units correctly.

For safety reasons the base station must be mounted in a 19-inch rack which has safety covers according to IEC65. When two base stations are mounted above each other, the minimum distance between them must be 50 mm or the rack must be force-air cooled.

Fiber-optic transmission units



Laser safety statement (Europe)

Fiber-optic transmission units are classified as a "CLASS 1 Laser Product" according to EN 60825-1, Safety of Laser products. Class 1 laser products are considered safe and do not result in biological hazard if used according to the instructions.

Laser safety statement (US)

Fiber-optic transmission units are classified as a "CLASS 1 Laser Product" according to 21CFR 1040.10 of the US Food and Drug Administration (FDA) Center for Devices and Radiological Health.

Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

To ensure proper use of this product, please read this instruction manual carefully and retain for future reference. Should the unit ever require maintenance, contact an authorized service location.

Fiber-optic cable precautions

Fiber-optic cables and connectors are easily damaged; take the following percautions into account:

- Do not bend the cable beyond the minimum permissible bend range specified for the cable.
- Avoid kinks in the cable.
- Avoid subjecting the cable to a high tension force (even momentarily).
- Do not twist the cable when connecting it to equipment.
- Insert connectors straight and fully into their corresponding sockets.
- In fiber-optic cable systems always put the dust caps on cable and panel connectors immediately after disconnecting a cable. Keep the dust caps clean.

Cleaning fiber-optic connectors

WARNING

Never clean an optical connector attached to a fiber that is carrying light.

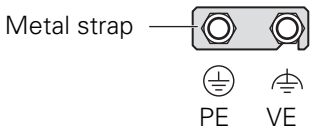
Particles of foreign matter on the tip of a ferrule can have a disabling effect on fiber-optic transmission. Fiber-optic connectors need to be cleaned every time they are mated and unmated; it is essential that fiber-optic users develop the necessary discipline to always clean the connectors before they are mated.

Use a commerially available cleaning kit specifically designed for fiber-optic connectors and follow the manufacturer's instructions carefully.

- The connector sections to be cleaned include the tips and sides of ferrules, the interior walls of alignment sleeves, and the interior and exterior of connector shells.
- For plugs, the interior surfaces of alignment sleeves and the tips of ferrules are to be cleaned with a cleaning stick treated with the appropriate fluid. (Cleaning sticks with a slender design are available that allow alignment sleeves to be cleaned without having to detach them.)
- For jacks, it is important to clean both the tips and sides of the completely protruding ferrules.
- Both the male and female connector shells tend to attract dust and metal particles, so it is important to clean both the insides and outsides.
- The fiber end face and ferrule must be absolutely clean before it is inserted into a transmitter or receiver.
- Mate the connector immediately! Don't let the connector lie around and collect dust before mating.
- Air can be used to remove lint or loose dust from the port of a transmitter or receiver to be mated with the connector. Never insert any liquid into the ports.

Base station earthing

The rear of the base station power supply unit has two separate screw terminals for protective earth ⏚ (PE) and video earth ⏚ (VE). These are normally connected by a metal strap.



The protective earth terminal is internally connected to the protective earth conductor of the power cable. In normal circumstances the connection between the protective earth and the video earth should **not** be broken. If required, the central earth connection wire of the studio can be connected to terminal PE in accordance with VDE regulation 0800/part2.

Only if the studio (or OB van) is equipped with separate protective and video earth systems may the metal strap be removed. Under these circumstances the video earth terminal must be connected to the central functional earth potential (video earth) of the studio. This earth potential should have functional protective and noiseless earth (FPE) qualities as stated in the VDE regulation 0800/part2. A low impedance interconnection of both earth conductors must be provided at the central studio earthing point.

Mains lead wiring for UK users

The wires in the mains lead are colored in accordance with the following code:

GREEN and YELLOW- EARTH

BLUE- NEUTRAL

BROWN- LIVE

As the colors of the wires in the mains lead of this apparatus may not correspond with the colored markings identifying the terminals in your plug proceed as follows:

- The wire colored GREEN AND YELLOW must be connected to the terminal on the plug marked with the letter E or by the safety earth symbol ⏚ or colored GREEN or GREEN AND YELLOW.
- The wire colored BROWN must be connected to the terminal marked with the letter L or colored RED.
- The wire colored BLUE must be connected to the terminal marked with the letter N or colored BLACK.

Ensure that your equipment is connected correctly - if you are in any doubt consult a qualified electrician.

Chapter 1

Introduction

1.1 Welcome

The 3G Fiber Transmission System is a reliable and robust transmission system that uses advanced digital technology to transport video, control and many other signals from your HD camera head to your studio or OB van and vice versa.

1.1.1 About this manual

The purpose of this manual is to present a detailed description of how to install and operate the 3G Fiber Transmission System. It provides the information necessary to use the system in different configurations.

1.1.2 Related documents

Before proceeding, check the Grass valley website at www.grassvalley.com for the latest version of this user's guide and additional information:

- Online versions of documentation; updated versions of user's guides, data sheets, brochures, application notes in pdf-format are available for download.
- Software downloads; camera software updates, release notes and installation instructions are available for download.

1.2 System overview

1.2.1 Transmission

Grass Valley's latest 3G Fiber Transmission System is based on digital transmission and a new, robust power system. The transmission system consists of a dockable camera adapter that fits on Grass Valley HD camera heads and a base station that takes care of power, signal transport and connection to your studio or OB van.

The 3G Fiber Transmission System is the perfect interface between your HD camera and the rest of your system. The heavy-duty base station provides many features in a compact package while the camera adapter provides maximum freedom of movement.

3G Fiber transmission offers video transmission and remote control of cameras up to a distance of 4,000 m (13,120 ft), using hybrid fiber cables.

Transmission quality can be precisely monitored before and during operation right from the OCP 400 operational control panel.

1.2.2 Dockable adapter

The dockable principle allows a choice of transmission and thus the greatest flexibility and cost-effective solutions in multiple applications.

1.2.3 Base station

The base station is only 2U high yet offers full broadcast functionality and quality. The low height means that rack space is saved. Its low power consumption and efficient internal cooling eliminate the need for space between adjacent units. Sliding rails are additionally available for easy access to the back panel. The wings on either side of the back panel protect all connectors from damage, including the Fiber connector. The Fiber connector itself can easily be mounted at different angles to suit all mounting requirements.

1.2.4 Operational controls

You can access the base station menu, which contains all operational settings, from an Operational Control Panel. In addition to the operational menu, the installation and service menus can be activated from the base station by pressing a switch behind the front panel. The base station is compatible with all existing control system components.

An OCP 400 operational control panel can be connected directly to the base station using a cross-over Ethernet cable.

Full camera control is provided via a C2IP Ethernet-based control network.

1.2.5 Intercom

The communication facilities provide for two-wire or four-wire high quality intercom signals.

1.3 Main features

- The 3G Fiber Transmission System offers flexible and multiple audio and video connectivity at the base station.
- Allows video transmission, power and control of cameras up to a distance of 4,000 m (13,120 ft) , using hybrid Fiber cables.
- Transmission of 1080p50/59.94, 1080i50/59.94, 720p50/59.94 and many psf HD video formats.
- Transports the following digital signals from camera to base station: main video signal, four audio channels (including embedded digital audio), two intercom channels, control and private data.
- Transports the following digital signals from base station to camera: power, two external HD video channels, teleprompter signal, three intercom channels, control and private data.
- Full camera control via Grass Valley's C2IP Ethernet-based control network. Compatible with Grass Valley's Fusion product line for seamless integration with other Grass Valley broadcast products.
- Two-wire or four-wire intercom compatible with international standards.
- The adapter has a compact and ergonomic design and is dockable with all Grass Valley HD cameras.
- All operational controls within easy reach at the back panel of the camera adapter.
- The swiveling Fiber connector on the camera adapter provides a maximum of freedom and moveability for the operator.
- Designed to fit onto the new Grass Valley Reflex SuperXpander: the hot shoe connection enables swift and easy coupling with the SuperXpander without the need for flying leads or other cabling.
- Base station built in a compact 2U high 19-inch rack housing.
- Teleprompter, color bar, HD-SDI outputs standard on board.
- The digital transmission backbone and power module meet the most demanding broadcasting needs.
- Heavy-duty design with a new base station power unit with low power consumption, ideal for OB vans.
- Both HD and simultaneous high-quality SD outputs (optional) are available.

Chapter 2

Base station

2.1 Installation

2.1.1 Control bus

The base station is connected to the control network hub or router via an Ethernet cable (straight-through, not cross-over). An OCP (Operational Control Panel) and, if required an MCP (Master Control Panel), are also connected to the Ethernet network via a hub or router. An OCP can also be connected directly to the base station using a cross-over Ethernet cable.

The IP address and other options for the Ethernet connection can be set up in the basestation system menu. These items can also be set up remotely using a network configuration tool such as Grass Valley's SiteConfig.

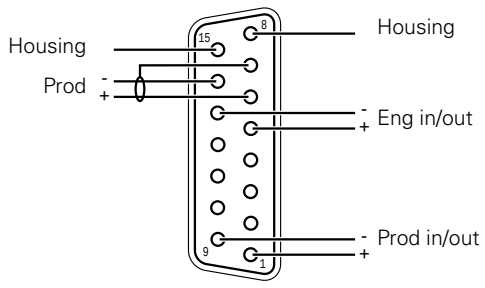
☞ Note

By default, the Ethernet connection is set up for automatic IP configuration.

2.1.2 Intercom cabling

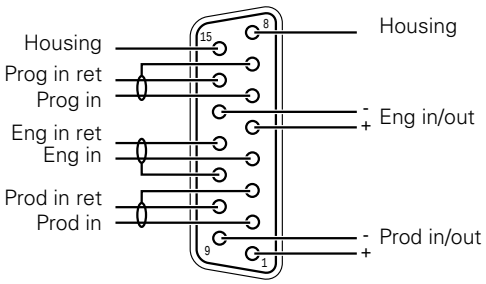
Connect the studio intercom system to the rear of the base station. The wiring of the panel connector is shown below for two-wire and four-wire systems.

Two-wire systems



Function	Value
Signal level	0 dBu (RMS)
Load impedance	200 Ω
Voltage level	max. 40 VDC

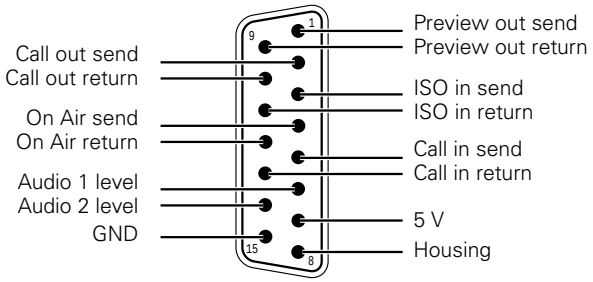
Four-wire systems



Function	Value
Output signal level	+6 or 0 dBu (RMS) selectable
Output impedance	max. 50 Ω symmetrical
Input signal level	+6 or 0 dBu (RMS) selectable
Impedance	min. 9 kΩ symmetrical

2.1.3 Studio signalling

Connect the studio signalling system to the rear of the base station. The wiring of the signalling connector is shown below:

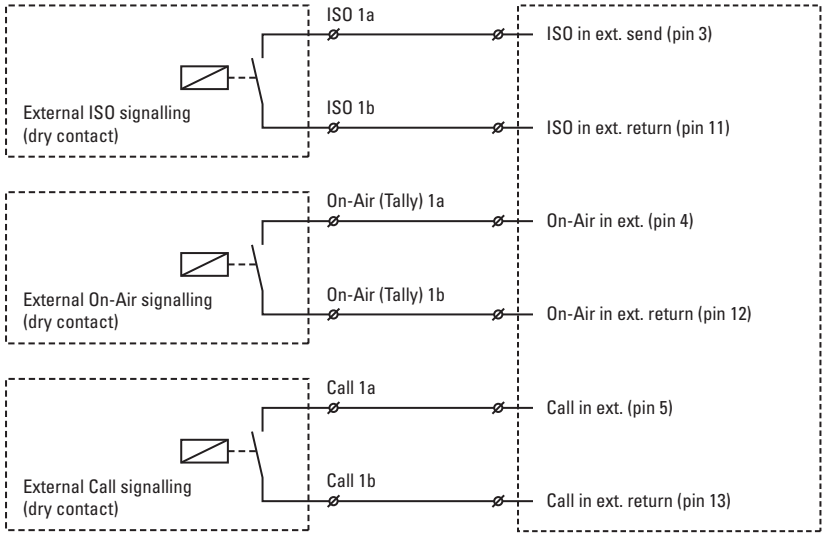


There are several connection methods for the ISO (On Air Yellow), On Air and Call signalling functions: **dry contact**, **common ground**, **voltage level** and **open circuit/voltage level.**

A selection in the `SYSTEM > SIGNALLING` menu allows you to make the activity state of the function (Active or Inactive) correspond to a particular input signal. There are two leads for each connection - Send and Return.

Signalling function	Send pin	Return pin
ISO	3	11
On Air	4	12
Call	2	10

Dry contact



☞ Note

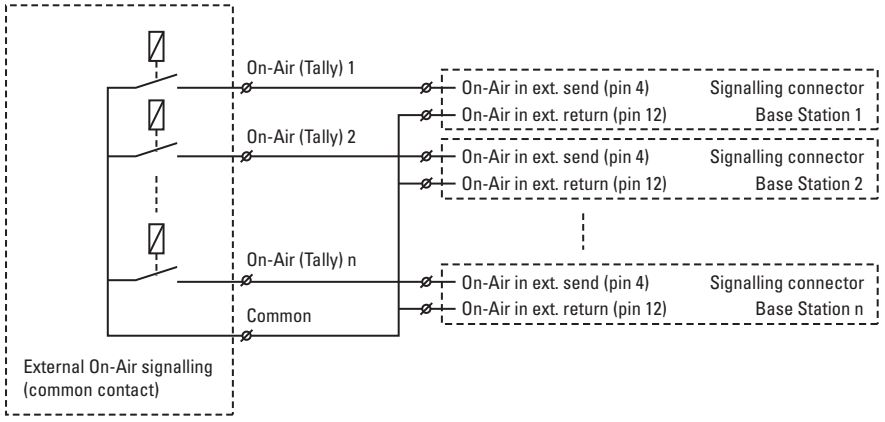
A common return (not ground!) can be used for all three functions (ISO, On Air and Call)

If a contact is closed, the corresponding function is Active or Inactive, depending on the selection the SYSTEM > SIGNALLING menu:

Menu setting	Input is shorted:	Input is open:
LH (low-high)	Function is Active	Function is Inactive
HL (high-low)	Function is Inactive	Function is Active

Dry contact with multiple base stations

This is an example of an On Air signalling with multiple base stations using a common contact.



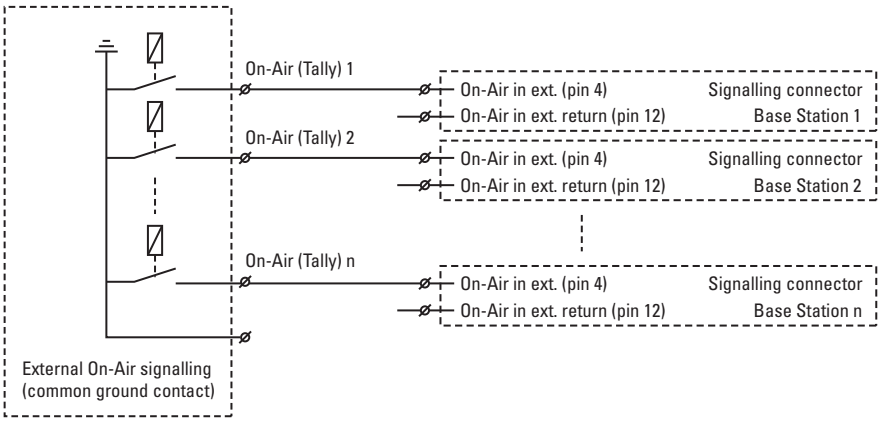
☞ Note

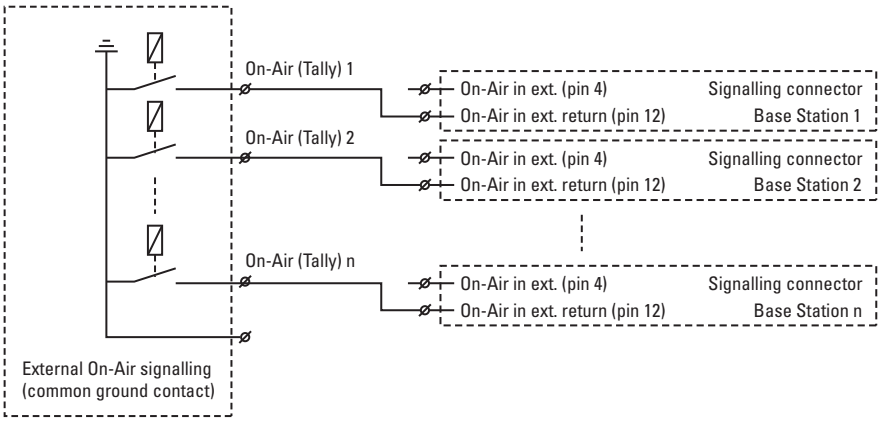
Use either Send or Return only, but do not mix.

