User's Guide

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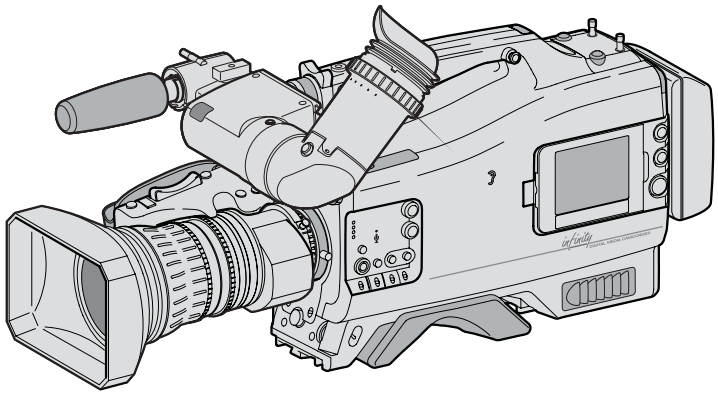

DMC 1000

Infinity Digital Media Camcorder

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:

- EN60950 : Safety

- EN55103-1: EMC (Emission)

- EN55103-2: EMC (Immunity)

following the provisions of:

a. the Low Voltage directive 2006/95/EC
b. the EMC directive 2004/108/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.

Copyright

Trademarks

Website

Visit the Grass Valley public website to download the latest user's guide updates and additional information about your broadcast product:

www.thomsongrassvalley.com

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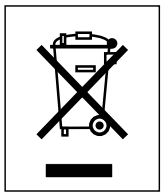
End-of-life product recycling



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 the requirements of the Environmental Protection Agency, individual state agencies 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 the program can be found at:

www.thomsongrassvalley.com/environment

Software licenses for this product

The Infinity Digital Media Camcorder incorporates software code that is licensed under the GNU General Public License (GPL) and the GNU Lesser General Public License (LGPL). Under these licenses customers have the right to obtain, modify, and redistribute the relevant source code. You can find the relevant source code packages at www.thomson.net/open-software. You can also obtain a copy of the source code from Thomson on CD. A fee for creation, handling and postage will be charged. To request a CD with the source code, send an e-mail to jean-pierre.fourche@thomson.net.

The Infinity Digital Media Camcorder incorporates software code that is licensed under the MIT license.

The Infinity Digital Media Camcorder incorporates software code that is licensed under the Modified BSD license.

The text of these licenses is available at www.thomson.net/open-software.

The Infinity Digital Media Camcorder incorporates Info-ZIP (Copyright (c) 1990-2007 Info-ZIP. All rights reserved.) The full text of this license is available at www.info-zip.org/license.html.

Warnings

To prevent fire or shock hazard, do not expose the camcorder to rain or moisture and avoid using it in humid or damp places.

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

To prevent risk of overheating, ventilate the unit correctly.

In case of an emergency ensure that the battery pack and the external power supply are disconnected.

Always disconnect the DC input connector before removing the battery.

Connect the camcorder to a power source with the specified voltage rating.

When using an external power supply it must be connected to earth potential.

Cautions

To ensure continuous high performance from the camcorder take the following cautions into consideration:

- Refer mounting and installation of optional boards to qualified service personnel.
- Use recommended accessories only.
- Do not subject the camcorder to severe shocks or vibration.
- Do not expose the camcorder to extreme temperatures.
- Do not leave the camcorder in direct sunlight or close to heating appliances for extended periods.
- Do not allow sunlight to shine directly into the viewfinder.
- Avoid extreme highlights as these can cause various kinds of optical reflections.
- Do not allow laser beams to shine into the lens as this could damage the imagers.
- Always turn off power after use.
- Remove the media before storing the camcorder for an extended period.
- Clean the camcorder and its attachments regularly, especially contact areas such as the touch screen and hand grip. For cleaning the touch screen refer to the maintenance section.

Batteries

- To avoid the risk of explosion always replace the battery with a correct type.
- Dispose of used batteries according to the instructions of the manufacturer of the battery.
- Remove the battery before storing the camcorder for an extended period.

Tripod installation

- This camcorder can be mounted on a tripod. For safe installation and operation of the tripod refer to the manufacturer's documentation.
- The typical configuration for this camcorder (camera with a standard HD lens, 2-inch viewfinder, battery and a top light mounted, total weight 10.2 kg or 22.5 lbs has proved to be stable when used on a tripod with the following specifications: height 1.45 m (57 in), leg distance at floor level of 0.80 m (31.5 in).These values are recommendations only. Always check the mechanical stability of the unit before using it.

Attention

About the Xensium imager

- The Xensium imager used in the Infinity camcorder is equipped with an electronic rolling shutter. When shooting under (artificial) low-frequent fluorescent lighting conditions the image may be affected by intensity variations.

About the side panel display

- The camcorder's side panel display is a TFT display that is manufactured using high precision technology that yields a quality of 99.99% or higher. However, it is possible that one or more pixels may constantly display a single color or be permanently off. This does not indicate a defective display and your recorded data is not affected.
- Exposing the display to direct sunlight or very bright light sources for extended periods may damage the unit. It is recommended that you close the display with the screen facing the camcorder body.

About REV PRO disks

- When a REV PRO disk is not in use, always store it in its protective case.
- Avoid handling the disk by the front edge (the edge that inserts into the drive).
- If you suspect a disk is defective, replace it immediately. Do not continue to use it as this could damage the drive.
- If a disk is difficult to insert, make sure that the logo is facing away from the camcorder and try again. Never force a disk into or out of the REV PRO drive; this could damage the drive and the disk.
- Avoid exposing REV PRO disks to direct sunlight, extreme temperatures or moisture.
- Avoid exposing REV PRO disks to strong magnetic fields such as those produced by monitors or speakers.
- Avoid dropping a REV PRO disk. This could cause damage to the disk.

Chapter 1

Introduction

1.1 Technology

The Grass Valley™ Infinity™ Digital Media Camcorder signifies a revolutionary step in ENG and EFP acquisition — combining the best of Grass Valley's multiple Emmy® award-winning camcorder engineering with leading IT recording and connectivity technologies. This camcorder is part of the new Infinity Series product line — designed from the ground up to bring all the benefits of advanced technologies to the broadcast and production industries. This line represents the future of acquisition and recording products, delivering affordable, open and truly flexible systems.

- HD/SD multi-format support including 1080i50/59.94, 720p50/59.94, 576i50 and 480i59.94.
- Flexible video encoding/decoding options, including DV25, JPEG2000 and MPEG-2.
- Choice of removable recording/playback media including intgerated Grass Valley REV PRO™ and CompactFlash® slots.
- Video, audio and metadata content are written in the open OP-1A MXF-based wrapper.
- Traditional inputs and outputs.
- Supports multiple IT-based interfaces: USB 2.0, IEEE 1394 and Gigabit Ethernet.

1.1.1 Xensium™ imager

The Infinity Digital Media Camcorder uses the new Grass Valley Xensium imagers which offer a wider dynamic range and improved signal-to-noise performance when compared to current CMOS imagers.

The imaging chip is at the heart of professional camera design, and Grass Valley has continually worked to achieve high resolution, wide contrast handling and low noise. Coupled with Grass Valley's broad spectrum digital signal processing it is set to deliver remarkable pictures in uncompromised HD resolutions.

1.1.2 Advanced camcorder technology

The Infinity Digital Media Camcorder provides a choice of video formats and standards selectable within the camcorder. You can choose from 576i50, 480i59.94, 1080i50, 1080i59.94, 720p50 and 720p59.94. Standard-definition (SD) formats are selectable in either 16:9, 4:3 or

letterbox aspect ratios. This makes the camcorder ideal for multi-format acquisition and for straightforward migration from standard definition (SD) to high definition (HD) within your workflow. The camcorder provides digital imaging for crystal-clear quality with advanced 22-bit accurate video processing for image control.

1.1.3 IT-based recording media

The Infinity Digital Media Camcorder is the first camcorder to use off-the-shelf REV PRO removable disks and professional-grade CompactFlash solid-state memory as recording and playback media. The extremely durable REV PRO removable disks provide the portability, and cost-effectiveness of videotape with the speed, flexibility, and ease-of-use of true nonlinear media such as hard disks.

Professional-grade CompactFlash memory is a readily available solid-state technology that delivers the high level of performance needed for demanding professional video applications. These cards are small, lightweight and extremely durable. Professional-grade CompactFlash cards currently hold up to 16 GB with sufficient throughput for both SD and HD recording. Trends indicate that CompactFlash cards will continue to increase in storage capacity while decreasing in cost—making it an excellent open solution for solid-state recording.

Both REV PRO and CompactFlash media offer unprecedented advantages in terms of usability, price and performance. They offer many benefits for video professionals such as nonlinear random access to video files, simultaneous playback while recording and non-degrading archival storage.

1.1.4 On-board selectable compression

Infinity Series products provide you a choice of compression schemes and bit rates, giving you the option to select what is best for your workflow today and for the future. The Infinity Digital Media Camcorder supports DV, JPEG2000 and MPEG-2 (optional) compression, assignable via the camcorder's user interface. The DV codec is 25 Mb/s 4:2:0 (PAL) or 4:1:1 (NTSC), making it ideal for immediate use in your workflow today. JPEG2000 is a next-generation compression scheme that can be used for both SD and HD acquisition. It provides high-efficiency compression, 10-bit 4:2:2 encoding, high image quality and no blocking artifacts —and is fully scalable. Industry-standard MPEG-2 compression is available as an option and can be used for a variety of HD compression profiles.

1.1.5 Ultimate connectivity

The Infinity Digital Media Camcorder connects using both traditional and IT interfaces. Traditional inputs and outputs include BNC connectors for (HD-)SDI, CVBS, Time Code, AES digital audio and XLRs for analog audio. The camcorder comes with three USB 2.0 connectors (two hosts and one device), one IEEE 1394 connector and a HDMI display connector. It can also connect to an external storage device (such as a hard drive or flash memory stick) via USB or IEEE 1394. The Gigabit Ethernet port provides access to Ethernet networks.

1.1.6 User interface

Camcorder operators can manipulate the camcorder through traditional controls for standard operation and through a touch screen display. The built-in user interface supports video monitoring, clip management, audio setup and metering, and detailed camcorder configuration.

You can also use the LCP 400 application to control the camcorder. Running on a Windows Mobile PDA or TouchPhone, it gives you access to all camera menus and settings — and lets you change them while shooting. It displays audio levels and, thanks to its extremely low latency, lets you make critical adjustments to audio parameters such as gain. You can create and edit metadata such as names, dates, slugs, locations and even camera settings before, during or after recording.

1.1.7 Enhancing your workflows

The Infinity Digital Media Camcorder enhances your existing workflow today, while allowing you to move to more efficient IT workflows in the future. You can use the camcorder's storage media just like videotape in tape-based workflows. The only difference is that you use digital media recorders and digital media drives as tape machine substitutes. However, Infinity Series products offer more than videotape replacement. In nonlinear editing environments, for example, you can also connect a REV PRO drive or CompactFlash card reader to a workstation for direct access.

1.2 Key features

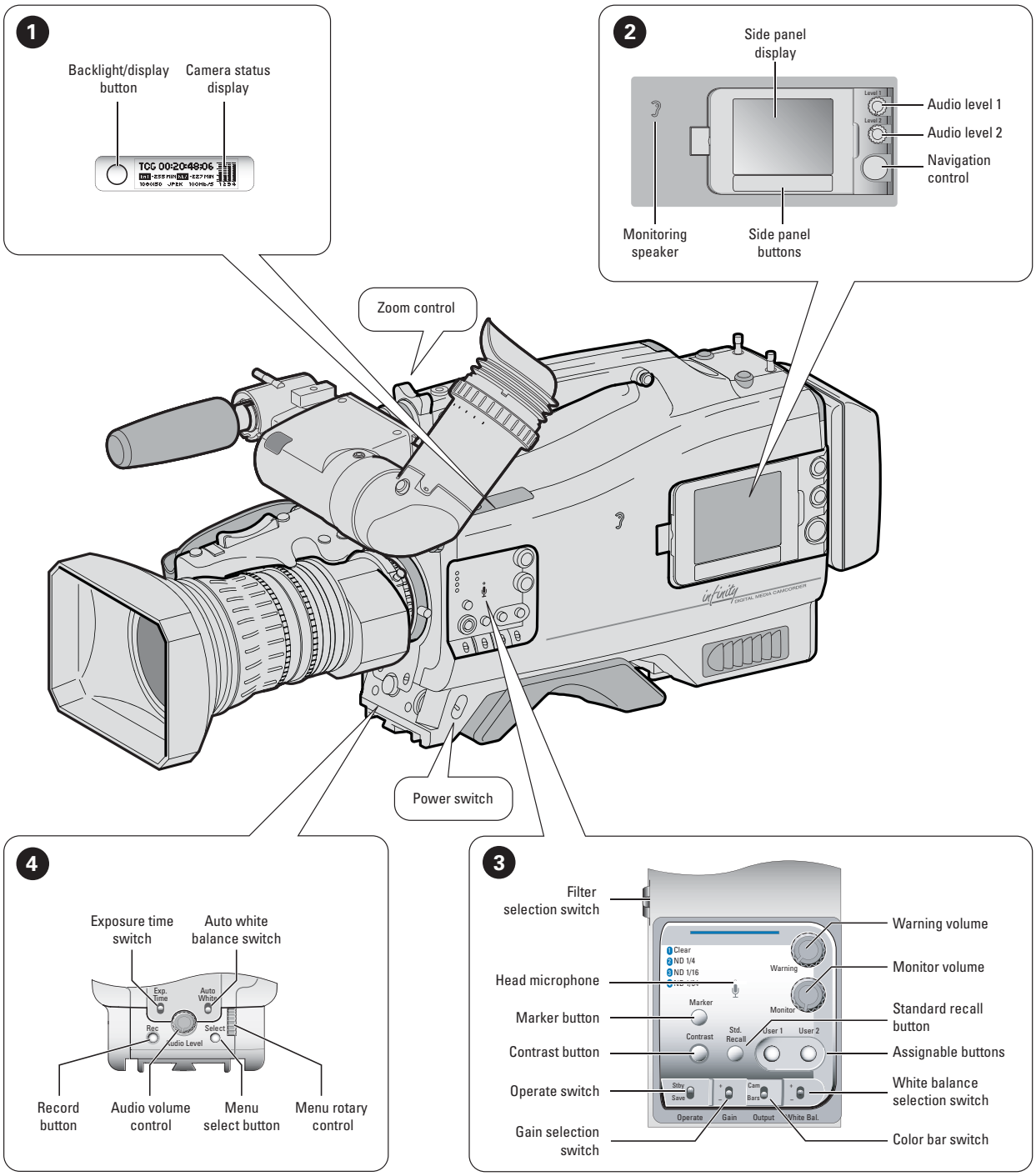
- Three Xensium™ based 2/3-inch CMOS imagers with advanced image processing functions:
  - Full 1920 x 1080 active-pixel matrix
  - Superior noise performance
- HD/SD multi-format support including 1080i50/59.94, 720p50/59.94, 576i50 and 480i59.94 video standards
- Recording and playback to and from Grass Valley REV PRO and professional CompactFlash® insertable media and external devices
- Large internal video buffer for instant recording and switch-over mechanism
- Video, audio and metadata content are written in the open OP-1A MXF based wrapper
- Supports DV25, JPEG2000, and MPEG-2 (optional) compression schemes:
  - DV compression (25 Mb/s) for NTSC (4:1:1) and PAL (4:2:0)
  - JPEG2000 high-efficiency compression for SD (4:2:2) and HD (4:2:2)
  - MPEG-2 compression (requires optional DMC 1100 MPEG-2 board)
- Traditional inputs/outputs include BNC connectors for HD-SDI or SDI (selectable, with or without embedded audio), CVBS, timecode, AES/EBU digital audio and XLR outputs for analog audio
- IT-based interfaces:
  - Three high-speed USB 2.0 connectors (two host and one device)
  - IEEE 1394 connector
  - HDMI viewfinder connector, allows connection to alternative HD and HD-ready displays
  - Gigabit Ethernet
- C2IP remote control over IP connections
- Configurable four-channel audio router with selectable input sources
- Built-in 3.6-inch TFT color touch screen with user interface for:
  - Audio setup and metering
  - Video setup and monitoring
  - Recording setup and metadata
  - Clip management
  - Detailed camera configuration

1.3 Infinity type numbers

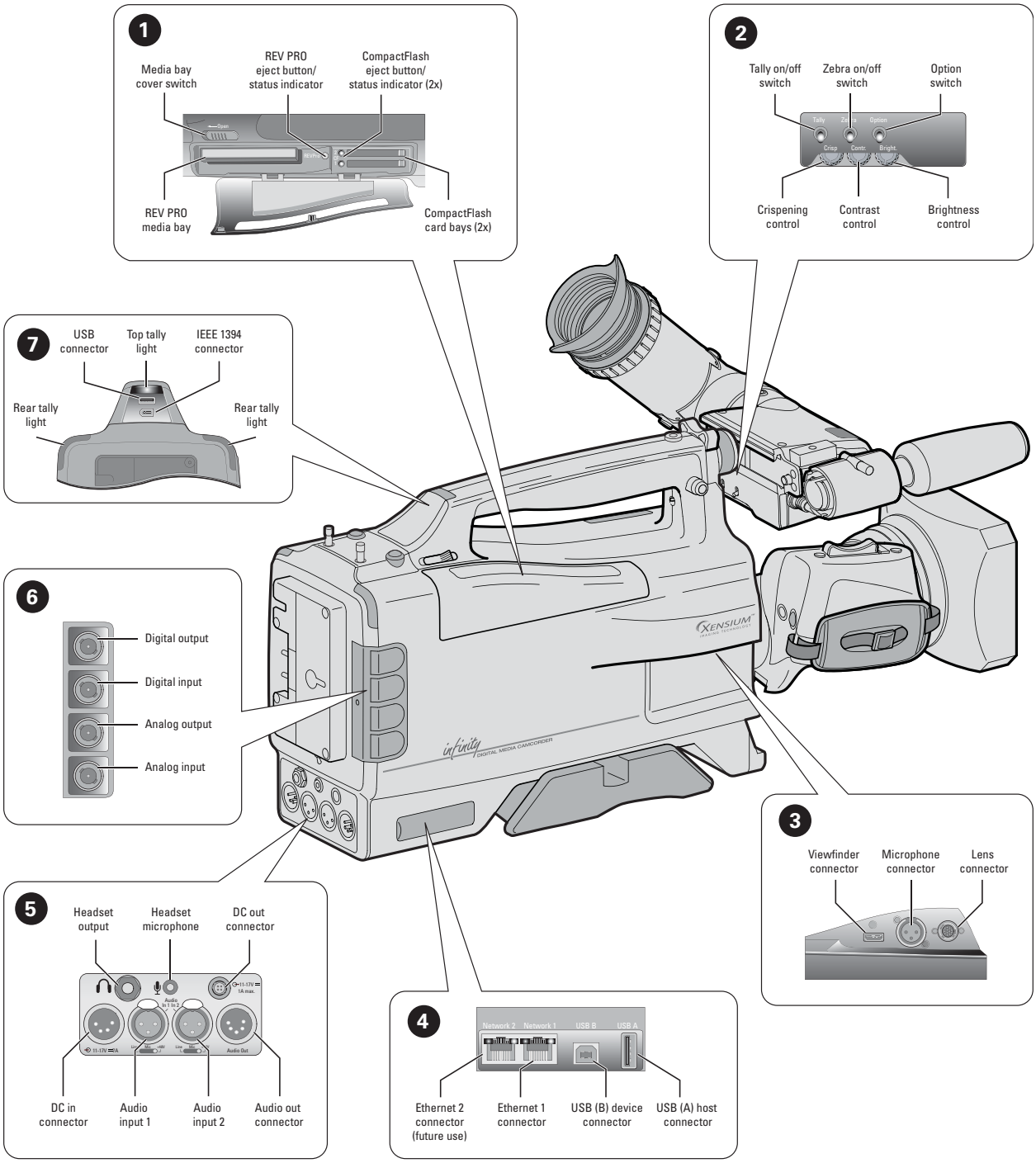
Unit	Type number
Infinity Digital Media Camcorder	DMC 1000/10
2-inch HDTV CRT viewfinder	DMC 1100
Standard front microphone kit	AJ-MC700
Options	
MPEG2 HD/SD board	DMC 1120
Stereo front microphone connector kit	DMC 1180
Accessories	
Wireless Local Control Panel application	LCP 400
Operational Control Panel	OCP 400/10
Wide angle eyepiece for 2-inch viewfinder	LDK 5390
External power supply (100 W)	LDK 5901
Camera carrying bag	LDK 5020/60
Universal transport case	LDK 5020/05
Tripod adapter plate	LDK 5031/10

1.4 Quick reference

The illustrations on the following pages show the location and name of the controls on the camcorder. The table lists the controls and references the location in the manual where more information can be found.



	Control name	Paragraph reference
❶	Backlight / Display button	"Lights and indicators" on page 47
	Camera Status display	"Side panel home screen" on page 44
❷	Monitoring speaker	"Monitoring" on page 48
	Side panel display	"Side panel home screen" on page 44
	Audio level 1 rotary switch	"Recording audio" on page 82
	Audio level 2 rotary switch	"Recording audio" on page 82
	Navigation control	"Side panel display" on page 52
	Side panel buttons	"Side panel display" on page 52
❸	Filter selection switch	"Working with optical filters" on page 68
	Warning volume control	(future use)
	Monitor volume control	"Monitoring" on page 48
	Standard recall button	"Standard video settings" on page 66
	Assignable buttons (User 1 and User 2)	"Assignable buttons" on page 37
	White balance selection switch	"Auto white balance" on page 71
	Color bar switch	"Color bar" on page 65
	Gain selection switch	"Gain selection" on page 67
	Operate switch	(future use)
	Contrast button	"Viewfinder" on page 39
	Marker button	(future use)
	Head (memo) microphone	(future use)
	Filter selection switch	"Working with optical filters" on page 68
❹	Exposure time switch	"Exposure time" on page 73
	Auto white balance switch	"Auto white balance" on page 71
	Menu rotary control	"Viewfinder menu" on page 58
	Menu select button	"Viewfinder menu" on page 58
	Audio volume control	"Recording audio" on page 82
	Record button	"Recording" on page 95
	Power switch	"Power supply" on page 33
	Zoom control	"Assignable buttons" on page 37


1
Media bay cover switch
REV PRO eject button/ status indicator
CompactFlash eject button/ status indicator (2x)
REV PRO media bay
CompactFlash card bays (2x)
2
Tally on/off switch
Zebra on/off switch
Option switch
Crispening control
Contrast control
Brightness control
7
USB connector
Top tally light
IEEE 1394 connector
Rear tally light
Rear tally light
6
Digital output
Digital input
Analog output
Analog input
3
Viewfinder connector
Microphone connector
Lens connector
5
Headset output
Headset microphone
DC out connector
DC in connector
Audio input 1
Audio input 2
Audio out connector
4
Network 2
Network 1
USB B
USB A
Ethernet 2 connector (future use)
Ethernet 1 connector
USB (B) device connector
USB (A) host connector

	Control name	Paragraph reference
❶	Media bay cover switch	"Recording media" on page 89
	REV PRO eject button / status indicator	"Recording media" on page 89
	CompactFlash eject button / status indicator	"Recording media" on page 89
	CompactFlash card bays	"Recording media" on page 89
	REV PRO media bay	"Recording media" on page 89
❷	Tally on/off switch	"Lights and indicators" on page 47
	Zebra on/off switch	"Viewfinder" on page 39
	Option switch	"Viewfinder" on page 39
	Brightness control	"Viewfinder" on page 39
	Contrast button	"Contrast button" on page 74
	Crispening control	"Viewfinder" on page 39
❸	Viewfinder connector	"Viewfinder (2-inch)" on page 22
	Front microphone connector	"Mounting a microphone" on page 24
	Lens connector	"Mounting a lens" on page 21
❹	Ethernet 2 connector	(future use)
	Ethernet 1 connector	"USB connection" on page 102
	USB (B) device connector	"USB connection" on page 102
	USB (A) host connector	"USB connection" on page 102
❺	Headset output	"Audio monitoring" on page 84
	Headset microphone (MicRear)	"Audio monitoring" on page 84
	DC out connector	"Power supply" on page 33
	DC in connector	"Power supply" on page 33
	Audio input 1	"Inputs" on page 80
	Audio input 2	"Inputs" on page 80
	Audio out connector	"Outputs" on page 85
❻	Digital output connector	"Input and output connectors" on page 62
	Digital input connector	"Input and output connectors" on page 62
	Analog output connector	"Input and output connectors" on page 62
	Analog input connector	"Input and output connectors" on page 62
❼	USB host connector	"USB connection" on page 102
	Top tally light	"Lights and indicators" on page 47
	IEEE 1394 connector	"IEEE 1394 connection" on page 102
	Rear tally lights	"Lights and indicators" on page 47

1.5 About this user's guide

Chapter 1 - Introduction

Outlines the technology used and lists the main features of the camcorder.

Chapter 2 - Attaching parts

Describes how to attach and adjust parts and accessories.

Chapter 3 - General set-up

Explains how to set up basic functions of the system to prepare it for use.

Chapter 4 - Menu navigation

Explains how to access and navigate the menu system to set up system, video and audio, and recording preferences.

Chapter 5 - Video setup

Describes the procedures that should be followed to prepare the camcorder video setup.

Chapter 6 - Audio setup

Outlines the procedures that should be followed to prepare the camcorder audio setup.

Chapter 7- Recording setup

Provides information on how to choose and set up the recording parameters and media.

Chapter 8 - Shooting

Outlines how you use the camcorder to capture video.

Chapter 9 - Clip management

Tells you how to use the playback and editing functions of the camcorder.

Chapter 10 - Communications

This chapter explains how to set-up storage, communication links and transfer files.

Chapter 11 - Specifications

Contains mechanical and technical specifications.

Chapter 12 - Menus

Shows reference tables to all functions of the main menu systems of the camcorder.

Chapter 13 - Licenses

References licenses and legal information.

Chapter 2

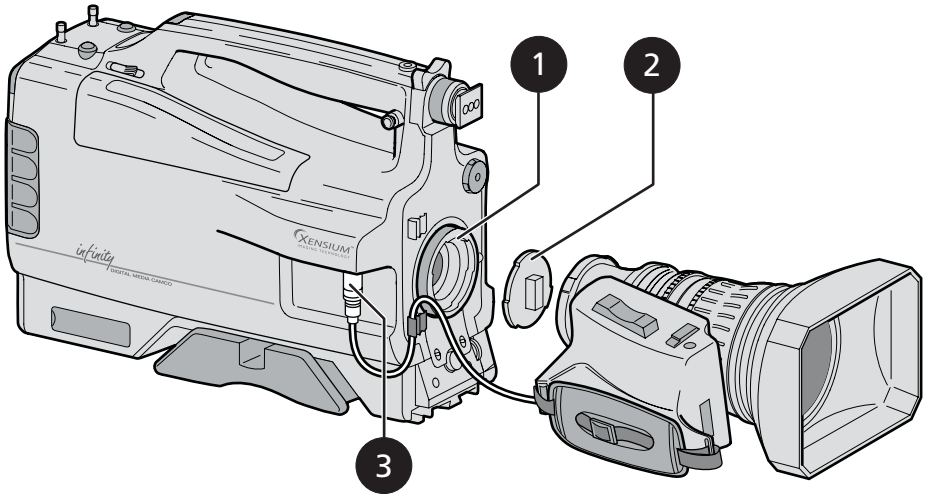
Attaching parts

2.1 Mounting a lens

Attach a lens to the camcorder as follows:

Caution
Do not attach a lens weighing more than 5 kg (11 lbs) to the camcorder without a support.

1. Ensure that the lens locking ring ❶ is in the unlocked position - turned counterclockwise as seen from camcorder front.
2. Remove dust protection cap ❷.
3. Hold the lens so that the positioning pin aligns with the notch of the lens mount. Fit the lens into the lens mount and hold it in place.
4. Turn the lens locking ring ❶ clockwise to lock the lens in place.
5. Connect the lens cable to the lens connector ❸ at the right side of the camcorder.
6. Place the lens cable into the bottom clip at the front of the camcorder and the clip located at the side.



When a new lens is fitted to the camcorder it may be necessary to carry out some adjustments to optimize its use, for example, back focus or shading. For more information about these adjustments refer to the lens manufacturer's documentation

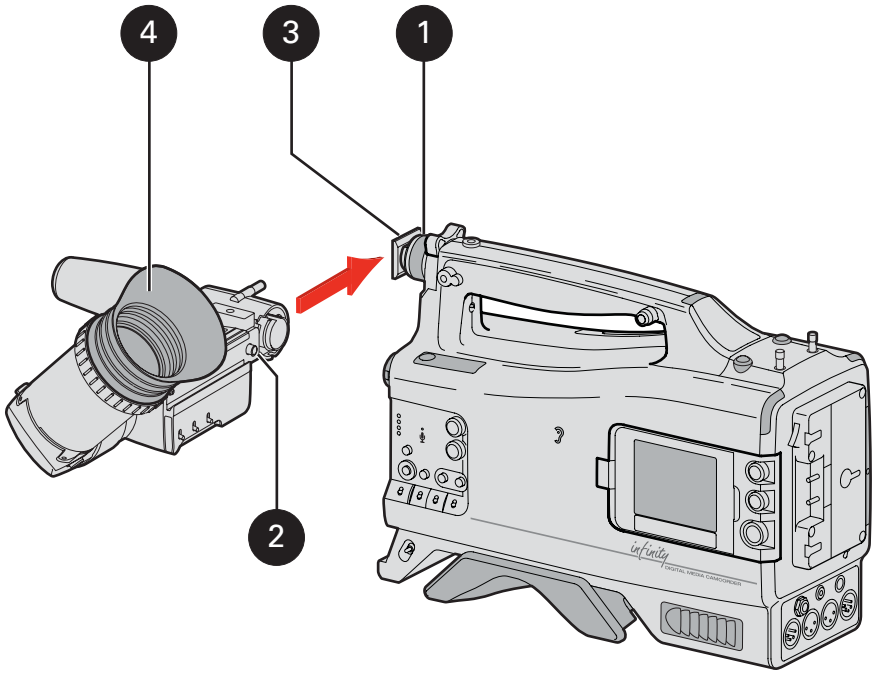
☞ Note

Always mount the dust protection cap when the lens is not attached to the camcorder.

2.2 Viewfinder (2-inch)

2.2.1 Mounting the viewfinder

1. Loosen the locking ring ❶ at front of the camcorder handle.
   – As seen from camcorder rear, turning the locking ring counterclockwise loosens it.
2. Push down retaining stud ❷ and slide the viewfinder onto the support bracket ❸.
3. Tighten the locking ring ❶ by turning it clockwise (as seen from camcorder rear) so that the viewfinder is mounted securely to the support.
4. Connect the viewfinder cable to the viewfinder connector socket at the right of the camcorder.
5. Place the cable into the top clip at the front of the camcorder.



For improved comfort, fit the supplied leather eye piece cover over the rubber eyepiece ❹. Spare eye piece covers (3922 405 00461) are available from your Grass Valley representative.

