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DXC-990
DXC-990P

3-CCD Colour Video Camera

The Sony DXC-990/990P is a 1/2 type DSP 3-CCD Colour video camera which incorporates ExwaveHAD™ technology – a new Sony technology that greatly improves camera sensitivity (F11 at 2000 lx) while reducing smear.

DXC-990/DXC-990P

*Exwave*HAD™

DXC-990 (NTSC)
DXC-990P (PAL)

With high picture quality and so many functions, the DXC-990/990P is the ideal choice for a variety of applications

The DXC-990/990P not only inherits all of the advanced functions of its predecessor, the DXC-950/950P, but also includes improved technology and innovative features for versatile operation in the same body size.

Allowing use of a high quality Bayonet mount lens, and providing a resolution of 850 TV lines and high S/N ratio, the DXC-990/990P is ideal for applications such as microscopy, industrial inspection and remote camera systems where picture accuracy and detail are important.

Incorporating new 10-bit DSP technology, a user friendly on-screen menu allows for simple control of various features including a DynaLatitude™ function, Partial Enhance, and a wide selection of Automatic Exposure (AE) modes.

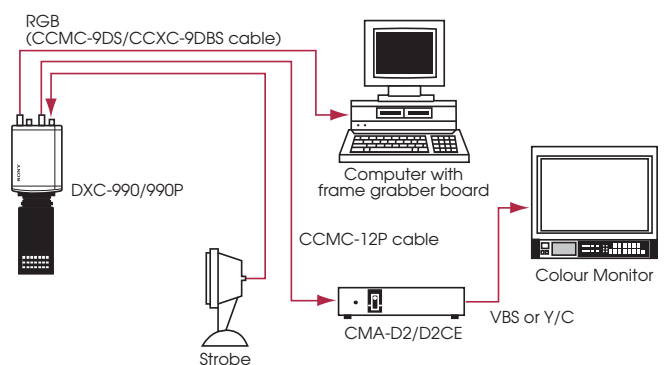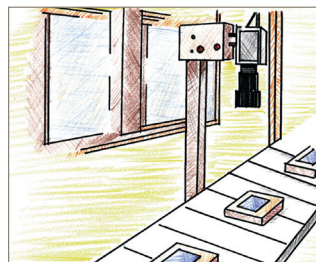### Microscopy

Useful DXC-990/990P functions include:

DynaLatitude, Digital Detail, Partial Enhance, Colour Shading Compensation
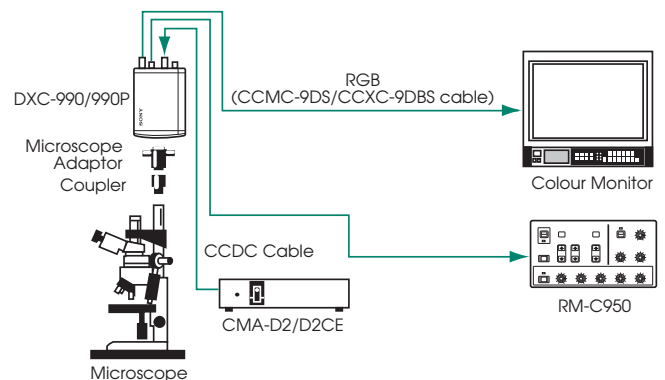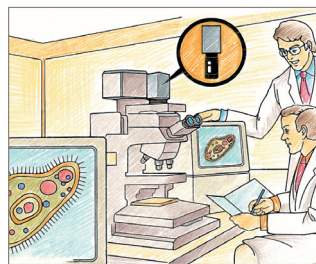
Industrial Inspection
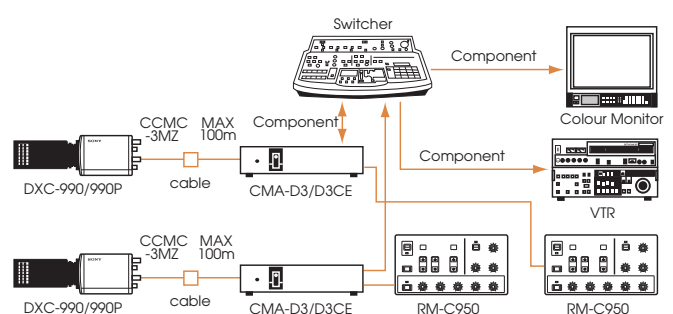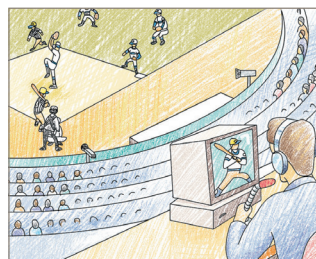
Useful DXC-990/990P functions include:

