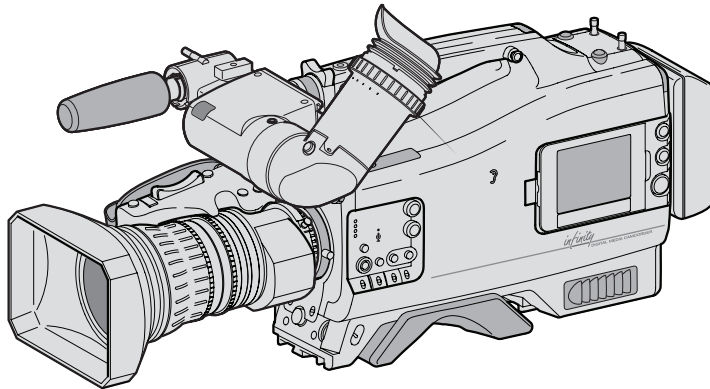


## User's Guide

3922 496 30601 August 2009 v3.0



## DMC 1000

Infinity Digital Media Camcorder

(software v12.3)

---

## Declaration of Conformity

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

- EN60065 : Safety
- EN55103-1: EMC (Emission)
- EN55103-2: EMC (Immunity)

following the provisions of:

- a. the 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.

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[www.grassvalley.com](http://www.grassvalley.com)

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# Table of contents

## Chapter 1 – Introduction

1.1	About this guide	13
1.2	Technology	13
1.2.1	Xensium™ imager	14
1.2.2	Advanced camcorder technology	14
1.2.3	IT-based recording media	14
1.2.4	On-board selectable compression	14
1.2.5	Ultimate connectivity	15
1.2.6	User interface	15
1.2.7	Enhancing your workflows	15
1.3	Key features	16
1.4	Infinity type numbers	17
1.5	Quick reference	18
1.6	About this user's guide	22

## Chapter 2 – Attaching parts

2.1	Mounting a lens	25
2.2	Viewfinder (2-inch)	26
2.2.1	Mounting the viewfinder	26
2.2.2	Positioning the viewfinder	27
2.2.3	Mounting a wide angle eyepiece	27
2.3	Mounting a microphone	28
2.4	Attaching a battery	29
2.5	Adjusting the shoulder pad	30
2.6	Attaching a carrying strap	30
2.7	Mounting a top light	31
2.8	Wireless microphone receiver	32
2.9	Tripod adapter plate	33
2.10	Anchoring the camcorder	34

## Chapter 3 – General set-up

3.1	Power supply	35
3.1.1	Battery supply	35
3.1.2	External power	36
3.1.3	Power switch	37
3.2	Using the side panel display	38
3.3	Push buttons	39
3.4	Assignable buttons	40
3.4.1	Operation panel	40
3.4.2	Lens	40
3.4.3	Carrying handle	41
3.5	Lens settings	41

<b>3.6</b>	<b>Viewfinder</b> .....	<b>42</b>
3.6.1	Viewfinder set-up .....	42
3.6.2	Viewfinder markers .....	43
3.6.3	Viewfinder LED indicators .....	43
3.6.4	Viewfinder on-screen display .....	45
<b>3.7</b>	<b>Side panel home screen</b> .....	<b>46</b>
3.7.1	Overview .....	46
3.7.2	Indicators .....	47
<b>3.8</b>	<b>Camera status display</b> .....	<b>49</b>
<b>3.9</b>	<b>Lights and indicators</b> .....	<b>50</b>
3.9.1	Tally indicators .....	50
3.9.2	Media indicators .....	50
<b>3.10</b>	<b>Playback indicators</b> .....	<b>50</b>
<b>3.11</b>	<b>Monitoring</b> .....	<b>51</b>
3.11.1	Video monitoring .....	51
3.11.2	External SDI signal monitoring .....	51
3.11.3	Audio monitoring .....	52
<b>3.12</b>	<b>Time and date settings</b> .....	<b>52</b>

## Chapter 4 – Menu navigation

<b>4.1</b>	<b>Menu navigation</b> .....	<b>53</b>
<b>4.2</b>	<b>User levels</b> .....	<b>54</b>
<b>4.3</b>	<b>Side panel menu</b> .....	<b>55</b>
4.3.1	Home screen .....	55
4.3.2	Side panel menus .....	55
4.3.3	Function buttons .....	56
4.3.4	Menu structure .....	57
<b>4.4</b>	<b>Viewfinder menu</b> .....	<b>59</b>
4.4.1	Viewfinder menu structure .....	59
4.4.2	Entering the viewfinder menu system .....	60
4.4.3	Finding your way .....	60
4.4.4	Leaving the viewfinder menu system .....	61
4.4.5	Making changes .....	61
4.4.6	Undoing changes .....	61
<b>4.5</b>	<b>User files</b> .....	<b>62</b>
4.5.1	Scene files .....	62
4.5.2	Production files .....	62
4.5.3	Lens files .....	62
4.5.4	Operator files .....	62

## Chapter 5 – Video setup

<b>5.1</b>	<b>Input and output connectors</b> .....	<b>63</b>
5.1.1	Digital connectors .....	64
5.1.2	Analog connectors .....	65
<b>5.2</b>	<b>Colour bars</b> .....	<b>66</b>
<b>5.3</b>	<b>Standard video settings</b> .....	<b>67</b>
<b>5.4</b>	<b>Gain selection</b> .....	<b>68</b>
<b>5.5</b>	<b>Working with optical filters</b> .....	<b>69</b>

<b>5.6</b>	<b>Colour temperature</b> .....	<b>70</b>
5.6.1	Presets .....	70
5.6.2	Memory positions .....	70
5.6.3	Continuous white balance .....	70
5.6.4	Selecting the color temperature .....	71
<b>5.7</b>	<b>Auto white balance</b> .....	<b>72</b>
<b>5.8</b>	<b>Exposure time</b> .....	<b>74</b>
<b>5.9</b>	<b>Contrast button</b> .....	<b>75</b>
<b>5.10</b>	<b>Video menu adjustments</b> .....	<b>76</b>
5.10.1	Detail .....	76
5.10.2	Skin detail .....	77
5.10.3	Knee .....	78
5.10.4	Gamma .....	78
5.10.5	Matrix .....	79
5.10.6	Color saturation .....	79

## Chapter 6 – Audio setup

<b>6.1</b>	<b>Introduction</b> .....	<b>81</b>
<b>6.2</b>	<b>Inputs</b> .....	<b>82</b>
6.2.1	Front microphone .....	83
6.2.2	Rear line or microphone inputs .....	83
6.2.3	Digital audio sources .....	83
6.2.4	Wireless microphone (optional) .....	83
6.2.5	Audio mixer .....	83
6.2.6	Gain settings .....	84
<b>6.3</b>	<b>Recording audio</b> .....	<b>84</b>
6.3.1	Select source .....	84
6.3.2	Set recording levels .....	85
<b>6.4</b>	<b>Audio monitoring</b> .....	<b>87</b>
<b>6.5</b>	<b>Outputs</b> .....	<b>88</b>
6.5.1	Rear outputs .....	88
6.5.2	Digital audio outputs .....	89
6.5.3	SDI embedded audio .....	89
<b>6.6</b>	<b>General audio settings</b> .....	<b>89</b>
6.6.1	Audio Headroom .....	89
6.6.2	Test tone .....	89
<b>6.7</b>	<b>Intercom</b> .....	<b>90</b>
6.7.1	Audio connection .....	90
6.7.2	Intercom channels .....	90
6.7.3	Talk buttons .....	90
6.7.4	Call .....	91
6.7.5	Return channels .....	91
6.7.6	Incoming channels .....	91
6.7.7	Intercom routing .....	92

## Chapter 7 – Recording setup

<b>7.1</b>	<b>Main format settings</b> .....	<b>93</b>
7.1.1	Video standard .....	93
7.1.2	Recording compression .....	94
7.1.3	Recording from external video sources .....	95
<b>7.2</b>	<b>Time code settings</b> .....	<b>95</b>
<b>7.3</b>	<b>Genlock</b> .....	<b>96</b>

7.4	Recording buffer	96
7.5	Recording media	97
7.5.1	REV PRO media	97
7.5.2	CompactFlash cards	99
7.5.3	External USB media	99
7.6	Systemized configurations	100
7.6.1	Introduction	100
7.6.2	Network setup	101
7.6.3	User level	101
7.6.4	Intercom	101
7.6.5	Remote Tally and ISO recording	101
7.6.6	Remote recording	102

## Chapter 8 – Shooting

8.1	Getting a picture	103
8.1.1	Viewfinder	103
8.1.2	Recall standard video values	103
8.1.3	Exposure	103
8.1.4	Video adjustments	104
8.1.5	Audio adjustments	104
8.1.6	Frame and focus	104
8.2	Recording	105
8.2.1	Start recording	105
8.2.2	Stop recording	105
8.3	Quick review	106

## Chapter 9 – Clip management

9.1	Thumbnails	107
9.1.1	Overview	107
9.1.2	Thumbnail information	108
9.2	Playback	109
9.2.1	Playback monitor	109
9.2.2	Transport buttons	109
9.2.3	Menu button	110

## Chapter 10 – Communications

10.1	Setting up communication	111
10.2	USB connection	111
10.3	Ethernet connection	112
10.4	IEEE 1394 connection	112
10.5	FTP connection	113

## Chapter 11 – Specifications

11.1	Specifications for DMC 1000	115
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<b>11.2</b>	<b>Connectors</b> .....	<b>117</b>
11.2.1	Audio input connectors (Rear1 and Rear2) .....	117
11.2.2	Audio output connector .....	117
11.2.3	Front microphone connector (Front1) .....	117
11.2.4	Front microphone connector (Front1 and Front2) .....	117
11.2.5	Headphones output .....	118
11.2.6	Headset microphone input (MicRear) .....	118
11.2.7	Power input connector (DC in) .....	118
11.2.8	Accessory output connector .....	118
<b>11.3</b>	<b>Dimensions</b> .....	<b>119</b>
<b>11.4</b>	<b>Compression profiles</b> .....	<b>120</b>
11.4.1	JPEG 2000 profiles .....	120
11.4.2	DV25 .....	120
11.4.3	1080P JPEG 2000 profiles .....	121
11.4.4	MPEG-2 I-frame .....	121
11.4.5	1080P MPEG-2 I-frame .....	122
11.4.6	MPEG-2 D10 .....	122
11.4.7	1080P MPEG-2 Long GoP (closed GoP) .....	123
11.4.8	1080i MPEG-2 Long GoP (closed GoP) .....	123
11.4.9	720P MPEG-2 Long GoP (closed GoP) .....	124

## Chapter 12 – Side panel menu

12.1	Audio menu .....	125
12.2	Video menu .....	131
12.3	Setup menu .....	136
12.4	System menu .....	138

## Chapter 13 – Viewfinder menu

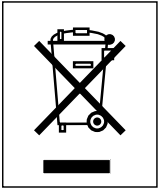
13.1	VF menu .....	143
13.2	Video menu .....	146
13.3	Setup menu .....	151
13.4	Audio menu .....	153
13.5	System menu .....	159

## Chapter 14 – Maintenance

14.1	Updating software .....	165
14.1.1	Preparation .....	165
14.1.2	Update procedure .....	166
14.2	Licenses .....	168
14.2.1	Obtaining a license .....	168
14.2.2	Installation .....	169
14.3	Black calibration .....	170
14.4	Touch screen calibration .....	172
14.5	Cleaning the touch screen .....	172
14.6	Messages .....	172
14.7	Troubleshooting .....	174

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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.grassvalley.com/environment](http://www.grassvalley.com/environment)

### Software licenses for this product

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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](http://www.thomson.net/open-software).

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## 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. Do not cover air vents with stickers or attachments.



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



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.

### Internal 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-frequency 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 when not using it.

### 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 About this guide

The purpose of this user's guide is to present a detailed functional description of the Infinity DMC 1000 camcorder. It provides the necessary information to use the camcorder in different configurations and in various workflows. The guide is so designed that it can be used as an introduction to those who are new to the camcorder, as a simple procedural guide to those who wish to setup and start shooting immediately, and as a reference work.



#### Note

This user's guide describes the functionality of the camcorder based on software v12.3. When your camcorder is not updated to this version, refer to section 14.1 on page 165 for information about updating your camcorder.

---

### 1.2 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 Infinity Series line of products — designed from the ground up to bring all the benefits of advanced technologies to the broadcast and production industries. This line represents the current and future approach to acquisition and recording, delivering affordable, open and truly flexible systems.

- HD/SD multi-format support including 1080i50/59.94, 1080p23.98/25/29.97 (optional), 720p50/59.94, 576i50 and 480i59.94.
- Flexible video encoding/decoding options, including JPEG2000, DV and MPEG-2 and D10 (optional).
- Choice of removable recording/playback media including integrated 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.

### 1.2.1 Xensium™ imager

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

The imaging chips are 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.

### 1.2.2 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, 720p59.94. Additionally, video formats 1080p23.98, 1080p25, 1080p29.97 are available as a cost-option. 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.

### 1.2.3 IT-based recording media

The Infinity Digital Media Camcorder uses 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 commercially 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 32 GB with sufficient throughput for both SD and HD recording, playback and ingest.

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

### 1.2.4 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 in the future. The Infinity Digital Media Camcorder supports JPEG2000, DV and D10 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 compression can be used for both SD and HD acquisition. It provides high-efficiency compression, 10-bit 4:2:2 encoding 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, including I-frame and Long GoP.

### 1.2.5 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. The Gigabit Ethernet port provides compatibility with the C2IP camera control system.

### 1.2.6 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 wireless 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 low latency, lets you make critical adjustments to e.g. audio parameters. You can create and edit metadata such as names, dates, slugs, locations and even camera settings before, during or after recording.

### 1.2.7 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 and low cost.

## 1.3 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
- Optional 1080p23.98, 1080p25, 1080p29.97 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 and D10 compression (requires DMC 1120 MPEG-2 compression 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

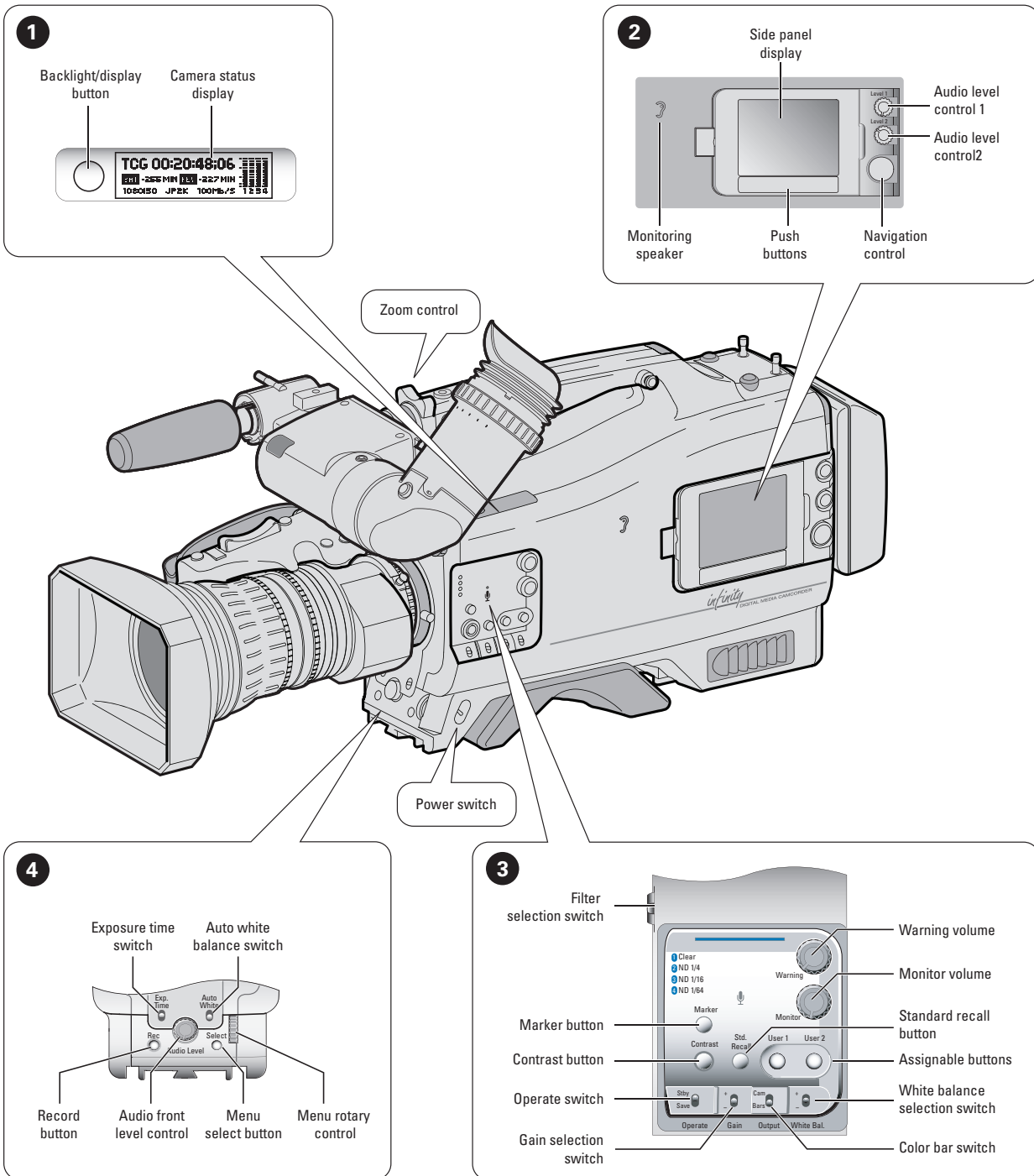


## 1.4 Infinity type numbers

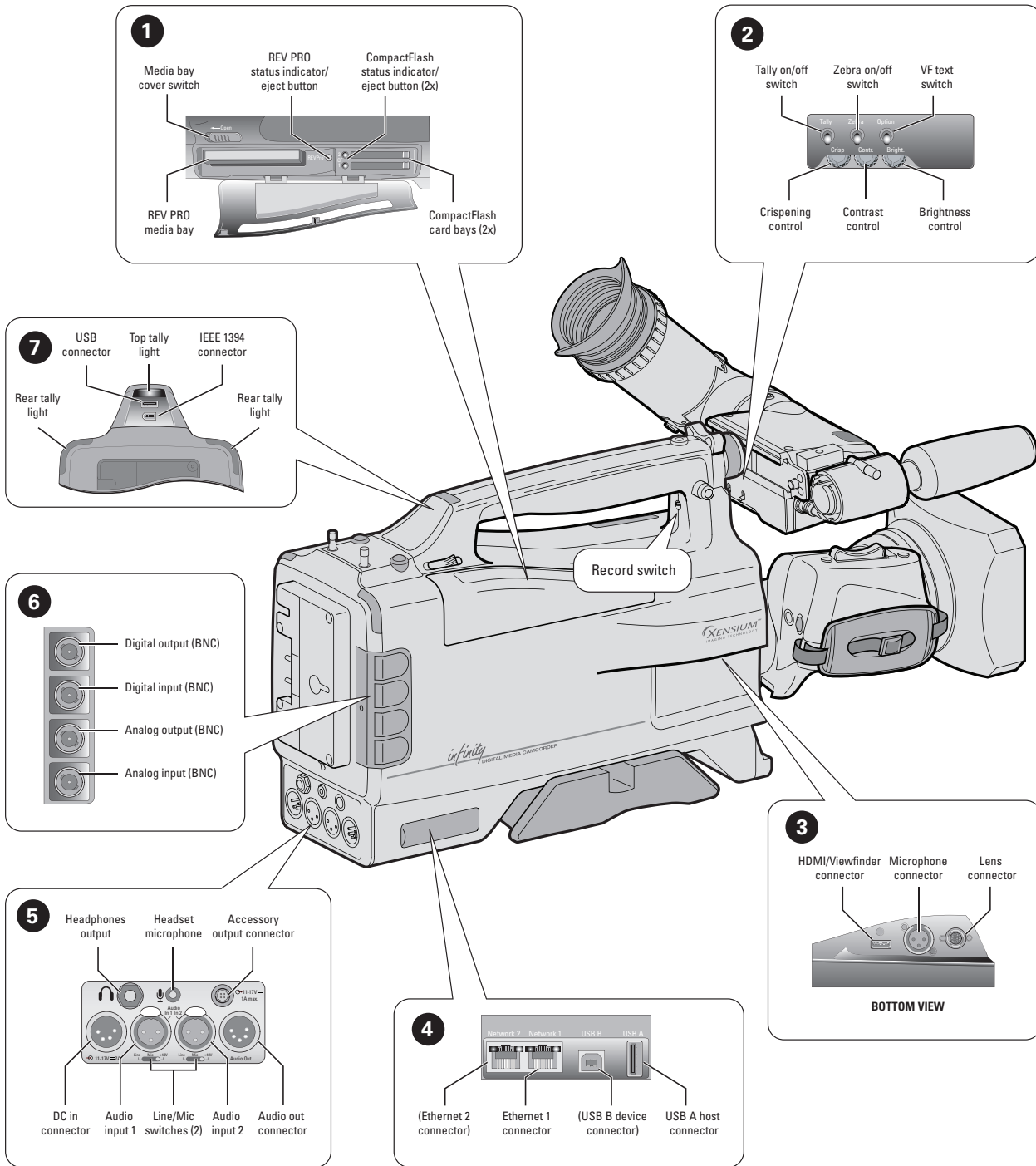
Type number	Unit
<b>Camcorder:</b>	
DMC 1000/10	Infinity Digital Media Camcorder (with REV PRO 35 drive)
DMC 1000/20	Infinity Digital Media Camcorder (with REV PRO XP/ER drive)
DMC 1100	Infinity 2-inch CRT black and white HD viewfinder
<b>Options:</b>	
DMC 1120	Infinity DMC MPEG-2 HD/SD compression board (kit)
DMC 1130	Infinity DMC 1080P 24/25/30 video modes option (license)
DMC 1180	Infinity DMC Stereo front microphone connector option (kit)
<b>Accessories:</b>	
LCP 400	Wireless Local Control Panel (application)
OCP 400/10	Operational Control Panel
AJ-MC700	Standard mono front microphone (kit)
LDK 5020/05	Universal transport case
LDK 5020/60	Infinity DMC carrying bag
LDK 5020/70	Infinity DMC camera glove
LDK 5022	Infinity DMC raincover
LDK 5031/10	Tripod adapter plate
LDK 5390	Wide angle eyepiece for 2-inch viewfinder
LDK 5391	Long eyepiece ocular for 2-inch viewfinder
LDK 5901	External power supply unit (100 W)

## 1.5 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
1	Backlight / Display button	"Lights and indicators" on page 50
	Camera Status Display (CSD)	"Side panel home screen" on page 46
2	Monitoring speaker	"Monitoring" on page 51
	Side Panel Display (SPD)	"Side panel home screen" on page 46
	Audio level 1 control	"Recording audio" on page 84
	Audio level 2 control	"Recording audio" on page 84
	Navigation control	"Side panel menu" on page 55
	Push buttons	"Push buttons" on page 39
3	Filter selection switch	"Working with optical filters" on page 69
	Warning volume control	(future use)
	Monitor volume control	"Monitoring" on page 51
	Standard recall button	"Standard video settings" on page 67
	Assignable buttons (User 1 and User 2)	"Assignable buttons" on page 40
	White balance selection switch	"Auto white balance" on page 72
	color bar switch	"Colour bars" on page 66
	Gain selection switch	"Gain selection" on page 68
	Operate switch	(future use)
	Contrast button	"Viewfinder" on page 42
	Marker button	(future use)
	Filter selection switch	"Working with optical filters" on page 69
	4	Exposure time switch
Auto white balance switch		"Auto white balance" on page 72
Menu rotary control		"Viewfinder menu" on page 59
Menu select button		"Viewfinder menu" on page 59
Audio front level control		"Recording audio" on page 84
Record button		"Recording" on page 105
	Power switch	"Power supply" on page 35
	Zoom control	"Carrying handle" on page 41



	Control name	Paragraph reference
1	Media bay cover switch	"Recording media" on page 97
	REV PRO eject button / status indicator	"Recording media" on page 97
	CompactFlash eject button / status indicator	"Recording media" on page 97
	CompactFlash card bays	"Recording media" on page 97
	REV PRO media bay	"Recording media" on page 97
2	Tally on/off switch	"Lights and indicators" on page 50
	Zebra on/off switch	"Viewfinder" on page 42
	VF text switch	"Viewfinder" on page 42
	Brightness control	"Viewfinder" on page 42
	Contrast button	"Contrast button" on page 75
	Crispening control	"Viewfinder" on page 42
3	Viewfinder connector	"Viewfinder (2-inch)" on page 26
	Front microphone connector	"Mounting a microphone" on page 28
	Lens connector	"Mounting a lens" on page 25
4	Ethernet 2 connector	(future use)
	Ethernet 1 connector	"USB connection" on page 111
	USB (B) device connector	(future use)
	USB (A) host connector	"USB connection" on page 111
5	Headphones output	"Audio monitoring" on page 87
	Headset microphone (MicRear)	"Audio monitoring" on page 87
	Accessory output connector	"Power supply" on page 35
	DC in connector	"Power supply" on page 35
	Audio input 1	"Inputs" on page 82
	Audio input 2	"Inputs" on page 82
	Mic/Line switches (2)	"Inputs" on page 82
	Audio out connector	"Outputs" on page 88
6	Digital output BNC connector	"Input and output connectors" on page 63
	Digital input BNC connector	"Input and output connectors" on page 63
	Analog output BNC connector	"Input and output connectors" on page 63
	Analog input BNC connector	"Input and output connectors" on page 63
7	USB host connector	"USB connection" on page 111
	Top tally light	"Lights and indicators" on page 50
	IEEE 1394 connector	"IEEE 1394 connection" on page 112
	Rear tally lights	"Lights and indicators" on page 50
	Record switch	"Recording" on page 105

## 1.6 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 - Side panel menu**

Shows reference tables to all functions of the side panel menu system of the camcorder.

### **Chapter 13 - Viewfinder menu**

Shows reference tables to all functions of the viewfinder menu system of the camcorder.

### **Chapter 14 - Maintenance**

Information on updating software, installing licenses and maintaining the camcorder.







# Chapter 2

## Attaching parts

### 2.1 Mounting a lens

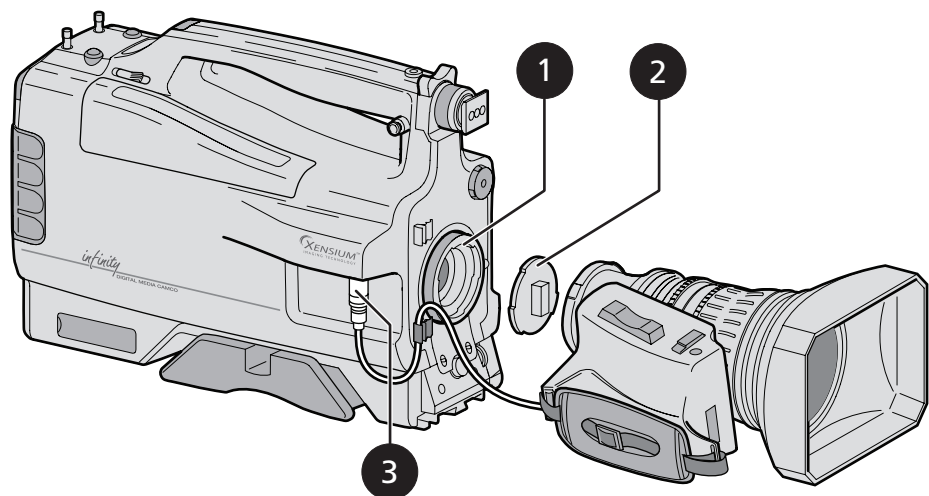
Attach a lens to the camcorder as follows:



#### Caution

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

1. Ensure that the lens locking ring **1** is in the unlocked position - turned counterclockwise as seen from camcorder front.
2. Remove dust protection cap **2**.
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 **1** clockwise to lock the lens in place.
5. Connect the lens cable to the lens connector **3** 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. Also refer to the "Lens settings" on page 41 to change the camcorder's lens settings.