2.2.2 Positioning the viewfinder

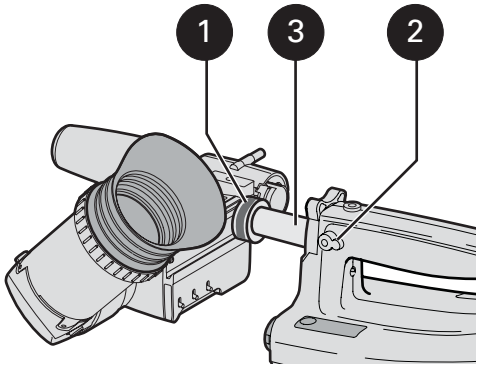
Horizontal position

1. Loosen the locking ring ❶. As seen from camcorder rear, turning the locking ring counterclockwise loosens it.
2. Slide the viewfinder horizontally along the rail to the desired position.
3. Tighten the locking ring ❶ by turning it clockwise.

Forward position

Position the viewfinder backwards or forwards along the camcorder axis as follows:

1. Loosen locking lever ❷ and move viewfinder support bar ❸ forwards or backwards to suit your needs.
2. Tighten locking lever ❷.

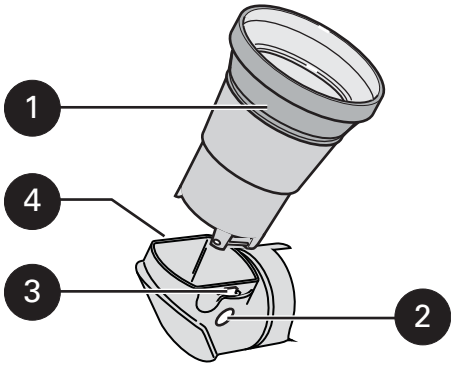


2.2.3 Mounting a wide angle eyepiece

If you regularly use the viewfinder at a distance, it is recommended that you fit the optionally available wide angle eyepiece (LDK 5390/00).

To fit the wide angle eyepiece proceed as follows:

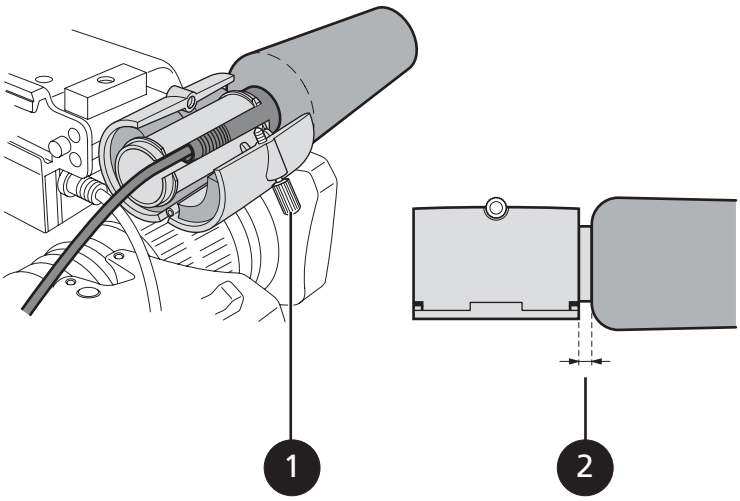
1. Hold the eyepiece ❶ securely.
2. Press the button ❷ below the eyepiece tube and swing it free of the button clip ❸.
3. Press the button ❹ above the eyepiece tube and remove the eyepiece.
4. Fit the wide angle eyepiece ❶ to the two clips ❸ ensuring that they both click into place.



2.3 Mounting a microphone

To attach a microphone to the camcorder proceed as follows:

1. Unscrew the knurled screw ❶ and open the microphone holder.
2. Place the microphone inside the rubber jaws of the holder.
3. Don't allow the wind hood to touch the holder ❷ as this reduces the damping effect.
4. Close the holder and tighten the knurled screw ❶.
5. Connect the microphone cable to the **MIC** audio connector on the right side of the camcorder.
   – The microphone connector supplies phantom power (+48 Vdc).
   – Ensure that the input sensitivity is correctly selected in the camcorder menu to match the type of microphone you are using.
6. To avoid mechanical pick-up, do not let the microphone cable touch the holder.
7. Place the microphone cable into the top clip at the front of the camcorder to guide the cable.



2.4 Attaching a battery

To attach a battery to the battery plate proceed as follows:

1. Insert the studs of the battery into the corresponding keyhole slots ❶ located at the back of the plate.

☞ Note

Different plates are optionally available for different battery types.

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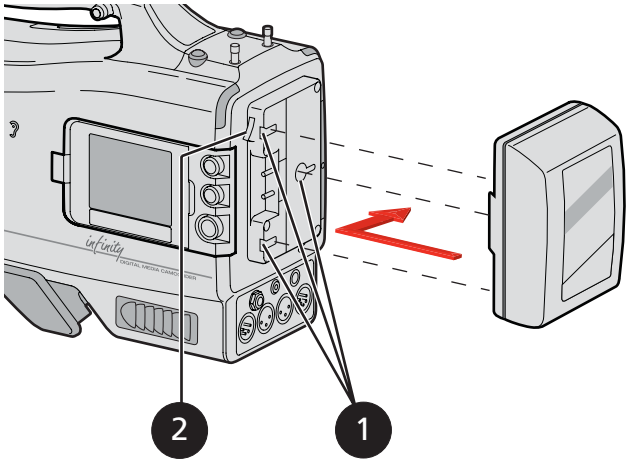
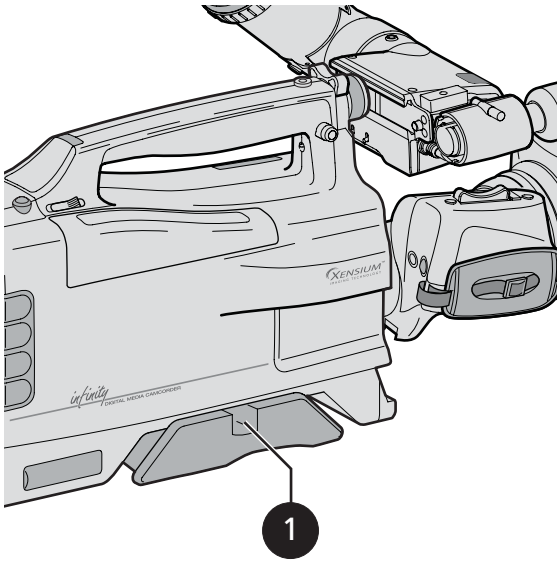
2. Slide the battery sideways (to the right, as shown below) until it clicks into place.
3. To remove the battery, press down the locking lever ❷ and unclip the battery by sliding it to the left.



For more details on using your battery, refer to the battery manufacturer's documentation.

2.5 Adjusting the shoulder pad

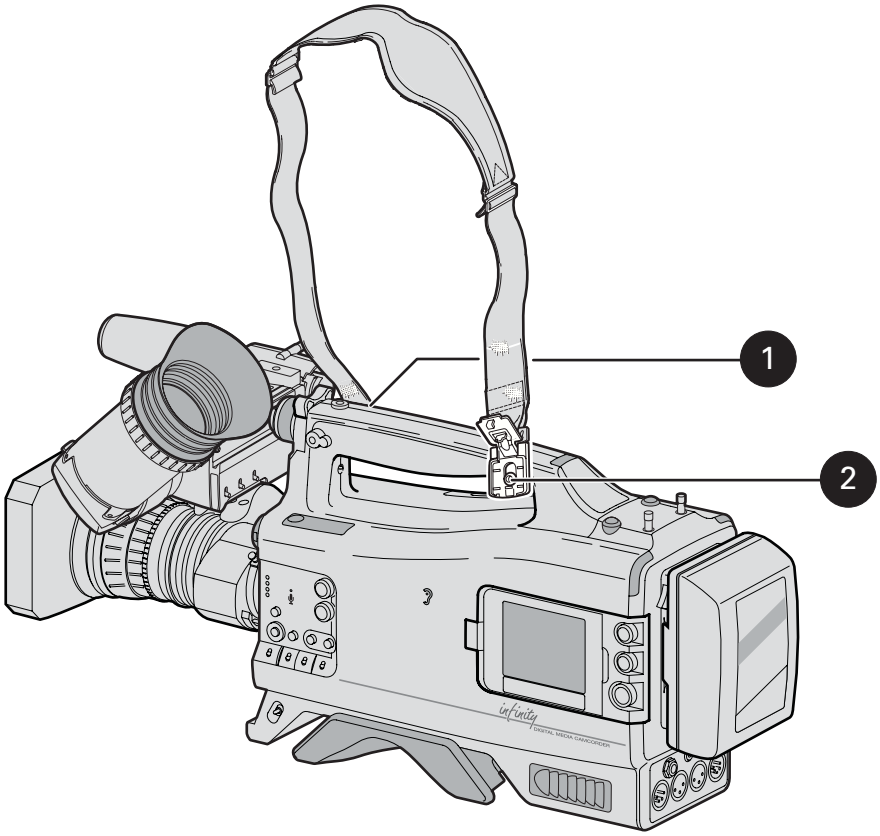
1. Press and hold lever ❶ to change the position of the shoulder pad.
   – The shoulder pad can now be moved backwards and forwards along the axis of the camcorder.
2. Adjust the shoulder pad when all unit are mounted to obtain the best balance when used on your shoulder.



2.6 Attaching a carrying strap

Attach the shoulder strap so that the deeper curve of the strap ❶ is next to your neck when you are carrying the camcorder.

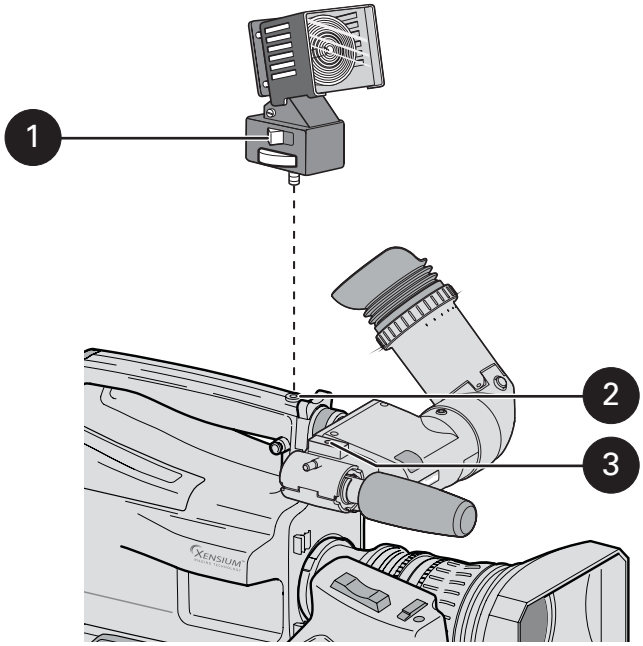
1. Connect the shoulder strap to the studs ❷ on either side of the carrying handle.
2. Close the clips and ensure they are locked.



2.7 Mounting a top light

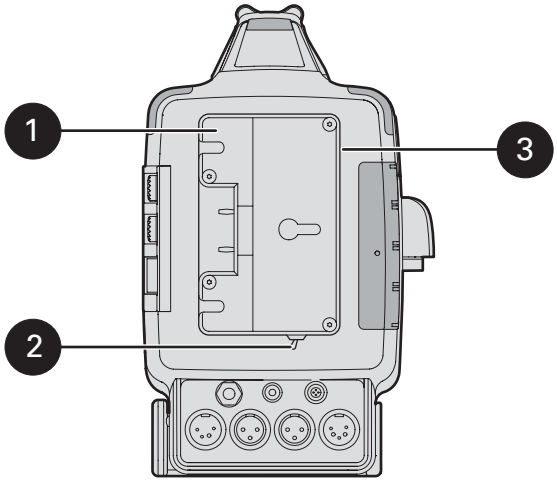
To mount a top light onto the camcorder, proceed as follows:

1. Screw the top light ❶ into the screw hole located on the top of the carrying handle ❷ or on top of the viewfinder ❸.
2. Power the top light according to the instructions delivered with the light.



2.7.1 Top light operation

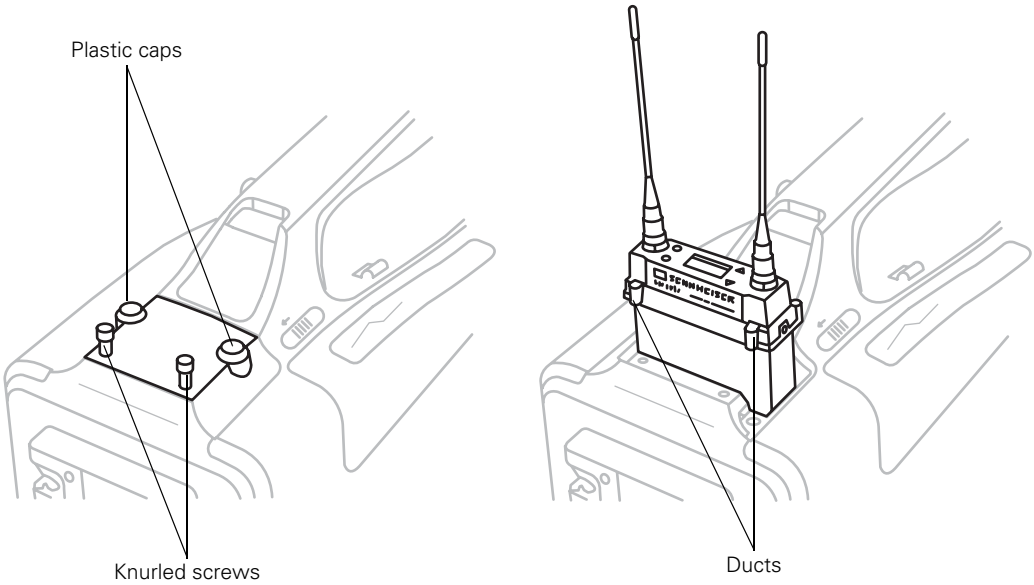
A connector ❸ at the top right of the battery plate ❶ supplies power for an optional top light. The top light can be switched on manually with the switch on the light or automatically when the camcorder is recording. Use the switch ❷ at the bottom of the battery plate to select between manual and automatic top light operation.



2.8 Wireless microphone receiver

To place a wireless microphone receiver into the camcorder, proceed as follows:

1. Switch off the camcorder.
2. Unscrew the two knurled screws that secure the wireless bay cover in place.
3. Tilt up the cover at the rear and slide backwards to remove it from the camcorder.
4. Remove the two plastic caps from the holes in the cover and store them in a safe place.
5. Ensure that the receiver unit is fitted with a 44-pin D-type connector (refer to the manufacturer's instructions).
6. Screw the antennas onto the receiver unit.
7. Pre-position the receiver unit's four fixing screws and washers in the ducts.
8. Insert the wireless receiver unit into the bay with the text facing to the rear of the camcorder. Push firmly until it is in place.
9. Secure the receiver unit to the camcorder chassis with the four fixing screws.
10. Switch on the camcorder and set up the receiver according to the manufacturer's instructions.
11. Slide the cover down over the antennas.
12. Insert the cover clip in under the carrying handle before pushing it all the way down into its recess.
13. Tighten the two knurled screws to secure the cover in place.



2.9 Tripod adapter plate

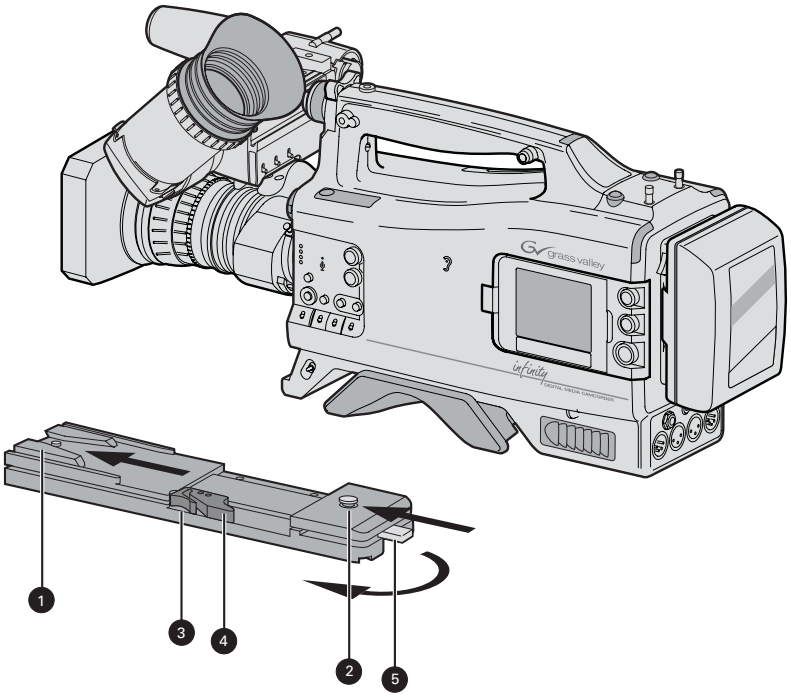
To mount the camcorder on a tripod, the tripod adapter plate (LDK 5031/10) must first be attached to the tripod. Follow the tripod manufacturer's instructions to mount the wedge plate supplied with the tripod to the tripod adapter plate; then mount them firmly onto the tripod.

Attach the camcorder to the tripod adapter plate as follows:

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

Caution

Failure to attach the camcorder to the adapter plate correctly will result in an unsecured camcorder. Ensure that the rear stud ❷ is engaged and that the camcorder clicks into place.



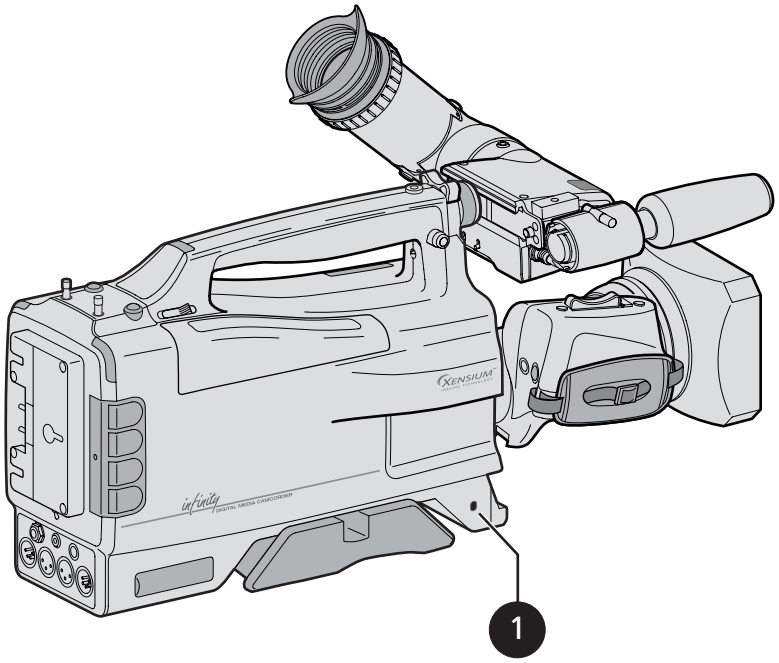
Remove the camcorder from the tripod as follows:

1. Press the red locking lever ❸ against the release handle ❹ and hold.
2. Ensure that you have a firm hold of the camcorder.
3. Pull the release handle ❹ forward.
4. Move the camcorder backwards and up.
   – The camcorder is now free of the tripod adapter plate.

2.10 Anchoring the camcorder

Your camcorder is equipped with a security slot anchoring point ❶ to fit an anti-theft device. These devices normally consist of a plastic-coated steel cable with a lock.

1. Attach one end of the anti-theft device to a securely anchored fixture.
2. Insert the other end in the opening in the camcorder ❶ and lock with the supplied key.



Chapter 3

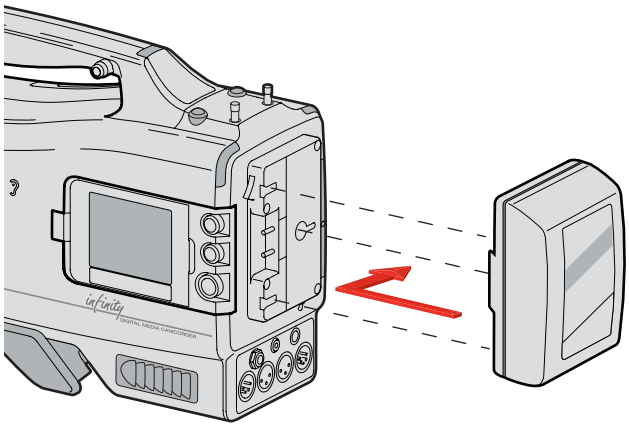
General set-up

3.1 Power supply

Attach lens, viewfinder, microphone and any other accessories to the camcorder before switching on. The camcorder can be powered by a battery pack or an external power supply.

3.1.1 Battery supply

Connect a fully charged battery to the battery plate.



The battery capacity is displayed on the camera status display and on the side panel display. The capacity can also be displayed permanently in the viewfinder by setting the power/media indicator in the viewfinder menu.

☞ Note

The battery indicator in the viewfinder lights if battery capacity is low. It flashes continuously when battery capacity is critical. The battery low and critical levels can be set in the viewfinder menu.

For details on the battery use and charging procedure, refer to the battery manufacturer's instructions.

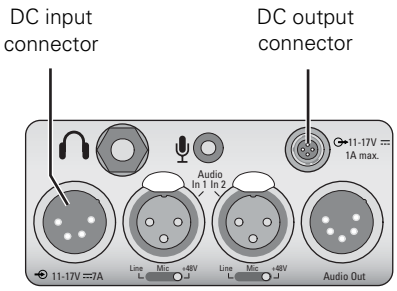
3.1.2 External power

DC input supply

To power the camcorder from a external power supply, apply a power source of 15 VDC nominal to the DC input connector at the rear of the camcorder.

Caution

The input voltage must not exceed 17 VDC and the external power supply must not supply more than 8 A or 100 W. The use of the Grass valley LDK 5901 External power supply is recommended.



A low power message appears in the viewfinder when the external voltage drops below the level set in the viewfinder SYSTEM/POWER menu.

The camcorder switches off automatically if the supply voltage falls below 10.0 VDC. To start the camcorder again, first disconnect the supply source(s) that fell below this level. The camcorder will start up when the supplied voltage level is at least 10.7 VDC.

Caution

Only connect an external battery pack (for example a battery belt) to the DC input connector when the battery pack is protected against reverse current.

DC output connector

The DC output connector provides a supply voltage of 12 VDC typical supplied by the battery or by the DC input connector. An automatic circuit limits the current that can be supplied from this connector to 1.0 A.

3.1.3 Power switch

Switch on

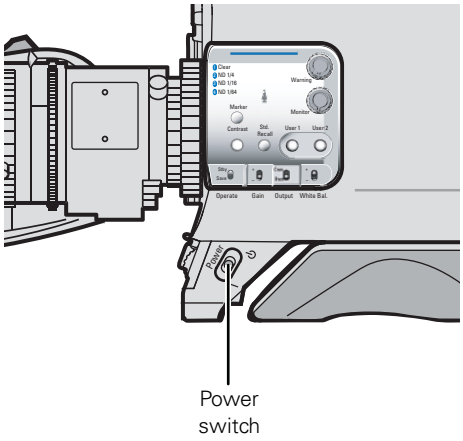
Set the camera power switch of the camera to the on position I

– Allow some time for the camcorder to become fully operational.

Switch off

To switch off the camera, set the power switch of the camera to the ⏻ position.

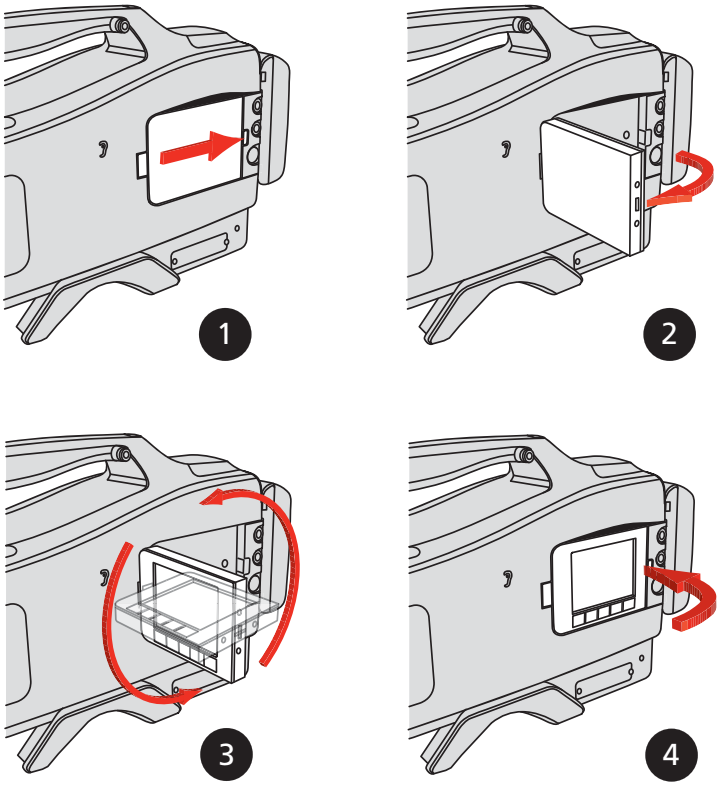
– Allow a few seconds for the camcorder to shut down. The camcorder may continue to write information to the recording media. During this time the blue light of the camcorder Status Display flashes. Wait until this process is completely finished before removing or disconnecting the power source.



3.2 Opening the side panel display

Use the side panel display to configure the camcorder and to view video or camera status. To open and position the display:

1. Push back the latch.
2. Swing out the panel so that it is perpendicular to the camcorder.
3. Rotate the screen 180° counterclockwise.
   – The screen display flips over when you pass the 120° point.
4. Swing the panel back into its recess in the camcorder.
   – You can, of course, leave the panel in position 2 or 3 to view live video.



3.3 Assignable buttons

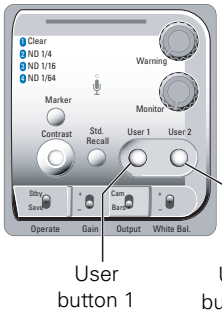
There are several assignable buttons on the camcorder:

- user buttons 1 and 2 on the control panel,
- the RET button on the lens,
- the zoom and record switch on the carrying handle.

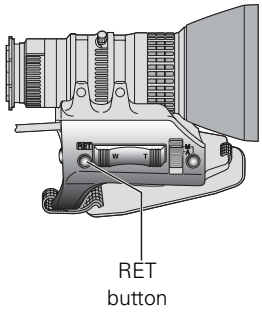
The assignments are set in the **SYSTEM/HARDWARE**/BUTTONS menu.

> ☞ Note
> In menu paths, buttons along the bottom of the side panel display are shown in bold.

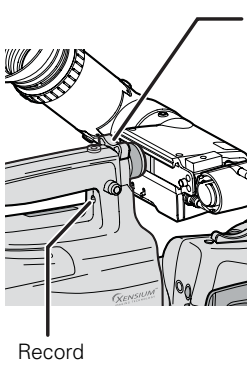
3.3.1 Operation panel

Location	Control	Possible assignments
	User button 1	• **Disable (default)** • Ext Iris • Mark out • Mark in • Record • Forward • Rewind • Pause play • Stop play • Start play
	User button 2	• **Disable (default)** • Ext Iris • Mark out • Mark in • Record • Forward • Rewind • Pause play • Stop play • Start play

3.3.2 Lens

Location	Control	Possible assignments
	**RET** button	• **Playback (default)** • Ext. signal The playback function shows the last 5 seconds of the last recorded clip. The Ext. signal function displays the external SDI video signal.

3.3.3 Carrying handle

Location	Control	Possible assignments
	Zoom control (only available with digital lenses)	• **Disabled - default** • Enabled
	Record switch	• **Disabled - default** • Enabled

3.4 Lens preferences

When you connect a lens to the camcorder you may need to adjust the back focus. Refer to the lens manufacturer's instructions to find out how to do this. The **SYSTEM/HARDWARE**/LENS menu allows you to choose and, if necessary, adjust other parameters to suit your lens type and your personal preferences.

Lens type

In the **SYSTEM/HARDWARE**/LENS menu, select the lens type from two predefined settings; standard (Std) or wide angle (WA). This gives you the optimum shading settings for either a standard or wide angle lens.

Auto iris

If required, switch on the auto iris function in the **SYSTEM/HARDWARE**/LENS menu. In this menu, you can also set the parameters associated with the auto and the momentary iris.

Lens indicators

The ND/RE indicator in the viewfinder lights when a lens range extender is selected or an ND filter is applied.

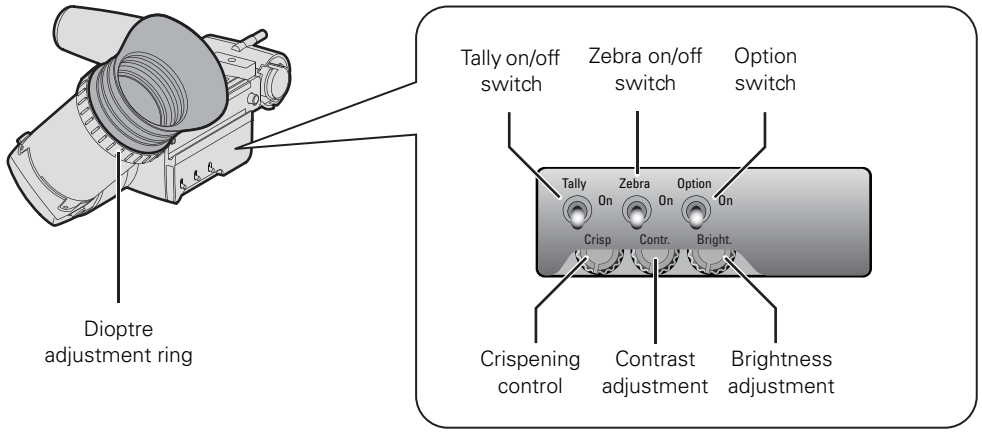
The Iris indicator in the viewfinder shows the value of the iris opening (when enabled in the VF submenu of the viewfinder menu).

The Zoom indicator in the viewfinder shows the degree to which the lens has been zoomed out or in ranging from 0 (wide angle) to 99 (tele). It shows 50 if the lens does not support this feature.

3.5 Viewfinder

3.5.1 Viewfinder set-up

Set up the viewfinder according to your own preferences; adjust viewing parameters, select markers, message boxes and on-screen display times. These parameters are set in the VF submenu of the viewfinder menu. You can turn on the color bars to help setting up the viewfinder.



Viewfinder picture settings

Adjust the **Brightness** and **Contrast** controls according to your preferences. If you wish, use the **Crispening** (peaking) control to adjust the sharpness of the viewfinder picture. Reduce crispening when the gain is set to higher levels.

The dioptre of the viewfinder can be adjusted to suit your eyesight by turning the **Dioptre** ring.

Exposure indication

Switch on the **Zebra** function so that the viewfinder displays a zebra pattern in areas where high video levels occur. This diagonal line pattern indicates that the area affected is higher than the predetermined level of the full scale video exposure value. Go to the VF/ZEBRA in the viewfinder menu to set the video levels at which the zebra function works.

Tally on/off switch

The **Tally on/off** switch is used to control the tally lights at the front and rear of the camcorder. When this switch is set to the **Off** position, the tally lights do not light when the camcorder is recording. The rear tally lights can be set to follow the **Tally on/off** switch in the SYSTEM/TALLY/REAR FOLLOW submenu of the viewfinder menu.