Strobe trigger function, WEN output, RGB sync, RS-232C Interface, Extended Genlock (VBS GENLOCK and HD/VD In/Out)

Remote Camera System

Useful DXC-990/990P functions include:

Motorized remote control lens, Selectable AE speed, User-defined AE area

- **Superior Picture Quality – ExwaveHAD CCDs**
- **Picture Contrast Controls**
- **DSP (Digital Signal Processing)**
- **Picture Enhancement Controls**
- **On-Screen Menu**
- **AE (Automatic Exposure)**
- **Electronic Shutter Functions**

■ Superior Picture Quality – ExwaveHAD CCDs

The DXC-990/990P incorporates 1/2 type IT (Interline Transfer) ExwaveHAD technology. Inheriting the unique sensing technology of the DXC-950/950P, the DXC-990/990P attains a high sensitivity of F11 at 2000 lx while the improved HAD sensor structure drastically reduces smear level. This permits pictures of the highest quality to be captured in difficult lighting conditions. With the high packing density of these CCD image sensors and their accurate spacial offsetting, a remarkably high horizontal resolution of 850 TV lines is achieved. The combination of ExwaveHAD technology, improved electronic circuitry and advanced video processing results in an excellent signal-to-noise ratio of 63 dB (NTSC) and 62 dB (PAL)

■ Picture Contrast Controls

DynaLatitude Function

Automatically adjusts contrast corresponding to the brightest signal level of the entire image. Clear images can be captured if both bright and dark areas exist within the image.

OFF   ON

Simulated picture

DCC + (Dynamic Contrast Control Plus)

Avoids hue factor distortion that can occur when subjects are very bright. DCC+ also automatically adjusts the knee point according to the contrast of the image.

OFF   ON

Simulated picture

Black Stretch

Black stretch/compress enhances the gradation of the dark area by stretching or compressing the range of the image.

Knee Control

By adjusting the knee, a knee point and knee slope are set so that the highlighted areas of the picture can be clearly reproduced.
High/Normal/Low switchable

■ On-Screen Menu

The on-screen menu feature allows for quick and easy picture adjustments while viewing the image. All camera control functions are accessible from the side panel of the camera or through the optional RM-C950.

■ DSP (Digital Signal Processing)

The DXC-990/990P incorporates Sony 10-bit DSP technology.
DSP enables a variety of enhancement features and increases picture reliability that cannot be achieved with analog signal processing.
The DXC-990/990P has several DSP functions for powerful picture controls.
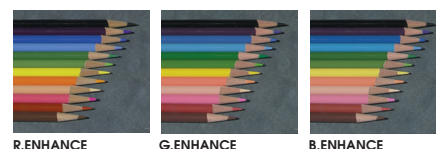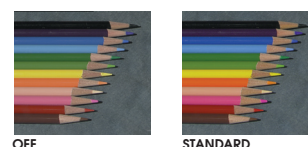
■ Picture Enhancement Controls

Digital Detail

Adjusts the sharpness of the object outline with minimal noise.
This feature also enables horizontal detail frequency control.

Linear Matrix

Provides sophisticated electronic adjustment for accurate colour reproduction by adjusting colour saturation and hue.

OFF   STANDARD

R.ENHANCE   G.ENHANCE   B.ENHANCE

Partial Enhance

Allows a particular colour to be selected, and its hue, saturation and detail altered. In addition, the detail produced by the high resolution of the camera can be softened or emphasized in certain parts of the image by the Partial Enhance function.