If a contact is closed, the corresponding function is Active or Inactive, depending on the selection the SYSTEM > SIGNALLING menu:

Menu setting	Input is shorted:	Input is open:
LH (low-high)	Function is Active	Function is Inactive
HL (high-low)	Function is Inactive	Function is Active

Common ground





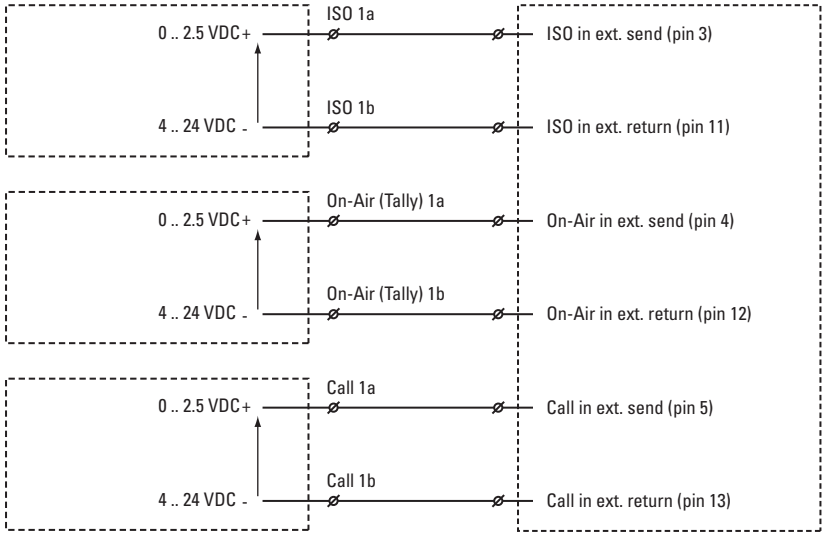
☞ Note

Ensure that a reliable ground coupling exists between the control device ground and the base station ground.

If a contact is closed, the corresponding function is Active or Inactive, depending on the selection the SYSTEM > SIGNALLING menu:

Menu setting	Input is shorted:	Input is open:
LH (low-high)	Function is Active	Function is Inactive
HL (high-low)	Function is Inactive	Function is Active

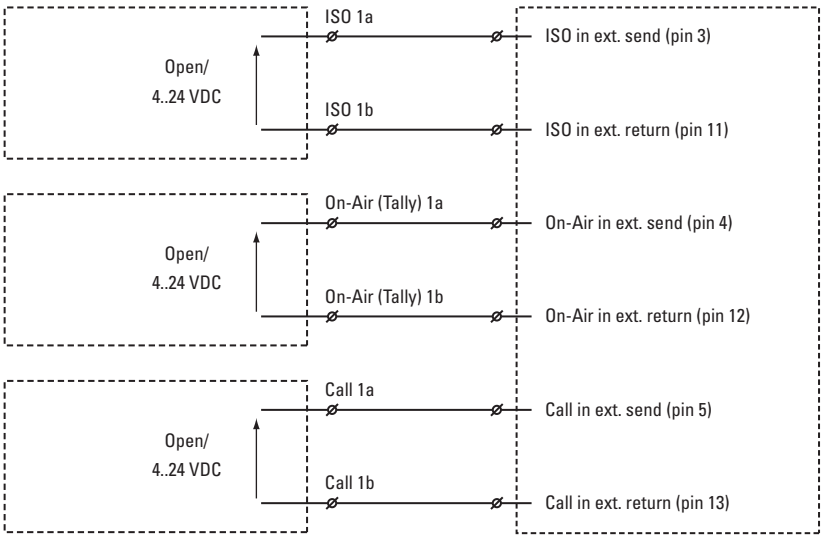
Voltage level



Apply a DC voltage to the inputs (respect polarity). If the voltage is low (0 to 2.5 V), the function is Active (or Inactive). If the voltage is high (4 to 24 V) the function is Inactive (or Active). The function state depends on the selection the SYSTEM > SIGNALLING menu:

Menu setting	Input is 0 to 2.5V:	Input is 4 to 24V:
LH (low-high)	Function is Active	Function is Inactive
HL (high-low)	Function is Inactive	Function is Active

Open circuit/Voltage level



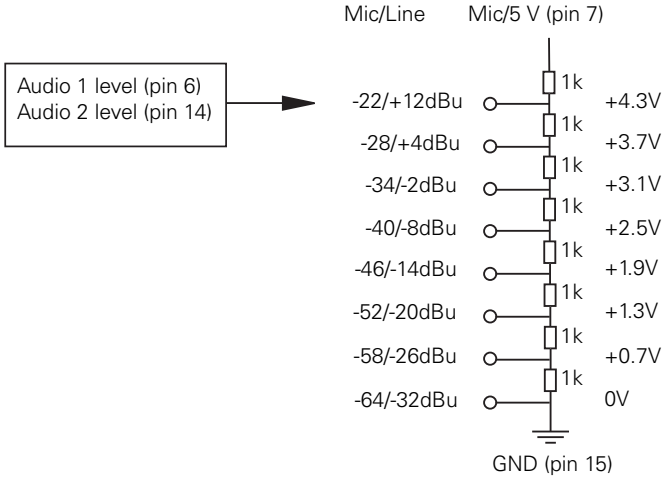
Leave the circuit open or apply a DC voltage to the inputs (respect polarity). If the circuit is open, the function is Active (or Inactive). If the voltage is high (4 to 24 V) the function is Inactive (or Active). The function state depends on the selection the `SYSTEM > SIGNALLING` menu:

Menu setting	Input is open:	Input is 4 to 24V:
OH (open-high)	Function is Active	Function is Inactive
HO (high-open)	Function is Inactive	Function is Active

2.1.4 External audio level control

The camera audio level for channel 1 and 2 can be externally controlled by the base station. In the camera menu, go to the INSTALL > AUDIO > AUDIO GAIN MODE item and select **Ext**.

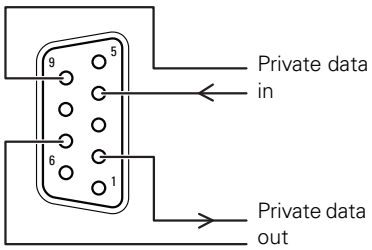
On the OCP, push the **SETUP** button and choose the Cam(era) submenu. Use the **NEXT** button to scroll to the REM AUDIO menu and select **Rem**. Apply a DC voltage to pins 6 and 14 of the signalling connector to control the levels of audio channels 1 and 2 respectively, as shown in the figure below:



The actual audio level depends on the setting of the selection switches at the back panel of the camera adapter. When Mic is selected, the maximum gain level is -64 dBu, while maximum Line level is -32 dBu.

2.1.5 Private data

Private data channels can be used for sending serial data via the transmission cable. For example, electronic scriptboard or character data for a video display unit or pan and tilt data can be transmitted to the camera.



Function	Value
Bitrate	max. 100 kbit/s
Output level (high)	> 4 V
Output level (low)	< 4 V
Output impedance	250 Ω
Input level (high)	> 2 V (max. 12 V)
Input level (low)	< 2 V
Input impedance	> 4.7 kΩ

Remember that the propagation-delay times are different for different cable lengths, especially if a return signal is involved. At maximum lengths the total delay is at least 25 µs and can be more than 30 µs depending on the type of cable. The duty cycle difference between input and output is max. 5%.

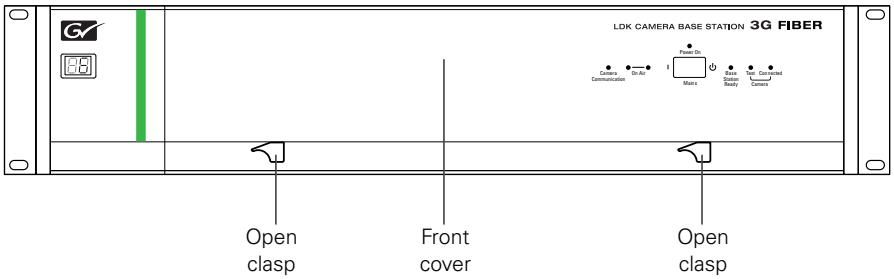
2.2 Base station menu

The base station can be set up using either:

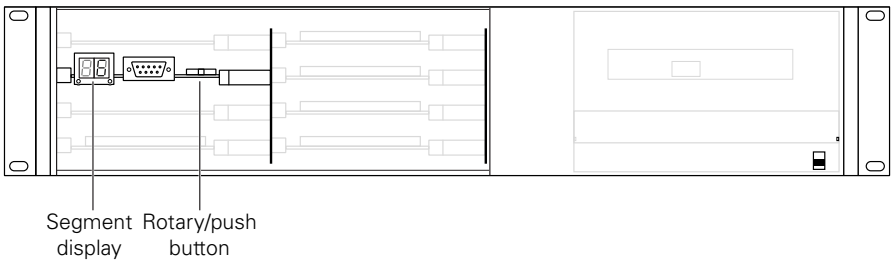
- The rotary/push button on the data board inside the base station or
- An Operation Control Panel (OCP) connected to the base station.

2.2.1 Using the rotary/push button

Push the two clasps at the bottom of the front cover upward and remove the front cover to access the inside:



Locate the rotary/push button on the data board at the left. Rock the button to the left or right to select the required item. The segment display shows the code of the selected item.



Note

When accessed from the base station, the user level is set to **Install**.

There are three items that can be selected:

Base station menu

When "NN" is displayed, push the rotary/push button twice to enter the base station menu. The rotary/push button can be used to navigate through the menu. The menu appears on the Monitoring and CVBS + Text outputs of the base station.

Camera number

When "CA" is displayed, push the rotary/push button to enter the selection mode. Rock the button to the left or right to select an available camera number. Push the rotary/push button again to confirm the new camera number. The base station automatically resets and the new camera number is shown in the display.

H-Phase adjustment

When "HP" is displayed, push the rotary/push button to enter the H-Phase adjustment mode. Rock the button to the left or right to shift the H-Phase. If you continue to rock the button, the shift change occurs in bigger steps. Push the rotary/push button again to leave the H-Phase adjustment mode.

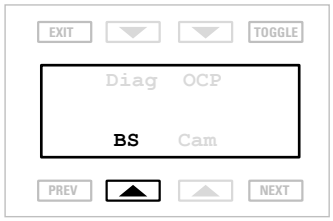
☞ Note

This item is only available when a reference signal is present.

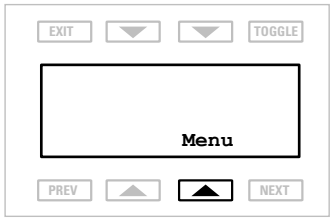
2.2.2 Using the OCP

The OCP can be used access the base station menu instead of the rotary/push button.

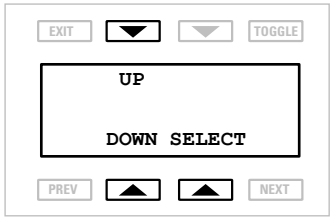
1. Push the **Setup** button on the OCP to open the menu.
2. Push the selection button to choose the BS menu.



3. Push the selection button enter the Menu



4. The menu appears on the Monitoring and CVBS + Text outputs of the base station. Use the appropriate selection buttons to navigate the menu. You can also use the rotary contol on the OCP to move up or down through the menu.



☞ Note

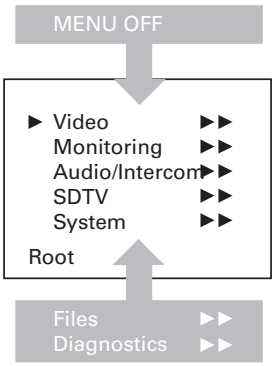
When accessed from the OCP, the user level is set to **Operator**.

2.2.3 Menu navigation

The base station menu is used for configuring the base station. As there are a large number of functions and set-up options available, it may require some time to become familiar with them all. The menu video signal is available on the Monitoring and CVBS+Text outputs.

Entering the menu

Use the rotary/push button at the front of the base station or the Operational Control Panel to access the base station menu. The functions of the base station are grouped into menus and sub-menus. When accessed, the main menu appears on the monitor.



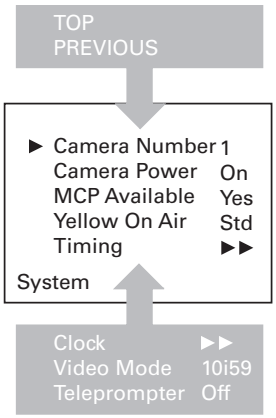
The main menu screen shows five items and the name of the menu. One or more item can be hidden but become visible when you scroll down. A cursor shows your position in the menu. The navigation buttons (rotary/push button or OCP buttons) move the cursor up and down.

Finding your way

Use navigation buttons to move the cursor through the menu items. If a double arrow (>>) is visible, then pressing the rotary/push button or the SELECT button brings you one level lower in the menu system. Only five items are visible in each menu. Scroll up or down to see more items.

When you first enter a menu (other than the main menu) the cursor is positioned next to the first item. The TOP and PREVIOUS entries are not immediately visible but are located above the first item. Use the control to scroll up to them.

- Select TOP to bring you back to the MAIN menu.
- Select PREVIOUS to go back to the menu that you were in before the current one.



The SYSTEM menu above shows the items displayed when you first enter the menu and the other items that are available by scrolling up or down.

Leaving the menu

If you are deep within the menu structure, follow these steps to leave:

- If necessary move the cursor to the left most column.
- Scroll upwards until the cursor points to TOP (this is the main menu).
- Press the rotary/push button or the SELECT button on the OCP. The cursor now points to the Menu off item of the MAIN menu.
- Press the rotary/push button or the SELECT button on the OCP to leave the system menu.

This is the recommended way of leaving the system menu. The menu system disappears after a few seconds when you stop navigating. This delay can be set in the `MONITORING > MENU` menu. However, when you enter the system menu again you enter at the last position of the cursor and not at the top of main menu. To prevent confusion the next time you enter the system menu, it is advisable to leave the system menu by returning to the main menu (TOP) and selecting MENU OFF.

Making changes

To find out where to change a function, consult "Base station menu" on page 47to find out under which menu group or subgroup the function is located. If the cursor points to an item (and there are no double arrows to indicate a sub-menu) then the item pointed to has a value. The value can be:

- a toggle value (only two values)
- a list value (more than two values)
- an analogue value (variable from 00 to 99)
- or unavailable (---).

If the value is unavailable it cannot be changed. This is indicated by three dashes (---). This can occur, for example, when a function is switched off. The analogue values associated with that function are then unavailable. If there are only two values associated with the function, then

pressing the rotary/push button toggles between these two values. If a value is displayed next to a function that is one of several possible values, then pressing the rotary/push button or the SELECT button on the OCP places the cursor in a list menu indicating the value currently selected. Use the rotary/push button or the SELECT button on the OCP to point to a new value.

Press the rotary/push button or the SELECT button on the OCP to return the cursor to the function list. If an analogue value is displayed next to a function name, then pressing the rotary/push button or the SELECT button on the OCP places the cursor in front of the value and the navigation control is used to change the analogue value. Press the rotary/push button or the SELECT button on the OCP to return the cursor to the function list.

Using Recall File to undo changes

If you make changes to the settings in the menu and you decide not to keep them, use the Recall File function to recall a standard or stored set of values for the parameters. These files are available in the FILES menu.