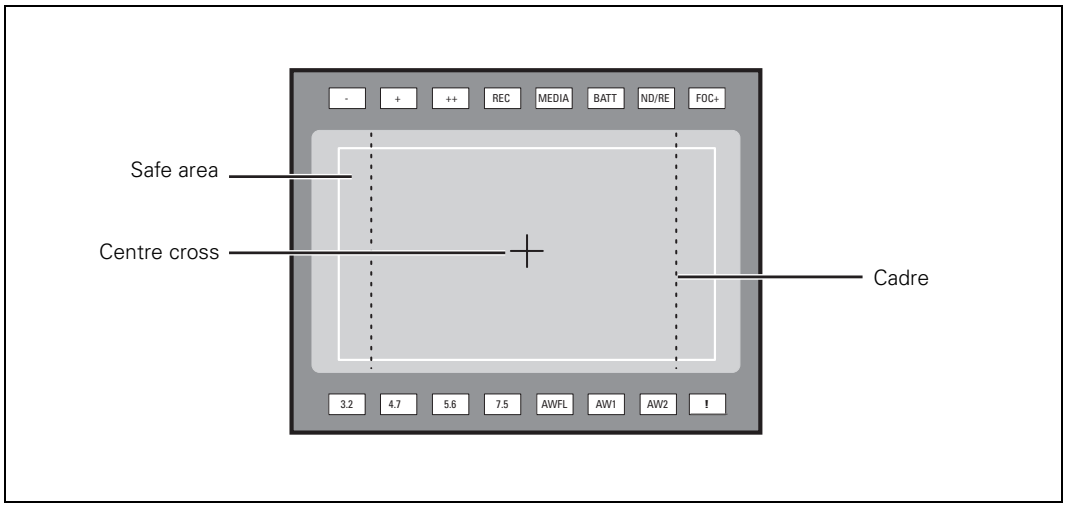
Option (Hide) switch

To hide on-screen indicators, menus, focus assist and zebra signals from the viewfinder signal, set the **Option** switch to the **On** position. Markers continue to be displayed.

3.5.2 Viewfinder markers

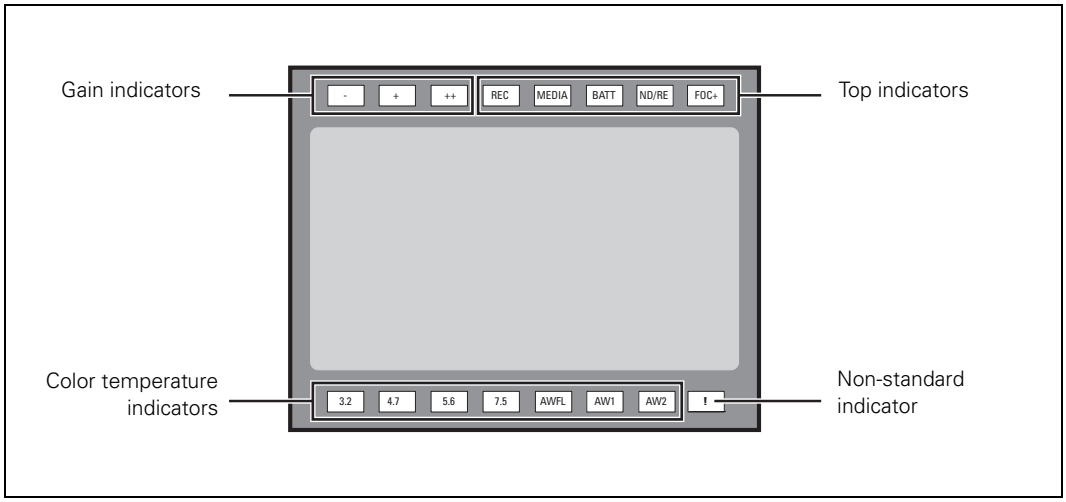
Go to the VF menu to select the markers you wish to see in the viewfinder. The following markers can be set up:

- The **safe area** indicates an area that represents 80% of the whole viewfinder picture area. This is the minimum area seen on a TV-set.
- The **centre cross** marks the centre of the picture.
- The **cadre** is a dotted white line or a shaded area that shows the limits of a 16:9 area in a 4:3 picture, or the limits of a 4:3 area in a 16:9 picture.



The display properties of the markers can be set in the VF submenu of the viewfinder menu.

3.5.3 Viewfinder LED indicators



Gain indicators

The gain indicators at the top of the viewfinder light as follows:

Indicator	Function
–	Gain is – (-6dB, -3dB)
+	Gain is + (6, 9, 12 or 18dB)
++	Gain is ++ (9, 12, 18 or 24dB)
+ and ++	Gain is +++ (30, 36 or 42dB)

Top indicators

The top indicators provide status information about the camcorder:

Indicator	Function
REC	• lights when the camcorder is recording
MEDIA	• flashes when 5 minutes or less of the current media is left • lights continuously when the current media is at an end
BATT	• flashes when battery level is low • lights continuously when battery level is critical
ND/RE	• lights when an ND optical filter or the range extender is selected
FOC+	• lights when the focus assist function is on

Color temperature indicators

The color temperature indicators light as follows:

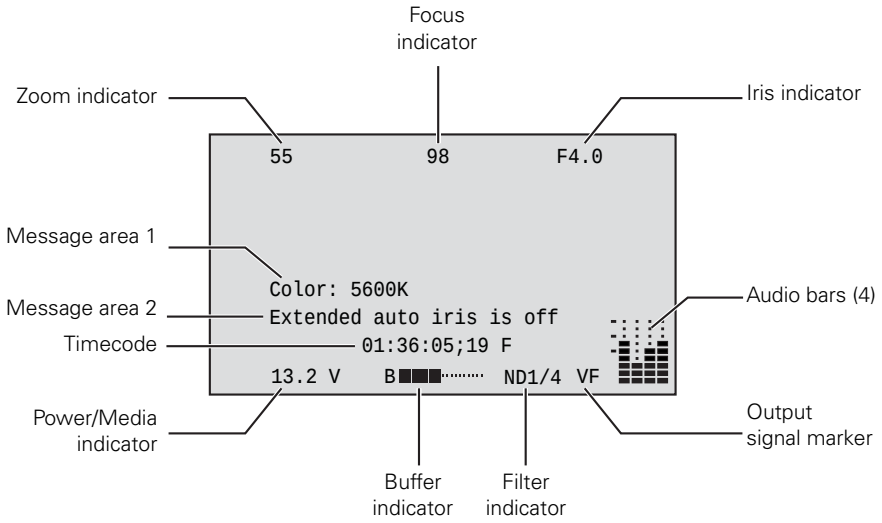
Indicator	Function
3.2	lights when preset temperature of 3200K is selected
4.7	lights when preset temperature of 4700K is selected
5.6	lights when preset temperature of 5600K is selected
7.5	lights when preset temperature of 7500K is selected
AWFL	lights when memory for fluorescent light (FL50 or FL60) is selected
AW1	lights when Auto White Balance memory 1 is selected
AW2	lights when Auto White Balance memory 2 is selected

Non-standard indicator (!)

The non-standard video settings indicator (!) lights when exposure time is not set to the nominal value. It also lights when black stretch, extended auto iris, or AWC or FL color temperature is on.

3.5.4 Viewfinder on-screen display

The viewfinder on-screen display shows operational settings and messages while shooting.



Indicator	Function
Zoom indicator	Indicates the zoom position of the lens ranging from 0 (wide angle) to 99 (tele). It shows 50 if the lens does not support this feature.
Focus indicator	Indicates a value for the focus distance ranging from 0 (close-up) to 99 (infinity). This feature is only available when a digital lens is used.
Iris indicator	Indicates the iris opening (F -value) of the lens. Typical range is F1.4 to F25.
Audio bars	These bars display the audio levels for channels 1 to 4. The resolution is 12 segments per channel for full range.
Message area 1 and 2	Displays operational messages, errors and warnings.
Output signal marker	Marks the output signal as the viewfinder signal. This indicator is only shown when the digital output is set to VF.
Optical filter indicator	Indicates the selected optical filter.
Buffer indicator	Indicates the level of the recording buffer. There are 20 segments; each segment represents 5% of the full buffer capacity.
Power/media indicator	This indicator can be set to display information about the current media or about the camcorder's power system. Select the indicator in the VF/INDICATOR/SELECTABLE menu. **Storage**: Displays the remaining recording time on the current media. **Batt**: Displays the supplied voltage of the battery or the external power supply.
Timecode	This indicator displays the timecode.

Enabling or disabling indicators

The indicators on the viewfinder on-screen display can be enabled or disabled in the VF/INDICATORS submenu of the viewfinder menu.

3.6 Messages

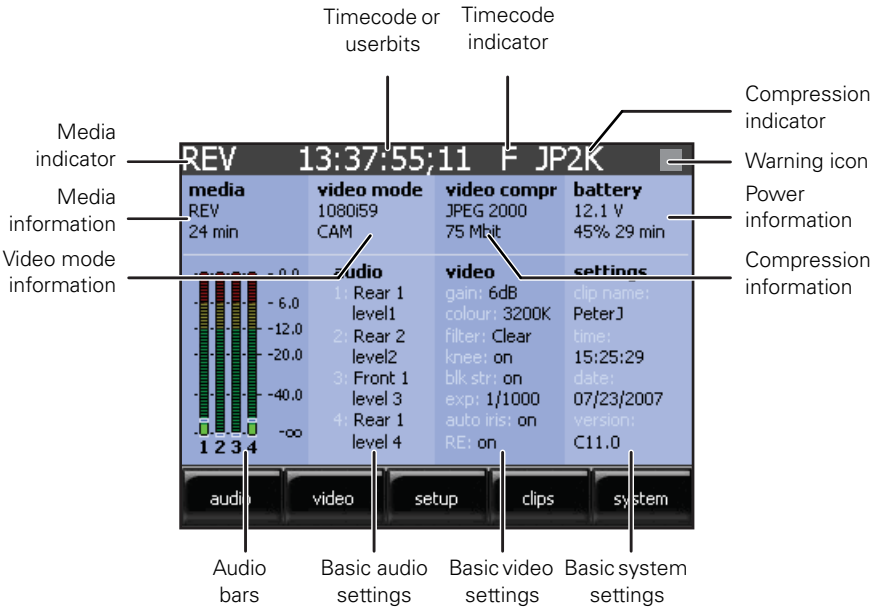
The messages that appear in the viewfinder are explained in the following table:

Message	Description	Possible action(s)
Media not present	Selected storage media is not present or cannot be accessed.	Insert media or change the media selection.
Battery low	Battery capacity is low.	Be prepared to change or recharge battery as soon as possible.
Battery empty	Battery is empty.	Switch off the camcorder and change or recharge battery.
Power low	External voltage is low	Check external power supply.
Media almost full	Selected storage media is almost full.	Prepare for switch-over procedure or stop recording and change media.
Media full	Selected storage media is full .	Recording continues on the next preferred media.
Incompatible video	The clip was recorded with a different video standard and/or compression.	Set the camcorder to the same video standard and compression scheme as the clip.
<audio source> overload	A selected audio source is peaking. Audio distortion may occur.	Reduce gain or input level of the indicated audio source.
Changing to <media>	Recording continues on the next preferred media.	
Touch screen locked	Touch screen is locked.	Press lock button again to unlock screen.
System shutdown	Camcorder is in the process of switching off.	Do not disconnect power supply or battery.
Temp high	Internal temperature is too high.	Switch off the camcorder and move the unit to a cooler place.
Replace battery	Battery is depleted.	Use a different battery.
Replace REV disk	REV disk approaching end of life.	Format REV disk or exchange the disk with a new one.
Replace REV drive	REV drive approaching end of life.	The REV mechanism may need maintenance. Contact your Grass Valley service representative for assistance.

3.7 Side panel home screen

3.7.1 Default style

The home screen of the side panel display provides information on audio, video and recording parameters as well as information on media and power. The title bar is red when the camcorder is recording.



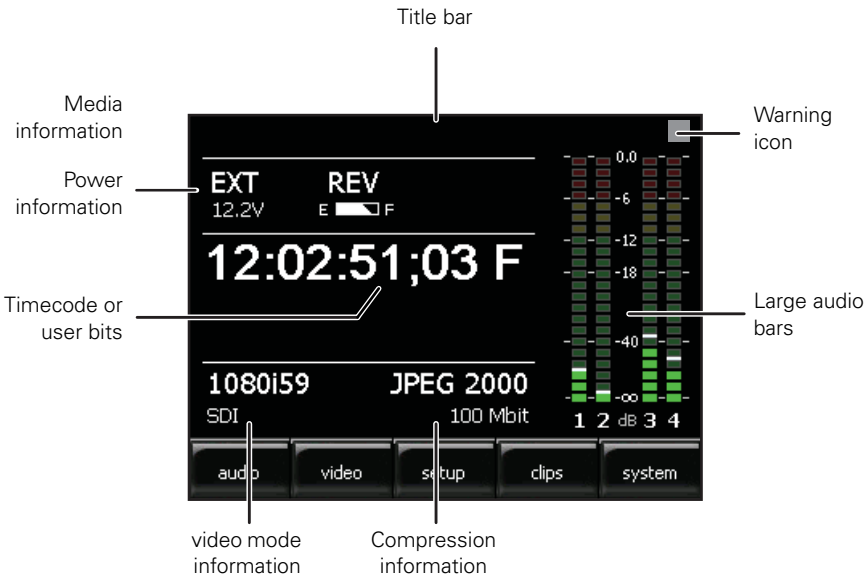
The following table shows an overview of the indicators that can be found on the home screen:

Indicator/information	Function
Timecode/Userbits	Displays the current timecode or userbits value.
Timecode indicator	Indicates timecode run mode: F = Free run R = Record run
Compression indicator	Indicates the current video compression: JP2K = JPEG 2000 MP2I = MPEG2I DV25 = DV
Warning icon	Touch screen is locked Media is almost full Media is full Battery level is low Battery level is critical
Power information	Displays information about the power system: type of power (battery or external), voltage of the battery or the external power supply and remaining capacity or minutes of the battery (depends on battery type).

Indicator/information	Function
Compression information	Displays the selected video compression and bit rate.
Basic system settings	Displays clip name, time and date and package version information.
Basic video settings	Displays important video settings: video gain, color temperature, optical filter, knee, black stretch, exposure time, auto iris indicator and range extender indicator.
Basic audio settings	Displays audio sources and recording level controls for channel 1 to 4.
Audio bars	These bars display the audio levels for channels 1 to 4.
Video mode information	Displays current video standard and recording source.
Media information	Displays the selected recording media (REV, CF1, CF2 or EXT) and remaining recording time on the media.
Media indicator	Indicates the selected recording media (REV, CF1, CF2 or EXT).

You can set an alternative screen as the default home screen in the **SYSTEM/SIDEPANEL/** HOME SCREEN menu. The day and night screens show less information than the default home screen but use clearer and larger indicators. The day screen is the inverted (white background) version of the night screen.

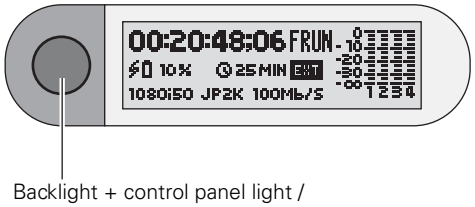
3.7.2 Day or night style



3.8 Camera status display

The status display on the front-left shoulder of the camcorder provides basic information about the camcorder status (timecode, video standard, compression and audio, active media). When a battery is attached it gives active information about the health of the battery.

1. Push the display button to switch on the status display backlight.
   – The blue light on the control panel below also lights.
2. Observe the display.
3. Push and hold the display button for two seconds to scroll through the status information.
   – The blue lights switch off automatically after a few seconds of non-activation.

Location	Available display screens
 Backlight + control panel light / display button	1. Timecode screen
	2. Timecode/User bits screen
	3. Real time screen
	4. Power status screen
	5. Software version screen

The blue backlight of the display flashes when the camera is shutting down or when battery level is low.

When the camcorder is switched off the display is still active as long as a battery is attached. Even when the camcorder battery is removed the display continues to work for some time.

3.9 Lights and indicators

3.9.1 Tally indicators

The red tally indicators at the front of the viewfinder and at the rear camcorder normally light to indicate that the camcorder is recording. The REC indicator in the viewfinder also lights.

The Tally on/off switch is used to control the tally lights at the front and rear of the camcorder. When this switch is set to the Off position, the tally lights do not light when the camcorder is recording. The rear tally lights can be programmed to follow the Tally on/off switch in the SYSTEM/TALLY/REAR FOLLOW submenu of the viewfinder menu.

3.9.2 Media indicators

The indicators in the media bay provide information about the inserted media.

Media indicator	Media status
Off	No media present
Blue (flashing slowly)	Mounting
Blue	Mounted (available)
Blue (flashing fast)	Reading from media
Red	Writing to media
Purple (red and blue)	Media is full
Red / Blue (alternating color)	Media is rejected

3.10 Playback indicators

When playing back recordings the following indicators are shown:

Indication	Recorder operation
REC	Recording
||	Paused
1x, 2x, 4x, 8x, 16x, 32x, 64x	Playback (the numbers indicate the forward speed)
-1x, -2x, -4x, -8x, -16x, -32x, -64x	Reverse playback (the numbers indicate the reverse speed)

3.11 Monitoring

3.11.1 Video monitoring

The live and playback video signal can be monitored on any combination of the viewfinder, the side panel display or a video monitor connected to analog or digital video outputs.

Viewfinder

The 2-inch HD CRT viewfinder displays a monochrome video signal with indicators, markers and messages. The zebra markings and the focus assist crawler signals are also superimposed on the video signal.

☞ Note

Use the Option switch to remove superimposed signals from the viewfinder display. Selected markers are still displayed.

When the camcorder video format is set to a HD standard, the detail level of the video signal in the viewfinder can be set independently of the normal output video signal. The VF detail is set in the VF/DETAIL submenu of the viewfinder menu.

Side panel display

The side panel display can be used to view live video, clip playback and menus. Press the view push button under the display to switch between live view and menu view. In live view the side panel displays the live video signal in color without the viewfinder on-screen display.

Digital video output

The digital video output at the rear of the camcorder carries an (HD)-SDI signal that can be used for monitoring with a suitable monitor. The output signal is SD or HD depending on the selected video format.

Analog video output

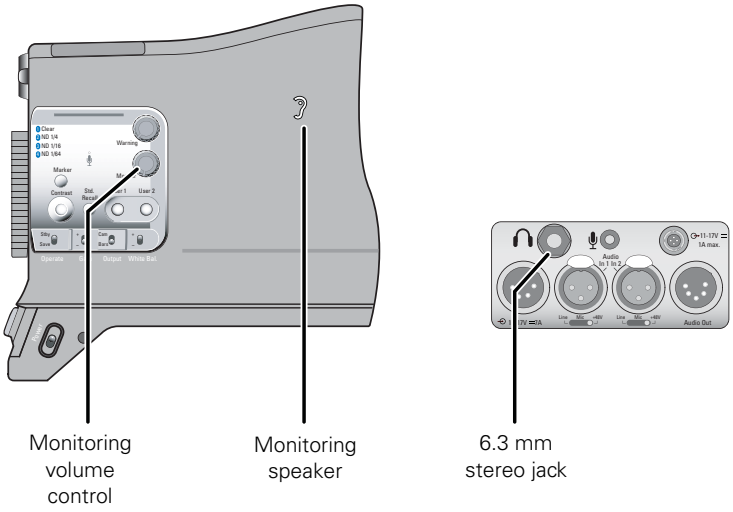
The analog video output at the rear of the camcorder can be set up to carry a CVBS analog video signal that is suitable for monitoring purposes. The signal is the same as the signal shown on the side panel display.

3.11.2 External SDI signal monitoring

The RET button on the lens can be assigned a function in the **SYSTEM/HARDWARE**/BUTTONS menu. When the button is assigned to the EXT. function, press it to display an external SDI signal in the viewfinder or side panel display.

3.11.3 Audio monitoring

The camcorder has a built-in monitor speaker on the left side of the camera. This speaker carries live audio or playback audio signals. Alternatively, plug a headphone into the 6.3 mm stereo jack at the rear of the camcorder to monitor these signals. Adjust the volume of the audio with the monitoring volume control.



3.12 Time and date settings

The first time you use the camcorder you need to enter the time and date and time zone for your location.

1. Tap **SYSTEM**
2. Tap **DATE/TIME**
3. Tap **TIME** and use the arrows in the pop-up to enter the current time in HH:MM:SS format.
4. Tap **DATE** and use the arrows in the pop-up to enter the current date in MM:DD:YY format.
5. Tap **TIME ZONE** and use the arrows in the pop-up to enter the time zone offset.

3.13 Genlock

To genlock the output signal of the camcorder to an external source, set the lock source item in the **SYSTEM/HARDWARE**/GENLOCK menu. There are three options: None, Analog and Digital.

- When set to None, the camcorder uses the internally generated clock.
- When set to Analog, the camcorder uses a CVBS or LTC signal applied to the Analog In connector at the rear-right of the camcorder.
  The reference source supplied must match the type of input signal selected in the **SYSTEM/HARDWARE**/PORTS/ANALOG INPUT menu. For example, if you apply a CVBS signal, then CVBS must be selected as the analog input signal; if you apply a LTC signal, then LTC must be selected.
- When set to Digital, the camcorder uses an SDI signal applied to the Digital In connector at the rear-right of the camcorder.

Note

For the camcorder to genlock correctly, the reference source must match the temporal frequency mode of the camcorder. If they do not match, the camcorder reverts automatically to the internal clock.

Chapter 4

Menu navigation

4.1 Menu navigation

This section describes the structure of the control system built around the viewfinder menu and the side panel menu. It explains how to set up the camcorder for your personal preferences. The camcorder functions and their values are also explained.

Operationally, the camcorder is very easy to use. However, because of the large number of functions available and the large number of set-up options, it may require some time for you to become familiar with them all. We recommend that you spend time using the various controls and displays in order to discover the wide range of possibilities.

The functions of the camcorder are grouped into menus and submenus. There are two separate menu systems in the camcorder:

- The **side panel menu** is shown on the side panel display on the left side of the camcorder and is controlled by tapping the screen with your finger. It contains all functions for configuring the camcorder and for post-processing recorded material.
  - The side panel menu is best suited for off-shoulder use.
- The **viewfinder menu** is displayed as a text overlay in the viewfinder. It can be controlled by the **rotary** control and the **select** button at the front of the camcorder.
  - The viewfinder menu contains operational controls, making it easy to use the camcorder on the shoulder.

Additionally, there are two optional external control panels that can be used to control the camcorder:

- The Wireless Local Control Panel LCP 400 is control software application that runs on a mobile device such as a PDA or TouchPhone. Refer to the user's guide of the LCP 400 to set up a remote connection and control the camcorder
- The Operational Control Panel OCP 400 offers remote access to the camcorders functions and is best suited for studio use. Refer to the user's guide of the OCP 400 to set up a remote connection and control the camcorder.

4.1.1 User levels

Four user levels can be selected (0 .. 3) that restrict the set of functions which can be changed. In this way, the danger of accidentally changing critical functions while shooting can be reduced. User level 0 locks most of the operational controls and is not normally used for operational purposes. The recommended minimum user level is 1. For full control, set the level to 3.

If some menu items are dimmed (grey) they may be locked for the installed user level. Change the user level in the **SYSTEM/SECURITY**/USER LEVEL menu.

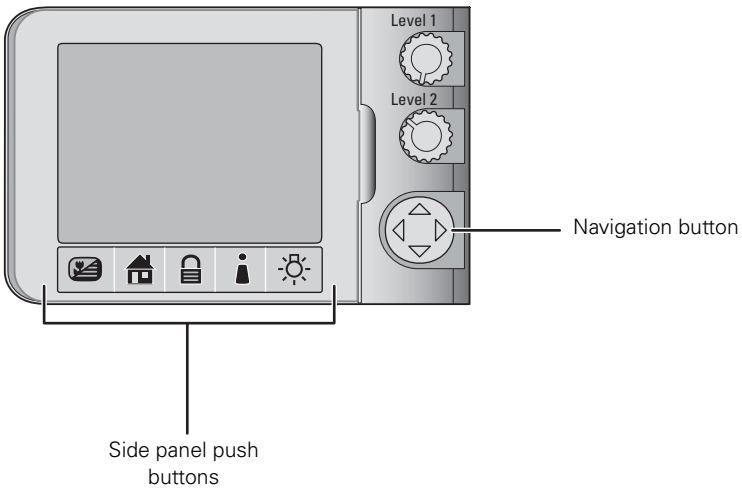
4.2 Side panel display

The side panel display provides controls to access the user interface and camcorder menu system. The panel can be rotated 270° around a hinged point. Rotation of more than 120° around the horizontal axis results in a picture flip around horizontal axis. The best way to use the side panel display for menu navigation is to set it back into the camcorder body recess with the five push buttons at the bottom.

The side panel display allows direct interaction with menu controls shown on the screen. The touch screen is designed to work with a finger or other soft objects. The screen is sensitive to a single pressure location only, so only one touch surface control can be adjusted at a time.

Caution
Do not apply any sharp or rigid object (no pens or pencils) to the surface of the touch screen.

Use arrows of the navigation button to move around items on the touch screen. Push the center of the button to activate the item.



The push buttons below the display have the following functions:

Button	Name	Function
	Cam/Menu	Switches the side panel display between camera view and menu/clip.
	Home	In the side panel menu: - switches to the home screen. In the clip manager: - switches to the thumbnail overview.
	Lock	Push to lock the touch screen; push again to unlock.
	User	In the side panel menu: - user programmable shortcut button. Push to directly accesss the menu of your choice (the metadata menu is the default value). - to program, select a menu and hold the button for 2 seconds. In the clip manager: - displays the thumbnail properties.
	Backlight	Turns the backlight on or off.

4.3 Side panel menu

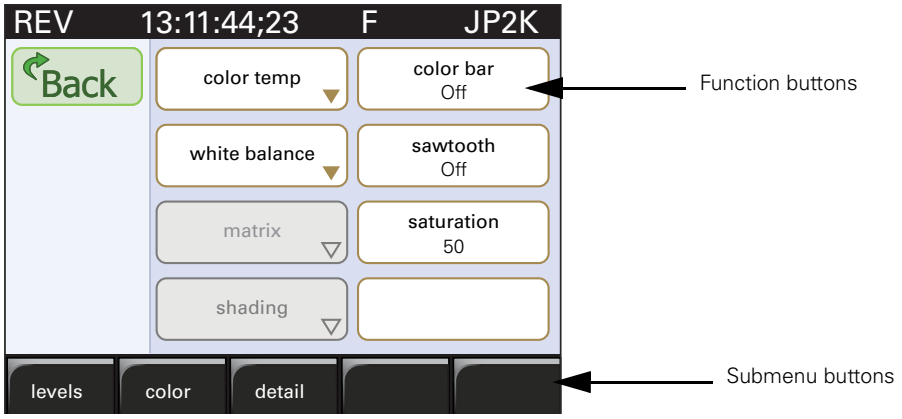
4.3.1 Home screen

When you open the side panel display you see the home screen that shows the most important camera information:

- To select and enter values, tap the screen with your finger.
- Tap the buttons along the bottom to access the different menu functions.
- Use the Home button  under the display to return to the home screen.

4.3.2 Side panel menus

When you tap one of the buttons at the bottom of the home screen a menu screen opens. A new set of buttons for the submenus appears across the bottom of the screen. In the example below, the VIDEO button has been selected and the LEVELS, COLOR and DETAIL submenus are shown:



When you enter a menu, the submenu on the left is automatically selected and its associated function buttons are shown. At any stage you can tap BACK to move back up through the menu levels.

- Tap a button across the bottom of the screen to open a submenu.
  - the submenu's associated function buttons are shown.

4.3.3 Function buttons

The screen can show up to eight function buttons. When less functions are required the button spaces are left blank. If a particular function is momentarily unavailable, it is dimmed.

There are two types of function button:

- A button with a title and a small arrow in the corner.
- A button with a title and a value under it.

Function buttons that have a small arrow in the corner have a submenu. Tap this type of button to open a screen with a new sub-set of function buttons.

Function buttons with a title and a value are used to change the value of the parameter. Tap this type of button to open a pop-up box. This pop-up box allows you to select a value for the function. In the example below, you can select the video standard:

The buttons in the pop-up box are used as follows:

Button	Use
	tap the arrow buttons to move through the list of available values.
	tap to undo any unapplied changes and close the pop-up box.
	tap to apply the selected value.
	tap to apply your selection and close the pop-up box.

☞ Note

In this guide, the menu paths are shown as follows: **SETUP**/**FORMATS**/VIDEO STANDARD
Buttons along the bottom of the screen are shown in bold.

4.3.4 Menu structure

The five black screen buttons at the bottom of the home screen show the five main functional groups.

When you tap one of these buttons, the menu screen associated with this button opens. The submenus for the selected group are then shown across the bottom of the screen.

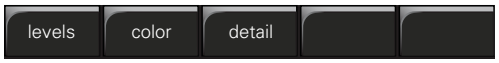
Audio

The audio group contains all functions and controls associated with setting up the audio.

- **inputs** selects the sources for each of the four recording channels.
- **channels** sets the levels for each of the four recording channels.
- **outputs** selects the signals for the SDI and audio connector outputs.
- **monitoring** selects audio and alarm outputs for monitoring.
- **setup** sets levels for the audio inputs.

Video

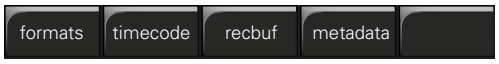
The video group contains all functions and controls associated with picture control.



- **levels** gives access to video parameters such as gain, exposure, blacks, knee, etc.
- **color** allows the parameters affecting color such as color temperature, white balance or matrix to be set.
- **detail** sets all parameters affecting contour processing.

Setup

The setup group contains all functions associated with setting up the recording parameters.



- **formats** sets up video standards, recording sources and compression.
- **timecode** sets up all timecode features.
- **recbuf** handles media selection.
- **metadata** lists available story files.

Clips

Selecting the clips button opens the clip manager. Recorded clips are shown as thumbnails and can be selected for play back and manipulated. The five black screen buttons displayed in the clip manager depend on the context.

System

The system group contains all the configuration parameters for the camcorder:

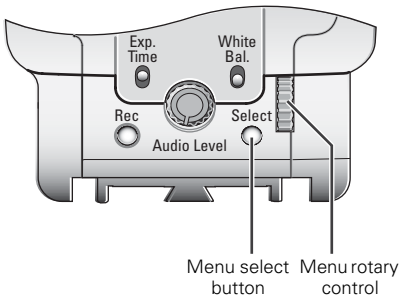
- **hardware** sets up viewfinder, lens, buttons and ports.
- **date/time** set the date and time parameters.
- **side pane**l sets display parameters for the side panel display.
- **files** allows operator and scene files to be stored and recalled.
- **security** allows access level to be set.

☞ Note

For a full list of functions contained within the side panel menu refer to "Side panel menu" on page 109.

4.4 Viewfinder menu

The camcorder is operated via the viewfinder text display and the control system menu switches. The systems menu is viewed in the viewfinder and navigated by means of the **Menu rotary control** and the **Menu select button** which are both located at the front of the camcorder.



☞ Note

The length of time the menu is displayed can be set in the `VF/OSD/TIME OUT` menu.

4.4.1 Viewfinder menu structure

The functions of the camcorder are grouped into menus and sub-menus. There are five different menus that are listed in the main menu. Each of these menus gives you access to a particular group of functions:

```
VF                    >>
Video                 >>
Setup                 >>
Audio                 >>
System                >>
```

VF menu: contains the functions which determine how items in the viewfinder are displayed.

