

CCD Black-and-White Video Camera Module

取扱説明書 2 ページ

Bedienungsanleitung Seite 62

Operating Instructions Page 24

Mode d'emploi Page 42

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電気製品は、安全のための注意事項を守らないと、
火災や人身事故になることがあります。

この取扱説明書には、事故を防ぐための重要な注意事項と製品の取り扱いかたを示してあります。この取扱説明書をよくお読みのうえ、製品を安全にお使いください。お読みになったあとは、いつでも見られるところに必ず保管してください。

XC-73/73CE

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5～6ページの注意事項をよくお読みください。製品全般の注意事項が記されています。7ページの「使用上のご注意」もあわせてお読みください。

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長期間、安全にお使いいただくために、定期点検をすることをおすすめします。点検の内容や費用については、お買い上げ店またはソニーのサービス窓口にご相談ください。

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万一、異常が起きたら

- ・ 煙が出たら
- ・ 異常な音、においがしたら
- ・ 内部に水、異物が入ったら
- ・ 製品を落としたり、キヤビネットを破壊したときは



- ① 本機が接続されている電源供給機器の電源を切る。
- ② DC電源ケーブルを抜く。
- ③ お買い上げ店またはソニーのサービス窓口にご連絡する。

1. The first part of the document discusses the importance of maintaining accurate records of all transactions.

2. It then goes on to describe the various methods used to collect and analyze data, including interviews, surveys, and focus groups.

3. The next section details the results of the research, highlighting the key findings and their implications for practice.

4. Finally, the document concludes with a discussion of the limitations of the study and suggestions for future research.

5. The overall goal of this research was to provide a comprehensive overview of the current state of the field and to identify areas for further investigation.

6. The findings of this study have important implications for the development of effective interventions and policies.

7. In conclusion, this research has provided valuable insights into the complex nature of the phenomenon being studied.

When completed, this

document will be

submitted to the

Owner's Record

The model and serial numbers are located at the rear. Record the model and serial numbers in the spaces provided below. Refer to them whenever you call upon your dealer regarding this product.

Model No. _____ Serial No. _____

For customers in the U.S.A.

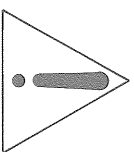
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Contents

Caution on Installing the Camera 26

Overview 27

System Components 29

Location and Function of Parts and Operation 31
XC-73/73CE CCD Video Camera Module 31
VCT-37 Tripod Attachment 34

Connections 35

Factory Settings 37

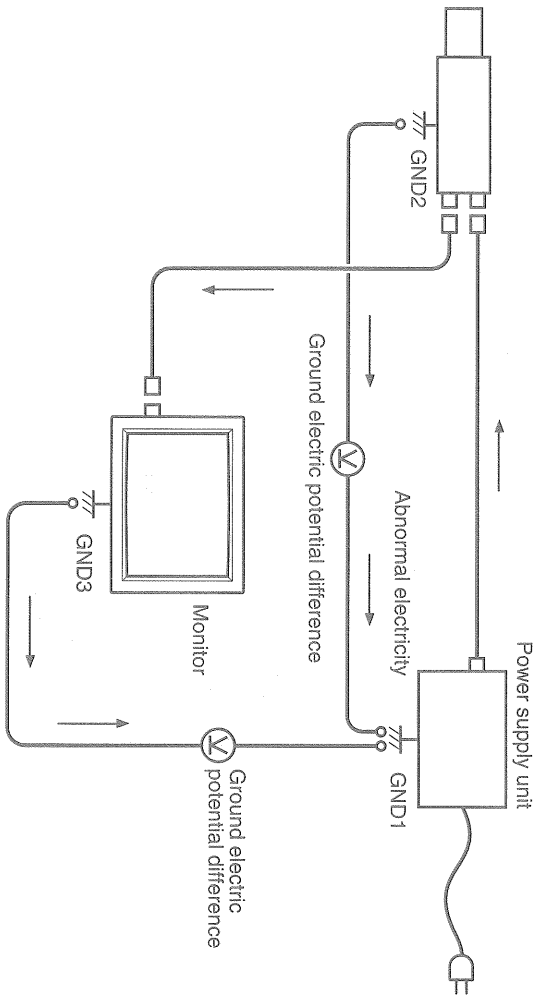
Notes on Operation 38

Typical CCD Phenomena 39

Specifications 40
Warranty and Maintenance 41

Caution on Installing the Camera

When you install the camera with various peripheral devices and if the devices have different ground electric potential, ground only one device. In case there is an ground electric potential difference, the camera may be damaged.