User levels

The menu items are divided into two user levels. The operator level (O) is default accessible. Menu items with user level Install (I) are only accessible if the menu level is set to **Install**. To enter the Install level proceed as follows:

1. Enter the menu.
2. Navigate to the `MONITORING` > `MENU` > `MENU LEVEL` item.
3. Set the Menu level to **Inst**.

The purpose of the user levels is to restrict the set of functions which can be changed by whoever is using the base station. In this way a the danger of the operator accidentally changing critical functions while shooting is reduced.

☞ Note

When accessed from the base station, the user level is set to **Install** while the user level is set to **Operator** when accessed from the OCP.

2.3 Intercom setup

The studio camera systems offer extensive intercom facilities between cameraman, tracker (floor man), base station and studio. To help you set up and operate the intercom system, the following controls are available:

- Base station menu system
- Camera head menu system
- Camera adapter rear panel
- Camera head switches

Tip

When setting up a system it is usually more convenient to use an OCP to select your preferences in both the base station and camera head menu systems.

2.3.1 Studio interface setup

A four-wire or a two-wire studio system can be connected to the base station. In the AUDIO > INTERCOM menu, select the Wire Mode for engineering (ENG), production (PROD) and programming (PROG) channels. By default these values are set to four-wire.

Isolate

The isolate function completely disconnects the base station intercom from the studio system. The function can be switched locally or remotely via the OCP.

Levels

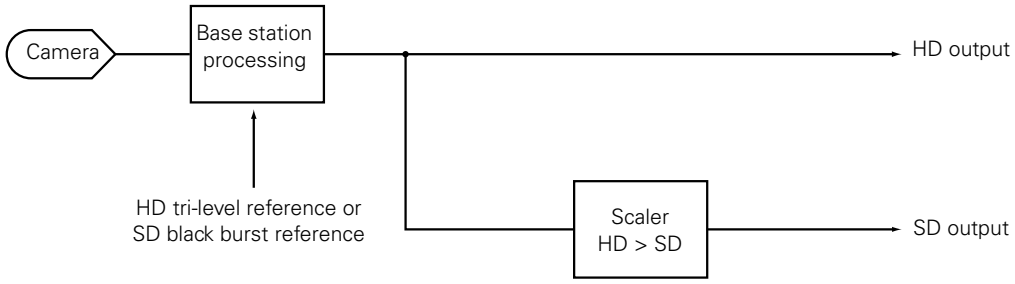
In the four-wire mode the menu gives you a choice of either a 0 dBu or a +6 dBu signal level. In the two-wire mode this level is set to 0 dBu.

- Set the input and output intercom levels for the PROD and ENG channels. The range is 0 to 99; default is 50.
- Set the input level for the PROG channel.
- Set the levels for the sidetone in a two-wire system in this menu.

2.4 Reference and timing set up

2.4.1 Basic signal processing

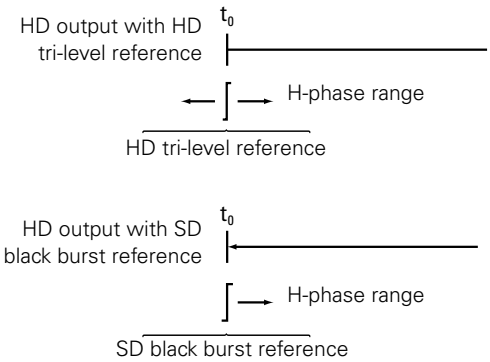
The base station can be synchronized using HD tri-level or SD black burst references. Both references can be adjusted to match the video output signals. This is an overview of the base station output signal paths:



The default settings for the base station reference signals are:

- The first reference is HD tri-level: the outputs are in time with the HD tri-level synchronization.
- The second reference is SD black burst: the outputs are in time with the SD black burst.

2.4.2 Adjustment procedure for HD timing



Tip

When HD tri-level reference is used, the HD output is in sync with the HD tri-level reference. A timing offset can be set with the SYSTEM > TIMING > H PHASE COARSE and H PHASE FINE items of the base station menu.

2.4.3 Adjustment procedure for SD timing

The SD output signal can be delayed using the following procedure:

1. Enter the base station menu in service mode:
   MONITORING > MENU > MENU LEVEL > INST > SERVICEMODE > EXEC > YES
2. After factory delivery there is a fixed minimum delay between HD and SD outputs:
   SDTV > TIMING > COMP
3. Set the SDTV timing to variable:
   SDTV > TIMING > VAR
4. Adjust the SD output delay using the following items:
   SDTV > TIMING > SYNC SHIFT PIXELS and SHIFT LINES

☞ Note

The adjustment must be carried out for each video mode. The last setting for each mode is memorized.

The CVBS viewing output is a non-standard output and the SD output delay adjustment does not apply to this output.

HD-trilevel sync does not contain 4-field (NTSC) or 8-field (PAL) sequence information and therefore will be random. If this is required black burst reference should be used.

Chapter 3

Camera adapter

3.1 Mounting

3.1.1 General

In general, a camera system is delivered with the camera head and camera adapter already attached. However, the dockable concept enables switching the transmission system by exchanging the camera adapter (and base station).

Caution

Be extremely careful with the connectors between the camera head and the adapter. Do not allow the metal guide pins to damage the pins of the connector.

Follow the indicated steps in the exact order given below. Tightening or loosening the screws in the wrong order could result in mechanical damage to the camera and adapter.

Exchange the adapter in a safe area, preferably indoors. Make sure your working area is clean and dust free.

3.1.2 Detaching

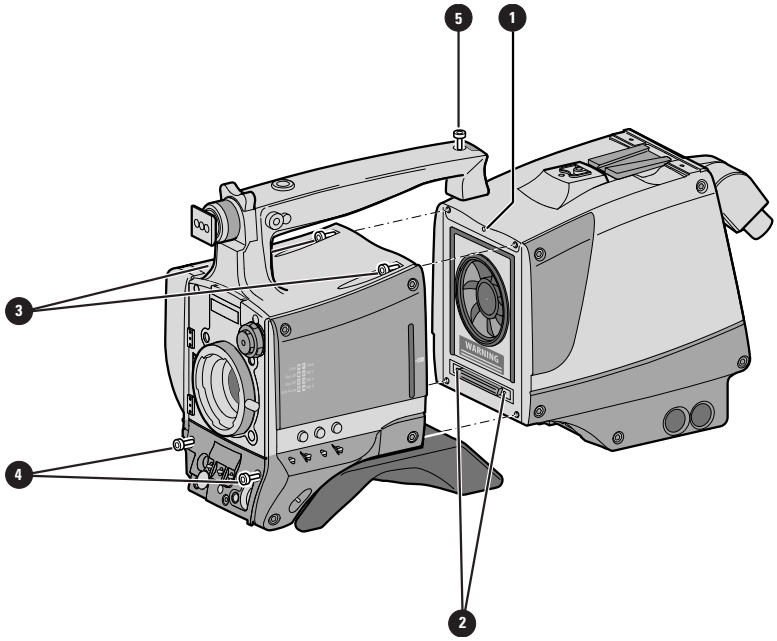
To detach the adapter from the camera head proceed as follows:

1. Unscrew the vertical screw (5) in the handgrip of the camera head.
2. Unscrew the two horizontal screws (4) at the front of the camera head.
3. Unscrew the two horizontal screws (3) at the top of the camera head.
4. Carefully disconnect the adapter from the camera head.

3.1.3 Attaching

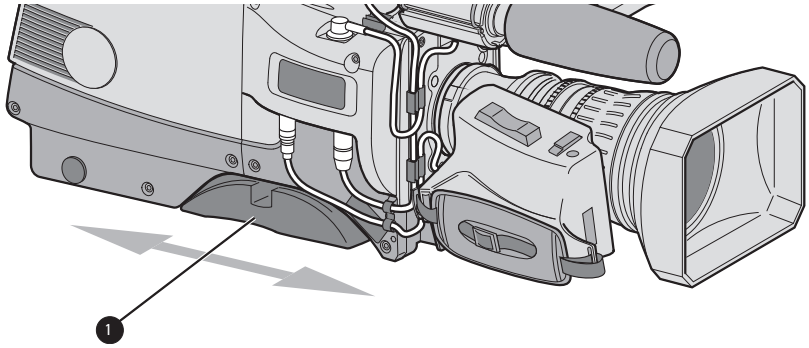
To attach the adapter to the camera head proceed as follows:

1. Fit the guide pin at the top rear of the camera head and the guide pins on either side of the camera connector into the corresponding slots (1 and 2) of the adapter.
2. First, tighten the two horizontal screws (3) on the top of the camera head.
3. Next, tighten the two horizontal screws (4) at the front of the camera head.
4. Lastly, tighten the vertical screw (5) in the handgrip of the camera head.



3.1.4 Adjusting the shoulder pad

To change the position the shoulder pad press and hold lever (1). The shoulder pad can now be moved backwards and forwards along the axis of the camera.

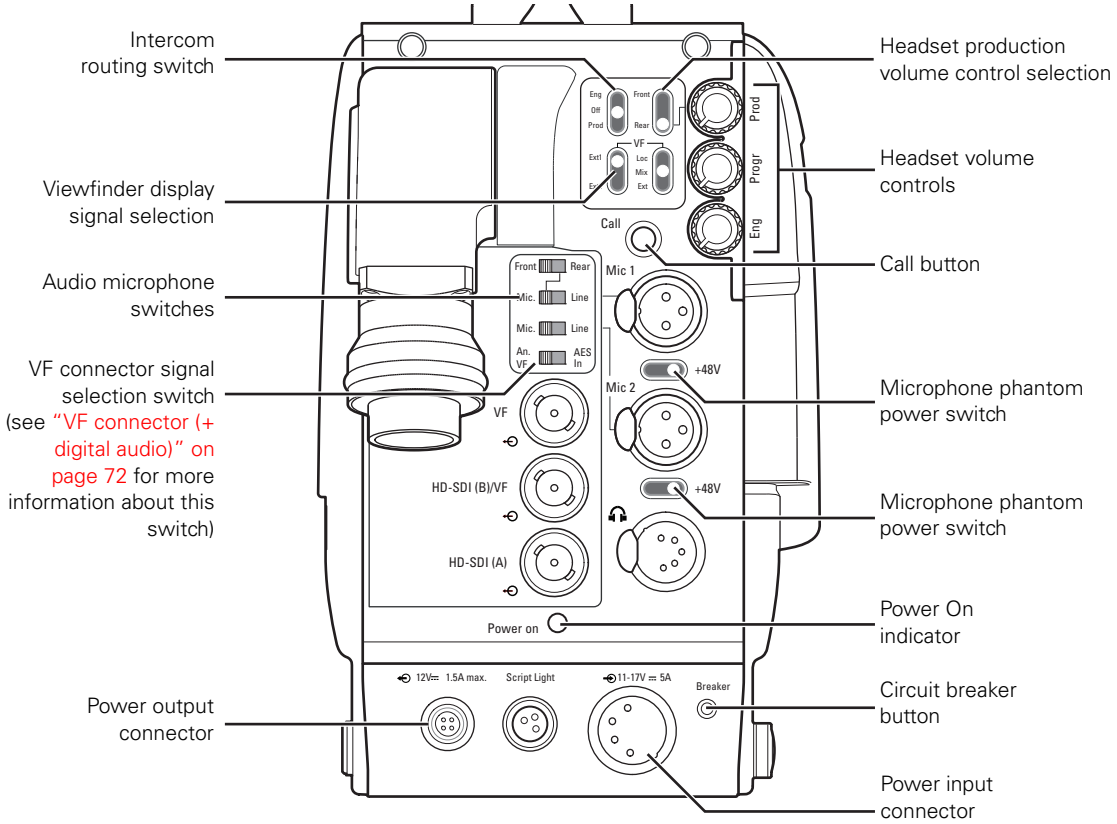


Tip

Adjust the shoulder pad when all units are mounted to get the best balanced shoulder position.

3.2 Controls and indicators

3.2.1 Overview



3.2.2 Power

The power supply for the camera and its adapter is normally supplied via the transmission cable coming 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 transmission cable, an output power socket supplies 12 VDC, 1.5 A maximum for powering accessories.

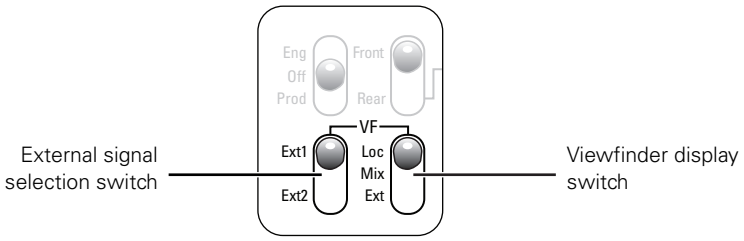
It is also possible to operate the camera without a transmission cable by supplying a 12 VDC supply to the DC input socket. The BATT indicator in the viewfinder lights if the camera supply voltage is less than 11.5 VDC when using an external supply.

If excessive current flows in the camera or adapter, the circuit breaker trips and shuts off power to all the units. If this happens check the units for faults and if necessary take corrective actions before pressing the circuit breaker button to reset the power.

3.2.3 Selecting monitoring signals

Viewfinder display signal

The viewfinder can display local (from camera) or external (from base station) video. Two switches at the back of the adapter determine the signal that is displayed in the viewfinder.



The viewfinder display switch determines how the local and external signals are displayed in the viewfinder:

- Loc: displays the local signal (Y only) in the viewfinder,
- Mix: displays a mix (-½A + ½B) of the local (Y only) and external signal or
- Ext: displays the external signal in the viewfinder

When the viewfinder display switch is set to **Mix** or **Ext**, the external signal selection switch determines which external (return) video signal from the base station is displayed in the viewfinder:

- Ext1: displays external signal Ext1 or
- Ext2: displays external signal Ext2 or Ext3.

Go to the `INSTALL` > `BUTTONS` > `EXT2 ASSIGN` menu and select Ext3 to use the Ext3 channel instead of Ext2.

3.2.4 Using audio

Analog audio channels

Set the gain levels (-22 to -64 dB) for these channels in the `AUDIO` section of the `INSTALL` menu. A high-pass filter for each channel can also be switched on via this menu.

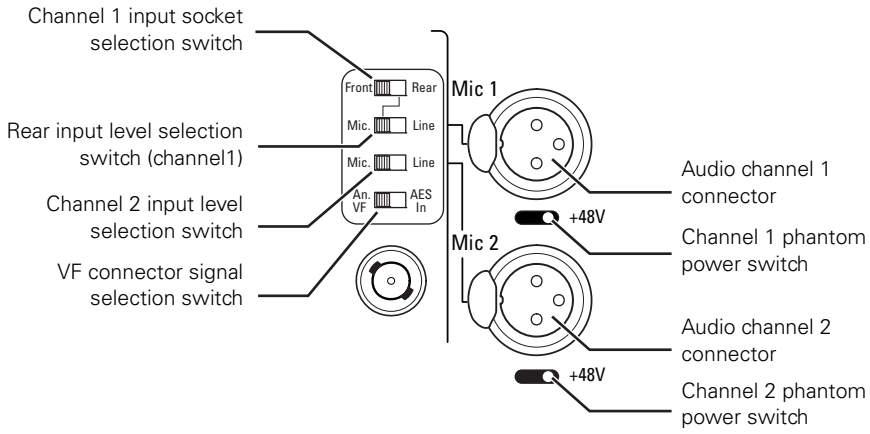
The channel 1 input socket selection switch selects either:

- the socket at the front-right of the camera, or
- the **Mic 1** audio channel 1 connector at the rear of the adapter

as the input for channel 1.

The rear input level switch selects either a line level input or a microphone level input for the channel 1 rear connector. The line level input sensitivity is 32 dB lower than the microphone input sensitivity.

The switch under the **Mic 1** socket selects a phantom power supply (48 V) for the rear socket. Phantom power (48 V) is always present on the front-right microphone socket.



The channel 2 rear input level switch selects either a line level input or a microphone level input for the channel 2 rear connector (**Mic 2**). The switch under the **Mic 2** socket selects a phantom power supply (+48 V) for the rear socket.

Audio channels 1 and 2 are available on the **audio output 1 and 2** connectors (XLR-3) at the base station and as digital outputs on the **digital audio output (1+2)** connector (BNC) at the base station. They are also embedded as audio channels 1 and 2 in the HD-SDI video signal.