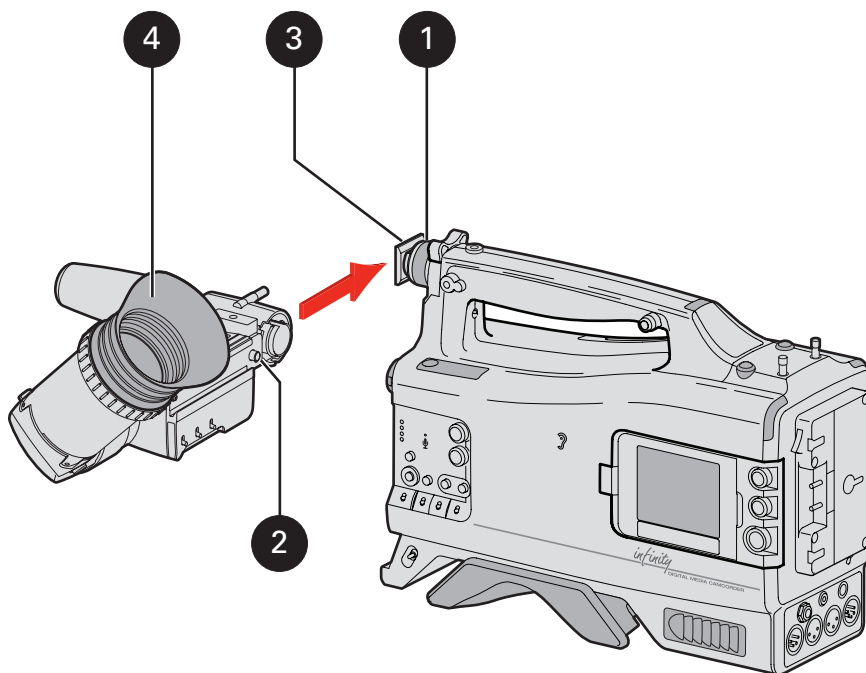
#### Note

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

## 2.2 Viewfinder (2-inch)

### 2.2.1 Mounting the viewfinder

1. Loosen the locking ring **1** at front of the camcorder handle.
  - As seen from camcorder rear, turning the locking ring counterclockwise loosens it.
2. Push down retaining stud **2** and slide the viewfinder onto the support bracket **3**.
3. Tighten the locking ring **1** 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.



Hint: for improved comfort, fit the supplied eyepiece cover over the rubber eyepiece **4**. Spare eye piece covers (3922 405 00461) are available from your Grass Valley representative.

## 2.2.2 Positioning the viewfinder

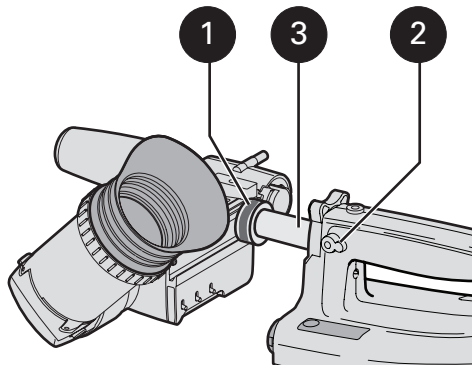
### Lateral position

1. Loosen the locking ring **1**. 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 **1** by turning it clockwise.

### Forward position

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

1. Loosen locking lever **2** and move viewfinder support bar **3** forwards or backwards to suit your needs.
2. Tighten locking lever **2**.

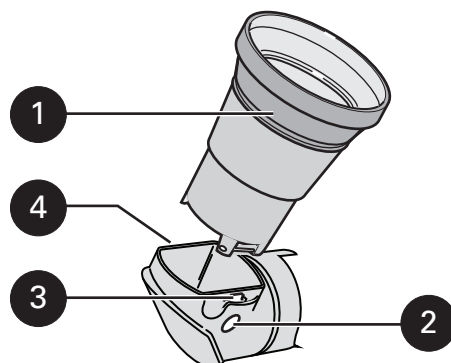


## 2.2.3 Mounting a wide angle eyepiece

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:

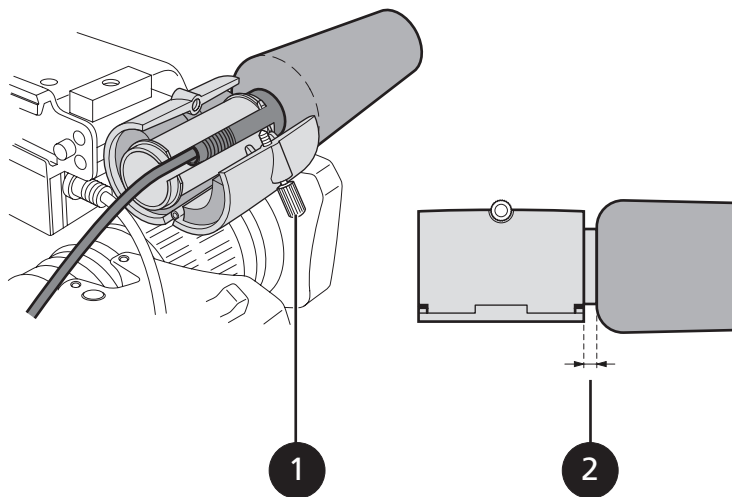
1. Hold the viewfinder's eyepiece securely.
2. Press the button **2** below the eyepiece tube and swing it free of the button clip **3**.
3. Press the button **4** above the eyepiece tube and remove the eyepiece.
4. Fit the wide angle eyepiece **1** to the two clips **3** ensuring that they both click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



## 2.3 Mounting a microphone

To attach a microphone to the camcorder proceed as follows:

1. Unscrew the knurled screw **1** 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 **2** as this reduces the mechanical damping effect.
4. Close the holder and tighten the knurled screw **1**.
5. Connect the microphone XLR cable to the camcorder's **MIC** audio connector on the right side of the camcorder.
  - The camcorder's 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. Active microphones have a typical sensitivity of +20dB.
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.

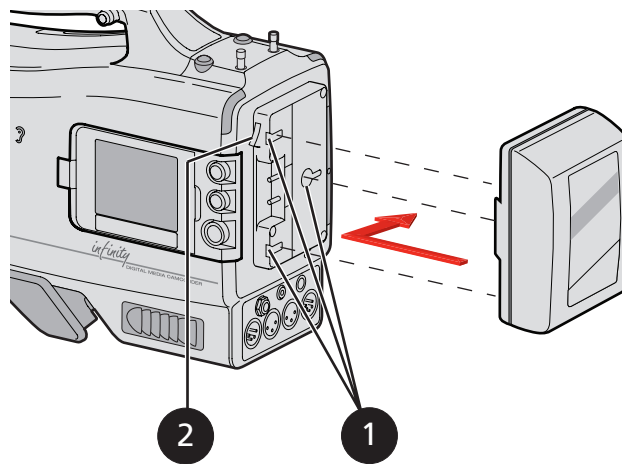


## 2.4 Attaching a battery

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

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

1. Insert the studs of the battery into the corresponding keyhole slots **1** located at the back of the plate.
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 **2** and unclip the battery by sliding it to the left.

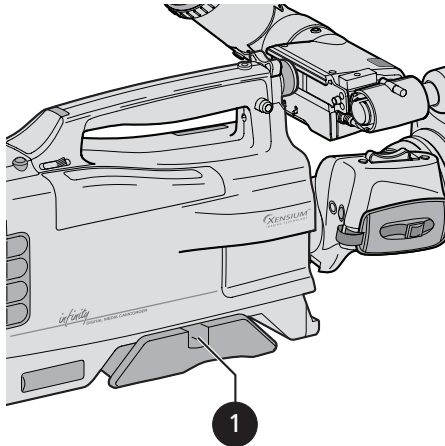


### Note

Different plates are optionally available for different battery types.

## 2.5 Adjusting the shoulder pad

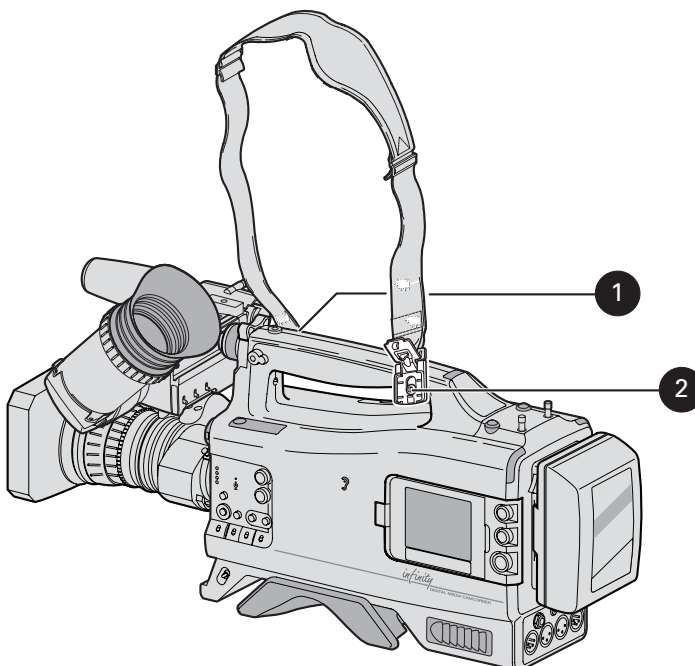
1. Press and hold lever **1** to change the position of the shoulder pad.
  - The shoulder pad can now be moved backwards and forwards along the axis of the camcorder.
2. Adjust the shoulder pad when all attachments and accessories are mounted to obtain the best balance when used on your shoulder.



## 2.6 Attaching a carrying strap

Attach the shoulder strap so that the deeper curve of the strap **1** is next to your neck when you are carrying the camcorder.

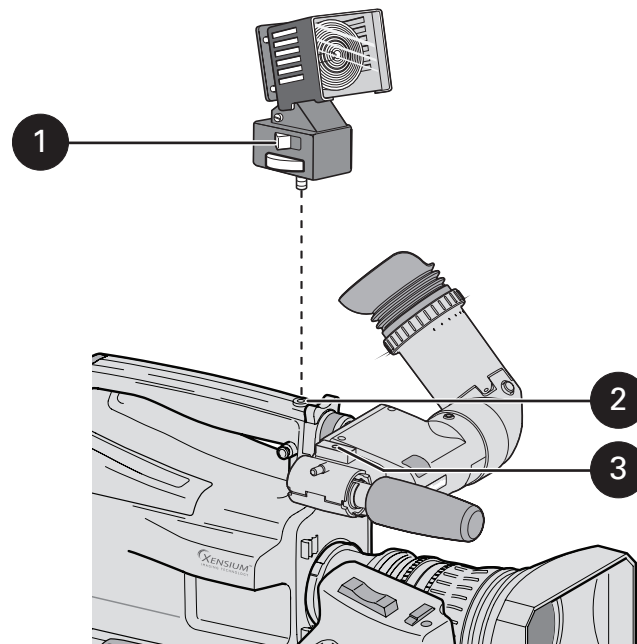
1. Connect the shoulder strap to the studs **2** on either side of the carrying handle.
2. Close the clips and ensure they are locked.



## 2.7 Mounting a top light

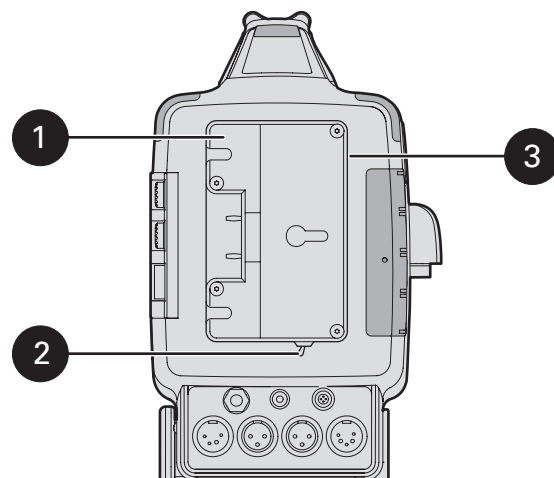
To mount a top light onto the camcorder, proceed as follows:

1. Screw the top light **1** into the screw hole located on the top of the carrying handle **2** or on top of the viewfinder **3**.
2. Power the top light according to the instructions delivered with the light.



### Top light operation

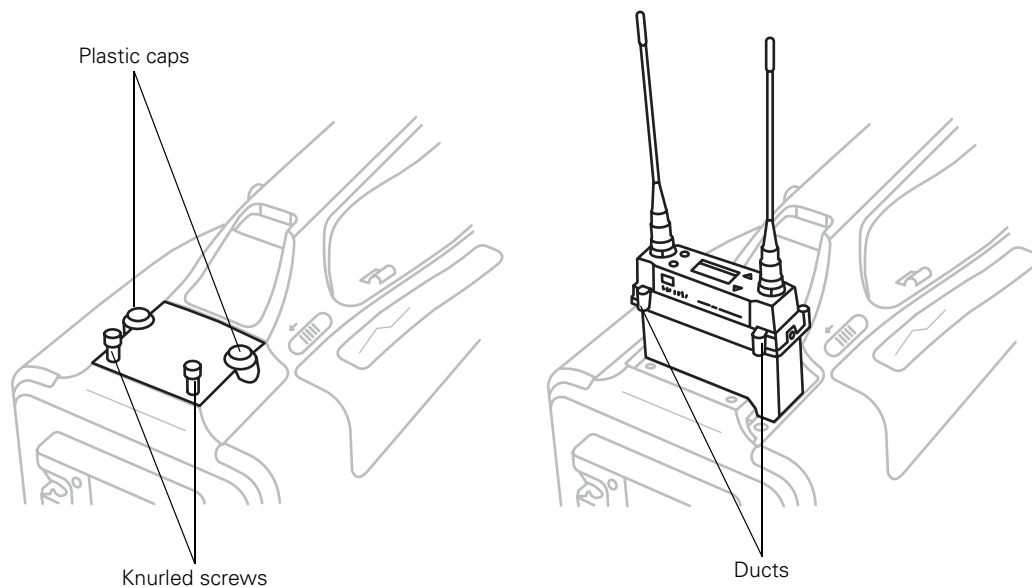
A connector **3** at the top right of the battery plate **1** supplies power for an optional top light. The top light can be switched on manually with the switch on the light or automatically when the camcorder is recording. Use the switch **2** at the bottom of the battery plate to select between manual 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. If needed, 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 head. 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.

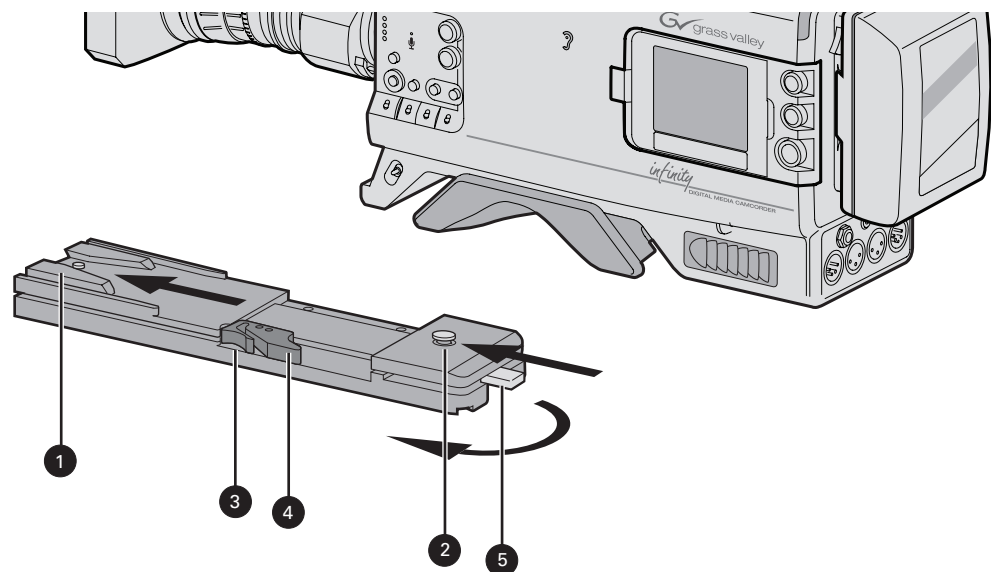
Attach the camcorder to the tripod adapter plate as follows:

1. Open the locking lever **5** by swinging it to the right.
2. Slide the camcorder horizontally along the tripod adapter plate from back to front ensuring that the front of the camcorder engages the V-slot **1** at the front of the tripod adapter plate, and that the slot on the bottom of the camcorder engages the round stud **2** at the rear of the tripod adapter plate.
3. Firmly push the camcorder forward until it clicks into place.
4. When the camcorder is mounted firmly, swing the locking lever **5** around to the rear of the plate to the left until it locks the camcorder.



### Caution

Failure to attach the camcorder to the adapter plate correctly will result in an unsecured camcorder. Ensure that the rear stud **2** is engaged and that the camcorder clicks into place.



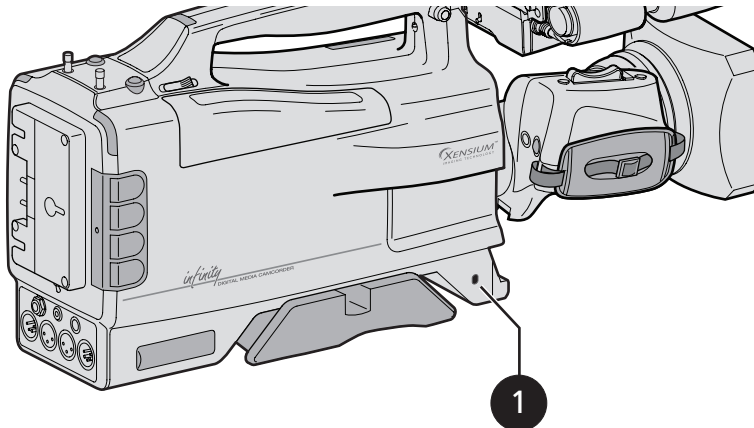
Remove the camcorder from the tripod as follows:

1. Open the locking lever **5** by swinging it to the right.
2. Press the red locking lever **3** against the release handle **4** and hold.
3. Ensure that you have a firm hold of the camcorder.
4. Pull the release handle **4** forward.
5. Move the camcorder backwards and up.
  - The camcorder is now free of the tripod adapter plate.

## 2.10 Anchoring the camcorder

The DMC 1000 is equipped with a security slot anchoring point **1** to fit an anti-theft device. These devices normally consist of a plastic-coated steel cable with a lock. Attach the device as follows:

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 **1** and lock it with the supplied key.



### Note

Grass Valley does not assume any responsibility for the security of your camcorder. The anchor point is only an aid to help you protecting your camcorder.

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# Chapter 3

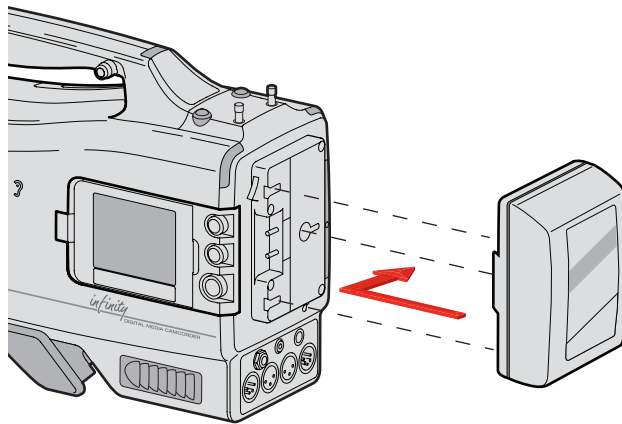
## General set-up

### 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

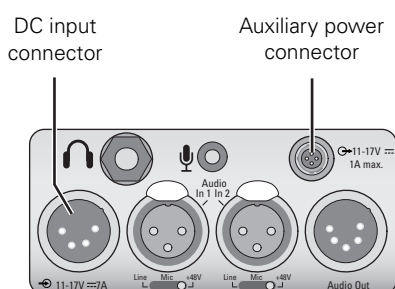
#### DC input supply

To power the camcorder from an 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 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 that is protected against reverse current.

#### Auxiliary power connector

This connector provides a supply voltage of 11 to 17 VDC 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.



#### Tip

Use the auxiliary output to power an HDMI external video display.

### 3.1.3 Power switch

#### Switch on

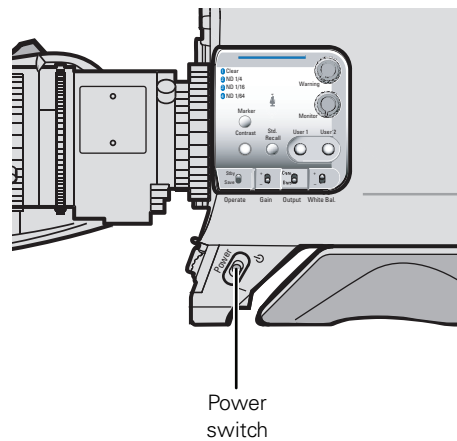
Set the power switch of the camcorder to the **I** position.

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

#### Switch off

To switch off the camcorder, set the power switch to the **⏻** position.

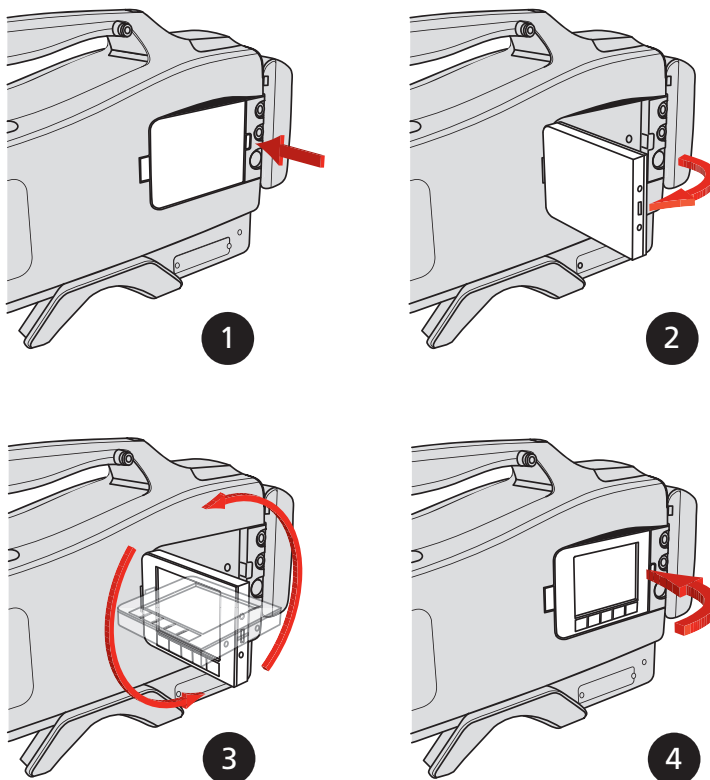
- Allow a few seconds for the camcorder to shut down. The camcorder may continue to write buffered video data to the recording media. During this time the blue backlight of the camcorder status display flashes. Wait until this process is completely finished before removing or disconnecting the power source.



## 3.2 Using 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 the small latch at the back of the panel.
  - The panel will come out a bit.
2. Swing out the panel so that it is perpendicular to the camcorder.
3. Rotate the screen 180° counterclockwise.
  - Rotation of more than 120° around the horizontal axis results in a picture flip around horizontal axis.
4. Swing the panel back into its recess in the camcorder.
  - You can leave the panel in position 2 or 3 to view live video from a distance.



The side panel display provides controls to access the user interface and camcorder menu system. 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.

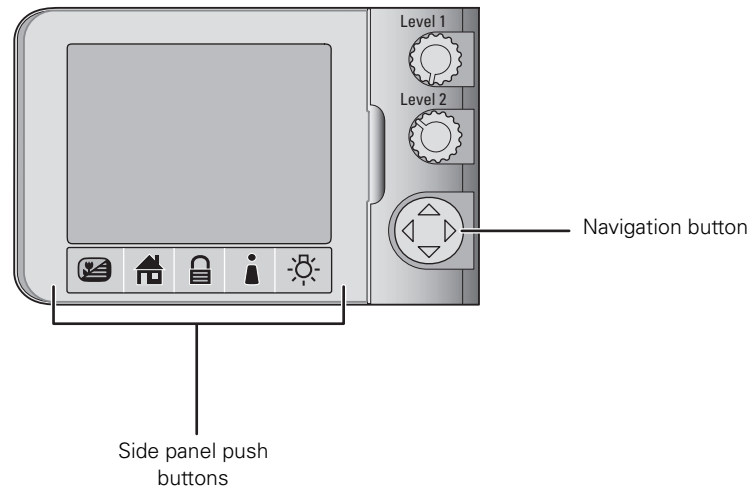
The side panel display allows direct interaction with menu controls shown on the screen. The touch screen is designed to work with a finger or other soft objects. The screen is sensitive to a single pressure location only, so only one touch surface control can be adjusted at a time.



### 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.



### 3.3 Push buttons

The push buttons below the side panel display have the following functions:


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

## 3.4 Assignable buttons

There are several assignable buttons on the camcorder:

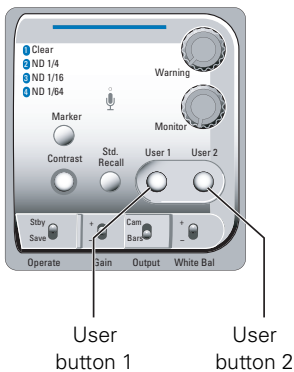
- user buttons 1 and 2 on the control panel,
- the RET button on the lens,
- the zoom and record switch on the handgrip.

