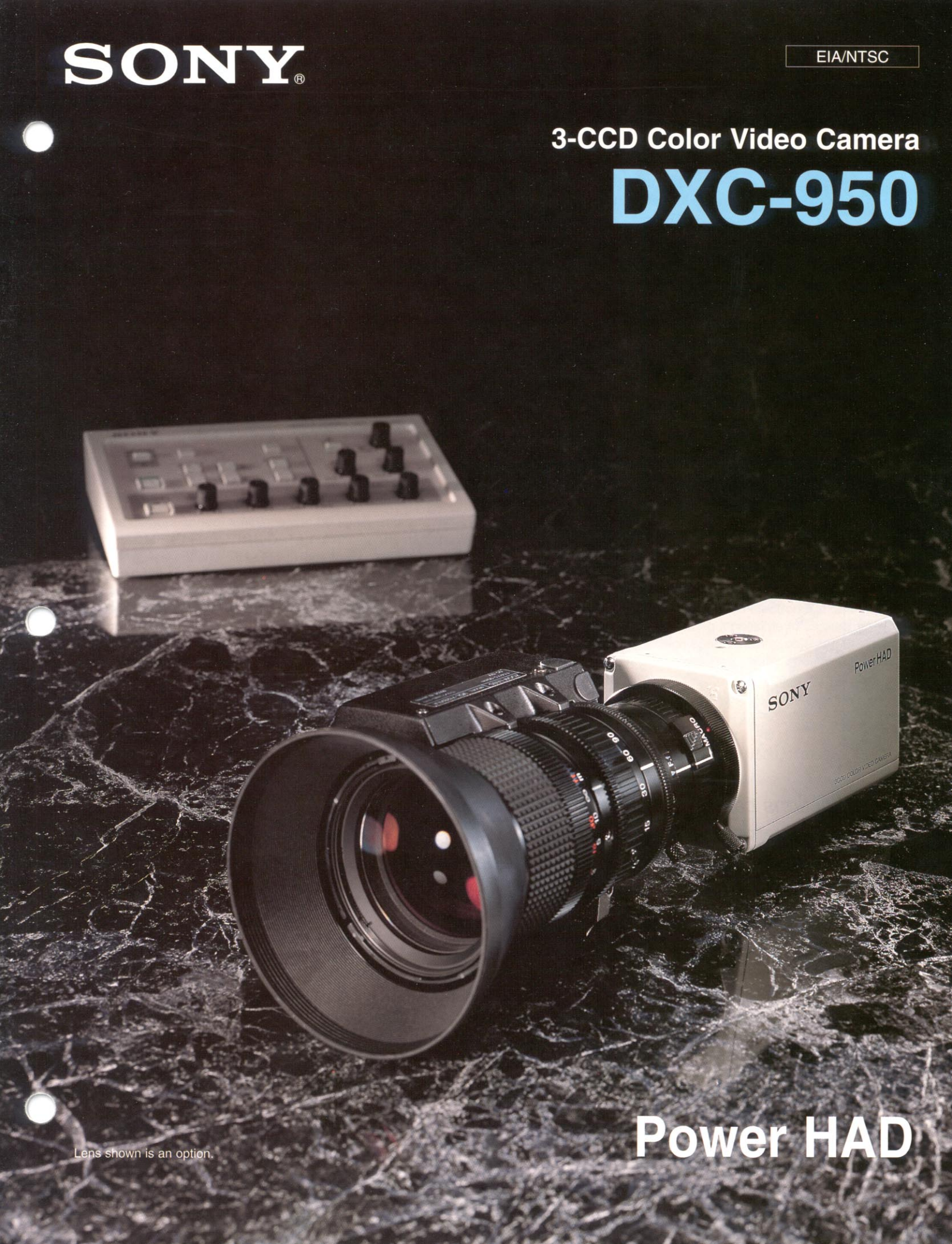
SONY

EIA/NTSC

3-CCD Color Video Camera

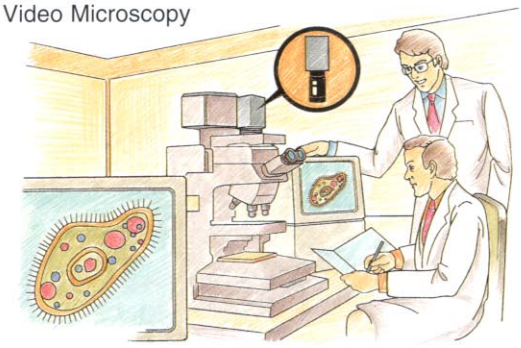
DXC-950



Lens shown is an option.