Overview

Before operating the unit, please read this manual thoroughly and retain for future reference.

The XC-73/73CE is a monochrome video camera module using a CCD (Charge Coupled Device) solid state image sensor.

High image quality

The CCD provides a high-resolution image with 768 × 494 pixels (XC-73) or 752 × 582 pixels (XC-73CE).

Range of operating modes

You can easily select the required operating mode. The gain, for example, can be set to AGC (A), or to fixed gain (F) or manual gain control (M) by an external switch. γ (gamma) compensation can be switched on or off by an internal jumpers. By an internal jumper connection to switch the charge accumulation mode from frame to field, if external sync signals in noninterlace mode are input, the same sensitivity can be obtained as in interlace mode.

External synchronization

The camera module can be synchronized with three types of signals explained below. The capture frequency range is $\pm 1\%$ of the horizontal scan frequency.

HD (horizontal drive), VD (vertical drive) signals: The camera module automatically determines whether to operate in interlace or noninterlace mode from the HD and VD signals input for external synchronization.

VS (Video/Sync) signals: External synchronization with a video or composite sync signal. (The unit switches automatically between HD/VD and VS synchronization.)

Reset pulse signal: The timing for reading out the contents of the register can be adjusted by the reset pulse signal.

Internal sync signal output

FLD (Field Index) signals are output constantly from the 6-pin connector. An internal switch change allows the HD and VD signals also to be output from the 12-pin connectors.

Overview

Electronic shutter function

Shutter speed can be selected from a wide range (1/125 to 1/10000 sec.) or in flickerless (FL) mode.

Body fixing

Two mounting screw holes are provided in the reference plane on the lower surface of the body, allowing mounting with the absolute minimum deviation of the optical axis.

Other features

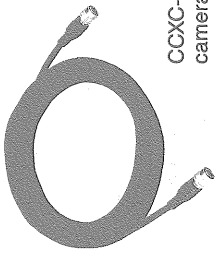
- Long life and high reliability
- Fine image, minimum distortion
- High resistance to vibration and impact
- Quick start-up
- Stability against even strong magnetic fields
- Low power consumption (1.4 W)

Compatibility with the series XC-77

This camera module can directly replace a series XC-77 camera module, because the cross section size, the VIDEO OUT connector, and the pin assignments of the 12-pin connectors, are all common with those of the series XC-77.

System Components

The CCD camera module XC-73/73CE system comprises the following optional products (available separately).



CCXC-12P05S
camera cable (5 m)



XC-73/XC-73CE
CCD video camera module



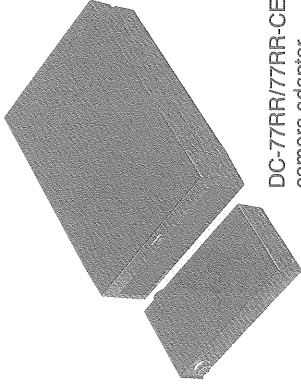
PC-XC12 connector (12-pin)



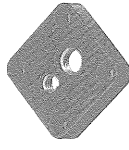
PC-XC06 connector (6-pin)



Standard lenses
VCL-16Y-M
VCL-12YM
VCL-08YM



DC-77RR/77RR-CE
camera adapter



VCT-37
tripod attachment

System Components

XC-73/73CE video camera module

This is a small-size, high-resolution, monochrome video camera module using a 1/3 inches CCD image sensor.

PC-XC06 connector (6-pin)

This is used to connect the lens cable of an auto-iris lens to the LENS connector of the camera module.

VCL-08YM standard lens

This is a standard f/1.4 lens of focal length 8 mm. The iris and focus are manually adjusted.

DC-77RR/77RR-CE camera adapter

This is connected to the camera module to enable power supply from ordinary AC power source, and also handles transmission of video signals from the camera module and exchange of sync signals between the camera module and an external sync signal generator.

CCXC-12P05S/05D/05FR/05U camera cable (5 m)

This is attached to the DC IN/SYNC connector of the camera module with a 12-pin connector and is used for power supply, transmission of video signals, and exchange of sync signals.