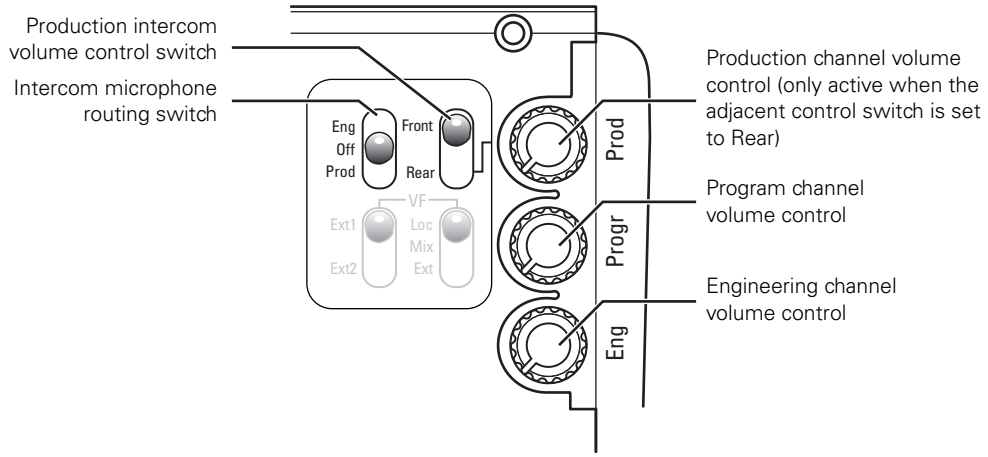
Digital audio channels

Two AES/EBU digital audio channels are available. Set the VF connector signal selection switch to **AES In** and connect a digital audio source to the VF connector.

Digital audio channels 3 and 4 are available on the **digital audio output (3+4)** connector (BNC) at the base station and as embedded audio channels 3 and 4 in the HD-SDI video signal.

3.2.5 Intercom

Three intercom channels – production (Prod), program (Prog) and engineering (Eng) – are sent from the base station to the camera operator's headset. The camera operator's intercom microphone signal is sent back to the base station. Routing and volume controls for the intercom can be found on the back of the adapter:



Production intercom volume control switch

Use this 2-position switch to control the volume of the production signal in the intercom either at the front of the camera or at the rear of the adapter.

Intercom microphone routing switch

This 3-position switch routes the camera operator's intercom microphone signal to Engineering (Eng position, latched) or production (Prod position, momentary), or turns it off (mid-position).

The VTR Start button at the front of the camera or the VTR button on the lens can be assigned to send the intercom signal to Production or Engineering, regardless of the position of this switch. Go to the INSTALL > BUTTONS > VTR START item and select PROD or ENG.

Intercom headset volume controls

- Prod - adjusts the volume of the production signal to the camera headset when selection switch is in the Rear position.
- Prog - adjusts the volume of the programme signal to the camera headset.
- Eng - adjusts the volume of the engineering intercom signal to the camera headset.

The INTERCOM section of the INSTALL menu contains various settings for all these channels. Signals for left and right headset muffs and sidetone levels can be selected. Intercom microphone amplification levels, phantom power supply and microphone on/off switches are also available in this menu.

Tracker intercom

A tracker can connect a headset to the side of the adapter to receive the intercom channels from the base station and the camera operator's microphone signal. The tracker's microphone signal is passed to the camera operator and to the base station.

3.2.6 Communication

Call button

Press this momentary button to send a signal to the control panels calling for attention. The ND/RE indicator in the viewfinder shows when a call signal is sent or received.

The call button can also be used to playback a voice mail message that has been recorded in the base station. Press once to start playback; press again to stop.

Data channel

The Aux connector on the side of the adapter provides analog control signals and allows for the connection of a two-way private data channel between camera and base station.

Tracker tally signal

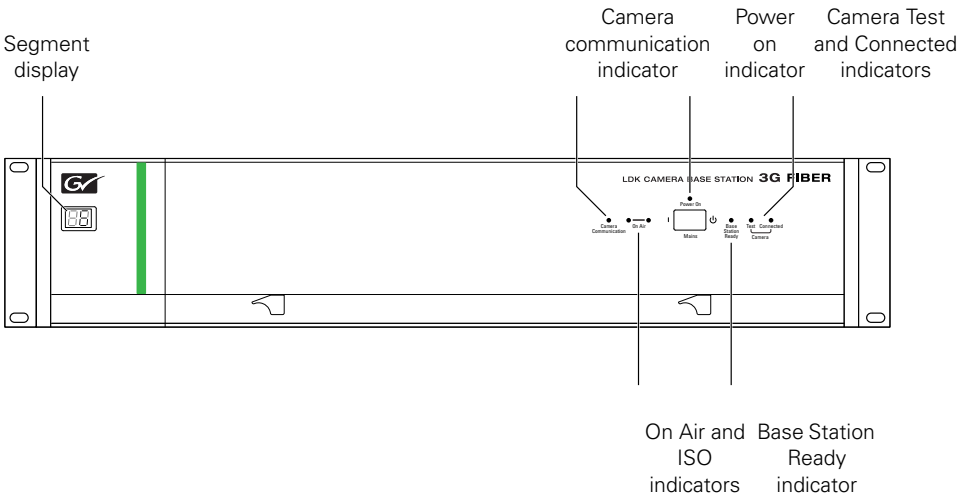
The tracker connector on the side of the adapter, as well as providing full intercom facilities for the dolly or crane driver, also carries a tally signal and a 12 VDC power supply. This allows an external On Air lamp to be used.

Chapter 4

Transmission

4.1 Base station indicators

During setup and operation transmission can be monitored on the base station. There are several display and indicators that provide information about operational functions.



Segment display

In normal operation the segment display shows the logical number of the camera connected to the base station. When the base station menu is accessed the display shows menu items.

Power On indicator

This green indicator lights when the base station is switched on.

Camera Communication indicator

This green indicator lights when communication between camera and base station is established and working correctly.

On Air and ISO indicators

The red On Air indicator lights when the connected camera is switched On Air. The yellow ISO indicator lights when the connected camera is in ISO mode.

Base station Ready indicator

This green indicator lights when the base station is operationally ready.

Camera Test indicator

This bi-color indicator lights red or yellow to indicate the camera and transmission status. Refer to the table below for an explanation.

Camera Connected indicator

This green indicator lights when the camera is connected (and camera power is not switched off by the OCP, MCP or base station menu).

Camera Connected ind.	Camera Test indicator	Description or fault condition
Green flashing	Off	Transmission cable is connected to camera.
Green	Off	Transmission cable is connected to camera and camera is powered.
Off	Red flashing	Transmission cable open.[1)]
Off	Red	Transmission cable error: shortcircuit or wrong power system.[2)]
Off	Yellow	Camera power is switched off by a control panel or from a menu.
Off	Yellow	Power shutdown sequence in progress
Off	On	Selftests are running

Other indications of these situations:

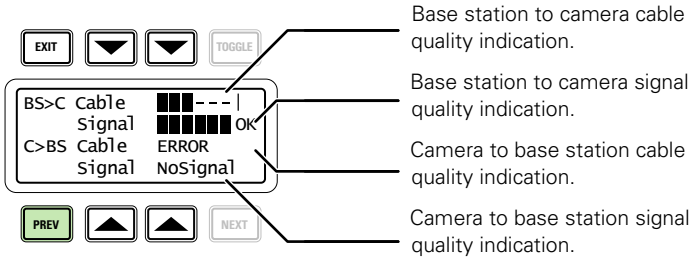
[1)] OCP: Cable LED flashes red; MCP: `DIAGNOSE > – OPEN`; Base station menu: `DIAGNOSTICS > COMMUNICATIONS > CAMERA CONNECTED – NO`

[2)] OCP: Cable LED red (continuously); MCP: `DIAGNOSE > – SHORT;` Base station menu: `DIAGNOSTICS > BOARD DIAGNOSTICS > POWER BOARD > STATUS`

4.2 Transmission diagnostics

4.2.1 Monitoring transmission

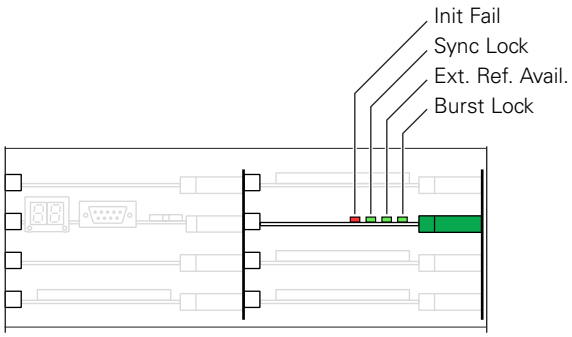
A connected Operational Control Panel can be used to monitor the transmission between camera and base station.



Indication	Description
▮▮▮▮▮ OK	Cable or signal quality is OK
▮▮▮--- |	Cable or signal quality is below optimum, transmission is still in operation. The quality level can vary between 6 (high) and 0 (low) units.
------ |	Cable or signal quality is poor. Check cables or transmission.
ERROR	Cable error: check cable for interruptions, broken or dirty optical connections.
NoSignal	No signal is received: Check transmission.

4.2.2 Sync/encoder HD board diagnostics

The LEDs on the sync/encoder HD board show the status of the board and the signal locking as follows:

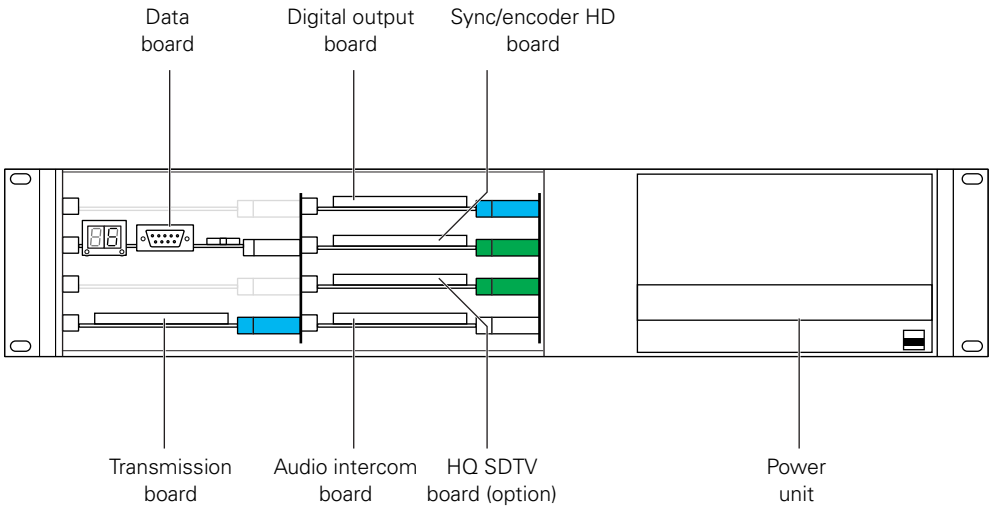


Indicator	Description
Init. Fail	Lights (red) when a configuration or initialisation error occurs or when the bus clock or video synchronization pulses are missing.
Sync Lock	Lights (green) when horizontal and vertical lock are OK.

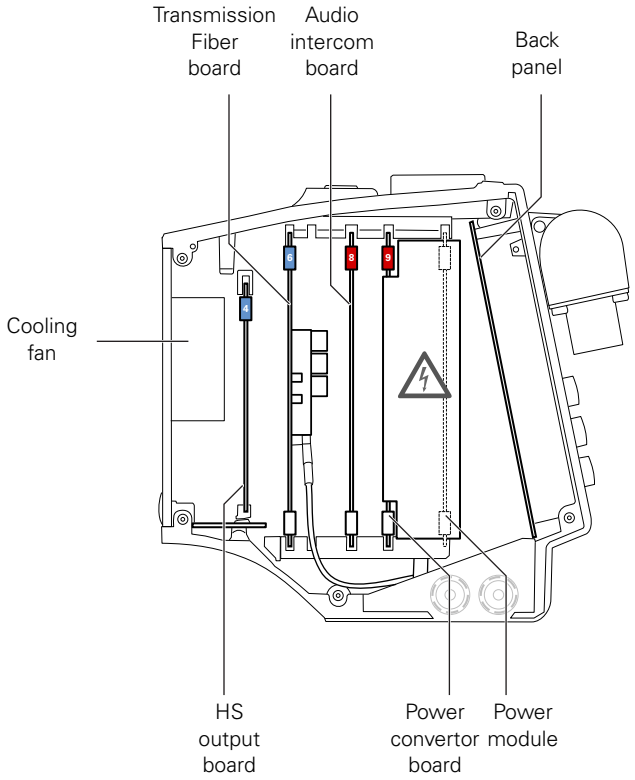
Indicator	Description
Ext. Ref. Avail.	Lights (green) when an external synchronization signal is present.
Burst Lock	Lights (green) when the subcarrier/H-phase lock is OK.

4.3 Board locations

4.3.1 Base station board locations



4.3.2 Camera adapter board locations



4.4 Replacements

4.4.1 Replacing base station fuses

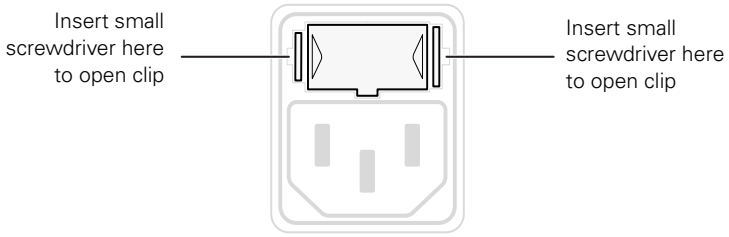
Caution

Switch off the base station and disconnect power cables before proceeding.

Caution

Use only fuses of the type and rating specified. Always replace both fuses at the same time.

The base station is equipped with 2x 8 AT type 250 V fuses . They are located in the mains entry of the power supply unit at the back of the base station. Follow these steps to replace the fuses:

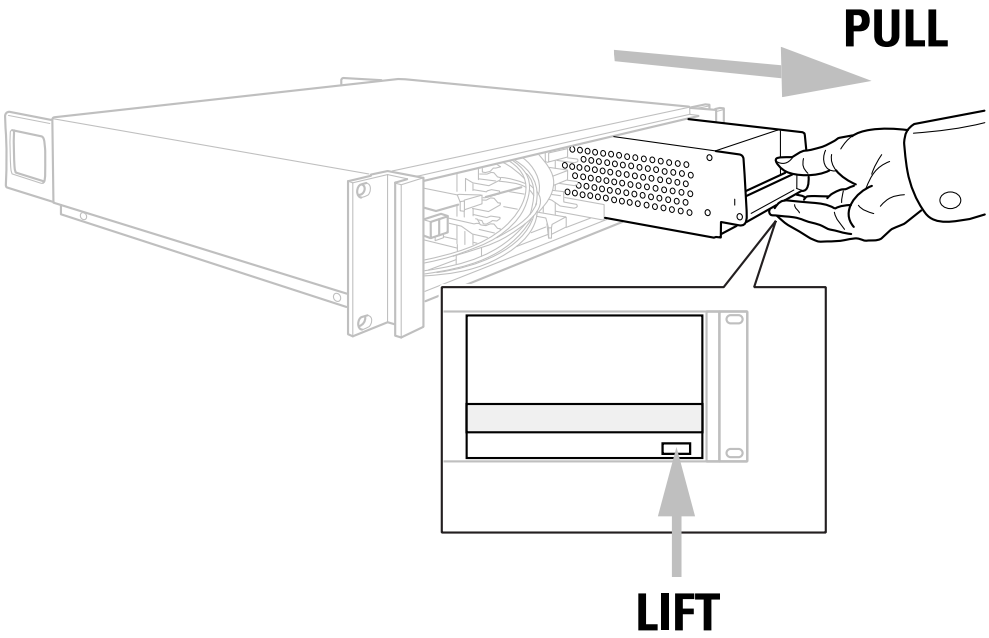


1. Insert a very small screwdriver into the hole at the left side and then at the right side of the fuseholder to unclip both side of the fuseholder.
2. Extract the fuseholder from the mains entry by pulling of the small clip at the bottom of the fuseholder.
3. Replace both fuses.
4. Insert the fuseholder until it clicks into place.
5. Connect the power supply for the base station to the IEC connector at the rear.