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

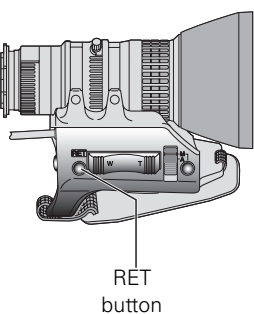
 **Note**

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

### 3.4.1 Operation panel

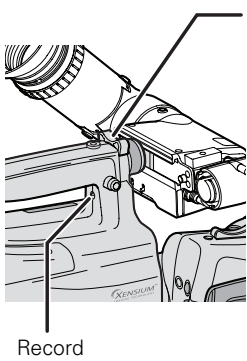
Location	Control	Possible assignments
	User button 1 and user button 2	<ul style="list-style-type: none"> <li>• <b>Disable (default)</b></li> <li>• Ext Iris</li> <li>• Mark out</li> <li>• Mark in</li> <li>• Record</li> <li>• Forward</li> <li>• Rewind</li> <li>• Pause play</li> <li>• Stop play</li> <li>• Start play</li> </ul>

### 3.4.2 Lens

Location	Control	Possible assignments
	RET button	<ul style="list-style-type: none"> <li>• <b>Playback (default)</b></li> <li>• Ext. signal</li> </ul> <p>The playback function shows the last 5 seconds of the last recorded clip.</p> <p>The Ext. signal function displays the external SDI or HD-SDI video signal.</p> <p>Note: the location of the RET button can vary depending on the type and make of your lens.</p>



### 3.4.3 Carrying handle

Location	Control	Possible assignments
 <p>The diagram shows a close-up of the camcorder's carrying handle. A line labeled 'Zoom' points to a small wheel on the lens barrel. Another line labeled 'Record' points to a button on the handle.</p>	Zoom control (only available with digital lenses)	<ul style="list-style-type: none"> <li>• Disabled - default</li> <li>• Enabled</li> </ul>
	Record switch	<ul style="list-style-type: none"> <li>• Disabled - default</li> <li>• Enabled</li> </ul>

## 3.5 Lens settings

### Back focus

When you first connect a lens to the camcorder you need to check and, if necessary, 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 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.

### Lens interface

When using a lens with a digital interface, make sure that the lens interface is set to digital. Zoom control is only enabled when the lens interface is set to digital.

### 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 when the camcorder's ND filter is selected.

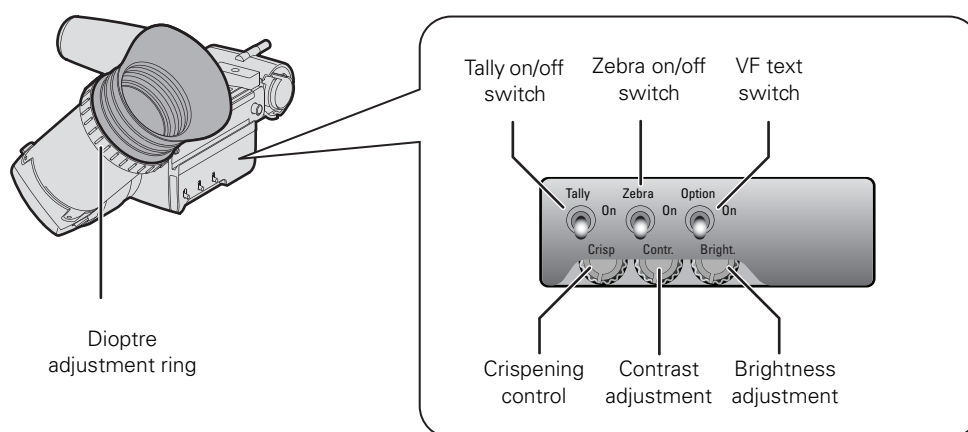
The **Iris** indicator in the viewfinder shows the value of the iris opening (when enabled in the **VF** submenu of the viewfinder menu).

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.

## 3.6 Viewfinder

### 3.6.1 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 or sawtooth 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 add sharpness to 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 moving line pattern indicates that the area of the picture has a video level that is within a specific range. 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.

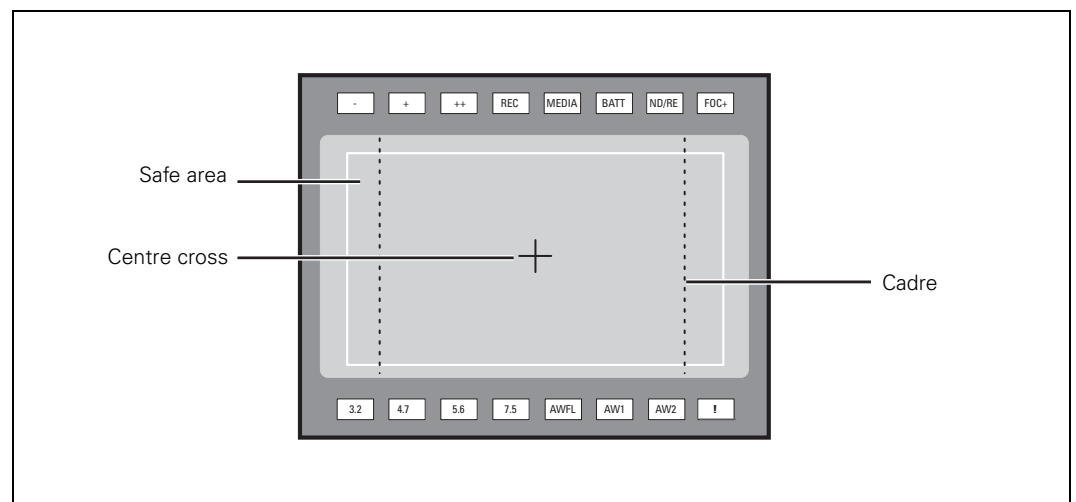
#### VF text switch

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

### 3.6.2 Viewfinder markers

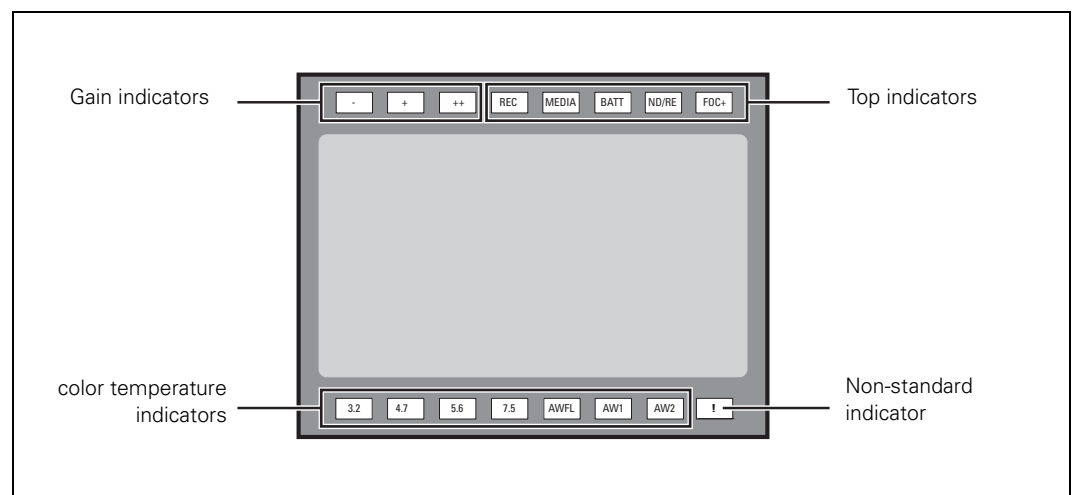
Go to the **VF** menu to select the markers you wish to see in the viewfinder. The following markers can be set up:

- 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.

### 3.6.3 Viewfinder LED indicators



### Gain indicators

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

Indicator	Function
-	Gain is - (-6dB or <b>-3dB</b> )
+	Gain is + (3dB, <b>6dB</b> , 9dB, 12dB, 15dB or 18dB)
++	Gain is ++ (6dB, <b>9dB</b> , 12dB, 15dB, 18dB or 24dB)
+ and ++	Gain is +++ (9dB, 12dB, 15dB, 18dB, 24dB, <b>30dB</b> , 36dB or 42dB)

### Top indicators

The top indicators provide status information about the camcorder:

Indicator	Function
REC	<ul style="list-style-type: none"> <li>lights when the camcorder is recording</li> </ul>
MEDIA	<ul style="list-style-type: none"> <li>flashes when 5 minutes or less of the current media is left</li> <li>lights continuously when the current media is at an end</li> </ul>
BATT	<ul style="list-style-type: none"> <li>flashes when battery level is low</li> <li>lights continuously when battery level is critical</li> </ul>
ND/RE	<ul style="list-style-type: none"> <li>lights when an ND optical filter or the range extender is selected</li> <li>lights when a Call signal is received from a connected OCP 400.</li> </ul>
FOC+	<ul style="list-style-type: none"> <li>lights when the focus assist function is on</li> </ul>

### 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 a 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

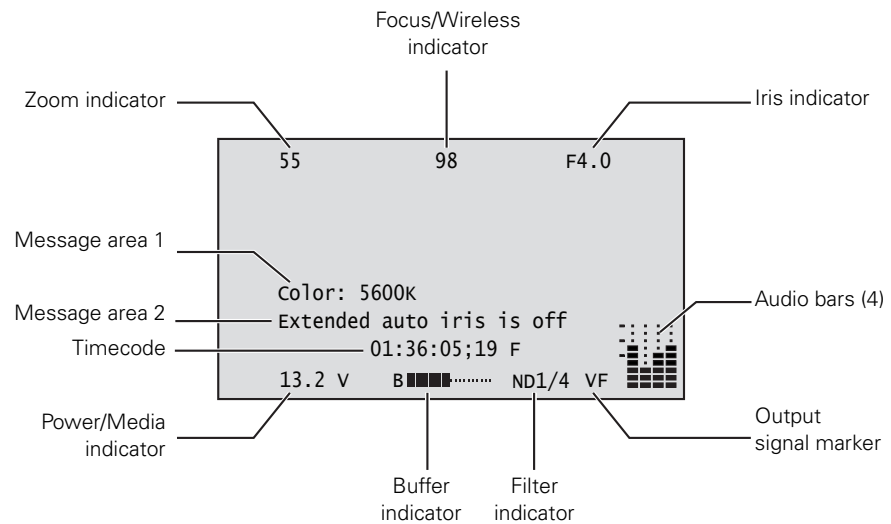
### Non-standard indicator (!)

The non-standard video settings indicator (!) lights when one of the following conditions occur:

- exposure time is not set to the nominal value;
- black stretch is on;
- extended auto iris is on;
- AWC or FL color temperature is on.

### 3.6.4 Viewfinder on-screen display

The viewfinder on-screen display can be used to show the following operational settings and messages while shooting.



Indicator	Function
<b>Zoom indicator</b>	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.
<b>Focus/Wireless indicator</b>	<p>This indicator can be set to display information about the lens focus distance or about the (optional) wireless microphone receiver. Select the indicator in the VF &gt; INDICATOR &gt; FOCUS/WRX menu.</p> <p><b>Focus:</b> Indicates a percentage value for the focus distance ranging from 0 (close-up) to 99 (infinity). Note: This feature is only available when a digital lens is used.</p> <p><b>Wr:</b> wireless microphone receiver status:            No indication: Wireless input is not selected.            Wx:-- = Wireless input is selected but the RF receiver is not detected.            Wx:OK = Wireless input is selected and RF connection is good.            Wx:SQ = Wireless input is selected and squelch function is active.            Wx:RF = Wireless input is selected and RF connection is poor.</p>
<b>Iris indicator</b>	Indicates the iris opening (F -value) of the lens. Typical range is F1.4 to F25.
<b>Audio bars</b>	These bars display the audio levels for channels 1 to 4. The resolution is 12 segments per channel for full range.
<b>Message areas 1 and 2</b>	Display operational messages, errors and warnings.
<b>Output signal marker</b>	Marks the output signal as the viewfinder signal. This indicator is only shown when the digital output port (BNC) is set to 'VF'.
<b>Optical filter indicator</b>	Indicates the selected optical filter.
<b>Buffer level indicator</b>	Indicates the level of the recording buffer. There are 20 segments; each segment represents 5% of the full buffer capacity.

Indicator	Function
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. <b>Storage:</b> Displays the remaining recording time (in minutes) on the current media. When the selected media is not available the indication "No info" will be shown. <b>Batt:</b> Displays the supplied voltage of the battery or the external power supply.
Timecode	This indicator displays the timecode.

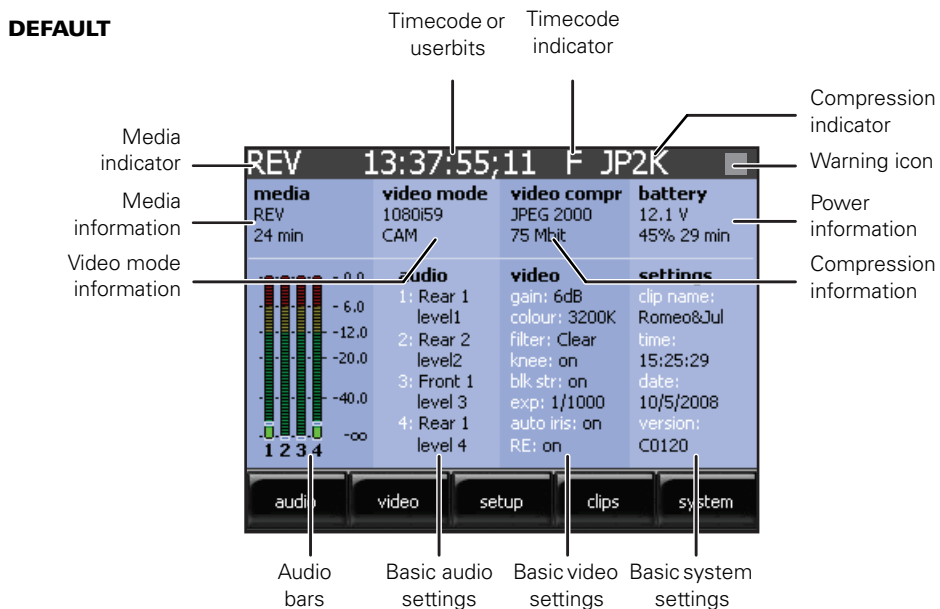
### Enabling or disabling indicators

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

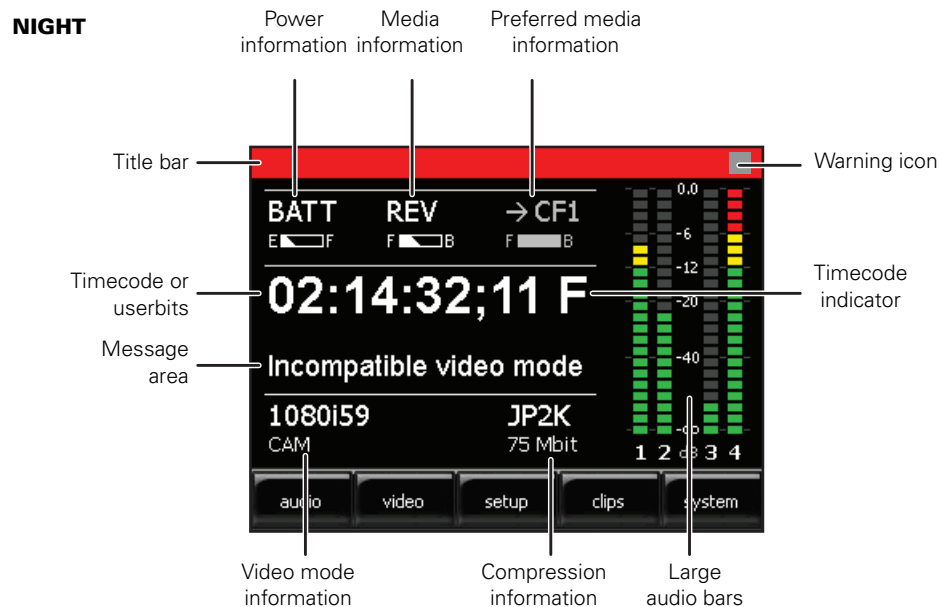
## 3.7 Side panel home screen

### 3.7.1 Overview

The home screen of the side panel display provides information on audio, video and recording parameters as well as information on media and power.








You can change the layout of the 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 Indicators

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

Indicator/information	Default home screen	Night or day home screen
<b>Timecode/Userbits</b>	Displays the current timecode or userbits value.	
<b>Timecode indicator</b>	Indicates timecode run mode: F = Free run, R = Record run	
<b>Compression indicator</b>	Indicates the current video compression: JP2K = JPEG 2000 MP2G = MPEG-2 (Long GoP) MP2I = MPEG-2 (I-frame only) DV25 = DV D10 = D10	not shown
<b>Warning icon</b>	 Media is almost full  Replace media  Touch screen is locked	 Battery level is low  Replace battery
<b>Power information</b>	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).	
<b>Compression information</b>	Displays the selected video compression and bit rate	

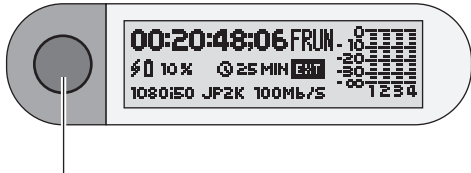
Indicator/information	Default home screen	Night or day home screen
Basic system settings	Displays clip name, time and date and package version information.	not shown
Basic video settings	Displays important video settings: video gain, color temperature, optical filter, knee, black stretch, exposure time, auto iris indicator and range extender indicator.	not shown
Basic audio settings	Displays audio sources and recording level controls for channel 1 to 4.	not shown
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 (primary media)	Displays the selected recording media (REV, CF1, CF2 or EXT) and remaining recording time in minutes on the media. When the selected media is not available a dash ("-") will be shown.	Displays the selected recording media (REV, CF1, CF2 or EXT) and remaining recording time on the media. F = full media, B = blank media
Media information (preferred media)	not shown	Displays the selected preferred media (REV, CF1, CF2 or EXT) and remaining recording time on the media. F = full media, B = blank media
Media indicator	Indicates the selected recording media (REV, CF1, CF2 or EXT).	not shown
Message area	not shown	Displays camcorder messages, warnings and information.



## 3.8 Camera status display

The status display on the top left 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 screens.
  - The blue light switches off automatically after a few seconds of non-activation.

	Status screens
 <p data-bbox="437 916 735 969">Backlight + control panel light / display button</p>	1. Timecode screen
	2. Timecode/User bits screen
	3. Real time screen
	4. Power status screen
	5. Software version, PID and serial number screen

The blue backlight of the display flashes when the camcorder is shutting down or when battery level is low. It also flashes when a software update is in progress.

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. When 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 (media available)
Blue (flashing fast)	Reading from media
Red	Writing to media
Purple (red + blue)	Media is full
Red / Blue (alternated flashing)	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. *)



#### Note

Media files recorded with MPEG-2 Long GoP compression cannot be fast forwarded or reversed.

## 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

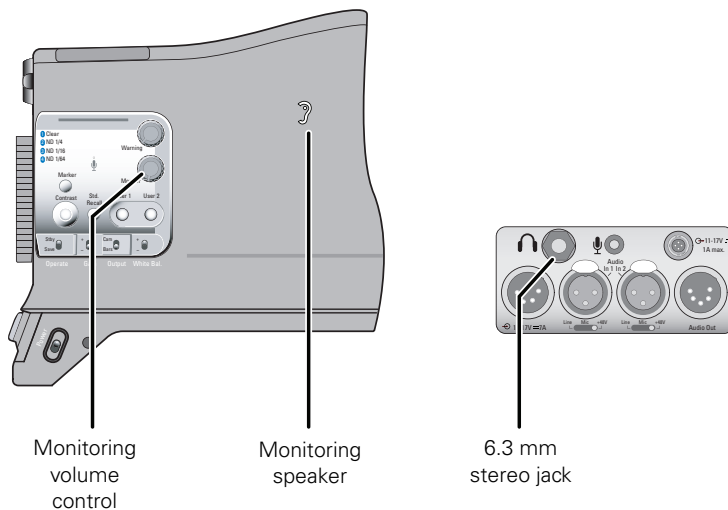
The analog video output at the rear of the camcorder can be set up to carry a CVBS analog video signal that is suitable for monitoring purposes. The signal is the same as the signal shown on the side panel display.

### 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 camcorder. 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.

# 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 a 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.

## 4.2 User levels

Four user levels can be set up (0.. 3) that restrict the group 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.

User level	Usage	Description
0	Remote operation	On this level, most operational controls are locked. It can be used for remote operation or unattended recording.
1	Basic camera operation	Minimum operational level. All basic operational controls are accessible.
2	Advanced operation	Same as use level 1 but extended with recording setup and user files access.
3	Expert operation, camera configuration	Full operational and configuration control.
S1	Advanced setup, service or maintenance	For advanced setup, maintenance and field service adjustments.

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



### Tip


To limit access to camera functions, you can set a maximum user level in the **SYSTEM > MAX USER LEVEL** in the Viewfinder menu.

## 4.3 Side panel menu

### 4.3.1 Home screen

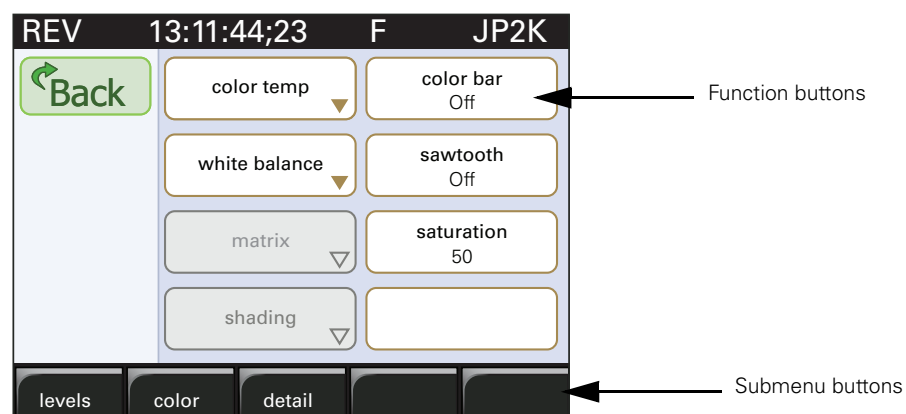
When you open the side panel display you see the home screen that shows the most important camera information:



- 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.

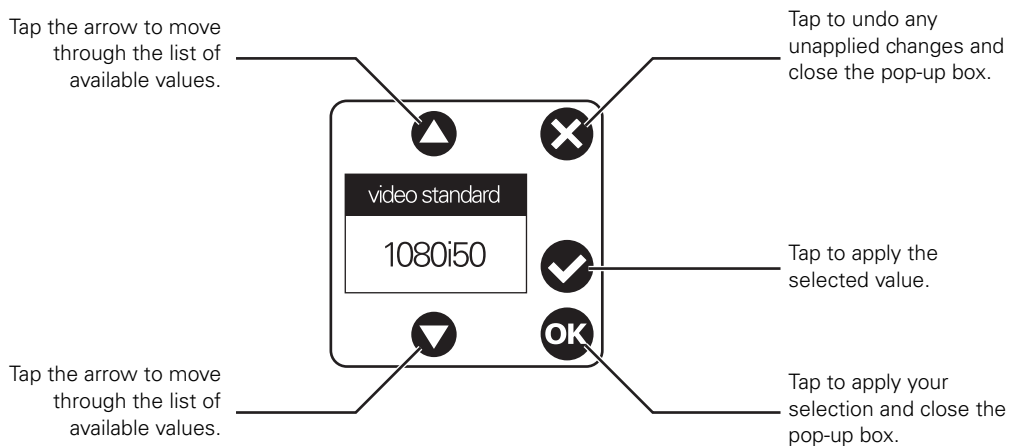
There are two types of function button:

- 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.

#### Pop-up

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:



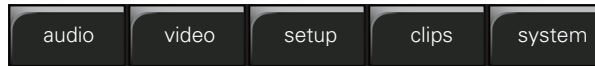
#### Note

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

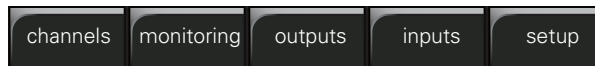
The five black screen buttons at the bottom of the home screen show the five main functional groups.



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

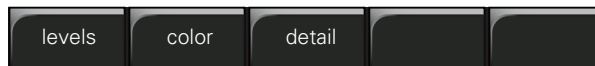
The audio group contains all functions and controls associated with setting up the audio.



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

#### Video

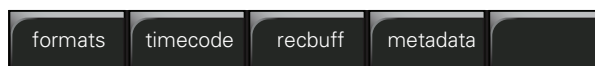
The video group contains all functions and controls associated with picture control.



- **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.



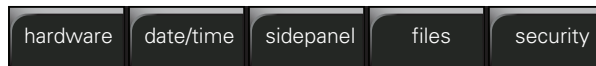
- **formats** sets up video standards, recording sources and compression.
- **timecode** sets up all timecode features.
- **recbuff** handles media selection.
- **metadata** lists available story files.

## 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.
- **sidepanel** sets display parameters for the side panel display.
- **files** allows operator, production, scene and lens files to be stored and recalled.
- **security** allows access level to be set.



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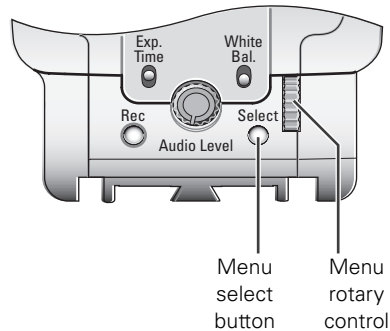
### Note

For a full list of functions contained within the side panel menu refer to [“Side panel menu” on page 125.](#)

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## 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 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.



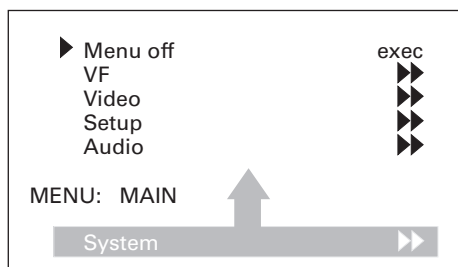
### Note

For a full list of functions contained within the viewfinder menu refer to [“Viewfinder menu” on page 143](#).

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### 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.

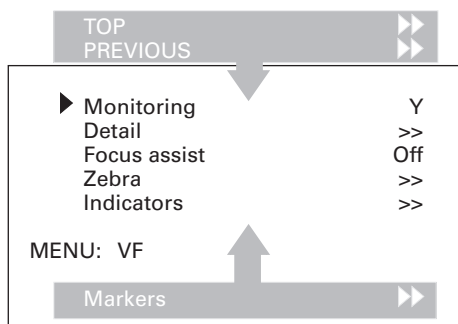
### 4.4.3 Finding your way

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 tables in the “[Viewfinder menu](#)” on page 143 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 0 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 **Standard Recall** button at the side of the camcorder to recall a standard set of values for the video parameters.

## 4.5 User files

User files contain camcorder settings. Go to the **SYSTEM > FILES** menu to manage (recall and store) these files. The tables in the chapter [“Side panel menu” on page 125](#) and chapter [“Viewfinder menu” on page 143](#) indicate which settings are stored in which user file.

### 4.5.1 Scene files

Scene files contain settings related to picture performance and image adjustment (e.g. colour, gain and detail). Up to five scene files (Scene1 to Scene4 and Customer) can be stored in the camcorder while more files can be stored on a USB-stick. A ‘recall only’ Factory file is available that contains factory default scene settings.

#### Standard recall

Pushing the **Standard Recall button** on the left-front side of the camera recalls the standard scene file. The standard scene file can be either a Factory or Customer file. A Factory file contains the factory default settings while the Customer file can be defined by the user.

The standard file that is recalled can be set in the **SYSTEM > FILES > STD RECALL MODE** menu.



#### Tip

Select **none** to disable the **Standard Recall button**.

---

### 4.5.2 Production files

Production files contain settings related to production (e.g. video format, compression and audio settings). Up to five production files (Prod1 to Prod4 and Customer) can be stored in the camcorder while more files can be stored on a USB-stick. A ‘recall only’ Factory file is available that contains factory default production settings.