Power HAD

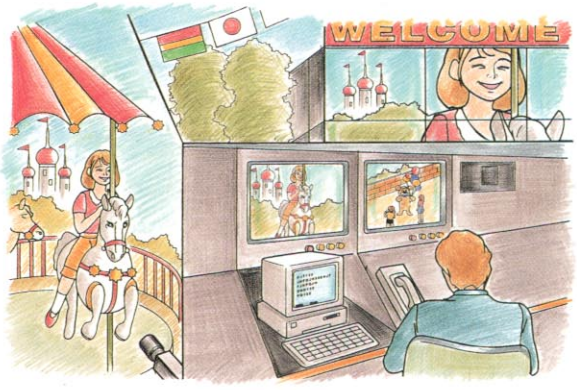
Video Microscopy



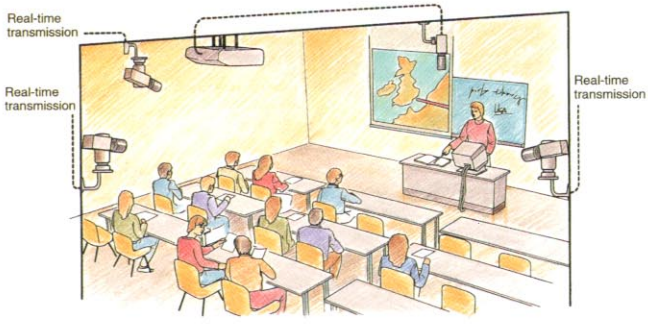
Now Sony introduces the DXC-950, a 3-CCD color video camera which not only inherits all of the advanced functions of its predecessor the DXC-930, but also includes improved technology and innovative features for versatile operation in the same body size.

The DXC-950 adapts the newly developed Power HAD™ (Hole Accumulated Diode) CCDs by Sony, following the well-proven Hyper HAD™ CCDs. It gives a significant improvement in sensitivity and a dramatic reduction in vertical smear. Combined with improved built-in electronic video circuitry, Sony Power HAD CCDs provide higher resolution and a higher signal-to-noise ratio.

Computer Control



Distance Learning

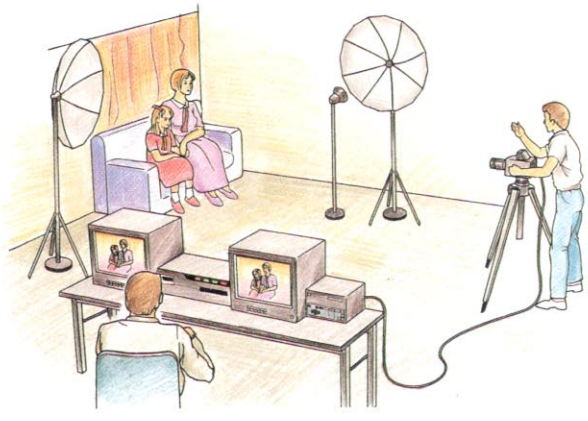


Moreover, the DXC-950 incorporates convenient operational functions such as a Flash Synchronization specifically useful in photo-proof applications and a Three-pattern Light Metering System especially effective in microscope applications.

All functions can be easily controlled from the camera rear panel, the optional RM-C950 Remote Control Unit or an external computer via RS-232C. Multiple component, RGB, Y/C and composite video signal outputs allow the DXC-950 to be readily integrated into any industrial video system.

With a host of advanced features and outstanding picture quality, the DXC-950 is sure to satisfy the critical demands of industrial video users and expand the camera system versatility in existing applications, including scientific research, computer imaging, video conferencing, photo-proof and industrial inspection systems.

Photo Studio



Superior Picture Quality - New Power HAD CCDs

The DXC-950 incorporates newly developed 1/2-inch IT (Interline Transfer) Power HAD CCDs with 380,000 effective picture elements. Inheriting the unique Hyper HAD sensing technology, the DXC-950 attains a high sensitivity of F9.5 at 2000 lx while the improved HAD sensor™ structure drastically reduces smear level by 20dB. 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 750TV lines is achieved. The combination of Power HAD technology, improved electronic circuitry and advanced video processing results in an excellent signal-to-noise ratio of 60dB.

Compact and Lightweight

Newly developed ICs and the extensive use of high packing density technology makes the DXC-950 remarkably compact and lightweight. It can be easily installed even where space is at a premium like ceiling installations or high end surveillance applications.

On-screen Menu

Various camera control functions can be easily and quickly set by the MENU/FUNCTION/DATA buttons on the camera rear panel, the optional RM-C950 Remote Control Unit or an external computer. The function menu can be displayed on a monitor using the camera component, Y/C, RGB or composite video signal outputs. The menu screens are divided into four groups for easy setup; Exposure setup, Color setup, General setup and System setup. Users can preset two patterns menus (A or B) respectively and choose with the Memory Bank function.

Precise Picture Controls

The DXC-950 provides more precise camera control with new advanced functions such as linear matrix, shading compensation, master pedestal, gamma selection and detail level which enable optimal image color and contrast to be reproduced whatever the situation is. Master pedestal, detail and gain can be easily adjusted by just turning the knobs on the optional RM-C950 without having to display the menu-screen to make the change.