4.4.2 Replacing base station power supply unit

To remove the power unit from the base station, proceed as follows:

1. Make sure that the base station is switched off and disconnected from the mains.
2. Remove the screw at the rear of the power unit.
3. Push the two clasps at the bottom of the front cover to the left and remove the front cover.
4. Grasp the metal horizontal bar and at the same time tilt the lever (indicated by the arrow below) and pull out the power unit.



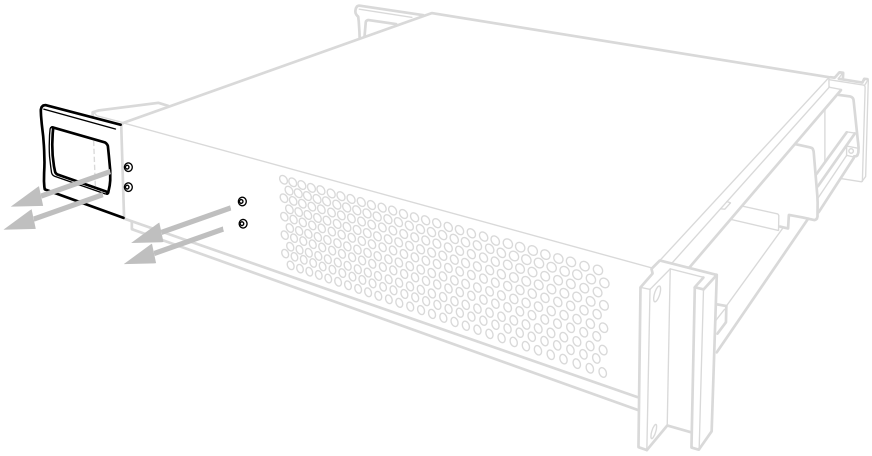
To reinstall the power unit into the base station, proceed as follows:

1. Slide the power unit into the guides and tilt the lever at the bottom right side of the power unit.
2. Push in the power unit and release the lever. Make sure that the power unit is correctly locked.
3. Tighten the screw at the rear of the power unit. Replace the front cover and click it into place.

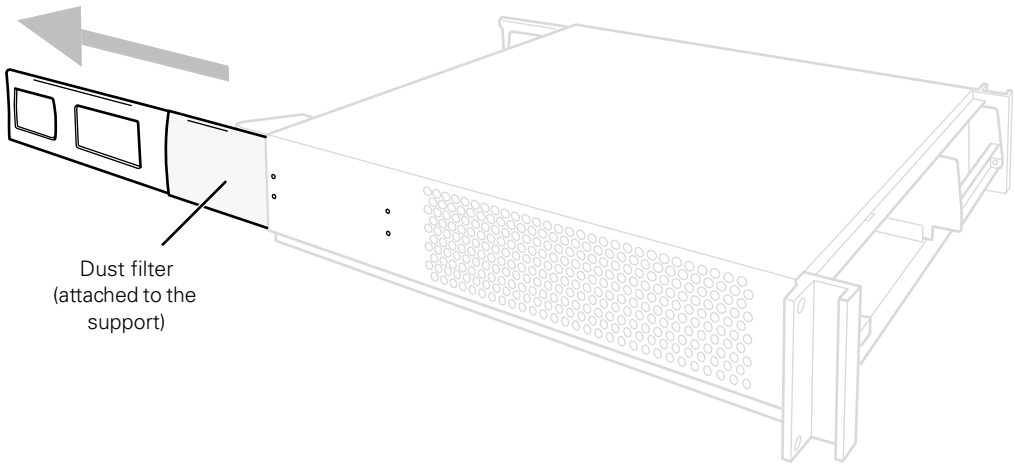
4.4.3 Replacing base station air filter

The air filter of the base station is located inside the side panel of the casing. When the air filter is dirty, it needs to be replaced. Contact your local Grass Valley representative to purchase a replacement air filter. Follow the steps below to replace the filter:

1. Remove four screws from the left side panel.



2. Pull out the bracket from the base station casing. The air filter is attached to the bracket.



3. Unhook and remove the filter.
4. Attach a clean air filter to the bracket.
5. Slide the bracket together with the filter back into the base station.
6. Fix the support with four screws.

Chapter 5

Menus

5.1 Base station menu

The structure of the main menus and their submenus are shown on the following pages. The first column shows the user level: Install ("I") or Operator ("O"). You only see menu functions whose user level is equal to or less than the user level set on your unit. Where appropriate, the default value of the function in the standard factory file is shown after the function.

All items in the table are visible at the install user level. However, if an item is not relevant it is not shown.

The *Oper* in the Level column indicates that this item is visible at the Operator user level; the *Inst*all indicates that this item is visible at the Install user level.

The *Scene* in the File column indicates that the value of this item is stored in the Scene file; the *Sys* indicates that the value of this item is stored in the System file; the *Oper* indicates that the value of this item is stored in the Operator file.

In the Values column, the default values of the item are shown in **bold**.

5.1.1 Top level

Menu	Description
Video	Contains those functions which affect the picture quality.
Monitoring	Contains those functions which determine how items in the video monitor are displayed.
Audio/Intercom	Contains those functions which control various aspects of audio and intercom.
SDTV	Settings related to the SDTV outputs of the base station (only available when the optional LDK 4531/30 High Quality SD board is installed).
System	Contains functions that are used to set up the general configuration and for carrying out adjustments and calibrations of the base station.
Files	This menu allows values to be stored in system and operator files, and allows these files to be recalled as required.
Diagnostics	is designed to provide information on the current status of the base station.

5.1.2 Video menu

Menu item		Values	Description	Level	File
Colour Bar					
	Colour Bar	On, **Off**	Turns color bar on or off (when no camera signal is present/detected)	Oper	Scene
	Colour bar type	**SMPTE-219**, SMPTE, Full	Selects the color bar type.	Install	Sys

5.1.3 Monitoring menu

Menu item	Values	Description	Level	File
Monitoring source	R, G, B, **Y**	Selects signal on monitoring HDTV analog output.	Oper	Scene
Menu				
Display	On, **Time**	Selects the menu display to be permanently on (visible) or to disappear after a set time.	Oper	Oper
Menu Time	5..99 **(10)**	Sets the length of time the menu is displayed when the Display mode is set to Time.	Oper	Oper
Menu Level	**Oper**, Inst, (Serv)	Sets the user access level for the menu.	Oper	-
Service Mode	Exec > Are your sure?	Enters the service access level.	Oper	-
Status bar				
Studio				
Studio	On, **Off**	Displays the studio name in the status bar.	Oper	Oper
Name	<studio name>	Edit the studio name string value.	Oper	-
Operator				
Studio	On, **Off**	Displays the operator's name in the status bar.	Oper	Oper
Name	<operator name>	Edit the operator's name string value.	Oper	-
Camera Number	On, **Off**	Displays the camera number in the status bar.	Oper	Oper
Cable Length	**Off**, Perc, Lngth	Displays the cable length in percentage used or length left.	Oper	Oper
HD Out Text				
Warning Y-pos	1..14 **(14)**	Sets vertical level (in lines) for the warning messages on the text output(s).	Install	-
CamName Y-pos	1..14 **(1)**	Sets vertical level (in lines) for the camera name on the text output(s).	Install	-

5.1.4 Audio/intercom menu

Menu item			Values	Description	Level	File
Audio						
	Audio Level 1		0dB, **6dB**	Selects studio audio attenuation for input 1.	Install	Sys
	Audio Level 2		0dB, **6dB**	Selects studio audio attenuation for input 2.	Install	Sys
Intercom						
	Isolate					
		Source	**Local**, Rmote	Local = settings are available in the base station menu; Rmote = settings are available in the MCP	Oper	Oper
		Isolate	Isol, **Syst**	Isol = Isolate Program and Production intercom from camera head; Syst = isolate is off	Install	Install
	Eng					
		Wire Mode	2wire, **4wire**	Selects studio intercom wiring mode for Engineering intercom channel,	Install	Sys
		Side Tone	0..99 **(50)**	Sets side tone (feedback) volume level.	Oper	Oper
		Level	0dB, **6dB**	Selects intercom channel attenuation.	Oper	Oper
		In Ref Level	0..99 **(50)**	Sets input reference level.	Install	Sys
		Out Ref Level	0..99 **(50)**	Sets output reference level.	Install	Oper
	Prod					
		Wire Mode	2wire, **4wire**	Selects studio intercom wiring mode for Production intercom channel.	Install	Sys
		Side Tone	0..99 **(50)**	Sets side tone (feedback) volume level.	Oper	Oper
		Level	0dB, **6dB**	Selects intercom channel attenuation.	Oper	Oper
		In Ref Level	0..99 **(50)**	Sets input reference level.	Install	Sys
		Out Ref Level	0..99 **(50)**	Sets output reference level.	Install	Oper
	Prog					
		Wire Mode	2wire, **4wire**	Selects studio intercom wiring mode for Programme intercom channel.	Install	Sys
		Level	0dB, **6dB**	Selects intercom channel attenuation.	Oper	Oper
		In Ref Level	0..99 **(50)**	Sets input reference level.	Install	Sys
	Call		**Call**, Voice	Selects funtion of Call action: Call or Voice Mail.	Oper	Oper
	Voice Mail					
		Record Eng	**On**, Off	When turned on, intercom messages from the Engineering channel are recorded.	Oper	Oper
		Record Prod	**On**, Off	When turned on, intercom messages from the Production channel are recorded.	Oper	Oper
		Record Prog	**On**, Off	When turned on, intercom messages from the Program channel are recorded.	Oper	Oper

5.1.5 SDTV menu

☞ Note

This menu is only available when the optional LDK 4531/30 High Quality SD board is installed.

Menu item		Values	Description	Level	File
Contour					
	Contour	**On**, Off	Turns contour on or off.	Oper	Scene
	Source	G, R, **Y**, R+G	Selects the source to be used for contour generation.	Oper	Scene
	Level	0..99 **(10)**	Sets contour level.	Oper	Scene
	Vertical Level	0..99 **(50)**	Sets the level of the vertical component in the contour signal.	Oper	Scene
	Noise Slicer	0..99 **(6)**	Sets the level of the noise slicer.	Oper	Scene
	Coarse/fine	0..99 **(25)**	Sets the coarseness of the contour (0 = very fine)	Oper	Scene
	Level Dependence	0..99 **(25)**	Sets the dependency level for the noise slicer.	Oper	Scene
	Soft Contour	**On**, Off	Turns soft contour on or off. This function reduces the amount of contour added for large transitions.	Oper	Scene
	Soft Contour Level	0..99 **(70)**	Sets the upper limit level for soft contour.	Oper	Scene
Video Output		GRB, YPrPb, **CVBS**, Off	Select signal type for the SD video outputs.	Install	Scene
Aspect Ratio		**16:9**, 4:3	Selects aspect ratio for SD signal.	Install	
Letterbox		**Off**, 16:9	Selects letterbox function (only when aspect ratio = 4:3)	Install	

5.1.6 System menu

Menu item	Values	Description	Level	File
Cable				
% of max. Spec. Att.	0..255 **(100)**	Displays the percentage of Triax cable attenuation that is occuring with respect to the maximum specified value.	Oper	
Remaining Length (mtr)	0..5000 **(5)**	Displays the length of Triax cable that still can be attached (in meters).	Oper	
Camera Comm				
CamComm.Mode	**Auto**, Manual		Install	
CamComm. Type	Serial, GSC		Install	
Camera Number	1..99 (**99**)	Selects the camera number.	Oper	
IP Address				
IP Config Mode	Man, **Auto**	Selects manual or automatic IP configuration mode.	Oper	
BS IP digit 1	1..250 **(69)**	Selects IP address digit 1 (for manual IP configuration mode.)	Oper	
BS IP digit 2	0..255 (**254**)	Selects IP address digit 2 (for manual IP configuration mode.)	Oper	
BS IP digit 3	0..255 (**1**)	Selects IP address digit 3 (for manual IP configuration mode.)	Oper	
BS IP digit 4	1..254 (**1**)	Selects IP address digit 4 (for manual IP configuration mode.)	Oper	
CAM IP digit 1	1..250 **(69)**	Selects IP address digit 1 (for manual IP configuration mode.)	Oper	
CAM IP digit 2	0..255 (**254**)	Selects IP address digit 2 (for manual IP configuration mode.)	Oper	
CAM IP digit 3	0..255 (**1**)	Selects IP address digit 3 (for manual IP configuration mode.)	Oper	
CAM IP digit 4	1..254 (**1**)	Selects IP address digit 4 (for manual IP configuration mode.)	Oper	
Subnet Mask	0..31 (**24**)	Selects the subnet mask value (for manual IP configuration mode.)	Oper	
Apply IP Settings	**exec** > busy > exec	Apply Exec to apply the new manually set IP settings.	Oper	
Ethernet				
Ethernet Speeds	10Mb, 100Mb, **Auto**	Selects the Ethernet network speed.	Install	
Ethernet Duplex	Half, Full, **Auto**	Selects the Ethernet duplex mode.	Install	
Serial				
Serial Speed	9600, 19200, 38400, 57600, **115200**	Selects speed of the serial connection.	Install	
Serial Compress	On, **Off**	Turns data compression over the serial connection on or off.	Install	
Camera power	**On**, Off	Turns the power the camera on or off	Oper	Oper
Control Mode	**C2IP**, Serial	Selects control network mode.	Install	

Menu item	Values	Description	Level	File
No Signal	**Col.Bar**, Black	Selects the type of video signal the base station generates when no camera signal is present/detected: Col.Bar = Color bar is generated Black = Black video signal is generated	Oper	-
MCP Available	Yes, No			
Signalling inputs				
Yellow On Air	**Standard**, Independent	Standard: use to switch off the yellow On Air signal (ISO) when a red On Air tally signal is active. Independent: use to leave the yellow On Air signal (ISO) unchanged when a red On Air tally signal is active.	Oper	
Yellow On/Off	**Low/High**, High/Low, Open/High, High/Open	Selects switching behaviour for the yellow On Air (ISO) signalling inputs.	Oper	
On Air On/Off	**Low/High**, High/Low, Open/High, High/Open	Selects switching behaviour for the red On Air (Tally) signalling inputs.	Oper	
Timing				
H Phase Coarse	0..99 (**50**)	Sets horizontal phase (coarse adjustment)	Oper	Sys
H Phase Fine	0..99 (**50**)	Sets horizontal phase (fine adjustment)	Oper	Sys
Teleprompter	**On**, Off	Turns teleprompter channel on or off.	Install	Sys
OCP Contour mode	**SDTV**, HDTV	Selects type of contour that is controlled by the OCP.	Install	Sys

5.1.7 Files menu

Menu item	Values	Description	Level	File
User Operator Files				
Operator File	**O_BS1**, O_BS2, O_BS3, O_BS4	Selects Operator file to use.	Oper	
Recall	**exec** > run > exec	Recalls selected Operator file.	Oper	
Store	**exec** > run > exec	Stores selected Operator file.	Install	
Std Operator Files				
Operator File	**Cust**, Fact	Selects standard Operator file to use: Cust(omer) or Fact(ory).	Install	
Recall	**exec** > run > exec	Recalls selected standard Operator file.	Install	
Store	**exec** > run > exec	Stores selected standard Operator file.	Install	
User System Files				
System File	**S_BS1**, S_BS2, S_BS3, S_BS4	Selects System file to use.	Install	
Recall	**exec** > run > exec	Recalls selected System file.	Install	
Store	**exec** > run > exec	Stores selected System file.	Install	
Std. System Files				
System File	**Cust**, Fact	Selects standard system file to use: Cust(omer) or Fact(ory).	Install	
Recall	**exec** > run > exec	Recalls selected standard system file.	Install	
Store	**exec** > run > exec	Stores selected standard system file.	Install	