VCT-37 tripod attachment

This attaches to the bottom of the camera module to fix the camera module to a tripod.

PC-XC12 connector (12-pin)

This is used to attach the camera cable to the DC IN/SYNC connector of the camera module.

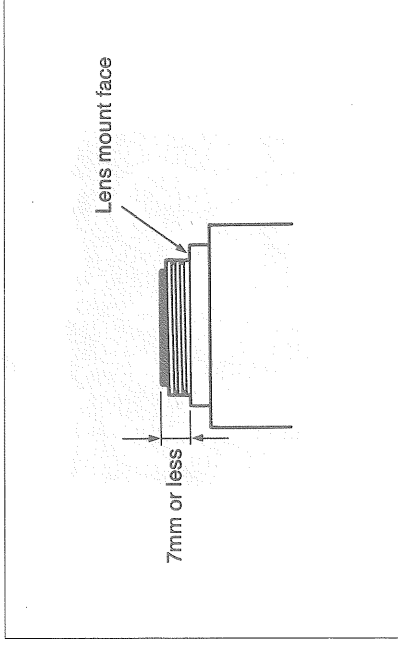
Location and Function of Parts and Operation

XC-73/73CE CCD Video Camera Module

- 1 Lens mount**
Attach a VCL-08YM standard lens, or any C-mount lens or other optical equipment.

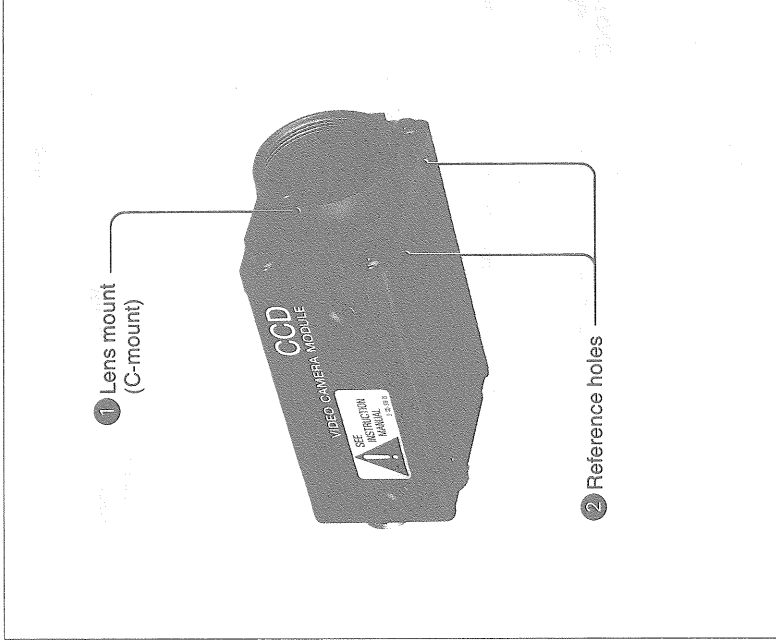
Note

The lens must not project more than 7 mm from the lens mount.