Video menu: contains those functions which affect the picture quality.

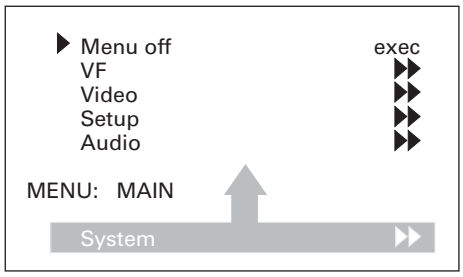
Setup menu: used to set recording and media setup parameters.

Audio menu: used to set audio and audio monitoring parameters

System: contains the functions that are used to set up the general configuration of the camcorder. It also contains controls to customize those switches that are directly operated on the camcorder.

4.4.2 Entering the viewfinder menu system

Press the **Select** button after the camcorder is switched on, the message `MENU OFF` appears in the viewfinder. Press the **Select** button again while this text is showing, the `MAIN` menu appears in the viewfinder.



The `MAIN` menu screen shows five items. The name of the menu is shown below these. Four more items are hidden but become visible when you scroll down using the **Rotary** control. A cursor shows your position in the menu. The **Rotary** control moves the cursor up and down.

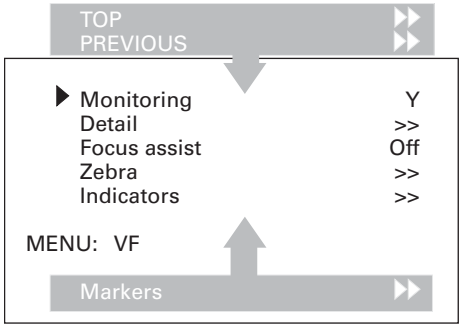
4.4.3 Finding your way

Use the **Rotary** control to move the cursor through the menu items. If a double arrow (>>) is visible, then pressing the **Select** button brings you one level lower in the menu system. Only five items are visible at the same time 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.

The **VF** menu, for example, shows the items displayed when you first enter the menu. The other items are available by scrolling up or down with the **Rotary** control.



4.4.4 Leaving the viewfinder menu system

If you do not use the menu it disappears after a few seconds. (This delay can be programmed in the VF menu.)

You can manually exit the menu by following the following procedure:

1. If necessary move the cursor to the left column with the **Select** button.
2. Scroll upwards with the **Rotary** control until the cursor points to TOP (this is the MAIN menu).
3. Press the **Select** button. The cursor now points to the MENU OFF item of the MAIN menu.
4. Press the **Select** button to leave the SYSTEM menu.

☞ Note

When you press the **Select** button you enter the SYSTEM menu at the last position of the cursor. To prevent confusion the next time you enter the SYSTEM menu, you may want to always leave the menu by returning to the MAIN menu (TOP) and selecting MENU OFF.

4.4.5 Making changes

To find out where you have to go to change a function, consult the appendix to discover under which menu group or sub-group the function you want to change 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)
- 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 **Select** 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 **Select** button places the cursor in a list menu indicating the value currently selected. Use the **Rotary** control to point to a new value. Press the **Select** button to return the cursor to the function list.

If an analogue value is displayed next to a function name, then pressing the **Select** button places the cursor in front of the value and the **Rotary** control is used to change the analogue value. Press the **Select** button to return the cursor to the function list.

4.4.6 Undoing changes

If you make changes to the video settings in the menu and you decide not to keep them, use the **Std. Recall** button at the side of the camcorder to recall a standard set of values for the video parameters.

Chapter 5

Video setup

5.1 Video standards

To obtain the video standards of your choice for recording and output, you must make several selections in the **SETUP/FORMATS** menu on the side panel display.

There are six different video standards. Each of these standard is used to derive the video signals for recording and output. The video formats you select affect many other functions such as output signal formats and recording capacity.

Video standard	HD-SDI output	SDI output	CVBS output
1080i59.94 (HD)	1920 x 1080i59.94		
720p59.94 (HD)	1280 x 720p59.94		
480i59.94 (SD)		480i59.94	NTSC
1080i50 (HD)	1920 x 1080i50		
720p50 (HD)	1280 x 720p50		
576i50 (SD)		576i50	PAL

*Interlaced formats are indicated by **i**; progressive formats by **p**. The field/frame rate (50 or 59.94) is shown after one of these letters.

The camcorder can be used in either HD standards or SD standards. The SDI video outputs are switched automatically to the appropriate standards.

An analog CVBS output is available. This down-converted SDTV signal is present at the analog output in either NTSC or PAL.

5.1.1 Aspect ratio

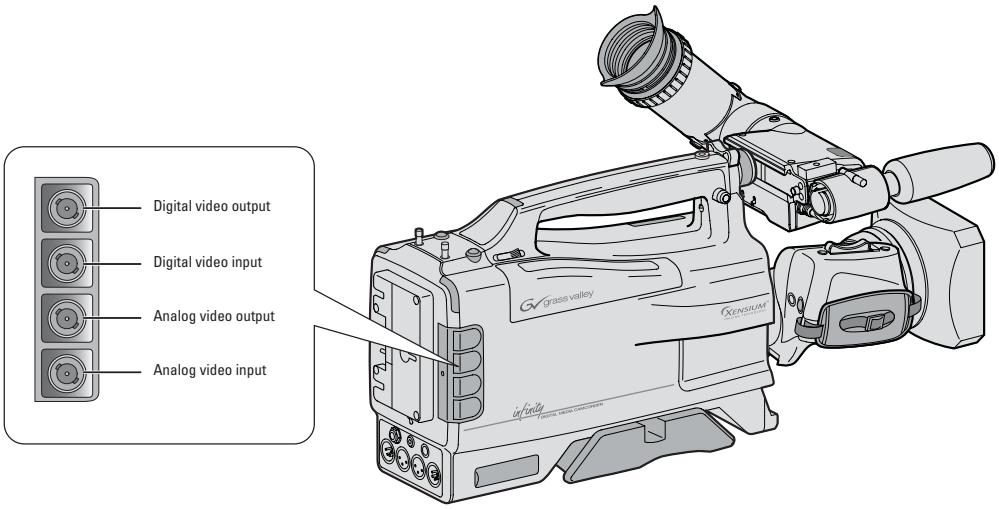
The native aspect ratio of the imager is 16:9. The HD signal is always 16:9 while the SD signal can be set to 4:3 or 16:9. The 4:3 format can be cropped (side panels removed from 16:9 aspect ratio) or letterboxed (16:9 format in 4:3 aspect ratio with black bars on top and bottom).

5.2 Input and output connectors

Four BNC connectors are located at the rear-right of the camcorder. The output signals on these connectors depend on the port settings that are set in the **SYSTEM/HARDWARE/**PORTS menu.

☞ Note

The output signals follow the video standard that has been selected in the **SETUP/FORMATS** menu for the camcorder.



Connector name	Function
Digital video output	• normal HD-SDI or SDI output, or • viewfinder signal HD-SDI output. (Video standard depends on video format of camcorder.)
Digital video input	HD-SDI or SDI input for: • viewing, • recording, • extracting and locking to VITC, or • embedded SDI audio.
Analog video output (or digital audio output)	Analog video output • CVBS for viewing/monitoring purposes, or • LTC - linear time code output. (This connector can also be configured to provide an AES digital audio output signal.)
Analog video input (or digital audio input)	Analog video input • CVBS for recording and for genlocking, or • LTC - linear time code input to lock to an external time code source and also for genlocking. (This connector can also be configured to accept an AES digital audio input signal.)

5.2.1 Digital connectors

SDI signals

The SDI (SD) output signal is according to SMPTE 259M with a maximum of 4 audio channels (24-bit) embedded in the DSC signal according to SMPTE 272 M-A, and Error Detection and Handling (EDH) signals according to SMPTE RP 165.

The HD-SDI (HD) output signal is according to SMPTE 292M: Bit-Serial Digital Interface for High Definition Television Systems with a maximum of 4 audio channels (24-bit) embedded in the DSC signal according to SMPTE 299M, and Error Detection and Handling (EDH) signals according to SMPTE RP 165.

Embedded time code standard

The (HD-)SDI inputs and outputs are capable of extracting or inserting embedded time code from or to the (HD-)SDI signal according to:

- HD-SDI: RP188-1999: Transmission of Time Code and Control Code in the Ancillary Data Space of a Digital Television Data Stream,
- SDI: SMPTE-266M-2002: 4:2:2 Digital Component Systems Digital Vertical Interval Time Code.

Viewfinder output signal

The viewfinder signal can be selected in the **SYSTEM/HARDWARE**/PORTS menu for output as a HD-SDI signal on the digital video connector. When selected, the message VF is shown in the viewfinder. The viewfinder signal is only output when the video format of the camcorder is set to a HD standard.

All display messages, menus and markers, and the viewfinder signal processing (zebra, focus assist, VF detail) are applied to the output signal. Crispening of the viewfinder signal is not applied.

If the Option switch on the viewfinder is set to the On position, only selected markers are shown. VF detail is still applied.

5.2.2 Analog connectors

Analog video

The Analog Out connector provides a 1Vpp CVBS analogue output signal. This signal is only present if the connector is terminated correctly with 75 Ω. A linear time code signal according to SMPTE 12M-1999 can also be provided for locking external units to the time code generator of the camcorder.

The Analog In connector accepts a 1Vpp CVBS external video signal for genlocking the camcorder and for recording. This signal can also be viewed in the viewfinder. A black burst signal can be used for genlocking.

A linear time code signal according to SMPTE 12M-1999 can also be supplied to this connector for locking the time code generator of the camcorder to an external unit.

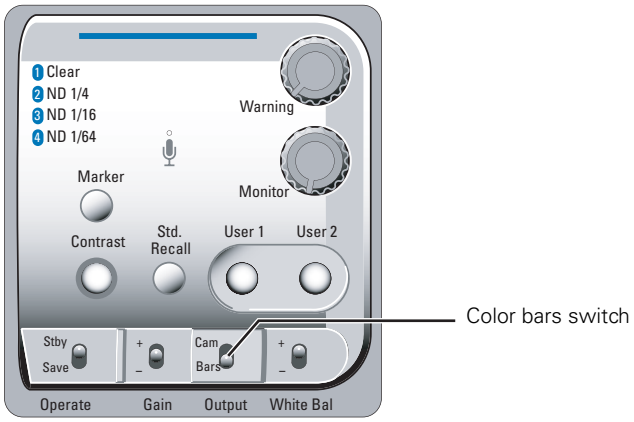
Digital audio

The Analog Out connector can also be set in the **SYSTEM/HARDWARE**/PORTS menu to provide an AES digital audio output signal. Select the audio source for the output in the **AUDIO/OUTPUTS**/AES AUDIO menu.

The Analog In connector can also be set in the **SYSTEM/HARDWARE**/PORTS menu to accept an AES digital audio input signal. Select AES audio as a recording source in the **AUDIO/OUTPUTS**/AES AUDIO menu.

5.3 Color bar

The color bar switch is used to switch a standard test signal that can be used to set up and check the camcorder.



The internal test signal generator produces standard SMPTE color bars. When switched on, a standard 1 kHz tone can be enabled which is routed directly to all four audio channels. Go to the **AUDIO/SETUP**/TEST TONE to enable or disable the test tone. Both the color bars and tone can be recorded. The test signals are also available at the BNC and audio output connectors.

When the color bar test signal is switched on, the following functions are temporarily switched off:

- Black stretch
- White limiter
- Zebra
- Safe area (viewfinder)
- Cadre (viewfinder)

The lens iris closes automatically when the color bars are switched on.

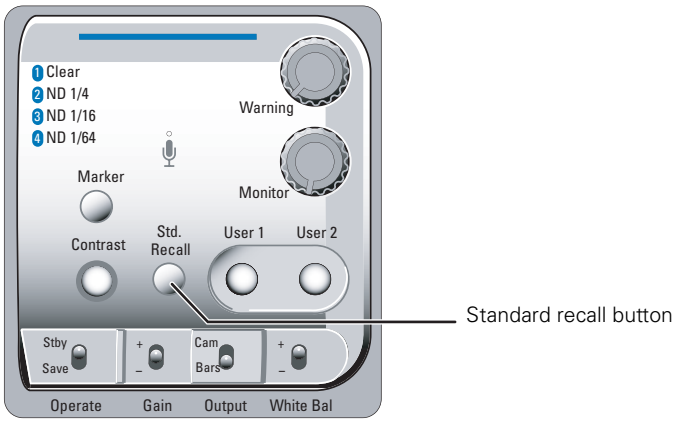
5.4 Standard video settings

To ensure that some of the camcorder functions are not set to unusual values, a standard file has been defined that contains the default values for most video functions. To recall the standard values for the various video functions:

➢ Press the **Std. recall** button on the left side of the camcorder and hold it for a few seconds. The message "Standard recall completed" appears in the viewfinder.

☞ Note

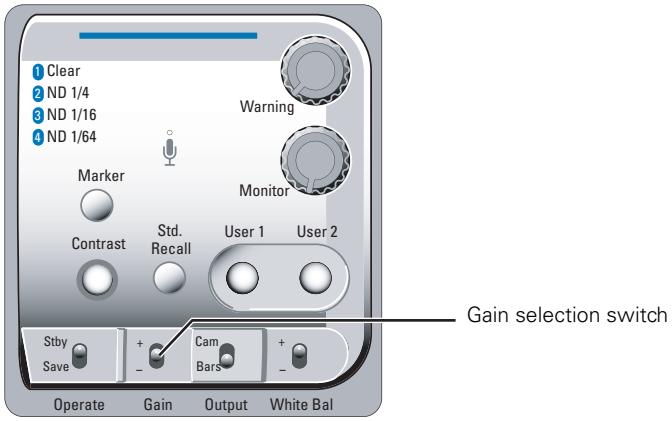
The standard values only take effect when the camcorder is not recording.



The non-standard indicator (**!**) in the viewfinder lights when the video settings are not set to their standard value, for example, when exposure is not set to nominal. It also lights when black stretch or extended auto iris is on and if AWC or FL50 or FL60 is selected with the white balance switch.

5.5 Gain selection

Depending on the available light levels you may need to adjust the gain of the camcorder. Setting the gain level higher may introduce more noise into the image. Select the gain value with the up/down **Gain** selection switch on the left-front side of the camcorder.



Press the switch up or down for a short period to select to select one of the five preset gain settings: [-], [0], [+], [++] and [+++].

☞ Note

The actual value of the gain in dB is assigned to these symbols in the **VIDEO/LEVELS**/GAIN/GAIN PRESET menu.

The gain indicators in the viewfinder permanently light to indicate the value selected. (The [+] and [++] indicators light when the gain is [+++]).

Symbol		Gain value
-	can be set to:	-6 dB or -3 dB
0	is always	0 dB
+	can be set to:	6, 9, 12 or 18 dB
++	can be set to:	9, 12, 18 or 24 dB
+++	can be set to:	30, 36 or 42 dB

Variable gain

The gain selection switch can also be used to vary the gain continuously between its minimum and maximum value.

1. Hold the switch continuously in the up or down position until the indication VAR appears.
2. Use the rotary control at the front of the camera to change the gain in steps of 0.1 dB
3. You can change the gain as long as the value text is visible in the viewfinder.
4. Press the gain selection switch once to bring up the variable gain again. Change the value using the front rotary control.
5. Press the switch again to go to the nearest preset value.

5.6 Working with optical filters

The camcorder has an optical neutral density filter wheel that can be placed in the optical path to reduce the incoming light. The filter wheel has a clear position and three neutral density filters. These neutral density filters can be used, for example, to control depth of field or exposure levels.

Position	Filter
1	Clear
2	ND 1/4 filter (2 stops down)
3	ND 1/16 filter (4 stops down)
4	ND 1/64 filter (6 stops down)

The filters are selected with the **filter wheel switch** at the top-front of the camcorder or in the **VIDEO**/**LEVELS**/FILTER WHEELS/N/D FILTER menu.

➢ Rotate the filter wheel switch to move the optical filter.
- The status of the filter wheel is displayed in the viewfinder for a few seconds.
- The **ND/RE** indicator in the viewfinder lights when an ND (Neutral Density) filter is selected.

☞ Note

Because there are several ways (LCP 400, side panel menu, etc.) to select the optical filter, the position of the filter wheel switch itself does not necessarily represent the currently selected filter.

☞ Note

The camcorder does not need optical color filters to be able to white balance correctly. The range of the auto-white balance is so wide (from 2000K to 20,000K) that there is never any need to use color filters to obtain the correct white.

5.7 Color temperature

For true color reproduction you must compensate for the ambient lighting conditions by selecting a color temperature value.

5.7.1 Presets

Four presets (3.2K, 4.7K, 5.6K and 7.5K) for reference color temperatures are available:

- 3200K (3.2K) - for tungsten light (indoor)
- 4700K (4.7K) - for mixed lighting (tungsten and daylight)
- 5600K (5.6K) - for HMI (daylight) lighting or outdoors, clear sky with full sun
- 7500K (7.5K) - for outdoors, shaded conditions

5.7.2 Memory positions

Three memory positions (FL50/FL60, AW1 and AW2) are available to store the results of the auto-white measurement process. The memory positions are filled with measured values using the automatic white balance switch at the front of the camcorder. The FL50/FL60 position is recommended for shooting with fluorescent light. The three memory positions are:

- FL50/FL60 - combined memory position for fluorescent light sources
  - FL50 is for 50Hz fluorescent light sources (the color matrix is automatically set to CoolFL and exposure to 50Hz.)
  - FL60 is for 60Hz fluorescent light sources (the color matrix is automatically set to CoolFL and exposure to 60Hz.)
- AW1 - memory position 1
- AW2 - memory position 2

Note

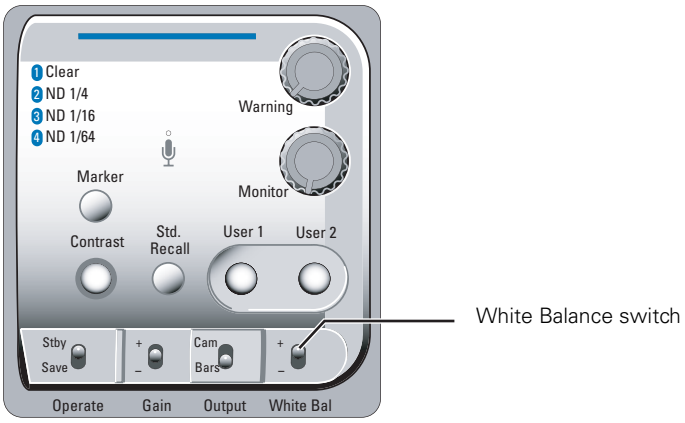
The measured values for FL50 and FL60 are stored in a single memory position. When a new value is stored the old value is deleted.

5.7.3 Continuous white balance

A continuous automatic white balance position (AWC) is also available. This function continuously measures the ambient light and adjusts the white balance accordingly. It can be used when a constant color balance is required under variable lighting conditions (sunrise/ sunset, moving between indoors and outdoors). The automatic continuous white adjustment can range between 2000K and 20,000K.

5.7.4 Selecting the color temperature

The up/down **White Bal** switch on the left side of the camcorder allows you to select the standard color temperatures, the memory positions or the automatic position.



Press the switch up or down for a short period to select the next available value.

- The **color temperature** indicators in the viewfinder light to show which position is selected. None of these indicators light when AWC is selected, but the non-standard **(!)** indicator lights.
- The viewfinder also displays the actual value of a measured color temperature. The range of the auto-white balance is from 2000K to 20,000K.

Variable color temperature

The **White Bal** switch on the left-front side of the camcorder can also be used to vary the color temperature continuously between its minimum and maximum value (2000K to 20,000K).

1. Hold the switch continuously in the up or down position until the indication VAR appears.
2. Use the rotary control at the front of the camera to change the color temperature. The value starts at the current preset.
3. You can change the color temperature as long as the value text is visible in the viewfinder.
4. Press the **White Bal** switch once to bring up the variable color temperature again. Change the value using the front rotary control.
5. Press the switch again to go to the nearest color temperature preset value.

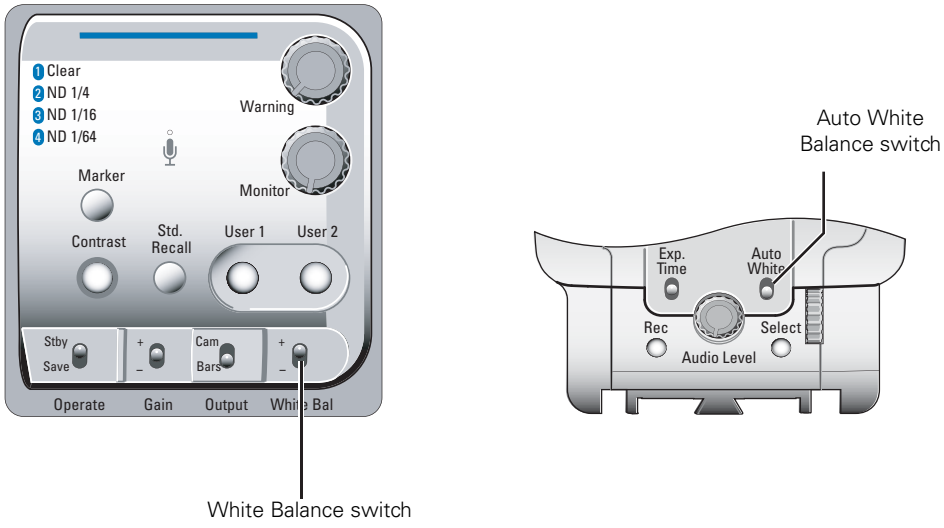
The color temperature can also be adjusted in the **VIDEO/COLOR**/COLOR TEMP./VAR. COL. TEMP menu to act as an electronic color filter. This control varies the color balance to obtain warmer or colder color effects. When an automatic white balance process is performed, the electronic color filter is reset to its default value.

5.8 Auto white balance

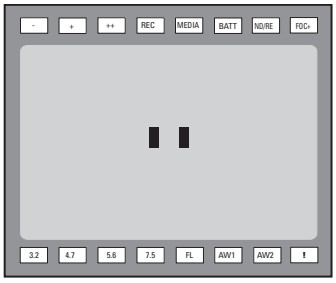
If the reference color temperatures do not match your lighting conditions, carry out the automatic white balance procedure. When the procedure is started, the camcorder measures a white area in the middle of the picture and stores the color temperature in the selected FL50/60, AW1 or AW2 memory positions.

☞ **Note**

Make sure that the color bars are switched off before starting the auto white balance procedure.

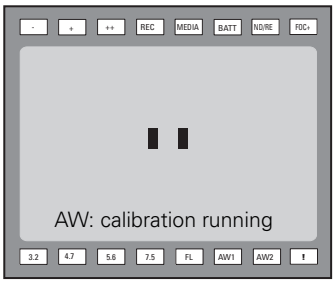


1. Use the **White Bal** switch to select one of the memory positions FL50/60, AW1 or AW2 in which to store the measured color temperature value.
2. Hold the **White Bal** switch at the front of the camcorder in the up position. The following appears in the viewfinder:



3. Point the camcorder so that the reference white surface is between the two black boxes on the screen.

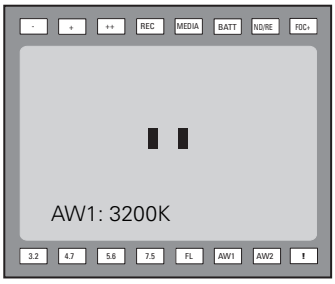
4. Release the **White Bal** switch to start the measurement procedure. A message indicating that the calibration procedure is runnning appears.



Note

If there is insufficient light, the **Video too low** message appears in the viewfinder.

5. When the process is completed (within a few seconds) the **OK** message and the measured temperature appears in the viewfinder.



The measured color temperature is now stored in the selected memory position and can be recalled as required. If the button is pressed during the measurement process or when the auto white balance procedure fails, the memory position resets to it original value.

Note

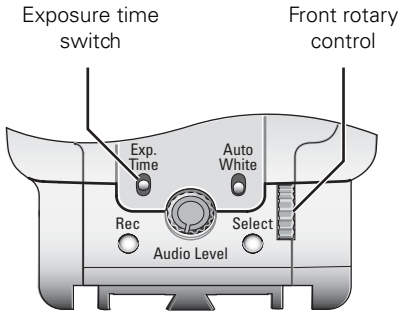
During the auto white procedure the auto iris and knee functions are temporarily turned off. They are reset after the procedure has finished.

Note

Black balance is not necessary with this camcorder because of the continuous automatic black control circuits.

5.9 Exposure time

The exposure time values of 1/200, 1/500, 1/1000 and 1/2000 of a second are used to capture fast moving objects so that these can be played back sharply in slow motion. The value selected depends on the speed of the moving object.



Press the momentary up/down **Exp. Time** switch to select an exposure time. When VAR is selected, use the front rotary control to adjust the value. The value can be adjusted as long as the value text is visible. The variable exposure time value is saved under the VAR setting.

☞ Note

If an exposure time other than nominal is selected, the non-standard indicator (**!**) in the viewfinder lights.

Value	Function
Nom	nominal setting
50 Hz	shooting with 50Hz lighting (adjustable)
60 Hz	shooting with 60Hz lighting (adjustable)
1/200	for fast moving objects
1/500	for fast moving objects
1/1000	for fast moving objects
1/2000	for fast moving objects
VAR	enables the exposure to be varied - use the front rotary control to adjust the value

Lighting

The exposure selection also includes lighting control positions which can be used when shooting with lighting that is operating at a different frequency than the camcorder. There are two positions; 50 Hz and 60 Hz. These positions can be varied in a range from -10 to +10.

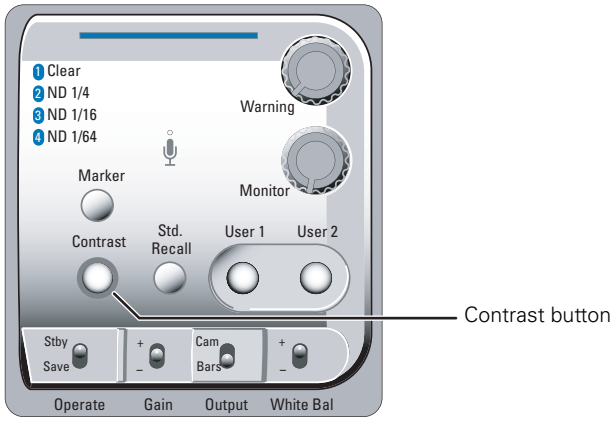
To reduce flicker select the frequency closest to the frequency of the lights and then vary the lighting control in the **VIDEO/LEVELS**/EXPOSURE/LIGHTING menu to obtain the best result.

☞ Note

Increasing the exposure speed lowers the camcorder sensitivity proportionally.

5.10 Contrast button

The contrast button can be set to activate black stretch or knee (or both at the same time) to produce more detail in the dark areas of the picture or creating more headroom for the white without affecting the rest of the picture. The contrast button can set in the **SYSTEM/HARDWARE**/BUTTONS/CONTRAST BUTTON menu.



➢ Press the **Contrast** button to switch this function on and off.

☞ Note

When contrast is switched on, the non-standard indicator (**!**) in the viewfinder lights.

You can change the black stretch settings in the **VIDEO/LEVELS**/BLACK STRETCH menu and the knee settings in the in the **VIDEO/LEVELS**/KNEE menu.

5.11 Video menu adjustments

The following video adjustments are accessed via the **VIDEO** menu:

- detail enhancement
- skin detail
- knee (highlight compression)
- matrix (color adjustment)
- gamma

☞ Note

Many of these controls are for advanced users and require the use of additional measurement equipment (for example, a waveform monitor, a calibrated picture monitor, etc.) for correct adjustment.

5.11.1 Detail

Horizontal and vertical detail enhancement increases the perception of image sharpeness by creating contrast-rich edges around an object's contour. The following menu items are available to control the detail enhancement process:

- Level
- Source
- Vertical
- Coarse/fine Level
- Level dependency
- Noise slicer
- Soft detail
- Soft detail level
- Knee detail

Refer to the Video menu contents list in chapter 12 for more details on these controls.

☞ Note

Detail enhancement differs between SD and HD modes.

5.11.2 Skin detail

Use skin detail to change the contour level in a selected color range. The detail level within this color range can then be set independently of the rest of the picture.

Decreasing the detail level of a persons skin color softens only the skin tones. But not only skin colors can be selected, for example, decrease the detail level of a playing field to accentuate the players or increase the skin detail level to accentuate a rough surface.

Two skin contour ranges can be independently defined; both can be used at the same time. The color range to which the skin contour level is applied can be selected automatically or manually.

Automatically selecting the skin area

To automatically sample a color range run the Auto skin detail procedure as follows:

1. In the **VIDEO/DETAIL**/SKIN DETAIL menu, select the memory position skin 1 or 2 (not 1+2).
2. Select the **VIDEO/DETAIL**/SKIN DETAIL/AUTO item.
3. Point the two small white boxes that appear in the centre of the picture at the color range you wish to sample.
4. Select the **VIDEO/DETAIL**/SKIN DETAIL/AUTO item again to start the measurement procedure.
   - Auto iris is switched on.
   - The process running message appears in the viewfinder.
   - When the process is completed (within a few seconds) the OK message appears in the viewfinder.
5. Adjust the skin contour level with the **VIDEO/DETAIL**/SKIN DETAIL/LEVEL menu.
   - Decrease the value below 50 to soften the selected area.
   - Increase the value above 50 to add extra contour.

Repeat the steps for the other skin memory position if required.

To outline the selected area, set the menu item **VIDEO/DETAIL**/SKIN DETAIL/VIEW to On. The color range set by the automatic procedure can be adjusted manually if required.

Manually adjusting the skin range

The color ranges stored in memory positions 1 and 2 can be adjusted manually as follows:

1. In the **VIDEO/DETAIL**/SKIN DETAIL menu, select WIDTH 1 to adjust the red and blue (saturation) skin gate for memory position 1.
   Select WIDTH 2 to adjust the red and blue (saturation) skin gate for memory position 2.,
   The higher the number, the broader the range.
2. In the **VIDEO/DETAIL**/SKIN DETAIL menu, select COLOR 1 to adjust the red and blue (color) skin gate for memory position 1.
   Select COLOR 2 to adjust the red and blue (color) skin gate for memory position 2.

5.11.3 Knee

The knee function is used to compress highlights and to give a tonal graduation in the highlight areas. The pivoting knee circuit adapts both the knee point and the compression ratio according to the highlight content of the picture to emulate the softly limiting S-shaped transfer characteristics of film. Digital True Color Knee circuitry maintains the correct hue for compressed highlights, reproducing colors faithfully, even overexposed skin tones. The knee parameters are set in the **VIDEO/LEVELS/**KNEE menu. Set knee compression to off, auto or manual.

The automatic knee mode overrides the manual settings. The higher the signal in, the more this automatic circuit tries to compress the signal, and compensate for overexposure of the highlights.

The manual mode allows specific adjustment in the highlight region of the image:

- The point M item adjusts the level (between 70% and 100%) at which the knee circuitry starts to compress highlights in the manual mode. The higher the number, the higher this level is.
- The slope M item adjusts the slope of the knee curve in manual mode. Higher numbers lower the slope giving more detail in highlight information.

A desaturation control defines the point at which the output is colorless in the compressed highlight areas.