- **Linear Matrix**

The linear matrix function provides sophisticated electronic adjustments for accurate color reproduction.

- **Shading Compensation**

The shading compensation feature provides a uniformed brightness for images displayed on the screen, by electically compensating color shading.

- **Detail Level Adjustments**

Detail adjusts the sharpness of outlines of objects in the reproduced picture.

- **Selectable Knee Position**

In addition to the normal position, a lower knee point and gentle knee slope are available so that an area of highlight in the picture can be reproduced more clearly.

CCD Integration Mode Selection

The DXC-950 has the ability to switch between Field or Frame CCD integration modes with the function menu buttons on the camera rear panel or by using the optional RM-C950. Field integration is effective for capturing moving objects, since the charges combined from adjacent lines are integrated over one field (1/60s) and the picture lag is reduced when compared to Frame integrates. On the other hand, the Frame integration mode integrates the charge of each horizontal pixel line for 1/30s so that vertical resolution is higher than with Field intergration and this offers better results in still image capture.

Variable Speed Electronic Shutter

The DXC-950 features a variable speed electronic shutter built into the CCD imagers, making it possible to capture blur-free, clear pictures of high speed moving objects. In addition to the conventional eight-step shutter speed selection, Long Term Exposure and Clear Scan™ is available by manually selecting shutter speeds by 1 frame or 1 H steps respectively.

- **8-step Speed Function**

1/100 (flickerless mode), 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 (seconds)

- **Long Term Exposure Function (1 frame step selection)**

The shutter speed (charge accumulation time) can be selected from 1 to 255 frames (Field mode) or 2 to 256 frames (Frame mode) in 1 frame steps. This function provides a remarkable enhancement in sensitivity by accumulating the charge on the CCDs over a longer time than the normal accumulation period. Therefore dark objects can be clearly captured in this mode. By synchronizing the timing of the camera signal output with an external memory such as Sony DKR-700, this function is very effective in image processing or image analysis applications.

- **Clear Scan Function (1 H step selection)**

Shutter speeds can be finely changed from 260/525 to 1/525 H in 1 H (63.5µs) steps or by an eight-step speed selection. It is ideal for shooting computer displays without horizontal bands appearing across the display screen. This function enables the DXC-950 to eliminate the horizontal streak, which occurs when shooting with a conventional camera by matching the DXC-950 shutter speed with the computer display scanning frequency.

CCD IRIS™ Function

The CCD IRIS function, a development originated by Sony, automatically controls exposure by electronically adjusting for incoming light levels. This function is equivalent to six F steps in lens iris and is effective in microscope applications. It enables the DXC-950 to adjust the incoming light level automatically even when using a less costly microscope adaptor without auto iris level control. Also, when the CCD IRIS function is used with an auto iris lens and AGC (Automatic Gain Control) function, an even wider range of incoming light levels can be accommodated.

Various White Balance Control

The DXC-950 has three white balance control modes such as AWB, ATW and Manual (R/B Gain) to meet a wide range of operational conditions. Moreover, the white adjusted by AWB and ATW mode can be readjusted more precisely with R/B Paint function.

- **AWB (Auto White Balance):** Memorizes the adjusted white balance value.
- **ATW (Auto Tracing White Balance):** Adjusts the white balance automatically in response to the varying light conditions.
- **Manual (R/B Gain):** White balance can be adjusted using the red and blue gain level controls in accordance with user requirements.
- **R/B Paint:** When users are not content with the automatic white balance adjustments from the AWB or ATW mode, the white balance can be readjusted more precisely using the red and blue level controls.

Three-pattern Light Metering System

When desired to observe a spot in a given picture intensively, it is possible to concentrate light to that area so that the object becomes easy to detect under appropriate light condition. Three-pattern light metering areas, Large (75%), Medium (50%) and Spot (25%), can be chosen according to the light condition of the object. This method enables the DXC-950 to capture more suitable images in a necessary area and is especially ideal for microscope applications.

Flash Synchronization Function

This function enables the DXC-950 to be used in a photo proof or portrait application by synchronizing the DXC-950 with a flash so that any shot can be identified at once using a connected monitor or printer. Flash synchronization is available when an external flash unit or photo flash slave unit is connected to the DXC-950. In the case of an external flash unit, it is connected to the camera directly and the camera is the master unit. By pushing the trigger button on the rear panel or on the RM-C950, the connected external flash unit detects the synchronization from the camera or the RM-C950 and fires a flash simultaneously. (Master Mode) On the other hand, by connecting a photo flash slave unit to the camera, the DXC-950 itself perceives an external flash and optically synchronizes with the timing of the external flash. (Slave Mode)

Multiple Signal Outputs

In addition to a BNC connector providing a composite signal output, the DXC-950 has a 9-pin D-sub output connector for component and RGB signals. A Y/C or VBS signal is also available from the 9-pin D-sub connector simultaneously, and is selected by the function menu control buttons on the camera rear panel or with the optional RM-C950 Remote Control Unit. A sync signal can also be added onto the G output signal so that an image processing or analysis system without a separate sync signal input can be used with the camera. The flexibility provided by these multiple outputs makes the DXC-950 easy to install into a wide range of system configurations and facilities image capture by a computer or video recorder.