5.1.8 Diagnostics menu

Menu item			Values	Description	Level	File
Camera Type			<camera type>	Identifies camera type (e.g. LDK 8000)	Oper	
BS Type			<Base Station type>	Identifies base station type (e.g. LDK 4400)	Oper	
BS Package						
	Package		**Ok**, NotOK	Displays package status	Oper	
	Package 12NC		5973	Displays 12NC	Oper	
	Package version		<version>	Displays package version	Oper	
Board ID						
	Data Board		<12nc>, <status>,<date>	Displays 12nc, status and production date.	Oper	
	Sync/Enc Board		<12nc>, <status>,<date>	Displays 12nc, status and production date.	Oper	
	Digital output Board		<12nc>, <status>,<date>	Displays 12nc, status and production date.	Oper	
	HQ SDTV output Board		<12nc>, <status>,<date>	Displays 12nc, status and production date. (only when HQ SDTV output Board is installed)	Oper	
	Fiber Transmission Board		<12nc>, <status>,<date>	Displays 12nc, status and production date.	Oper	
	Optical Connect Board		<12nc>, <status>,<date>	Displays 12nc, status and production date.	Oper	
	Power Detection Board		<12nc>, <status>,<date>	Displays 12nc, status and production date.	Oper	
	Audio/Intercom Board		<12nc>, <status>,<date>	Displays 12nc, status and production date.	Oper	
Board Diagnostics						
	Power Board					
		Fiber Status	CAMON, TSHRT, POPEN, SOPEN, PSHRT, NOCAM, ERROR, OVRLD, PWOFF, UKNOW	Refer to the Diagnostics section in this user's guide for a description of the Fiber Status.	Oper	
		Local Power Status	**Ok**, NotOK	Displays status of the power board.	Oper	
		Power Overheated	Yes, **No**	Displays status of power overheating	Oper	
		Temperature	<temp>	Displays power internal temperature	Oper	
		Fan	**Ok**, NotOK	Displays status of the internal cooling fan.	Oper	
		Fan (V)	**<voltage>**	Displays current fan voltage	Oper	
	Sync/Encoder Board					
		Reference Available	**None**, SDTV, HDTV	Displays available type of reference signal	Oper	
		Burst Lock	Yes, **No**		Oper	
		Sync Lock	Yes, **No**		Oper	
		Ext1 Input	**None**, HDSDI, SDI	Selects input type for External video input 1	Oper	
		Ext2 Input	**None**, HDSDI, SDI	Selects input type for External video input 2	Oper	
	Data Board					
		Firmware Status	<status>	Firmware status	Oper	
		Boot Software Id	<id>	Boot software identification	Oper	
		Base Station 12NC	<12nc>	Base station code number ('12nc')	Oper	
		Software Status	<status>	Base station software status	Oper	

Menu item	Values	Description	Level	File
Eth MAC	<MAC address>	Displays the Ethernet MAC address of the network adapter.	Oper	
Eth Link Type	**Unknown**, 10Mb/Half, 10Mb/Full, 100Mb/Half, 100Mb/Full	Displays the Ethernet link type for the C2IP network.	Oper	
Eth Link State	**Connected**, disconnected	Displays the Ethernet link state.	Oper	
Audio/Intercom Board				
Self test	**exec** > run	Select exec to run the diagnostic self test.	Oper	
ENG Test Tone Intern	**run** > ok (error)		Oper	
PROD Test Tone Intern	**run** > ok (error)		Oper	
PROG Test Tone Intern	**run** > ok (error)		Oper	
ENG Test Tone Studio	**run** > ok (error)		Oper	
PROD Test Tone Studio	**run** > ok (error)		Oper	
Digital Output Board				
FPGA Temp (C)	<temp>	Displays current FPGA temperature (C)	Oper	
FPGA Temp (F)	<temp>	Displays current FPGA temperature (F)	Oper	
Transmission Diag.				
Transmission System	HDDT, Triax, Mobox, Fib_A, Fib_D, Unkno, **FibHS**	Displays the transmission system in use.	Oper	
CAM -> BS				
Fiber Cable Status			Oper	
Fiber Signal Status	**OK**, Critic, Error, NoSig	Displays signal status of the fiber connection from the camera to the base station: OK = Fiber transmission is OK Critic = Signal level is critical but transmission will continue. Error = Signal level is too low and transmission is not guaranteed. NoSig = No signal detected	Oper	
Opt. RX Margin (dB)	0..65535 **(20)**	Displays optic receiving margin in dB	Oper	
BS -> CAM				
Fiber Cable Status			Oper	
Fiber Signal Status	**OK**, Critic, Error, NoSig	Displays signal status of the fiber connection from the base station to the camera: OK = Fiber transmission is OK Critic = Signal level is critical but transmission will continue. Error = Signal level is too low and transmission is not guaranteed. NoSig = No signal detected	Oper	
Opt. RX Margin (dB)	0..65535 **(20)**	Displays optic receiving margin in dB	Oper	
Communications Diag.				
Camera Connected	Yes, **No**	Displays whether the camera is connected.	Oper	

Menu item		Values	Description	Level	File
	C2IP panels	0..10 **(1)**	Amount of control panels (MCP or OCP) connected to the camera system.	Oper	
	LDK Connect Gatew	**No**, Yes	Displays whether a LDK Connect Gateway is present in the C2IP network.	Oper	

5.2 Camera adapter menu

The Install and Diagnostics menus of the camera system menu contain transmission setup items. Their contents are listed in the following sections. For more information about accessing and using the camera system menu, refer to user's guide of the camera head.

5.2.1 Install menu

Install		Values	Description	Level	File
Video Mode		<available modes>	Selects a video acquisition mode (available modes depend on your camera head).	User 3	-
Disable Camera		**Off**, On	Turn disable camera on or off. When on, the camera's user panel is locked.	User 0	-
Intercom					
	SideTone Level	0..99 **(50)**	Sets the sidetone level (audio feedback to the headphone) in the camera operator's headphone.	User 3	Oper
	Cam Mic	Off, **Switch**, Track, Prod	Selects the camera operator's intercom mic routing: Off = no routing; Switch = intercom route depends on switch at the rear of the adapter; Track = route signal to tracker channel; Prod = route signal to production channel.	User 1	Oper
	Cam Mic Gain	0dB, **40dB**	Selects gain of camera operator's intercom mic.	User 1	Oper
	Cam Mic Power	**Off**, On	Turns 12V Bias Tee power to camera operator's intercom mic on or off.	User 1	Oper
	Prod volume	**Front**, Rear	Selects volume control used to adjust Production channel volume.	User 1	Oper
	Cam PROD	Off, Left, Right, **Both**	Selects the camera operator's ear muff(s) for the production channel.	User 1	Oper
	Cam ENG	Off, Left, Right, **Both**	Selects the camera operator's ear muff(s) for the engineering channel.	User 1	Oper
	Cam PROG	Off, Left, Right, **Both**	Selects the camera operator's ear muff(s) for the program channel.	User 1	Oper
	Cam TRACK	Off, Left, Right, **Both**	Selects the camera operator's ear muff(s) for the tracker channel.	User 1	Oper
	Cam TRACK Level	0..99 **(50)**	Sets tracker signal level in the camera operator's headphones.	User 1	Oper
	Track Mic To	**Off**, Cam, Eng, Prod, All	Selects the tracker mic routing.	User 1	Oper
	Track Mic Gain	0dB, **40dB**	Selects gain of camera Tracker's intercom mic.	User 1	Oper
	Track Mic Power	**Off**, On	Turns +12V bias tee power Tracker's mic on or off.	User 1	Oper
	Track Source	Eng, **Side**	Selects engineering intercom or tracker's mic sidetone for tracker's headphone.	User 1	Oper
Audio					

Install			Values	Description	Level	File
	Audio ip mode		Ch1, Ch1&2	Selects audio input mode: Channel 1 or Channel 1 and 2 (Only when a Wireless adapter is installed)	User 1	Oper
	Audio Gain Mode		Loc, **Ext**	Selects audio gain mode: Loc: audio gain levels is controlled by the camera (local); Ext: audio gain level is controlled by the base station (external).	User 1	Oper
	Audio 1 Source		Line, Mic, Mic48, **Front**	Selects source for audio channel 1 (Only when a Wireless adapter is installed)	User 1	Oper
	Audio 1 Level		-22dB, -28dB, -34dB, -40dB, -46dB, -52dB, -58dB, **-64dB**	Sets input gain level for audio channel 1 (when audio gain mode is set to local).	User 1	Oper
	Audio 1 HPF		**Off**, On	Turns high-pass filter for audio channel 1 on or off. Use to reduce 50 Hz and 60 Hz hum or low frequency noise.	User 1	Oper
	Audio 2 Source		Line, Mic, Mic48, **Front**	Selects source for audio channel 2 (Only when a Wireless adapter is installed)	User 1	Oper
	Audio 2 Level		-22dB, -28dB, -34dB, -40dB, -46dB, -52dB, -58dB, **-64dB**	Sets input gain level for audio channel 2 (when audio gain mode is set to local).	User 1	Oper
	Audio 2 HPF		**Off**, On	Turns high-pass filter for audio channel 2 on or off. Use to reduce 50 Hz and 60 Hz hum or low frequency noise.	User 1	Oper
Tally						
	Onair Lamp		**Enable**, Disable	Select enable when the tally light at the front of the 7-inch viewfinder has to follow the tally signal; select disable if you never want it to light.	User 0	Oper
	Tally Lock		Off, **On**	Turns tally lock function on or off. When tally lock is on, some camera controls are locked when camera is on air.	User 3	-
Reverse Scan						
	Reverse Scan		**Off**, On	Turns reverse scan on or off.	User 0	Scene
	Mode		**Horiz**, Vert, Both	Selects reverse scan mode: Horiz = the image is flipped horizontally; Vert = the image is flipped vertically; Both = the image is flipped both horizontally and vertically.	User 0	Scene
Exposure						
	Lighting		-10..+10 **(0)**	Sets the exposure correction to fine-adjust for ambient lighting frequency when exposure mode is 50 Hz or 60 Hz.	User 1	Scene
	Clean Scan					
		Cl.Scan Mode	Extended, **Normal**	Selects clean scan mode: Normal (VAR2 on OCP/MCP) = shutter is running (no smear); Extended (VAR1 on OCP/MCP) = shutter is not running (more accurate clean scan but possible vertical smear).	User 1	-

Install		Values	Description	Level	File
	Value	50.8.. 125.0 Hz (50 Hz) / 61.0 .. 150.0 Hz (60 Hz) or 19.6 .. 7.9 ms (50 Hz) / 16.3 .. 6.6 ms (60 Hz)	Select clean scan frequency.	User 1	-
	Units	**Hz**, mSec	Selects display units for clean scan.	User 1	-
Gain Preset					
	Gain - (dB)	**-3dB**, -6dB	Selects gain value for - preset.	User 2	Oper
	Gain + (dB)	**3dB**, 6dB, 9dB	Selects gain value for + preset.	User 2	Oper
	Gain ++ (dB)	**6dB**, 9dB, 12dB	Selects gain value for ++ preset.	User 2	Oper
AutoWhite					
	Awb Speed	0..99 **(4)**	Sets the speed for the auto white balance procedure.	**Service**	-
	Awb Gain	0..99 **(10)**	Sets the gain value for the auto white balance procedure.	**Service**	-
Timing					
	H.Phase	0..99 **(50)**	Sets the horizontal phase output signal.	User 0	-
	V-shift	**Off**, On	Turns V-shift on or off. Used to synchronize the camera with DLP type projectors or to hide the horizontal bar of CRT monitors. Only available for a limited number of video modes.	User 0	Scene
	V-shift Level	0..99 **(0)**	Sets the variable video delay from 0 to 1 frame.	User 0	Scene
PCI id		0..8 **(1)**	Selects the ID for external PC operation.	**Service**	-
Main text insert		**Auto**, On, Off	Selects VF text insert mode: Auto = inserts VF text into the main camera signal when the camera is accessed from the OCP 400 or MCP 400 control panels; On = always inserts VF text; Off = never inserts VF text.	User 3	-
HD-SDI(B) Video		Main, **VF**	Selects the output signal on the HD-SDI(B)/ VF connector: Main: the main camera signal is output; VF: the viewfinder signal (with markers, indicators and text overlay) is output.	User 3	-
Buttons					
	Ext2 Assign	**EXT2**, EXT3	When set to EXT3, the EXT3 video input from the base station is used when EXT2 is selected in the camera.	User 0	Oper
	SW1	Call, **EXT1**, EXT2	Assigns a function to Switch 1: Call = generate Call signal; EXT1 = switch VF to external signal 1; EXT2 = switch VF to external signal 2.	User 0	Oper
	SW1 Control	**Mom.**, Alt.	Selects behaviour of Switch 1: momentary or alternating..	User 0	Oper

Install		Values	Description	Level	File
	SW2	EIris, FocAst, EXT1, **EXT2**	Assigns a function to Switch 2: EIris = Turns extended auto iris on or off; FocAst = Turns focus assist on or off; EXT1 = switch VF to external signal 1; EXT2 = switch VF to external signal 2.	User 0	Oper
	SW2 Control	**Mom.**, Alt.	Selects behaviour of Switch 2 momentary or alternating..	User 0	Oper
	VTR Start	**PROD**, ENG , Zoom, EXT1, EXT2	Assigns a function to VTR Start switch: PROD = Production intercom; ENG = Engineering intercom; Zoom = Viewfinder zoom function; EXT1 = switch VF to external signal 1; EXT2 = switch VF to external signal 2.	User 1	Oper
	VTR St. Control	**Mom.**, Alt.	Selects behaviour of VTR Start switch: momentary or alternating.	User 1	Oper
	VTR Lens	**PROD**, ENG , Zoom, EXT1, EXT2	Assigns a function to VTR Lens switch: PROD = Production intercom; ENG = Engineering intercom; Zoom = Viewfinder zoom function; EXT1 = switch VF to external signal 1; EXT2 = switch VF to external signal 2.	User 1	Oper
	VTR L. Control	**Mom.**, Alt.	Selects behaviour of VTR Lens switch: momentary or alternating.	User 1	Oper
	RET Lens	**Zoom**, EXT, FocAst	Assigns a function to RET Lens switch: Zoom = Viewfinder zoom function; EXT = switch VF to external signal (select EXT1 or 2 with the switch at the rear of the camera); FocAst = Focus assist function.	User 1	Oper
	RET Control	**Mom**, Alt.	Selects behaviour of RET Lens switch: momentary or alternating.	User 1	Oper
	RET2 Switch	Zoom, **EXT**	Assigns a function to RET2 Lens switch: Zoom = Viewfinder zoom function; EXT = switch VF to external signal (select EXT1 or 2 with the switch at the rear of the camera);	User 1	Oper
	RET2 Control	**Mom.**, Alt.	Selects behaviour of RET2 lens switch: momentary or alternating..	User 1	Oper
	2" VF Option	**None**, Disab	Selects behaviour of the Option switch on the control panel of the 2-inch viewfinder.	User 1	Oper
	Handgrip Left	**PROD**, ENG	Selects intercom channel to use with the left button under the handgrip.	User 1	Oper
Fan Operation					
	Head Fan	Off, **On**	Turns the head fan on or off. Turns itself on after 120 min. or when temperature is too high.	User 3	-
	adapter Fan	Off, **On**	Turns the adapter fan on or off. Turns itself on after 120 min. or when temperature is too high.	User 3	-

5.2.2 Diagnostics menu

Diagnostics menu		Value(s)	Description	Level	File
Communication					
	BS Connected	Yes, **No**	Displays base station connection status.	User 2	-
	C2IP Panels	0..99	Displays amount of C2IP control panels connected to the camera.	User 2	-
	LDK Connect GW				
	Ser. Stats (DTCP)				
Transmission					
	Cam. Config	INVALID, 4000MK2, 5000, 6000, 6200, 8000	Displays camera system configuration.	User 2	-
	Camera ID	xxxxxxx	Displays camera indentification code.	User 2	-
	Camera Number	0..99	Displays logical camera number in the network.	User 2	-
	Adaptor type	**None**, Triax, Fiber, Wireless, NonTriax	Displays type of the attached camera adapter.	User 2	-
	Adaptor typeNr	**LDK5418**	Displays type of the attached camera adapter.	User 2	-
	Sensor Voltage	**OK**, NotOK	Displays sensor voltage status.	User 2	-
	Shutter Run	Run, **Off**	Displays shutter run status.	User 2	-
	Cam. 12NC	####	Displays last 4 digits of the camera 12NC.	User 2	-
	Cam. Version	<version>	Displays camera version.	**Service**	-
	Cam. Status	0..99	Displays camera status.	User 2	-
Cam Temp					
	Head temp (C)	-55..128	Displays camera head temperature in C.	User 2	-
	Head temp (F)	-67..262	Displays camera head temperature in F.	User 2	-
	Head fan (V)	n.n	Displays camera head fan voltage.	User 2	-
	Head fan	Off, Var	Displays camera head cooling fan status.	User 2	-
	Adaptor temp (C)	-55..128	Displays adapter temperature in C.	User 2	-
	Adaptor temp (F)	-67..262	Displays adapter temperature in F.	User 2	-
	Adaptor fan (rpm)	1650	Displays adapter rotation speed (in rpm)	User 2	-
	Adaptor fan (V)	n.n	Displays adapter fan voltage.	User 2	-
	BackPnl temp (C)	Off, Var	Displays adapter cooling fan status.	User 2	-
	BackPnl temp (F)	n.n	Displays adapter fan voltage.	User 2	-
PCB Status					

