grass valley
A THOMSON BRAND

User's Guide

November 2005

LDK 4502/4503

HDTV camera base station

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 : EMC (Emission)
- EN55103-2 : EMC (Immunity)

following the provisions of:

a. the Safety Directives 73/23//EEC and 93/68/EEC
b. the EMC Directives 89/336/EEC and 93/68/EEC

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.

Copyright

www.grassvalley.com

Table of Contents

Chapter 1 – Introduction

Chapter 2 – Connecting the system

Chapter 3 – Using the Base Station

Chapter 4 – Diagnostics

Chapter 5 – Preventative maintenance

Chapter 6 – Menu structure and contents

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

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture. If the unit is in a wet or damp environment, a rain cover must be used to protect it for personal safety reasons (EN60065). The rain cover supplied with the unit protects it according to safety specification EN60529 up to level IPX2 (spraying water).

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 50mm or the rack must be force-air cooled.

Triax cable systems

WARNING

Only connect a Triax cable from the same LDK camera family to the unit.

Do not allow system earth currents to exceed 1.5A in the outer shield of the Triax cable or 0.2A in other cable shields.

To avoid excessive earth currents in a Triax system, galvanically separate the power earth connection of equipment connected to the camera from the camera earth.

It is strictly prohibited to short circuit the inner and outer shields of a Triax cable used to connect a camera to a base station.

Galvanic separation

Because of the nature of Triax systems, with long distances between camera and Base Station, the risk of earth currents flowing is greater. These earth currents can result in damage to the equipment.

For example, a monitor connected directly to the CVBS output of the camera is powered locally. The earthing point of the monitor's power supply can be at a different potential with respect to the earthing point of the Base Station. If the power earth of the monitor is also the video earth, then this earth potential is transferred to the camera via the shield of the BNC connector. The difference in earth potential between the camera and the Base Station results in an earth current in the Triax system.

To prevent earth currents from flowing in the Triax system, we recommend galvanic separation of earthed equipment connected to the camera. This separation can be achieved by using an isolation transformer between the local power outlet and the equipment connected to the camera. Alternatively, use equipment that has a double insulation and therefore does not require an earth connection.

Fibre optic transmission units

The CLASS 1 LASER PRODUCT label is located on top of the fibre optic connector on the rear panel.

Laser safety statement (Europe)

Fibre 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)

Fibre 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.

WARNING

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.

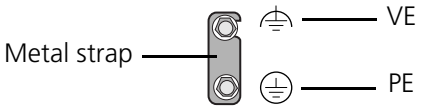
Fibre optic cable precautions

Fibre 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 fibre optic cable systems always put the dust caps on cable and panel connectors immediately after disconnecting a cable. Keep the dust caps clean.

Base Station earthing

The rear of the 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.

Precautions

To ensure continual high performance from the camera take the following precautions into consideration:

- Avoid very damp places. If the environment is wet or damp a rain cover must be used to protect the unit.
- Do not subject the unit to severe shocks or vibration.
- Do not expose the camera to extremes of temperature.
- Do not leave the unit in direct sunlight or close to heating appliances for extended periods.
- Do not allow sunlight to shine into the viewfinder.
- Do not allow LASER beams to shine into the lens as this could damage the CCD sensors.
- Avoid extreme highlights as these can cause various kinds of optical reflections.
- Be careful when connecting and disconnecting triax cables.
    - Do not mix triax units from different types of camera systems (HD with SD, RGB triax with digital triax).
    - Make connections swiftly and firmly to avoid false error messages.

Mains lead wiring for UK users

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

GREEN and YELLOW	- EARTH
BLUE	- NEUTRAL
BROWN	- LIVE

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

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

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

Chapter 1

Introduction

1.1 Technology

The slimline HDTV Camera Base Station is the perfect interface between your HDTV camera and the rest of your system. The heavy-duty base station provides state-of-the-art technology in a compact package. The high level of modularity guarantees ideal matching with any type of application; you can use the system in a studio or for mobile field production, for HDTV or for SDTV production. Optional modules can be inserted or removed at any time, making it possible to change the configuration on a day-to-day basis.

The Base Station is only 2RU 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 triax connector. The triax connector itself can easily be mounted at different angles to suit all mounting requirements.

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.

1.1.1 Advanced TriaxHD Features

The advanced TriaxHD transmission system, which is a further development of the Emmy Award winning triax transmission system, makes the base station and camera compatible with industry standard triax cables. This allows the reuse of existing, reliable and valuable cable inventories. TriaxHD offers video transmission and remote control of cameras up to a distance of 3300 ft (1000 m) and beyond, using standard 0.55" (14mm) triax cables. For even longer distances, the base station has been prepared for a fiber-optic transmission system to minimize upgrade costs.

The TriaxHD system is based on 30MHz full-bandwidth 4:2:2 transmission (Y/Cr/Cb components). The double sideband modulation technique used in combination with Y/

Cr/Cb transmission ensures linearity, resolution and an optimal signal-to-noise ratio over the maximum cable length. Bandwidth efficient channel combining and equalization techniques minimize cross-talk and interference. Teleprompter and viewfinder signals maintain high performance with relatively long cable lengths.

1.1.2 HD Fibre features

The HD Fibre system allows video transmission and remote control of cameras up to a distance of 13,000 ft (4000 meters) and beyond, using industry standard fibre optic cable. It is based on 30MHz full-bandwidth 4:2:2 transmission (Y/Cr/Cb components).

The double sideband modulation technique used in combination with Y/Cr/Cb transmission ensures linearity, resolution and an optimal signal-to-noise ratio over the maximum cable length. Bandwidth efficient channel combining and equalization techniques minimize cross-talk and interference. Teleprompter and viewfinder signals maintain high performance with relatively long cable lengths.

1.1.3 Modular construction

The modular concept makes it easy to expand the functionality by simply adding new modules. Quick exchange of the modules for servicing or the ability to swap modules between Base Stations is another benefit.

The external video input module provides two analog video inputs and loop-through analog outputs. The signal can be PAL or NTSC, and does not need to be clamped. It can also be non-synchronized. The external video input module can be replaced in future by a digital one.

HDTV and simultaneous high-end SDTV

Besides standard high-definition outputs, the Base Station can be optionally equipped with simultaneous high-end SDTV outputs. This offers ultimate flexibility: produce in SDTV one day, and in HDTV the next, or do both simultaneously. Having both SDTV and HDTV outputs facilitates a gradual and managed transition from STDV to HDTV. Three 1.5 Gb/s HD-SDI outputs are available on the Base Station. The high quality SDTV Module adds three 270 Mb/s SDI and three analog outputs (these can be programmed to be either R, G, B, or Y, Pr, Pb or three CVBS outputs).

Monitoring

Monitoring in the analog HD video domain requires the monitoring module. The outputs on this module provide four switchable signals (R, G, B and Y), which are simultaneously available on a WFM and PXM connector. The switching is done in the digital video domain and can be controlled from an OCP or MCP. The PXM output can be used for analog picture monitoring, and the WFM output for monitoring on a waveform monitor. An additional conventional VGA connector, which is also provided by this module, contains R, G, B, H-sync, and V-sync signals for relative low-cost analog HD monitoring using an appropriate computer monitor. For monitoring in the SD video domain, one of the SDI outputs or analog outputs of the High Quality SDTV module can be used.

Audio and intercom

The audio and advanced intercom module provides 4-channel intercom and 2-channel audio from the camera. The high-quality audio from the camera head is passed to the different outputs via balanced line drivers on the module for clean transparent sound. The gain levels can be remotely controlled.

In the installation menu of the Base Station, a choice is provided between a 4-wire or a 2-wire intercom system. An intercom channel can be assigned as a data channel for private data. A 1kHz test-tone generator and voicemail extend the functionality even further. The voicemail stores messages from a combination of sources like Program, Production or Engineering for the camera operator. By adding the engineering intercom module, a 5-channel full-featured intercom is possible.

The engineering intercom module provides a 2-channel intercom between camera operator and engineering. The module fits into the front of the unit and facilitates the plugging in of a headset and level adjustment for both ears. It is ideal for a simple intercom facility in a standalone mode of operation, or to expand the 4-channel advanced intercom to a 5-channel intercom.

1.2 Features

- Small; only 2RU high
- 19-inch rack unit
- Flexible by virtue of its modular construction
- Teleprompting, color bar, digital HDTV outputs standard on board
- The digital transmission backbone and power module meet the most demanding broadcasting needs
- Heavy-duty concept with low power consumption, ideal for OB vans
- TriaxHD version (LDK 4502) allows video transmission and remote control of cameras up to a distance of 3300 ft (1000 meters) and beyond, using industry standard 14mm triax cables.
- Fibre optic version (LDK 4503) allows video transmission and remote control of cameras up to a distance of 13,000 ft (4000 meters) and beyond.
- Full camera control via the Series 9000 Universal Camera Control System or via the C2IP Ethernet-based network.
- Two-wire or four-wire intercom to international standards.
- HDTV and simultaneous high quality SDTV outputs (optional)
- High-end simultaneous SDTV outputs (both digital as well as analog) on the HD Base Station for a gradual and managed transition from SDTV to HDTV.

1.3 Specifications

Table 1-1 HDTV Camera Base Station

Item	Value
Power	
Power requirements	115V/230V AC +/- 15%, 47 to 63Hz
Power consumption	270 W (470 VA) max. fully equipped
Power connection	IEC type, 3-pin male
Environment	
Operating temperatures	-20 to +50°C (-4 to +122°F)
Storage temperatures	-40 to +70°C (-40 to +158°F)
Operating humidity	Max. 90% (non condensing)
Altitude	Max. 50,000 ft
Shock resistance	Max.10G (transport), Max. 2G (operating)
Weight (approx.)	17 kg (37.5lbs) fully equipped
Dimensions (WxHxD)	438 (19" rack) x 88 (2RU) x 510 mm 17.2 x 3.5 x 20.1 inch
Transmission (Triax)	
Typical. cable length	1,000 m. (3,281 ft) (14 mm./0.55" triax cable)
Bandwidth	30/ 15/ 15 MHz., Y/Cr/Cb
Transmission (Fibre)	
Typical. cable length	4,000 m (13,000 ft) hybrid fibre cable SMPTE311M
Bandwidth	30/ 15/ 15 MHz., Y/Cr/Cb
Video inputs	
Teleprompter	BNC (looped-through), 1.0Vp-p, 75 Ohm
Reference	BNC (looped-through), 1.0Vp-p, 75 Ohm HD tri-level sync or SD Black Burst
Video outputs	
HD-SDI	3x BNC, 0.8Vp-p, 75 Ohm, SMPTE 292M, 1080i or 720p at 59.94 or 50Hz
Text out	BNC, 1.0Vp-p, 75 Ohm VBS
Composite video	BNC, 1.0Vp-p, 75 Ohm CVBS, for viewing purposes
External control	
C2IP camera control	Ethernet RJ-45 connector
Series 9000	4-pin, male (2-wire camera control bus)
Serial	RS-232 D-sub 9-pin, male
Functional connections	
Signalling in/out	D-sub 15-pin, male
Auxiliary in/out	D-sub 9-pin, female

Table 1-2 HDTV Camera Base Station Optional modules

Item	Value
External video input module LDK 4530/10	2x BNC, 1.0 Vp-p, 75 Ohm (loop-through) CVBS or VBS
SDTV output HD module LDK 4531/20	3x BNC SDI out, 0.8Vp-p, 75 W, SMPTE 259M, ITU-R, BT.601 3x BNC Analog out, R, G, B or Y, Pr, Pb, or 3x CVBS (menu selection): - RGB out: 3x 0.7Vp-p (+/- 1%), 75 Ohm - Y, Pr, Pb: 3x 0.7Vp-p (+/- 1%), 75 Ohm - CVBS out: 3x 1.0Vp- p (+/- 1%), 75 Ohm Frequency response 0.1 to 5.75MHz (+0.5dB/-1dB) K factor Less than 2%
2 ch. audio & 2/4-wire intercom module LDK 4540/10	Audio out XLR- 3 2x, 0/+6dBu (+/-1.5dB, max. 18dBu, 600 W, Gain Max. 70dB) Frequency response 40Hz to 15kHz, (+1/-3dB, 1kHz, -10dBu output level) Distortion Less than 0.5% (100Hz/ 1kHz, +6dBu out, 600 Ohm) S/N ratio 58dB (unweighted RMS) Intercom in/out D- sub 15- pin, female (program in, production in/out, engineering in/out in: 0 or 6dBu (max. 6 or 12dBu), 9 kOhm, out: 0 or 6dBu (+/ -2dB, max 12dBu), 600 Ohm Frequency response 150Hz to 6kHz (1kHz, -10dBu output level) Distortion Less than 2% (1kHz, +12dBu level)
Engineering intercom module LDK 4541/10	6dBu, +/- 2dB, max 12dBu, 25-400 Ohm Frequency response 150Hz to 6kHz, +/- 3dB (0dB, 1kHz, -10dBu output level) S/N ratio 46dB (unweighted RMS) Phantom power +12Vdc (+/ -1V), menu selectable
Monitoring HD module LDK 4560/20	PXM video out BNC 1x, 1.0Vp-p, 75 Ohm, SMPTE 274M or SMPTE 296M (depending on acquisition format); R, G, B or Y (menu selection) with HD tri-level SYNC WFM video out BNC 1x, 1.0Vp-p, 75 Ohm, SMPTE 274M or SMPTE 296M (depending on acquisition format); R, G, B or Y (menu selection) with HD tri-level sync. Analog HDTV out VGA-type D-connector, 15-pin, female, with R, G, B, H-sync and V-sync Frequency response 0.1 to 30MHz (+0.5dB/- 1dB)

1.3.1 Dimensions

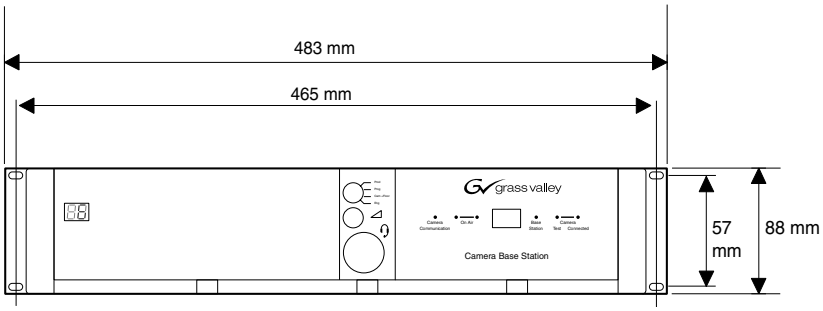
Width: 438 mm

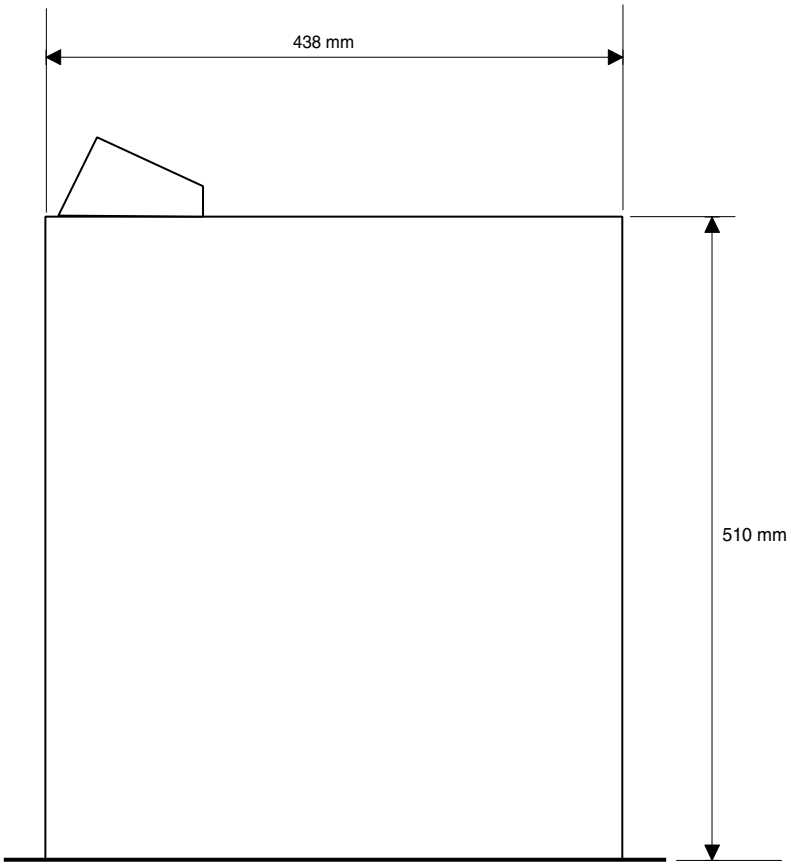
Height: 88 mm

Depth: 510 mm max. (excluding triax connector + cable)

Weight: approx. 17kg.