OFF   ON
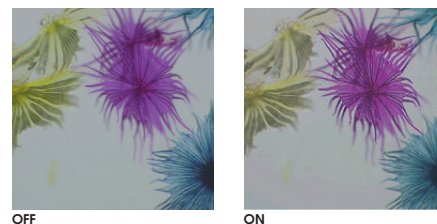
■ AE (Automatic Exposure)

AE automatically controls the level of brightness by varying the exposure times. This is done by combining the CCD IRIS® function, AGC (Automatic Gain Control), and Auto Iris function of the lens. The DXC-990/990P is equipped with a number of convenient AE modes.
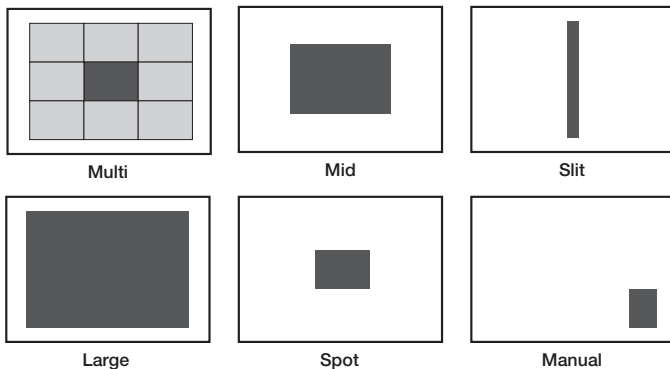
AE Level

Adjusts the standard brightness level by up to + / - 0.5 F-stop in a lens iris.

AE Speed

Selectable AE conversion speed to suit applications under varying lighting conditions.

AE Area

AE Area is a light metering system that includes six different modes.

Multi	Mid	Slit
Large	Spot	Manual

■ Electronic Shutter Functions

Variable speeds

A variable speed electronic shutter is built into the CCD imager, making it possible to capture blur-free, clear images of high speed moving objects.
The DXC-990/990P features 11 different shutter speeds (OFF to 1/100,000), including flickerless mode.

Clear Scan™ Function

The Clear Scan feature eliminates the horizontal bands that appear across the screen when shooting a computer display. This is achieved by matching the camera shutter speed with the display scanning frequency.

CCD IRIS Function

When the level of incoming light exceeds the auto iris adjustment range, the CCD IRIS function automatically reduces the exposure in a range equivalent to 10 F-stops.

■ Bayonet mount

The DXC-990/990P is designed to accept high quality bayonet mount lenses so that it can adapt various kinds of professional lenses. The strong points of bayonet mount lenses include higher sensitivity and lower colour shading compared with C mount lenses. A hot-shoe connection is also provided to eliminate the need for a lens-to-camera interconnecting cable, providing easy remote control of zoom, focus and iris function.

■ Scene Files and User Files

• Scene Files: The preset files are set to accommodate four different situations (Standard/Microscope/Full Auto/Strobe). Copying the settings between two files is also possible (File A/B).
• User Files: Allows user to set two custom parameters in the menu for instant recall.

■ Hyper Gain (+30 dB)

High sensitivity mode used for shooting objects in very low light conditions.

GAIN (0 dB)	GAIN (18 dB)	HYPER GAIN
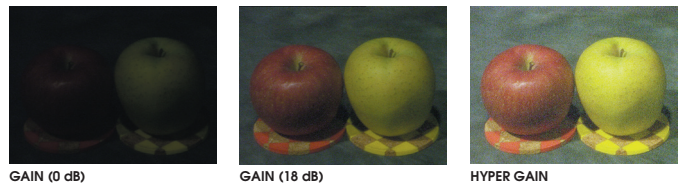
■ Colour Shading compensation

Allows for verification of colour on microscope.

■ RGB, component, Y/C and composite video outputs

■ RS-232C controllable

Easy control and operation of the camera by an external computer is possible.

■ Field or Frame integration mode

The DXC-990/990P has the ability to switch between Field or Frame CCD integration modes. Field integration is effective for capturing moving objects, while Frame integration is good for capturing a still image.

■ White Balance modes

AWB, ATW-Normal/Wide, MANU, Preset 3200K/5600K

■ Extended Genlock (VBS Genlock and HD/VD in/out)

Allows for synchronisation of signals with frame grabber boards.

■ Synchronisation capabilities (Strobe function, WEN output)

Realises full vertical resolution of fast moving objects.