### 4.5.3 Lens files

Lens files contain settings related to the lens configuration (e.g. white shading). Up to five lens files (Lens1 to Lens4 and Customer) can be stored in the camcorder while more files can be stored on a USB-stick. A ‘recall only’ Factory file is available that contains factory default lens settings.

### 4.5.4 Operator files

Operator files contain settings related to the operation of the camcorder and personal preferences (e.g. user button assignments). Up to five operator files (Oper1 to Oper4 and Customer) can be stored in the camcorder while more files can be stored on a USB-stick. A ‘recall only’ Factory file is available that contains factory default operator settings.



#### Note

If the camera is on-air when a user file is recalled, then the recalled values do not become active until the camera goes off air.

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# Chapter 5

## Video setup

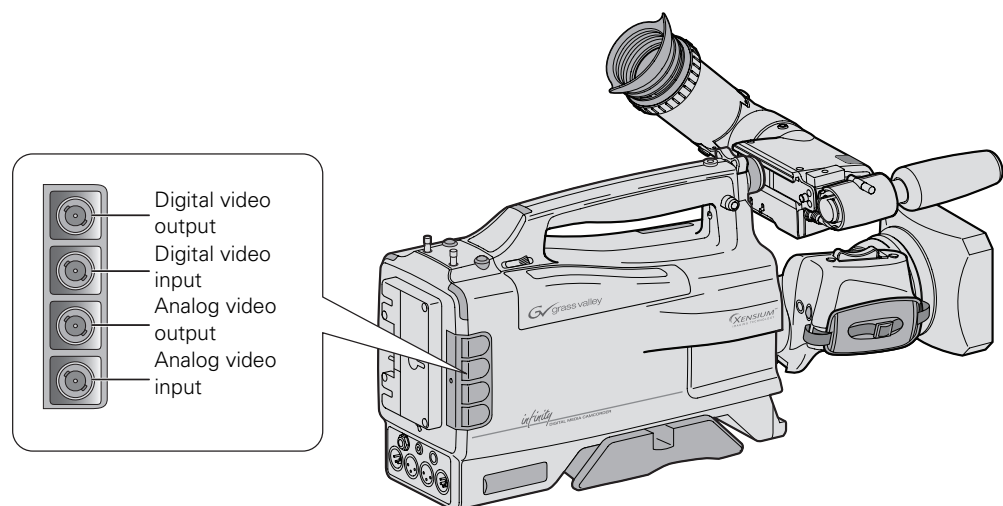
### 5.1 Input and output connectors

Four BNC connectors are located at the rear-right of the camcorder. The output signals on these connectors depend on the settings 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	<ul style="list-style-type: none"> <li>• normal HD-SDI or SDI output, or</li> <li>• viewfinder signal HD-SDI output. (Video standard depends on video format of camcorder.)</li> </ul>
Digital video input	HD-SDI or SDI input for: <ul style="list-style-type: none"> <li>• viewing,</li> <li>• recording,</li> <li>• extracting and locking to VITC, or</li> <li>• embedded SDI audio.</li> </ul>

Connector name	Function
Analog video output (or digital audio output)	<p>Analog video output</p> <ul style="list-style-type: none"> <li>• CVBS for viewing/monitoring purposes <i>*)</i>, or</li> <li>• LTC - linear time code output.</li> </ul> <p><i>*)</i> When an SD video standard is selected, On Screen Display (viewfinder information) is not available even when OSD is enabled.</p> <p>This connector can also be configured to provide an AES digital audio output signal.</p>
Analog video input (or digital audio input)	<p>Analog video input</p> <ul style="list-style-type: none"> <li>• CVBS for recording and for genlocking, or</li> <li>• LTC - linear time code input to lock to an external time code source and also for genlocking.</li> </ul> <p>This connector can also be configured to accept an AES digital audio input signal.</p>

## 5.1.1 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.



## 5.1.2 Analog connectors

### Analog video

The **Analog Out** connector provides a 1.0 Vpp CVBS analogue output signal. This signal is only present if the connector is terminated correctly with 75  $\Omega$ . 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 1.0 Vpp 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.

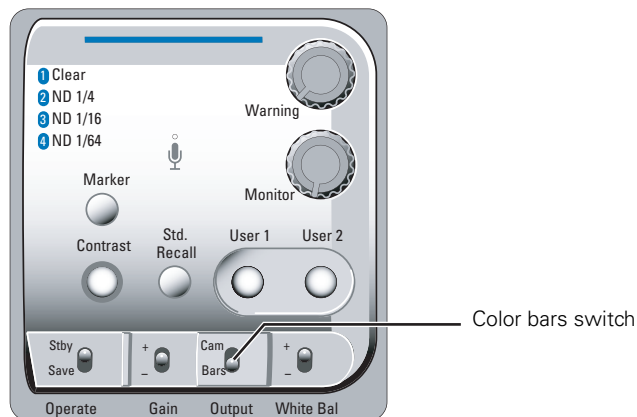
### Digital audio

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.

## 5.2 Colour bars

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 clipper
- Zebra
- Safe area (viewfinder)
- Cadre (viewfinder)

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

## 5.3 Standard video settings

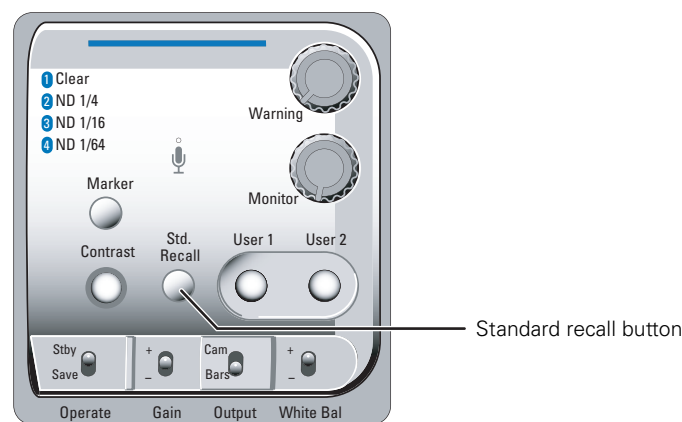
To ensure that some of the camcorder functions are not set to unusual values, a standard file has been defined that contains the default values for most video functions. To recall the standard values for the various video functions:

- Press the **Standard 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

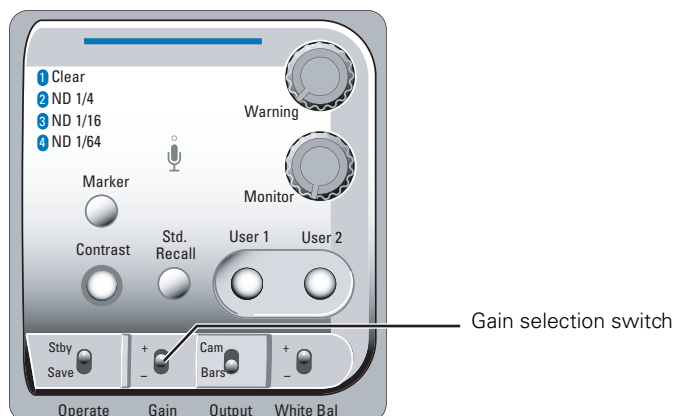
The standard values only take effect when the camcorder is not recording.



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.

## 5.4 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 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 camcorder 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.

## 5.5 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 (e.g. the LCP 400, side panel menu) 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 2000 K to 20000 K) that there is never any need to use color filters to obtain the correct white.

---

## 5.6 Colour temperature

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

### 5.6.1 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

### 5.6.2 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.

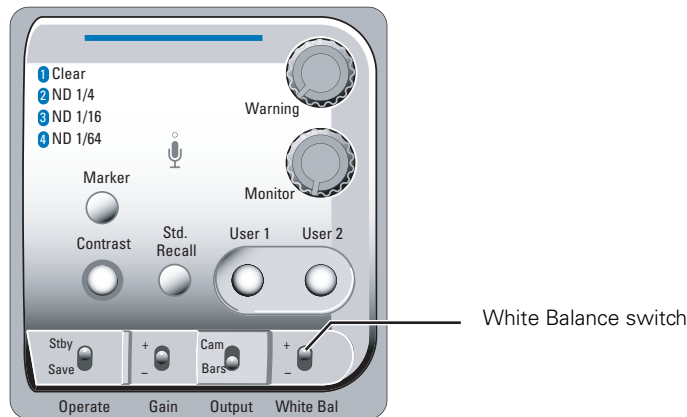
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### 5.6.3 Continuous white balance

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.

### 5.6.4 Selecting the color temperature

The up/down **White Balance** 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 2000 K to 20000 K.

#### Variable color temperature

The **White Balance** 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 camcorder 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 Balance** 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.

In the **VIDEO > COLOR > COLOR TEMP. > VAR. COL. TEMP** menu, the color temperature can be adjusted. This function acts 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.

## 5.7 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 / FL60, AW1 or AW2 memory positions.

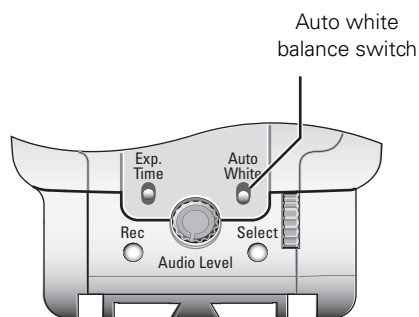


### Note

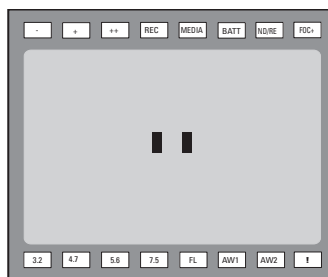
Make sure that the color bars are switched off before starting the auto white balance procedure.



White Balance switch



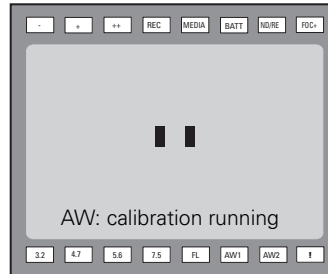
1. Use the **White Balance** switch to select one of the memory positions FL50 / FL60, AW1 or AW2 in which to store the measured color temperature value.
2. Hold the **Auto White** switch at the front of the camcorder in the up position. The following appears in the viewfinder:



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



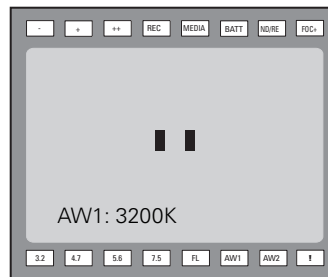
4. Release the **Auto White** switch to start the measurement procedure. A message indicating that the calibration procedure is running appears.



#### Note

When 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 its 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.

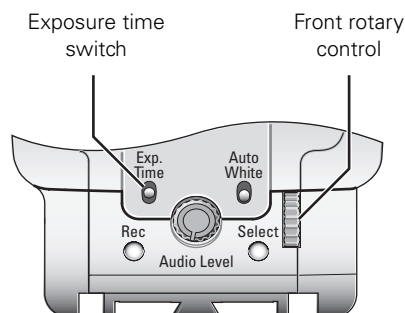


#### Note

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

## 5.8 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.

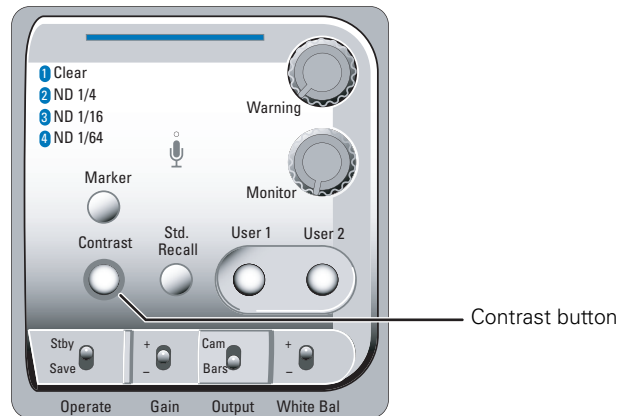


### Note

Increasing the exposure speed lowers the camcorder sensitivity proportionally.

## 5.9 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.

## 5.10 Video menu adjustments

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

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

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 **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.

---


### 5.10.1 Detail

Horizontal and vertical detail enhancement increases the perception of image sharpness 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 [section 12.2 on page 131](#) for more details on these controls.

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 **Note**

Detail enhancement differs between SD and HD modes.

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### 5.10.2 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.

### 5.10.3 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.

### 5.10.4 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.

### 5.10.5 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 fluorescent lights, which eliminates the green spikes produced by fluorescent 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.

### 5.10.6 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 and 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,
- an optional wireless microphone receiver (one or two channels), or
- one of three aliased intercom channels (Sidetone, Engineering, Production or Program).

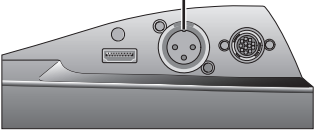
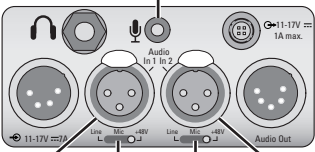


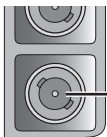
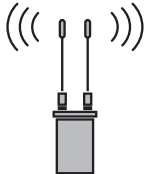
Audio signals are output:

- on the rear 5-pin XLR audio output connector,
- as embedded channels in the (HD-)SDI output signal, or
- as AES/EBU 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,
- select output channels or sources and
- set up an intercom configuration.

## 6.2 Inputs

Location	Connector	Function
<p>Front microphone input</p> 	Front microphone input (Front1 or Front2)	<p>This XLR-3 socket accepts a balanced mono microphone signal from a high quality dynamic microphone. A phantom power supply is provided as standard.</p> <p>When the optional DMC 1180 stereo front microphone connector kit is installed, this socket is replaced with a 5-pin XLR female socket that accepts a stereo balanced microphone.</p>
<p>Headset microphone input (MicRear)</p> 	Headset microphone input (MicRear)	Connect a headset microphone to this mini-jack 3.5 mm) socket.
<p>Audio Input 1</p> <p>Mic/Line switches (2x)</p> <p>Audio Input 2</p> 	Audio Input 1 (Rear1)	<p>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:</p> <ul style="list-style-type: none"> <li>• line</li> <li>• mic</li> <li>• mic +48 V phantom power</li> </ul>
	Audio Input 2 (Rear2)	<p>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:</p> <ul style="list-style-type: none"> <li>• line</li> <li>• mic</li> <li>• mic +48 V phantom power</li> </ul>
 <p>Digital SDI audio output</p>	Digital SDI audio inputs (SDI1 to SDI8)	Eight channels of embedded SDI inputs.
 <p>Digital AES audio output</p>	Digital AES audio inputs (AES1 and AES2)	Two-channel digital audio input compliant with the AES/EBU protocol.
	Wireless microphone inputs (Wrx1 and Wrx2)	Wireless microphone input. Requires the installation of a wireless receiver unit (optional). This adds one or two wireless audio sources (Wrx1 and Wrx2).

Refer to [Section 11.2 on page 117](#) 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 DMC 1180 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 (analog) 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 **AES 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, one or two wireless microphone channels are available. To set up a wireless microphone refer to the instructions delivered with your unit.

### 6.2.5 Audio mixer

A built-in, four-channel audio mixer is available to combine four inputs to a **Mixer** audio signal which can be used as any other input. To set up the audio mixer, go to the **AUDIO > SYSTEM > MIXER** menu and select up to four audio sources using the **SOURCE** buttons. Choose **Mute** for the sources you do not want to use.

The mix level for each source can be set using the **LEVEL** buttons. After the audio sources are mixed, an audio limiter avoids clipping of the audio signal.

## 6.2.6 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 possible sources are:

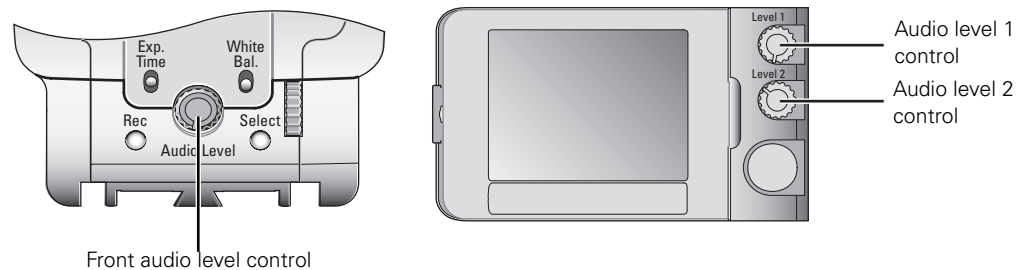
- Rear1 - analog audio 1 input,
- Rear2 - analog audio 2 input,
- Wrx1 and Wrx2 - wireless audio channels (optional),
- Front1 - front microphone or stereo front microphone channel 1 (optional),
- Front2 - stereo front microphone channel 2 (optional)
- MicRear - rear mini-jack headset microphone,
- AES1 - 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,
- Sidetone - sidetone (intercom loopback) channel (when in systemized operation),
- Program - intercom Program channel (when in systemized operation),
- Eng - intercom Engineering channel (when in systemized operation),
- Prod - intercom Production channel (when in systemized operation), 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.

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:

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

The following buttons appear (for each channel #):

- **CH # LVL CONTROL** - selects the method to adjust the audio level:
  - **AGC** or **AGC-12DB** 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.
- **CH# FIXED LVL** - sets the fixed recording level for the channel when **LVL CONTROL** is set to **FIXED**.
- **CH# FILTER** - selects a filter that is applied to the channel.
- **CH# AGC PROFILE** - selects a profile used for the 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 camcorder 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.



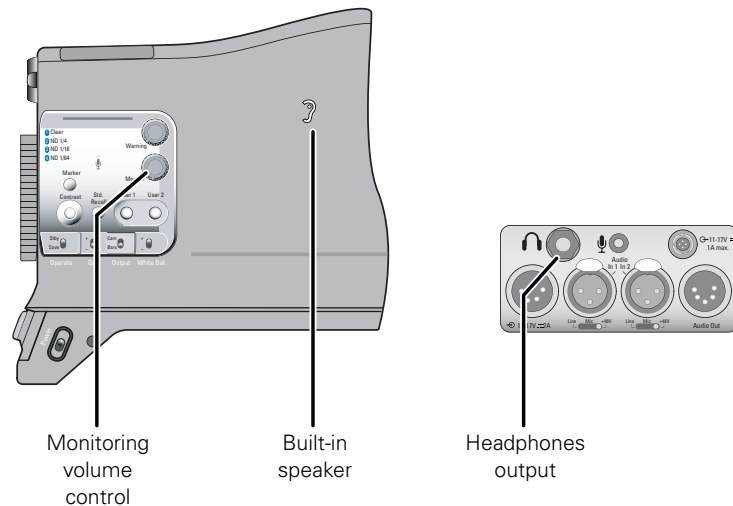
#### Note

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.



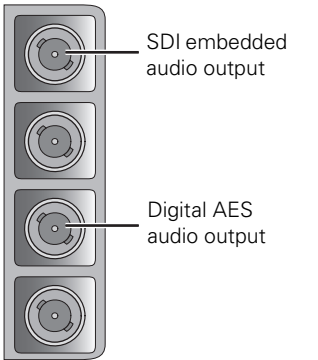
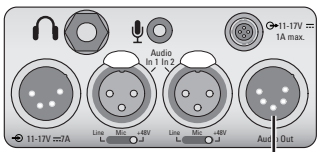
To select an audio source to monitor with the headphones:

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  Digital AES audio output (AES1 and AES2)	Eight embedded SDI outputs compliant with SMPTE 272 M-A and SMPTE 299M protocols.  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.

### 6.5.1 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 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.



## 6.5.2 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.



### Tip

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

---

## 6.5.3 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

### 6.6.1 Audio Headroom

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

### 6.6.2 Test tone

To turn the test tone on or off and to choose the test tone level (when the color bars are turned on) go to the **AUDIO > SETUP > TEST TONE** menu.

## 6.7 Intercom

The audio functions of the Infinity DMC 1000 camcorder can be easily configured to enable the use of an intercom system. This chapter describes how to set up the audio controls for a typical intercom use.

### 6.7.1 Audio connection

Intercom is a very versatile function of the DMC 1000 camcorder. It can be used to establish an audio connection between two camcorders, or a camcorder and a base unit. The physical audio connection exist of:

- Two BNC-fitted digital audio cables (SDI or AES);
- Analog audio cable(s) connected to the rear XLR-output of the camcorder;
- A camera-mountable transceiver system with intercom support.

The following setup describes a typical intercom set-up used with a camera-mountable transceiver system with intercom support. For more details about configuring a transceiver system, refer to the documentation of the manufacturer.

### 6.7.2 Intercom channels

Depending on the kind of audio connection, you need to assign the intercom channels to the physical audio connections in the camcorder. To do this, follow these steps:

1. Go to the **AUDIO > SYSTEM > INTERCOM** menu.
2. Tap the intercom channel buttons and choose the following settings:
  - For **PROD**, select **SDI In3** (this input is used as intercom Production channel);
  - For **ENG**, select **SDI In4** (this input is used as intercom Engineering channel);
  - For **PROGRAM**, select **SDI In1** (this input is used as intercom Program channel);
  - For **SIDETONE**, select **MicRear** (this mic. input is used as sidetone);
  - For **PROD-RET**, select **Sidetone** (sidetone to Production return);
  - For **ENG-RET**, select **Sidetone** (sidetone to Engineering return).

### 6.7.3 Talk buttons

Assign the user buttons at the left front (User 1 and User 2) to intercom talk functions:

1. Go to the **SYSTEM > HARDWARE > BUTTONS** menu,
2. Tap **USER 1** button and select **Eng Talk**,
3. Tap **USER 2** button and select **Prod Talk**.

Press User button 1 to talk through the Engineering return channel and push User button 2 to talk to the Production return channel



#### Note

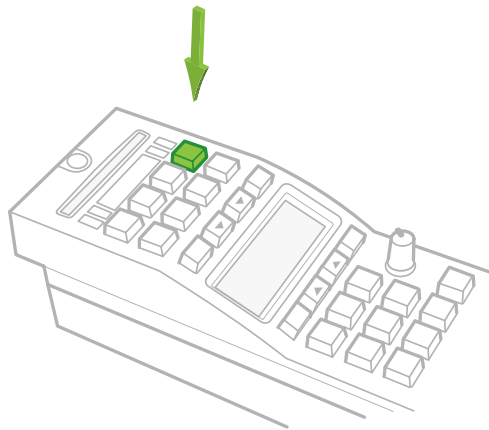
When the User buttons are not assigned to an intercom talk function, both intercom return channels always receive the defined return audio.

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### 6.7.4 Call

Either user button can be assigned to the intercom Call function. When the user button is pressed, a signal is sent to a connected OCP 400 control panel, calling for attention. The **CALL** button on the OCP 400 lights green.

The ND/RE indicator in the viewfinder also lights when a call signal is sent or received.



#### Note

This function is only available when the **SYSTEM > HARDWARE > NETWORK > REMOTE REC** item is turned off.

---

### 6.7.5 Return channels

The return intercom channels (Engineering and Production return) can be output to the embedded SDI audio channels, depending on your transmission configuration:

1. Go to the **AUDIO > OUTPUTS > SDI OUT** menu.
2. Tap the button of the SDI channel you want to use for the Engineering return channel,
3. Select **Eng-Ret**,
4. Tap the button of the SDI channel you want to use for the Production return channel,
5. Select **Prod-Ret**.

### 6.7.6 Incoming channels

Set up the built-in audio mixer to combine the incoming intercom channels to your personal preference:

1. Go to the **AUDIO > SYSTEM > MIXER** menu.
2. Tap each **SOURCE** buttons and choose the following settings:
  - For **SOURCE1**, select **Eng** (incoming Engineering intercom channel),
  - For **SOURCE2**, select **Prod** (incoming Production intercom channel),
  - For **SOURCE3**, select **Program** (incoming Program intercom channel),

- For SOURCE4, select **Sidetone** (Sidetone channel from the cameraman mic)
- 3. Tap each **LEVEL** buttons and set the desired channel mix contribution. The default value for all channels is 50, which means that all channels are equally loud.

Set up the monitoring section to listen to the intercom channels:

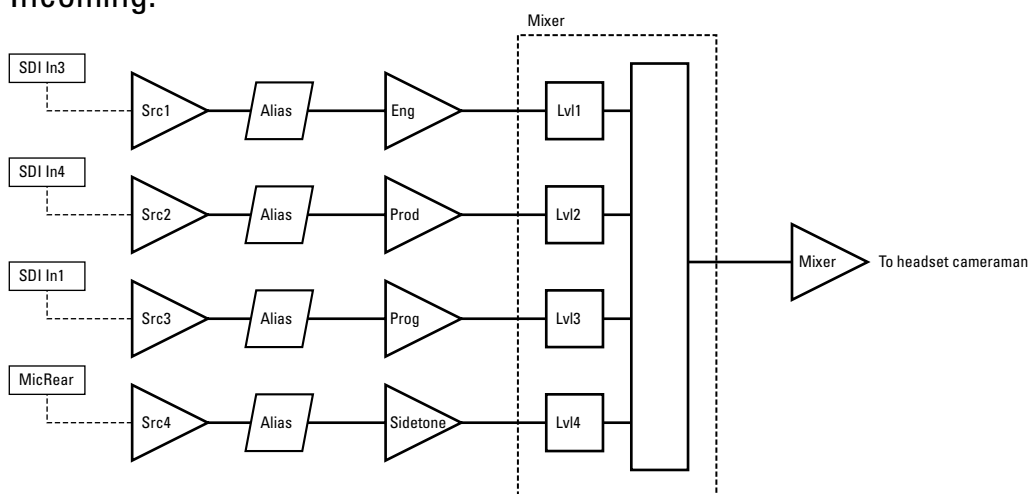
1. Go to the **AUDIO > MONITORING** menu.
2. Tap the **HDPH MODE LEFT** button and select **Source**,
3. Tap the **HDPH SOURCE LEFT** button and select **Mixer**,
4. Do the same for the headphone right settings.

Both headphone muffs now produce the mixed intercom channels. This is the most common use of the intercom function. You can also use one headphone channel to listen to any intercom channel or the pre-defined mix, while on the other headphone channel is used for recording or live monitoring.

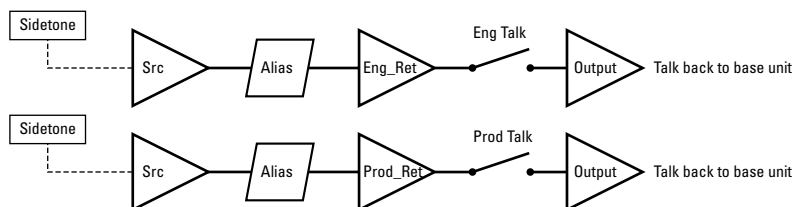
### 6.7.7 Intercom routing

The following schematic overview provides a survey of the intercom routing:

#### Incoming:



#### Outgoing:



# 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 (video) 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 **ASPECTRATIO** to set the desired aspect ratio (16:9, 4:3 or Letterbox) for your recording.

#### 7.1.1 Video standard

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 video standards (and three additional standards as a cost-option) available for recording. Each of these standards 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.

The camcorder can be used in either HD standards or SD video format. The (HD-)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.