RS-232C Interface

The DXC-950 is newly equipped with an RS-232C interface, allowing the camera to be remotely controlled from an external computer by using a 8-pin connector.

Genlock Capability

The DXC-950 can be synchronized with a VBS or a BS signal from other equipment and includes an SC/H phase adjustment control.

Color Bar Generator

Full color bars (SMPTE) can be generated as a test signal source for system and monitor adjustment.

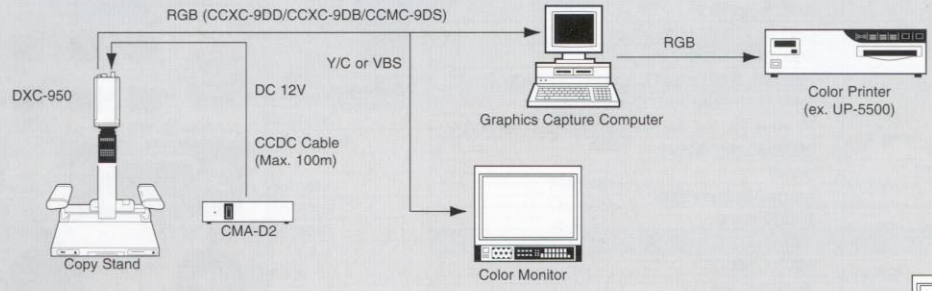
System Flexibility

The DXC-950 can be remotely controlled from the optional RM-C950 and CCU-M5. The new RM-C950 Remote Control Unit operates all functions on the camera rear panel, along with zoom, focus and iris functions. The supplied cable is 3m. On the other hand, the CCU-M5 Camera Control Unit is suitable for users would like to control the camera from a distance. The maximum cable length is 300m with CCTZ-3RGB/3YC and CCZ-A cable. Of course, the existing RM-930 Remote Control Unit can also be used with the DXC-950.

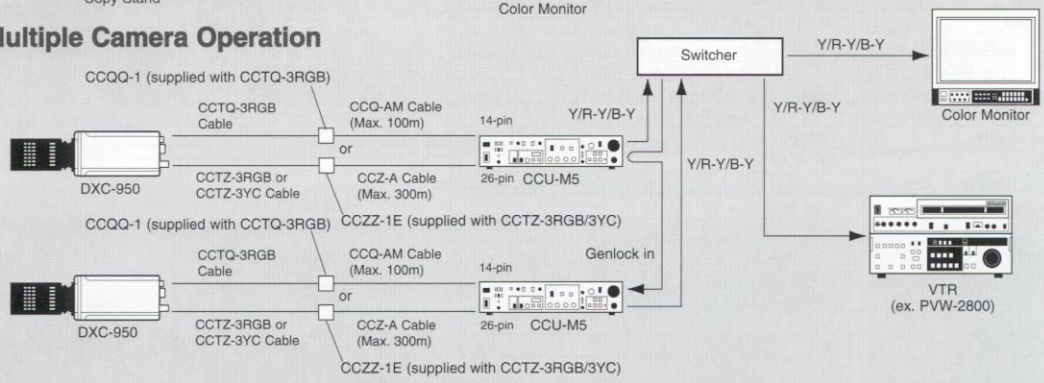
Bayonet Mount Lens Adoption

The DXC-950 is designed to accept 1/2-inch bayonet mount lenses. A dual hot-shoe connection is also provided to eliminate the need for a lens to camera interconnecting cable. This improves the reliability of the connection and simplifies lens interchange. 2/3-inch mount lenses can also be used by connecting the optional LO-32BMT Lens Mount Adaptor.

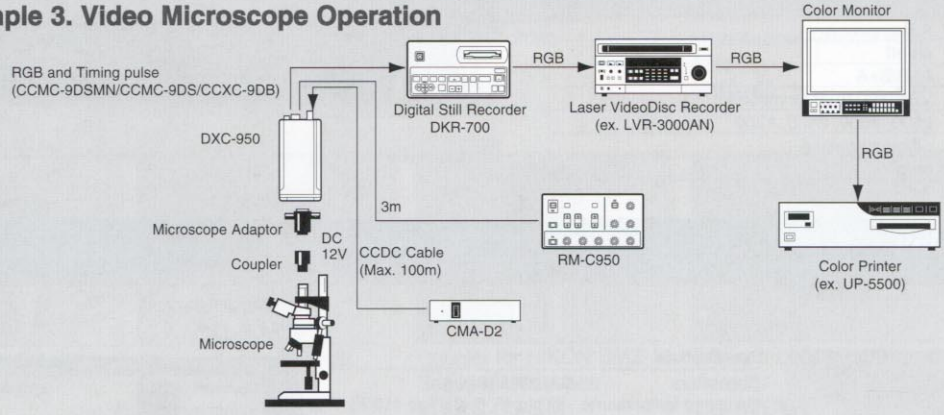
Example 1. Computer Image Processing Operation