C-mount lens

Models	VCL-707BXM	VCL-714BXEA	VCL-717BXEA	YH12x4.8 KTS (by Canon)	YH18x6.7 KTS (by Canon)
Mount	Bayonet	Bayonet	Bayonet	Bayonet	Bayonet
Focal length	7.5-52.5 mm	7.5-105 mm	7-119 mm	4.8-58 mm	6.7-121 mm
Zoom ratio	7x	14x	17x	12x	18x
Zoom control	Manual	Remote	Remote	Remote	Remote
Focus control	Manual	Remote	Remote	Remote	Remote
Iris control	Manual	Remote	Remote	Remote	Remote
Maximum Object Distance	1 : 1.6	1 : 1.4	1 : 1.4	1 : 1.5 (4.8-44.6 mm) 1 : 1.95 (58 mm)	1 : 1.4 (6.7-91 mm) 1 : 1.85 (121 mm)
Minimum Object Distance	0.3 mm	1.1 mm	1.0 mm	0.4 mm	0.9 mm
Macro	Not applicable	Applicable	Applicable	Applicable	Applicable
Filter size	M58 x 0.75 mm	M72 x 0.75 mm	M86 x 1.0 mm	105 mm P1.0	82 mm P0.75
Mass	560 g	1.13 kg	1.7 kg	1.73 kg	1.4 kg
Dimensions	60 (dia.) x 125 (L) mm	110 (dia.) x 185.9 (L) mm	107 (W) x 117 (H) x 181.5 (D) mm	162.2 (W) x 101 (H) x 211.7 (L) mm	114.5 (W) x 93 (H) x 117.8 (L) mm
Notes	–	Zoom/Focus/Iris functions can be remotely controlled from the RM-C950.			

12-pin Multi Cable (2/5/10/25 m)

CCMC-12P02
CCMC-12P05
CCMC-12P10
CCMC-12P25

DC Cable (5/10/25/50/100 m)

CCDC-5
CCDC-10
CCDC-25
CCDC-50A
CCDC-100A

9-pin D-sub Cable

CCXC-9DD

(5m, 9-pin D-sub <—> 9-pin D-sub)

Camera Adaptor

CMA-D2
CMA-D2CE
CMA-D2MD
CMA-D2MDCE

- Supplies DC power and transmits video/sync signal between the adaptor and the DXC-990/990P with CCMC 12-pin multi-core cable
- Complies with medical safety standard (CMA-D2MD/ D2MDCE Only)
- Dimensions: 210 (W) x 50 (H) x 200 (D) mm
- Max. cable length: 25 m with CCMC-12P25 cable

Camera Adaptor

CMA-D3
CMA-D3CE

- Supplies DC power and transmits video/sync signal between the adaptor and the DXC-990/990P with CCZ-A cable and CCMC-3MZ cable.
- Connects with optional RM-C950 remote control unit
- AC IN/DC IN
- Composite, Y/C, RGB or component video signal output
- Dimensions: 210 (W) x 44 (H) x 210 (D) mm
- Max. cable length: 100 m with CCZ-A100 cable

9-pin D-sub Cable

CCXC-9DBS

(5m, 9-pin D-sub <—> BNCs (R/G/B/SYNC/VBS))

Remote Control Unit

RM-C950

- Full remote control of the DXC-990/990P camera functions and lens zoom/focus/iris functions via RS-232C
- Dimensions: 212 (W) x 41 (H) x 132 (D) mm

1/2 type 3-CCD Microscope Adaptor

MVA-41A

9-pin D-sub Cable

CCMC-9DS

(5m, 9-pin D-sub <—> BNCs (R/G/B/SYNC), DIN 4-pin (Y/C))

Coupler

MVAC-33 Series

MVAC-33-N   MVAC-33-O   MVAC-33-SM
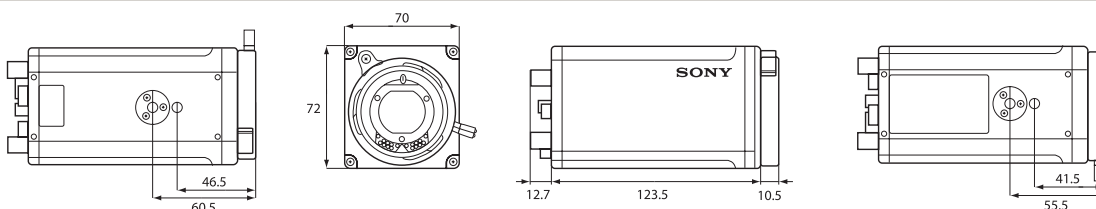
2/3-inch Lens Mount Adaptor

LO-32BMT

Camera Cable

CCMC-3MZ

(3m, for CMA-D3/D3CE connection, Capable of connecting to the CCZ-A2/A5/A25/A50/A100 cables, CCZZ-1E interconnection adaptor is supplied)