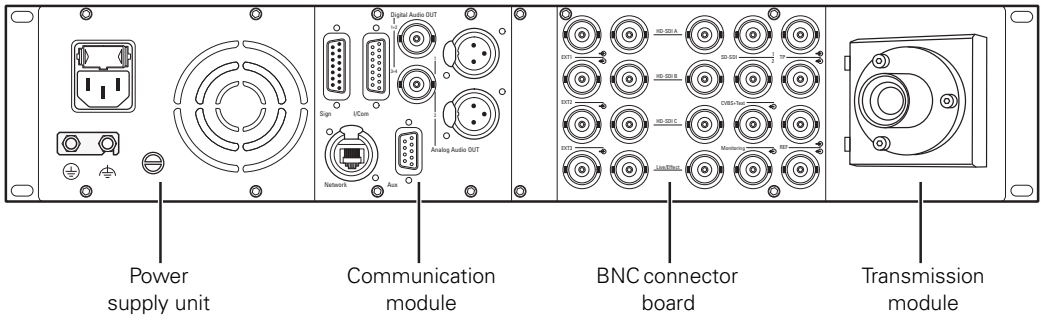
Diagnostics menu		Value(s)	Description	Level	File
	Board	DVP, SyncM, PPG, PPGsb, SeDa, LSP, RCB, PrePr, FSP, DaCam, FrDri, DacOu, FwDri, Front	Selects a board to display detailed information.	User 2	
	Board PID	<id>	Displays Product ID of the selected board.	User 2	
	Board 12NC	####	Displays the last 4 digits of the 12NC of the selected board.	User 2	
	Board Status	0..99	Displays the hardware status of the selected board.	User 2	
	BootSw Ver.	0..99	Displays the boot software version of the selected board.	User 2	
	FPGA Ver.	0..99	Displays the FPGA version of the selected board.	User 2	
	Firmw 12NC	####	Displays the last 4 digits of the firmware 12NC of the selected board.	User 2	
	Firmw Status	0..99	Displays the firmware status of the selected board.	User 2	
	Firmw Version	0..99	Displays the firmware version of the selected board.	Service	
	Softw 12NC	####	Displays the last 4 digits of the 12NC of the software of the selected board.	User 2	
	Softw Status	0..99	Displays the software status of the selected board.	User 2	
	Softw Version	0..99	Displays the software version of the selected board.	Service	
System Status					
	System	Unknown, HD, HD-HS, SD, Illegal	Displays the camera system configuration.	User 2	
	Camera	Unknown, HD, HD-HS, SD, Illegal	Displays the camera head configuration.	User 2	
	Head HW	Unknown, HD, HD-HS, SD, Illegal	Displays the camera head hardware configuration.	User 2	
	adapter	Unknown, HD, HD-HS, SD, Illegal	Displays the camaera adapter configuration.	User 2	
	Basestation	Unknown, HD, HD-HS, SD, Illegal	Displays the base station configuration.	User 2	

Chapter 6

Connectors

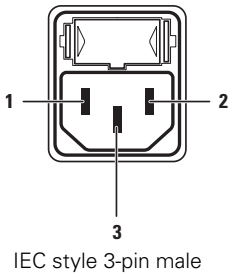
6.1 LDK 4410 3G Fiber base station connectors

6.1.1 Connector locations



6.1.2 Power supply unit

Mains power connector



IEC style 3-pin male

Pin	Description
1	Neutral
2	Line
3	Earth

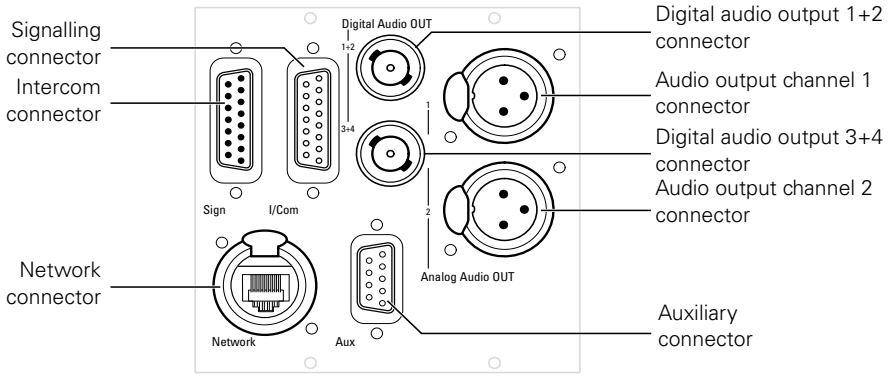
Mains input voltage:
100 to 240 VAC (auto-sensing)

Fuses (2x):
8AT / 250 VAC

Mains frequency:
47 to 63 Hz (auto-sensing)

Power consumption:
450 W max.

6.1.3 Communication module



Digital audio output 1+2 connector

BNC connector

BNC connector, 2-channel AES/EBU compliant audio output, 1.0 Vpp, 75 Ω

This connector carries the digitally converted audio channel 1 and 2 from the camera's Mic 1 and Mic 2 connectors.

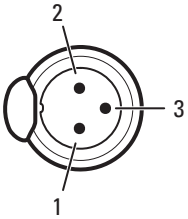
Digital audio output 3+4 connector

BNC connector

BNC connector, 2-channel AES/EBU compliant audio output, 1.0 Vpp, 75 Ω

This connector carries digital audio channel 3 and 4 from the camera's VF connector (when AES In is selected by the VF connector signal selection switch on the adapter).

Audio output 1 connector



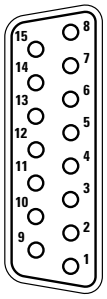
XLR 3-pin male

Pin	Description
1	Audio shield
2	Audio output
3	Audio return

Sensitivity range: -64 dBu to -22 dBu

Signal at pin 2 of audio output is in phase with signal at pin 2 of audio input.

Intercom connector



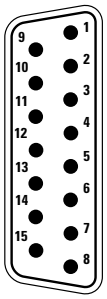
SubD 15-pin female

Pin	Description
1	Prod out (4-wire out, 2-wire in/out)
2	Prod in (4-wire only)
3	Prod in shield (4-wire only)
4	Eng in (4-wire only)
5	Eng out (4-wire out, 2-wire in/out)
6	Prog in (4-wire only)
7	Prog in shield (4-wire only)

Pin	Description
8	Housing
9	Prod out return (4-wire out, 2-wire in/out)
10	Prod in return (4-wire only)
11	Eng in shield (4-wire only)
12	Eng in return (4-wire only)
13	Eng out return (4-wire out, 2-wire in/out)
14	Prog in return (4-wire only)
15	Housing

Shield of cable to the pin marked housing.

Signalling connector



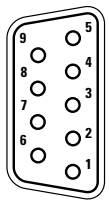
SubD 15-pin male

Pin	Description
1	Preview output ext. (relay contact < 10 Ω)
2	Call output ext. (relay contact < 10 Ω)
3	ISO input ext. (dry contact)
4	On Air input ext. (dry contact)
5	Call input ext. (dry contact)
6	Audio 1 level (analog input voltage from 0 to 5 V)
7	5 V (Operating Control Panel)

Pin	Description
8	Housing
9	Preview output ext. return
10	Call output ext. return
11	ISO input ext. return
12	On Air input ext. return
13	Call input ext. return
14	Audio 2 level (analog input voltage from 0 to 5 V)
15	GND

Microphone impedance >200 Ω
Sensitivity range: -70 to -28 dBm
Signal at pin 2 of audio input is in phase with signal at pin 2 of the audio output.
Shield of cable to the pin marked housing.

Auxiliary connector



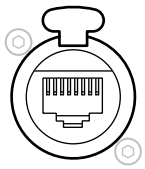
SubD 9-pin female connector

Pin	Description
1	5 V
2	AN0 (0 to 5 V input)
3	Private data out
4	Private data in
5	Housing (attach cable shield to this pin)

Pin	Description
6	GND
7	AN1 (0 to 5 V input)
8	Private data out return
9	Private data in return

Shield of cable directly to the connector housing.

Network connector

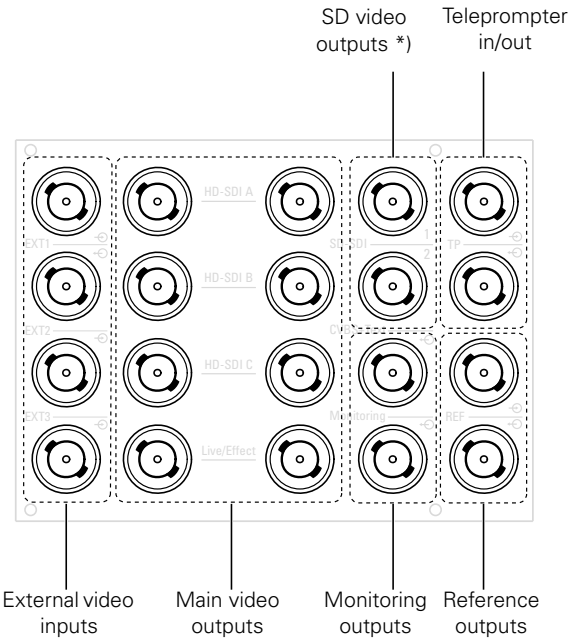


8-pin standard RJ-45 ethernet connector

Pin	Description
1	Transmit data + (TX+)
2	Transmit data - (TX-)
3	Receive data+ (RX+)
4	no connection
5	no connection
6	Receive data - (RX-)
7	no connection
8	no connection

Ethernet 10Base-T, 100Base-TX compliant with IEEE-802.3 (edition 2000)

6.1.4 BNC connector board



External video input connectors

Connector	Signal
Ext 1-in	External 1 HD-SDI or SDI video input
Ext 1-out	External 1 HD-SDI or SDI looped-through signal
Ext 2-in	External 2 HD-SDI or SDI video input
Ext 3-in	External 3 HD-SDI or SDI video input

*) These signals are only available when the optional LDK 4531/30 High Quality SD board is installed.

☞ Note

Make sure that the applied external video inputs match the temporal frequency (50 or 59.94 Hz) of the selected camera video mode and that they are synchronized with the camera output signal.

External video signals

The video signals applied on the external video inputs are returned to the camera. Apply the external video signal according to the following table:

Selected camera video mode	External video input (Ext1, 2 or 3)	Output on the camera adapter
1080p50/59	576i50 or 480i59.94	1080i50/59
	1080p50/59	1080i50/59
	720p50/59	no signal
	1080i50/59	no signal
720p50/59	576i50 or 480i59.94	1080i50/59
	1080p50/59	no signal
	720p50/59	720p50/59
	1080i50/59	no signal
1080i50/59	576i50 or 480i59.94	1080i50/59
	1080p50/59	no signal
	720p50/59	no signal
	1080i50/59	1080i50/59

Main video output connectors

Connector	Signal or function
HD-SDI A (2x)	2x BNC, 0.8 Vpp, 75 Ω, SMPTE 292M (1.5 Gbit/s) with embedded audio
HD-SDI B (2x)	2x BNC, 0.8 Vpp, 75 Ω, SMPTE 292M (1.5 Gbit/s)
HD-SDI C (2x)	2x BNC, 0.8 Vpp, 75 Ω, SMPTE 292M (1.5 Gbit/s)
Live/Effect (2x)	2x BNC, 0.8 Vpp, 75 Ω, SMPTE 292M (1.5 Gbit/s) with embedded audio

SD video outputs

Connector	Signal or function
SD-SDI-1	BNC, 0.8 Vpp, 75 Ω, SMPTE 259M (270 Mbit/s) *)
SD-SDI-2	BNC, 0.8 Vpp, 75 Ω, SMPTE 259M (270 Mbit/s) *)

*) These signals are only available when the optional LDK 4531/30 High Quality SD board is installed.

Monitoring video outputs

Connector	Signal or function
CVBS+Text	CVBS (analog SD) output signal with menu text and indicators inserted.
Monitoring	HD-SDI Monitoring output signal with menu text and indicators inserted.

Teleprompter connectors

Connector	Signal or function
TP-in	Teleprompter input signal (analog SD)
TP-out	Teleprompter looped-through (output) signal

Reference connectors

Connector	Signal
REF-in	Reference input signal (HD Trilevel sync or SD Black Burst)
REF-out	Reference looped-through (output) signal

☞ Note

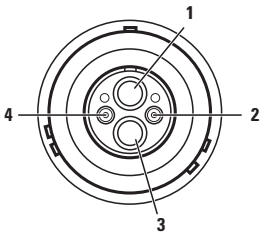
The last loop-through output in a chain must be terminated by a 75 Ω terminal resistor.

☞ Note

The maximum number of base stations that can be looped through is 6.

6.1.5 Transmission module

Hybrid fiber connector (front view)

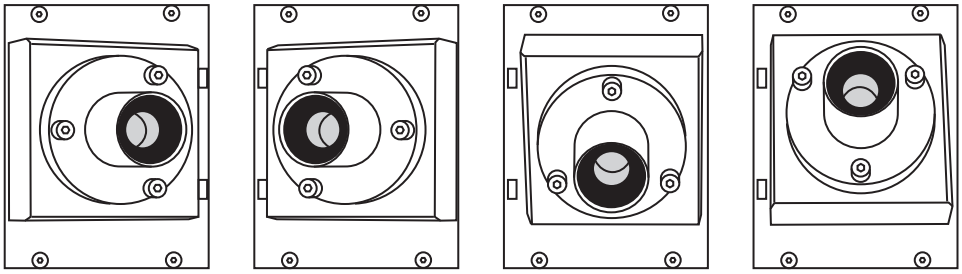


Pin	Description
1	Optic fiber channel A
2	Power supply return
3	Optic fiber channel B
4	Power supply

LEMO Hybrid Fiber connector compliant with SMPTE 304M.

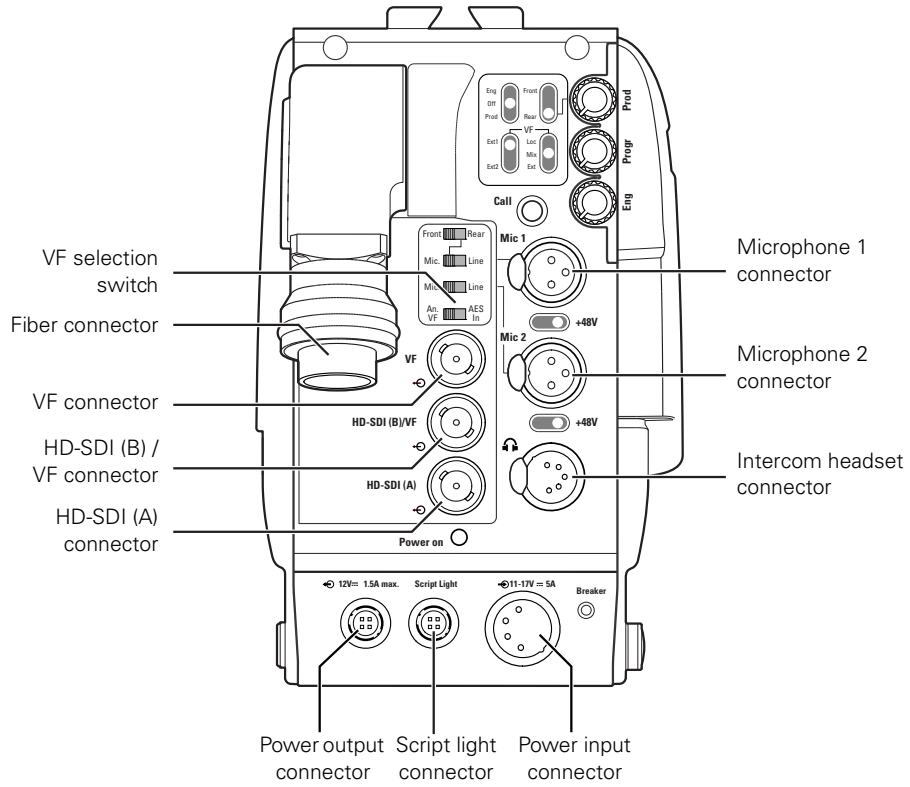
Various types of Hybrid fiber connector are available by request

The transmission connector can be mounted to suit your cable run.