Example 2. Multiple Camera Operation

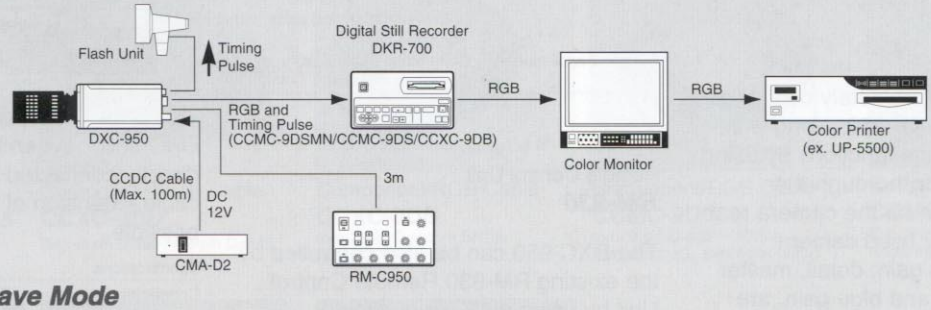


Example 3. Video Microscope Operation

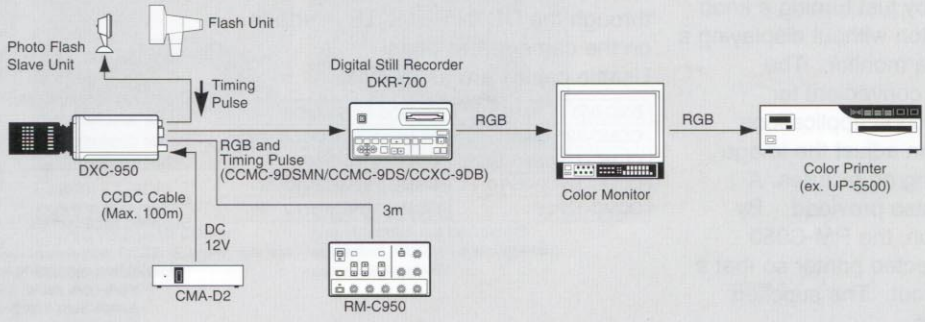


Example 4. Photo-proof Operation

1.) Flash Master Mode



2.) Flash Slave Mode

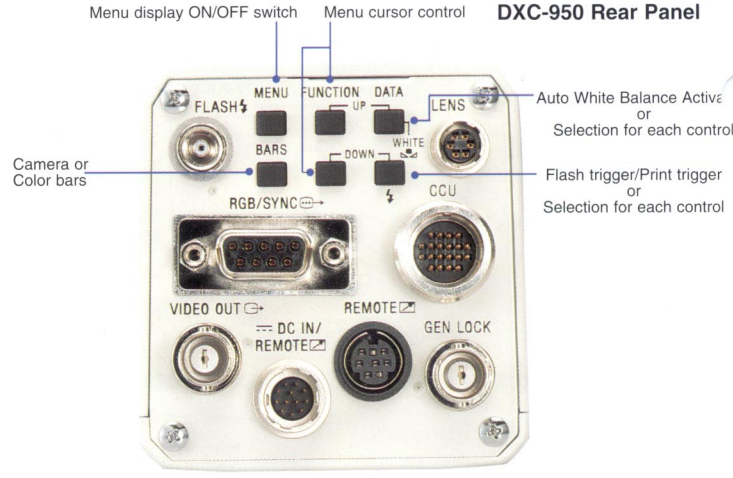


Function Menu

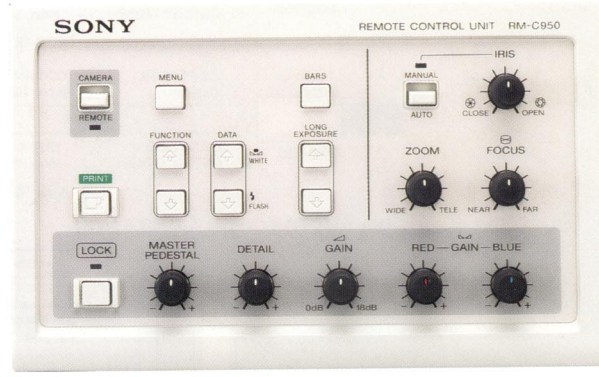
Control items	Selection
1. Exposure Setup	
Gain	AGC/step/ISO
step	0dB to +18dB (1dB step)
ISO	400, 800, 1600
Shutter	off/Long Exp./step/C. scan/CCD IRIS
Long Exp.	OFF, 1 to 256FRM, Sync/W. en
step	FL (1/100), 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 (seconds)
C. Scan	260/525 to 1/525H
CCD IRIS	on/off
AE Window	Large/Medium/Spot
Field/Frame	Field/Frame
2. Color Setup	
C. Temp	3200K/5600K
WHT. Bal	auto/manu/ATW
auto R paint	- 7 to 0 to + 7
B paint	- 7 to 0 to + 7
manu R gain	- 99 to 0 to + 99
B gain	- 99 to 0 to + 99
Linear Matrix	on/off
Shading	off, 1 to 99
3. General Setup	
M. Pedestal	- 99 to 0 to + 99
Detail	- 99 to 0 to + 99
H. Phase	- 99 to 0 to + 99
SC phase	0/180
fine	- 99 to 0 to + 99
Gamma	on/off
Knee	1/2
G sync	on/off
4. System Setup	
Mem. Bank	A/B
Mem. Protect	on/off
Data Send	A>B/B>A
D-sub out	VBS/YC, RGB/Component
Baud Rate	9600, 4800, 2400, 1200
Flash	off/master/slave
Printer Trig.	on/off

DXC-950 Rear Panel & RM-C950 Front Panel

DXC-950 Rear Panel



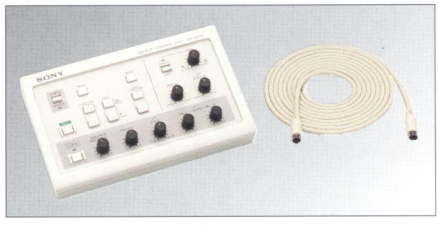
RM-C950 Front Panel



Optional Accessories

Remote Control Unit

RM-C950



The RM-C950 can remotely control all functions of the DXC-950, along with zoom, focus and iris functions by using an 8-pin connector thorough the RS-232C interface on the camera rear panel. Frequently used camera functions such as gain, detail, master pedestal and red and blue gain, are easily controlled by just turning a knob or pressing a button without displaying a menu-screen on a