Dimensions

70

72

46.5
60.5

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12.7   123.5   10.5

41.5
55.5

Unit: mm

Specifications

|	DXC-990/990P
Pick-up device	1/2 type IT (Interline Transfer) Exwave HAD CCD
Effective picture elements	DXC-990: 768 (H) x 494 (V) DXC-990P: 752 (H) x 582 (V)
Sensing area	6.4 x 4.8 mm
Scanning system	1/2 type interlined
Horizontal frequency	15.734 kHz
Vertical frequency	59.94 Hz
Sync system	Internal or external with VBS, HD/VD
Horizontal resolution	850 TV lines
Sensitivity	F11 (2000lx)
Minimum illumination	1lux (F1.4, GAIN: HYPER)
S/N ratio	63 dB (NTSC) / 62 dB (PAL)
Gain	STEP / AGC (0-24 dB) / HYPER
Shutter speed	0.5 - 1/100,000 s
Lens mount	Bayonet mount
AE area	Multi / Large / Medium / Spot / Slit / Manual
AE level	Variable
AE speed	Fast / Mid / Slow selectable
AE detect	Average / Peak selectable
Contrast effect	Manual / DynaLatitude / DCC+ selectable
Knee point	High / Normal / Low selectable
Black stretch	Variable
Gamma	On / Off
Pedestal	Master,R/B manual adjustable
Black balance	ABB
White balance	AWB / ATW normal / ATW wide / Manual / 3200K / 5600K selectable AWB or ATW R/B paint, manual R/G gain
ATW area	Normal / Manual
ATW speed	Slow / Mid / Fast
Detail level	On (Variable) / Off
Detail frequency	High / Mid / Low
Linear matrix	On / Off
Linear matrix mode	STANDARD / R Enhance / G Enhance / B Enhance / Manual Selectable
Partial enhance	All / In / Out
CCD integration mode	Field / Frame
Shading compensation	On / Off (manual)
Trigger polarity	Positive edge trigger / Negative edge trigger selectable
Baud rate	19200 / 9600 / 4800 / 2400 / 1200 selectable
Sync	RGB / G / OFF
Trigger	On / Off
User file	A / B
Scene file	Standard / Microscope / Full Auto / Strobe / File AorB
Output signals	VBS, RGB/SYNC, Y/C, Y/R-Y/B-Y
Serial data	RS-232C
Operational temperature	-5°C to 45°C
Storage temperature	-20°C to 60°C
Power requirements	DC 10.5 V to 15.0 V
Power consumption	Approx. 8.0 W
Dimensions	70 x 72 x 123.5
Mass	630 g
Connectors	RGB/SYNC (9pin D-sub), DC IN/VBS (12pin), VIDEO OUT (BNC), TRIGGER IN (BNC), REMOTE (8 pin mini DIN), GEN LOCK IN (BNC), LENS (6pin)
Supplied accessories	Lens mount cap, Stopper mount, Operation instruction manual, Panel sheet for RM-950

Optional accessories

|	
Camera adaptor	CMA-D2 / D2CE / D2MD / D2MDCE, CMA-D3 / D3CE
Camera cable	CCMC-12P02 / 12P05 / 12P10 / 12P25, CCDC-5 / 10 / 25 / 50A / 100A, CCXC-9DD, CCXC-9DBS, CCMC-9DS, CCMC-3MZ
Remote control unit	RM-C950
Microscope adaptor	MVA-41A
Microscope coupler	MVAC-33 Series (MVAC-33-N/33-O/33-SM)
Lens mount adaptor	LO-32BMT
Lens	VCL-707BXM / 714BXEA / 717BXEA, YH12X4.8 KTS / YH18X6.7 KTS (by Canon)

DXC-990/990P Connector Pin Assignments
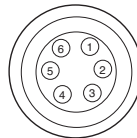
6-pin

Menu	Lens: Remote
1	NC
2	NC
3	DC OUT (G)
4	INTERNAL CONNECT
5	IRIS CONTROL
6	DC OUT (+)
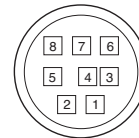
8-pin