Figure 1-3. Dimensions





1.4 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.

1.5 Storage

The unit may be stored (non-operating condition) in environments within the following limits:

- Temperature: -40°C to +70°C (-40°F to +158°F)
- Humidity: Max. 90% (non condensing)
- Altitude: max. 50,000 feet

When stored, the unit should be protected from temperarure extremes which may cause condensation, and should also be protected from high levels of dust.

Chapter 2

Connecting the system

2.1 Configurations

2.1.1 Cameras and Base Stations with C2IP network

Triax systems

Each camera head with a Triax adapter is connected to a Base Station using a Triax cable. The maximum length of cable that can be used without significant degradation of the video signal is 1000m (3,300 ft.) for a 14mm Triax cable. The power supply is applied to the Base Station and via the Triax cable to the camera.

Fibre systems

Each camera head with a Fibre adapter is connected to a Base Station using a hybrid fibre optic cable. The maximum length of cable that can be used without significant degradation of the video signal is 4000m (13,000 ft). The power supply is applied to the Base Station and via the cable to the camera.

Ethernet

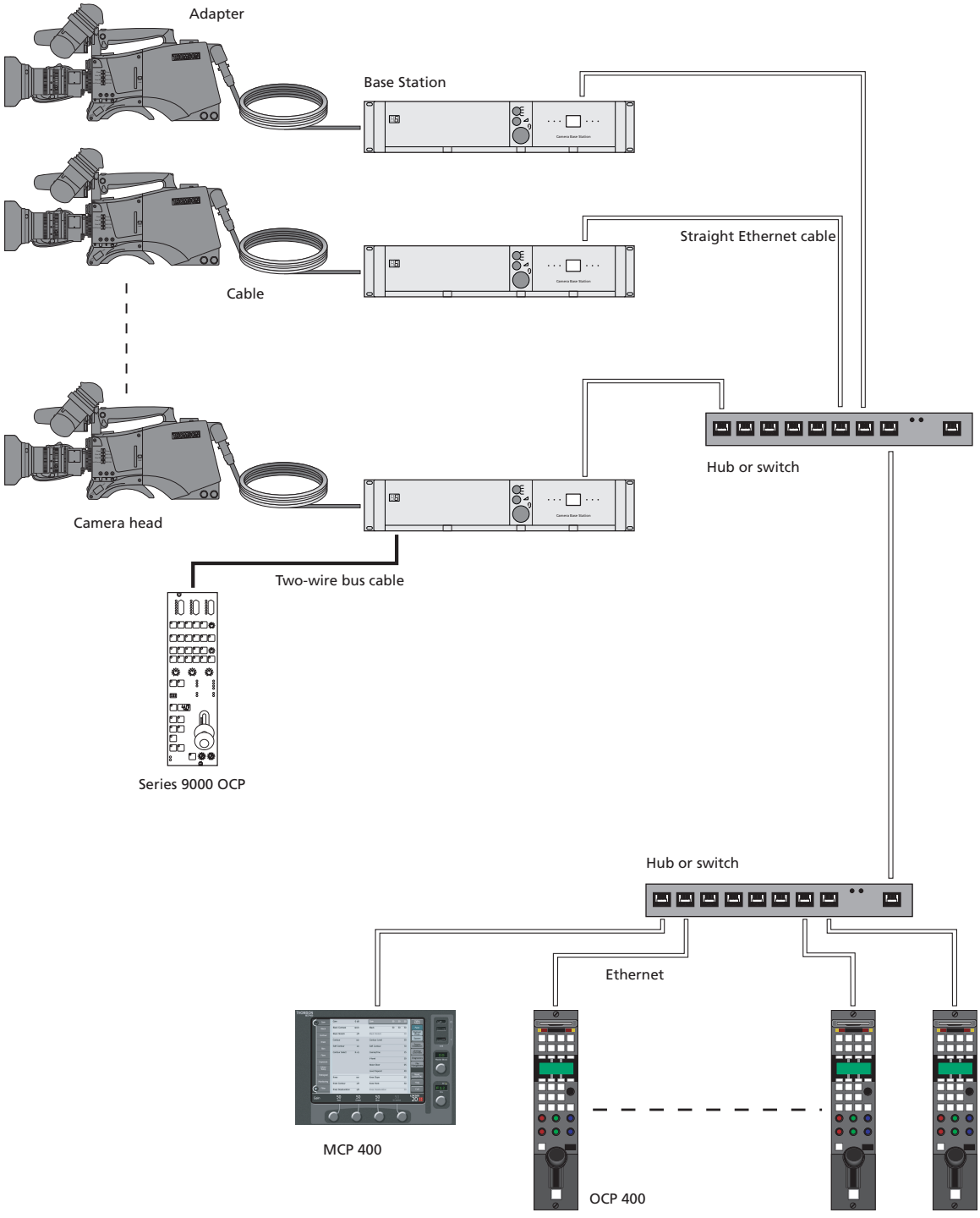
The Base Stations are each connected to a network hub or router via an Ethernet cable (straight through, not cross-over). The OCP 400 operational control panels and, if required the MCP 400 Master Control Panel, are also connected to the Ethernet network via a hub or router.

☞ **Note**

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

If required, a Series 9000 OCP can be connected directly to a Base Station using a two-wire bus cable. In this situation no loop-through is available and the camera number must be set to 1.

Figure 2-1. Cameras and Base Stations with C2IP network control

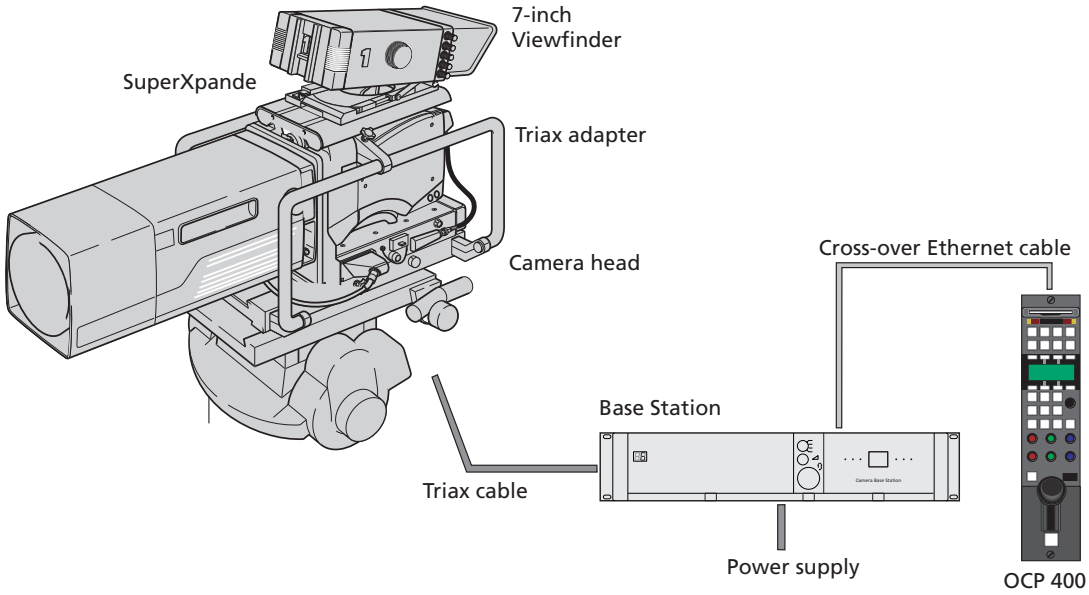


2.1.2 Camera with Triax adapter and SuperXpander

A camera head with a Triax adapter can be mounted in the LDK 4482 SuperXpander. This enables large box lenses to be used with the camera. The Triax adapter connects to the SuperXpander via a flying lead. A 7-inch viewfinder LDK 4016 is mounted on the SuperXpander. The power supply for the camera is applied to the SuperXpander.

The SuperXpander is connected to the Base Station using a Triax cable. The maximum length of cable that can be used without significant degradation of the video signal is 1000m (3,300 ft.) for a 14mm Triax cable. The Base Station is powered by a separate mains power supply. An OCP 400 operational control panel can be connected directly to the Base Station using a cross-over Ethernet cable.

Figure 2-2. Camera with SuperXpander and Triax adapter



2.1.3 Triax cable lengths

The approximate maximum cable lengths between a Base Station and a camera are given in the table below. The signal degrades gradually when these lengths are exceeded. Reduce these lengths by 20% when a teleprompter signal is sent to the camera. The maximum cable length for 8mm Triax can be adversely influenced by the power consumption of the camera.

Table 2-3 Triax cable length guide

Cable diameter	Maximum length
8mm / 0.32 inch	500 m / 1600 ft.
11mm / 0.43 inch	700 m / 2300 ft.
14mm / 0.55 inch	1000 m / 3300 ft.

2.2 Control bus

The Base Station can be connected to either:

- an Ethernet control network (C2IP)

or

- a two-wire Series 9000 control bus (S9000).

One of these options can be selected in the `SYSTEM / CONTROL MODE` menu item. The Base Station is delivered with the default value set to C2IP, so only the Ethernet control bus is active.

If you use control panels of the Series 9000 system, then you must change the value of the System / Control Mode menu item to S9000 so that you can connect these panels to the 4-pin Data connector at the rear of the unit.

(To loop-through Series 9000 control panels use the special connector cable provided.)

The IP address and other options for the Ethernet connection can be set up in the System menu. These items can also be set up remotely using a network configuration tool such as NetConfig.

☞ **Note**

Even if you have selected the C2IP control bus, then you can still connect a single OCP from the Series 9000 system to the 4-pin Data connector at the rear of the unit. However, you may not connect more than one device as this leads to unreliable operation.

2.3 Power supply

Caution

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

Use only fuses of the type and rating specified.

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.

Before connecting your unit to the power supply check the fuse type (230 or 115) on the IEC power connector at the rear of the Base Station.

If the fuse type shown corresponds to your power supply voltage, connect the power supply for the Base Station to the IEC connector at the rear.

If the fuse type does ***not*** correspond to your power supply voltage you must change the fuses before connecting the supply as follows:

1. Insert a small screwdriver into the slot above the pins of the IEC connector and unclip the fuse holder unit.
2. Insert you finger under the indication unit and pull it out.
3. Rotate the indication unit 180° so that the correct indication for you voltage supply is displayed at the back of the Base Station (230 or 115).
4. Slide the indication unit securely back into its slot.
5. Insert the appropriate fuses into the alternative fuse holder which is delivered separately with the Base Station (4AT fuses into the 230 fuse holder; 10AT fuses into the 115 fuse holder). The type of fuse holder is marked on the holder.
6. Slide the fuse holder securly back into the IEC connector until it clips into place.
7. Check again that you have used the correct fuses and that the corresponding indication is shown.
8. Connect the power supply for the Base Station to the IEC connector at the rear.

Figure 2-4. Base Station fuses

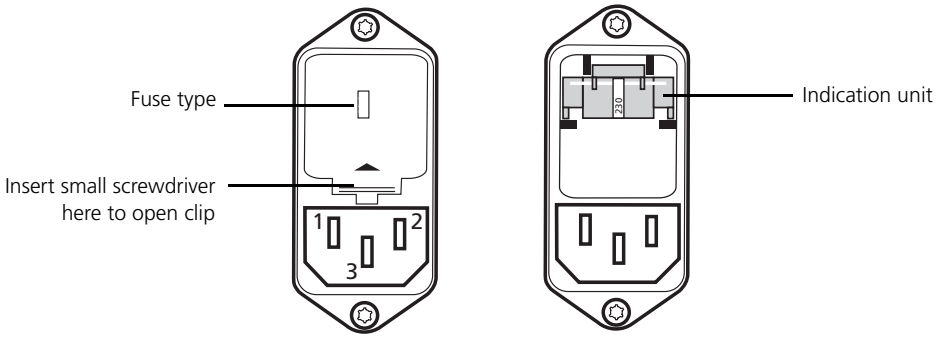


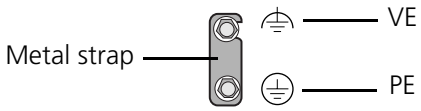
Table 2-5 Power supply specifications

Function	Value
Mains input voltage	230 Vac or 115 Vac
Fuses	4AT (230 Vac) or 10AT (115 Vac)
Mains frequency	47 to 63 Hz
Power consumption	270 Watt (470 VA)

2.3.1 Base Station earthing

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

Figure 2-6. Base Station earthing



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.

2.4 Connecting the studio intercom system

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.

Figure 2-7. Intercom connection - two-wire system

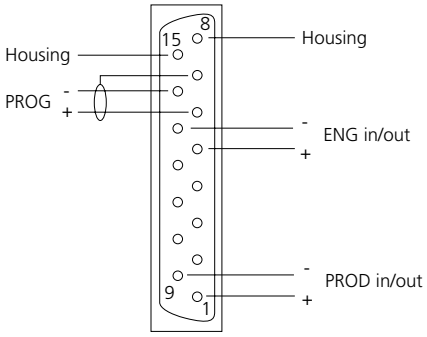


Figure 2-8. Intercom connection - four-wire system

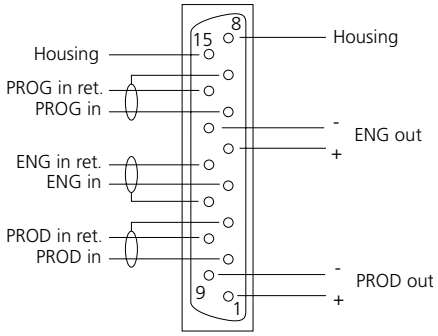


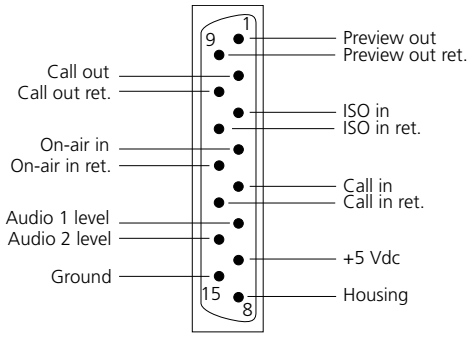
Table 2-9 Intercom signal specifications

Function	Value
4-wire	
Output signal level	+6dBu or 0dBu selectable
Output impedance	50 ohm (max), symmetrical
Input signal level	+6dBu or 0dBu selectable
Impedance	9 Kohm (min), symmetrical
2-wire	
Signal level	0dBu
Load impedance	200 ohm
DC level	40 Vdc maximum

2.5 Connecting the studio signalling

Connect the studio signalling system to the rear of the Base Station. The wiring of the panel connector is shown.