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:

Video standard	Format	Resolution	Frame rate (Mbps)	Digital video output	Analog video output
1080i50	HD	1920 x 1080i	50	1080i50	-
720p50	HD	1280 x 720p	50	720p50	-
576i50	SD	576i	50		PAL
480i59	SD	480i	59.94		NTSC
1080p2398*	HD	1920 x 1080p	23.98	1080psF23.98	-
1080p25*	HD	1920 x 1080p	25	1080psF25	-
1080p2997*	HD	1920 x 1080p	29.97	1080psF29.97	-
1080i59	HD	1920 x 1080i	59.94	1080i59	-
720p59	HD	1280 x 720p	59.94	720p59	-

\*) only available when the optional DMC 1130 1080P license is installed.

## 7.1.2 Recording compression

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 video standard that has been selected.

Video standard	Compression	Available bitrates	Indication
HD 1080i50, 720p50, 1080i59, 720p59, 1080p25*, 1080p2997*, 1080p2398*	JPEG2000	50 Mb/s, 75 Mb/s, 100 Mb/s	JP2K
	MPEG-2 I-frame only **	60 Mb/s, 80 Mb/s	MP2I
	MPEG-2 Long GoP **	25 Mb/s (18Mb/s for 720p modes), 35 Mb/s, 50 Mb/s	MP2LG
SD 576i50, 480i59	JPEG2000	30 Mb/s, 40 Mb/s, 50 Mb/s	JP2K
	MPEG-2 I-frame only **	30 Mb/s, 40 Mb/s, 50 Mb/s	MP2I
	D10 **	30 Mb/s, 40 Mb/s, 50 Mb/s	D10
	DV25	25 Mb/s	DV25

\*) only available when the optional DMC 1130 1080P license is installed.

\*\*\*) only available when the optional DMC 1120 MPEG-2 board is installed.

### 7.1.3 Recording from external video sources

To record from an external video signal make sure the video standard and source (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, 1080p25*, 1080p2997*, 1080p2398*
Analog Input	CVBS	576i50 or 480i59.94

\*) only available when the optional DMC 1130 1080P license is installed.



#### Note

When the external video signal does not match the camcorder's video mode and recording compression, the message **check external video signal** is shown.

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.

#### Aspect ratio (SD)

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 (LB) (16:9 format in 4:3 aspect ratio with black bars on top and bottom).

## 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 record-run (recording time only), tap **RUN MODE** to toggle the value.

## 7.3 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 Input BNC 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 or HD-SDI signal applied to the Digital Input BNC 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.

---

## 7.4 Recording buffer

### Anti-shock mechanism

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

### Seamless recording

When the camcorder runs out of storage capacity on the selected media during recording, it automatically switches over to another media, when available. Select the preferred media order or disable the function in the **SETUP > REC BUFF > PREFERRED MEDIA** menu.



## 7.5 Recording media

The media bay is located at the top-right of the camcorder and 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.

### 7.5.1 REV PRO media

#### Versions

Different types of Grass Valley REV PRO media are available to suit your needs. REV PRO XP is tuned for high performance and fast ingest, while the REV PRO ER focuses on capacity. The Infinity DMC 1000/10 is equipped with a REV PRO 35 media drive, whereas the DMC 1000/20 comes with a REV PRO XP/ER drive.

#### DMC 1000/00

REV PRO media type	data throughput	recording capacity	recording time (SD@25 Mb/s)	recording time (HD@75 Mb/s)
REV PRO 35	< 75 Mb/s	35 GB	> 120 min	> 45 min

#### DMC 1000/10

REV PRO media type	data throughput	recording capacity	recording time (SD@25 Mb/s)	recording time (HD@75 Mb/s)
REV PRO XP	170 - 240 Mb/s	40 GB	> 140 min	> 50 min
REV PRO ER	130 - 240 Mb/s	65 GB	> 240 min	> 80 min
REV PRO 70	130 - 240 Mb/s	70 GB	> 240 min	> 80 min



#### Note

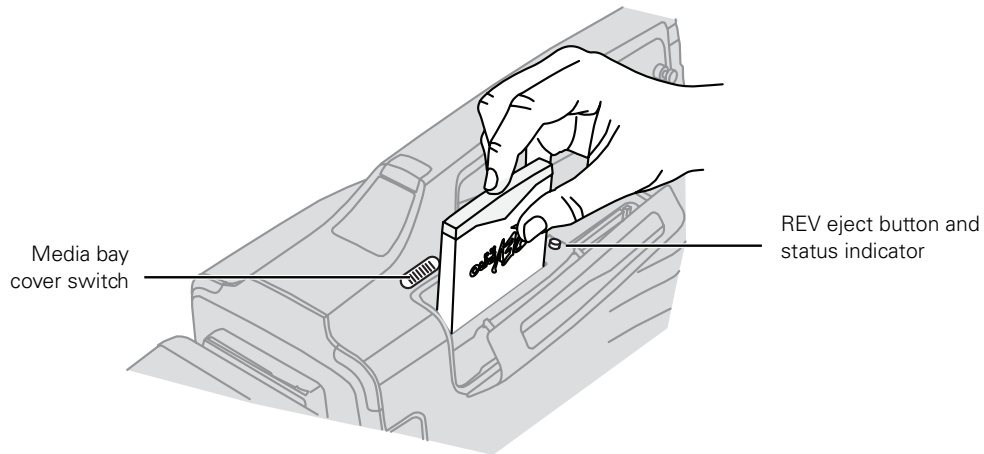
Make sure to use only REV PRO media that match the version of your camcorder.

#### REV PRO disks


To insert a REV PRO 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. During mounting, the indicator flashes.
  - When the disk is ready for use, the indicator is blue. It lights purple when the disk is full.
  - Close the media bay cover.
3. In the **SETUP** > **FORMATS** > **MEDIA SELECTION** menu, select REV.

To eject the disk, push the REV 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 (> 40 mm or 1.5 in) 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 at 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 power is on. Never force a disk into or out of the REV drive: this could damage both the drive and the disk.

---

## 7.5.2 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.
4. In the **SETUP > FORMATS > MEDIA SELECTION** menu, select CF1 or CF2.

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

Especially for high bandwidth compression profiles, make sure to test your CompactFlash media before using them in critical workflows. Use only high-speed CompactFlash cards that are fast enough for the chosen recording compression profile.

---

## 7.5.3 External USB media

To record to external media:

1. Connect a USB mass storage device to one of the USB device connectors on the camcorder.
2. In the **SETUP > FORMATS > MEDIA SELECTION** menu, select EXT.



### Note

Make sure that external USB devices are using a FAT32 file system. External REV drives however may use a UDF file system.

---

## 7.6 Systemized configurations

### 7.6.1 Introduction

Depending on your production workflow, the DMC 1000 can be used in different camera configurations.

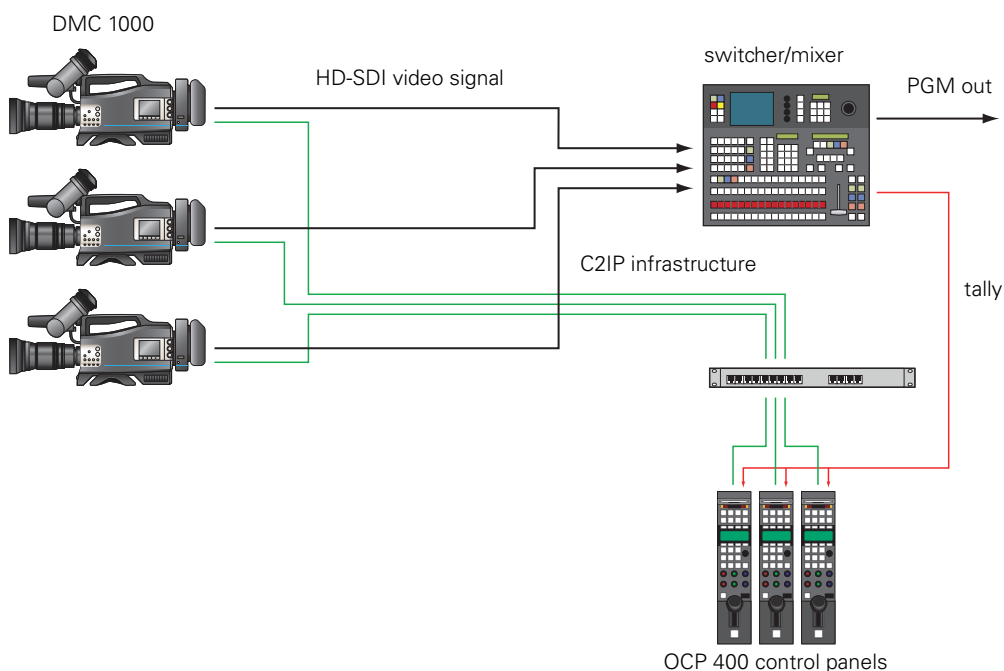
#### Basic configuration

A basic configuration is a single camcorder mounted on a tripod. The live video output is directly fed into a video switcher/mixer using a single coaxial (HD-) SDI connection. Camera control is done on each individual DMC 1000 using the camcorder's operation panels or the remote control application LCP 400.



#### Network configuration

This configuration can be set up as a single camera operation or as a complete, multi-camera environment. Like the basic configuration, it also has the camcorder on a tripod with live video output via (HD-)SDI but also with an OCP 400 control panel providing direct camera control and tally control.



## 7.6.2 Network setup

Before you can use the DMC 1000 camcorder in a C2IP camera network, you need to set the IP address and camera number.

### Setting the camera IP address

1. Go to the **SYSTEM > HARDWARE > NETWORK** menu and set the **IP ADDRESS** item. Make sure that the DMC 1000 has a unique IP address within the Ethernet network.
  - The default IP address is 192.168.1.10

### Setting the camera number

1. Go to the **SYSTEM > HARDWARE > NETWORK** menu and set the **CAMERA #** item. Make sure that the camera number is unique within the C2IP network.
  - The default camera number is 17.
2. Press the **SETUP** button on the OCP 400 to enter the setup menu. Use the rotary control to select the same camera number in the **CamNum** item.

## 7.6.3 User level

When the DMC 1000 camcorder is used in a systemized configuration, it is advised to limit the maximum user level to 0 or 1. Go to the **SYSTEM > MAX USER LEVEL** in the Viewfinder menu and select a user level. Refer to the [“Side panel menu” on page 125](#) to see which items are accessible for each user level.

## 7.6.4 Intercom

In the section [“Intercom” on page 90](#) you can find information about setting up the intercom functions of the DMC 1000 camcorder.

## 7.6.5 Remote Tally and ISO recording

You can set up the tally signalling to follow the switcher’s On-Air signal:

1. Make sure that the On-Air signal from the switcher is connected to the OCP 400. Refer to the OCP 400 user’s guide for more information.
2. Go to the **SYSTEM > HARDWARE > NETWORK** menu and turn the **REMOTE TALLY** item On.



### Note

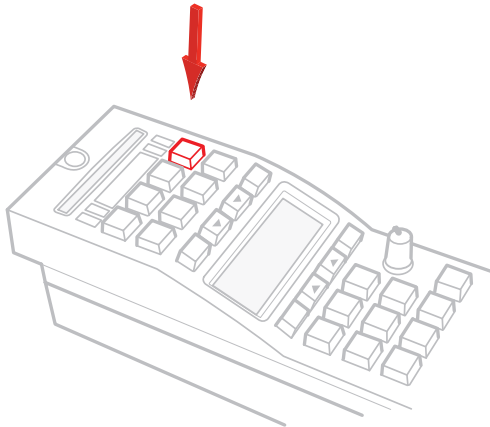
When you start a recording on the camcorder when Remote Tally is On, the tally lights do not light. The title bar on the side panel display turns Yellow to indicate an ISO recording.

---

## 7.6.6 Remote recording

By turning remote recording on, an operator can start a recording from the OCP 400. Go to the **SYSTEM > HARDWARE > NETWORK** menu and turn the **REMOTE REC** item on.

Start a recording by pressing the momentary **CALL** button at the top-right of the OCP 400. The Tally indication on the OCP lights. When a recording is in progress, pressing the **CALL** button stops the recording. The Tally lights extinguish.




# Chapter 8

## Shooting

### 8.1 Getting a picture

#### 8.1.1 Viewfinder

1. To set up the viewfinder refer to [“Viewfinder” on page 42](#).
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 **Standard 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 72.

- 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).

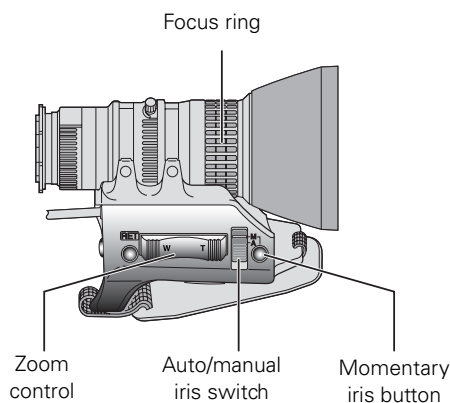
To improve the contrast of the picture when there are very bright and very dark areas in the scene press the contrast button.

## 8.1.5 Audio adjustments

Monitor the audio sources and adjust their levels. Refer to “Recording audio” on page 84.

## 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.

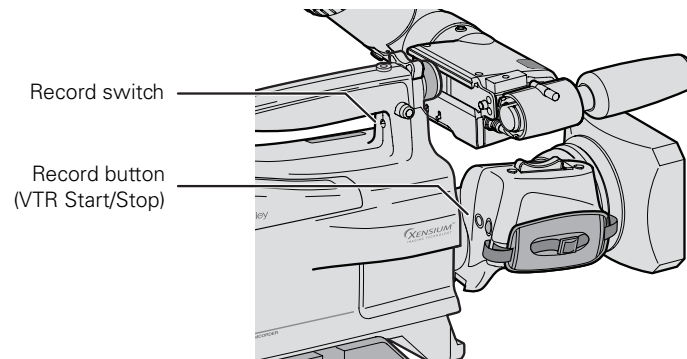
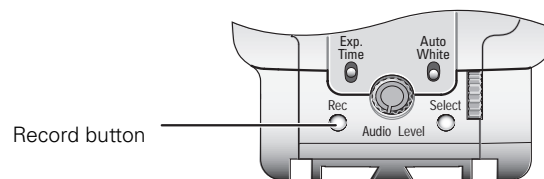




## 8.2 Recording

### 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

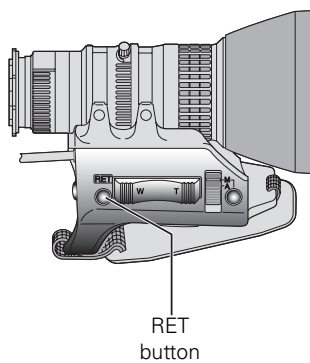
To stop recording, press the record button on the lens, the camcorder front or the switch under the carrying handle again.

- 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.



### Note

Make sure that the RET button is assigned to Playback in the **SYSTEM** > **HARDWARE** > **BUTTONS** > **LENS** > **RET BUTTON** menu.

# Chapter 9

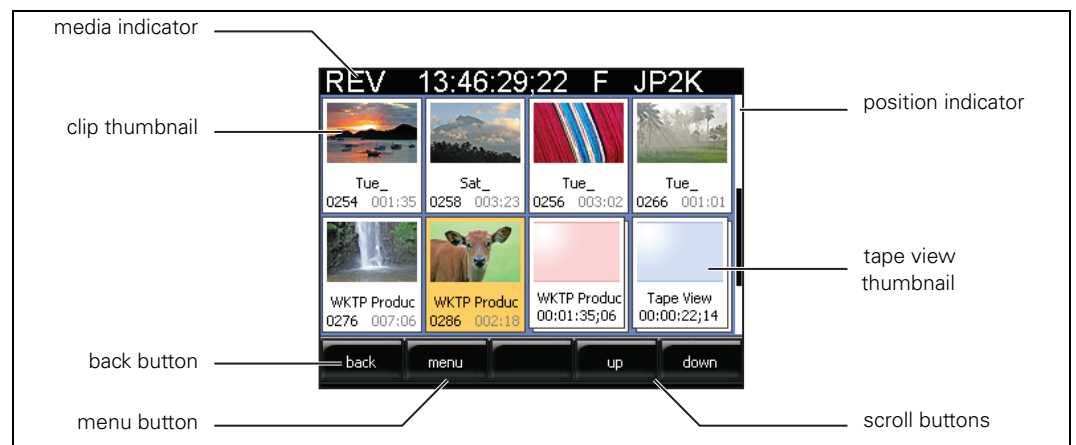
## Clip management

### 9.1 Thumbnails

#### 9.1.1 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.

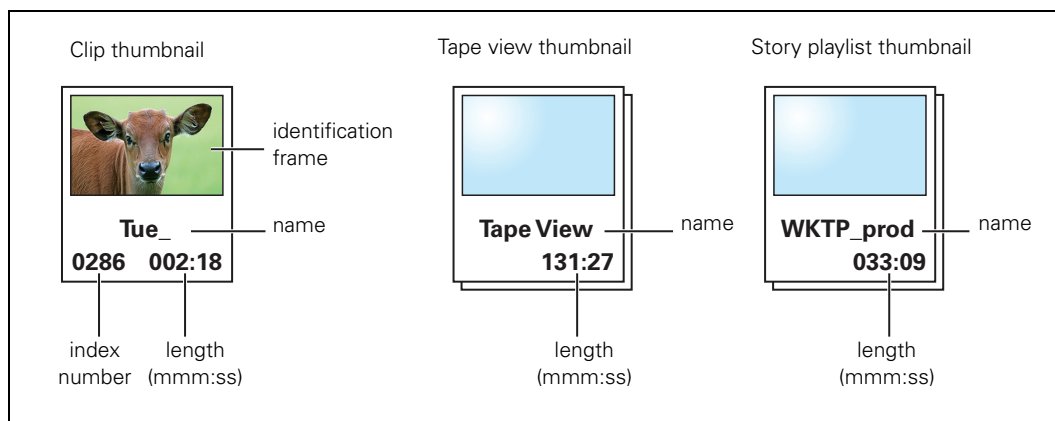


#### Note

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 accessed.

## 9.1.2 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 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.



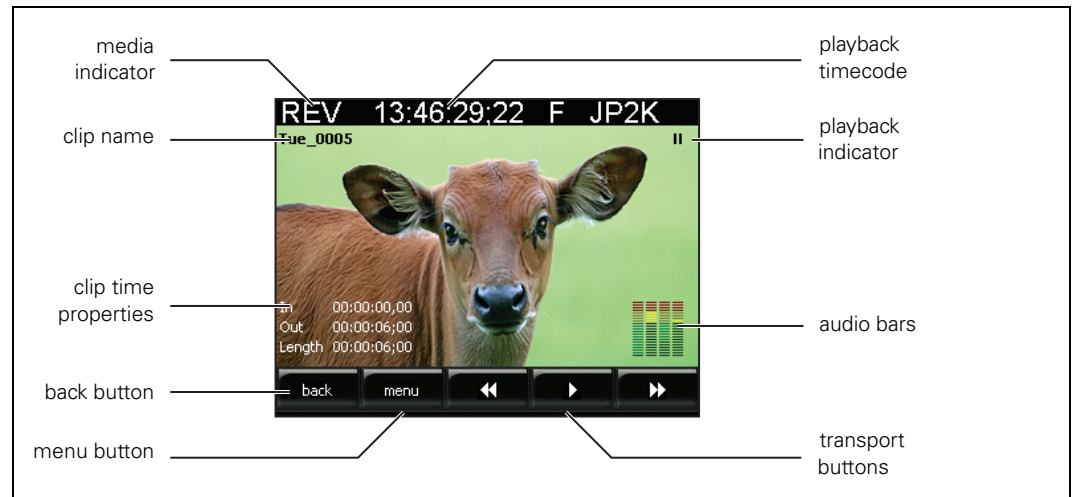
#### Note

Changing the VF Monitoring or the VF-menu on SPD settings can affect the appearance of thumbnails. Small text items may be visible in the thumbnail.

## 9.2 Playback






### 9.2.1 Playback monitor

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.



### 9.2.2 Transport buttons

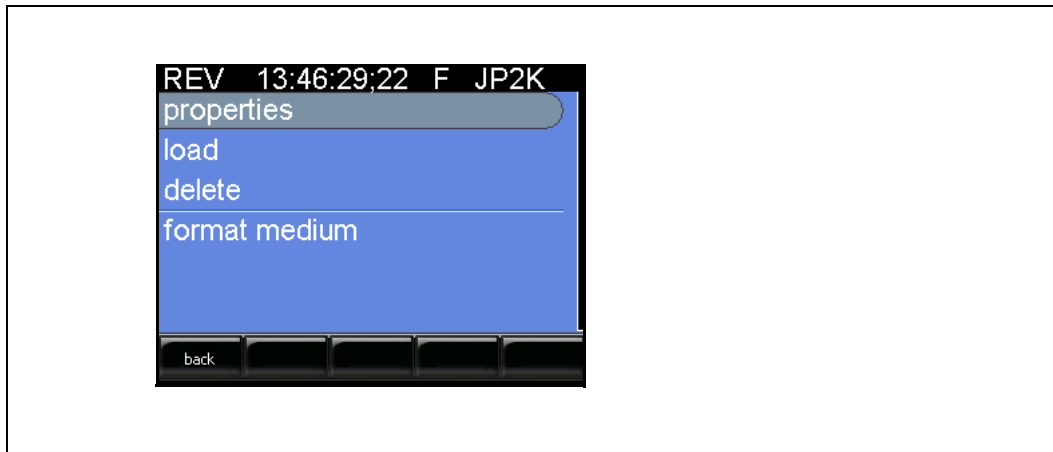
The buttons at the bottom of the screen are used as follows:

Button	Use
	Returns to the thumbnail overview
	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 headphones connected to the rear jack if this is set up in the audio menu.

### 9.2.3 Menu button

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

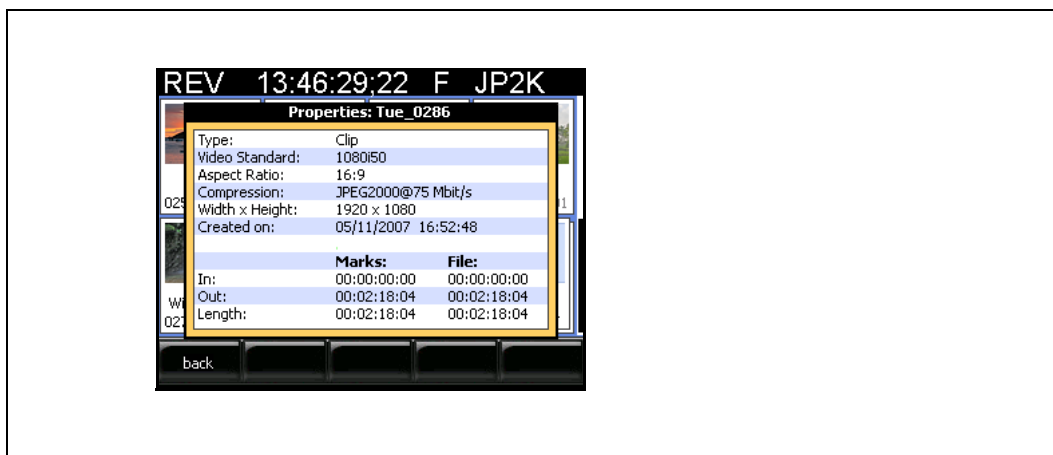


- **properties**: show detailed information about the selected clip;
- **load**: loads the selected clip into the playback monitor;
- **delete**: delete the selected clip;
- **format medium**: formats the current media.

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

### Properties

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



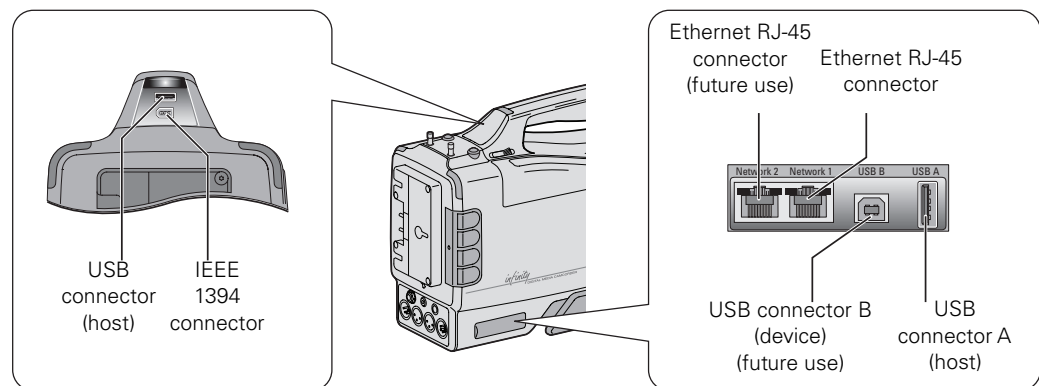
Tap the **BACK** button at the bottom to close the properties pop-up box.

# Chapter 10

## Communications

### 10.1 Setting up communication

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



### 10.2 USB connection

The USB host connectors on the top-rear panel and right-side panel can be used to connect a USB mass storage drive or other device. The connection does not need further configuration.



#### Note

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



#### Note

Maximum combined power load that can be drawn from the USB ports is 250 mW.

## 10.3 Ethernet connection

The camcorder uses TCP/IP as its communication protocol. Change the Ethernet settings in the **SYSTEM > HARDWARE > PORTS > NETWORK** menu. Below are the default network settings used by the camcorder:

Item	Default setting
IP address	192.168.1.10
Subnet mask	255.255.255.0
Gateway address	0.0.0.0

## 10.4 IEEE 1394 connection

Connect external IEEE 1394 devices to this connector. The external device can be used to ingest streaming video data from the camcorder. Select the playback method in the **SYSTEM > HARDWARE > PORTS > IEEE 1394** menu:

IEEE 1394 setting	Video playback
Off	Playback on IEEE 1394 port is disabled (default)
Exclusive	Playback on IEEE 1394 port only (no video is shown on the side panel display)
Both	Playback on IEEE 1394 port with simultaneous video monitoring on the side panel display (lower video frame rate may be possible)



### Note

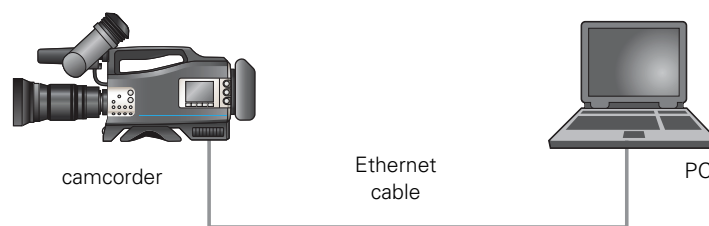
Playback on the IEEE 1394 port is available for SD video standards using the DV25 video codec.



## 10.5 FTP connection

To manage story files that are stored in the camcorder or to transfer story files between the camcorder and an external PC, an FTP connection can be used. Follow these steps to set up a working connection:

1. Use an Ethernet (a crossover or straight-through type can be used) cable to connect the camcorder with a remote PC. Plug the cable into Ethernet connector 1 on the right-side panel of the camcorder and the other end into a free Ethernet connector on the PC.
2. Use automatic network setting (DHCP) on your PC (it may take a few seconds for the IP-address to be assigned) or use manual settings (the camcorder's IP-address is 169.254.1.218 and subnet mask is 254.0.0.0).