5.11.4 Gamma

To compensate for the non-linear response of display devices, a gamma correction is introduced into the video signal. The gamma correction adjusts the tonal response of the characteristic curve. The choices in the **VIDEO/LEVELS/**GAMMA menu are Nominal, Low, and Pre. This selection determines how mid-range tonal values are reproduced. The camcorder reproduces more tonal graduations (less picture contrast) in Nom than in Low.

Gamma control:

- Nom position (76) = gamma 0.45 (default)
- Low position (50) = gamma 0.65
- Pre position (0 …100) = lets you adjust the slope manually (M, R, G, B).
  - Master gamma adjusts the slope of the characteristic curve using the range 0 to100. When set to the default, 76, it is equivalent to Nom, a slope of 0.45 and when set to 50 it is equivalent to Low, a slope of 0.65. The adjustable range under master gamma equates to slopes that range from 0.35 to 1.0.
  - Red gamma adjusts the slope of red gamma response curve between 0 and100.
  - Green gamma adjusts the slope of green gamma response curve between 0 and 100.
  - Blue gamma adjusts the slope of blue gamma response curve between 0 and 100.

Changing the slopes of the individual color gamma curves alters the purity of white in the mid-range tonal values.

5.11.5 Matrix

The matrix modifies the camcorder's color gamut. Colorimetry is selected by means of a variable 6-point digital matrix or via preset matrices. Changes made to matrix settings do not affect the blacks and whites in the image. A wide range of presets and a variable 6-point digital matrix assure accurate color matching. The preset choices are:

Preset	Color matrix settings
EBU	ITU-709 color gamut
RAI	Color gamut for matching to Sony camcorders
BBC	Color gamut as specified by the BBC prior to the ITU-709 standard
B-W	Black and white gamut
SKIN	ITU-709 color gamut (optimized for skin tone reproduction)
1:1	Pass-through gamut for testing and service purposes only
CoolFL	Color gamut designed for shooting under flourescent lights, which eliminates the green spikes produced by flourescent bulbs.
VAR1	Adjustable settings
VAR2	Adjustable settings

Colors can be made punchier, or more saturated, and others can be made more pastel, or de-saturated, to create a special look. Matrix adjustments allow the color gamut of the camcorder to be matched to that of other camcorders, even from different manufacturers. Any changes should be made under controlled conditions. The only way to accurately see these changes is to adjust the matrix settings when the camcorder is connected to a vectorscope and an evaluation monitor.

5.11.6 Color saturation

The color saturation of the video signal can be adjusted in the **VIDEO/COLOR**/SATURATION menu. Higher values give more saturation, lower values give less saturation.

Chapter 6

Audio setup

6.1 Introduction

Audio signals from various sources can be recorded onto four audio recording channels. These channels are identified in the menus as:

- ch1
- ch2
- ch3
- ch4

The sources used for recording can be:

- the front microphone,
- the line or mic. inputs at the rear of the camcorder,
- AES digital audio signals applied to the BNC input at the right-rear of the camcorder,
- one of eight embedded SDI audio channels, or
- an optional wireless microphone receiver.

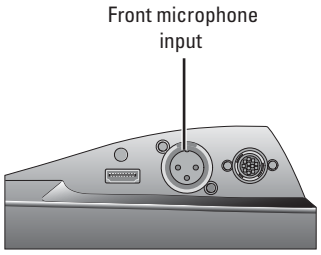
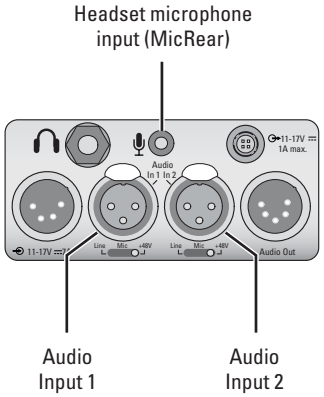
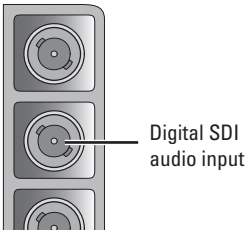
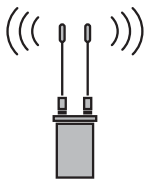
Audio signals are output:

- on the rear 5-pin XLR audio output connector,
- as embedded channels in the SDI output signal, or
- as AES digital audio signals on the BNC connector on the right-rear of the camcorder.

The following pages will tell you how to:

- connect the inputs and set input sensitivity,
- select recording channel sources and set recording levels,
- monitor channels and sources, and
- select output channels or sources.

6.2 Inputs

Location	Connector	Function
	Front microphone input (Front1 or Front2)	This XLR-3 socket accepts a balanced mono microphone signal from a high quality dynamic microphone. A phantom power supply is provided as standard. When the optional DMC1180 stereo front microphone connector kit is installed, this socket is replaced with a 5-pin XLR female socket that accepts a stereo balanced microphone.
	Headset microphone input (MicRear)	Connect a headset microphone to this mini-jack 3.5 mm) socket.
	Audio Input 1 (Rear1)	This XLR-3 socket accepts balanced audio signals from microphones or line level sources. With the switch under the socket, set the input to either: • line • mic • mic +48 V phantom power
	Audio Input 2 (Rear2)	This XLR-3 socket accepts balanced audio signals from microphones or line level sources. With the switch under the socket, set the input to either: • line • mic • mic +48 V phantom power
	Digital SDI audio inputs (SDI1 to SDI8)	Eight channels of embedded SDI inputs.
	Digital AES audio inputs (AES1 and AES2)	Two-channel digital audio input compliant with the AES/EBU protocol.
	Wireless microphone inputs (Wrx1)	Wireless microphone input. Requires the installation of a wireless receiver unit (optional).

Refer to Section 11.2 on page 105 for detailed pin layouts for several audio connectors.

6.2.1 Front microphone

Connect a microphone to the XLR-3 (or XLR-5) connector at the front of the camcorder. The front microphone connector accepts either a mono microphone or a stereo microphone (using the optional DMC1180/00 stereo front microphone connector kit).

6.2.2 Rear line or microphone inputs

There are two XLR-3 connectors at the back of the camcorder. To connect a microphone to these sockets:

1. Set the switch under the socket to **+48V** (left position) for microphones that need external (phantom) power, otherwise set it to **Mic** (middle position).
2. Connect a microphone to one of the XLR-3 connectors at the back of the camcorder.

The two XLR-3 connectors at the back can also be used for line-level audio inputs. To connect a line-level input:

1. Set the switch under the socket to **line** (right position).
2. Connect a line signal to one of the XLR-3 connectors at the back of the camcorder.

6.2.3 Digital audio sources

To connect an AES digital audio source:

1. Connect a digital audio source to the Analog Input BNC connector (bottom) at the right-rear of the camcorder.
2. Go to the **SYSTEM/HARDWARE**/PORTS menu.
3. Tap the ANALOG IN button and use the arrows in the pop-up box to select **digital audio.**

To connect an embedded SDI digital audio source:

1. Connect an SDI video source with embedded audio to the Digital video Input BNC connector (second one from the top) at the right-rear of the camcorder.

6.2.4 Wireless microphone (optional)

When the optional wireless microphone receiver kit is installed, a wireless microphone channel is available. To set up a wireless microphone refer to the instructions delivered with your unit.

6.2.5 Gain settings

Set the input gain level in the **AUDIO/INPUTS** menu for:

- the front microphone inputs,
- the rear microphone inputs,
- the rear line-level inputs, and
- the optional wireless audio input.

6.3 Recording audio

6.3.1 Select source

To select the source for each of the four recording channels:

1. Go to the **AUDIO/CHANNELS** menu.
2. Tap one of the SOURCE CH buttons numbered 1 to 4.
3. Tap the arrows in the pop-up box to select a source for that channel.

The sources are:

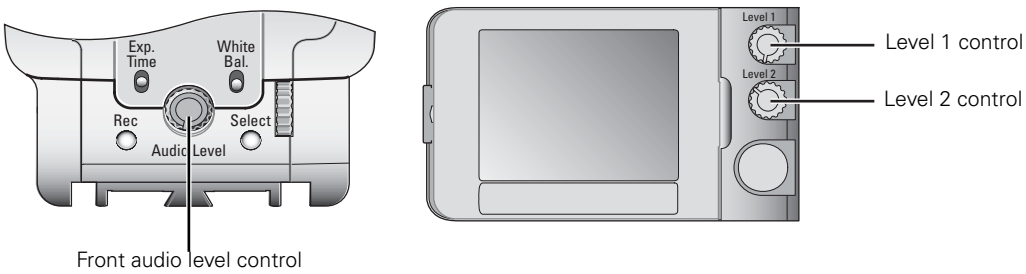
- Rear1 - analog audio 1 input,
- Rear2 - analog audio 2 input,
- Wrx1 - wireless channel (optional),
- Front1 - front microphone or stereo front microphone channel 1 (optional),
- Front2 - stereo front microphone channel 2 (only available when installed)
- MicRear - rear mini-jack headset microphone,
- AES1 - digital audio input channel 1 via BNC connector,
- AES2 - digital audio input channel 2 via BNC connector,
- SDI In1..8 - embedded digital audio input channels from the SDI input, or
- Mute.

Four channels are always recorded. When a recording channel is not used, set the recording source for that channel to **Mute**.

6.3.2 Set recording levels

Audio levels for the four recording channels are controlled automatically or manually. When manual control is selected, the two rotary controls at the left-rear of the camcorder are used to adjust the audio levels. These can be programmed to adjust a single channel or a combination of channels (1+3, 2+4).

The front audio level control can be assigned to any channel. This control can be used together with the rotary controls at the rear.



To set up audio level control for each of the four recording channels:

1. Go to the **AUDIO/CHANNELS** menu.
2. Tap one of the CHANNEL buttons numbered 1 to 4.

The following buttons appear:

- FILTER - selects a filter that is applied to the channel.
- LVL CONTROL - selects the method to adjust the audio level:
  - AGC or AGC-STEREO turns on the Automatic Gain Control.
  - LEVEL 1/2 is the top control at the left-rear of the camcorder.
  - LEV1/2+FRONT takes the average value of the level 1/2 and front audio controls.
  - FIXED allows you to set a fixed level for the channel (with FIXED LVL).
  - FRONT is the rotary control at the front of the camcorder.
- RECORDING LVL - sets the fixed recording level for the channel when LVL CONTROL is set to FIXED.
- AGC PROFILE - selects a profile used for the Automatic Gain Control (AGC) when selected.

Set up these controls for each of the four recording channels. The Level 1 control can be assigned to channels 1 or 3; the Level 2 control can be assigned to channels 2 or 4.

Automatic Gain Control

When AGC (or AGC-STEREO) is selected the camera uses its internal circuitry to automatically adjust the recording level according to a selectable response profile:

- STANDARD uses a standard response curve.
- QUIET uses a response curve that is suitable for low-volume circumstances, like concerts or speeches.
- NOISY uses a response curve that is suitable for noisy circumstances like outside, heavy wind situations or crowds.

Manual level control

When LEVEL 1/2, LEV1/2+FRONT or FRONT is selected, the recording levels can be manually adjusted. Adjust the levels with the controls that you have selected at the left-rear or front of the camcorder.

Use the audio bars on the home screen of the side panel display to adjust the recording level for each channel. The audio bars are also shown on the camera status display and in the viewfinder.

☞ Note

When the audio input signal is too high, the message "<INPUT> OVERLOAD" appears in the viewfinder. Decrease the level or gain of the indicated input.

6.4 Audio monitoring

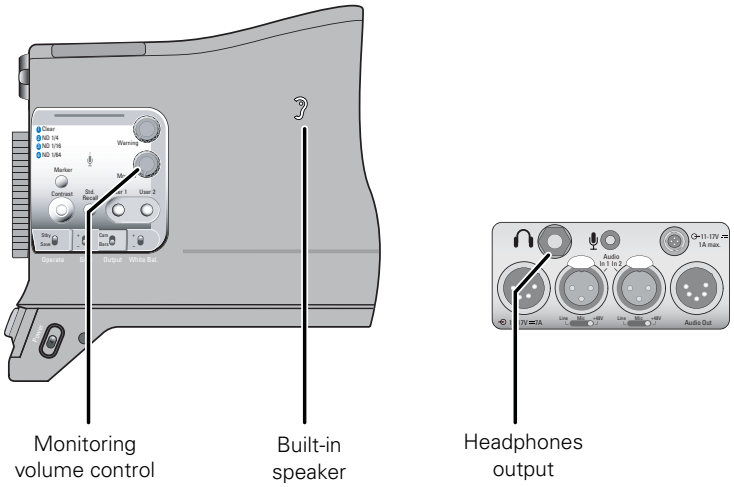
The camcorder has a built-in monitor speaker on the left side panel. You can monitor the live audio on this speaker. Alternatively, plug a headphone into the 6.3 mm jack at the rear of the camcorder to monitor the audio. Adjust the volume of the speaker or the headphone with the monitoring volume control.

To select an audio source to monitor with the headphones:

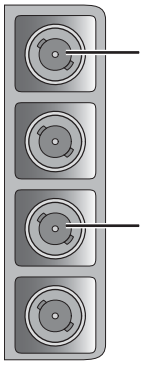
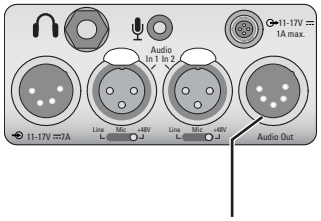
1. Go to the **AUDIO/MONITORING** menu.
2. Tap the HDPH MODE LEFT or HDPH MODE RIGHT button and use the arrows in the pop-up box to select Source or Channel mode.
3. Tap the HDPH SOURCE LEFT or HDPH CHANNEL LEFT buttons to select the recording channel or input source to monitor on the left headphone speaker.
4. Tap the HDPH SOURCE RIGHT or HDPH CHANNEL RIGHT buttons to select the recording channel or input source to monitor on the right headphone speaker.

To select an audio source to monitor on the speaker:

1. Go to the **AUDIO/MONITORING** menu.
2. Tap the SPEAKER MODE button and use the arrows in the pop-up box to select one of the headphone follow modes.



6.5 Outputs

Location	Connector	Function
	SDI embedded audio output	Eight embedded SDI outputs compliant with SMPTE 272 M-A and SMPTE 299M protocols.
	Digital AES audio output (AES1 and AES2)	Two channel digital audio compliant with the AES/EBU protocol.
	Analog audio output (Rear1 and Rear2)	This XLR-5 socket supplies two balanced audio output signals at line level.

Rear outputs

An 5-pin XLR audio connector at the back of the camcorder provides two audio line outputs (Rear1 and Rear2). The driver circuitry for these outputs is normally disabled to save power. You must first enable the driver to obtain an output signal:

1. Go to the **AUDIO/OUTPUTS**/REAR menu.
2. Tap the REAR button and and use the arrows in the pop-up box to select ENABLED.

To select a signal for output:

1. Go to the **AUDIO/OUTPUTS**/REAR menu.
2. Tap the REAR MODE button and use the arrows in the pop-up box to select SOURCE or CHANNEL mode.
   – If you select the source mode, the channel selection button is disabled; if you select the channel mode, the source selection button is disabled.
3. Tap either the SOURCE or CHANNEL selection button to select the recording channel or source to be routed to the rear output.

Do this for both Rear1 and Rear2.

☞ Note

If you initially set up the output signal for both modes (source and channel), you can use the mode button to quickly switch between the selected signals.

Digital audio outputs

The Analog Out BNC connector can be programmed to provide two channels of AES audio. To select the signals for digital audio:

1. Go to the **SYSTEM/HARDWARE**/PORTS menu.
2. Tap the ANALOG OUT button and use the arrows in the pop-up box to select DIGITAL AUDIO.
3. Go to the **AUDIO/OUTPUTS**/AES AUDIO menu.
4. Tap the AES MODE button and use the arrows in the pop-up box to select SOURCE or CHANNEL mode.
   – If you select the source mode, the channel selection button is disabled; if you select the channel mode, the source selection button is disabled.
5. Tap either the SOURCE or CHANNEL selection button to select the recording channel or source to be routed to the AES audio output.

☞ Note

If you initially set up the output signal for both modes, you only need to use the AES mode button to switch between the selected signals.

SDI embedded audio

Eight embedded SDI audio channels are available at the Digital Out BNC connector. To select the signals for the SDI audio channels:

1. Go to the **AUDIO/OUTPUTS**/SDI OUT menu.
2. Tap on one of the eight SDI CHANNEL buttons and use the arrows in the pop-up box to select the audio signal to be routed to that SDI audio channel.

6.6 General audio settings

To set the audio system headroom, go to the **AUDIO/OUTPUTS**/SETUP/HEADROOM menu. You can select -18dBFS or -20dBFS.

To turn the test tone on or off when the color bars are selected and to adjust its level, go to the **AUDIO/OUTPUTS**/SETUP/TEST TONE menu.

Chapter 7

Recording setup

7.1 Main format settings

To select the recording video standard, source, compression and bit rate use the **SETUP/ FORMATS** menu on the side panel display.

- Tap VIDEO STANDARD to select the camera video standard.
- Tap VIDEO SOURCE to select the recording source.
  - Select CAM to record the live signal from the camera.
  - Select SDI or CVBS to record an external video signal from a digital or analog video input.
- Tap either VIDEO COMPR. SD or VIDEO COMPR. HD (depending on the selected video standard) to set the recording compression scheme and use the arrows in the pop-up menu to select a video compression scheme.
- To set the recording media tap MEDIA SELECTION and select the media to record to.
- Tap CHUNK SIZE to select a chunk size to use for your recording.
- Tap VF PLAYBACK to set the way the recorded video is played back in the viewfinder.
- When recording in SD video standards tap ASPECT RATIO to set the desired aspect ratio (16:9, 4:3 or Letterbox) for your recording.

Video standard

The selected video standard defines the resolution and the frame rate of the video signal that is recorded onto the media. The table below shows the possible options:

Standard	Format	Resolution
1080i50	HD	1920 x 1080i50
720p50	HD	1280 x 720p50
720p59	HD	1280 x 720p59.94
1080i59	HD	1920 x 1080i59.94
480i59	SD	480i59.94
576i50	SD	576i50

Compression schemes

The recording compression defines the type of compression that is used to record the video signal. The available compression schemes and bit rates depend on the recording video standard that has been selected.

Video standard		Compression	Available bit rates	Indication
HD	1080i50, 720p50, 1080i59, 720p59	JPEG2000	50 Mb/s, 75 Mb/s, 100 Mb/s	JP2K
		MPEG2-I *	60 Mb/s, 80 Mb/s	MP2I
SD	576i50, 480i59	DV25	25 Mb/s	DV25
		JPEG2000	30 Mb/s, 40 Mb/s, 50 Mb/s	JP2K
		MPEG2-I *	30 Mb/s, 40 Mb/s, 50 Mb/s	MP2I

* only available when the optional DMC1120 MPEG2 board is installed.

7.1.1 Recording from external inputs

To record from an external video signal make sure the video standard and type (SDI or CVBS) match the provided signal. The external video signal is displayed both in the viewfinder and on the side panel display.

Port	Video source	Video standards
Digital Input	SDI	720p50, 720p59.94, 1080i50 or 1080i59.94
Analog Input	CVBS	576i50 or 480i59.94

☞ Note

When the camcorder settings do not match the external signal a message is shown ("Incompatible video standard").

☞ Note

When CVBS is selected as a video source make sure that the analog input is set to CVBS in the **SYSTEM/HARDWARE**/PORTS/ANALOG INPUT menu.

7.2 Time code settings

To set the time code use the **SETUP** menu on the side panel display.

1. Tap **TIMECODE**.
2. To set the time code, tap TC SET and use the arrows in the pop-up to select a time code value.
   - To reset the time code to zero, tap TC RESET.
   - To re-generate the time code from the inserted media, tap SYNCHRONIZE/RE-GENERATE.
   - To synchronize the time code to a selected source, tap SYNCHRONIZE/SOURCE.
3. To change the time code mode from the default value free-run (continuous time clock) to rec-run (recording time only), tap RUN MODE to toggle the value.

7.3 Recording buffer

The built-in recording buffer enables the camcorder to continue recording even when the media is temporarily unaccessable, for example, due to heavy shocks. This system operates automatically. When the anti-shock function is activate, the buffer indicator on the viewfinder screen shows buffer usage.

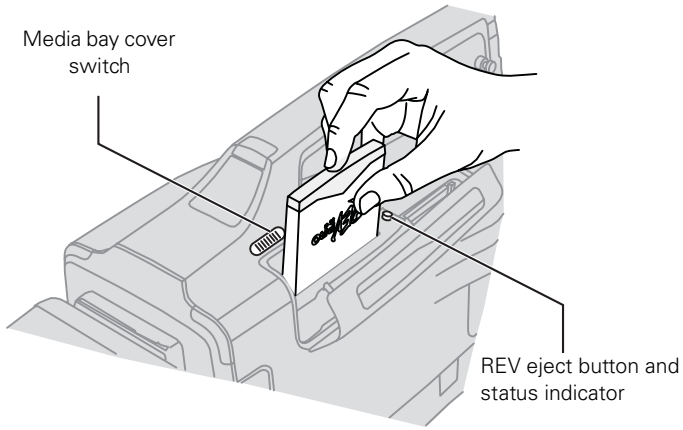
7.4 Recording media

The media bay on the top-right shoulder of the camcorder includes one REV PRO media slot and two CompactFlash slots. Slide the cover switch towards the back of the camcorder to open the protective cover and to get access to the media slots.

To insert a disk into the REV drive:

1. Ensure that the REV PRO logo on the disk is facing away from the camcorder.
2. Insert the disk in the direction indicated by the arrow on the front of the disk and push firmly until it clicks into place.
   - Wait a few seconds for the disk to be mounted.
   - When the disk is ready for use, the indicator is blue.
   - The indicator is purple when the disk is full.

3. Close the media bay cover.



To eject the disk, push the eject button and wait for the system to eject the disk (do not interrupt the power supply).

Emergency disk eject procedure

1. Disconnect power (battery, external supply) from the camcorder and set the power switch to the ⏻ position.
2. Insert a long metal pin (e.g. a paperclip) into the disk eject hole of the REV drive. The hole is located next to the slot at the inner side of the media bay.
3. Push the pin firmly down until the REV disk is tilted upwards.
4. Pick up the disk a the top and gently pull it out of its slot.
5. Reconnect power and switch on the camcorder.

Caution
Never use the emergency eject procedure while the power is on. Never force a disk into or out of the REV drive; this could damage both the drive and the disk.

7.4.1 CompactFlash cards

To insert a CompactFlash card into slot CF1 or CF2:

1. Ensure that the logo on the card is facing away from the camcorder.
2. Insert the card and push firmly until it clicks into place.
   - When the card is ready for use, the indicator is blue.
   - The indicator is purple when the card is full.
3. Close the media bay cover.

To eject the card, push the media indicator and wait until the light extinguishes. Gently push the eject button at the right side to eject the card.

☞ Note

Use only high-speed CompactFlash cards and ensure that the cards are fast enough for the chosen recording compression profile.

Chapter 8

Shooting

8.1 Getting a picture

8.1.1 Viewfinder

1. To set up the viewfinder refer to "Viewfinder" on page 39.
2. Aim the camcorder at the subject and use the viewfinder to monitor the picture.
   – If you press the live button  below the side panel display, the live picture is also displayed on the display.

8.1.2 Recall standard video values

You may wish to recall the standard video values if you want to ensure that the camcorder video parameters are not set to unusual values.

➢ Press the **Std. Recall** button on the left side of the camcorder and hold it for a few seconds.

8.1.3 Exposure

Iris

Select either the automatic (**A**) or manual (**M**) iris mode on the lens. In manual mode the iris can be controlled by turning the iris ring on the lens. In automatic mode there are two auto iris modes available in the camcorder:

– **Auto iris**: the light levels are automatically adjusted; you can still set gain and exposure speed.

– **Extended auto iris**: The extended auto iris function automatically controls iris and gain to suit the lighting conditions.

Monitoring exposure

Set the zebra switch on viewfinder to **On** to indicate high exposure levels with a striped pattern.

Optical filter

Use the optical neutral density (ND) filters to reduce the incoming light and so control the depth of field or exposure levels.

Gain

For low-light or high-light conditions use the gain switch to vary the amplification of the signal.

Exposure

Use 1/200, 1/500, 1/1000 or 1/2000 values to capture fast moving objects with little blurring.

8.1.4 Video adjustments

To ensure true color reproduction carry out the white balance procedure"Auto white balance" on page 71.

- If you cannot perform the white balance procedure, select a fixed reference color temperatures to match your lighting conditions, or
- use the AWC white balance position when a constant color balance is required under changing lighting temperatures (sunsets, indoor/outdoor use).

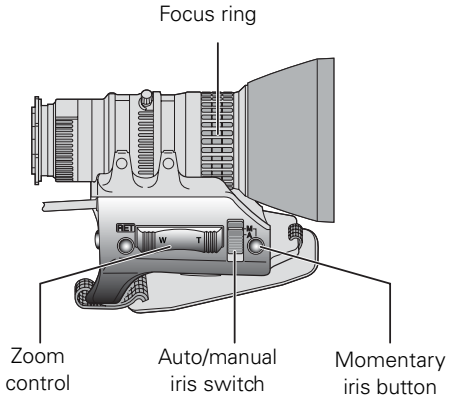
To improve the contast of the picture when there are very bright and very dark areas in the scene press the contrast button.

8.1.5 Audio adjustments

Monitor the audio sources and adjust their levels. Refer to "Recording audio" on page 82.

8.1.6 Frame and focus

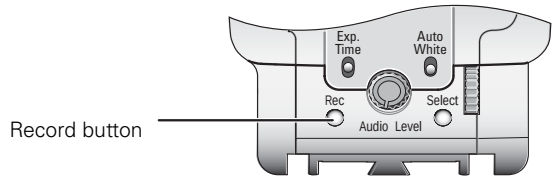
1. Frame the subject by zooming in or out. Use the W (wide angle) and T (tele) switch on the lens.
   - You can also use the zoom control on the front of the carrying handle.
   - Use the viewfinder markers to help frame the picture.
2. Adjust the focus on the lens.
   - If the focus assist function is switched on, the viewfinder shows a pattern to assist with focusing.

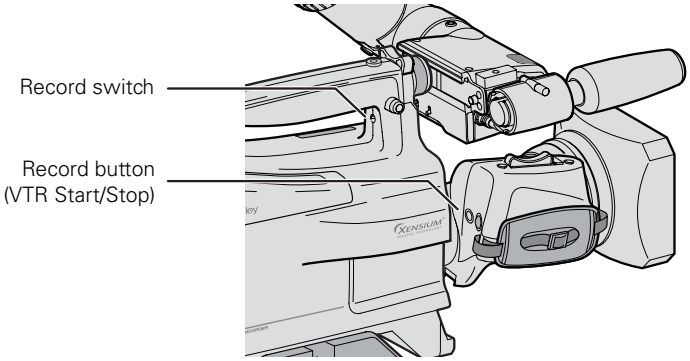


8.2 Recording

8.2.1 Start recording

1. To start recording, press the record button on the lens.
   – You can also use the Rec. button on the front of the camcorder or the record switch under the carrying handle to start recording.
   – The Rec. indicator in the viewfinder and the tally indicators light. The status bar on the side panel display is red when the camcorder is recording.





2. During recording, monitor the viewfinder indications (power and media indicator).

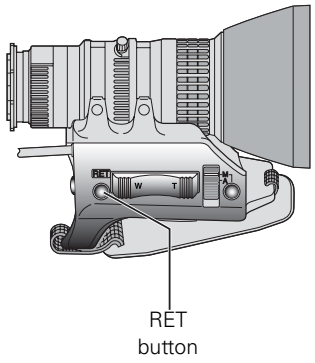
8.2.2 Stop recording

➢ To stop recording, press the record button on the lens, the camcorder front or the switch under the carrying handle again.
   – The actual recording to the media might continue even after you stop recording. The media indicator lights as long as the camcorder is writing to the media. Do not interrupt power to the camcorder during this time.

8.3 Quick review

➢ To review the last 5 seconds of a recorded clip, press the RET button on the lens to play it back in the viewfinder.

– If you press the button below the side panel display, the playback signal is displayed on the display as well.



Chapter 9

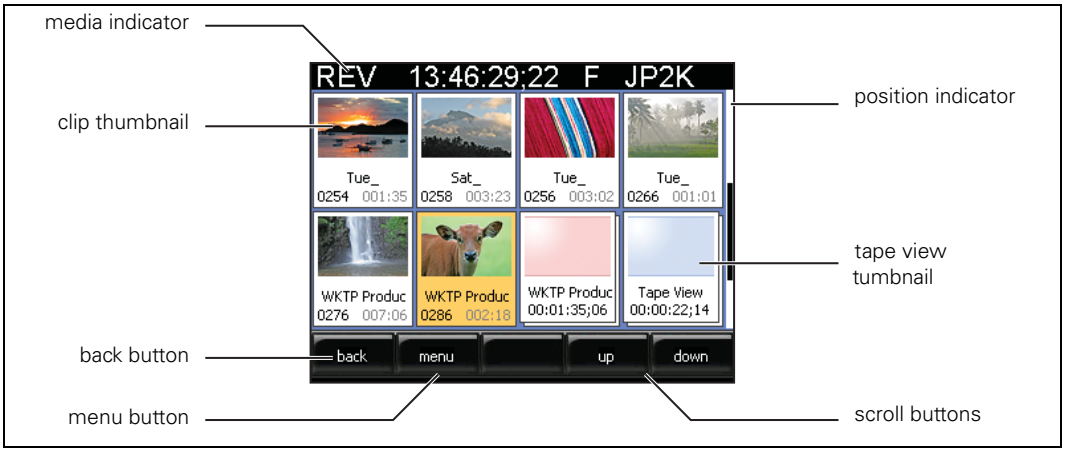
Clip management

9.1 Viewing clips

9.1.1 Thumbnail overview

To view recorded clips use the side panel menu and tap the **CLIPS** button. This opens the thumbnail overview of all recorded clips. The last recorded clip is selected. Use the **UP** and **DOWN** buttons to view more thumbnails. Scrolling up shows older clips.

➢ To select a clip, tap its thumbnail. The thumbnail is highlighted.



The thumbnail overview also shows playlists. There are two types of playlist:

- a Tape View playlist, and
- a Story playlist.

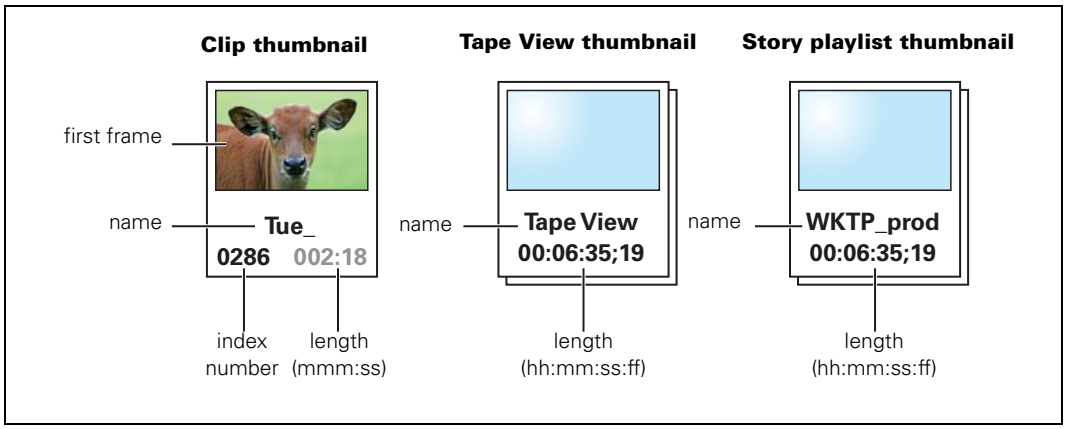
The playlists are shown after the clips. The Tape View playlist is always shown first.