Figure 2-10. Signalling connection



2.5.1 Call, On-air and Iso signals

There are four connection methods for the Call, On-air and Iso (On-air yellow) signalling functions:

1. Dry contact
2. Common ground
3. Voltage level Send lead
4. Open / voltage level Send lead

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

Table 2-11 Signalling send and return pins

Function	Send pin	Return pin
Call	2	10
Iso	3	11
On-air	4	12

The following tables show the selectable states for each of the four connection methods. The states are Open/High (OH); High/Open (HO); Low/High (LH) or High/Low (HL).

Table 2-12 Dry contact (no ground, no voltage)*

Menu setting	Input shorted	Input open
LH	Function ON	Function OFF
HL	Function OFF	Function ON

* a common return (not ground!) can be used for the three functions.

Figure 2-13. Dry contact signalling

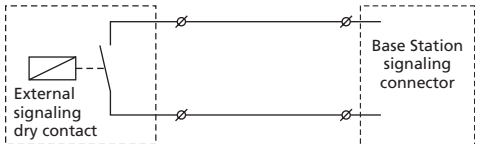


Table 2-14 Common ground (connect one lead only to ground)*

Menu setting	Input grounded	Input open
LH	Function ON	Function OFF
HL	Function OFF	Function ON

* use either Send or Return only, do not mix.

Figure 2-15. Common ground signalling

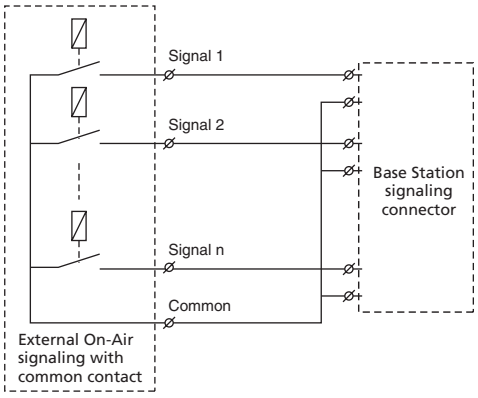


Table 2-16 Voltage level Send lead (0 to 2.5 Vdc, 4 to 24 Vdc)*

Menu setting	Input 0 to 2.5V	Input 4 to 24V
LH	Function ON	Function OFF
HL	Function OFF	Function ON

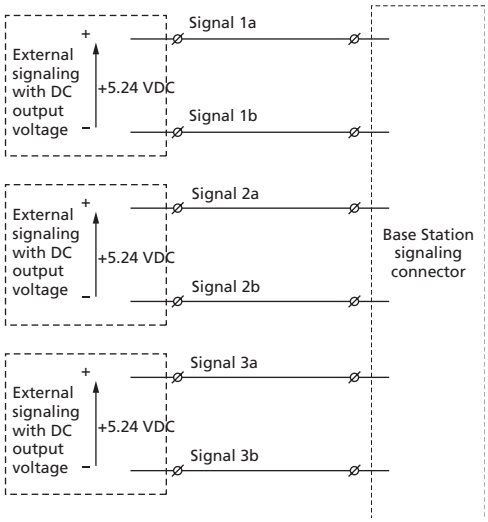
* isolated from ground.

Table 2-17 Open / voltage level Send lead (open, 4 to 24 Vdc)*

Menu setting	Input open	Input 4 to 24V
OH	Function ON	Function OFF
HO	Function OFF	Function ON

* isolated from ground.

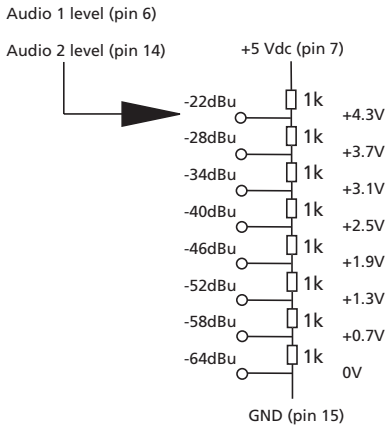
Figure 2-18. Voltage level signalling



2.5.2 Audio level

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.

Figure 2-19. Audio level control



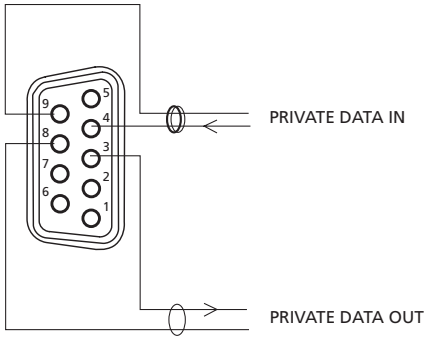
2.6 Auxiliary connections

2.6.1 Private data

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

The tracker microphone intercom channel is used for the data channel from camera head to Base Station. The program intercom channel is used for the data channel from Base Station to camera head. The input and output signals are available on the auxiliary connectors of the camera and Base Station. If a channel is used for private data, then of course the original functions are no longer available.

Figure 2-20. Private data on auxiliary connector



To select the function of the Base Station to camera channel set the Base Station menu item AUDIO/INTERCOM\INTERCOM\PRIVATE DATA\PROG Channel to Priva.

To select the function of the Camera to Base Station channel set the Base Station menu item AUDIO/INTERCOM\INTERCOM\PRIVATE DATA\TRACKER CHANNEL to PRIVATE.

Remember that the propagation-delay times are different for different triax cable lengths, especially if a return signal is involved. At maximum lengths of 2400 metres the total delay is at least 25 µsec. and can be more than 30 µsec, depending on the type of triax cable.

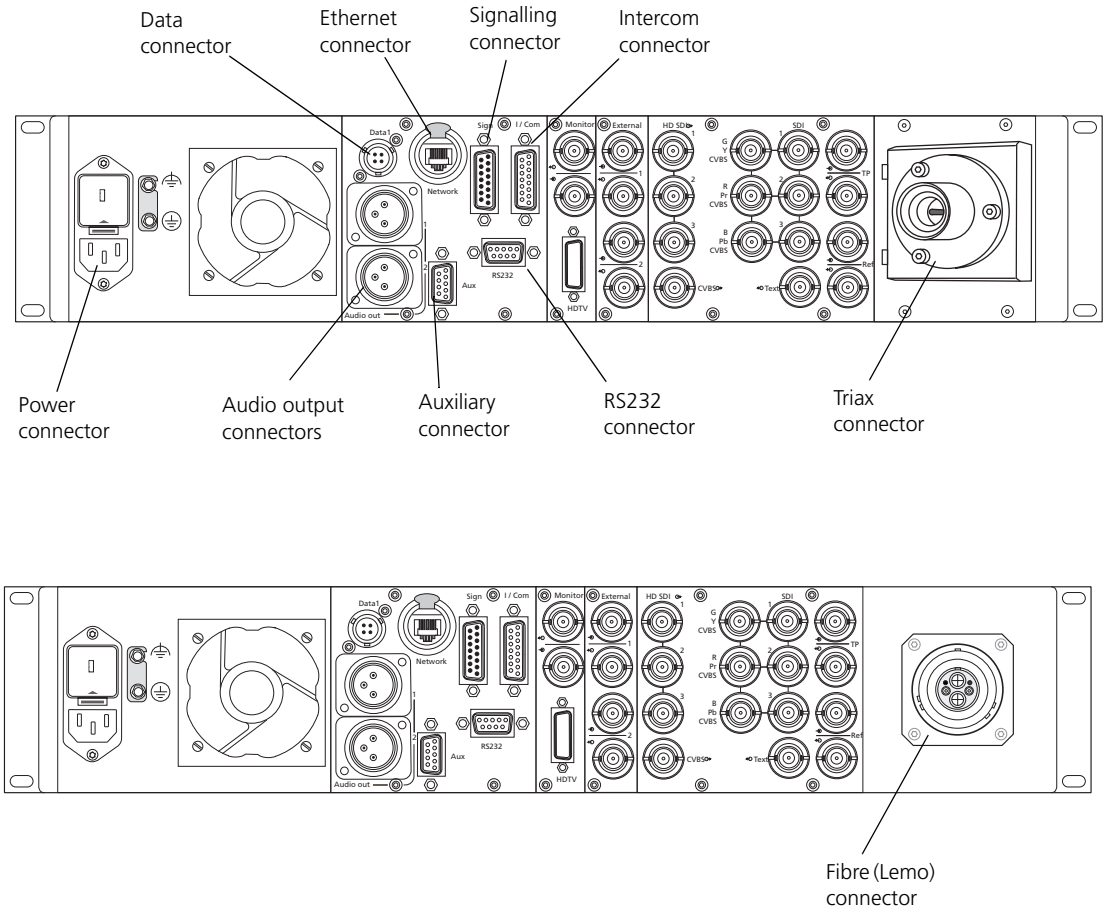
The duty cycle difference between input and output is max 5%.

Table 2-21 Private data signal specifications

Function	Value
Baudrate	2400 bits/sec typical; 4800 bits/sec max.
Input level	TLL, possible RS232 "0"= 0V +/- 0.5V "1"= 5V +/- 0.5V
Input impedance	100Kohm
Output impedance	150 ohm
Max load	~1Kohm

2.7 Base Station connectors

Figure 2-22. Base Station connector location

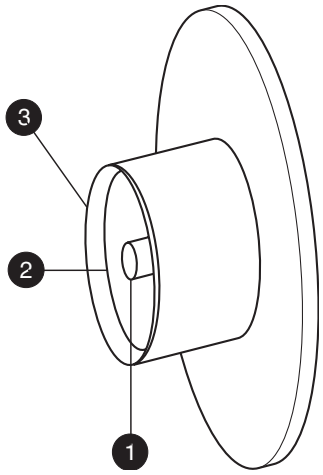


Caution

Do not allow system earth currents to exceed 1.5A in the outer shield of the Triax cable or 0.2A in other cable shields.

2.7.1 Triax connector

Figure 2-23. Triax connector



panel view (X540)

1. Inner pin: Signals + power
2. Inner shield: Return
3. Outer shield: Base Station housing

Fischer male: Panel part number3922 407 30531

Trilock female: Panel part number3922 407 30551

ARD female: Panel part number3922 407 30571

X540LEMO 3 female: Panel part number3922 407 30631

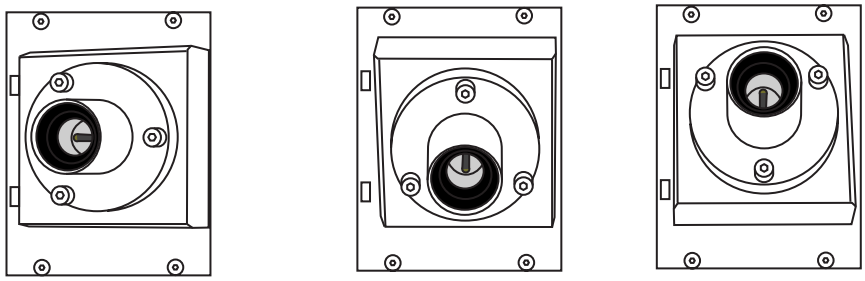
LEMO 4 female: Panel part number3922 407 30591

LEMO BBC male: Panel part number3922 407 30611

The panel part numbers are the connectors including the assembly.

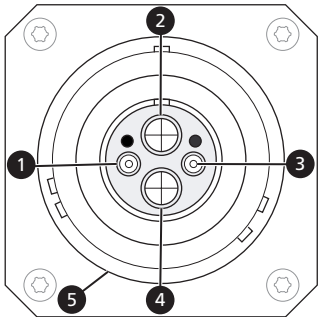
Triax connector orientation

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



2.7.2 Fibre connector

Figure 2-24. Hybrid fibre connector



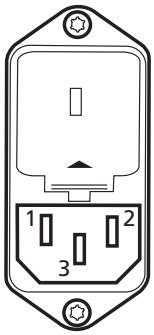
LEMO; panel view (X540)

1. Power
2. Fibre A
3. Return
4. Fibre B
5. Shield

Shield of cable directly to the connector housing.

2.7.3 Power connector

Figure 2-25. Power connector



IEC style 3-pin male; panel view

1. Neutral
2. Line
3. Earth

Mains input voltage: 230 Vac or 115 Vac

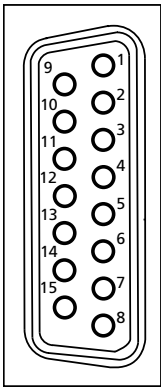
Fuses: 4AT (230Vac) or 10AT (115 Vac)

Mains frequency: 47 to 63 Hz

Power consumption: 320 Watt

2.7.4 Intercom connector

Figure 2-26. Intercom connector



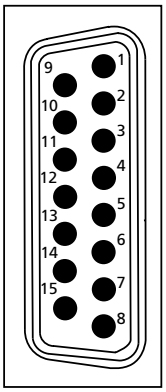
SubD 15-pin female; panel view

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. Progr. in (4-wire only)
7. Progr. in shield (4-wire only)
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. Progr. in return (4-wire only)
15. Housing

Shield of cable to the pin marked housing.

2.7.5 Signalling connector

Figure 2-27. Signalling connector



SubD 15-pin male; panel view (X 370)

Panel part number 2411 022 05292

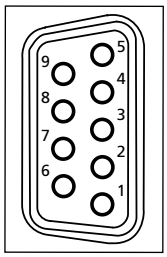
Cable part number 2411 022 06157

1. Prev. out ext. (relay contact < 10 ohm)
2. Call out ext. (relay contact < 10 ohm)
3. Iso in ext. (dry contact)
4. On-Air in ext (dry contact)
5. Call in ext. (dry contact)
6. Audio 1 level (analogue input voltage 0V to +5V, see below)
7. +5 Vdc; OCP
8. Housing
9. Prev. out ext. return
10. .Call out ext. return
11. .Iso in ext. return
12. On-Air in ext. return
13. Call in ext. return
14. Audio 2 level (see pin 6)
15. GND

Shield of cable to the pin marked housing.

2.7.6 Auxiliary connector

Figure 2-28. Auxiliary connector



SubD 9-pin female; panel view (X371)

Panel part number: 2411 022 06238

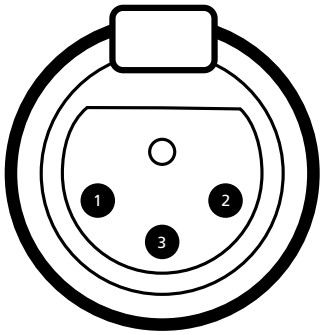
Cable part number: 2411 022 05284

1. +5V
2. AN 0
3. Private data out
4. Private data in
5. Housing (Shield of cable to this pin)
6. GND
7. AN 1
8. Private data out ret
9. Private data in ret

Shield of cable directly to the connector housing.

2.7.7 Audio out connector

Figure 2-29. Audio out connectors



XLR 3-pin male; panel view

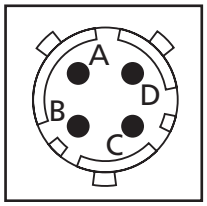
1. Audio Screen
2. Audio Out
3. Audio Return

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.

2.7.8 Data connector

Figure 2-30. Data connector (S9000 oly)



4-pin male; panel view (X368 / X3784)

Panel part number: 2411 020 11367

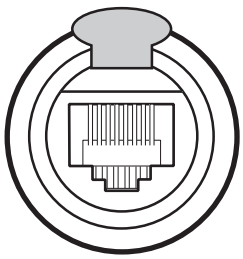
Cable part number: 2411 020 12025

A. Data
B. Data not
C. Not connected
D. Shield

Shield of cable to the pin marked housing.