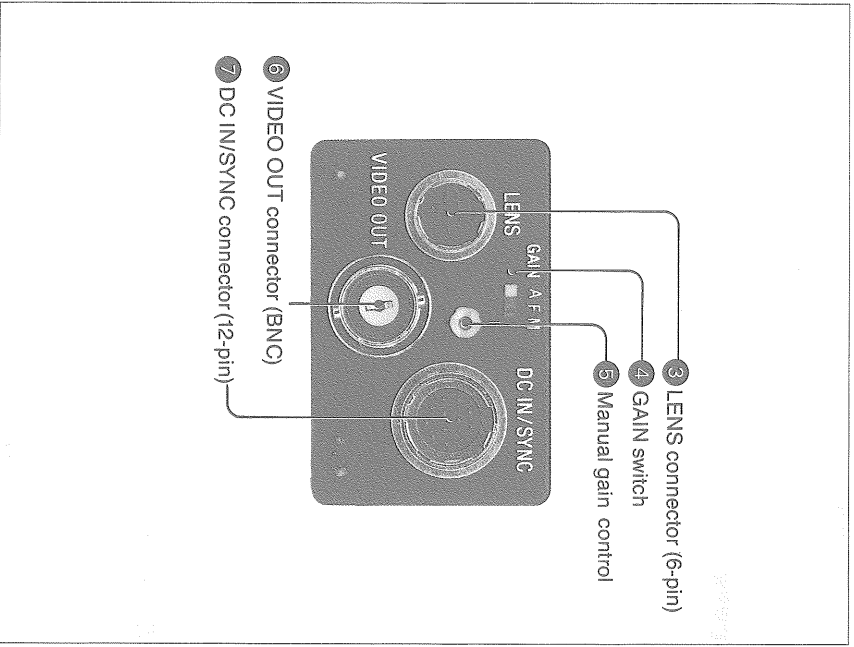


- 2 Reference holes**
These screw holes are precisely cut for camera module mounting. Using these holes assures accurate alignment of the optical axis.

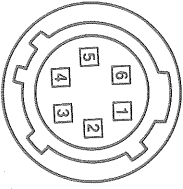
Refer to the service manual for detailed dimensions.



Location and Function of Parts and Operation



- 3 LENS connector (6-pin)**
The lens cable of an auto-iris lens plugs into this connector, for automatic iris control. The pin configuration of this connector is as follows.



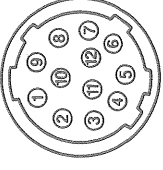
Pin No.	Signal
1	FLD signal output
2	Trigger
3	Ground
4	_____
5	Video signal output
6	+12 V DC output

- 4 GAIN switch**
This switch selects AGC (A), fixed gain (F), or manual gain control (M).
- 5 Manual gain control**
In manual gain mode, this controls the gain level.
- 6 VIDEO OUT (Video signal output) connector (BNC)**
You can use this connector for video signal output from the camera module. The CCXC-12P05S camera cable must be attached to the DC IN/SYNC connector and the video signal output from the DC IN/SYNC connector must not have a 75-ohm termination.

⑦ DC IN/SYNC (DC power input/sync signal I/O) connector (12-pin)

Connect a CCXC-12P05S camera cable to this connector for the +12 V DC power supply and the video signal output from the camera module. When a sync signal generator is

connected to this connector, the camera module is synchronized with the external sync signals. The pin configuration of this connector is as follows.



Pin No.	External sync mode		Restart/Reset	Camera sync output
	HD, VD	VS		
1	Ground	Ground	Ground	Ground
2	+12 V DC	+12 V DC	+12 V DC	+12 V DC
3	Video output (Ground)	Video output (Ground)	Video output (Ground)	Video output (Ground)
4	Video output (Signal)	Video output (Signal)	Video output (Signal)	Video output (Signal)
5	HD input (Ground)	---	HD input (Ground)	HD output (Ground)
6	HD input (signal)	---	HD input (signal)	HD output* (signal)
7	VD input (Signal)	VS input (Signal)	Reset (Signal)	VD output* (Signal)
8	---	---	---	Clock output (Ground)
9	---	---	---	Clock output** (Signal)
10	Ground	Ground	---	Ground
11	+12 V DC	+12 V DC	---	+12 V DC
12	VD input (Ground)	VD input (Ground)	Reset (Ground)	VD output (Ground)

* An internal switch change is necessary to output HD, VD signals. See the service manual for details.

** An internal jumper change is necessary to output the clock signal. See the service manual for details.

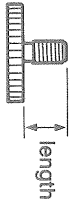
Location and Function of Parts and Operation

VCT-37 Tripod Attachment

Use a tripod with screws meeting either of the following specifications.