3. Install FTP software on the PC.
4. Use the following settings for your FTP software (refer to the documentation of your software for more information):
  - userid: **anything but blank**;
  - password: **anything but blank**;
  - IP-address: **169.254.1.218**;
  - remote port: **21**;
5. Use the FTP software to connect to the camcorder. After connecting, the contents of the system's root directory will be shown.
6. Go to the **\\storyfiles** directory. All storyfiles on the camcorder are listed here. You can copy, move, delete and rename any of the files.



# Chapter 11

## Specifications

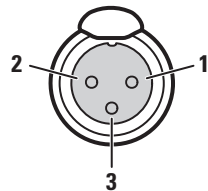
### 11.1 Specifications for DMC 1000

Item	Value	
<b>General</b>		
Dimensions (H x W x L)	240 x 150 x 330 mm (9.4 x 5.9 x 13.0 in) without lens, VF and battery	
Weight (approx.)	5.0 kg (11.0 lbs) without VF; 5.7 kg (12.6 lbs) including VF	
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, VF, compression, buffer and lens)	
Power consumption (recording)	49 W (while recording to REV)	
<b>Camera section</b>		
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	
<b>Video standard</b>	<b>576i/480i mode</b>	<b>1080i/720p mode</b>
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
Sensitivity	2000 lux (186 ft cd) at F8 typical	

Item	Value	
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	
<b>Compression</b>	<b>SD</b>	<b>HD</b>
DV25	PAL (4:2:0) and NTSC (4:1:1)	-
JPEG 2000	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 (requires optional DMC 1120 board)	8-bit, 4:2:0	8-bit, 4:2:0
	30 Mb/s, 40 Mb/s and 50 Mb/s I-frame (VBR profile)	60 Mb/s and 80 Mb/s (I-frame)
<b>File formats and media</b>		
High quality content	MXF OP-1A (SMPTE 378M), including 4 channels of PCM audio and metadata	
Metadata	Compatible with SMPTE Metadata Dictionary RP210	
REV drive	REV PRO 35 digital media drive (DMC 1000/10) or REV PRO XP/ER digital media drive (DMC 1000/20)	
CompactFlash	2x type I and II CompactFlash slots, speed depending on media	
<b>Camcorder connectors</b>		
Front microphone input	1x XLR-3 female, balanced, +48 V phantom or 1x XLR-5 female, balanced, +48 V phantom (requires DMC 1180 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), 1 or 2 channels (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 V <sub>pp</sub> , 75 Ω	
(HD-)SDI output	BNC connector SMPTE 292M (1.5 Gb/s) or SMPTE 259M (270 Mb/s), 0.8 V <sub>pp</sub> , 75 Ω	
Analog video input	BNC connector CVBS, Blackburst, Linear Timecode or AES/EBU audio, 1.0 V <sub>pp</sub> , 75 Ω	
Analog video output	BNC connector CVBS, Linear Timecode or AES/EBU audio, 1.0 V <sub>pp</sub> , 75 Ω	
Power input (DC in)	XLR-4 male (11.0 to 17.0 VDC)	
Accessory output	4-pin female Hirose power output 12 VDC (nom.) 1.0A with tally signal.	
<b>IT-connectivity</b>		
Ethernet	1 x RJ-45 Ethernet connector and 1x RJ-45 connector for future use	
USB	2 x USB A host connector, 1 x USB B device connector USB 2.0 compliant	
IEEE 1394	6-pin IEEE 1394 connector (powers up to 10 W)	

## 11.2 Connectors

### 11.2.1 Audio input connectors (Rear1 and Rear2)

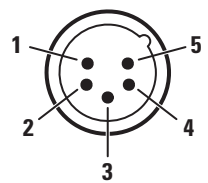


XLR 3-pin female  
(panel view)

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

Microphone impedance: 200  $\Omega$   
Max. input level: +22 dBu  
Phantom power: +48 V (switchable)  
Mic/Line switchable

### 11.2.2 Audio output connector

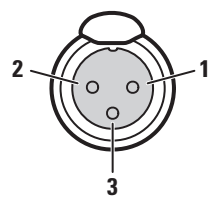


XLR 5-pin male  
(panel view)

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.

### 11.2.3 Front microphone connector (Front1)

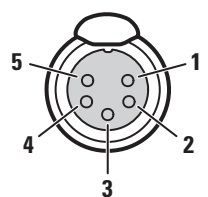


XLR 3-pin female  
(panel view)

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

Microphone impedance: 200  $\Omega$   
Max. input level: +14 dBu  
Phantom power: +48 V (fixed)

### 11.2.4 Front microphone connector (Front1 and Front2)

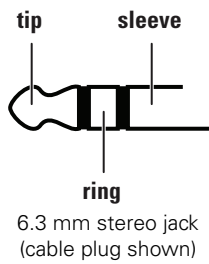


XLR 5-pin female  
(panel view)

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  $\Omega$   
Max. input level: +14 dBu  
Phantom power: +48 V (fixed)

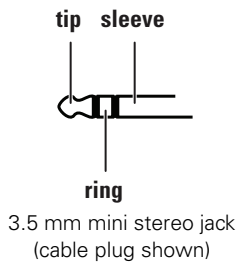
### 11.2.5 Headphones output



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

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

### 11.2.6 Headset microphone input (MicRear)



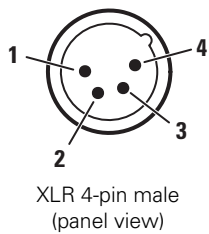
Pin	Description
sleeve	Ground (cable shield)
tip	Signal hot (+)
ring	signal cold (-)

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.

### 11.2.7 Power input connector (DC in)



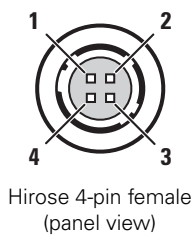
Pin	Description
1	Ground
2	not connected
3	Ground (bridged to pin 1)
4	+15 VDC (nom.)



#### Note

Power input (pin 4) accepts a voltage from 11.0 to 17.0 VDC maximum.

### 11.2.8 Accessory output connector



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

NOTE: power output (pin 4) follows the applied power input (DC in).

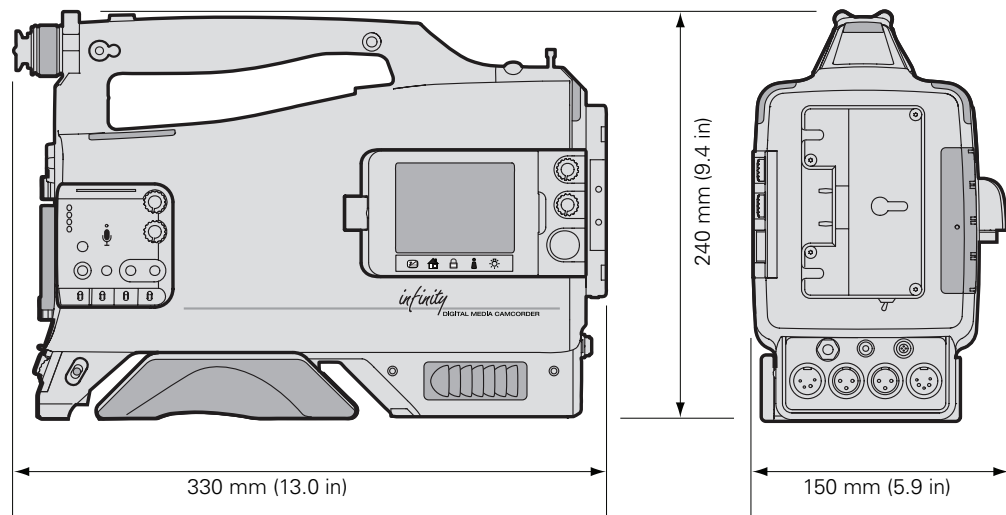
**Note**

The power output (at pin 4) follows the battery voltage (when attached) or the DC input voltage applied to the power input connector.

**Note**

The tally/on-air signal (at pin 2) is connected to an internal switch that follows the camcorder's rear tally lights. When the rear tally lights are on, the contact is closed.

## 11.3 Dimensions



## 11.4 Compression profiles

This chapter contains an overview of all compression profiles supported by the camcorder and lists their characteristics for each video mode.

### 11.4.1 JPEG 2000 profiles

	resolution	GoP struct.	GoP length	GoP seq.	frame rate	chroma sampling	bit-depth	CBE/VBE	profile/level	bitrate (Mbps)
1080i profiles (field wrapped)										
	1920x1080i	I-frame	1	I	25	4:2:2	10 bits	VBE	n/a	50
	1920x1080i	I-frame	1	I	25	4:2:2	10 bits	VBE	n/a	75
	1920x1080i	I-frame	1	I	25	4:2:2	10 bits	VBE	n/a	100
	1920x1080i	I-frame	1	I	29.97	4:2:2	10 bits	VBE	n/a	50
	1920x1080i	I-frame	1	I	29.97	4:2:2	10 bits	VBE	n/a	75
	1920x1080i	I-frame	1	I	29.97	4:2:2	10 bits	VBE	n/a	100
720P profiles (frame wrapped)										
	1280x720p	I-frame	1	I	25	4:2:2	10 bits	VBE	n/a	50
	1280x720p	I-frame	1	I	25	4:2:2	10 bits	VBE	n/a	75
	1280x720p	I-frame	1	I	25	4:2:2	10 bits	VBE	n/a	100
	1280x720p	I-frame	1	I	29.97	4:2:2	10 bits	VBE	n/a	50
	1280x720p	I-frame	1	I	29.97	4:2:2	10 bits	VBE	n/a	75
	1280x720p	I-frame	1	I	29.97	4:2:2	10 bits	VBE	n/a	100
625i profiles (fame wrapped)										
	720x576i	I-frame	1	I	25	4:2:2	10 bits	VBE	n/a	30
	720x576i	I-frame	1	I	25	4:2:2	10 bits	VBE	n/a	40
	720x576i	I-frame	1	I	25	4:2:2	10 bits	VBE	n/a	50
525i profiles (fame wrapped)										
	720x486i	I-frame	1	I	29.97	4:2:2	10 bits	VBE	n/a	30
	720x486i	I-frame	1	I	29.97	4:2:2	10 bits	VBE	n/a	40
	720x486i	I-frame	1	I	29.97	4:2:2	10 bits	VBE	n/a	50

### 11.4.2 DV25

	resolution	GoP struct.	GoP length	GoP seq.	frame rate	chroma sampling	bit-depth	CBE/VBE	profile/level	bitrate (Mbps)
	720x576i	I-frame	1	I	25	4:2:0	8 bits	CBE	n/a	25
	720x480i	I-frame	1	I	29.97	4:1:1	8 bits	CBE	n/a	25



### 11.4.3 1080P JPEG 2000 profiles



#### Note

The following profiles are only available when the optional DMC 1130 1080P license is installed.

	resolution	GoP struct.	GoP length	GoP seq.	frame rate	chroma sampling	bit-depth	CBE/VBE	profile/level	bitrate (Mbps)
23.98 psF (segmented frame wrapped)										
	1920x1080p	I-frame	1	I	23.98	4:2:2	10 bits	VBE	n/a	50
	1920x1080p	I-frame	1	I	23.98	4:2:2	10 bits	VBE	n/a	75
	1920x1080p	I-frame	1	I	23.98	4:2:2	10 bits	VBE	n/a	100
25 psF (segmented frame wrapped)										
	1920x1080p	I-frame	1	I	25	4:2:2	10 bits	VBE	n/a	50
	1920x1080p	I-frame	1	I	25	4:2:2	10 bits	VBE	n/a	75
	1920x1080p	I-frame	1	I	25	4:2:2	10 bits	VBE	n/a	100
29.97 psF (segmented frame wrapped)										
	1920x1080p	I-frame	1	I	29.97	4:2:2	10 bits	VBE	n/a	50
	1920x1080p	I-frame	1	I	29.97	4:2:2	10 bits	VBE	n/a	75
	1920x1080p	I-frame	1	I	29.97	4:2:2	10 bits	VBE	n/a	100

### 11.4.4 MPEG-2 I-frame



#### Note

The following profiles are only available when the optional DMC 1120 MPEG-2 board is installed.

	resolution	GoP struct.	GoP length	GoP seq.	frame rates	chroma sampling	bit-depth	CBE/VBE	profile/level	bitrate (Mbps)
<b>720P</b>	1280x720p	I-frame	1	I	25	4:2:0	8 bits	VBE	MP@HL	60
	1280x720p	I-frame	1	I	25	4:2:0	8 bits	VBE	MP@HL	80
	1280x720p	I-frame	1	I	29.97	4:2:0	8 bits	VBE	MP@HL	60
	1280x720p	I-frame	1	I	29.97	4:2:0	8 bits	VBE	MP@HL	80
<b>1080i</b>	1440x1080i	I-frame	1	I	25	4:2:0	8 bits	VBE	MP@H-14L	60
	1440x1080i	I-frame	1	I	29.97	4:2:0	8 bits	VBE	MP@H-14L	60
	1920x1080i	I-frame	1	I	25	4:2:0	8 bits	VBE	MP@HL	80
	1920x1080i	I-frame	1	I	29.97	4:2:0	8 bits	VBE	MP@HL	80
<b>625i</b>	720x576i	I-frame	1	I	25	4:2:2	8 bits	VBE	422@ML	30
	720x576i	I-frame	1	I	25	4:2:2	8 bits	VBE	422@ML	40
	720x576i	I-frame	1	I	25	4:2:2	8 bits	VBE	422@ML	50

	resolution	GoP struct.	GoP length	GoP seq.	frame rates	chroma sampling	bit-depth	CBE/VBE	profile/level	bitrate (Mbps)
525i	720x480i	I-frame	1	I	29.97	4:2:2	8 bits	VBE	422@ML	30
	720x480i	I-frame	1	I	29.97	4:2:2	8 bits	VBE	422@ML	40
	720x480i	I-frame	1	I	29.97	4:2:2	8 bits	VBE	422@ML	50

### 11.4.5 1080P MPEG-2 I-frame

#### Note

The following profiles are only available when both the optional DMC 1120 MPEG-2 board and the DMC 1130 1080P license are installed.

	resolution	GoP struct.	GoP length	GoP seq.	frame rate	chroma sampling	bit-depth	CBE/VBE	profile/level	bitrate (Mbps)
23.98psF	1440x1080	I-frame	1	I	23.98	4:2:0	8 bits	VBE	MP@H-14L	60
	1920x1080	I-frame	1	I	23.98	4:2:0	8 bits	VBE	MP@HL	80
25psF	1440x1080	I-frame	1	I	25	4:2:0	8 bits	VBE	MP@H-14L	60
	1920x1080	I-frame	1	I	25	4:2:0	8 bits	VBE	MP@HL	80
29.97psF	1440x1080	I-frame	1	I	29.97	4:2:0	8 bits	VBE	MP@H-14L	60
	1920x1080	I-frame	1	I	29.97	4:2:0	8 bits	VBE	MP@HL	80

### 11.4.6 MPEG-2 D10

#### Note

The following profiles are only available when the optional DMC 1120 MPEG-2 board is installed.

	resolution	GoP struct.	GoP length	GoP seq.	frame rate	chroma sampling	bit-depth	CBE/VBE	profile/level	bitrate (Mbps)
25Fps	720x608i	I-frame	1	I	25	4:2:2	8 bits	CBE	D10 30	30
	720x608i	I-frame	1	I	25	4:2:2	8 bits	CBE	D10 40	40
	720x608i	I-frame	1	I	25	4:2:2	8 bits	CBE	D10 50	50
29.97Fps	720x512i	I-frame	1	I	29.97	4:2:2	8 bits	CBE	D10 30	30
	720x512i	I-frame	1	I	29.97	4:2:2	8 bits	CBE	D10 40	40
	720x512i	I-frame	1	I	29.97	4:2:2	8 bits	CBE	D10 50	50

### 11.4.7 1080P MPEG-2 Long GoP (closed GoP)



#### Note

The following profiles are only available when both the optional DMC 1120 MPEG-2 board and the DMC 1130 1080P license are installed.

	reso- lution	GoP struct.	GoP len.	GoP sequence	frm. rate	chrn. sampl.	bit- dpth	CBE/ VBE	profile/ level	bitrate (Mbps)
23.98psF	1440x1080	Long GoP	12	IBBPBBPBBPBB	23.98	4:2:0	8 bits	VBE	MP@H-14L	25
	1440x1080	Long GoP	12	IBBPBBPBBPBB	23.98	4:2:0	8 bits	VBE	MP@H-14L	35
	1920x1080	Long GoP	12	IBBPBBPBBPBB	23.98	4:2:0	8 bits	VBE	MP@HL	50
25psF	1440x1080	Long GoP	12	IBBPBBPBBPBB	25	4:2:0	8 bits	VBE	MP@H-14L	25
	1440x1080	Long GoP	12	IBBPBBPBBPBB	25	4:2:0	8 bits	VBE	MP@H-14L	35
	1920x1080	Long GoP	12	IBBPBBPBBPBB	25	4:2:0	8 bits	VBE	MP@HL	50
29.97psF	1440x1080	Long GoP	15	IBBPBBPBBPBBPBB	29.97	4:2:0	8 bits	VBE	MP@H-14L	25
	1440x1080	Long GoP	15	IBBPBBPBBPBBPBB	29.97	4:2:0	8 bits	VBE	MP@H-14L	35
	1920x1080	Long GoP	15	IBBPBBPBBPBBPBB	29.97	4:2:0	8 bits	VBE	MP@HL	50

### 11.4.8 1080i MPEG-2 Long GoP (closed GoP)



#### Note

The following profiles are only available when the optional DMC 1120 MPEG-2 board is installed.

	reso- lution	GoP struct.	GoP len.	GoP sequence	frm. rate	chrn. sampl.	bit- dpth	CBE/ VBE	profile/ level	bitrate (Mbps)
25i	1440x1080i	Long GoP	12	IBBPBBPBBPBB	25	4:2:0	8 bits	VBE	MP@H-14L	25
	1440x1080i	Long GoP	12	IBBPBBPBBPBB	25	4:2:0	8 bits	VBE	MP@H-14L	35
	1920x1080i	Long GoP	12	IBBPBBPBBPBB	25	4:2:0	8 bits	VBE	MP@HL	50
29.97i	1440x1080i	Long GoP	15	IBBPBBPBBPBBPBB	29.97	4:2:0	8 bits	VBE	MP@H-14L	25
	1440x1080i	Long GoP	15	IBBPBBPBBPBBPBB	29.97	4:2:0	8 bits	VBE	MP@H-14L	35
	1920x1080i	Long GoP	15	IBBPBBPBBPBBPBB	29.97	4:2:0	8 bits	VBE	MP@HL	50

### 11.4.9 720P MPEG-2 Long GoP (closed GoP)



#### Note

The following profiles are only available when the optional DMC 1120 MPEG-2 board is installed.

	reso- lution	GoP struct.	GoP len.	GoP sequence	frm. rate	chrn. sampl.	bit- dpth	CBE/ VBE	profile/ level	bitrate (Mbps)
50p	1280x720p	Long GoP	6	IBBPBB	50	4:2:0	8 bits	VBE	MP@HL	18
	1280x720p	Long GoP	6	IBBPBB	50	4:2:0	8 bits	VBE	MP@HL	35
	1280x720p	Long GoP	6	IBBPBB	50	4:2:0	8 bits	VBE	MP@HL	50
59.94p	1280x720p	Long GoP	6	IBBPBB	59.94	4:2:0	8 bits	VBE	MP@HL	18
	1280x720p	Long GoP	6	IBBPBB	59.94	4:2:0	8 bits	VBE	MP@HL	35
	1280x720p	Long GoP	6	IBBPBB	59.94	4:2:0	8 bits	VBE	MP@HL	50

# Chapter 12

## Side panel menu

### 12.1 Audio menu

Menu item	Values	Description	Level	File
channels				
channel 1				
ch1 lvl control	AGC standard, AGC-12dB, Front, Level1, <b>Lev1+Front</b> , Level2, Lev2+Front, Fixed	Selects a recording level control.	1	Prod
ch1 fixed lvl	0..99 ( <b>50</b> )	Sets the fixed recording level (when fixed control is selected).	1	Prod
ch1 filter	<b>None</b> , 150Hz	Selects the channel filter.	1	Prod
ch1 AGC profile	<b>Standard</b> , Quiet, Noisy	Selects the AGC (Automatic Gain Control) profile.	1	Prod
channel 2				
ch2 lvl control	AGC standard, AGC-12dB, Front, Level1, Lev1+Front, Level2, <b>Lev2+Front</b> , Fixed	Selects a recording level control.	1	Prod
ch2 fixed lvl	0..99 ( <b>50</b> )	Sets the fixed recording level (when fixed control is selected).	1	Prod
ch2 filter	<b>None</b> , 150Hz	Selects the channel filter.	1	Prod
ch2 AGC profile	<b>Standard</b> , Quiet, Noisy	Selects the AGC (Automatic Gain Control) profile.	1	Prod
channel 3				
ch3 lvl control	AGC standard, AGC-12dB, Front, Level1, <b>Lev1+Front</b> , Level2, Lev2+Front, Fixed	Selects a recording level control.	1	Prod
ch3 fixed lvl	0..99 ( <b>50</b> )	Sets the fixed recording level (when fixed control is selected).	1	Prod
ch3 filter	<b>None</b> , 150Hz	Selects the channel filter.	1	Prod
ch3 AGC profile	<b>Standard</b> , Quiet, Noisy	Selects the AGC (Automatic Gain Control) profile.	1	Prod

Menu item	Values	Description	Level	File
channel 4				
ch4 lvl control	AGC standard, AGC-12dB, Front, Level1, Lev1+Front, Level2, <b>Lev2+Front</b> , Fixed	Selects a recording level control.	1	Prod
ch4 fixed lvl	0..99 ( <b>50</b> )	Sets the fixed recording level (when fixed control is selected).	1	Prod
ch4 filter	<b>None</b> , 150Hz	Selects the channel filter.	1	Prod
ch4 AGC profile	<b>Standard</b> , Quiet, Noisy	Selects the AGC (Automatic Gain Control) profile.	1	Prod
source ch1	Rear1, Rear2, Wrx1,[Wrx2], <b>Front1</b> , [Front2], MicRear, AES1, AES2, SDI In1.8, Sidetone, Program, Eng, Prod, Mute	Selects a recording source for channel 1.	1	Prod
source ch2	Rear1, Rear2, Wrx1,[Wrx2], <b>Front1</b> , [Front2], MicRear, AES1, AES2, SDI In1.8, Sidetone, Program, Eng, Prod, Mute	Selects a recording source for channel 2.	1	Prod
source ch3	<b>Rear1</b> , Rear2, Wrx1,[Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1.8, Sidetone, Program, Eng, Prod, Mute	Selects a recording source for channel 3.	1	Prod
source ch4	Rear1, <b>Rear2</b> , Wrx1,[Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1.8, Sidetone, Program, Eng, Prod, Mute	Selects a recording source for channel 4.	1	Prod
<b>monitoring</b>				
hdph mode left	<b>Channel</b> , Source	Selects channel/source mode for the headphones left channel input.	0	Prod
hdph source left	Rear1, Rear2, Wrx1, [Wrx2], <b>Front1</b> , [Front2], MicRear, AES1, AES2, SDI In1.8, Sidetone, Program, Eng, Prod, Mixer	Selects a source to be routed to the headphones left channel when input mode is source.	0	Prod
hdph channel left	<b>Ch1</b> , 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 <b>channel</b> .	0	Prod
speaker mode	<b>Hdph L+R</b> , Hdph L, Hdph R	Selects channel/source mode for the speaker input.	0	Oper
hdph mode right	<b>Channel</b> , Source	Selects channel/source mode for the headphones right channel input.	0	Prod

Menu item		Values	Description	Level	File
	hdph source right	Rear1, Rear2, Wrx1, [Wrx2], <b>Front1</b> , [Front2], MicRear, AES1, AES2, SDI In1..8, Sidetone, Program, Eng, Prod, Mixer	Selects a source to be routed to the headphones right channel when input mode is <b>source</b> .	0	Prod
	hdph channel right	<b>Ch1</b> , 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.	0	Prod
	speaker mute	<b>On</b> , Off	Mutes speaker signal (turns audio off).	0	Oper
<b>outputs</b>					
	rear				
	rear	Enabled, <b>Disabled</b>	Enables or disables the rear1 and rear2 outputs. Disable the outputs to save power.	1	Prod
	rear 1 mode	<b>Channel</b> , Source	Selects channel/source mode for the rear1 output.	1	Prod
	rear 1 source	Rear1, Rear2, Wrx1, [Wrx2], <b>Front1</b> , [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, Prod, Mixer	Selects a source to be routed to the rear1 output when input mode is <i>source</i> .	1	Prod
	rear 1 channel	<b>Ch1</b> , 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 <i>channel</i> .	1	Prod
	rear 2 mode	<b>Channel</b> , Source	Selects channel/source mode for the rear2 output.	1	Prod
	rear 2 source	Rear1, Rear2, Wrx1, [Wrx2], <b>Front1</b> , [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, Prod, Mixer	Selects a source to be routed to the rear2 output when input mode is <i>source</i> .	1	Prod
	rear 2 channel	Ch1, <b>Ch2</b> , 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 <i>channel</i> .	1	Prod
	AES Audio				
	AES mode	<b>Channel</b> , Source	Selects input mode for the AES audio output.	1	Prod
	AES 1 source	Rear1, Rear2, Wrx1, [Wrx2], <b>Front1</b> , [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, Prod, Mixer	Selects a source to be routed to the AES1 output when input mode is <i>source</i> .	1	Prod
	AES 1 channel	<b>Ch1</b> , 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 <i>channel</i> .	1	Prod

Menu item	Values	Description	Level	File
AES 2 source	Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, Prod, Mixer	Selects a source to be routed to the AES2 output when input mode is <i>source</i> .	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 <i>channel</i> .	1	Prod
SDI out				
SDI channel 1	Ch1, Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4, Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, Prod, Mixer	Selects a channel, source or intercom channel to embed in the SDI audio output channel.	1	Prod
SDI channel 2	<i>same as above (ch2)</i>	<i>same as above</i>	1	Prod
SDI channel 3	<i>same as above (ch3)</i>	<i>same as above</i>	1	Prod
SDI channel 4	<i>same as above (ch4)</i>	<i>same as above</i>	1	Prod
SDI channel 5	<i>same as above (ch1)</i>	<i>same as above</i>	1	Prod
SDI channel 6	<i>same as above (ch1)</i>	<i>same as above</i>	1	Prod
SDI channel 7	<i>same as above (ch1)</i>	<i>same as above</i>	1	Prod
SDI channel 8	<i>same as above (ch1)</i>	<i>same as above</i>	1	Prod
<b>inputs</b>				
front				
gain	-20..+25 (0)	Sets input gain in dB for front mic input (mono or stereo).	1	Prod
limiter	On, Off	Turns audio limiter for Front mic input on or off.	1	Prod
rear1				
gain (mic)	-5..+30 (0)	Sets input gain (in 5 dB steps) for rear 1 mic input.	1	Prod
gain (line)	0..+20 (0)	Sets input gain (in 5 dB steps) for rear 1 line input.	1	Prod
rear 1 limiter	On, Off	Turns audio limiter for rear 1 input on or off.	1	Prod
rear2				
gain (mic)	-5..+30 (0)	Sets input gain (in 5 dB steps) for rear 2 mic input.	1	Prod
gain (line)	0..+20 (0)	Sets input gain (in 5 dB steps) for rear 2 line input.	1	Prod
rear 2 limiter	On, Off	Turns audio limiter for rear 2 input on or off.	1	Prod
wireless 1				
gain	0..20 (0)	Sets input gain (in 5 dB steps) for wireless microphone input 1.	1	Prod
wireless 2				