2.7.9 Ethernet connector

Figure 2-31. Ethernet connector (C2IP)

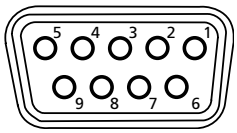


Neutrik RJ-45; panel view (X378)

8-pin Standard Ethernet RJ-45 connector

2.7.10 RS232 serial connector

Figure 2-32. RS232 serial connector



SubD 9-pin male; panel view

X7 Data Board9-pin

X379 Signal Connector Board

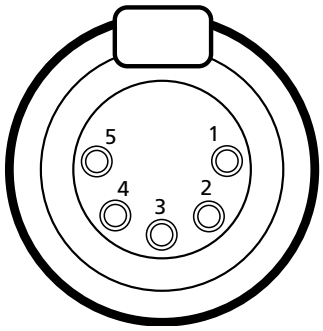
Panel part number: 2422 025 12962

Serial Interface Cable: 4822 872 03413

1. SPARE
2. RS-RXD-Receive Data
3. RS-TXD-Transmit Data
4. RS-DTR-Data Terminal Ready
5. RS-DGND-Signal Ground
6. RS-DSR-Data bSet Ready
7. RS-RTS-Request To Send
8. RS-CTS-Clear To Send
9. +12V

2.7.11 Front headset connector

Figure 2-33. Headset connector



XLR 5-pin female; panel view (X574)

1. Microphone return
2. Microphone
3. Telephone return
4. Telephone left
5. Telephone right

Microphone level -64dBu

Microphone impedance 200 ohm

Telephone level +6dBm nominal

Telephone output impedance <50 ohm

Shield of cable directly to the connector housing.

Chapter 3

Using the Base Station

3.1 Base Station controls and indicators

Figure 3-1. Base Station controls

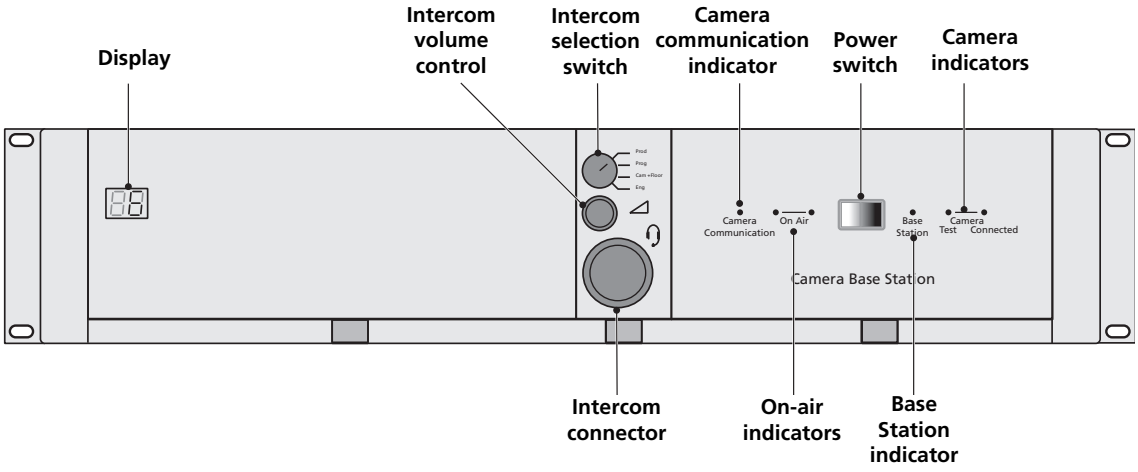


Table 3-2 Functional discription

Control or indicator	Description
Display	During normal operation the display shows the number of the camera connected to the Base Station. When the set-up control (located behind the left front cover) is activated, the display shows a two letter code to identify the set-up function (see Set-Up). The display can be switched on or off via the Base Station menu system.
Intercom volume control	Adjusts the volume of the selected intercom channel being monitored on the connector below.
Intercom selection switch	Use this switch to select the intercom channel that is monitored on the connector below.

Table 3-2 Functional discription

Control or indicator	Description
Intercom connector	Connect a headset to this connector to monitor the selected intercom channel.
Camera communication indicator	This green LED lights when the communications between Camera and Base Station are OK.
On Air and ISO indicators	The red LED lights when the Camera is On Air. If the Camera is selected as ISO Camera the yellow LED lights.
Power switch	Switches the power supply to the Base Station on and off. A built-in light lights to indicate that the power is ON.
Base Station indicator	This green LED lights when the Base Station is operationally ready.
Camera indicators	This bi-colour TEST LED lights red or yellow to indicate the Camera and Triax status: - Red lights continuously – Triax short circuit. - Red flashes – Triax open circuit. - Yellow – Camera power switched off with the OCP or MCP (polling). This green CONNECTED LED lights when the Camera is connected and the Camera power switch is On.

3.2 Setting up the Base Station

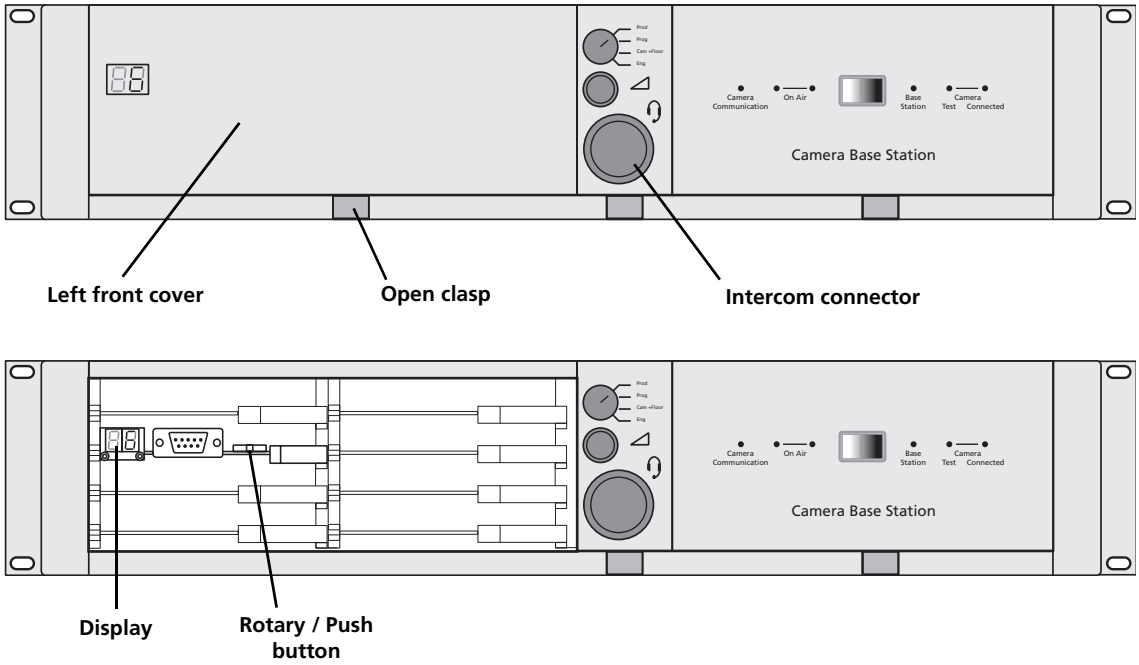
The Base Station is set up using either:

a. The Rotary/Push button behind the front cover oof the Base Station

or

b. An OCP attached to the Base Station

Figure 3-3. Base Station set up controls



3.2.1 Set-up items

There are four items that can be accessed via the set-up Rotary/Push button on the Data Board:

- Camera number (CA)
- Subcarrier adjustment (SC)
- H-phase (HP)
- System menu (NN)

Remove the left front cover to access the Rotary/Push button on the Data Board. Rotate the button to the left or right to select the required item. The display shows the abbreviation of the current item.

Camera Number (CA)

When CA is displayed, push the Rotary/Push button to enter the selection mode. Rotate the button to the left or right to select an available camera number. Push the Rotary/Push button to set the new camera number. The Base Station automatically resets and the new camera number is shown in the display.

Subcarrier (SC)

When SC is displayed, push the Rotary/Push button to enter the Subcarrier adjustment mode. Rotate the button to the left or right to shift the Subcarrier phase. If you continue to rotate the button, the shift change occurs in bigger steps. Push the Rotary/Push button to leave the Subcarrier adjustment mode.

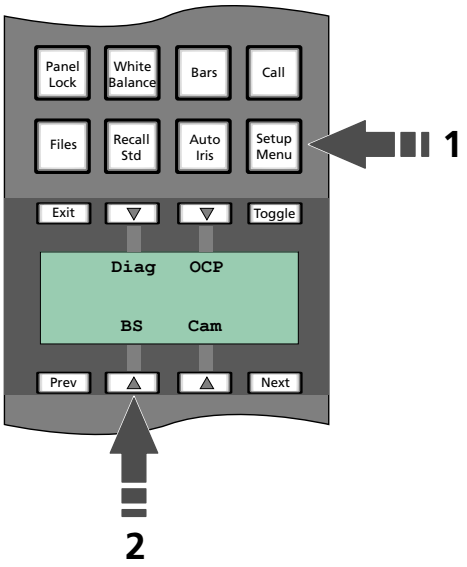
H-Phase (HP)
When HP is displayed, push the Rotary/Push button to enter the H-Phase adjustment mode. Rotate the button to the left or right to shift the H-Phase. If you continue to rotate the button, the shift change occurs in bigger steps. Push the Rotary/Push button to leave the H-Phase adjustment mode.

System Menu (NN)
When NN is displayed, push the Rotary/Push button twice to enter the System Menu. The Rotary/Push button can be used to navigate through the menu system, however, it is more convenient to use the OCP connected to the Base Station.

3.3 Using an OCP 400 to set up the Base Station

An OCP can be used to set up the base station instead of the Rotary/Push button.

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



The BS submenu appears. Use the **Next** button to view subsequent pages.

Table 3-4 Base Station set-up menu

Menu	Selections	Function	Level	Possible values
BS	MONITORING	Picture monitor selection	S	CVBS, R,G,B, Y, EXT1, EXT2, Y/EXT1, Y/EXT2
	-			
	-			
	MENU	BS internal menu enable	S	

Table 3-4 Base Station set-up menu

Menu	Selections	Function	Level	Possible values
Next	H PHASE	Adjustment H-Phase	B	0..99
	SC COARSE	Adjustment SC-Phase coarse	B	0, 90, 180, 270
	-			
	SC FINE	Adjustment SC-Phase fine	B	0..99
Next	NOTCH LVL	Notch Depth	B	0..99
	NOTCH	Notch function	B	On, Off
	-			
	-			

Select the **MENU** item of the BS menu to access the internal menu of the Base Station. The internal menu appears on the Base Station Text output and CVBS output (if switched on).

Table 3-5 Base Station internal menu

Menu	Selections	Function	Level
BS internal menu	UP*	UP menu	S
	-		
	DOWN*	DOWN menu	S
	SELECT	Select item	S

* Or use the rotary contol on the OCP to move up or down through the menu.

3.4 Using the Base Station system menu

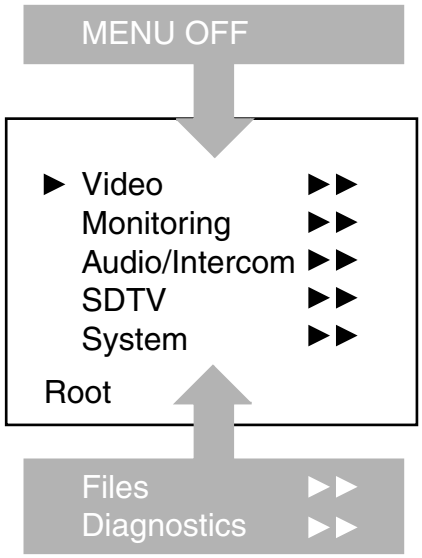
The menu system is used for configuring the base station. As there are a large number of functions and set-up options available, it may require some time for you to become familiar with them all.

The System Menu video signal is available on the Text output of the base station. The System Menu text can also be superimposed on the CVBS output if desired.

3.4.1 Entering the system menu

Use the Rotary/Push button behind the left front cover to control some basic set-up functions and to navigate through the menu system. The system functions of the base station are grouped into menus and sub-menus. Rotate the Rotary/Push button to the left or right to select the Systems Menu. The display shows the abbreviation NN. Push the Rotary/Push button twice to enter. The Main menu appears on the monitor.

Figure 3-6. Main menu



The main menu screen shows five items and the name of the menu. One more item is hidden but becomes visible when you scroll down. A cursor shows your position in the menu. The Rotary/Push button moves the cursor up and down.

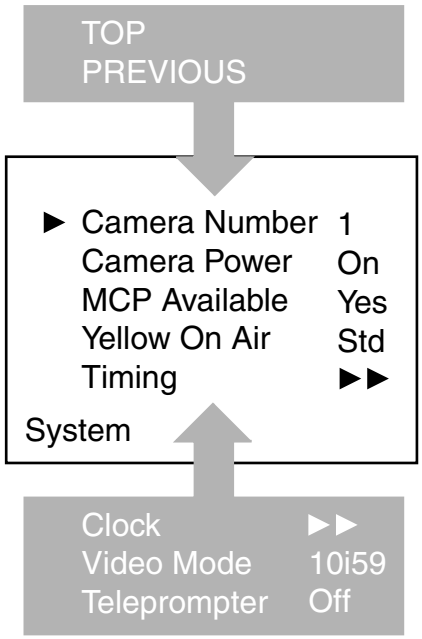
3.4.2 Finding your way

Use the Rotary/Push button to move the cursor through the menu items. If a double arrow (>>) is visible, then pressing the Rotary/Push button brings you one level lower in the menu system. Only five items are visible in each menu. Scroll up or down to see any additional 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 Rotary 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.

Figure 3-7. System menu



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 with the Rotary control.

3.4.3 Leaving the Systems Menu

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

- If necessary move the cursor to the left most column with the Rotary/Push button.
- Scroll upwards until the cursor points to TOP (this is the main menu).
- Press the Rotary/Push button. The cursor now points to the Menu off item of the MAIN menu.
- Press the Rotary/Push button 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 programmed 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.

3.4.4 Making changes

To find out where to change a function, consult the List of System Menu Functions at the end of this section to 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 places the cursor in a list menu indicating the value currently selected. Use the Rotary/Push button to point to a new value. Press the Rotary/Push button 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 places the cursor in front of the value and the Rotary/Push button is used to change the analogue value. Press the Rotary/Push button to return the cursor to the function list.

3.4.5 Using the Recall File to undo changes

If you make changes to the settings in the Systems 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.

3.4.6 Base Station menu structure

Access to the functions on these menus is determined by the user level that has been set. The menus are as follows (refer to Chapter 6 for more details):

Main (top) menu
The top menu gives access to the other menus.

Video menu
The video menu contains those functions which affect the picture quality.

Monitoring menu
This menu contains the functions which determine how items in the video monitor are displayed.

Audio/Intercom
The functions contained under this menu control various aspects of audio and intercom.

System menu
This menu contains the functions that are used to set up the general configuration and for carrying out adjustments and calibrations of the Base Station.

Files menu
This menu allows values to be stored in System and operator files, and allows these files to be recalled as required.

Diagnostic menu

The diagnostic menu is designed to provide information on the current status of the Base Station.

3.4.7 Base Station user levels

The menu items are divided into two user levels. The operator level Op. (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.

The system Menu Structure paragraph of this section indicates which functions are available at each user level.

3.4.8 Video menu - Special features

Auto lighting

The Auto Lighting item of the the video menu compensates for variations in the frequency of the power supply used for gas discharge lamps (fluorescent or HMI lighting).