ISO standard: length 4.5 mm \pm 0.2 mm

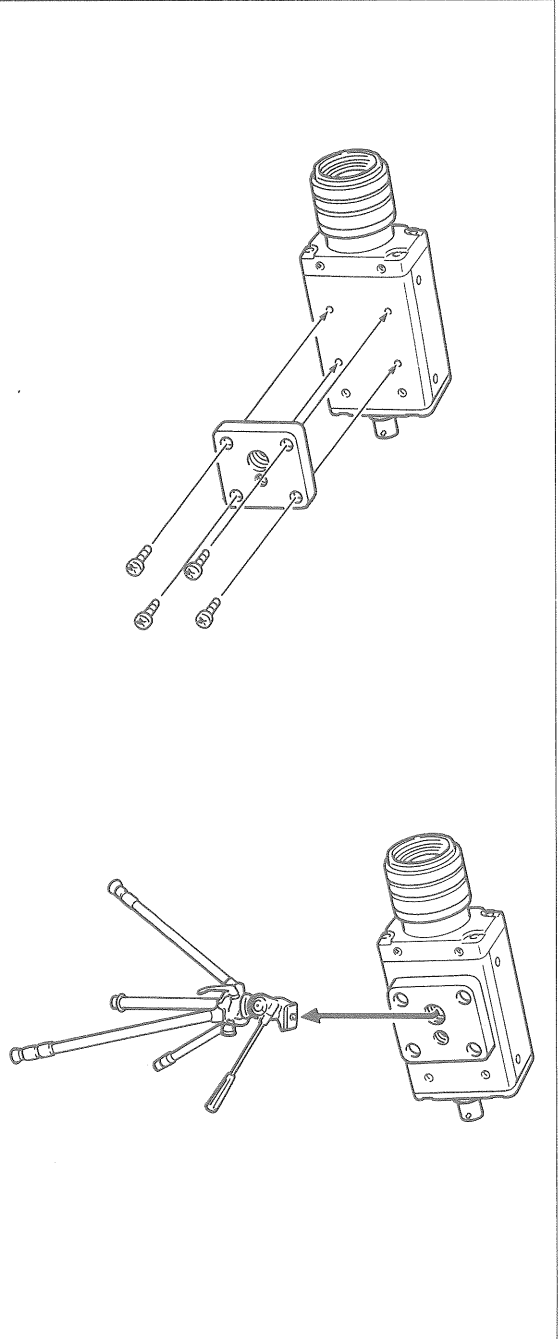
ASA standard: length 0.197 inches



Note

Use screws with a maximum length of 4 mm to fix the tripod attachment to the CCD video camera module.

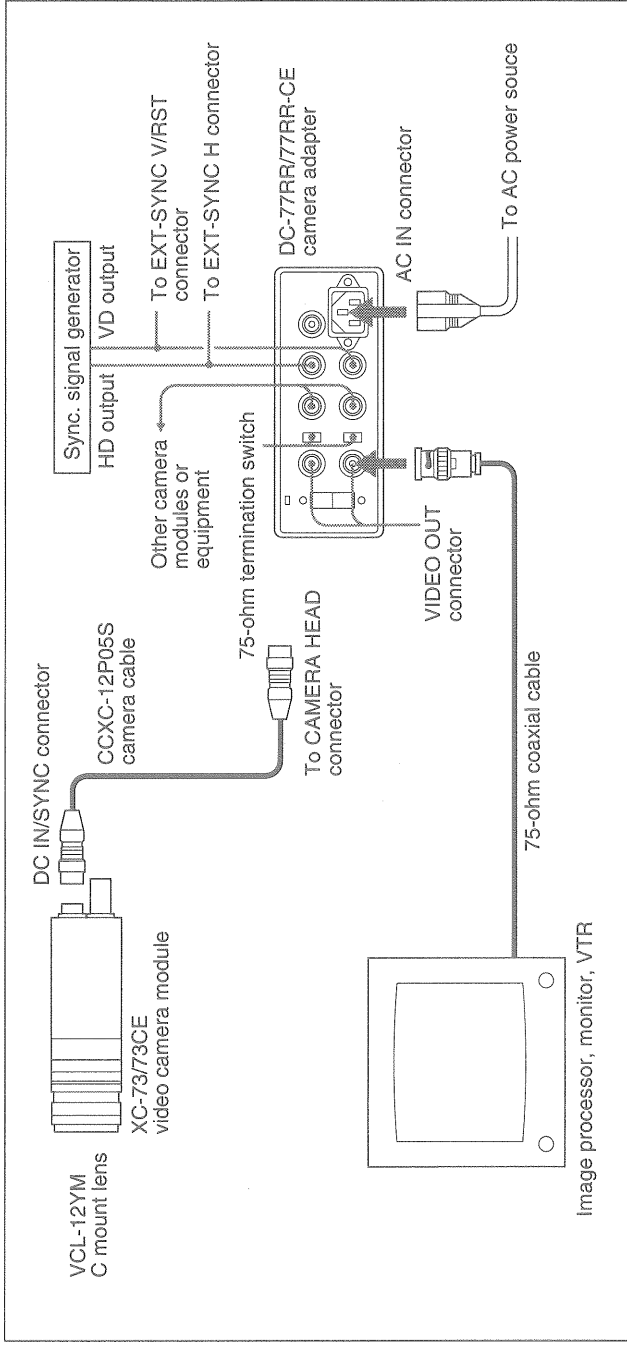
Attaching the tripod attachment to the video camera module