Menu item		Values	Description	Level	File
	gain	0..20 (0)	Sets input gain (in 5 dB steps) for wireless microphone input 2.	1	Prod
<b>setup</b>					
	test tone	<b>Disable</b> , -6dBFS, Headroom	Selects 1KHz test tone level (only audible when color bar is on): Disabled = no test tone -6dBFS = test tone level is at -6dBFS Headroom = test tone level is the same as the selected audio headroom.	3	Prod
	headroom	<b>-18dBFS</b> , -20dBFS	Selects audio headroom.	3	Prod
	stereo option	<b>Mono</b> , Stereo	Set to <b>Stereo</b> when the optional DMC 1180 stereo microphone connector kit is installed.	S1	-
<b>mixer</b>					
	source 1	Ch1, Ch2, Ch3, Ch4, Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, <b>Eng</b> , Prod, Mixer, Mute	Selects a source for audio mixer source 1.	1	Prod
	source 2	Ch1, Ch2, Ch3, Ch4, Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, <b>Prod</b> , Mixer, Mute	Selects a source for audio mixer source 2.	1	Prod
	source 3	Ch1, Ch2, Ch3, Ch4, Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, <b>Program</b> , Eng, Prod, Mixer, Mute	Selects a source for audio mixer source 3.	1	Prod
	source 4	Ch1, Ch2, Ch3, Ch4, Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, <b>Sidetone</b> , Program, Eng, Prod, Mixer, Mute	Selects a source for audio mixer source 4.	1	Prod
	level 1	0..99 (50)	Sets mix level for source 1.	1	Prod
	level 2	0..99 (50)	Sets mix level for source 2.	1	Prod
	level 3	0..99 (50)	Sets mix level for source 3.	1	Prod
	level 4	0..99 (50)	Sets mix level for source 4.	1	Prod
<b>intercom</b>					
	prod	Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8 ( <b>SDI In 3</b> )	Selects which input is used for the intercom Production (Prod) channel.	1	Prod

Menu item		Values	Description	Level	File
	eng	Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8 ( <b>SDI In 4</b> )	Selects which input is used for the intercom Engineering (Eng) channel.	1	Prod
	program	Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8 ( <b>SDI In 1</b> )	Selects which input is used for the intercom Program (program) channel.	1	Prod
	sidetone	Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], <b>MicRear</b> , AES1, AES2, SDI In1..8	Selects which input is used for sidetone.	1	Prod
	prod-ret	Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, <b>Sidetone</b> , Program, Eng, Prod	Selects which input is used for the intercom Production return (prod-ret) channel.	1	Prod
	eng-ret	Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, <b>Sidetone</b> , Program, Eng, Prod	Selects which input is used for the intercom Engineering return (eng-ret) channel.	1	Prod

## 12.2 Video menu

Menu item	Values	Description	Level	File
<b>levels</b>				
gain				
gain	VAR, [preset -], <b>0dB</b> , [preset +], [preset ++], [preset +++]	Selects variable gain or gain preset (see presets below for values)	1	-
var. gain	- 6.0dB .. 42.0dB ( <b>0dB</b> )	Sets variable gain (in 0.1dB steps).	1	-
gain presets				
-	-6dB, <b>-3dB</b>	Selects gain value for - preset.	3	-
+	+3dB, <b>+6dB</b> , +9dB, +12dB, +15dB, +18dB	Selects gain value for + preset.	3	-
++	+6dB, <b>+9dB</b> , +12dB, +15dB, +18dB, +24dB	Selects gain value for ++ preset.	3	-
+++	+9dB, +12dB, +15dB, +18dB, +24dB, <b>+30dB</b> , +36dB, +42dB	Selects gain value for +++ preset.	3	-
painting range	<b>+3dB</b> , +6dB	Selects painting range.	3	-
gain RGB				
R	0..99 ( <b>50</b> )	Sets gain level (R)	3	Scene
G	0..99 ( <b>50</b> )	Sets gain level (G)	3	Scene
B	0..99 ( <b>50</b> )	Sets gain level (B)	3	Scene
black				
black RGBM				
R	0..99 ( <b>50</b> )	Sets black level adjustment (R)	3	Scene
G	0..99 ( <b>50</b> )	Sets black level adjustment (G)	3	Scene
B	0..99 ( <b>50</b> )	Sets black level adjustment (B)	3	Scene
M	0..99 ( <b>50</b> )	Sets black level adjustment (Master)	1	Scene
dynamic black	On, <b>Off</b>	Turns dynamic black on or off	1	-
auto black	On, <b>Off</b>	Returns black levels their default values (50;50;50;50)	1	-
black stretch				
black stretch	On, <b>Off</b>	Turns black stretch on or off. Use to enhance image details in the dark parts of the image.	3	Scene
black contrast	<b>Stretch</b> , Press	Sets contrast to black stretch or black press when black stretch is on.	3	Scene
black str. lvl	0..99 ( <b>50</b> )	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. Clear means that no filter is used.	0	-
Home filterwheel	On, <b>Off</b>	Runs the filterwheel home positioning. Allow a few seconds for the filterwheel to adjust.	0	-

Menu item	Values	Description	Level	File
exposure				
exposure	Nom, Var, 50Hz, 60Hz, 1/200, 1/500, 1/1000, 1/2000	Selects exposure time. This function is also controlled by the exposure time switch at the front of the camcorder.	1	-
lighting	-10 . . . +10 (0)	Sets the exposure correction (in steps of 1 Hz) to synchronise with lighting frequency when exposure mode is 50 Hz or 60 Hz.	1	-
var. exp. time	50 Hz .. 3270 Hz, (50.0 Hz), 60 Hz .. 3280 Hz (60.0 Hz)	Sets the exposure time in 0.5 Hz steps when exposure mode is <i>Var</i> (you can also use the exposure button at the front of the camcorder)	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;	1	Scene
knee source	Y, NAM	Selects knee type: Y = Y-component/luminance; NAM = Non-Additive Mix (luminance of highest RGB component)	3	Scene
desaturation	On, Off	Turns knee desaturation on or off.	3	Scene
white limiter	On, Off	Turns white limiter 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.	3	Scene
white imiter lvl	0..99 (54)	Sets the white limiter 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 (76,76,76); 2 = Low curve (50,50,50); LIN = Linear curve (0,0,0); VAR = Variable curve (76,76,76)	3	Scene
gamma curve	ARD, CCIR, 6xARD, RAI, Cinestyle1, Cinestyle2, CineLog, BBC04, BBC05, BBC06	Selects a standard curve for gamma correction.	3	Scene

Menu item	Values	Description	Level	File
gamma RGBM				
R	0..99 (76)	Sets the gamma level (R)	3	Scene
G	0..99 (76)	Sets the gamma level (G)	3	Scene
B	0..99 (76)	Sets the gamma level (B)	3	Scene
M	0..99 (76)	Sets the gamma level (Master)	3	Scene
<b>color</b>				
color temp				
color temp	VAR, 3200K, 4700K, 5600K, 7500K, AW1, AW2, AWC, FL50, FL60	Selects variable color temperature, color temperature preset, Auto White memory location or Auto White Continuous (AWC) setting.	1	-
var. col. temp	<current setting for color temperature>	Shows or sets (when color temp = VAR) the current color temperature.	1	Scene
white balance				
autowhite	<status>	Shows the running status of the auto white balance procedure.	1	-
autowhite speed	0..38 (4)	Sets auto auto speed for auto white balance procedure.	S1	-
autowhite gain	0..38 (10)	Sets auto white gain for auto white balance procedure.	S1	-
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.	3	Scene
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	Lens

Menu item	Values	Description	Level	File
hor. saw RGB				
R	0..99 (50)	Sets the white shading hor. sawtooth (R)	3	Lens
G	0..99 (50)	Sets the white shading hor. sawtooth (G)	3	Lens
B	0..99 (50)	Sets the white shading hor. sawtooth (B)	3	Lens
hor. par RGB				
R	0..99 (0)	Sets the white shading hor. parameter (R)	3	Lens
G	0..99 (0)	Sets the white shading hor. parameter (G)	3	Lens
B	0..99 (0)	Sets the white shading hor. parameter (B)	3	Lens
ver. saw RGB				
R	0..99 (50)	Sets the white shading vert. sawtooth (R)	3	Lens
G	0..99 (50)	Sets the white shading vert. sawtooth (G)	3	Lens
B	0..99 (50)	Sets the white shading vert. sawtooth (B)	3	Lens
ver. par RGB				
R	0..99 (0)	Sets the white shading vert. parameter (R)	3	Lens
G	0..99 (0)	Sets the white shading vert. parameter (G)	3	Lens
B	0..99 (0)	Sets the white shading vert. parameter (B)	3	Lens
color bar	On, Off	Turns color bar on or off.	1	-
sawtooth	On, Off	Turns sawtooth on or off.	1	-
saturation	0..99 (50)	Sets color saturation level.	1	-
CVBS chroma	On, Off	Turns chroma component in CVBS output signal on or off.	1	-
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: default values for SD and HD are different.	3	Scene
level	0..99 (SD:20, HD:50)	Sets detail enhancement level. Note: default values for SD and HD 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.	3	Scene
soft level	0..99 (SD:70, HD:30)	Sets the upper limit level of detail enhancement for soft detail. Note: default values for SD and HD are different.	3	Scene

Menu item	Values	Description	Level	File
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.	1	Scene
autoskin	Off > On > Win > Off	Shows current status of the auto skin detail procedure.	1	
skin width				
width 1 RB				
R	0..99 (50)	Hue width for skin gate 1 (R)	1	Scene
B	0..99 (50)	Hue width for skin gate 1 (B)	1	Scene
width 2 RB				
R	0..99 (50)	Hue width for skin gate 2 (R)	1	Scene
B	0..99 (50)	Hue width for skin gate 2 (B)	1	Scene
location XY				
X	0..46	Read only value for skin location X	1	
Y	0..17	Read only value for skin location Y	1	
skin level	0..99 (14)	Sets skin contour level.	1	Scene
skin view	Off, On	Turns skin view mode on or off.	1	-
skin color				
color 1 RB				
R	0..99 (50)	color tone for skin gate 1 (R)	1	Scene
B	0..99 (50)	color tone for skin gate 1 (B)	1	Scene
color 2 RB				
R	0..99 (50)	color tone for skin gate 2 (R)	1	Scene
B	0..99 (50)	color tone for skin gate 2 (B)	1	Scene

## 12.3 Setup menu

Menu item	Values	Description	Level	File
<b>formats</b>				
video standard	1080i59, 720p59, <b>1080i50</b> , 720p50, 576i50, 480i59, (1080p2398, 1080p25, 1080p2997)	Selects camera video standard. Note: 1080p standards are only available with the 1080p option.	2	Prod
video compr. SD	DV25, [D10 30, D10 40, D10 50], <b>JP2K30</b> , JP2K40, JP2K50, [MP2I30, MP2I40, MP2I50, MP2LG]	Selects video compression and bitrate for SD recording. Note: MPEG-2 and D10 compression are only available with the MPEG2 option board.	2	Prod
media selection	<b>REV</b> , CF1, CF2, Extern	Selects the storage media for recording multimedia data.	0	Prod
VF playback	<b>Conf</b> , Full	Sets the way content is displayed in the viewfinder: Conf = as is ('confidence'); Full = maximized cropping.	2	Prod
video source	<b>CAM</b> , SDI, CVBS	Selects video (recording) source: CAM = camera live video; SDI = digital video input; CVBS = analog video input (only available when an SD video standard is selected)	2	Prod
video compr. HD	<b>JP2K50</b> , JP2K75, JP2K100, [MP2I60, MP2I80, MP2LG25, MP2LG35, MP2LG50]	Selects video compression and bitrate for HD recording. Note: MPEG-2 selections are only available with the MPEG-2 option board.	2	Prod
chunk size	<b>NoLimit</b> , [10 sec], 30 sec, 60 sec, 2 GByte	Sets the chunk size for the mediafile. Note NoLimit is not available when CF1 or CF2 is selected. Note: 10 sec is not available for bitrates of 75 Mbp/s or higher.	2	Prod
aspect ratio	<b>16:9</b> , 4:3, LB	Sets aspect ratio of the recorded signal (only available when an SD video standard is selected)	2	Prod
<b>timecode</b>				
run mode	<b>Record-run</b> , Free-run	Sets the run mode of the timecode generator: Record-run = timecode generator only runs when recording. Free-run = timecode generator runs continuously.	3	Prod
<b>userbits</b>				
userbit mode	Usr value, <b>Date</b> , Ext input	Selects the timecode user bits mode.	3	Prod
userbits 1	UB1..4	0..F ( <b>0</b> )	3	Prod
userbit type	<b>Date/Time</b> , Page/Line, Unspec.	Selects the timecode user bits type.	3	Prod
userbits 2	UB5..8	0..F ( <b>0</b> )	3	Prod
setup				



Menu item		Values	Description	Level	File
	input type	DVITC, ATC SD, ATC HD	Selects timecode type to be used for the input:	3	Prod
	f-run sync	Real time, Local value, External	Selects type of timecode synchronisation.	3	Prod
	ATC SD lines	None, 11, 11+13, 12, 12+14, 13, 13+15, 14, 14+16, 15, 15+17, 16, 16+18, 17, 17+19, 18, 18+20, 19, 20	Selects video lines used to embed the ATC (Ancillary Time Code) into the SD video signal.	S1	Prod
	dropframe mode	NDF, DF	Selects non drop frame (NDF) mode or drop from (DF) for timecode.	3	Prod
	DVITC line	None, 14, 16, 14+16	Selects video lines used to embed the DVITC (Digital Vertical Interval Time Code) into the video signal.	S1	Prod
	ATC HD lines	NONE, 9, 9+11	Selects video lines used to embed the ATC (Ancillary Time Code) into the HD video signal.	S1	Prod
	play mode	Regen., From file	Sets the playback mode of the timecode generator.	3	Prod
	new timecode				
	hrs	0..23 (0)	Sets value for hours.	1	Prod
	min	0..59 (0)	Sets value for minutes.	1	Prod
	sec	0..59 (0)	Sets value for seconds.	1	Prod
	frms	0..29 (0)	Sets value for frames.	1	Prod
<b>recbuff</b>					
	preferred media	Not Active, REV-CF-EXT, REV-EXT-CF, CF-REV-EXT, CF-EXT-REV, EXT-REV-CF, EXT-CF-REV	Order of preferred media when the camcorder switches media during recording.	0	Prod
<b>metadata</b>					
	storyfile	no story, <list of available storyfiles>	Selects story file name used in the system.	1	Prod

## 12.4 System menu

Menu item	Values	Description	Level	File
<b>hardware</b>				
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	1	Oper
detail				
detail	On, Off	Turns detail for viewfinder signal on or off.	1	Oper
detail lvl	0..99 (50)	Sets detail level for viewfinder signal.	0	Oper
lens				
autoiris				
autoiris	On, Off	Turns auto iris on or off.	1	Oper
peak average	0..99 (78)	Sets the balance between peak and average video level. 0 = strong reaction to highlights, 99 = less reaction to highlights.	3	Oper
setpoint	0..99 (20)	Sets auto iris exposure level.	3	Oper
autoiris const.				
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.	1	Oper
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.	1	-
extended iris				
gain speed	1..5 (5)	Sets the gain speed for extended auto iris.	3	Oper
iris min.	F5.6, F8.0, F11.0, <b>F16.0</b>	Sets the minimum iris value for extended auto iris.	3	Oper
gain max.	0..15dB (15dB)	Sets the maximum gain value for extended auto iris.	3	Oper
iris max.	F1.4, <b>F2.0</b> , F2.8, F4.0, F5.6	Sets the maximum iris value for extended auto iris.	3	Oper
lens type	Std, WA	Selects the lens type (used to apply the correct shading type): Std = standard lens; WA = wide angle lens.	1	Lens
buttons				
contrast button	<b>BlkStrKnee</b> , Knee, BlkStr Disabled	Assigns a function to the contrast button: BlkStrKnee = black stretch + knee Knee = knee BlkStr = black stretch	0	Oper
user buttons				

Menu item		Values	Description	Level	File
	user 1	Start play, Stop play, Pause play, Rewind, Forward, , Record, Ext iris, Call, Eng Talk, Prod Talk, <b>Disabled</b>	Assigns a function to user button 1.	1	Oper
	user 2	Start play, Stop play, Pause play, Rewind, Forward, , Record, Ext iris, Call, Eng Talk, Prod Talk, <b>Disabled</b>	Assigns a function to user button 2.	1	Oper
	lens				
	RET button	Ext signal, <b>Playback</b>	Assigns a function to the RET button on the lens.	0	Oper
	handgrip				0
	zoom control	Enabled, <b>Disabled</b>	Enables or disables the zoom control on top of the camcorder's carrying handle.	0	Oper
	record switch	Enabled, <b>Disabled</b>	Enables or disables the record switch under the carrying handle.	0	Oper
	ports				
	digital out	<b>Normal</b> , 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	<b>CVBS</b> , Timecode, AES Audio, Audiosync	Selects the signal for the analog BNC input connector.	1	-
	analog out	<b>CVBS</b> , Timecode, AES Audio, Audiosync	Selects the signal for the analog BNC output connector.	1	-
	IEEE 1394	<b>Off</b> , 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, <b>Analog</b> , Digital	Selects the type of source to which the camcorder locks.	1	-
	fan control				3
	silent mode	<b>Rec</b> , Off	Selects mode for cooling fan: Rec = switches temporarily to silent fan profile during recording Off = always use selected fan profile	3	Prod
	profile	<b>Normal</b> , Silent, Cool	Selects a profile for the cooling fan: Cool = maximum cooling (fast response) Normal = normal cooling (linear) Silent = minimal cooling (slow response)	3	Prod
	network				3
	camera #	0..99 ( <b>17</b> )	Sets the logical camera number within the C2IP network.	3	
	remote rec	On, <b>Off</b>	Turns remote recording by the OCP 400 on or off.	3	

Menu item	Values	Description	Level	File
remote tally	On, Off	Turns remote tally signalling by the OCP 400 on or off.	3	
ip address	x.x.x.x (192.168.1.10)	Sets the camcorder's IP address in the C2IP network.	3	
subnetmask	x.x.x.x (255.255.255.0)	Sets the camcorder's subnet mask in the C2IP network.	3	
gateway	x.x.x.x (0.0.0.0)	Sets the camcorder's gateway address in the C2IP network.	3	
timing				
ver.timing	1..625	Set the vertical timing	3	-
H-phase coarse	0..863		3	-
H-phase fine	0..99		3	-
CVBS subc.phase	0..99		3	-
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	-
titlebar	timecode, userbits	Shows timecode or userbits on the sidepanel title bar.	1	-
home screen	default, day, night	Selects a home screen style for the side panel display: default = extended information panel; day = white style (better visibility); night = dark style.	0	-
VF-menu on SPD	On, Off	Turns on the superimposed viewfinder menu on the side panel display. Note: use the Cam/Menu button to switch to <i>Cam View</i> to see the viewfinder menu.	0	-
VF-menu on CVBS	On, Off	Turns on the superimposed viewfinder menu on the CVBS output signal. Note: make sure the analog output port is set to CVBS.	0	-
files				

Menu item	Values	Description	Level	File
std recall mode	<b>Factory</b> , Customer, None	Sets scene file that is recalled when the standard recall button is pressed. When None is selected, the standard recall button is disabled.	2	-
scene files				
recall scene from	<b>Factory</b> , Customer, (Scene1), (Scene2), (Scene3), (Scene4), (USB)	Recalls a stored scene file.	1	-
store scene to	<b>Customer</b> , Scene1, Scene2, Scene3, Scene4, (USB)	Stores current scene settings to the selected scene file.	2	-
production files				
recall prod from	<b>Factory</b> , Customer, (Prod1), (Prod2), (Prod3), (Prod4), (USB)	Recalls a stored production file.	1	-
store prod to	<b>Customer</b> , Prod1, Prod2, Prod3, Prod4, (USB)	Stores current production settings to the selected scene file.	2	-
lens files				
recall lens from	<b>Factory</b> , Customer, (Lens1), (Lens2), (Lens3), (Lens4), (USB)	Recalls a stored lens file.	1	-
store lens to	<b>Customer</b> , Lens1, Lens2, Lens3, Lens4, (USB)	Stores current lens settings to the selected scene file.	2	-
operator files				
recall oper from	<b>Factory</b> , Customer, (Oper1), (Oper2), (Oper3), (Oper4) (USB)	Recalls a stored operator file.	1	-
store oper to	<b>Customer</b> , Oper1, Oper2, Oper3, Oper4, (USB)	Stores current operator settings to the selected operator file.	2	-
<b>security</b>				
user level	usr lvl 0..3 ( <b>usr lvl 3</b> )	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
<b>Detail</b>			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
<b>Zebra</b>			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
<b>Indicators</b>			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

Menu item	Values	Description	Level	File
Focus/Wrx	Focus, Wrx, Off	Selects information that is shown by the focus/wireless indicator: Focus = lens focus distance (0 = close-up, 99 = infinity) Wrx = wireless microphone receiver status; Off = indicator is not shown.	0	Oper
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 = storage time in minutes left on selected media (when media is not available "No info" is shown). Off = indicator is not shown.	0	Oper
<b>Markers</b>			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 and shaded areas.	0	Oper
Shading	Shading, Black	Sets shading style for the cadre marker (when cadre marker style is set to <b>Shad</b> or <b>Both</b> ): Shading = transparent area; Black = black area.	0	Oper
Centre Cross	On, Off	Turns the centre marker on or off.	0	Oper
<b>Safe area</b>			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
<b>OSD</b>			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



Menu item		Values	Description	Level	File
	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
	VF menu on CVBS	On, Off	Turns on the superimposed viewfinder menu on the CVBS output signal. Note: make sure the analog output port is set to <i>CVBS</i> .	0	Oper

## 13.2 Video menu

Menu item		Values	Description	Level	File
<b>Gain</b>				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
<b>Exposure time</b>				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 camcorder)	1	Scene
	Lighting select	-10 . . . +10 (0)	Sets the exposure correction (in steps of 1 Hz) to synchronise with lighting frequency when exposure mode is 50 Hz or 60 Hz.	1	Scene
<b>Color temp</b>				0	
	Temp lvl	2000K ... 20000K (5600K)	Sets the color temperature.	0	Scene
<b>Detail</b>				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: default values for SD and HD are different.	3	Scene
	Vert lvl	0..99 (SD:20, HD:50)	Sets the level of the vertical component in the detail signal. Note: default values for SD and HD 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, 99 = very coarse).	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)		S1	Scene
	Pos + lvl			S1	
	Det black lvl	0..99 (50)		S1	Scene
	Low-mid pos	0..99 (5)	Sets the position and detail level for the lower middle range signal values.	S1	Scene
	Low-mid lvl	0..99 (50)		S1	Scene
	Mid pos	0..99 (22)		S1	Scene
	White pos	0..99 (32)	Sets the range position and detail level for the highest (white) signal values.	S1	Scene
	White lvl	0..99 (50)		S1	Scene
<b>Soft detail</b>				2	
	Soft detail	On, Off	Turns soft detail On or Off. This function reduces the amount of detail added for large transitions.	2	Scene

Menu item		Values	Description	Level	File
	Level	0..99 (SD:70, HD:30)	Sets the upper limit level of detail enhancement for soft detail. Note: default values for SD and HD are different.	2	Scene
<b>Black lvl</b>				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
<b>Black stretch</b>				3	
	Black stretch	0 > 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
<b>Knee</b>				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 point	0..99 (30)	Sets the knee point when knee mode is set to automatic.	S1	Scene
	Auto ref	0..99 (30)	Sets the auto reference level when knee mode is set to automatic.	S1	Scene
	Auto limit	0..99 (50)	Sets the auto limitation level when knee mode is set to automatic.	S1	Scene
<b>Skin</b>				2	
	Skin	Off, 1, 2, 1+2	Turns skin detail off or on and selects the memory position.	2	Scene
	State	Off, On	Shows the current skin state.	2	
	View	Off, On	Turns indication of the selected area on or off.	2	

Menu item		Values	Description	Level	File
	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
<b>Auto skin</b>				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	
<b>Gamma</b>					
	gamma mode	Nom, Low, Lin, Preset	Selects gamma mode: Nom = Nominal curve (76,76,76); Low = Low curve (50,50,50); Lin = Linear curve (0,0,0); Preset = Variable curve (76,76,76)	2	Scene
	Curve	ARD, CCIR, 6xARD, RAI, Cinestyle1, Cinestyle2, CineLog, 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 gamma then matrix; M/G = first matrix, then gamma.	S1	Scene
<b>Matrix</b>					

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 gamma then matrix; M/G = first matrix then gamma.	S1	Scene
<b>Shading</b>					
	Shading	On, Off	Turns white shading compensation on or off.	3	Lens
	Hor Par R	0..99 (50)	Sets white shading horizontal parameter (R).	3	Lens
	Hor Saw R	0..99 (50)	Sets white shading horizontal sawtooth (R).	3	Lens
	Hor Par G	0..99 (50)	Sets white shading horizontal parameter (G).	3	Lens
	Hor Saw G	0..99 (50)	Sets white shading horizontal sawtooth (G).	3	Lens
	Hor Par B	0..99 (50)	Sets white shading horizontal parameter (B).	3	Lens
	Hor Saw B	0..99 (50)	Sets white shading horizontal sawtooth (B).	3	Lens
	Vert Par R	0..99 (50)	Sets white shading vertical parameter (R).	3	Lens
	Vert Saw R	0..99 (50)	Sets white shading vertical sawtooth (R).	3	Lens
	Vert Par G	0..99 (50)	Sets white shading vertical parameter (G).	3	Lens
	Vert Saw G	0..99 (50)	Sets white shading vertical sawtooth (G).	3	Lens
	Vert Par B	0..99 (50)	Sets white shading vertical parameter (B).	3	Lens
	Vert Saw B	0..99 (50)	Sets white shading vertical sawtooth (B).	3	Lens
<b>Flare</b>					
	Flare	On, Off	Turns flare compensation on or off.	3	Lens
	Red lvl	0..99 (50)	Sets flare compensation level (R).	3	Lens
	Green lvl	0..99 (50)	Sets flare compensation level (G).	3	Lens
	Blue lvl	0..99 (50)	Sets flare compensation level (B).	3	Lens
<b>White clipper</b>					
	White clipper	On, Off	Turns white clipper on or off. Use to limit highlight levels in the video signal.	3	Scene
	Level	0..99 (50)	Sets the white clipper 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			3	
CVBS Chroma	0..99 (75)		3	-
CVBS DAC user	0..99 (50)	CVBS output signal level (50 is the calibrated factory default level)	3	-