The frequency of power supply generators can vary from the nominal value. This variation affects the lighting which in turn affects the colour balance. If camera system and lighting are supplied by the same power source, then the base station auto lighting function can automatically adjust the exposure to follow the variations and maintain a constant colour balance. This correction only works when the camera exposure time is set to the 50Hz or 60Hz position.

Gain adjustment

The Gain Adjustments item of the the video menu is a special item. It combines menu items from various other menus to help you when you are adjusting the gain. It should only be used when carrying out the gain adjustments on the Sync/Encoder board in conjunction with the procedure given.

3.4.9 MCP availability

When no MCP is available it might occur that some functions are in an undesirable position, for example, a lock on the upper part of the OCP. To prevent this happening, set the Base Station menu item `SYSTEM \ MCP AVAILABLE` to **No** when an MCP is not available.

The functions affected by this setting and their state are as follows (if the item value is set to MCP Available = No)
:

Table 3-8 MCP not available

Function	State
Variable black stretch (Yes/No)	Yes
Variable gamma (Yes/No)	Yes
Variable Flare (Yes/No)	Yes
Saturation (Yes/No)	Yes
White clipper (Yes/No)	Yes
Knee slope (Yes/No)	Yes
Knee point (Yes/No)	Yes
Iris(Normal/Reverse)	Normal
OCP lock (Upper/Total)	Total
Intercom (System/Isolate)	System
Audio (External/MCP)	External
Aspect Ratio (External/MCP)	External
Aspect Ratio (4:3/16:9)	4:3
Autolight (Yes/No)	Yes

3.5 Intercom set up

Our Triax camera systems offer extensive intercom facilities between cameraman, tracker (floorman), 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
- Base Station front panel selection switch (optional)
- Camera head adapter rear panel
- Camera head switches

When setting up a system it is usually more convenient to use an OCP400 to select your preferences in both the Base Station and camera head menu systems.

☞ **Note**

For a fully-featured intercom system, the Base Station must be fitted with a BS Audio/ Intercom module and a BS Headset module, both of which are optionally available. If either of these modules is absent from your system then the associated features outlined below are obviously not available.

3.5.1 Base Station - studio interface set-up

A four-wire or a two-wire studio system can be connected to the Base Station. In the Base Station `AUDIO/INTERCOM` menu, select the Wire Mode for engineering (ENG), production (PROD) and programming (PROG). 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 an OCP.

Levels

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

- Set the input and output intercom levels for the PROD and ENG channels. The range is 00 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.

3.5.2 Base Station headset set-up

Note

The headset facilities are only available on Base Stations fitted with the BS Headset module which is optionally available.

A headset connected to the front of the Base Station is set-up via the AUDIO/INTERCOM menu of the Base Station using the ENG Headset submenu. In this menu you can select a 12Vdc phantom supply for the headset microphone and set the microphone level to 0dB or +20db.

The cameraman microphone signal and the tracker (floor) microphone signal can be individually switched on for the headset and the levels for each can be set. You can switch on a sidetone from the Base Station microphone and set its level.

The Base Station microphone signal is added to the ENG channel. Use the MIC ENG-OUT function in the menu to send it to the studio engineering channel. Use the MICTOENG-CAM function to send it to the camera.

Operation

The signal to the headset is controlled with a switch in the front of the Base Station which selects the intercom signal to be heard in the Base Station headset. The choices are:

- PROD (production)
- PROG (programming)
- CAM+FLOOR (cameraman and tracker)
- ENG (engineering)

If CAM+FLOOR is selected, the signal that is heard depends on the values set in the ENG Headset submenu for the CAMERAMIC and TRACKERMIC signals in the AUDIO/INTERCOM menu of the Base Station.

Note

If you have selected to operate a bi-directional private data channel between the Base Station and the camera in the AUDIO/INTERCOM menu of the Base Station, then the tracker microphone signal is not available in the Base Station and the Program signal is not available in the camera.

3.5.3 Voice mail

Voice Mail is an intercom message storage function.

☞ **Note**

Voice mail is only available if the Base Station menu item `AUDIO/INTERCOM \ INTERCOM \ CALL` is set to Voice.

Recording

Recording starts automatically at the start of a message. A new message erases the previous recorded message. The maximum message length is 16 seconds. Longer messages are recorded in a retroloop. Only the last 16 seconds are available for playback. Select the intercom channels to be recorded via the Base Station menu items `AUDIO/INTERCOM \ INTERCOM \ VOICE MAIL \ RECORD ENG`, `PROD` and `PROG`.

☞ **Note**

The voice mail box can only contain one message. If voice mail recording starts from an other intercom channel the previous message is erased.

Listening to the message

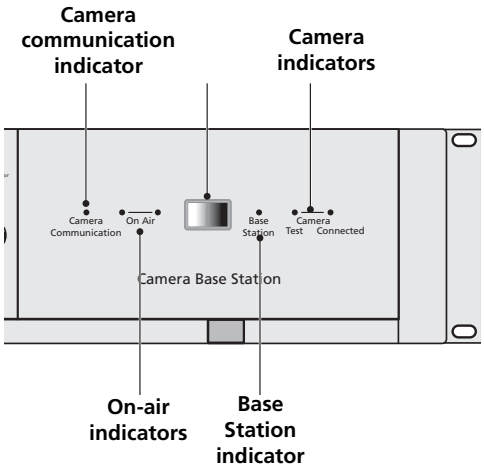
Push the camera call button to start playing out the recorded voice mail to the camera headset. Push the call button again to stop playing the voice mail message.

Chapter 4

Diagnostics

4.1 Base Station diagnostic indicators

Figure 4-1. Base Station indicators



4.1.1 Camera communication indicator

This green LED lights when the communications between Camera and Base Station are OK.

4.1.2 On Air and ISO indicators

The red LED lights when the Camera is On Air. If the Camera is selected as ISO Camera the yellow LED lights.

4.1.3 Base Station indicator

This green LED lights when the Base Station is operationally ready.

4.1.4 Camera indicators

The bi-colour **TEST** LED lights red or yellow to indicate the Camera and Triax status:

- Red lights continuously – Triax short circuit OR an interrupted core. Other indicators of this condition are:
  - OCP: Triax LED red (continuously)
  - MCP: DIAGNOSE \ TRIAX - SHORT
  - Menu: Diagnostics \ Board Diagnostics \ Power board \ Triax Status

  The interpretation of these messages is given below.
- Red flashes – Triax open circuit (no camera is connected). Other indicators of this condition are:
  - OCP: Triax LED Flashes red
  - MCP: DIAGNOSE \ TRIAX - OPEN
  - Menu: Diagnostics \ Communications \ Camera Connected - No
- Yellow – Camera power switched off with the Operational or Master Control Panel.

This green **CONNECTED** LED lights when the Camera is connected and the Camera power is not switched off by the MCP, OCP or Base Station menu.

Table 4-2 Diagnostic indicators for camera power

Communication	Test	Connected	
off	off	green	Camera power switched off by the camera power switch.
off	yellow	off	Camera power switched off by the MCP, OCP or base station menu.

4.2 Triax diagnostic indications

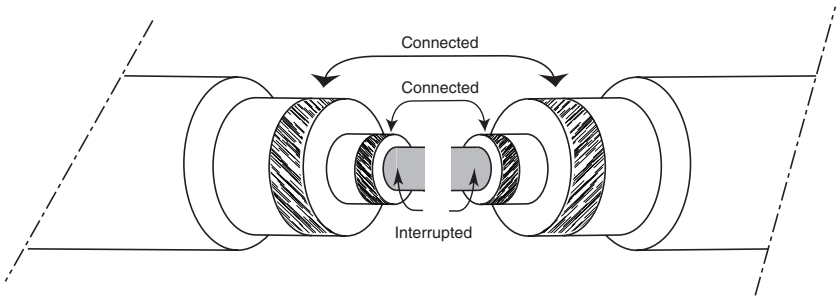
The Camera **TEST** LED lights red during these fault conditions.

General precautions to avoid Triax problems

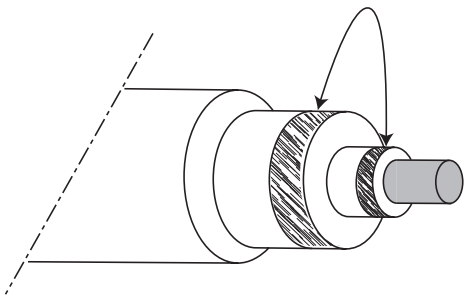
- Only use triax cable (with three conductors).
- Ensure that all triax connectors (camera, base station and extension cables) fit snugly into each other.
- Verify that there is no interruption in all three conductors of the triax cable before deploying (including extension triax cables).
- When using Triax connectors be sure to always make swift and firm connections to avoid unintended fault conditions.
- Verify that there is no shortcircuit between the outer and inner shield or core.

4.2.1 Core Open

Figure 4-3. Fault conditions for Core_Open message



1. Indicates an interrupted core when both shields are connected correctly while the camera is connected.

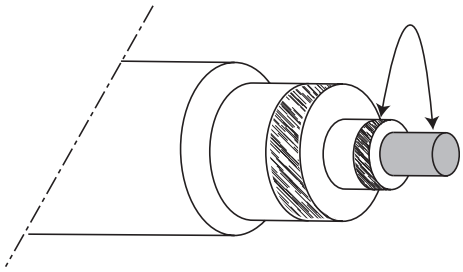


2. Indicates a short circuit between the outer and inner shield while the camera is NOT connected.

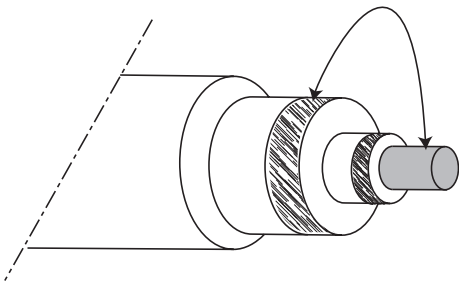
Base Station diagnostic message: `DIAGNOSTICS/BOARD DIAGNOSTICS/POWER BOARD/TRIAX STATUS >> COPEN`

4.2.2 Core Short

Figure 4-4. Fault conditions for Core_Short message



1. Indicates a short circuit between the core and the inner shield while the camera is NOT connected.

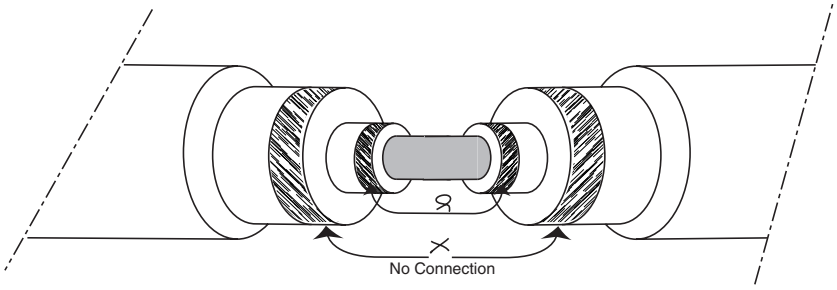


2. Indicates a short circuit between the core and the outer shield while the camera is NOT connected.

Base station diagnostic message:`DIAGNOSTICS/BOARD DIAGNOSTICS/POWER BOARD/TRIAX STATUS >> CSHRT`

4.2.3 Shield Open

Figure 4-5. Fault conditions for Shield_Open message

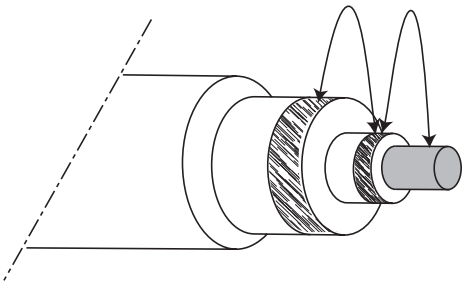


Indicates an interrupted outer shield.

Base station diagnostic message:`DIAGNOSTICS/BOARD DIAGNOSTICS/POWER BOARD/TRIAX STATUS >> SOPEN`

4.2.4 Total Short

Figure 4-6. Fault conditions for Total_Short message



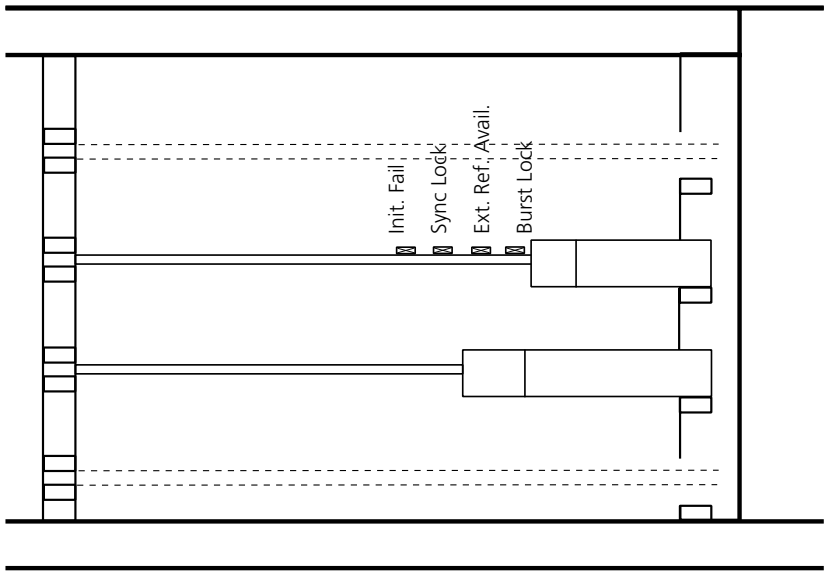
Indicates a short circuit between the inner shield, the outer shield and the core.

Base station diagnostic message:`DIAGNOSTICS/BOARD DIAGNOSTICS/POWER BOARD/TRIAX STATUS >> TSHRT`

4.3 Sync/Encoder HD board status

LED indicators on the Sync/Encoder board show the status of the board and the signal locking:

Figure 4-7. Sync/Encoder HD board



Init. Fail: - lights (red) if there is a configuration or initialisation error or if the bus clock or video sync pulses are missing.

Sync Lock: - lights (green) if the Hor. and Vert. lock is OK.

Ext. Ref. Avail.: - lights (green) if an external sync. signal is present.