monitor. The RM-C950 is very convenient for especially microscope applications because users can adjust the image while concentrating on pictures. A printer button is also provided. By pushing this button, the RM-C950 triggers the connected printer so that a picture is printed out. The supplied cable length is 3m.

Specifications

Connectors:	CAMERA (8-pin)
Operating temperature:	-5°C to 45°C (23°F to 113°F)
Power requirements:	DC 12V
Mass:	Approx. 400g (14 oz)
Dimensions:	212 (W) x 41 (H) x 132 (D) mm (8 3/8 x 1 5/8 x 5 1/4 inches) (excluding projecting parts and controls)
Supplied accessories:	Connection cable (3m) Operation manual

Remote Control Unit

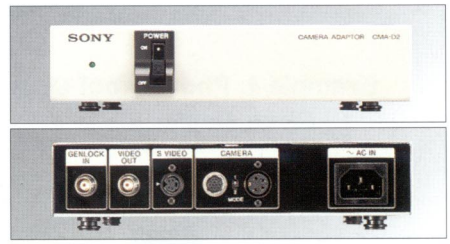
RM-930

The DXC-950 can be also controlled by the existing RM-930 Remote Control Unit by using a 12-pin connector through the DC IN/REMOTE interface on the camera rear panel.
Usable cables are as follows:

DXC-950 ↔ RM-930	RM-930 ↔ CMA-D2
CCMC-12P Cable	CCMC-12P or CCDC Cable
CCMC-12P02/05/10/25	CCDC-5/10/25/50A
CCMC-12P02/05/10	CCMC-12P02/05/10/25
CCMC-12P25	CCMC-12P02/05/10

Camera Adaptor

CMA-D2



The CMA-D2 supplies DC 12V to the DXC-950. When the CMA-D2 is directly connected to the DXC-950, a cable extension of up to 100m is possible.

Specifications

Connectors:	CAMERA (12-pin MULTI)* CAMERA (4-pin DIN) VIDEO OUT (BNC) S VIDEO OUT (Mini DIN 4-pin) GENLOCK IN (BNC)
DC out:	13V , 1.3A
Operating temperature:	-5°C to 45°C (23°F to 113°F)
Power requirements:	AC 120V, 50/60Hz
Power consumption:	23W
Dimensions:	210 (W) x 50 (H) x 200 (D) mm (8 3/8 x 2 x 7 7/8 inches)
Mass:	1.1kg (2 lb 7 oz)
Supplied accessories	AC power cord Operation manual

* Note: When connecting with the DXC-950 over a 12-pin multi-core cable, it is unnecessary to set the MODE switch from 1 to 2 although the predecessor DXC-930 is required to be set to 2.