Menu	Lens: Remote
1	INTER CONNECT
2	INTER CONNECT
3	DATA OUT
4	DC OUT (G)
5	DATA IN
6	NC
7	DATA OUT (+)
8	CMA DATA
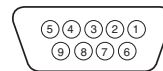
9-pin

| Menu	D-sub OUT: RGB D-sub VIDEO: VBS D-sub SYNC:C. SYNC	D-sub OUT: RGB D-sub VIDEO: VBS D-sub SYNC:WEN	D-sub OUT: Y/C D-sub VIDEO: VBS D-sub SYNC:C. SYNC	D-sub OUT: RGB D-sub VIDEO: Y/C D-sub SYNC:WEN	D-sub OUT: Y/ CR/CB D-sub OUT: Y/C D-sub SYNC:WEN	When using the CMA-D3/CE
1	VBS OUT (G)	VBS OUT (G)	Y/C OUT (G)	VBS OUT (G)	Y/C OUT (G)	- (G)
2	RGB OUT (G)	RGB OUT (G)	RGB OUT (G)	RGB OUT (G)	RGB OUT (G)	VBS/Y/C OUT (G)
3	R OUT (X)	R OUT (X)	R OUT (X)	R OUT (X)	CR OUT (X)	VBS OUT (X)
4	G OUT (X)	G OUT (X)	G OUT (X)	G OUT (X)	Y OUT (X)	Y OUT (X)
5	B OUT (X)	B OUT (X)	B OUT (X)	B OUT (X)	CB OUT (X)	C OUT (X)
6	VBS OUT (X)	VBS OUT (X)	Y OUT (X)	Y OUT (X)	Y OUT (X)	– (X)
7	C.SYNC OUT (X)	WEN OUT (X)	C.SYNC OUT (X)	WEN OUT (X)	WEN OUT (X)	WEN OUT (X)
8	C.SYNC OUT (G)	WEN OUT (G)	C.SYNC OUT (G)	WEN OUT (G)	WEN OUT (G)	WEN OUT (G)
9	– (X)	– (X)	– (X)	C OUT (X)	C OUT (X)	– (X)
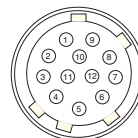
12-pin

Menu	D-sub VIDEO:VBS 12pin connector:IN	D-sub VIDEO:VBS 12pin connector: C.SYNC	D-sub VIDEO:VBS 12pin connector: HD/VD	D-sub VIDEO:Y/C 12pin connector:IN	D-sub VIDEO:Y/C 12pin connector:C. SYNC	D-sub VIDEO:Y/C 12pin connector: HD/VD
1	DC IN (G)	DC IN (G)	DC IN (G)	DC IN (G)	DC IN (G)	DC IN (G)
2	DC IN (+)	DC IN (+)	DC IN (+)	DC IN (+)	DC IN (+)	DC IN (+)
3	VBS OUT (G)	VBS OUT (G)	VBS OUT (G)	VBS OUT (G)	VBS OUT (G)	VBS OUT (G)
4	VBS OUT (X)	VBS OUT (X)	VBS OUT (X)	Y OUT (X)	Y OUT (X)	Y OUT (X)
5	-/HD IN (G)	- (G)	HD OUT (G)	-/HD IN (G)	- (G)	HD OUT (G)
6	-/HD IN (X)	- (X)	HD OUT (X)	-/HD IN (X)	- (X)	HD OUT (X)
7	VBS/VD IN (X)	C.SYNC OUT (X)	VD OUT (X)	VBS/VD IN (X)	C.SYNC OUT (X)	VD OUT (X)
8	- (G)	- (G)	- (G)	C OUT (G)	C OUT (G)	C OUT (G)
9	- (X)	- (X)	- (X)	C OUT (X)	C OUT (X)	C OUT (X)
10	DC IN (G)	DC IN (G)	DC IN (G)	DC IN (G)	DC IN (G)	DC IN (G)
11	DC IN (+)	DC IN (+)	DC IN (+)	DC IN (+)	DC IN (+)	DC IN (+)
12	VBS/VD IN (G)	C.SYNC OUT (G)	VD OUT (G)	VBS/VD IN (G)	C.SYNC OUT (G)	VD OUT (G)

Rear Panel

MENU button Displays/hides the menu on the monitor screen.

LEFT/FILE SELECT button Decreases the settings values.
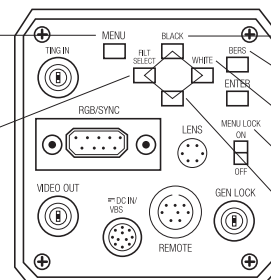
UP/BLACK button Moves the cursor up.

BERS button Displays/hides color bars.

RIGHT/WHITE button Increases the setimng values.

MENU LOCK switch Mechanical user settings

DOWN button Moves the cursor down.

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