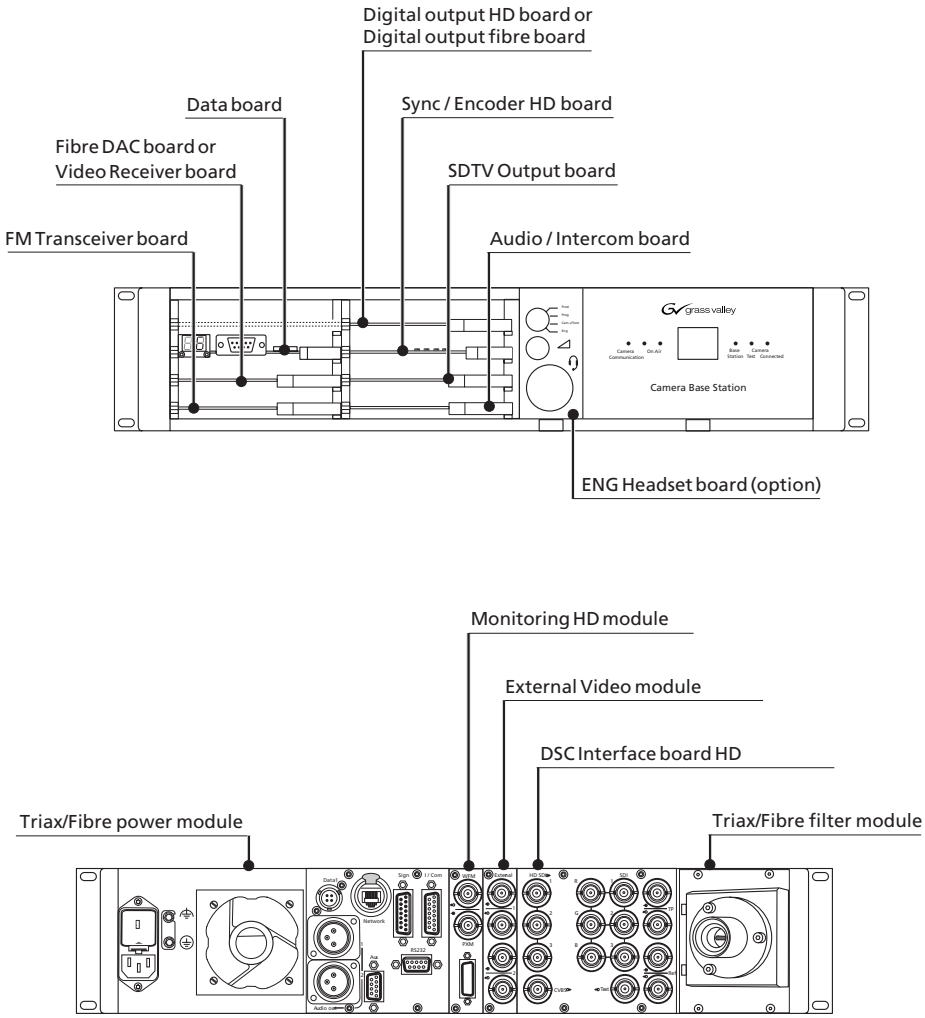
Burst Lock: - lights (green) if the subcarrier/H-phase lock is OK.

Chapter 5

Preventative maintenance

5.1 Module locations

Figure 5-1. Base Station modules



5.2 Replacements

The instructions given in this section are restricted to items which can be replaced at the first line service level. These modules include:

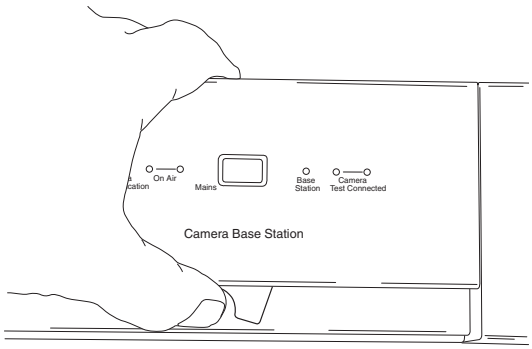
- Power Unit
- Dust filters

5.3 Power unit

Removing the Power Unit

- Remove the screw at the rear of the Power Unit.
- With your thumb push up the lever, as shown below, and pull the Power Unit out of the Base Station.

Figure 5-2. Removing the Power Unit

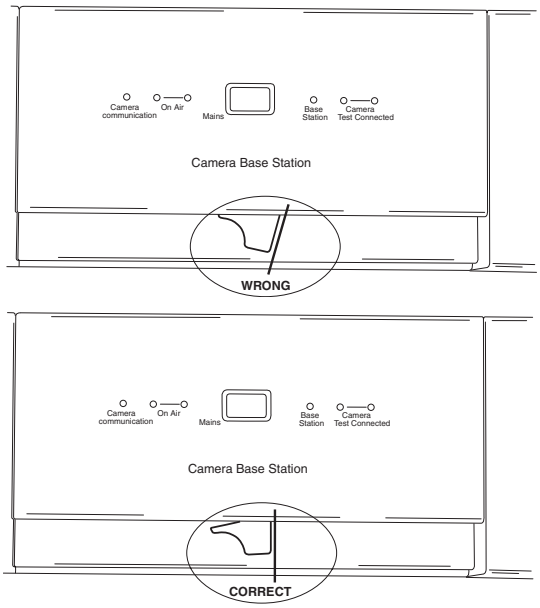


Installing the Power Unit

- Put the Power Unit into the guides and push until the lock clicks.
- Check that the Power Unit is correctly locked.
- Tighten the screw at the rear of the Power Unit.

The correct and incorrect locking positions are shown below.

Figure 5-3. Installing the Power Unit

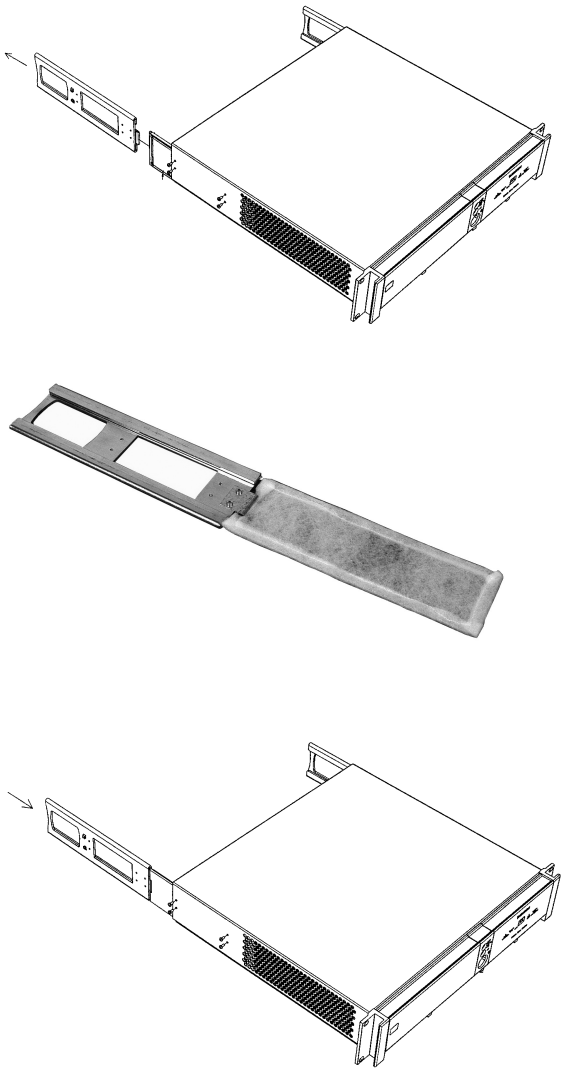


5.3.1 Replacing dust filters

Side-inlet

1. Remove 4 screws.
2. Slide back support with dust filter out of base station.
3. Remove dust filter.
4. Place clean dust filter in back support.
5. Slide back support with dust filter into base station.
6. Fix support with 4 screws.

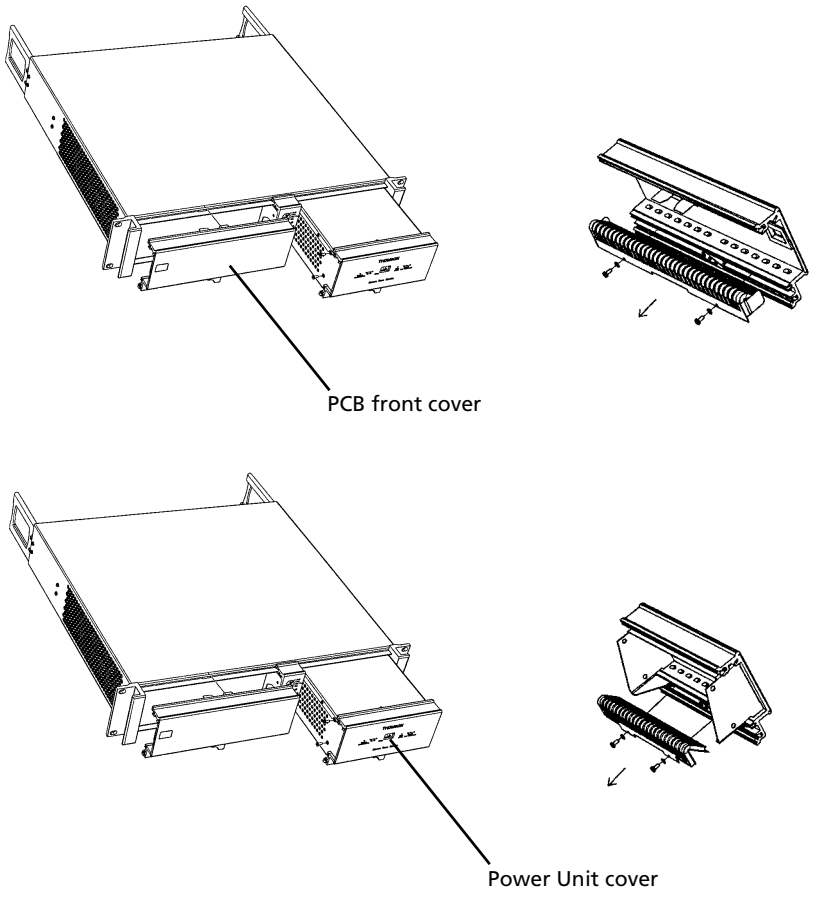
Figure 5-4. Replacing side dust filters



Front-inlet

1. Remove PCB front cover.
2. Remove dust filter.
3. Place clean dust filter.
4. Put back PCB front cover.
5. Remove front cover Power Unit.
6. Remove dust filter.
7. Place clean dust filter.
8. Return front cover Power Unit to its position.

Figure 5-5. Replacing front dust filters



Chapter 6

Menu structure and contents

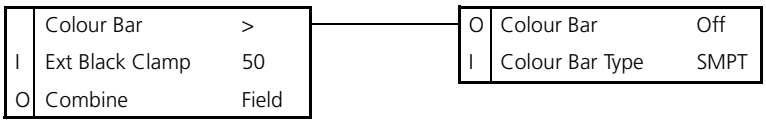
6.1 Menu structure

The structure of the main menus and their submenus are shown on the following pages. The first column shows the user level (I or 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.

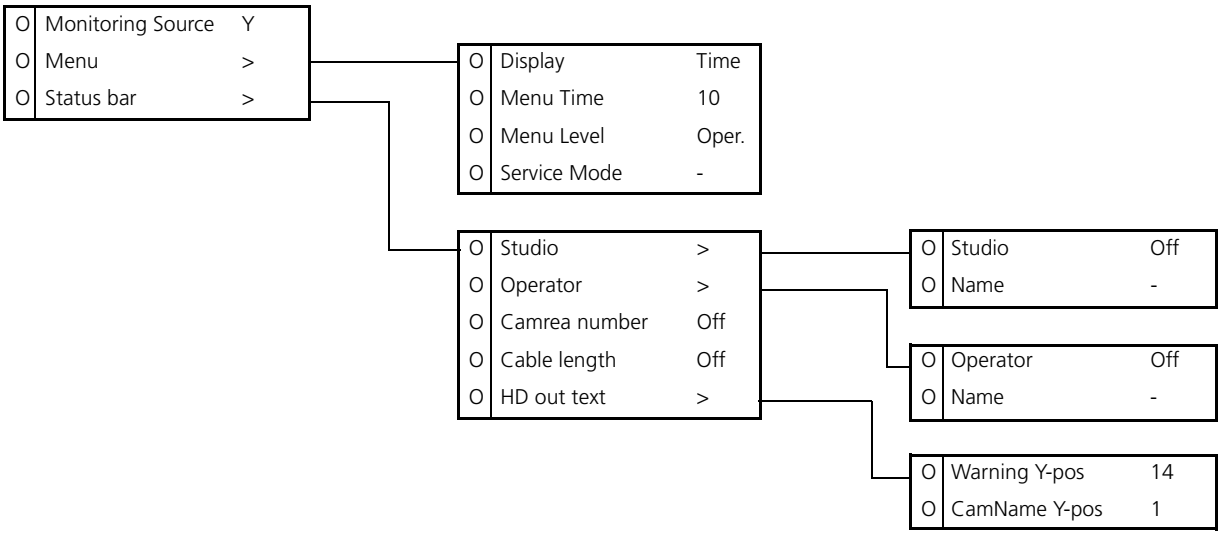
6.1.1 Top menu structure

	Video menu	>>
	Monitoring menu	>>
	Audio/Intercom menu	>>
	SDTV menu	>>
	System menu	>>
	Files menu	>>
	Diagnostics menu	>>