Lenses




Models	VCL-707BXM	VCL-712BXEA	VCL-716BXEA	YH17x7 KTS B (by Canon)
Mount	Boyonet	Boyonet	Boyonet	Boyonet
Focal length	7.5~52.5mm	7.5~90mm	7~112mm	7~119mm
Zoom ratio	7 x	12 x	16 x	17 x
Zoom control	Manual	Remote	Remote	Remote
Focus control	Manual	Remote	Remote	Remote
Iris control	Manual	Remote	Remote	Remote
Maximum aperture ratio	1 : 1.6	1 : 1.4	1 : 1.4	1 : 1.4
Minimum object distance	0.3m	1.1m	1.0m	0.95mm
Macro	Not applicable	Applicable	Applicable	Applicable
Filter size	M58 x 0.75mm	M72 x 0.75mm	M86 x 1.0mm	M82 x 0.75mm
Mass	560 g (1 lb 4 oz)	1.25 kg (2 lb 12 oz)	1.8 kg (3 lb 15 oz)	1.7 kg (3 lb 12 oz)
Dimensions	60 (dia.) x 125 (L)mm (2⅜ x 5 inches)	110 (dia.) x 184.2 (L)mm (4⅜ x 7⅜ inches)	120.5 (W) x 100 (H) x 178 (D)mm (4¾ x 4 x 7⅛ inches)	128(W) x 97.5(H) x 168.9(L)mm (5⅛ x 3⅞ x 6¾ inches)
Notes	———	Zoom/Focus/Iris functions can be remotely controlled from the RM-C950.		

Camera Control Unit
CCU-M5

Digital Still Recorder
DKR-700

Microscope Adaptor with Auto Iris
MVA-40

Microscope Adaptor
MVA-41A

Coupler for NIKON X/Y Series Microscopes
MVAC-33-N

Coupler for OLYMPUS BH-2/AH Series Microscopes
MVAC-33-O

Coupler for NIKON SMZ-10 Series Microscopes
MVAC-33-SM

2/3-inch Lens Mount Adaptor
LO-32BMT

DC Cable
CCDC-5/10/25/50A/100A
(5/10/25/50/100m)

12-pin Multi Cable
CCMC-12P02/05/10/25
(2/5/10/25m)

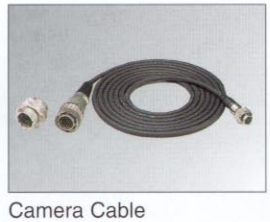
Component/RGB Cable
CCXC-9DD
(5m, 9-pin D-sub ↔ 9-pin D-sub)

Component/RGB Cable
CCXC-9DB
(5m, 9-pin D-sub ↔ BNCs (R/G/B/SYNC/VBS))

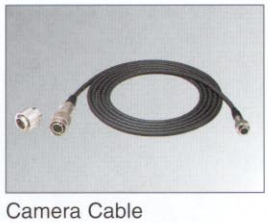
Component/RGB Cable
CCMC-9DS
(5m, 9-pin D-sub ↔ BNCs (R/G/B/SYNC), DIN 4-pin (Y/C))

Component/RGB Cable
CCMC-9DSMN
(5m, 9-pin D-sub ↔ BNCs (R/G/B), Audio Mini Jack (SYNC), DIN 4-pin (Y/C))

Camera Cable
CCTZ-3RGB
(3m, RGB/VBS out for CCU-M5 connection, CCZZ-1E interconnection adaptor is supplied)



Camera Cable
CCTZ-3YC
(3m, YC/VBS out for CCU-M5 connection, CCZZ-1E interconnection adaptor is supplied)

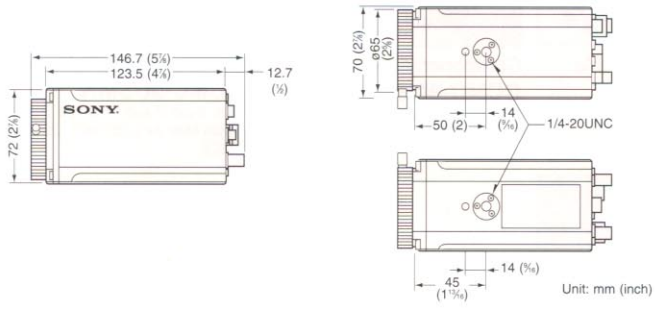


Camera Cable
CCTQ-3RGB
(3m, RGB/VBS out for CCU-M5 connection, CCQQ-1 interconnection adaptor is supplied)