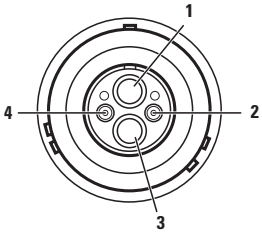


6.2 LDK 5420 3G Fiber camera adapter connectors

6.2.1 Connector locations back panel



Hybrid fiber connector



Pin	Description
1	Optic fiber channel A
2	Power supply return
3	Optic fiber channel B
4	Power supply

Note: Various types of hybrid fiber connector are available.

VF connector (+ digital audio)

BNC connector

This connector can be programmed as analog viewfinder output or digital audio input. The VF selection switch determines the function of the connector as follows:

An. VF — AES In: Analog viewfinder signal (Y only)

An. VF — AES In: AES/EBU digital audio input

HD-SDI (B) / VF connector

BNC connector

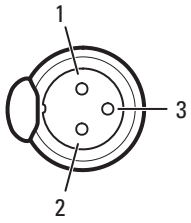
This socket is used to output the camera HD-SDI video signal.

HD-SDI (A) connector

BNC connector

This socket is used to output the camera HD-SDI video signal.

Microphone 1 + 2 connectors



XLR 3-pin female

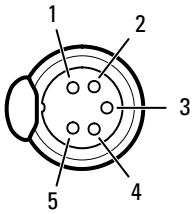
Pin	Description
1	Audio shield
2	Audio In (+)
3	Audio Return (-)

Microphone impedance > 200 Ω
Phantom power +48 V switchable
Sensitivity range microphone: -64 to -22 dBu

Sensitivity range line: +10 to +42 dBu

Signal at pin 2 of audio input is in phase with signal at pin 2 of audio output.

Intercom headset connector



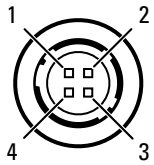
XLR 5-pin female

Pin	Description
1	Microphone return
2	Microphone
3	Telephone return
4	Telephone left
5	Telephone right

Microphone level: -64 dBu / -24 dBu switchable Microphone impedance: > 600 Ω

Output level: +6 dBu nominal
Output impedance: < 50 Ω

Power output connector



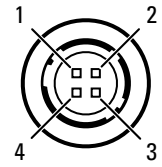
Hirose 4-pin female

Pin	Description
1	GND
2	On Air signal
3	GND
4	12 V (max.18 W)

Shield of cable directly to the connector housing.
The socket provides access to an internal tally switch. When the camera is On Air, the contact of the internal relay is closed (contact between pen 1 and pen 2).

Manufacturer code: HR10A-7R-6S

Script light connector



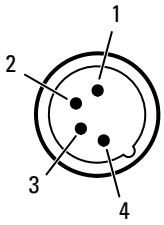
Hirose 4-pin female

Pin	Description
1	GND
2	Not connected
3	Not connected
4	12 V

Shield of cable directly to the connector housing.

Manufacturer code: HR10A-7R-6S

Power input connector



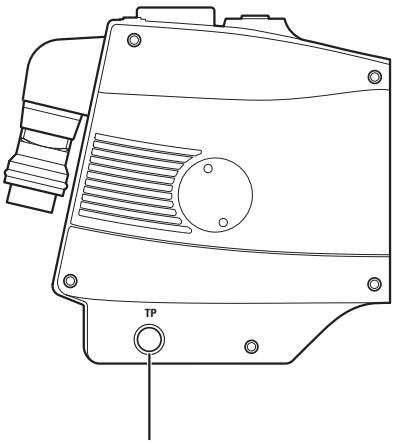
XLR 4-pin male

Pin	Description	
1	GND	Pins 1 & 2 are bridged
2	GND	
3	11.5 to 17 V	Pins 3 & 4 are bridged
4	11.5 to 17 V	

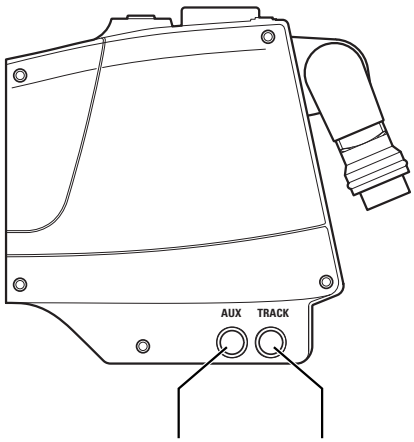
This socket accepts a DC voltage of 15 V nominal.

Caution
The input voltage must not exceed 17 V.

6.2.2 Connector locations side panels



Reference in / Teleprompter out connector



Auxiliary connector

Tracker connector

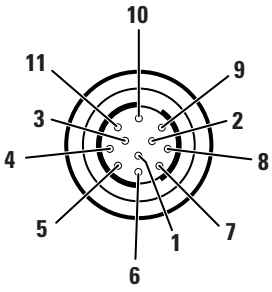
Reference input / teleprompter output connector

BNC connector

Reference input (in stand alone mode)
This connector is used to genlock the camera to a 0.6 Vpp HD tri-level reference input signal.

Teleprompter output (when the base station is connected)
This socket supplies the 1.0 Vpp teleprompter video signal coming from the base station.

Auxiliary connector



Fischer 11-pin female

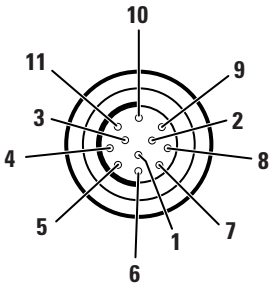
Pin	Description
1	+5 VL
2	0 VL
3	AN0
4	AN1
5	Not connected
6	On Air / Not connected
7	Private Data (Cam to BS)
8	GND
9	Private Data (BS to Cam)
10	GND
11	Shield

Private data input signals:
"0" < 4.0 V; "1" > 4.0 V
max. level: +/-12 V
input impedance: > 4.7 kΩ
bitrate: max. 100 kbit/s

Private data output signals:
CMOS levels +5 V
output impedance: 250 Ω

Analog outputs (AN0 and AN1):
output level: 0 to +5 V
output impedance: 100 Ω

Tracker connector



Fischer 11-pin female

Pin	Description
1	On Air return
2	Tracker microphone return
3	Tracker microphone input
4	Production tracker
5	Sidetone/engineering tracker
6	Intercom return
7	Program sound tracker
8	Cameraman microphone
9	Tally control tracker (CMOS level, R_{out} = 1 kΩ)
10	12 V (I_{max} = 100 mA)
11	12 V return

Mic. level: -64 dBu/-24 dBu switchable
Mic. impedance: > 600 Ω

Intercom output level: 0 dBu (nom.), +6 dBu (max.)
Intercom output impedance: < 200 Ω

Chapter 7

Specifications

7.1 LDK 4400 3G Fiber base station specifications

7.1.1 Technical specifications

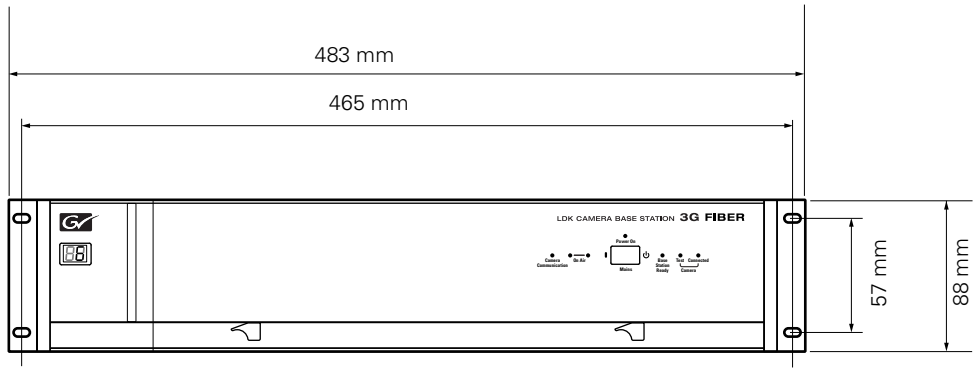
Item	Value
General	
Dimensions (W x H x D)	438 (19-inch rack) x 88 (2 RU) x 400 mm (17.2 x 3.5 x 15.7 in) excluding transmission connector
Weight (approx.)	13.5 kg (29.8 lbs)
Operating temperatures	0 to +40 °C (+32 to +104 °F)
Storage temperatures	-25 to +70 °C (-13 to +158 °F)
Operating humidity	max. 90% relative humidity (non condensing)
Shock resistance	max. 10 G (transport)
	max. 2 G (operating)
Altitude	max. 15,420 m (50,000 ft)
Power	
Power requirements	100 to 240 VAC, 47 to 63 Hz
Power consumption	450 W max. fully equipped
Power connection	IEC type, 3-pin male
Transmission	
Fiber connector	Hybrid fiber connector (Fischer, Lemo and Stratos types are available)
Cable length	4,000 m (13,100 ft) max. using SMPTE 311M hybrid fiber cable
Video and signal connectors	
Teleprompter input	1x BNC (loop-through output), 1.0 Vpp, 75 Ω
Reference	1x BNC (loop-through output), 1.0 Vpp, 75 Ω HD tri-level sync or SD Black Burst
HD-SDI outputs (with embedded digital audio)	6x BNC, 0.8 Vpp, 75 Ω, SMPTE 292M, 1080i/720p at 59.94/50 Hz; 1080p23.98/25/29.97 Hz

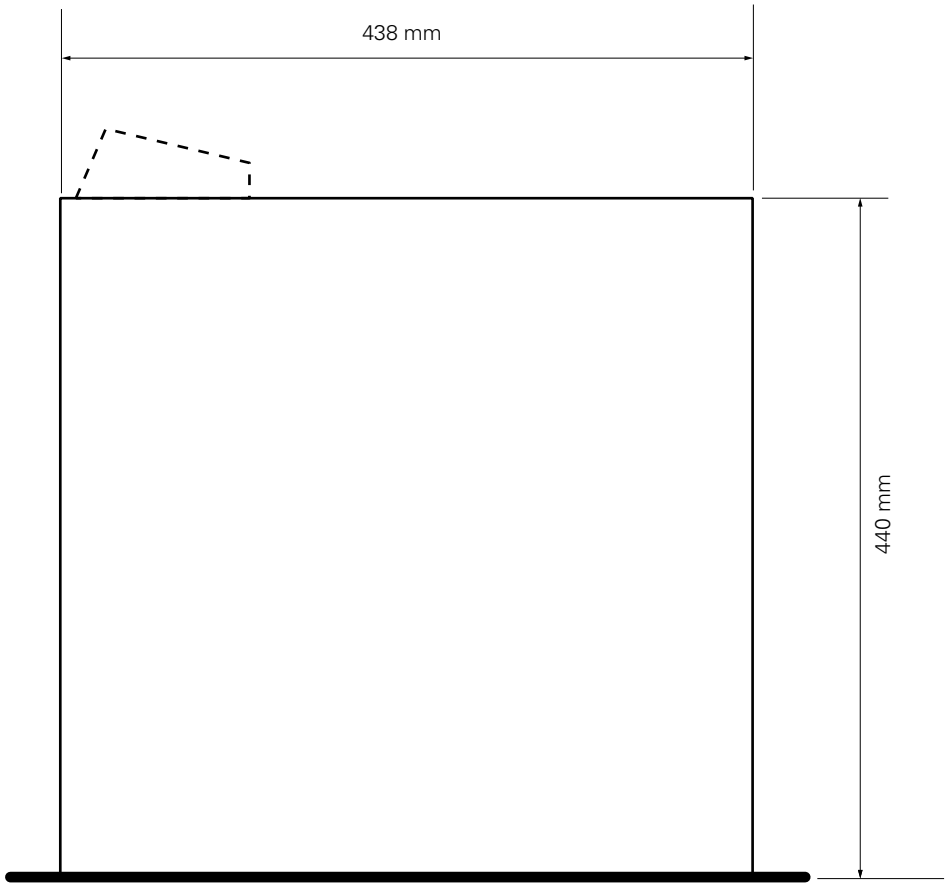
Item	Value
HD-SDI outputs (live/effect)	2x BNC, 0.8 Vpp, 75 Ω, SMPTE 292M, 1080i/720p at 59.94/50 Hz; 1080p23.98/25/29.97 Hz
HD monitoring output	1x BNC, 0.8 Vpp, 75 Ω, SMPTE 292M, 1080i/720p at 59.94/50 Hz; 1080p23.98/25/29.97 Hz
Composite video output	1x BNC, 1.0 Vpp, 75 Ω (CVBS, w. or w/o text, for viewing purposes)
External video inputs	3x BNC, 0.8 Vpp, 75 Ω, HD-SDI or SDI + 1x loop through output
Data connectors	
C2IP camera control	Ethernet RJ-45 connector
Signalling 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 to -64 dBu), DC
Auxiliary in/out	D-sub 9-pin, female; An0, 0 to 5 V in; private data in/out, 100 kbits/s TTL-levels (RS-232)
Analog audio outputs	
Audio out	2x BNC, 2 x 2 channels AES/EBU compliant, 1.0 Vpp, 75 Ω
Analog audio outputs	2x XLR-3, 0/+6 dBu (±1.5 dB, max. 18 dBu, 600 Ω, max. gain 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 output level, 600 Ω)
S/N ratio	58 dB (unweighted RMS)
Digital audio outputs	
Audio channel 1 + 2	2x BNC, 24 bits, AES/EBU compliant, 1.0 Vpp, 75 Ω
Audio channel 3 + 4	2x BNC, 24 bits, AES/EBU compliant, 1.0 Vpp, 75 Ω
Intercom	
Intercom in/out	D-sub 15-pin, female (Prog in, Prod in/out, Eng in/out)
Input	0 or 6 dBu (max. 6dBu or 12 dBu), 9 kΩ
Output	0 or 6 dBu (±2 dB, max 12 dBu), 600 Ω
Frequency response	150 Hz to 6 kHz (1 kHz, -10 dBu output level)
Distortion	less than 2% (1 kHz, +12 dBu output level)

7.1.2 LDK 4531/30 High Quality SD module

Item	Value
Digital video outputs	3x BNC SDI outputs, 0.8 Vpp, 75 Ω, SMPTE 259M, ITU-R, BT.601
Analog video outputs	3x BNC analog outputs, R, G, B or Y, Pr, Pb, or 3x CVBS (menu selection): - RGB out: 3 x 0.7 Vpp (+/- 1%), 75 Ω - Y, Pr, Pb: 3 x 0.7 Vpp (+/- 1%), 75 Ω - CVBS out: 3 x 1.0 Vp p (+/- 1%), 75 Ω
Frequency response	0.1 to 5.75 MHz (+0.5 dB/-1.0 dB)
K-factor	< 2%

7.1.3 Dimensions





7.2 LDK 5420 3G camera adapter specifications

7.2.1 Technical specifications

Item	Value
Power requirements	powered or 12 V (local)
Operating temperatures	-20 to +45° C (-4 to +113° F)
Storage temperatures	-25 to +70° C (-13 to +158° F)
Weight (approx.)	2.9 kg (6.4 lbs)
Dimensions (L x W x H)	215 x 130 x 205 mm (8.5 x 5.1 x 8.1 in) without handgrip
Fiber connector	Hybrid fiber connector (Fischer, Lemo and Stratos types are available)
Cable length	4,000 m (13,100 ft) max. using SMPTE 311M hybrid fiber cable
Monitor (Y)	BNC connector 1.0 Vpp; 75 Ω
Teleprompter out or Reference in (local mode)	BNC connector 1.0 Vpp; 75 Ω or 0.6 Vpp HD tri-level reference signal
Tracker	11-pin communication / signalling connector
Auxiliary/ Data	11-pins private data
Rear microphone inputs	2x XLR-3, balanced, +48 V phantom power
Intercom	XLR-5 with channels Engineering/Production/Program
DC power input	12 V (11.5 to 17.0 V), XLR-4 male
Script light power output	12 V, 0.25 A, 4-pin Hirose
DC power output	12 V, 1.5 A, 4-pin Hirose

7.2.2 Dimensions