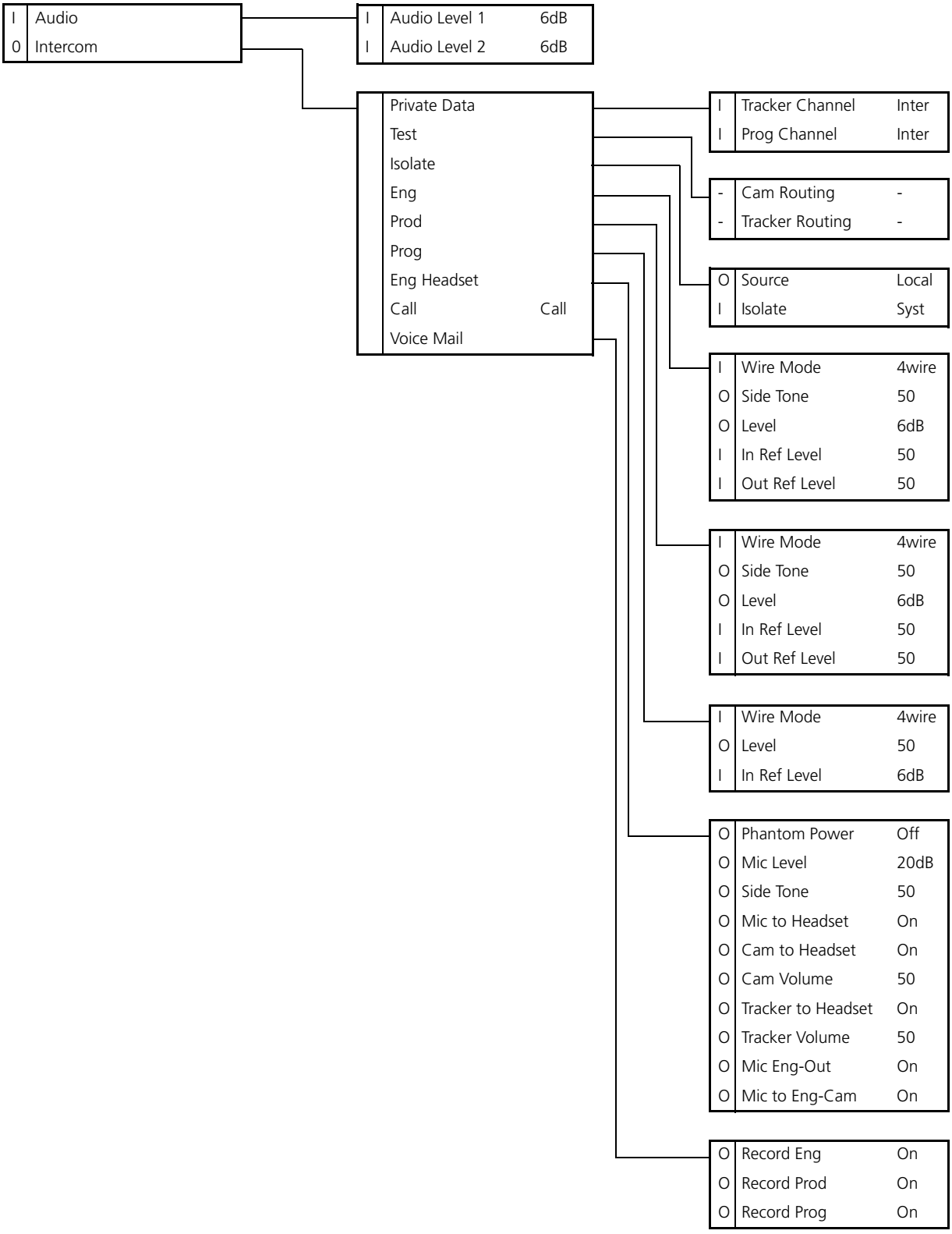
6.1.2 Video menu structure



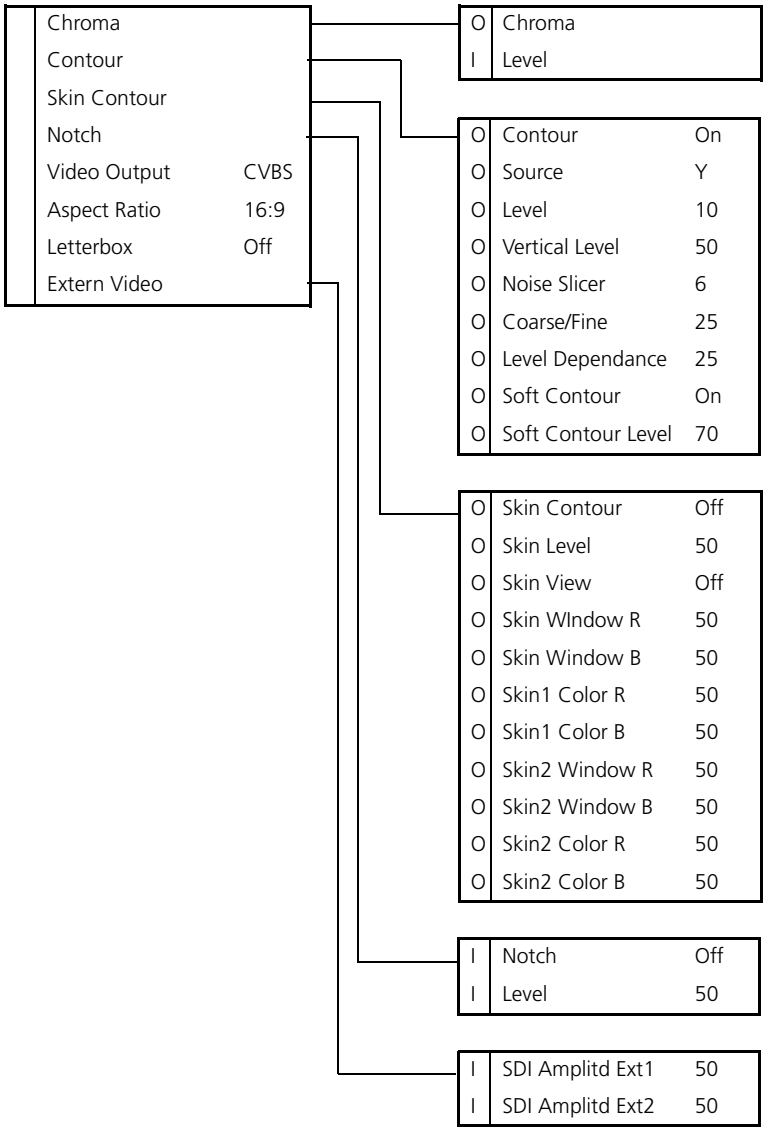
6.1.3 Monitoring menu structure



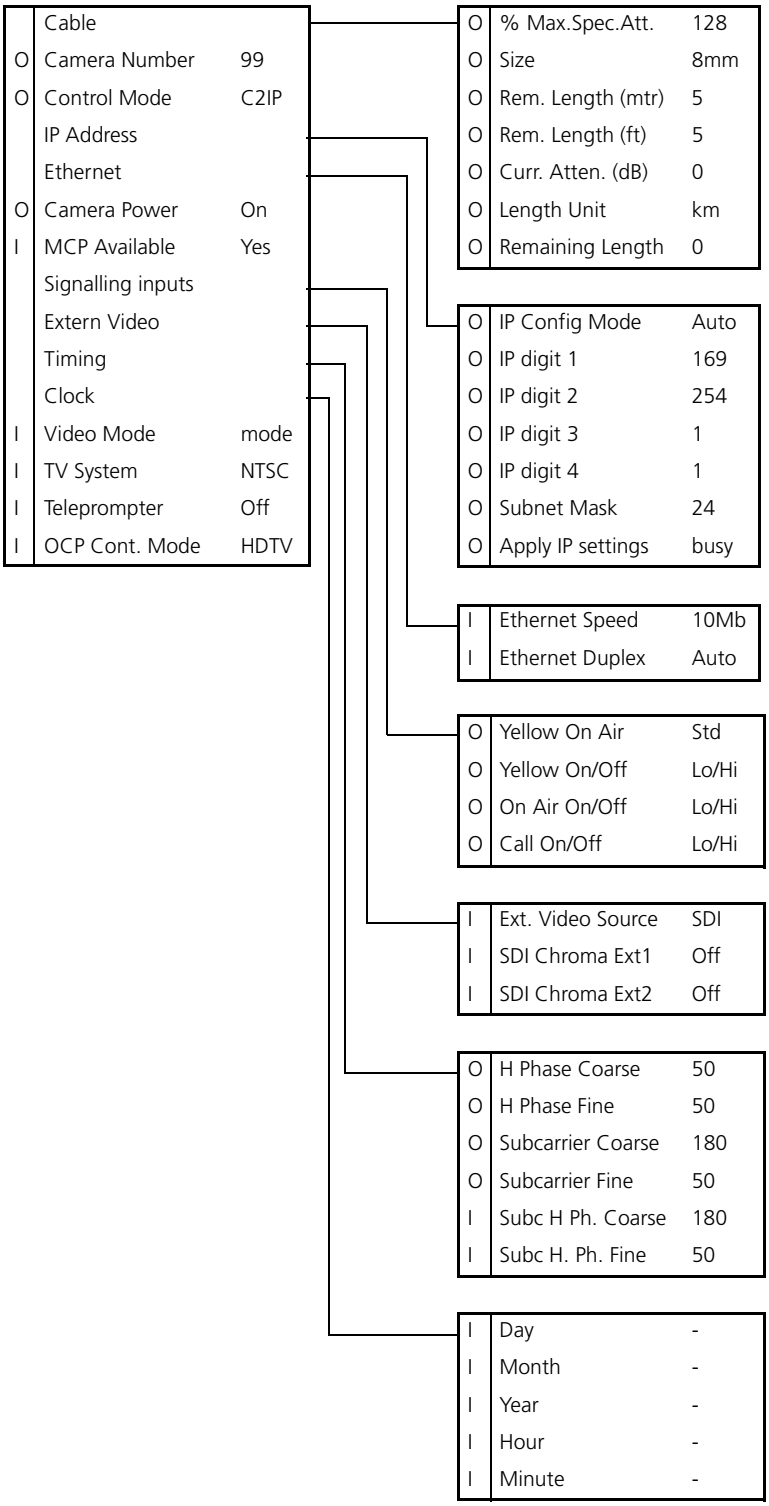
6.1.4 Audio/Intercom menu structure



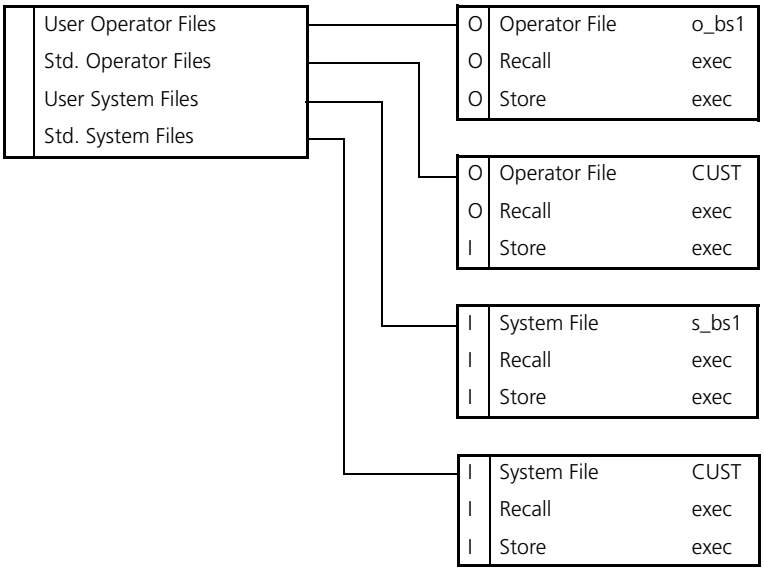
6.1.5 SDTV menu structure



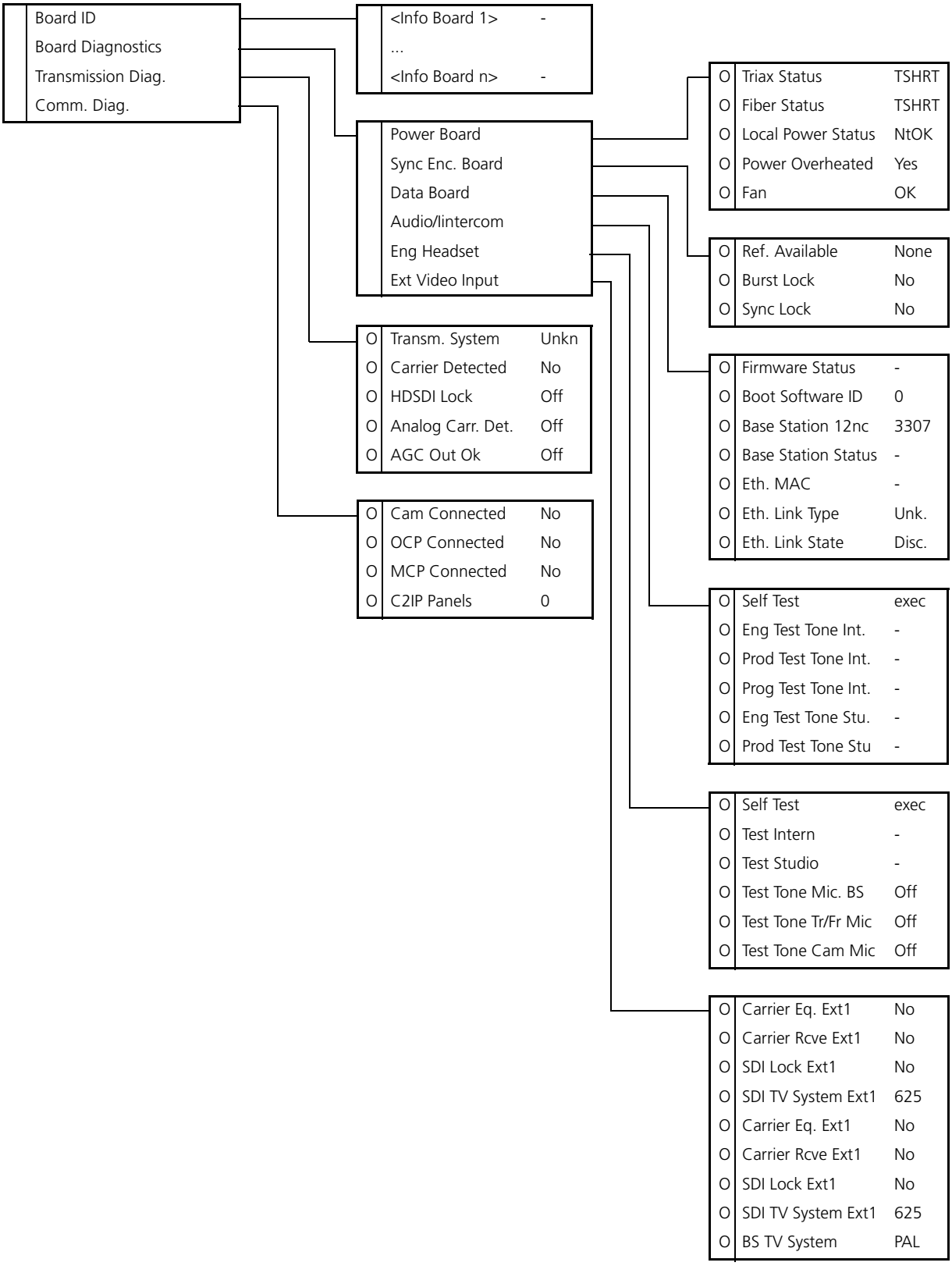
6.1.6 System menu structure



6.1.7 Files menu structure



6.1.8 Diagnostics menu structure



6.2 Menu contents

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

The Op. in the LEVEL column indicates that this item is visible at the Operator user level; the Inst. indicates that this item is visible at the Install user level.

The Sc. 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 Op. 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**.

6.2.1 Video menu content

MENU	VALUES	DESCRIPTION	LEVEL	FILE
Colour Bar				
Colour Bar	On, **Off**		Op.	Sc.
Colour Bar Type	**SMPTE**, Full	Changes the colour bar type (only HDTV out)	Inst	Sys
Ext Black Clamp	0..99 **(50)**		Inst	Sys
Combine	**Field**, 2-line, 4-line		Op.	Sc.

6.2.2 Monitoring menu content

MENU	VALUES	DESCRIPTION	LEVEL	FILE
Monitoring Source	R, G, B, **Y**	Select signal on Monitoring HDTV analogue output	Op.	Sc.
Menu				
Display	On, **Time**	Menu display time. ON=always Time=see below	Op.	Op.
Menu Time	5..99 (**10**)	Set the time the menu is dispalyed	Op.	Op.
Menu Level	Oper, **Inst**, Serv		Op.	
Service Mode	Exec	Are you sure? (Y/N)	Op.	
Status bar				
Studio				
Studio	On, **Off**	Display the studio names in the status bar	Op.	Op.
Name		Edit the studio name	Op.	
Operator				
Operator	On, **Off**	Display the camera operator's name in the status bar	Op.	Op.
Name		Edit the camera operator's name	Op.	
Camera Number	On, **Off**	Display the camera number in the status bar	Op.	Op.
Cable Length	**Off**, Perc, Length, Atten	Display the cable length in percentage used or length left	Op.	Op.
HD Out Text				
Warning Y-pos	1..**14**	Select the vertical position of the warning text	Op.	
CamName Y-pos	**1**..14	Select the vertical position of the camera name	Op.	

6.2.3 Audio/intercom menu content

MENU	VALUES	DESCRIPTION	LEVEL	FILE
Audio				
Audio Level 1	0dB, **6dB**	Studio audio level for input 1	Inst	Sys
Audio Level 2	0dB, **6dB**	Studio audio level for input 2	Inst	Sys
Intercom				
Private Data				
Tracker Channel	**Inter**, Priva	Private data channel from camera to base station	Inst	Sys
PROG Channel	**Inter**, Priva	Private data channel from base station to camera	Inst	Sys
Isolate				
Source	**Local**, Rmote	Local = Settings are available in the base station menu, Rmote = Settings are available in the MCP	Op.	Op.
Isolate	Isol, **Syst**	Isol = Isolate PRGM and PROD intercom to camera head with EGNG available, Syst = isolate is off	Inst	Inst.
ENG				
Wire Mode	2wire, **4wire**	Set studio intercom wiring mode	Inst	Sys
Side Tone	0..99 **(50)**	Set side tone volume level	Op.	Op.
Level	0dB, **6dB**	Set intercom channel attenuation	Op.	Op.
In Ref Level	0..99 **(50)**	Set input reference level	Inst	Sys
Out Ref Level	0..99 **(50)**	Set output reference level	Inst	Op.
PROD				
Wire Mode	2wire, **4wire**	Set studio intercom wiring mode	Inst	Sys
Side Tone	0..99 **(50)**	Set side tone volume level	Op.	Op.
Level	0dB, **6dB**	Set intercom channel attenuation	Op.	Op.
In Ref Level	0..99 **(50)**	Set input reference level	Inst	Syst
Out Ref Level	0..99 **(50)**	Set output reference level	Inst	Op.
PROG				
Wire Mode	2wire, **4wire**	Set studio intercom wiring mode	Inst	Sys
Level	0dB, **6dB**	Set intercom channel attenuation	Op.	Op.
In Ref Level	0..99 **(50)**	Set input reference level	Inst	Sys
ENG Headset				
Phantom Power	On, **Off**	Switch on the 12Vdc microphone phantom power	Op.	Op.
Mic Level	0dB, **20dB**	Set headset microphone sensitivity level	Op.	Op.
Side Tone	0..99 **(50)**	Set headset side tone level	Op.	Op.
Mic to Headset	**On**, Off	Side tone on of off		
Cam to Headset	**On**, Off	Camera ENG channel to headset	Op.	Op.