☞ Note

The thumbnail overview can show up to 60 clip thumbnails. When more clips are present on the current media, the thumbnails are grey but they can still be selected.

Thumbnail information

Thumbnails provide information about the clip or the playlist.



Tape View thumbnail

The Tape View thumbnail can be distinguished from other playlists by its name. Tape View contains a list of all compatible clips on the current media in chronological order. There is only one Tape View thumbnail.

Story playlist thumbnail

There can be many different story playlist thumbnails. Each playlist thumbnail is assigned the name of its associated story. It contains a list of all clips in that story in chronological order.

When a story is selected in the **SETUP/METADATA/**STORYFILE menu, all subsequent recorded clips are stored under that story's playlist.

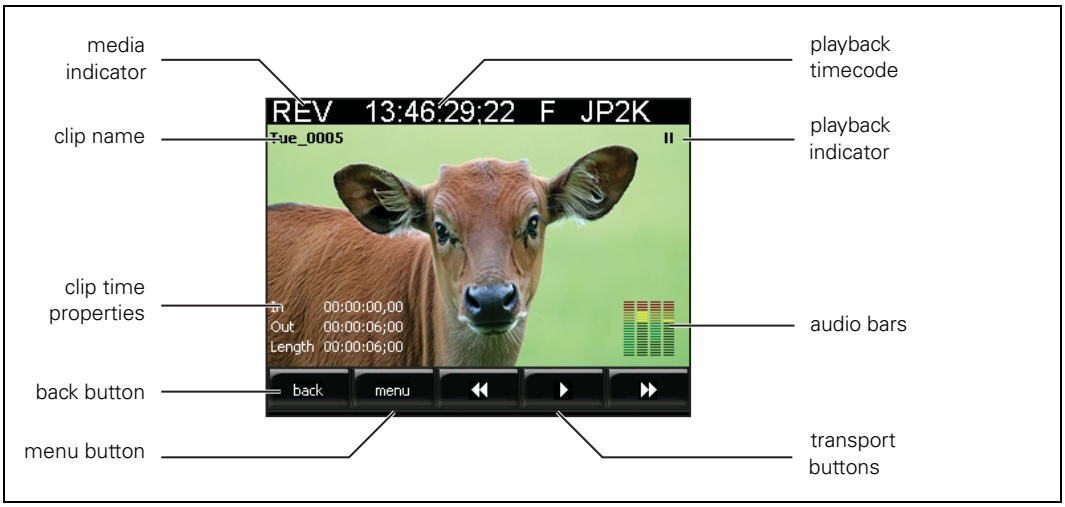
Incompatible clips or playlists

The camcorder can only playback clips or playlists where the video standard and compression formats are the same as the current settings of the camcorder.

A thumbnail is shown in red hue when either the video standard or compression format of the clip or playlist is different from the current settings. If you attempt to playback a red thumbnail, a message advises you to change the current camcorder settings in the **SETUP/FORMATS** menu to allow you to play back the clip.

9.1.2 Playback

To playback a clip or playlist you must first load it. Double-tap a thumbnail to load the clip or playlist you wish to view. The selected clip is loaded into the playback monitor and paused. The first frame is shown.



The buttons at the bottom of the screen are used as follows:

Button	Use
back	Returns to the thumbnail overview
menu	Opens the menu.
◀◀	Plays back the clip in reverse. Tapping again increases reverse playback speed to the following rates: -1x, -2x, -4x, -8x, -16x, -32x and -64x.
▶ ❚❚	Tap to freeze the clip; tap again to continue playback of the clip.
▶▶	Fast forward. Tapping again increases playback speed to the following rates: 1x, 2x, 4x, 8x, 16x, 32x and 64x.

The audio channels recorded with the clip are played back in the monitor speaker or in the headset connected to the rear jack if this is set up in the audio menu.

9.1.3 Menu button

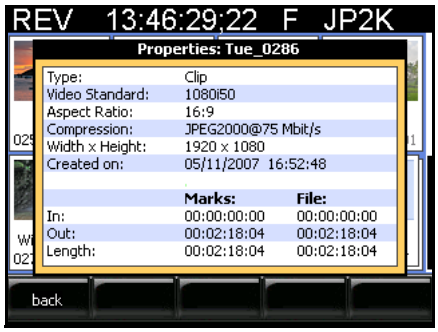
To look up detailed informatie about a selected clip, tap the MENU button.

- properties: show detailed information about the selected clip;
- load: loads the selected clip into the playback monitor;
- delete: delete the selected clip;
- format medium: formats the current media.

Tap the BACK button at the bottom to close the menu.

Properties

To look up detailed informatie about a clip tap the PROPERTIES button.



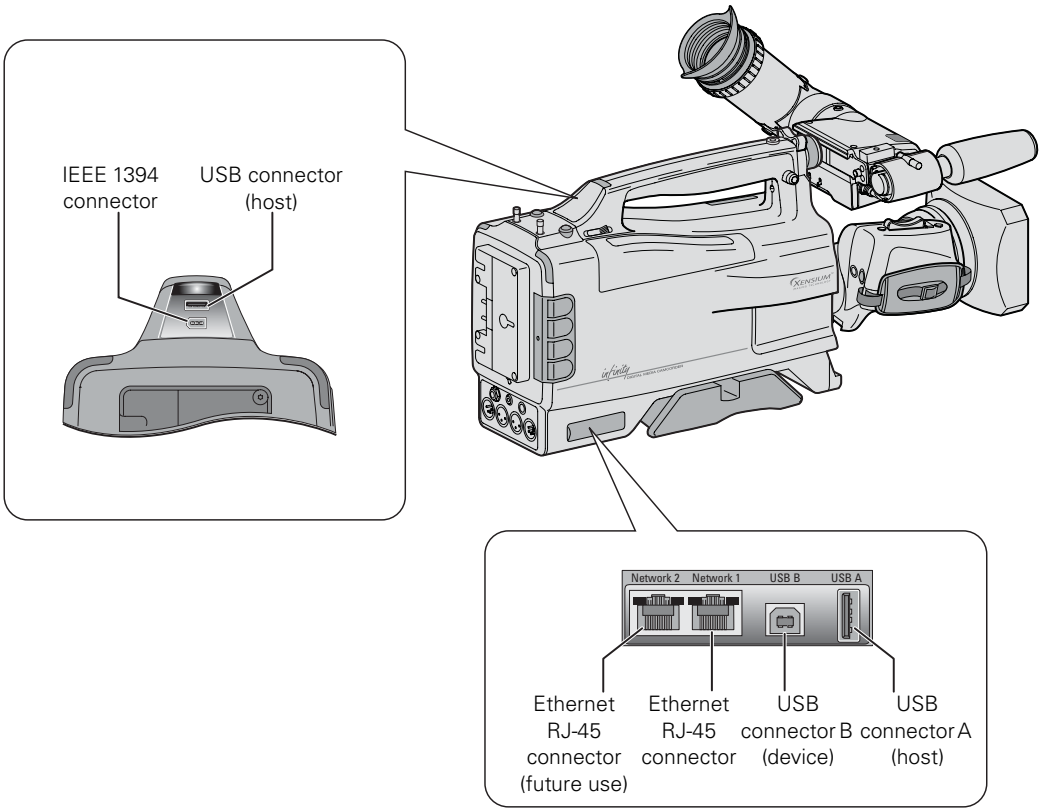
Tap the BACK button at the bottom to close the properties pop-up box.

Chapter 10

Communications

10.1 Setting up communication

The camcorder has two RJ-45 Ethernet connectors, two USB host and one USB device connector and an IEEE 1394 connector.



10.2 USB connection

The USB connectors on the top-rear panel and right-side panel can be used to connect a USB drive or other USB device.

☞ Note

Do not plug or unplug these devices while the camcorder is being used for critical play to air activity.

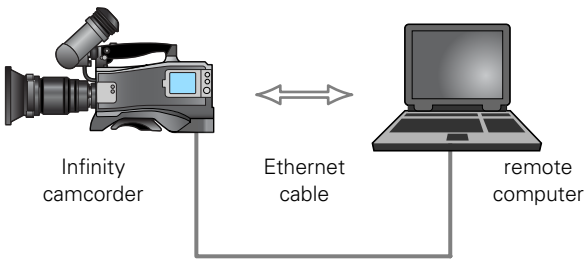
10.3 IEEE 1394 connection

Connect IEEE 1394 devices to this connector. Select the playback method in the **SYSTEM** / **HARDWARE** / PORTS / IEEE 1394 to Exclusive, Both or Off.

10.4 FTP connection

An FTP connection can be used to transfer files between the camcorder and an external computer. Follow these steps to set up a working connection:

1. Use an Ethernet (UTP) network cable to connect the camcorder with a remote computer. The cable can be a crossover or a straight-through type. Plug the cable into **Ethernet connector 1** on the right-side panel of the camcorder.
2. Use automatic network setting (DHCP) on your remote computer (it may take a few seconds for the IP-address to be assigned) or use manual settings (IP-address is 169.254.1.100 and subnet mask is 255.255.255.0)



3. Install an FTP client on the remote computer.
4. Use the following settings for the FTP client (refer to the documentation of your software for more information)
   - userid: **any (not blank);**
   - password: **any (not blank);**
   - IP-address: **169.254.1.218**;
   - remote port: **21** (default);
5. Use the FTP client to log in into the camcorder system. By default, the contents of the system's root directory will be shown.

Chapter 11

Specifications

11.1 Specifications for DMC 1000

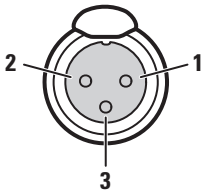
Item	Value	
General		
Dimensions (H x W x L)	250 x 157 x 365 mm (9.8 x 6.2 x 14.4 in) without lens, viewfinder and battery	
Weight (approx.)	5.0 kg (11.0 lbs) without viewfinder; 5.8 kg (12.8 lbs) including DMC 1100 2-inch viewfinder	
Operating temperatures	0 to +40 °C (32 to +104 °F)	
Storage temperatures	-20 to +60 °C (-4 to +140 °F)	
Humidity	10% to 90% (relative humidity)	
Power requirements	15 VDC (11.0 to 17.0 VDC)	
Power consumption (standby)	45 W (with active imaging, viewfinder, compression, buffer and lens)	
Power consumption (recording)	49 W (while recording to REV)	
Camera section		
Lens mount	2/3-inch television lens mount, bayonet type.	
Optical system	F1.4 prism system	
Optical filters	Clear, 1/4 ND, 1/16 ND, 1/64 ND (motorized)	
Color correction filters	3200 K, 4700 K, 5600 K, 7500 K, two AWB presets and continuous auto white balance; variable from 2200 K to 20000 K in 10 K steps	
Pick-up device	Three 2/3-inch full HD Xensium™ CMOS imagers	
Digital signal processing	22-bit accuracy	
Exposure	Electronic exposure down to 1/2000 s	
Clean scanning	50 Hz scanning: 51.0 to 103.0 Hz; 60 Hz scanning: 61.0 to 151.0 Hz	
Video standard	**576i/480i mode**	**1080i/720p mode**
Temporal frequencies	50/59.94 Hz	50/59.94 Hz
S/N Ratio (Y-signal)	61 dB (typical)	54 dB (typical)
Modulation depth (Y-signal)	70% at 5 MHz (16:9)	50% at 27 MHz (800 TV-lines)
Aspect ratio	16:9, 4:3 and letterbox	16:9

Item	Value	
Sensitivity	2000 lux (186 ft cd) at F8 typical	
Gain	-6 to +42 dB (user-definable presets) and variable master gain between -6 and +42 dB in 0.1 dB steps.	
Audio	Range from 20 Hz to 20 kHz (unweighted), 24 bits PCM, 48 kHz, dynamic range 85 dB	
Compression		
DV25	PAL (4:2:0) and NTSC (4:1:1)	
JPEG2000	**SD**	**HD**
	10-bit, 4:2:2	10-bit, 4:2:2
	30 Mb/s, 40 Mb/s and 50 Mb/s	50 Mb/s, 75 Mb/s and 100 Mb/s
MPEG-2 i-frame (requires optional DMC 1100 MPEG-2 board)	**SD**	**HD**
	8-bit, 4:2:0	8-bit, 4:2:0
	30 Mb/s, 40 Mb/s and 50 Mb/s	60 Mb/s and 80 Mb/s
File formats		
High quality content	MXF OP-1A (SMPTE 378M), including 4 channels of PCM audio and metadata	
Metadata	Compatible with SMPTE Metadata Dictionary RP210	
Built-in storage media		
REV drive	Grass Valley REV PRO disk drive	
CompactFlash	2x type I and II CompactFlash slots, speed depending on media	
Camcorder connectors		
Front microphone input	1x XLR-3 female, balanced, +48 V phantom or 1x XLR-5 female, balanced, +48 V phantom (requires DMC 1180/00 option)	
Rear audio inputs	2x XLR-3 female, mic/line-level, balanced, switchable +48 V phantom	
Additional audio inputs	2-channel AES/EBU audio (via BNC), 1channel (via wireless receiver slot) and 8 channels SDI (from SDI input)	
Audio outputs	1x XLR-5 male, line-level, 2-channel mixed balanced 6.3 mm stereo jack headphones	
Additional audio outputs	2-channel AES/EBU or embedded (HD-)SDI 8 channel audio via BNC connector.	
Lens connector	12-pin female Hirose interface connector	
Viewfinder connector	HDMI type A connector	
(HD-)SDI input	BNC connector SMPTE 292M (1.5 Gb/s) or SMPTE 259M (270 Mb/s), 0.8 Vpp, 75 Ω	
(HD-)SDI output	BNC connector SMPTE 292M (1.5 Gb/s) or SMPTE 259M (270 Mb/s), 0.8 Vpp, 75 Ω	
Analog video input	BNC connector CVBS, Blackburst, Linear Timecode or AES/EBU audio, 1.0 Vpp, 75 Ω	
Analog video output	BNC connector CVBS, Linear Timecode or AES/EBU audio, 1.0 Vpp, 75 Ω	
DC 15 V input	XLR-4 male (11.0 to 17.0 VDC)	
DC 12 V output	4-pin female Hirose connector, nom. 12 V 1.0 A with Tally-signal	
IT-connectivity		

Item	Value
Ethernet	1 x RJ-45 Ethernet connector (10BASE-T, 100BASE-T and Gigabit Ethernet), 1 x RJ-45 Ethernet connector for future use.
USB	2 x USB A host connector, 1 x USB B device connector
IEEE 1394	6-pin IEEE 1394 connector, powers up to 10 W
Supplied accessories	
User's documentation	User's Guide
Viewfinder (option)	
Model	DMC 1100
Display	HD CRT black/white
Resolution	> 600 TV lines (centre)

11.2 Connectors

Audio input connector XLR-3 (Rear1 and Rear2)



XLR 3-pin female
(panel view)

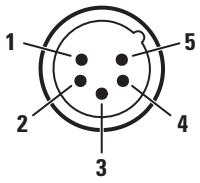
Pin	Description
1	Chassis ground (cable shield)
2	Audio Hot (+)
3	Audio Cold (-)

Microphone impedance: 200 Ω
Max. input level: +22 dBu

Phantom power: +48 V (switchable)

Mic/Line switchable

Audio output connector



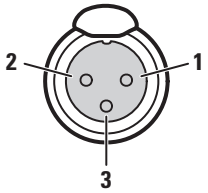
XLR 5-pin male
(panel view)

Pin	Description
1	Chassis ground (cable shield)
2	Audio 1 hot (+)
3	Audio 1 cold (-)
4	Audio 2 hot (+)
5	Audio 2 cold (-)

Max. output level: +22 dBu

Outputs are at balanced line level.

Front microphone connector XLR-3 (Front1)



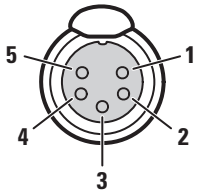
XLR 3-pin female
(panel view)

Pin	Description
1	Chassis ground (cable shield)
2	Audio (+)
3	Audio (-)

Microphone impedance: 200 Ω
Max. input level: +14 dBu

Phantom power: +48 V (fixed)

Front microphone connector XLR-5 (Front1 and Front2)



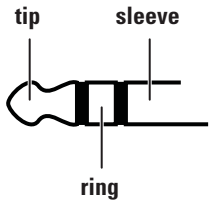
XLR 5-pin female
(panel view)

Pin	Description
1	Chassis ground (cable shield)
2	Audio 1 hot (+)
3	Audio 1 cold (-)
4	Audio 2 hot (+)
5	Audio 2 cold (-)

Microphone impedance: 200 Ω
Max. input level: +14 dBu

Phantom power: +48 V (fixed)

Headphones output

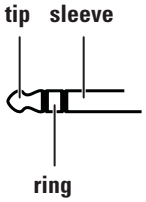


6.3 mm jack
(cable plug shown)

Pin	Description
sleeve	Ground (cable shield)
tip	Audio Left
ring	Audio Right

Headphones impedance: 200 Ω
Max. output level: +22 dBu

Headset microphone input (MicRear)



3.5 mm mini jack
(cable plug shown)

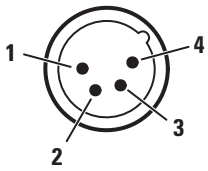
Pin	Description
sleeve	Ground (cable shield)
tip	Signal hot (+)
ring	signal cold (-)

Microphone impedance: 200 Ω
Max. input level: +14 dBu

Phantom power: +5 .. +7 V (fixed)

Note: for unbalanced operation the ring and sleeve should be internally bridged.

Power input connector (DC in)



XLR 4-pin male
(panel view)

Pin	Description
1	Ground
2	not connected
3	Ground (bridged to pin 1)
4	+15 VDC nom.

Note: power input accepts 11.0 .. 17.0 VDC

Power output connector (DC out)

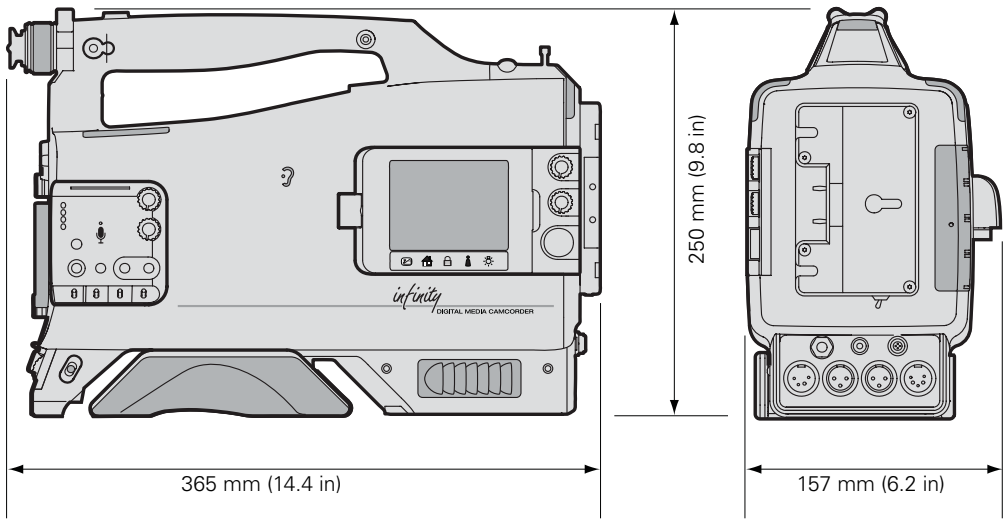
Hirose 4-pin female
(panel view)

Pin	Description
1	Ground
2	On-air / tally signal
3	Ground (bridged to pin 1)
4	+12 VDC nom. (max. 1.0 A)

This socket provides access to an internal tally switch. When the camera is on-air, the contact of the internal relay is closed.

Note: power output (pin 4) follows DC input.

11.3 Dimensions



Chapter 12

Side panel menu

12.1 Audio menu

Menu item	Values	Description	Level	File
channels				
channel 1				
ch1 filter	**None**, 150Hz	Selects the channel filter.	1	Prod
ch1 lvl control	AGC, Fixed, Lev1+Front, **Level 1**, Front	Selects a recording level control.	1	Prod
ch1 recording lvl	0..99 **(50)**	Sets the fixed recording level (when fixed control is selected).	1	Prod
ch1 AGC profile	Noisy, Quiet, **Standard**	Selects the AGC (Automatic Gain Control) profile.	1	Prod
channel 2				
ch2 filter	**None**, 150Hz	Selects the channel filter.	1	Prod
ch2 lvl control	AGC, Fixed, Lev2+Front, **Level 2**, Front	Selects a recording level control.	1	Prod
ch2 recording lvl	0..99 **(50)**	Sets the fixed recording level (when fixed control is selected).	1	Prod
ch2 AGC profile	Noisy, Quiet, **Standard**	Selects the AGC (Automatic Gain Control) profile.	1	Prod
channel 3				
ch3 filter	**None**, 150Hz	Selects the channel filter.	1	Prod
ch3 lvl control	AGC, (AGC-Stereo), Fixed, Lev1+Front, **Level 1**, Front	Selects a recording level control.	1	Prod
ch3 recording lvl	0..99 **(50)**	Sets the fixed recording level (when fixed control is selected).	1	Prod
ch3 AGC profile	Noisy, Quiet, **Standard**	Selects the AGC (Automatic Gain Control) profile.	1	Prod
channel 4				
ch4 filter	**None**, 150Hz	Selects the channel filter.	1	Prod

Menu item	Values	Description	Level	File
ch4 lvl control	AGC, (AGC-Stereo), Fixed, Lev2+Front, **Level 2**, Front	Selects a recording level control.	1	Prod
ch4 recording lvl	0..99 **(50)**	Sets the fixed recording level (when fixed control is selected).	1	Prod
ch4 AGC profile	Noisy, Quiet, **Standard**	Selects the AGC (Automatic Gain Control) profile.	1	Prod
source ch1	Rear1, Rear2, Wrx1, **Front1**, (Front2), MicRear, MicHead, AES1, AES2, SDI In1..8, Mute	Selects a recording source for channel 1.	1	Prod
source ch2	Rear1, Rear2, Wrx1, **Front1**, (Front2), MicRear, MicHead, AES1, AES2, SDI In1..8, Mute	Selects a recording source for channel 2.	1	Prod
source ch3	**Rear1**, Rear2, Wrx1, Front1, (Front2), MicRear, MicHead, AES1, AES2, SDI In1..8, Mute	Selects a recording source for channel 3.	1	Prod
source ch4	**Rear1**, Rear2, Wrx1, Front1, (Front2), MicRear, MicHead, AES1, AES2, SDI In1..8, Mute	Selects a recording source for channel 4.	1	Prod
monitoring				
hdph mode left	**Channel**, Source	Selects channel/source mode for the headphones left channel input.	1	Oper
hdph source left	Rear1, Rear2, Wrx1, **Front1** (Front2), MicRear, SDI In1..8, AES1, AES2	Selects a source to be routed to the headphones left channel when input mode is source.	1	Oper
hdph channel left	**Ch1**, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4	Selects a channel or channel mix to be routed to the headphones left channel when input mode is **channel**.	1	Oper
speaker mode	**Hdph L+R**, Hdph L, Hdph R	Selects channel/source mode for the speaker input.	1	Oper
hdph mode right	**Channel**, Source	Selects channel/source mode for the headphones right channel input.	1	Oper
hdph source right	Rear1, Rear2, Wrx1, **Front1** (Front2), MicRear, SDI In1..8, AES1, AES2	Selects a source to be routed to the headphones right channel when input mode is **source**.	1	Oper
hdph channel right	**Ch1**, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4	Selects a channel or channel mix to be routed to the headphones right channel when input mode is channel.	1	Oper
speaker mute	On, **Off**	Mutes speaker signal (audio off).	1	Oper
outputs				
rear				
rear	**Enabled**, Disabled	Enables or disables the rear1 and rear2 outputs. Set to disable for power saving.	1	Prod
rear 1 mode	**Channel**, Source	Selects channel/source mode for the rear1 output.	1	Prod

Menu item		Values	Description	Level	File
	rear 1 source	**Rear1**, Rear2, Wrx1, Front1, (Front2), MicRear, SDI In1..8, AES1, AES2	Selects a source to be routed to the rear1 output when input mode is **source**.	1	Prod
	rear 1 channel	**Ch1**, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4	Selects a channel or channel mix to be routed to the rear1 output when input mode is channel.	1	Prod
	rear 2 mode	**Channel**, Source	Selects channel/source mode for the rear2 output.	1	Prod
	rear 2 source	**Rear1**, Rear2, Wrx1, Front1, (Front2), MicRear, SDI In1..8, AES1, AES2	Selects a source to be routed to the rear2 output when input mode is **source**.	1	Prod
	rear 2 channel	Ch1, **Ch2,** Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4	Selects a channel or channel mix to be routed to the rear2 output when input mode is **channel**.	1	Prod
AES Audio					
	AES mode	**Channel**, Source	Selects input mode for the AES audio output.	1	Prod
	AES 1 source	**Rear1**, Rear2, Wrx1, Front1, (Front2), MicRear, SDI In1..8, AES1, AES2	Selects a source to be routed to the AES1 output when input mode is **source**.	1	Prod
	AES 1 channel	**Ch1**, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4	Selects a channel or channel mix to be routed to the AES2 output when input mode is **channel**.	1	Prod
	AES 2 source	**Rear1**, Rear2, Wrx1, Front1, (Front2), MicRear, SDI In1..8, AES1, AES2	Selects a source to be routed to the AES2 output when input mode is **source**.	1	Prod
	AES 2 channel	**Ch1**, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4	Selects a channel or channel mix to be routed to the AES2 output when input mode is channel.	1	Prod
SDI out					
	SDI channel 1	**Ch1**, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4, Rear1, Rear2, Wrx1, Front1, (Front2), MicRear, AES1, AES2, SDI In1..8	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
	SDI channel 2	**Ch1**, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4, Rear1, Rear2, Wrx1, Front1, (Front2), MicRear, AES1, AES2, SDI In1..8	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
	SDI channel 3	**Ch1**, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4, Rear1, Rear2, Wrx1, Front1, (Front2), MicRear, AES1, AES2, SDI In1..8	Selects a channel or source to embed in the SDI audio output channel.	1	Prod

Menu item		Values	Description	Level	File
	SDI channel 4	**Ch1**, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4, Rear1, Rear2, Wrx1, Front1, (Front2), MicRear, AES1, AES2, SDI In1..8	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
	SDI channel 5	**Ch1**, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4, Rear1, Rear2, Wrx1, Front1, (Front2), MicRear, AES1, AES2, SDI In1..8	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
	SDI channel 6	**Ch1**, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4, Rear1, Rear2, Wrx1, Front1, (Front2), MicRear, AES1, AES2, SDI In1..8	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
	SDI channel 7	**Ch1**, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4, Rear1, Rear2, Wrx1, Front1, (Front2), MicRear, AES1, AES2, SDI In1..8	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
	SDI channel 8	**Ch1**, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4, Rear1, Rear2, Wrx1, Front1, (Front2), MicRear, AES1, AES2, SDI In1..8	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
inputs					
front					
	gain	0..99 **(85)**	Sets the pregain level in dB for front mic input (mono or stereo).	3	Oper
	front mode	**Mono**, Stereo	Selects front mic input connection type (stereo when the optional stereo front microphone kit is installed)	S1	Oper
rear					
	rear 1 mic	0..99 **(85)**	Sets pregain input level in dB for rear 1 mic input.	3	Oper
	rear 1 line	0..99 **(85)**	Sets pregain input level in dB for rear 1 line input.	3	Oper
	rear 1 limiter	On, **Off**	Turns audio limiter for rear 1 input on or off.	3	Oper
	rear 2 mic	0..99 **(85)**	Sets pregain input level in dB for rear 2 mic input.	3	Oper
	rear 2 line	0..99 **(85)**	Sets pregain input level fin dB or rear 2 line input.	3	Oper
	rear 2 limiter	On, **Off**	Turns audio limiter for rear 2 input on or off.	3	Oper
wireless					
	gain	0..99 **(85)**	Sets pregain input level in dB for wireless mic inputs.		