## 13.3 Setup menu

Menu item	Values	Description	Level	File
<b>Formats</b>			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. MPEG-2 compression is optional.	0	Prod
Compress SD	DV25, JP2K30, JP2K40, JP2K50, (MP2I30), (MP2I40), (MP2I50)	Selects video compression and bitrate for SD recording. MPEG-2 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
<b>Timecode</b>			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.	3	Prod
TC Set	Off > On	Activates the new timecode settings as set in the New timecode item.	0	Prod
FRun mode			0	Prod
Play mode	Regenerated, From file	Sets the playback mode of the timecode generator.	3	Prod
Input TC type	DVITC, LTC	Selects timecode type to be used for the input: DVITC = Digital Vertical Interval Time Code; LTC = Linear Time Code.	0	Prod
Timecode sync	Real time, Local value, External	Selects type of timecode synchronisation.	0	Prod
Dropframe mode	NDF, DF	Selects drop frame or non drop frame mode (in 59.94 modes)	2	Prod
<b>New timecode</b>				
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
<b>Rec buffer</b>					
	preferred media	<b>Not Active</b> , REV-CF-EXT, REV-EXT-CF, CF-REV-EXT, CF-EXT-REV, EXT-REV-CF, EXT-CF-REV	Order of preferred media when the camcorder switches media during recording.	0	Prod
<b>Meta data</b>					
	Story name	<list of available story names>	Selects a story name to be used for recordings.	1	-



## 13.4 Audio menu

Menu item	Values	Description	Level	File
<b>Inputs</b>			3	
Front			3	Oper
Gain	-20..+25 (0)	Sets input gain in dB for front mic input (mono or stereo).	3	Oper
limiter	On, Off	Turns audio limiter for Front mic input on or off.	1	Prod
Rear1			3	
Gain (mic)	-5..+30 (0)	Sets input gain (in 5 dB steps) for rear 1 mic input.	3	Oper
Gain (line)	0..+20 (0)	Sets input gain (in 5 dB steps) for rear 1 line input.	3	Oper
Limiter	On, Off	Turns audio limiter for rear 1 input on or off.	3	Oper
Rear2			3	
Gain (mic)	-5..+30 (0)	Sets input gain (in 5 dB steps) for rear 2 mic input.	3	Oper
Gain (line)	0..+20 (0)	Sets input gain (in 5 dB steps) for rear 2 line input.	3	Oper
Limiter	On, Off	Turns audio limiter for rear 2 input on or off.	3	Oper
Wireless 1			3	
Gain	0..+20 (0)	Sets input gain (in 5 dB steps) for wireless mic input 1 (when available).	3	Oper
Wireless 2			3	
Gain	0..+20 (0)	Sets input gain (in 5 dB steps) for wireless mic input 2 (when available).	3	Oper
<b>Channels</b>			1	
Channel 1			1	
Lvl control	AGC standard, AGC-12dB, Fixed, Lev1+Front, <b>Level 1</b> , 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	<b>None</b> , 150Hz	Selects the channel filter.	1	Prod
AGC profile	Noisy, Quiet, <b>Standard</b>	Selects the AGC (Automatic Gain Control) profile.	1	Prod
Channel 2			1	
Lvl control	AGC standard, AGC-12dB, Fixed, Lev1+Front, <b>Level 2</b> , 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	<b>None</b> , 150Hz	Selects the channel filter.	1	Prod
AGC profile	Noisy, Quiet, <b>Standard</b>	Selects the AGC (Automatic Gain Control) profile.	1	Prod

Menu item	Values	Description	Level	File
Channel 3			1	
Lvl control	AGC standard, AGC-12dB, Fixed, Lev1+Front, <b>Level 1</b> , Front	Selects a recording level control.	1	Prod
fixed lvl	0..99 ( <b>50</b> )	Sets the fixed recording level (when fixed control is selected)	1	Prod
Filter	<b>None</b> , 150Hz	Selects the channel filter.	1	Prod
AGC profile	Noisy, Quiet, <b>Standard</b>	Selects the AGC (Automatic Gain Control) profile.	1	Prod
Channel 4			1	
Lvl control	AGC standard, AGC-12dB, Fixed, Lev1+Front, <b>Level 2</b> , Front	Selects a recording level control.	1	Prod
Recording lvl	0..99 ( <b>50</b> )	Sets the fixed recording level (when fixed control is selected)	1	Prod
Filter	<b>None</b> , 150Hz	Selects the channel filter.	1	Prod
AGC profile	Noisy, Quiet, <b>Standard</b>	Selects the AGC (Automatic Gain Control) profile.	1	Prod
source channel 1	Rear1, Rear2, Wrx1,[Wrx2], <b>Front1</b> , [Front2], MicRear, AES1, AES2, SDI In1..8, Sidetone, Program, Eng, Prod, Mute	Selects a recording source for channel 1.	1	Prod
source channel 2	Rear1, Rear2, Wrx1,[Wrx2], <b>Front1</b> , [Front2], MicRear, AES1, AES2, SDI In1..8, Sidetone, Program, Eng, Prod, Mute	Selects a recording source for channel 2.	1	Prod
source channel 3	<b>Rear1</b> , Rear2, Wrx1,[Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Sidetone, Program, Eng, Prod, Mute	Selects a recording source for channel 3.	1	Prod
source channel 4	Rear1, <b>Rear2</b> , Wrx1,[Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Sidetone, Program, Eng, Prod, Mute	Selects a recording source for channel 4.	1	Prod
<b>Outputs</b>			1	
Rear			1	
Rear	Enabled, <b>Disabled</b>	Enables or disables rear1 and rear2 outputs.	1	Prod
Rear 1 mode	<b>Channel</b> , Source	Selects mode for the rear1 output.	1	Prod

Menu item		Values	Description	Level	File
	Rear 1 source	Rear1, Rear2, Wrx1, [Wrx2], <b>Front1</b> , [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, Prod, Mixer	Selects a source to be routed to the rear1 output when input mode is <b>source</b> .	1	Prod
	Rear 1 channel	<b>Ch1</b> , 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 <b>channel</b> .	1	Prod
	Rear 2 mode	<b>Channel</b> , Source	Selects mode for rear2 output.	1	Prod
	Rear 2 source	Rear1, Rear2, Wrx1, [Wrx2], <b>Front1</b> , [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, Prod, Mixer	Selects a source to be routed to rear2 output when input mode is <b>source</b> .	1	Prod
	Rear 2 channel	Ch1, <b>Ch2</b> , 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 <b>channel</b> .	1	Prod
	AES Audio			1	
	AES mode	<b>Channel</b> , Source	Sets input mode for the AES audio output.	1	Prod
	AES1 source	Rear1, Rear2, Wrx1, [Wrx2], <b>Front1</b> , [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, Prod, Mixer	Selects a source to be routed to the AES1 output when input mode is <b>source</b> .	1	Prod
	AES1 channel	<b>Ch1</b> , 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 <b>channel</b> .	1	Prod
	AES2 source	Rear1, Rear2, Wrx1, [Wrx2], <b>Front1</b> , [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, Prod, Mixer	Selects a source to be routed to the AES2 output when input mode is <b>source</b> .	1	Prod
	AES2 channel	Ch1, <b>Ch2</b> , 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 <b>channel</b> .	1	Prod
	SDI out			1	
	Embedded chan 1	<b>Ch1</b> , Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4, Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, Prod, Mixer	Selects a channel or source to embed in the SDI audio output channel.	1	Prod

Menu item	Values	Description	Level	File
Embedded chan 2	Ch1, <b>Ch2</b> , Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4, Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, Prod, Mixer	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
Embedded chan 3	Ch1, Ch2, <b>Ch3</b> , Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4, Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, Prod, Mixer	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
Embedded chan 4	Ch1, Ch2, Ch3, <b>Ch4</b> , Ch1+2, Ch1+3, Ch2+4, Ch3+4, Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, Prod, Mixer	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
Embedded chan 5	<b>Ch1</b> , Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4, Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, Prod, Mixer	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
Embedded chan 6	<b>Ch1</b> , Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4, Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, Prod, Mixer	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
Embedded chan 7	<b>Ch1</b> , Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4, Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, Prod, Mixer	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
Embedded chan 8	<b>Ch1</b> , Ch2, Ch3, Ch4, Ch1+2, Ch1+3, Ch2+4, Ch3+4, Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, Prod, Mixer	Selects a channel or source to embed in the SDI audio output channel.	1	Prod
<b>Monitoring</b>			1	

Menu item		Values	Description	Level	File
	Mode left	<b>Channel</b> , Source	Selects headphones left muff input mode.	1	Oper
	Hdph left src	Rear1, Rear2, Wrx1, [Wrx2], <b>Front1</b> , [Front2], MicRear, AES1, AES2, SDI In1..8, Sidetone, Program, Eng, Prod, Mixer	Selects a source to be routed to the headphones left channel when input mode is <b>source</b> .	1	Oper
	Hdph left chan	<b>Ch1</b> , 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 <b>channel</b> .	1	Oper
	Mode right	<b>Channel</b> , Source	Selects headphones right muff input mode.	1	Oper
	Hdph right src	Rear1, Rear2, Wrx1, [Wrx2], <b>Front1</b> , [Front2], MicRear, AES1, AES2, SDI In1..8, Sidetone, Program, Eng, Prod, Mixer	Selects a source to be routed to the headphones right channel when input mode is <b>source</b> .	1	Oper
	Hdph right chan	<b>Ch1</b> , 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 <b>channel</b> .	1	Oper
	Speaker mode	Source, Channel, Hdph L, Hdph R, <b>Hdph L+R</b>	Selects speaker input mode.	1	Oper
	Speaker mute	<b>On</b> , Off	Mutes speaker signal (audio off).	1	Oper
<b>Setup</b>					
	test tone	<b>Disable</b> , -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	<b>-18dBFS</b> , -20dBFS	Selects audio headroom.	1	Prod
	front mode	<b>Mono</b> , Stereo	Set to <b>stereo</b> when the optional stereo front microphone kit is installed.	S1	
	mixer				
	source 1	Ch1, Ch2, Ch3, Ch4, Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, <b>Eng</b> , Prod, Mixer, Mute	Selects a source for audio mixer source 1.	1	Prod
	source 2	Ch1, Ch2, Ch3, Ch4, Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, Program, Eng, <b>Prod</b> , Mixer, Mute	Selects a source for audio mixer source 2.	1	Prod

Menu item		Values	Description	Level	File
	source 3	Ch1, Ch2, Ch3, Ch4, Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, Sidetone, <b>Program</b> , Eng, Prod, Mixer, Mute	Selects a source for audio mixer source 3.	1	Prod
	source 4	Ch1, Ch2, Ch3, Ch4, Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, Eng-Ret, Prod-Ret, <b>Sidetone</b> , Program, Eng, Prod, Mixer, Mute	Selects a source for audio mixer source 4.	1	Prod
	level 1	0..99 (50)	Sets mix level for source 1.	1	Prod
	level 2	0..99 (50)	Sets mix level for source 2.	1	Prod
	level 3	0..99 (50)	Sets mix level for source 3.	1	Prod
	level 4	0..99 (50)	Sets mix level for source 4.	1	Prod
	intercom				
	prod	Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8 ( <b>SDI In 3</b> )	Selects which input is used for the intercom Production (Prod) channel.	1	Prod
	eng	Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8 ( <b>SDI In 4</b> )	Selects which input is used for the intercom Engineering (Eng) channel.	1	Prod
	program	Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8 ( <b>SDI In 1</b> )	Selects which input is used for the intercom Program (program) channel.	1	Prod
	sidetone	Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], <b>MicRear</b> , AES1, AES2, SDI In1..8	Selects which input is used for sidetone.	1	Prod
	prod-ret	Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, <b>Sidetone</b> , Program, Eng, Prod	Selects which input is used for the intercom Production return (prod-ret) channel.	1	Prod
	eng-ret	Rear1, Rear2, Wrx1, [Wrx2], Front1, [Front2], MicRear, AES1, AES2, SDI In1..8, <b>Sidetone</b> , Program, Eng, Prod	Selects which input is used for the intercom Engineering return (eng-ret) channel.	1	Prod

## 13.5 System menu

Viewfinder menu item	Values	Description	Level	File
User Level	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	
Max User Level	Usr lvl 3, Usr lvl 2, Usr lvl 1, Usr lvl 0	Sets the maximum user level that can be accessed.	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	
Network			3	
Camera #	0..99 (17)	Sets the logical camera number within the C2IP network.	3	
Remote Rec	On, Off	Turns remote recording by the OCP 400 on or off.	3	
Remote Tally	On, Off	Turns remote tally signalling by the OCP 400 on or off.	3	
IP			3	
IP Digit 1	0..255	Sets the camcorder's IP address in the C2IP network.	3	
IP Digit 2	0..255		3	
IP Digit 3	0..255		3	
IP Digit 4	0..255		3	
Network mask			3	
IP Digit 1	0..255	Sets the camcorder's subnet mask in the C2IP network.	3	
IP Digit 2	0..255		3	
IP Digit 3	0..255		3	
IP Digit 4	0..255		3	
Gateway			3	
IP Digit 1	0..255	Sets the camcorder's gateway address in the C2IP network.	3	
IP Digit 2	0..255		3	
IP Digit 3	0..255		3	
IP Digit 4	0..255		3	
Apply IP Settings	exec	Apply IP settings.	3	
Files			0	
Scenefiles			0	
Store to			0	
Scenefile	Scene1, Scene2, Scene3, Scene4, (USB), customer	Selects the scene file to which the scene settings are stored. USB is available when a USB-stick is mounted.	1	
Store	Exec	Stores the scene settings to the selected scene file.	1	
Recall from			0	

Viewfinder menu item	Values	Description	Level	File
Scenefile	Scene1, Scene2, Scene3, Scene4, (USB), <b>customer</b> , factory	Selects the scene file to be recalled. USB is available when a USB-stick is mounted.	1	
Recall	Exec	Recalls the selected scene file.	1	
Operator files			0	
Store to			0	
Operator file	<b>Oper1</b> , Oper2, Oper3, Oper4, (USB), customer	Selects the operator file to which the operator settings are stored. USB is available when a USB-stick is mounted.	1	
Store	Exec	Stores the operator settings to the selected operator file.	1	
Recall from			0	
Operator file	Oper1, Oper2, Oper3, Oper4, (USB), <b>customer</b> , factory	Selects the operator file to be recalled. USB is available when a USB-stick is mounted.	1	
Recall	Exec	Recalls the selected operator file.	1	
Production files			0	
Store to			0	
Production file	<b>Prod1</b> , Prod2, Prod3, Prod4, (USB), customer	Selects the production file to which the production settings are stored. USB is available when a USB-stick is mounted.	1	
Store	Exec	Stores the production settings to the selected production file.	1	
Recall from			0	
Production file	Prod1, Prod2, Prod3, Prod4, (USB), <b>customer</b> , factory	Selects the production file to be recalled. USB is available when a USB-stick is mounted.	1	
Recall	Exec	Recalls the selected production file.	1	
Iris			0	
Iris	0..99 (50)	Sets iris value.	0	
Momentary iris			3	
Momentary iris	On, <b>Off</b>	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				



Viewfinder menu item		Values	Description	Level	File
	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 +	+3dB, +6dB, +9dB, +12dB, +15dB, +18dB	Selects gain value for + preset.	2	
	Preset ++	+6dB, +9dB, +12dB, +15dB, +18dB, +24dB	Selects gain value for ++ preset.	2	
	Preset +++	+9dB, +12dB, +15dB, +18dB, +24dB, +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	
Power				3	
	Battery			3	
	Warning lvl (%)	20%..30%	Sets battery capacity level (%) for <b>warning</b> message.	3	
	Fatal (%)	10%..20%	Sets battery capacity level (%) for <b>fatal</b> message.	3	
	Warning lvl (V)	11.1..16.5V	Sets battery capacity level (volts) for <b>warning</b> message.	3	
	Fatal (V)	10.7..13.5V	Sets battery capacity level (volts) for <b>fatal</b> message.	3	
	Warning lvl (Min)	6..11 Min	Sets battery capacity level (minutes) for <b>warning</b> message.	3	
	Intell. I/F	On, Off	Turns intelligent battery interface on or off.	3	

Viewfinder menu item	Values	Description	Level	File
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 cooling fan: Rec = switch temporarily to silent fan profile during recording Off = always use selected fan profile	3	Prod
Profile	Cool, <b>Normal</b> , Silent	Selects a profile for the cooling 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	<b>Disable</b> , 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 camcorder.	0	Oper
Button 2	<b>Disable</b> , 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 camcorder.	0	Oper
Lens			0	
RET button	Ext signal, <b>playback</b>	Assigns a function to the RET button on the lens.	0	Oper
Handgrip			0	
Zoom control	Enabled, <b>Disabled</b>	Enables or disables the zoom control on top of the camcorder's carrying handle.	0	Oper
Record switch	Enabled, <b>Disabled</b>	Enables or disables the record switch under the carrying handle.	0	Oper
IEEE 1394			1	
IEEE 1394	<b>Off</b> , Exclusive, Both	Selects IEEE 1394 interface operation mode: Exclusive = playback via IEEE 1394 only; Off = no playback via IEEE 1394; Both = normal playback via IEEE 1394 and monitoring on the side panel display.	1	
Wireless			3	

Viewfinder menu item	Values	Description	Level	File
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 in degrees celsius (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	



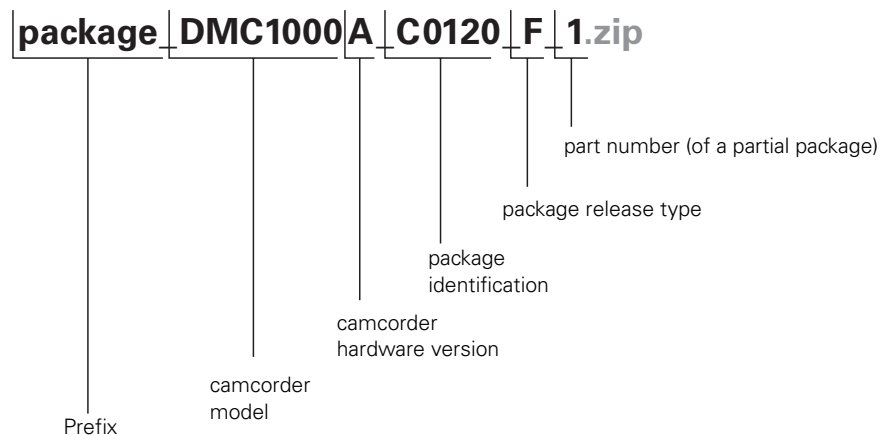
# Chapter 14

## Maintenance

### 14.1 Updating software

#### 14.1.1 Preparation

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



- Copy the downloaded package file to the root directory of a USB stick. Make sure that the USB stick has at least 128 MB of storage left.
- 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.

## 14.1.2 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.
2. Observe 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.
  - To be able to see the version information, the home screen on the side panel display must be set to **default** in the system > side panel > home screen menu.
3. Hold down the **Exp. Time** switch and press the **Select** button at the same time.
  - These buttons can be found at the front panel of the camcorder.
  - The message “Activating download manager” is shown and after that, the camcorder switches off and on again.
4. 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
```

5. Plug the USB stick into the connector at the rear of the handgrip or into the USB connector at the right side and wait a few seconds for the camcorder to detect it.
6. To cancel and restart the camcorder, press the **Auto White** switch at the front of the camcorder.
 

To start the update procedure, hold down the **Exp. Time** switch and press the **Select** button.
7. The camcorder searches for available update files. After a few seconds the display shows a list of available packages and licenses:

```
Select image using [EXP. TIME -] and [EXP. TIME +]
use [SELECT] to select and [AUTO WHITE] to abort
> Package on USB: C0121 [Valid] <
  Package on USB: C0113 [Invalid]
  Package on CAM: C0119
  License on USB: DMC_1080p_24_25_30 [Invalid]
  License on USB: Bluetooth [Valid]
```

8. Select the file you want to install and press the **Select** button. Only package files indicated as [Valid] can be installed.

**Note**

Up to 10 package and license files can be shown on the display. To access invisible files on the USB stick, first remove unnecessary files from the stick.

9. The camcorder makes a backup of any existing package file from the camera to the USB stick.
  - This file is renamed to “backup\_package.zip”.
10. The new software package file is then copied from the USB stick to the camcorder and checked.
11. If 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 copying it to the USB stick, then follow the update procedure again.

12. If the transfer was successful the following message is shown:

```
Package update to package Cxxxx
Press [SELECT] for full update
(xx files)
press [EXP. TIME -] for incremental update
(xx files)
```

13. 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: this choice only updates files that were changed. A full update may take as long as two hours and overwrites all files.
  - The number of files to be updated is shown for each choice.
14. Once you have made your selection, 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 ## [<File ID>]
Progress: 22%
(xx files)
```

15. During the update process the blue backlight of the camera status display flashes. Wait for the update procedure to finish (this can take up to two hours). Do not interrupt power or switch off the camcorder during the update procedure.

16. In some case (when the internal file system had to be updated) the following message is shown:

```
Software update almost finished
the camera needs to restart and finalize update
progress is shown on camera status display
Press [EXP TIME -] and [SELECT] to continue
```



#### Note

Do **not** switch off or operate the camcorder during finalizing.

17. Hold down the **Exp. Time** switch and press the **Select** button to continue.
- The camcorder restarts and starts finalizing the last part of the update.
  - The progress can be seen on the camera status display on top of the camcorder.
  - The side panel display may show unexpected information.
18. When the update procedure has completely finished the camcorder collects information and then displays the following message:

```
System update complete...
Total number of files: xx
Number of files failed: 0
```

19. 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 do a black calibration after updating the software. If this is the case, it is indicated on the display. Refer to ["Black calibration" on page 170](#) for more information about the black calibration procedure.

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

## 14.2 Licenses

Some commercial options need to be activated by installing a license on your camcorder. These licenses can be purchased from your Grass Valley representative. A license is a unique key and can only be installed on one camcorder; it is not transferable between camcorders.

### 14.2.1 Obtaining a license

1. Switch on the camcorder.
2. Plug a USB stick into the connector at the rear of the handgrip or into the USB connector at the right side and wait a few seconds for the camcorder to detect it.
3. In the Viewfinder menu, go the **SYSTEM/LICENSES** menu.
  - An overview of earlier installed licenses is shown.



4. Navigate to the `PID INFO TO USB` item and select it.
5. Three or four files are copied to the root directory of the USB stick. These files contain the unique product code of your camcorder.
  - The following message is shown in the viewfinder: “PID to USB is completed”
6. Unplug the USB stick and insert it into a computer.
7. Send an e-mail requesting a license to your Grass Valley representative and attach the files from the USB stick.
8. In due course, you will receive a return e-mail with a single license file. Follow the steps in the next chapter to install the license or licenses.

## 14.2.2 Installation

Follow these steps to install a license:

1. If you received the license file in a zip archive file, unzip the archive.
2. Copy the unzipped license file to the root directory of a USB stick.
3. Connect the camcorder to an external power supply or attach a fully charged battery to the camcorder.
4. Remove all media from the camcorder and unplug all external devices. Lens, viewfinder and microphone may stay connected to the camcorder.



### Note

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

---

1. Switch on the camcorder.
2. Observe 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.
  - To be able to see the version information, the home screen on the side panel display must be set to **default** in the system/side panel/home screen menu.
3. 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 message “Activating download manager” is shown and after that, the camcorder switches off and on again.
4. 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
```

5. Plug the USB stick into the connector at the rear of the handgrip or into the USB connector at the right side and wait a few seconds for the camcorder to detect it.
6. To cancel and restart the camcorder, press the **Auto White** switch at the front of the camcorder.

To start the update procedure, hold down the **Exp. Time** switch and press the **Select** button.

- The camcorder searches for available files. After a few seconds the display shows a list of available packages and licenses (image files):

```
Select image using [EXP. TIME -] and [EXP. TIME +]
use [SELECT] to select and [AUTO WHITE] to abort
Package on USB: C0115
Package on CAM: C0119
License on USB: DMC_1080p_24_25_30 [Invalid]
> License on USB: Bluetooth [Valid] <
```

- Select the license file that is valid for this camcorder and press the **Select** button.
  - All licenses contained in the file that are valid for this particular camcorder are installed. You can only install licenses that are valid.
- After a few seconds the following message is shown:

```
New license file handled
license is updated

Press [SELECT] or [EXP. time -] to restart camera
```

- 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 new licensed features activated.

## 14.3 Black calibration

After a software update, the camcorder might indicate that black calibration is necessary. To carry out black calibration follow these steps:

- Switch on the camcorder and wait for the system to start.



### Note

Make sure the **option** switch on the viewfinder is in the Off position.

---



### Note

Make sure user level is set to 3 to access the black calibration menu.

---

- Go to the **SYSTEM > BLACK CALIB** menu in the Viewfinder menu and select **Start**.
  - On confirmation the black calibration process starts.
- 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 camcorder temperature is also shown.

4. When the temperature reaches 63 °C the black calibration starts and the following message is shown in the viewfinder:

```
BLACK CALIBRATION IS RUNNING  
RUNNING
```

The filter wheels turn and internal system messages might appear in the viewfinder. These actions are part of the calibration procedure and can be ignored.

5. When 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 re-calibrate the screen. To do this follow these steps:

1. In the viewfinder menu, go to the **SYSTEM > PIN CODE > ENTER PIN** menu and enter your PIN code 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 to prevent damaging the screen surface.

## 14.6 Messages

The messages and warnings that appear in the viewfinder (and on the home screen on the side panel display when it is set to day or night type) are explained in the following table:

Message	Description	Possible action(s)
Battery low	Battery capacity is low.	Prepare to change or recharge battery as soon as possible.
Battery empty	Battery is empty.	Switch off the camcorder immediately and change or recharge its battery.
External voltage low	The voltage of the external power supply is low.	Switch off and check the external power supply or replace the unit.
High power use	The power usage of the camcorder is high	Prepare to switch off accessories or power supplied external media.
Power use too high	The power usage of the camcorder is too high	Switch off accessories or power supplied external media.

Message	Description	Possible action(s)
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 (when available).
Current media unavailable	You started a recording but the selected media is not available. Recording to buffer will start instead.	Insert media before the buffer is full. Recording will continue on the inserted media. When no media is inserted, the camcorder tries to record to the next preferred media.
Recording stopped	When none of the selected and preferred media is available, the recording stops.	Insert a new blank media and re-starts recording.
Incompatible video standard	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 overload {Front, Rear 1, Rear 2, WRX}	The indicated audio source has an overload. Signal distortion may occur.	Reduce the input level of the indicated audio source.
System shutdown	The camcorder is in the process of switching off.	Do not disconnect power supply or battery.
Hold for standard recall	Hold the button for at least two seconds to do a standard recall.	
Standard recall cancelled	The standard recall button was released within two seconds.	To do a standard recall, hold the button for two seconds.
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.

## 14.7 Troubleshooting

Symptom	Possible cause	Solution
No on-screen indicators or information visible in the viewfinder.	The VF text switch on the viewfinder is in the On position.	Set the VF text switch on the viewfinder to the Off position.
Lens zoom doesn't work	Servo setting on lens set to 'manual'.	Set the switch on the lens to S(ervo).
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.
Package file is not recognized.	File extension is incorrect.	On your computer, make sure that the package file has a single .zip extension. (If necessary, ask you IT system administrator about displaying file extensions.)
Package file is not shown when updating software	More than 10 license and package files are present on the USB stick.	Remove unnecessary files and try again.
License activation file is not recognized.	File extension is incorrect.	On your computer, make sure that the package file has a single .xml extension. Unzip if necessary. (If necessary, ask you IT system administrator about displaying file extensions and unzipping.)