MENU	VALUES	DESCRIPTION	LEVEL	FILE
Cam Volume	0..99 **(50)**	Set camer ENG channel to headset level	Op.	Op.
Tracker to Headset	**On**, Off	Tracker ENG channel to headset	Op.	Op.
Tracker Volume	0..99 **(50)**	Set tracker ENG channel to headset level	Op.	Op.
Mic ENG-Out	**On**, Off	Headset to base station ENG output	Op.	Op.
Mic to ENG-Cam	**On**, Off	Headset to camera ENG channel	Op.	Op.
Call	**Call**, Voice	Set functionality of the Call function	Op.	Op.
Voice Mail			Op.	Op.
Record ENG	**On**, Off	Intercom messages from the ENG channel are recorded	Op.	Op.
Record PROD	**On**, Off	Intercom messages from the PROD channel are recorded	Op.	Op.
Record PROG	**On**, Off	Intercom messages from the PROG channel are recorded	Op.	Op.

6.2.4 SDTV menu content

MENU	VALUES	DESCRIPTION	LEVEL	FILE
Chroma				
Chroma	**On**, Off	Switch on Chroma in the CVBS signal	Op.	Op.
Level	0..99 **(50)**	Set level of Chroma in the CVBS signal	Install	Syst
Contour				
Contour	**On**, Off	SDTV contour settings	Op.	Sc.
Source	G, R, **Y**, R+G	SDTV contour settings	Op.	Sc.
Level	0..99 **(10)**	SDTV contour settings	Op.	Sc.
Vertical Level	0..99 **(50)**	SDTV contour settings	Op.	Sc.
Noise Slicer	0..99 **(6)**	SDTV contour settings	Op.	Sc.
Coarse/fine	0..99 **(25)**	SDTV contour settings	Op.	Sc.
Level Dependence	0..99 **(25)**	SDTV contour settings	Op.	Sc.
Soft Contour	**On**, Off	SDTV contour settings	Op.	Sc.
Soft Contour Level	0..99 **(70)**	SDTV contour settings	Op.	Sc.
Skin Contour				
Skin Contour	**Off,** 1, 2, 1+2	Select Skin Contour 1 & 2	Op.	-
Skin Level	0..99 **(50)**	SDTV Skin Contour settings	Op.	-
Skin View	On, **Off**	SDTV Skin Contour settings	Op.	-
Skin1 Window R	0..99 **(50)**	SDTV Skin Contour settings	Op.	-
Skin1 Window B	0..99 **(50)**	SDTV Skin Contour settings	Op.	-
Skin1 Color R	0..99 **(50)**	SDTV Skin Contour settings	Op.	-
Skin1 Color B	0..99 **(50)**	SDTV Skin Contour settings	Op.	-
Skin2 Window R	0..99 **(50)**	SDTV Skin Contour settings	Op.	-
Skin2 Window B	0..99 **(50)**	SDTV Skin Contour settings	Op.	-
Skin2 Color R	0..99 **(50)**	SDTV Skin Contour settings	Op.	-
Skin2 Color B	0..99 **(50)**	SDTV Skin Contour settings	Op.	-
Notch				
Notch	On, **Off**	Switch on Notch filter on the CVBS outputs	Inst	Sc.
Level	0..99 **(50)**	Set Notch filter level on the CVBS outputs	Inst	Sc.
Video Output	GRB, YPrPb, **CVBS**, Off	Select signal type for the Options outputs	Inst	Sc.
Aspect Ratio	**16:9**, 4:3	Set aspect ratio for SDTV	Inst	-
Letterbox	**Off**, 16:9	Set letterbox function (only when aspect ratio = 4:3)	Inst	-
Extern Video				
SDI Amplitude Ext1	0..99 **(50)**	Set SDI signal amplitude for Input Ext1 (only when the LDK4530/10 Ext Video module is installed)	Inst	Sys
SDI Amplitude Ext2	0..99 **(50)**	Set SDI signal amplitude for Input Ext2 (only when the LDK4530/10 Ext Video module is installed)	Inst	Sys

6.2.5 System menu content

MENU	VALUES	DESCRIPTION	LEVEL	FILE
Cable				
% Of Max.Spec.Att.	0..255 (**128**)	Displays the percentage of attenuation that is occuring with respect to the maximum specified value	Op.	-
Size	**8mm**, 11mm, 14mm, 3/8", 1/2", 5/8"	Select the diameter of triax cable in use	Op.	Sys
Remaining Length (m)	0..5000 (**5**)	Displays the length of triax cable that still can be attached in metres	Op.	-
Remaining Length (ft)	0..5000 (**5**)	Displays the length of triax cable that still can be attached in feet	Op.	-
Cur Attenuation (dB)	0..18 (**0**)	Displays the present attenuation in dB	Op.	-
Length Unit	**km**, miles	Select the units that wil be shown for the remaining length	Op.	-
Remaining Length	0..50 (**0**)	Displays the length of the triax cable in km or miles	Op.	-
Camera Number	1..99 (**99**)	Set the camera number	Op.	-
Control Mode	**C2IP**, S9000	Set the type of control network	Op.	-
IP Address				
IP Config Mode	Man, **Auto**	Select automatic or manual configuration mode	Op.	-
IP digit 1	1..250 (**69**)	Set IP address digit 1 (only for manual IP Config Mode)	Op.	-
IP digit 2	0..255 (**254**)	Set IP address digit 2 (only for manual IP configuration mode)	Op.	-
IP digit 3	0..255 (**1**)	Set IP address digit 3 (only for manual IP configuration mode)	Op.	-
IP digit 4	1..254 (**1**)	Set IP address digit 4 (only for manual IP configuration mode)	Op.	-
Subnet Mask	0..31 (**24**)	Set the subnet mask value (only for manual IP configuration mode)	Op.	-
Apply IP Settings	Exec, **busy**	Select EXEC to implement the new manually set IP settings	Op.	-
Ethernet				
Ethernet Speed	100Mb, **10Mb**, Auto	Select the ethernet network speed	Inst	-

MENU	VALUES	DESCRIPTION	LEVEL	FILE
Ethernet Duplex	Full, Half, **Auto**	Select the ethernet duplex mode	Inst	-
Camera Power	**On**, Off	Switch the power to the camera	Op.	Op.
MCP Available	**Yes**, No	Refer to the user's guide *MCP not available* section	Inst	Op.
Signalling inputs				
Yellow On Air	**Standard**, Independent	Select Standard to switch off the yellow on-air signal (ISO) when a red on-air tally signal is activated. Select Independent to leave the yellow on-air signal (ISO) unchanged when a red on-air tally signal is activated.	Op.	Sys
Yellow On/Off	**Low/High**, High/Low, Open/High, High/Open	Selects switching behaviour for the ISO (yellow) on-air signalling inputs	Op.	-
On Air On/Off	**Low/High**, High/Low, Open/High, High/Open	Selects switching behaviour for the Tally (red) on-air signalling inputs	Op.	-
Call On/Off	**Low/High**, High/Low, Open/High, High/Open	Selects switching behaviour for the call signalling input	Op.	-
Extern Video				
Extern Video Source	CVBS, **SDI**	Set type of Video Input (only when the LDK4530/10 Ext Video module is installed)	Inst	Sys
SDI Chroma Ext1	On, **Off**	Chroma on Video Input 1 On/Off (only when the LDK4530/10 Ext Video module is installed)	Inst	Sys
SDI Chroma Ext2	On, **Off**	Chroma on Video Input 2 On/Off (only when the LDK4530/10 Ext Video module is installed)	Inst	Sys
Timing				
H Phase Coarse	0..99 (**50**)		Op.	Sys
H Phase Fine	0..99 (**50**)		Op.	Sys
Subcarrier Coarse	0, 90, **180**, 270		Op.	Sys
Subcarrier Fine	0..99 (**50**)		Op.	Sys
Subc H Phase Coarse	0, 90, **180**, 270		Inst	Sys
Subc H Phase Fine	0..99 (**50**)		Inst	Sys
Clock				

MENU	VALUES	DESCRIPTION	LEVEL	FILE
Day	1..31	Set value for Day	Inst	-
Month	[months]	Set value for Month	Inst	-
Year	0..99	Set value for Year	Inst	-
Hour	0..23	Set value for Hour	Inst	-
Minute	0..59	Set value for Minute	Inst	-
Video Mode	1080I50, **1080I59**, 720P50, 720P59, 1080PSF23, 1080PSF24, 1080PSF25, 1080PSF29, 1080I59-23, 720P59-23, 720P50-25, 720P59-29	Select a video mode for the Base Station test signal when no camera is connected. Note: when a camera is connected, the Base Station automatically identifies and switches to the video mode of the camera.	Inst	-
TV System	PAL, **NTSC**	Select a TV system for the Base Station CVBS output signal.	Inst	-
Teleprompter	On, **Off**		Inst	Sys
OCP Contour Mode	SDTV, **HDTV**		Inst	Sys

6.2.6 Files menu content

MENU	VALUES	DESCRIPTION	LEVEL	FILE
User Operator Files				
Operator File	**O_BS1**, O_BS2, O_BS3, O_BS4	Select Operator File	Op.	-
Recall	**exec**, run	Recall Operator File	Op.	-
Store	**exec**, run	Store Operator File	Op.	-
Std. Operator Files				
Operator File	**CUST**, FACT	Set the Standard Operator File to CUSTOMER of FACTORY	Op.	-
Recall	**exec**, run	Recall Standard Operator File	Op.	-
Store	**exec**, run	Store Standard Operator File	Inst	-
User System Files				
System File	**S_BS1**, S_BS2, S_BS3, S_BS4	Select System File	Inst	-
Recall	**exec**, run	Recall System File	Inst	-
Store	**exec**, run	Store System File	Inst	-
Std. System Files				
System FIle	**CUST**, FACT	Set the Standard System File to CUSTOMER of FACTORY	Inst	-
Recall	**exec**, run	Recall Standard System File	Inst	-
Store	**exec**, run	Store Standard System File	Inst	-

6.2.7 Diagnostics menu content

MENU	VALUES	DESCRIPTION	LEVEL	FILE
Board ID				
Power Board	(values)	displays 12nc, status and production date of the board	Oper	-
Power Fiber Board	(values)	[same]	Oper	-
HP/LP Board	(values)	[same]	Oper	-
Analog Tx/Rx Board	(values)	[same]	Oper	-
Sync/Enc Board	(values)	[same]	Oper	-
Sync/Enc Fiber Board	(values)	[same]	Oper	-
Data Board	(values)	[same]	Oper	-
Video Rec Board	(values)	[same]	Oper	-
Fiber DAC Board	(values)	[same]	Oper	-
Front End Board	(values)	[same]	Oper	-
Digital Rx Board	(values)	[same]	Oper	-
Audio/Intercom Board	(values)	[same]	Oper	-
Ext Video Input Board	(values)	[same]	Oper	-
DSC Input Board	(values)	[same]	Oper	-
Monitoring Board	(values)	[same]	Oper	-
FM Transc Board	(values)	[same]	Oper	-
Aux Rec Board	(values)	[same]	Oper	-
Optical Connect Board	(values)	[same]	Oper	-
DSC Interf Board	(values)	[same]	Oper	-
ENG Headset Board	(values)	[same]	Oper	-
Local Power Board	(values)	[same]	Oper	-
Digital Output Board	(values)	[same]	Oper	-
Dig Out Board HS	(values)	[same]	Oper	-
SDTV Output Board	(values)	[same]	Oper	-
HQ SDTV Output Board	(values)	[same]	Oper	-
A/D Convertor Board	(values)	[same]	Oper	-
Board Diagnostics				-
Power Board			Oper	-
Triax Status	DCPWR, **TSHRT**, ACPWR, COPEN, SOPEN, CSHRT, NOCAM, ERROR, OVRLD, ACODC, PWOFF, UKNOW	See *Diagnostics* section in this user's guide for a description of the Triax Status.	Oper	-
Fiber Status	CAMON, **TSHRT**, POPEN, SOPEN, PSHRT, NOCAM, ERROR, OVRLD, PWOFF, UKNOW	See *Diagnostics* section in this user's guide for a description of the Fiber Status.	Op.	-
Local Power Status	Ok, **NotOk**		Op.	-

MENU	VALUES	DESCRIPTION	LEVEL	FILE
Power Overheated	**Yes**, No		Op.	-
Fan	**Ok**, NotOK		Op.	-
Sync/Encoder Board			Op.	-
Reference Available	**None**, SDTV, HDTV		Op.	-
Burst Lock	Yes, **No**		Op.	-
Sync Lock	Yes, **No**		Op.	-
Data Board				-
Firmware Status	(value)		Op.	-
Boot Software Id	**0**..9999		Op.	-
Base Station 12NC	0..9999 **(3307)**		Op.	-
Base Station Status			Op.	-
Eth MAC		Indicates the Ethernet MAC value for the network adapter	Op.	-
Eth Link Type	**Unknown**, 10Mb/Half, 10Mb/Full, 100Mb/Half, 100Mb/Full	Indicates the link type for the C2IP network	Op.	-
Eth Link State	Connected, **Disconn**		Op.	-
Audio/Intercom Board				-
Self test	**exec**, run	Select EXEC to run a diagnostic self test	Op.	-
ENG Test Tone Intern	run, ok, error		Op.	-
PROD Test Tone Intern	run, ok, error		Op.	-
PROG Test Tone Intern	run, ok, error		Op.	-
ENG Test Tone Studio	run, ok, error		Op.	-
PROD Test Tone Studio	run, ok, error		Op.	-
ENG Headset Board				
Self Test	**exec,** run	Select EXEC to run a diagnostic self test	Op.	-
Test Intern	run, ok, error		Op.	-
Test Studio	run, ok, error		Op.	-
Test Tone Mic.BS	On, **Off**		Op.	-
Test Tone Tr/Flr.Mic	On, **Off**		Op.	-
Test Tone Cam.Mic	On, **Off**		Op.	-
Ext Video Input Board				
Carrier Eq Ext1	Yes, **No**		Op.	-
Carrier Rcve Ext1	Yes, **No**		Op.	-
SDI Lock Ext1	Yes, **No**		Op.	-
SDI TV system Ext1	**625**, 525		Op.	-
Carrier Eq Ext2	Yes, **No**		Op.	-
Carrier Rcve Ext2	Yes, **No**		Op.	-
SDI Lock Ext2	Yes, **No**		Op.	-
SDI TV system Ext2	**625**, 525		Op.	-

MENU	VALUES	DESCRIPTION	LEVEL	FILE
BS TV system	**PAL**, NTSC		Op.	-
Transmission Diag.				
Transmission System	Fiber, Triax, **Unkno**		Op.	-
Carrier Detected	**No,** Yes		Op.	-
HDSDI LOCK	On, **Off**		Op.	-
Analog Carrier det.	On, **Off**		Op.	-
AGC Out OK	On, **Off**		Op.	-
Communications Diag.			Op.	-
Camera Connected	Yes, **No**		Op.	-
OCP Connected	Yes, **No**		Op.	-
MCP Connected	Yes, **No**		Op.	-
C2IP panels	**0**..10		Op.	-