Specifications

Image device:	1/2-inch Interline Transfer Power HAD CCD (x3)
Picture elements:	768(H) x 494(V)
Sensing area:	6.4 x 4.8mm
Signal system:	NTSC standard
Scanning system:	2 : 1 interlaced, 525 lines
Horizontal frequency:	15.734kHz
Vertical frequency:	59.94Hz
Sync system:	Internal or External with VBS or BS
Horizontal resolution:	750TV lines
Lens mount:	1/2-inch Bayonet
Sensitivity:	F9.5 at 2,000 lx
Minimum illumination:	5 lx (F1.4)
Signal-to-noise ratio:	60dB
CCD Integration mode :	Field/Frame
Gain control:	AGC/0~18dB (1dB step)/ISO (400, 800, 1600) switchable
Electronic shutter:	OFF(1/60s)/STEP/Long Exp./C. Scan selectable
	STEP: 1/100(Flickerless mode), 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 (seconds)
	Long Exp.: 255 to 1 frames (for field mode), 256 to 2 frames (for frame mode), OFF
	C. Scan: 260/525 to 1/525H, OFF
Phase control:	H/SC phase control
CCD IRIS control:	ON/OFF switchable
AE Window :	Large/Medium/Spot
Color temperature:	3200K/5600K
White balance:	ATW, AWB (R/B Paint : -7 to 0 to +7)
	MANU (R/B Gain : -99 to 0 to +99)
Linear matrix:	ON/OFF switchable
Shading compensation:	OFF/1 to 9
Master pedestal:	-99 to 0 to +99
Detail:	-99 to 0 to +99
H. phase:	-99 to 0 to +99
SC phase:	0/180
Fine:	-99 to 0 to +99
Gamma:	ON/OFF switchable
Knee:	1/2 switchable
Green-on-sync:	ON/OFF switchable
Memory bank:	A/B switchable
Memory protect:	ON/OFF switchable
Data send:	A>B/B>A switchable
Baud rate:	9600, 4800, 2400, 1200
Flash mode:	OFF/master/slave
Printer trigger:	ON/OFF switchable
Video out:	VBS: 1.0Vp-p, 75Ω, sync negative
	RGB: 0.7Vp-p, 75Ω
	Y/C: Y: 1.0Vp-p, 75Ω, sync negative
	C: 0.286Vp-p, 75Ω, without sync
	Y/R-Y/B-Y: Y: 1.0Vp-p, 75Ω
	R-Y: 0.7Vp-p, 75Ω
	B-Y: 0.7Vp-p, 75Ω
Operating temperature:	-5°C to 45°C (23°F to 113°F)
Storage temperature:	-20°C to 60°C (-4°F to 140°F)
Power requirements:	DC 12V (Supplied from CMA-D2 or CCU-M5)
Power consumption:	Approx. 7.8W
Mass:	Approx. 670g (1 lb 8 oz)
Connectors:	Lens (6-pin), RGB/SYNC (D-sub 9-pin), GENLOCK IN (BNC), DC IN/REMOTE (12-pin), VIDEO OUT (BNC), CCU (20-pin), FLASH (Synchronous socket), REMOTE (8-pin)
Supplied accessories:	Lens mount cap
	Operation manual

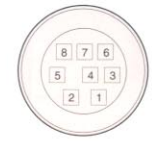
Dimensions:



Unit: mm (inch)

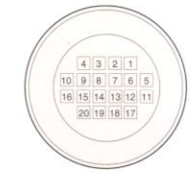
DXC-950 Rear Connector's Pin Assignments

8-PIN (REMOTE)



1	INTER CONNECT
2	INTER CONNECT
3	DATA OUT
4	DC OUT (G)
5	DATA IN
6	NC
7	DC OUT (+)
8	NC

20-PIN (CCU)

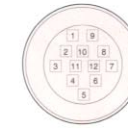


1	DC IN (+)
2	DC IN (G)
3	VBS (X)
4	VBS (G)
5	R/R-Y (X)
6	R/R-Y (G)
7	G/Y (X)
8	G/Y (G)
9	B/B-Y (X)
10	B/B-Y (G)
11	Y (X)
12	Y (G)
13	C (X)
14	C (G)
15	GENLOCK (X)
16	GENLOCK (G)
17	SERIAL DATA (X)
18	SERIAL DATA (G)
19	SENSE (+)
20	SENSE (-)

9-PIN D-SUB (RGB/SYNC)

1	VBS (G)
2	RGB (G)
3	R/R-Y (X)
4	G/Y (X)
5	B/B-Y (X)
6	Y/VBS (X)
7	SYNC/WEN (X)
8	SYNC/WEN (G)
9	C (X)/-

12-PIN (DC IN/REMOTE)



	CMA-D2 Series	RM-930
1	DC IN (G)	DC IN (G)
2	DC IN (+)	DC IN (+)
3	Y/VBS (G)	Y/VBS (G)
4	Y/VBS (X)	Y/VBS (X)
5	GND	FOCUS CONT
6	NC	IRIS CONT
7	GENLOCK (X)	CAM/REM CONT
8	C (G)/GND	ZOOM CONT
9	C (X)/ -	MODE
10	DC IN (G)	DC IN (G)
11	DC IN (+)	DC IN (+)
12	GENLOCK (G)	IRIS A/M

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