Menu item		Values	Description	Level	File
	limiter	On, **Off**	Turns audio limiter for wireless inouts on or off.		
setup					
test tone		**Disable**, -6dBFS, Headroom	Enables and selects 1KHz test tone level (only audible when color bar is on): Disable = no test tone -6dBFS = test tone level is at -6dBFS Headroom = test tone level is the same as the selected audio headroom.	1	Oper
headroom		**-18dBFS**, -20dBFS	Selects audio headroom.	3	Prod

12.2 Video menu

Menu item	Values	Description	Level	File
levels				
gain				
gain	[preset -], **0dB**, [preset +], [preset ++], [preset +++]	Selects gain preset (see presets below for values)	0	-
var. gain	- 6.0dB .. 42.0dB **(0dB)**	Sets variable gain (in 0.1dB steps).	0	-
gain presets				
-	-6dB, **-3dB**	Selects gain value for - preset.	2	-
+	+3dB, **+6dB**, +9dB, +12dB, +15dB, +18dB	Selects gain value for + preset.	2	-
++	+6dB, **+9dB**, +12dB, +15dB, +18dB, +24dB	Selects gain value for ++ preset.	2	-
+++	+9dB, +12dB, +15dB, +18dB, +24dB, **+30dB**, +36dB, +42dB	Selects gain value for +++ preset.	2	-
painting range	**+3dB**, +6dB	Selects painting range.	2	-
gain RGB				
R	0..99 **(50)**	Sets gain level (R)	2	Scene
G	0..99 **(50)**	Sets gain level (G)	2	Scene
B	0..99 **(50)**	Sets gain level (B)	2	Scene
black				
black RGBM				
R	0..99 **(50)**	Sets black level adjustment (R)	3	Scene
G	0..99 **(50)**	Sets black level adjustment (G)	3	Scene
B	0..99 **(50)**	Sets black level adjustment (B)	3	Scene
M	0..99 **(50)**	Sets black level adjustment (Master)	2	Scene
dynamic black	On, **Off**	Turns dynamic black on or off	3	Scene
auto black	On, **Off**	Runs auto black procedure.	3	Scene
black stretch				
black stretch	On, **Off**	Turns black stretch on or off. Use to enhance image details in the dark parts of the image.	3	Scene
black contrast	**Stretch**, Press	Sets contrast to black stretch or black press when black stretch is on.	3	Scene
black str. lvl	0..99 **(50)**	Sets black stretch level when black stretch is on. 50 is no stretch, >50 is black press.	3	Scene
filter wheels				
N/D filter	Clear, ND1/4, ND1/16, ND1/64	Selects optical neutral density (ND) filter. This function is also controlled by the filter wheel button.	0	-
Home filterwheels	On, **Off**	Runs the filterwheel home positioning. Allow a few seconds for the filterwheel to adjust.	0	-
exposure				

Menu item			Values	Description	Level	File
	exposure		**Nom**, 50Hz, 60Hz, 1/200, 1/500, 1/1000, 1/2000, Var	Selects exposure time. This function is also controlled by the exposure time switch at the front of the camcorder.	0	-
	lighting		-10 . . . +10 **(0)**	Sets the exposure correction to synchronise with lighting frequency when exposure mode is 50 Hz or 60 Hz.	1	Scene
	var. exp. time		50 Hz .. 3270 Hz,**(50 Hz),** 60 Hz .. 3280 Hz **(60 Hz)**	Sets the exposure time in 0.5 Hz steps when exposure mode is Var (you can also use the exposure button at the front of the camera)	1	Scene
flare						
	flare		**On**, Off	Turns the lens flare compensation on or off.	3	Lens
	flare RGB					
		R	0..99 **(10)**	Sets the lens flare compensation level (R)	3	Lens
		G	0..99 **(15)**	Sets the lens flare compensation level (G)	3	Lens
		B	0..99 **(25)**	Sets the lens flare compensation level (B)	3	Lens
knee						
	knee		**Off**, Auto, Var	Sets knee mode: Off = no knee function. Auto = automatic; Var = variable;	2	Scene
	knee source		**Y**, NAM	Selects knee type: Y = luminance; NAM = luminance of highest RGB component.	3	Scene
	desaturation		On, **Off**	Turns knee desaturation on or off.	S1	Scene
	white clipper		On, **Off**	Turns white clipper on or off. Use this function to limit highlight levels in the video signal.	3	Scene
	slope/point					
		slope	0..99 **(0)**	Sets the slope of the knee gamma curve (in manual mode).	3	Scene
		point	0..99 **(10)**	Sets the point where the knee gamma curve begins (in manual mode).	3	Scene
	desaturation lvl		0..99 **(50)**	Sets the desaturation level when knee mode is variable and desaturation is on.	1	Scene
	white clipper lvl		0..99 **(54)**	Sets the white clipper level. This is the luminance level at which limiting occurs.	3	Scene
gamma						
	gamma mode		**1**, 2, LIN, VAR	Selects gamma mode: 1= Nominal curve; 2 = Low curve; LIN = Linearised curve; VAR = manual curve.	2	Scene
	gamma curve		**ARD**, CCIR, 6xARD, RAI, BBC04, BBC05,BBC06	Selects a standard curve for gamma correction.	2	Scene
	gamma RGBM					
		R	0..99 **(29)**	Sets the gamma level (R)	3	Scene
		G	0..99 **(29)**	Sets the gamma level (G)	3	Scene

Menu item	Values	Description	Level	File
B	0..99 **(29)**	Sets the gamma level (B)	3	Scene
M	0..99 **(29)**	Sets the gamma level (Master)	3	Scene
color				
color temp				
color temp	VAR, 3200K, 4700K, **5600K**, 7500K, FL, AW1, AW2, AWC	Selects variable color temperature, color temperature preset, Auto White memory location or Auto White Continuous (AWC) setting.	0	-
var. col. temp	<current setting for color temperature>	Shows or sets (when color temp = VAR) the current color temperature.	0	-
white balance				
autowhite	<status>	Shows the running status of the auto white balance procedure.	0	-
autowhite speed	0..38 **(4)**	Sets auto auto speed for auto white balance procedure.	1	-
autowhite gain	0..38 **(10)**	Sets auto white gain for auto white balance procedure.	1	-
matrix				
matrix	Ebu, **Skin**, B/W, RAI, BBC, 1:1, CoolFL, Var1, Var2	Selects preset values for the matrix: Ebu = true color matrix; Skin = optimised for skin tone reproduction; B/W: monochrome picture; RAI: Sony cameras reproduction; BBC = BBC optimisation; 1:1 = matrix is off; CoolFL= optimised for mixed fluorescent and incandescent lighting.	3	Scene
sequence	G/M, **M/G**	Selects the order of the matrix and gamma functions: G/M = first gamma correction, then matrix; M/G = first matrix, then gamma correction.	S1	-
G>R B>R				
G>R	0..99 **(50)**	Sets the green/red ratio in the color matrix.	3	Scene
B>R	0..99 **(50)**	Sets the blue/red ratio in the color matrix.	3	Scene
R>G B>G				
R>G	0..99 **(50)**	Sets the red/green ratio in the color matrix.	3	Scene
B>G	0..99 **(50)**	Sets the blue/green ratio in the color matrix.	3	Scene
R>B G>B				
R>B	0..99 **(50)**	Sets the red/blue ratio in the color matrix.	3	Scene
G>B	0..99 **(50)**	Sets the green/blue ratio in the color matrix.	3	Scene
shading				
white shading	**On**, Off	Turns the white shading compensation on or off.	3	-
hor. saw RGB				
R	0..99 **(50)**	Sets the white shading hor. sawtooth (R)	3	-
G	0..99 **(50)**	Sets the white shading hor. sawtooth (G)	3	-

Menu item			Values	Description	Level	File
		B	0..99 **(50)**	Sets the white shading hor. sawtooth (B)	3	-
	hor. par RGB					
		R	0..99 **(0)**	Sets the white shading hor. parameter (R)	3	-
		G	0..99 **(0)**	Sets the white shading hor. parameter (G)	3	-
		B	0..99 **(0)**	Sets the white shading hor. parameter (B)	3	-
	ver. saw RGB					
		R	0..99 **(50)**	Sets the white shading vert. sawtooth (R)	3	-
		G	0..99 **(50)**	Sets the white shading vert. sawtooth (G)	3	-
		B	0..99 **(50)**	Sets the white shading vert. sawtooth (B)	3	-
	ver. par RGB					
		R	0..99 **(0)**	Sets the white shading vert. parameter (R)	3	-
		G	0..99 **(0)**	Sets the white shading vert. parameter (G)	3	-
		B	0..99 **(0)**	Sets the white shading vert. parameter (B)	3	-
	color bar		On, **Off**	Turns color bar on or off.	0	-
	sawtooth		On, **Off**	Turns sawtooth on or off.	3	-
	saturation		0..99 **(50)**	Sets color saturation level.	0	-
	CVBS chroma		**On**, Off	Turns chroma component in CVBS output signal on or off.	0	-
detail						
	detail					
		detail	**On**, Off	Turns detail enhancement on or off.	3	Scene
		source	**Y**, R,G,R+G	Selects the source to be used for detail generation.	3	Scene
		coarse/fine	0..99 **(50)**	Sets the coarseness of the detail enhancement (0 = very fine).	3	Scene
		vertical	0..99 **(SD:50, HD:25)**	Sets the level of the vertical component in the detail signal. Note: SD/HD default values are different.	3	Scene
		level	0..99 **(SD:25, HD:50)**	Sets detail enhancement level. Note: SD/HD default values are different.	3	Scene
		noise slicer	0..99 **(25)**	Sets the level of the noise slicer.	S1	Scene
		level depend	0..99 **(40)**	Sets the dependency level for the noise slicer.	S1	Scene
	soft detail					
		soft detail	**On**, Off	Turns soft detail on or off. This function reduces the amount of detail added for large transitions.	2	Scene
		soft level	0..99 **(30)**	Sets the upper limit level of detail enhancement for soft detail.	2	Scene
	knee detail		**Off**, 1, 2, 3, 4	Selects a level of detail enhancement for the compressed signal above the knee.	3	Scene
	skin detail					
		skin detail	**Off**, 1, 2, 1+2	Turns skin detail off or on and selects the memory position.	2	Scene

Menu item			Values	Description	Level	File
	autoskin		**Off** > On > Win > Off	Shows current status of the auto skin detail procedure.	2	
	skin width					
		width 1 RB				
		R	0..99 **(50)**	Hue width for skin gate 1 (R)	2	Scene
		B	0..99 **(50)**	Hue width for skin gate 1 (B)	2	Scene
		width 2 RB				
		R	0..99 **(50)**	Hue width for skin gate 2 (R)	2	Scene
		B	0..99 **(50)**	Hue width for skin gate 2 (B)	2	Scene
	location XY			(read only)	2	
	skin level		0..99 **(14)**	Sets skin contour level.	2	Scene
	skin view		**Off**, On	Turns skin view mode on or off.	2	-
	skin color					
		color 1 RB				
		R	0..99 **(50)**	Color tone for skin gate 1 (R)	2	Scene
		B	0..99 **(50)**	Color tone for skin gate 1 (B)	2	Scene
		color 2 RB				
		R	0..99 **(50)**	Color tone for skin gate 2 (R)	2	Scene
		B	0..99 **(50)**	Color tone for skin gate 2 (B)	2	Scene

12.3 Setup menu

Menu item	Values	Description	Level	File
formats				
video standard	1080i59, 720p59, **1080i50**, 720p50, 576i50, 480i59	Selects camera video standard.	0	Prod
video compr. SD	DV25, **JP2K30**, JP2K40, JP2K50, (MP2I30), (MP2I40), (MP2I50)	Selects video compression and bitrate for SD recording. MPEG2 compression schemes are optional.	0	Prod
media selection	**REV**, CF1, CF2, Extern	Selects the storage media for recording multimedia data.	0	Prod
VF playback	**Conf**, Full	Sets the way content is displayed in the viewfinder: Conf = as is ('confidence'); Full = maximized cropping.	0	Prod
video source	**CAM**, SDI, CVBS	Selects recording source: CAM = camera live video; SDI = digital video input; CVBS = analog video input (only available when an SD video standard is selected)	0	Prod
video compr. HD	**JP2K50**, JP2K75, JP2K100, (MP2I60), (MP2I80)	Selects video compression and bitrate for HD recording. MPEG2 compression is optional.	0	Prod
chunk size	**NoLimit**, 10 sec., 30 sec., 60 sec., 2 GB	Sets the chunk size for the mediafile. (**NoLimit** is not available when **CF1** or **CF2** is selected.)	0	Prod
aspect ratio	**16:9**, 4:3, LB	Sets aspect ratio of the recorded signal (only available when an SD video standard is selected)	0	Prod
timecode				
run mode	**Record-run**, Free-run	Sets the run mode of the timecode generator: Record-run = timecode generator only runs when recording. Free-run = timecode generator runs continuously.	0	Prod
userbits				
userbit mode	User value, **Real time**, Ext input	Selects the timecode user bits mode.	0	Prod
userbits 1				
UB1	0..F **(0)**	Sets a value for user bit 1.	0	Prod
UB2	0..F **(0)**	Sets a value for user bit 2.	0	Prod
UB3	0..F **(0)**	Sets a value for user bit 3.	0	Prod
UB4	0..F **(0)**	Sets a value for user bit 4.	0	Prod
userbit type	**Date/Time**, Page/Line, Unspec., reserved, 8-bit code	Selects the timecode user bits type.	0	Prod
userbits 2				
UB5	0..F **(0)**	Sets a value for user bit 5.	0	Prod

Menu item	Values	Description	Level	File
UB6	0..F **(0)**	Sets a value for user bit 6.	0	Prod
UB7	0..F **(0)**	Sets a value for user bit 7.	0	Prod
UB8	0..F **(0)**	Sets a value for user bit 8.	0	Prod
setup				
input type	DVITC, **LTC**	Selects timecode type to be used for the input: DVITC = Digital Vertical Interval Time Code; LTC = Linear Time Code.	0	Prod
f-run sync	**Real time**, Local value, External	Selects type of timecode synchronisation.	0	Prod
ATC SD	11..18 **(11)**	Selects the video line number used to embed the ATC (Ancillary Time Code) into the SD video signal.	0	Prod
dropframe	**NDF**, DF	Selects non drop frame (NDF) mode or drop from (DF) for timecode.	0	Prod
ATC HD	NONE, **9**	Selects the video line number used to embed the ATC (Ancillary Time Code) into the HD video signal.	0	Prod
play mode	**Regenerated**, From file	Sets the playback mode of the timecode generator.	0	Prod
new timecode				
hrs	0..24 **(0)**	Sets value for hours.	0	Prod
min	0..59 **(0)**	Sets value for minutes.	0	Prod
sec	0..59 **(0)**	Sets value for seconds.	0	Prod
frms	0..29 **(0)**	Sets value for frames.	0	Prod
recbuff				
preferred media	**Not Active**	Order of preferred media when the camcorder switches media during recording.	0	Prod
metadata				
storyfile	**<no story>**, <list of story file names>	Selects story file name used in the system.	0	-

12.4 System menu

Menu item	Values	Description	Level	File
hardware				
viewfinder				
VF monitoring	**Y**, R, G, B, x-G	Selects type of signal to view in viewfinder: Y = luminance signal; R,G,B = red, green or blue channel; x-G = inverted green channel	2	Oper
detail				

Menu item			Values	Description	Level	File
		VF detail	**On**, Off	Turns detail for viewfinder signal on or off.	2	Oper
		VF detail lvl	0..99 **(50)**	Sets detail level for viewfinder signal.	2	Oper
	lens					
		autoiris				
		autoiris	**On**, Off	Turns auto iris on or off.	3	Oper
		peak average	0..99 **(78)**	Sets the balance between peak and average video level.	3	Oper
		setpoint	0..99 **(20)**	Sets auto iris exposure level.	3	Oper
		autoiris const.			3	
		iris gain	5..10 **(5)**	Sets auto iris response speed: Lower values give slower speeds.	3	Oper
		iris threshold	0..99 **(63)**	Sets the threshold value for the auto iris function	3	Oper
		mom. iris setpoint	0..99 **(8)**	Sets momentary iris setpoint level.	3	-
		RE iris comp.	On, **Off**	Turns the iris compensation on or off. Use this setting to compensate for iris loss when a range extender is used.	0	-
		extended iris				
		gain speed	1..5 **(5)**	Sets the gain speed for extended auto iris.	S1	Oper
		exp.time speed				
		iris min.	F5.6, F8.0, F11.0, **F16.0**	Sets the minimum iris value for extended auto iris.	S1	Oper
		gain max.	0..15dB **(15dB)**	Sets the maximum gain value for extended auto iris.	S1	Oper
		exp. min. time				
		iris max.	F1.4, **F2.0**, F2.8, F4.0, F5.6	Sets the maximum iris value for extended auto iris.	S1	Oper
		lens type	**Std**, WA	Selects the lens type (used to apply the correct shading type): Std = standard; WA = wide angle.	0	Oper
	buttons					
		contrast button	**BlkStrKnee**, Knee, BlkStr	Assigns a function to the contrast button: BlkStrKnee = black stretch + knee Knee = knee BlkStr = black stretch	0	Oper
		user buttons				
		user 1	Start play, Stop play, Rewind, Forward, Pause play, Record, Mark in, Mark out, Ext iris, **Disabled**	Assigns a function to user button 1.	0	Oper

Menu item	Values	Description	Level	File
user 2	Start play, Stop play, Rewind, Forward, Pause play, Record, Mark in, Mark out, Ext iris, **Disabled**	Assigns a function to user button 2.	0	Oper
lens				
RET button	Ext signal, **Playback**	Assigns a function to the RET button on the lens.	0	Oper
handgrip				
zoom control	Enabled, **Disabled**	Enables or disables the zoom control on top of the camera carrying handle (zoom control is only available with digital lens interfaces.)	0	Oper
record switch	Enabled, **Disabled**	Enables or disables the record switch under the carrying handle.	0	Oper
ports				
digital out	**Normal**, VF	Selects the output signal for the digital output. When VF is selected the output signal marker ('VF') is shown on the text overlay.	1	-
analog in	**CVBS**, Timecode, AES Audio, Audiosync	Selects the signal for the analog BNC input connector.	1	-
analog out	**CVBS**, Timecode, AES Audio, Audiosync	Selects the signal for the analog BNC output connector.	1	-
IEEE 1394	**Off**, Exclusive, Both	Selects IEEE 1394 interface operation mode: Exclusive = playback via IEEE 1394 only; Off = no playback via IEEE 1394; Both = normal playback and simultaneous playback via IEEE 1394.	1	-
genlock				
lock source	None, Digital, **Analog**	Selects the type of source to which the camera locks.	1	-
date/time				
time				
HH	0..23 **(12)**	Sets real time clock (hours).	2	-
MM	0..59 **(00)**	Sets real time clock (minutes).	2	-
SS	0..59 **(00)**	Sets real time clock (seconds).	2	-
date				
MM	1..12 **(1)**	Sets month.	2	-
DD	1..31 **(1)**	Sets day of the month.	2	-
YY	0..98 **(8)**	Sets year (last two digits).	2	-
time zone	UTC-12:00 .. UTC+12:00 **(UTC+00:00)**	Selects the time zone in 0:30 hrs steps.	2	-
sidepanel				
backlight	1..15 **(15)**	Sets the brightness level of the backlight of the side panel display.	0	-
calibration	execute	Runs the touch screen calibration procedure.	S1	-

Menu item			Values	Description	Level	File
	titlebar		**timecode**, userbits	Shows timecode or userbits on the sidepanel title bar.	0	-
	home screen		**default**, day, night	Selects the home screen type of the side panel display: default = extended information day = black	0	-
	VF-menu on SPD		On, **Off**	Turn on to superimpose the viewfinder menu on the side panel display. Note: use the Cam/ Menu button to switch to Cam view to see the viewfinder menu.		
	VF-menu on CVBS		On, **Off**	Turn on the superimpose the viewfinder menu on the CVBS output signal. Make sure the analog output port is set to CVBS.		
files						
	std recall mode		**Factory**, Customer	Assigns the scene file that is recalled when the standard recall button on the camera is pressed.	2	-
	scene files					
		recall scene	**Factory**, Customer, (Scene1), (Scene2), (Scene3), (Scene4)	Recalls a stored scene file.	2	-
		store scene	**Customer**, Scene1, Scene2, Scene3, Scene4	Stores current scene settings to the selected scene file.	2	-
	operator files					
		recall operator	**Factory**, Customer, (Oper1), (Oper2)	Recalls a stored operator file.	2	-
		store operator	**Customer**, Oper1, Oper2	Stores current operator settings to the selected operator file.	2	-
security						
	user level		usr lvl 0..3 **(usr lvl 3)**	Sets the user level for the viewfinder menu and the side panel menu.	0	-

Chapter 13

Viewfinder menu

13.1 VF menu

Menu item		Values	Description	Level	File
Monitoring		**Y**, R, G, B, x-G	Selects type of signal to view in viewfinder: Y = luminance signal; R,G,B = red, green or blue channel; x-G = inverted green channel	2	Oper
Detail				2	
	Detail	**On** > Off	Turns detail for viewfinder signal on or off.	2	Oper
	Level	0..99 **(50)**	Sets detail level for viewfinder signal.	2	Oper
Focus assist		On > **Off**	Adds a crawling effect in the focused areas in the viewfinder to assist focussing.	0	Oper
Zebra				3	
	Zebra	On, **Off**	Turns zebra indication on or off. Zebra is a diagonal line pattern that indicates that the area affected has risen above a predetermined level of the full scale video exposure value.	3	Oper
	Mode	**Level**, Band	Selects zebra mode: Level = zebra indication appears in areas are brighter than the set level; Band = zebra indication appears in a 2.5% band around the set level.	3	Oper
	Level (%)	0..117 **(90)**	Sets the exposure level at which zebra indication is shown. When level is higher than 100% the zebra indicates overexposed areas.	3	Oper
	Contrast	0..99 **(15)**	Sets the zebra indication contrast.	3	Oper
Indicators				0	
	Zoom	**On** > Off	Turns the zoom indicator in the viewfinder on or off (if supported by the lens). This indicator shows the zoom range of the lens: 0 = wide angle; 99 = tele.	0	Oper
	Focus	On > **Off**	Turns the focus indicator in the viewfinder on or off. This indicator shows the focus distance of the lens: 0 = close-up; 99 = infinity.	0	Oper

Menu item		Values	Description	Level	File
	Iris	**On** > Off	Turns the iris indicator in the viewfinder on or off. This indicator shows the F-stop value (F1.4 .. F22) of the iris opening of the lens.	0	Oper
	Filter	**On** > Off	Turns the optical filter indicator on or off. This indicator shows the selected neutral density optical filter.	0	Oper
	Audio bars	**On** > Off	Turns the audio bars on or off. These four bars at the right side of the image indicate audio levels for channel 1 to 4..	0	Oper
	Time code	**On** > Off	Turns time code indicator on or off.	0	Oper
	Selectable	**Storage**, Batt, Off	Selects information that is shown by the bottom left indicator: Batt = power information; Storage = media storage left; Off = indicator is not shown.	0	Oper
Markers				0	
	Marker	On > **Off**	Turns the cadre marker on or off.	0	Oper
	Type	15:9, 14:9, **4:3**	Sets the aspect ratio of the cadre marker.	0	Prod
	Style	Dot, **Shad**, Both	Sets the style of the cadre marker: Dot = dotted lines; Shad = shaded areas; Both = dotted lines + shaded areas.	0	Oper
	Shading	**Shading** > Black	Sets shading style for the cadre marker (when cadre marker style is set to **Shad** or **Both**): Shading = transparent area; Black = black area.	0	Oper
	Centre cross	On > **Off**	Turns the centre marker on or off.	0	Oper
Safe area				0	
	Safe area	On, **Off**	Turns the safe area marker on or off. This marks the screen area that represents 80% of the whole viewfinder picture.	0	Oper
	Type	**16:9**, 15:9, 14:9, 4:3	Selects the aspect ratio of the safe area marker.	0	Prod
OSD				0	
	white lvl	0..99 **(70)**	Sets the white (positive) level of the characters: 0 = low intensity; 99 = high intensity.	0	Oper
	Black lvl	0..99 **(30)**	Sets the black (shading) level of the characters: 0 = black; 99 = no shading.	0	Oper
	Mode	On > **Time**	Selects the menu display to be permanently on or to disappear after set time.	0	Oper
	Time out	0..10 **(10)**	Sets the length of time the menu is displayed when the OSD mode is set to Time.	0	Oper
	VF menu on SPD	On, **Off**	Turns VF menu overlay on the side panel display on or off.	0	Oper

13.2 Video menu

Menu item			Values	Description	Level	File
Gain					2	
	Gain R		0..99 **(50)**	Sets gain level (R)	2	Scene
	Gain G		0..99 **(50)**	Sets gain level (G)	2	Scene
	Gain B		0..99 **(50)**	Sets gain level (B)	2	Scene
Exposure time					1	
	Var exp time		50 Hz .. 3270 Hz **(50Hz)** or 60 Hz .. 3280 Hz **(60Hz)**	Sets the exposure time in 0.5 Hz steps when exposure mode is Var (using the exposure button at the front of the camera)	1	Scene
	Lighting slct		-10 . . . +10 **(0)**	Sets the exposure correction to synchronise with lighting frequency when exposure mode is **50 Hz** or **60 Hz**.	1	Scene
Color temp					0	
	Temp lvl		2000K ... 20000K	Sets the color temperature.	0	Scene
	RE iris comp		On > **Off**	Turns the iris compensation on or off. Use this setting to compensate for iris loss when a range extender is used.	0	-
Detail					3	
	Detail		**On** > Off	Turns detail enhancement on or off.	3	Scene
	Source		**Y**,R,G,R+G	Selects the source to be used for detail generation.	3	Scene
	Level		0..99 **(SD:50, HD:25)**	Sets detail enhancement level. Note: SD/HD default values are different.	3	Scene
	Vert lvl		0..99 **(SD:25, HD:50)**	Sets the level of the vertical component in the detail signal. Note: SD/HD default values are different.	3	Scene
	Noise slicer		0..99 **(50)**	Sets the level of the noise slicer.	3	Scene
	Level depend		0..99 **(40)**	Sets the dependency level for the noise slicer.	3	Scene
	Coarse/fine		0..99 **(50)**	Sets the coarseness of the detail enhancement (0 = very fine).	3	Scene
	Knee detail		**Off**, 1, 2, 3, 4	Selects level of detail enhancement for the compressed signal above the knee.	3	Scene
	Black pos		0..29 **(0)**	Sets the black position level.	S1	
	Pos + lvl				S1	
		Det black lvl		Sets detection black level.	S1	
		Low-mid pos			S1	
		Low-mid lvl			S1	
		Mid pos			S1	
		White pos			S1	
		White lvl			S1	
Soft detail					2	

Menu item		Values	Description	Level	File
	Soft detail	**On**, Off	Turns soft detail on or off. This function reduces the amount of detail added for large transitions.	2	Scene
	Level	0..99 **(30)**	Sets the upper limit level of detail enhancement for soft detail.	2	Scene
Black lvl				2	
	Dyn. black	On, **Off**	Turns dynamic black on or off	2	Scene
	Auto black	On, **Off**	Turns automatic black on or off	3	Scene
	Master black	0..99 **(50)**	Sets black level adjustment (master)	2	Scene
	Black lvl R	0..99 **(50)**	Sets black level adjustment (R)	3	Scene
	Black lvl G	0..99 **(50)**	Sets black level adjustment (G)	3	Scene
	Black lvl B	0..99 **(50)**	Sets black level adjustment (B)	3	Scene
Black stretch				3	
	Black stretch	O > **Off**	Turns black stretch on or off. Use to enhance image details in the dark parts of the image.	3	Scene
	Level	0..99 **(50)**	Sets black stretch level when black stretch is on. 50 is no stretch, >50 is black press.	3	Scene
	Contrast	**Stretch**, Press	Sets contrast to black stretch or black press when black stretch is on.	3	Scene
Knee				2	
	Knee	Auto, Var, **Off**	Sets knee mode: Auto = automatic; Var = variable (manual); Off = no knee function.	2	Scene
	Knee type	**Y**, NAM	Selects knee type: Y = luminance; NAM = luminance of highest RGB component.	3	Scene
	Point	0..99 **(0)**	Sets the point where the knee gamma curve begins (in manual mode).	3	Scene
	Slope	0..99 **(10)**	Sets the slope of the knee gamma curve (in manual mode).	3	Scene
	Limit	0..99 **(0)**	Sets the knee limitation level.	S1	Scene
	Desat	On, **Off**	Turns knee desaturation on or off.	S1	Scene
	Desat lvl	0..99 **(50)**	Sets the desaturation level when knee mode is variable and desaturation is on.	S1	Scene
	Auto white point	0..99 **(30)**	Sets the knee point when knee mode is set to automatic.	S1	Scene
	Auto white ref	0..99 **(30)**	Sets the auto reference level when knee mode is set to automatic.	S1	Scene
	Auto white limit	0..99 **(50)**	Sets the auto limitation level when knee mode is set to automatic.	S1	Scene
Skin				2	
	Skin	**Off**, 1, 2, 1+2	Turns skin detail off or on and selects the memory position.	2	Scene
	State	**Off**, On	(read only indicator)	2	

Menu item			Values	Description	Level	File
	View		**Off**, On	Turns indication of the selected area on or off.	2	
	Level		0..99 **(15)**	Sets the skin detail level. Levels below 50 soften the selected area and levels above 50 add extra detail.	2	Scene
	Gate 1				3	
		Red lvl	0..99 **(50)**	Sets correction level for skin gate 1 (red color)	3	Scene
		Red width	0..99 **(50)**	Sets width level for skin gate 1 (red saturation)	3	Scene
		Blue lvl	0..99 **(50)**	Sets correction level for skin gate 1 (blue color)	3	Scene
		Blue width	0..99 **(50)**	Sets width level for skin gate 1 (blue saturation)	3	Scene
	Gate 2				3	
		Red lvl	0..99 **(50)**	Sets correction level for skin gate 2 (red)	3	Scene
		Red width	0..99 **(50)**	Sets width level for skin gate 2 (red saturation)	3	Scene
		Blue lvl	0..99 **(50)**	Sets correction level for skin gate 2 (blue color)	3	Scene
		Blue width	0..99 **(50)**	Sets width for skin gate 2 (blue saturation)	3	Scene
Auto skin					3	
	Auto skin		On, **Off**	Turns auto skin detail mode on or off.	3	
	State		**Off** > Win > Run	Shows the actual state of the auto skin procedure.	3	
	Window Loc X		<pixels>		3	
	Window Loc Y		<pixels>		3	
Gamma						
	gamma mode		**Nom**, Low, Lin, Preset	Selects gamma mode: Nom = Nominal curve; Low = Low curve; Lin = Linearised curve; Preset = manual curve.	2	Scene
	Curve		**ARD**, CCIR, 6xARD, RAI, BBC04, BBC05,BBC06	Selects a standard curve for gamma correction.	2	Scene
	Master gamma		0..99 **(76)**	Sets the gamma level (Master)	3	Scene
	Gamma R		0..99 **(76)**	Sets the gamma level (R)	3	Scene
	Gamma G		0..99 **(76)**	Sets the gamma level (G)	3	Scene
	Gamma B		0..99 **(76)**	Sets the gamma level (B)	3	Scene
	Mat/Gam order		G/M > **M/G**	Selects the order of the matrix and gamma functions: G/M = first famma then matrix; M/G = first matrix, then gamma.	S1	Scene
Matrix						

Menu item		Values	Description	Level	File
	Matrix	EBU, **Skin**, B/W, RAI, BBC, 1:1, CoolFL, Var1, Var2	Selects preset values for the matrix: EBU = true color matrix; SKIN = optimised for skin tone reproduction; B/W = monochrome picture; RAI = Sony cameras reproduction; BBC = BBC optimisation; 1:1 = matrix is off; CoolFL= optimised for mixed fluorescent and incandescent lighting.	3	Scene
	R->G	0..99 **(50)**	Sets the red/green ratio in the color matrix.	3	Scene
	G->R	0..99 **(50)**	Sets the green/red ratio in the color matrix.	3	Scene
	R->B	0..99 **(50)**	Sets the red/blue ratio in the color matrix.	3	Scene
	B->R	0..99 **(50)**	Sets the blue/red ratio in the color matrix.	3	Scene
	G->B	0..99 **(50)**	Sets the green/blue ratio in the color matrix.	3	Scene
	B->G	0..99 **(50)**	Sets the blue/green ratio in the color matrix.	3	Scene
	Mat/Gam order	G/M > **M/G**	Selects the order of the matrix and gamma functions: G/M = first famma then matrix; M/G = first matrix then gamma.	S1	Scene
Shading					
	Shading	**On**, Off	Turns white shading compensation on or off.	3	
	Hor Par R	0..99 **(50)**	Sets white shading horizontal parameter (R).	3	
	Hor Saw R	0..99 **(50)**	Sets white shading horizontal sawtooth (R).	3	
	Hor Par G	0..99 **(50)**	Sets white shading horizontal parameter (G).	3	
	Hor Saw G	0..99 **(50)**	Sets white shading horizontal sawtooth (G).	3	
	Hor Par B	0..99 **(50)**	Sets white shading horizontal parameter (B).	3	
	Hor Saw B	0..99 **(50)**	Sets white shading horizontal sawtooth (B).	3	
	Vert Par R	0..99 **(50)**	Sets white shading vertical parameter (R).	3	
	Vert Saw R	0..99 **(50)**	Sets white shading vertical sawtooth (R).	3	
	Vert Par G	0..99 **(50)**	Sets white shading vertical parameter (G).	3	
	Vert Saw G	0..99 **(50)**	Sets white shading vertical sawtooth (G).	3	
	Vert Par B	0..99 **(50)**	Sets white shading vertical parameter (B).	3	
	Vert Saw B	0..99 **(50)**	Sets white shading vertical sawtooth (B).	3	
Flare				3	
	Flare	**On**, Off	Turns flare compensation on or off.	3	
	Red lvl	0..99 **(50)**	Sets flare compensation level (R).	3	
	Green lvl	0..99 **(50)**	Sets flare compensation level (G).	3	
	Blue lvl	0..99 **(50)**	Sets flare compensation level (B).	3	
White limit				3	
	White limit	**On**, Off	Turns white limiter on or off. Use to limit highlight levels in the video signal.	3	Scene
	Level	0..99 **(50)**	Sets the white limiter level. This is the luminance level at which limiting occurs.	3	Scene

Menu item		Values	Description	Level	File
Saturation				3	
	Saturation	0..99 **(50)**		3	
CVBS Chroma				3	
	CVBS Chroma			3	

13.3 Setup menu

Menu item	Values	Description	Level	File
Formats			0	
Video standard	**1080i50**,720p50,576i50, 1080i59,720p59,480i59	Selects camera video standard.	0	Prod
Video source	**CAM**, SDI, CVBS	Selects recording source: CAM = camera; SDI = digital video input; CVBS = analog video input.	0	Prod
Compress HD	**JP2K50**, JP2K75, JP2K100, (MP2I60), (MP2I80)	Selects video compression and bitrate for HD recording. MPEG2 compression is optional.	0	Prod
Compress SD	DV25, **JP2K30**, JP2K40, JP2K50, (MP2I30), (MP2I40), (MP2I50)	Selects video compression and bitrate for SD recording. MPEG2 compression is optional.	0	Prod
media selection	**REV**, CF1, CF2, Extern	Selects the storage media for recording multimedia data.	0	Prod
Chunk size	**NoLimit**, 10 sec., 30 sec., 60 sec., 2 GB	Sets the chunk size for the mediafile. (**NoLimit** is not available when **CF1** or **CF2** is selected.)	3	Prod
VF playback	**Conf**, Full	Sets the way content is displayed in the viewfinder: Conf = as is ('confidence'); Full = maximized crop.	0	Prod
Aspect Ratio	**16:9**, 4:3, LB	Sets aspect ratio of the recorded signal (only available when an SD video standard is selected)	0	Prod
Timecode			0	
Run mode	**Record-run** > Free-run	Sets the run mode of the timecode generator: Record-run = timecode generator only runs when recording. Free-run = timecode generator runs continuously.	0	Prod
FRun set			0	
FRun mode			0	Prod
Output TC type	DVITC, **LTC**	Selects timecode type to be used for the output: LTC = Lineair timecode; DVITC = Digital Vertical Interval Timecode (from SDI)	0	Prod
Input TC type	DVITC, **LTC**	Selects timecode type to be used for the input: LTC = Lineair timecode; DVITC = Digital Vertical Interval Timecode (from SDI)	0	Prod
Drop frame	**NDF**, DF	Selects drop frame or non drop frame mode (in 59.94 modes)	0	Prod
New timecode				
Hours	0..24	Sets value for hours.	0	
Minutes	0..59	Sets value for minutes.	0	

Menu item			Values	Description	Level	File
	Seconds		0..59	Sets value for seconds.	0	
	Frames		1..25	Sets value for frames.	0	
	User bit mode		Usr value, Real time, Ext input	Sets timecode user bits mode.	0	Prod
	User bits					
		UB1	0..F	Sets user bits group 1 (hexadecimal value)	3	Prod
		UB2	0..F	Sets user bits group 2 (hexadecimal value)	3	Prod
		UB3	0..F	Sets user bits group 3 (hexadecimal value)	3	Prod
		UB4	0..F	Sets user bits group 4 (hexadecimal value)	3	Prod
		UB5	0..F	Sets user bits group 5 (hexadecimal value)	3	Prod
		UB6	0..F	Sets user bits group 6 (hexadecimal value)	3	Prod
		UB7	0..F	Sets user bits group 7 (hexadecimal value)	3	Prod
		UB8	0..F	Sets user bits group 8 (hexadecimal value)	3	Prod
Rec. buffer						
	preferred media		Not Active	Order of preferred media when the camcorder switches media during recording.	0	Prod
Metadata					1	
	Story name		<list of available story names>	Selects a story name to be used for recording.	1	

13.4 Audio menu

Menu item	Values	Description	Level	File
Inputs			1	
Front			3	
Gain	+30dB, +20dB, +10dB, **0dB**, -10dB, –20dB, -30dB	Sets pregain level for front mic input (Front 1 or Front 1+2)	3	Oper
Limiter	On, **Off**	Turns audio limiter on or off	3	Oper
Rear1			3	
Gain (mic)	0dB, **+20dB,** +30dB, +40dB, +50dB			
Gain (line)	**0dB**, +20dB,+30dB			
Limiter	On, **Off**	Turns audio limiter on or off		
Rear2			3	
Gain (mic)	0dB, **+20dB,** +30dB, +40dB, +50dB			
Gain (line)	**0dB**, +20dB,+30dB			
Limiter	On, **Off**	Turns audio limiter on or off		
Wireless			3	
Gain				
Channels			1	
Channel 1			1	
Lvl control	AGC, (AGC-Stereo), Fixed, Lev1+Front, **Level 1**, Front	Selects a recording level control.	1	Prod
fixed lvl	0..99 **(50)**	Sets the fixed recording level (when fixed control is selected)	1	Prod
Filter	**None**, 150Hz	Selects the channel filter.	1	Prod
AGC profile	Noisy, Quiet, **Standard**	Selects the AGC (Automatic Gain Control) profile.	1	Prod
Channel 2			1	
Lvl control	AGC, (AGC-Stereo), Fixed, Lev1+Front, **Level 2**, Front	Selects a recording level control.	1	Prod
Recording lvl	0..99 **(50)**	Sets the fixed recording level (when fixed control is selected)	1	Prod
Filter	**None**, 150Hz	Selects the channel filter.	1	Prod
AGC profile	Noisy, Quiet, **Standard**	Selects the AGC (Automatic Gain Control) profile.	1	Prod
Channel 3			1	
Lvl control	AGC, (AGC-Stereo), Fixed, Lev1+Front, **Level 1**, Front	Selects a recording level control.	1	Prod
fixed lvl	0..99 **(50)**	Sets the fixed recording level (when fixed control is selected)	1	Prod

Menu item	Values	Description	Level	File
Filter	**None**, 150Hz	Selects the channel filter.	1	Prod
AGC profile	Noisy, Quiet, **Standard**	Selects the AGC (Automatic Gain Control) profile.	1	Prod
Channel 4			1	
Lvl control	AGC, (AGC-Stereo), Fixed, Lev1+Front, **Level 2**, Front	Selects a recording level control.	1	Prod
Recording lvl	0..99 **(50)**	Sets the fixed recording level (when fixed control is selected)	1	Prod
Filter	**None**, 150Hz	Selects the channel filter.	1	Prod
AGC profile	Noisy, Quiet, **Standard**	Selects the AGC (Automatic Gain Control) profile.	1	Prod
source channel 1	Rear1, Rear2, Wrx1, **Front1**, (Front2), MicRear, SDI In1..8, AES1, AES2, Mute	Selects a recording source for channel 1.	1	Prod
source channel 2	Rear1, Rear2, Wrx1, **Front1**, (Front2), MicRear, SDI In1..8, AES1, AES2, Mute	Selects a recording source for channel 2.	1	Prod
source channel 3	**Rear1**, Rear2, Wrx1, Front1, (Front2), MicRear, SDI In1..8, AES1, AES2, Mute	Selects a recording source for channel 3.	1	Prod
source channel 4	Rear1, **Rear2**, Wrx1, Front1, (Front2), MicRear, SDI In1..8, AES1, AES2, Mute	Selects a recording source for channel 4.	1	Prod
Outputs			1	
Rear			1	
Rear	Enabled, **Disabled**	Enables or disables rear1 and rear2 outputs.	1	Prod
Rear 1 mode	**Channel**, Source	Selects mode for the rear1 output.	1	Prod
Rear 1 source	Rear1, Rear2, Wrx1, **Front1**, MicRear, SDI In1..8, AES1, AES2	Selects a source to be routed to the rear1 output when input mode is **source**.	1	Prod
Rear 1 channel	**Ch1**, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4	Selects a channel or channel mix to be routed to the rear1 output when input mode is **channel**.	1	Prod
Rear 2 mode	**Channel**, Source	Selects mode for rear2 output.	1	Prod
Rear 2 source	Rear1, Rear2, Wrx1, **Front1**, MicRear, SDI In1..8, AES1, AES2	Selects a source to be routed to rear2 output when input mode is **source**.	1	Prod
Rear 2 channel	Ch1, **Ch2,** Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4	Selects a channel or channel mix to be routed to rear2 output when input mode is **channel**.	1	Prod
AES Audio			1	
AES mode	**Channel**, Source	Sets input mode for the AES audio output.	1	Prod

Menu item		Values	Description	Level	File
	AES1 source	Rear1, Rear2, Wrx1, **Front1**, MicRear, SDI In1..8, AES1, AES2	Selects a source to be routed to the AES1 output when input mode is **source**.	1	Prod
	AES1 channel	**Ch1**, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4	Selects a channel or channel mix to be routed to the AES2 output when input mode is **channel**.	1	Prod
	AES2 source	Rear1, Rear2, Wrx1, **Front1**, MicRear, SDI In1..8, AES1, AES2	Selects a source to be routed to the AES2 output when input mode is **source**.	1	Prod
	AES2 channel	Ch1, **Ch2**, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4	Selects a channel or channel mix to be routed to the AES2 output when input mode is **channel**.	1	Prod
SDI out				1	
	Embedded chan 1	**Ch1**, Ch2, Ch3, Ch4, Rear1, Rear2, Wrx1, Front1, MicRear, AES1, AES2	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
	Embedded chan 2	Ch1, **Ch2**, Ch3, Ch4, Rear1, Rear2, Wrx1, Front1, MicRear, AES1, AES2	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
	Embedded chan 3	Ch1, Ch2, **Ch3**, Ch4, Rear1, Rear2, Wrx1, Front1, MicRear, AES1, AES2	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
	Embedded chan 4	Ch1, Ch2, Ch3, **Ch4**, Rear1, Rear2, Wrx1, Front1, MicRear, AES1, AES2	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
	Embedded chan 5	**Ch1**, Ch2, Ch3, Ch4, Rear1, Rear2, Wrx1, Front1, MicRear, AES1, AES2	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
	Embedded chan 6	**Ch1**, Ch2, Ch3, Ch4, Rear1, Rear2, Wrx1, Front1, MicRear, AES1, AES2	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
	Embedded chan 7	**Ch1**, Ch2, Ch3, Ch4, Rear1, Rear2, Wrx1, Front1, MicRear, AES1, AES2	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
	Embedded chan 8	**Ch1**, Ch2, Ch3, Ch4, Rear1, Rear2, Wrx1, Front1, MicRear, AES1, AES2	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
Monitoring				1	
	Mode left	**Channel**, Source	Selects headphones left muff input mode.	1	Oper
	Hdph left src	**Front1**, MicRear, AES1, AES2, SDI In1..8, Rear1, Rear2, Wrx1	Selects a source to be routed to the headphones left channel when input mode is **source**.	1	Oper

Menu item		Values	Description	Level	File
	Hdph left chan	**Ch1**, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4	Selects a channel or channel mix to be routed to the headphones left channel when input mode is **channel**.	1	Oper
	Mode right	**Channel**, Source	Selects headphones right muff input mode.	1	Oper
	Hdph right src	**Front1**, MicRear, AES1, AES2, SDI In1..8, Rear1, Rear2, Wrx1	Selects a source to be routed to the headphones right channel when input mode is **source**.	1	Oper
	Hdph right chan	**Ch1**, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4	Selects a channel or channel mix to be routed to the headphones right channel when input mode is **channel**.	1	Oper
	Speaker mode	Source, Channel, Hdph L, Hdph R, **Hdph L+R**	Selects speaker input mode.	1	Oper
	Speaker mute	**On**, Off	Mutes speaker signal (audio off).	1	Oper
Setup					
	test tone	**Disable**, -6dBFS, Headroom	Selects 1 KHz test tone level when color bar is on: Disable = no test tone -6 dBFS = test tone level is at -6 dBFS Headroom = level is the same as the selected audio headroom.	1	Oper
	headroom	**-18dBFS** > -20dBFS	Selects audio headroom.	1	Prod
	front mode	**mono**, stereo	Set to stereo when the optional stereo front microphone kit is installed.	S1	

13.5 System menu

Viewfinder menu item	Values	Description	Level	File
User lvl	**Usr lvl 3**, Usr lvl 2, Usr lvl 1, Usr lvl 0	Sets the user level for the viewfinder menu and side panel menu.	0	
PIN code			3	
Enter PIN	****	Enter PIN code (“0000”) for service level 1 access.	3	
Set PIN 1	****	Enter a new PIN code.	S1	
Camera #	0..99 **(17)**	Sets the camera identification number within the C2IP network.	3	
Files			0	
Scenefiles			0	
Store			0	
Scenefile	**Scene1**, Scene2, Scene3, Scene4, customer	Selects the scene file to which the scene settings are stored.	1	
Store	Exec	Stores the scene settings to the selected scene file.	1	
Recall			0	
Scenefile	Scene1, Scene2, Scene3, Scene4, **customer**, factory	Selects the scene file to be recalled.	1	
Recall	Exec	Recalls the selected scene file.	1	
Operator files			0	
Store			0	
Operator file	**Oper1**, Oper2, Oper3, Oper4, customer	Selects the operator file to which the operator settings are stored.	1	
Store	Exec	Stores the operator settings to the selected operator file.	1	
Recall			0	
Operator file	Oper1, Oper2, Oper3, Oper4, **customer**, factory	Selects the operator file to be recalled.	1	
Recall	Exec	Recalls the selected operator file.	1	
Production files			0	
Store			0	
Production file	**Prod1**, Prod2, Prod3, Prod4, customer	Selects the production file to which the production settings are stored.	1	
Store	Exec	Stores the production settings to the selected production file.	1	
Recall			0	
Production file	Prod1, Prod2, Prod3, Prod4, **customer**, factory	Selects the production file to be recalled.	1	
Recall	Exec	Recalls the selected production file.	1	
Iris			0	
Iris	0..99 **(50)**	Sets iris value.	0	

Viewfinder menu item	Values	Description	Level	File
Momentary iris			3	
Momentary iris	On > **Off**	Turns momentary iris on or off.	3	
Setpoint	0..99 **(8)**	Sets momentary iris setpoint level.	3	
Auto iris			3	
Auto Iris	**On** > Off	Turns auto iris on or off.	3	Oper
Peak/Average	0..99 **(78)**	Sets the balance between peak and average video level.	3	Oper
Setpoint	0..99 **(20)**	Sets auto iris exposure level.	3	Oper
Gain	5..10 **(5)**	Sets auto iris response speed. Lower values give slower speed.	3	Oper
Threshold	0..99 **(63)**	Sets the threshold value for the auto iris function	3	Oper
Extended auto iris				
Ext. auto iris	On, **Off**	Turns extended auto iris on or off. This function automatically regulates the video level by adjusting iris and gain to suit the ambient lighting conditions.	3	Prod
Gain speed	1..5 **(5)**	Sets the gain speed for extended auto iris.	S1	Oper
Minimum iris	F5.6, F8, F11, **F16**	Sets the minimum iris value for extended auto iris.	3	Oper
Maximum iris	F1.4, **F2.0**, F2.8, F4.0, F5.6	Sets the maximum iris value for extended auto iris.	3	Oper
Max (dB)	0..15 dB **(9 dB)**	Sets the maximum gain value for extended auto iris.	3	Oper
Gain presets			2	
Preset -	-6dB, **-3dB**	Selects gain value for - preset.	2	
Preset +	**+6dB**, +9dB, +12dB, +18dB	Selects gain value for + preset.	2	
Preset ++	**+9dB**, +12dB, +18dB, +24dB	Select sgain value for ++ preset.	2	
Preset +++	**+30dB**, +36dB, 42dB	Selects gain value for +++ preset.	2	
Tally			0	
Rear follow	**On** > Off	Turns the rear tally follow mode on or off. When follow mode is on the rear indicators follow the tally on/off switch on the viewfinder.	0	
Service			S1	
Sens. cal	**Off**, On	Runs sensor calibration.	S1	
3200K cal	**Off**, Run	Runs 3200K calibration.	S1	
3200K reset	**Exec**	Resets 3200K calibration value to the factory default.	S1	
Test patterns			3	
Sawtooth			3	
Sawtooth	**Off**, On	Turns sawtooth test signal on or off.	3	

Viewfinder menu item	Values	Description	Level	File
Power			3	
Battery			3	
Warning lvl (%)	20%..30%	Sets battery capacity level (%) for **warning** message.	3	
Fatal (%)	10%..20%	Sets battery capacity level (%) for **fatal** message.	3	
Warning lvl (V)	11.1..16.5V	Sets battery capacity level (volts) for **warning** message.	3	
Fatal (V)	10.7..13.5V	Sets battery capacity level (volts) for **fatal** message.	3	
Warning lvl (Min)	6..11 Min	Sets battery capacity level (minutes) for **warning** message.	3	
Fatal (Min)	3..10 Min	Sets battery capacity level (minutes) for **critical** fatal message.	3	
External			3	
Warning lvl (V)	11.0 V .. 12.0 V	Sets external supply level (volts) for "Power low" message.	3	
Fan control			3	
Silent mode	**Rec**, Off	Selects mode for camera fan: Rec = switch temporarily to silent fan profile during recording Off = always use selected fan profile	3	Prod
Profile	Cool, **Normal**, Silent	Selects a profile for the camera fan: Cool = maximum cooling Normal = normal cooling Silent = minimal cooling	3	Prod
Time/date			2	
Year	2000..2099	Sets the value for year.	2	
Month	1..12	Sets the value for month.	2	
Day	1..31	Sets the value for day.	2	
Store Date	Exec	Activates the new date settings.	2	
Hour	00..23	Sets the value for hour.	2	
Minutes	00..59	Sets the value for minutes.	2	
Seconds	00..59	Sets the value for seconds.	2	
Store Time	Exec	Activates the new time settings.	2	
Buttons			0	
User buttons			0	
Button 1	**Disable**, Ext Iris, Mark out, Mark in, Record, Forward, Rewind,Pause play, Stop play, Start play	Assigns a function to user button 1 on the side panel of the camera.	0	Oper
Button 2	**Disable**, Ext Iris, Mark out, Mark in, Record, Forward, Rewind,Pause play, Stop play, Start play	Assigns a function to user button 2 on the side panel of the camera.	0	Oper
Lens			0	

Viewfinder menu item	Values	Description	Level	File
RET button	Ext signal > **playback**	Assigns a function to the RET button on the lens.	0	Oper
Handgrip			0	
Zoom control	Enabled > **Disabled**	Enables or disables the zoom control on top of the camera carrying handle.	0	Oper
Record switch	Enabled > **Disabled**	Enables or disables the record switch under the carrying handle.	0	Oper
IEEE 1394			1	
IEEE 1394	**Off**, Exclusive, Both	Selects IEEE 1394 interface operation mode: Exclusive = playback via IEEE 1394 only; Off = no playback via IEEE 1394; Both = normal playback and simultaneous playback via IEEE 1394.	1	
Wireless			3	
Wrx1 attenuation	**0dB**, +12dB	Selects the input attenuation level of the wireless microphone channel Wrx1.	3	
Black calib			3	
Start	**Off**	Starts the black calibration procedure.	3	
Are you sure?	**No**, Yes	Select Yes to proceed and No to cancel.	3	
Cal temp	63	Black calibration temperature (fixed value).	3	
Diagnostics			3	
PackageID	<identification string>	Displays the identification of software package that is currently installed in the camcorder.	3	
REV			3	
Drive state	**OK**, Error, Warning	Displays the service status of the internal REV drive.	3	
Disk state	OK, Error, Warning	Displays the service status of the currently mounted REV disk.	3	
Power			3	
Voltage	<voltage>	Displays the voltage supplied to the camcorder.	3	
Power	<power>	Displays the power used by the camcorder in watts.	3	
Power mode	External, Battery	Displays the power supply method.	3	

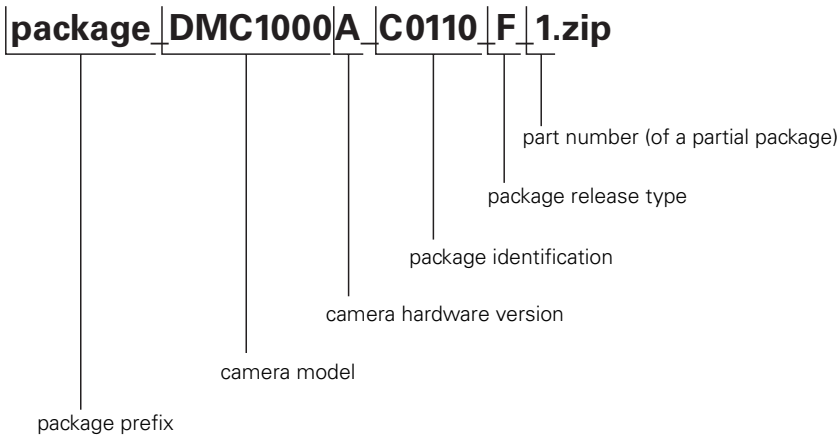
Chapter 14

Maintenance

14.1 Update software

14.1.1 Software package

Download the latest version of the software package from the Grass Valley website. Software package files are named according to the following convention:



- Locate the downloaded file on your computer and rename it to "package.zip".
- Copy the file to the root directory of a USB-stick. Make sure that the USB-stick has at least 128 MB of storage left.

14.1.2 Preparation

Prepare the following before updating the camcorder software:

- Connect the camcorder to an external power supply. Do not use a battery to power the camcorder because the update process can take a long time to complete (up to two hours).
- Remove all media from the camcorder and unplug all external devices. Lens, viewfinder and microphone may stay connected to the camcorder.

14.1.3 Update procedure

☞ Note

Do not interrupt power or switch off the camcorder during the update process.

Follow these steps to update the software of the camcorder:

1. Switch on the camcorder and wait for the system to start up. Observe the home screen on the side panel display and wait until the version information at the bottom right corner of the screen changes from ???? to the current software version information. This information is shown only when the home screen is set to **default** in the **SYSTEM**/SIDE PANEL/HOME SCREEN menu. You can also wait about a minute before proceeding.
2. Hold down the Exp. Time switch and press the Select button at the same time. These buttons can be found at the front of the camcorder. The camcorder restarts.
3. After a few seconds the following message appears on the side panel display:

   ```
   DOWNLOAD MECHANISM ACTIVATED
   INSERT A USB STICK WITH A PACKAGE OR LICENSE FILE
   OR DOWNLOAD A PACKAGE OR LICENSE FILE USING FTP
   THEN PRESS [EXP. TIME -] AND [SELECT]
   OR PRESS [AUTO WHITE] TO RESTART CAMERA
   ```

4. Plug the USB-stick into the connector at the rear of the handgrip or into the USB connector at the right side of the camcorder. Wait a few seconds for the camcorder to detect the USB-stick.
5. Hold down the Exp. Time switch and press the Select button to start the update procedure. Press the Auto White switch at the front of the camcorder to cancel and restart the camcorder.
6. The camcorder searches for available update files. A flashing LED on the USB-stick indicates that the USB-stick is being accessed. The following message appears:

   ```
   LOOKING FOR PACKAGE OR A LICENSE FILE
   .......
   ```

7. When both a software package file and a license file are found in the root directory of the USB-stick, the following message appears:

   ```
   FOUND BOTH A LICENSE UPDATE FILE AND A
   PACKAGE UPDATE FILE.
   WHICH ONE WOULD YOU LIKE TO USE?
   PRESS [SELECT] FOR THE PACKAGE UPDATE FILE
   PRESS [EXP. TIME -] FOR THE LICENSE UPDATE FILE
   PRESS [AUTO WHITE] TO RESTART CAMERA
   ```

   Press the Select button to continue installing the software update or press the Auto White switch at the front of the camcorder to cancel the procedure and restart the camcorder.

   When a previous version of the package file exists in the internal memory, the camcorder makes a backup of this file on the USB-stick. The file is renamed to "backup_package.zip". The following message is shown:

   ```
   BACKING UP OLD PACKAGE
   ```

8. The software package file is being copied from the USB-stick to the internal memory of the camcorder. The following message appears:

   ```
   COPYING PACKAGE TO SYSTEM
   ```

☞ Note

When this message does not appear it indicates that no software package file could be found in the root directory of the USB-stick or that the filename is not "package.zip". You can cancel the update procedure by switching off the camcorder after the next message.

9. After a few seconds the following message appears:

   ```
   PACKAGE UPDATE TO PACKAGE ###
   PRESS [SELECT] FOR FULL UPDATE (## FILES)
   PRESS [EXP. TIME -] FOR INCREMENTAL UPDATE (## FILES)
   ```

☞ Note

Check the software update version. When it is not the correct version you can cancel the update procedure by switching off the camcorder.

   – When the software package file is corrupt the following message appears:

     ```
     ERROR OCCURED WHILE HANDLING NEW PACKAGE
     PACKAGE IS CORRUPT
     PRESS [SELECT] OR [EXP. TIME -] TO RESTART CAMERA
     ```

     Try downloading the file again and copy it to the USB-stick.

10. Press the **Select** button to do a full update or hold down the **Exp. Time** switch to do an incremental update of the camcorder software. An incremental update takes a few minutes and only updates files that are changed. A full update may take as long as 2 hours and overwrites all files. The number of files to be updated is shown for each choice.
11. After selecting the update procedure starts. The following progress information is shown on the side panel display (you can also monitor progress on the camera status display on top of the camcorder):

    ```
    SYSTEM UPDATING TO PACKAGE ###
    FILE: 1 OF ##
    PROGRESS: 22%
    ```

12. Wait for the update procedure to finish. Depending on the package contents and the method of updating this may take up to 2 hours. Do not interrupt power or switch off the camcorder during the update procedure.

☞ Note

During the update process the blue backlight of the camera continues to flash.

---

13. After the update procedure is finished the following message is shown:

    ```
    SYSTEM UPDATE COMPLETE...
    TOTAL NUMBER OF FILES: ##
    NUMBER OF FILES FAILED: 0
    NUMBER OF FILES SKIPPED:0

    PRESS [SELECT] OR [EXP. TIME -] TO RESTART CAMERA
    ```

14. Switch off the camcorder or press the **Select** button or hold down the **Exp. Time** switch to restart the camcorder. After restarting the camcorder is ready for use with the updated software.

☞ Note

Depending on the contents of the software package it may be necessary to carry out a black calibration after updating the software. If this is the case, it is indicated on the display. Refer to "Black calibration" on page 149 for more information about the black calibration procedure.

☞ Note

After restarting make sure to check your xposure settings. These may have changed due to operation of the **Exp. Time** switch during the update procedure.

14.2 Updating the license

14.2.1 Preparation

Some optional camcorder features need to be activated by updating the camcorder's internal license. The license update has the form of an XML file can be obtained from your Grass Valley representative.

Prepare the following before updating the license:

- Copy the file to the root directory of a USB-stick.
- Connect the camcorder to an external power supply or attach a fully charged battery to the camcorder.
- Remove all media from the camcorder and unplug all external devices. Lens, viewfinder and microphone may stay connected to the camcorder.

14.2.2 Update procedure

☞ Note

Do not interrupt power or switch off the camcorder during the update process.

Follow these steps to update the license of the camcorder:

1. Switch on the camcorder and wait for the system to start up.
2. Hold down the Exp. Time switch and press the Select button simultaneously. These buttons can be found at the front of the camcorder. The camcorder restarts.
3. After a few seconds the following message appears on the side panel display:

```
DOWNLOAD MECHANISM ACTIVATED
INSERT A USB STICK WITH A PACKAGE OR LICENSE FILE
OR DOWNLOAD A PACKAGE OR LICENSE FILE USING FTP
THEN PRESS [EXP. TIME -] AND [SELECT]
OR PRESS [AUTO WHITE] TO RESTART CAMERA
```

4. Plug the USB-stick into the connector at the rear of the handgrip or into the USB connector at the right side of the camcorder. Wait a few seconds for the camcorder to detect the USB-stick.
5. Hold down the Exp. Time switch and press the Select button to start the update procedure. Press the Auto White switch at the front of the camcorder to cancel and restart the camcorder.
6. The camcorder searches for available update files. The following message appears:

```
LOOKING FOR PACKAGE OR LICENSE
.......
```

7. When both a software package file and a license file are found in the root directory of the USB-stick, the following message appears:

```
FOUND BOTH A LICENSE UPDATE FILE AS A
PACKAGE UPDATE FILE.
WHICH ONE WOULD YOU LIKE TO USE?
PRESS [SELECT] FOR THE PACKAGE UPDATE FILE
PRESS [EXP. TIME -] FOR THE LICENSE UPDATE FILE
PRESS [AUTO WHITE] TO RESTART CAMERA
```

8. Hold down the Exp. Time switch to continue installing the new license file or press the Auto White switch at the front of the camcorder to cancel the procedure and restart the camcorder.
9. The camcorder's license file will be overwritten by the new license file. The following message is shown:

```
NEW LICENSE FILE HANDLED
LICENSE IS UPDATED

PRESS [SELECT] OR [EXP. TIME -] TO RESTART CAMERA
```

10. Press the Select button or hold down the Exp. Time switch to restart the camcorder. After starting up the camcorder is ready for use with the updated license.

14.3 Black calibration

After a software update it may be necessary to carry out a black calibration. This will be indicated by the camcorder. To do a black calibration follow these steps:

1. Switch on the camcorder and wait for the system to start up.

☞ Note

Make sure the **option** switch on the viewfinder is in the 'off'-position.

---

2. Go to the `SYSTEM/USER LVL` menu in the viewfinder menu and set the user level to 3.
3. Go to the `SYSTEM/BLACK CALIB` menu in the viewfinder menu and select Start. After confirmation the black calibration runs.
4. The camcorder switches off its fans and the unit starts heating up until temperature reaches 63 °C. This may take several minutes. The following message is shown in the viewfinder:

   ```
   BLACK CALIB
   WAIT FOR BLACK CALIB START
   ```

   The current calibration temperature is shown in the viewfinder.
5. When the temperature reaches 63 °C the black calibration is started and the following message is shown in the viewfinder:

   ```
   BLACK CALIBRATION IS RUNNING
   RUNNING
   ```

   The filterwheels run and internal system messages may appear in the viewfinder. These can be ignored.
6. After black calibration has finished the camcorder restarts and the fans are switched on.

14.4 Touch screen calibration

If the touch screen does not respond accurately to your taps you need to recalibrate the screen. To do this follow these steps:

1. In the viewfinder menu, go to the `SYSTEM/PIN CODE/ENTER PIN` menu and enter "0000" to set the user level to service level 1.
2. In the side panel menu, go to the **`SYSTEM/SIDEPANEL`** menu.
3. Tap the `CALIBRATION` button to start the touch screen calibration procedure.
4. Follow the instructions on the screen.

☞ Note

When the touch screen cannot be used due to misalignment, push and hold the Home push button on the side panel display for five seconds. The calibration settings will be reset to their factory defaults. After resetting, perform the touch screen calibration procedure.

14.5 Cleaning the touch screen

☞ Note

Always turn off the camcorder before cleaning the touch screen.

Use a soft and dry cloth (preferably microfiber tissue) to clean the surface of the touch screen. Wipe gently and do not apply strong pressure as this may damage the screen.

14.6 Troubleshooting

Symptom	Cause	Solution
No on-screen indicators or information visible in the viewfinder.	Option (hide) switch on the viewfinder is in the ON position.	Set the Option (hide) switch to the OFF position.
Internal clock is reset to 00:00:00 after startup.	Built-in battery is exhausted.	Contact your Grass Valley service contact to have the battery replaced.