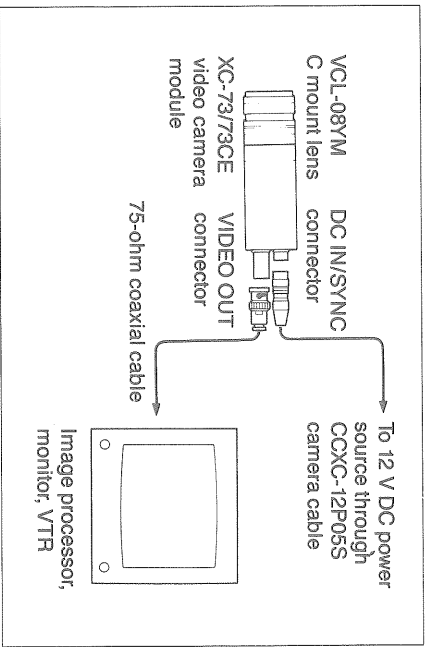
Connections

Connection to AC power source

Connect the camera module to a DC-77RR/77RR-CE adapter for AC power supply. See the manual for the DC-77RR/77RR-CE for details.



Direct connection to DC power source



Note

You can take the video output from the VIDEO OUT connector while supplying power through the DC IN/SYNC connector. Connect the camera module to the DC IN/SYNC connector with a CCXC-12P05S camera cable, and do not terminate the video signals from the DC IN/SYNC connector with 75 ohm.

Factory Settings

The following table lists the factory default settings for the various adjustments. See the service manual and the operation manual for the DC-77RR/77RR-CE camera adapter for details.

Item	Setting	Remarks
Gain	A <input type="checkbox"/> F M	AGC Fixed gain Manual gain control
γ	ON <input type="checkbox"/> OFF	Compensated Not compensated
75-ohm termination	<input type="checkbox"/> ON OFF	Terminated Not terminated
HD/VD signals	<input type="checkbox"/> EXT IN INT OUT	External signal input Internal signal output
Electronic shutter	<input type="checkbox"/> OFF FL 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/10000 (sec)	Flickerless
Restart/ Reset	ON <input type="checkbox"/> OFF	Frame sync Not frame sync
Charge accumulation	<input type="checkbox"/> FRAME FIELD	Frame accumulation Field accumulation

Notes on Operation

Power supply

The camera operates on 12 V DC. Use a stable power source free from ripple or noise.

Foreign bodies

Be careful not to spill liquids, or drop any flammable or metal objects in the camera body.

Heat radiation

Do not wrap the camera in cloth or other material while in operation. There is a danger of overheating.

Locations for operation and storage

Avoid operation or storage in the following places.

- Extremely hot or cold locations. Recommended temperature range is 0°C to 40°C. (32°F to 104°F)
- Humid or dusty locations
- Locations exposed to rain
- Locations subject to strong vibration
- Near generators of strong electromagnetic radiation such as TV or radio transmitters.

Care

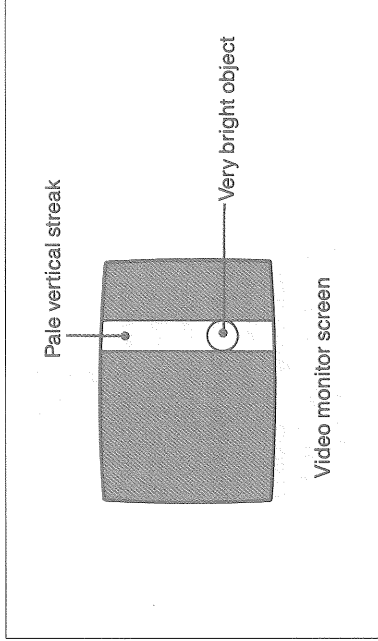
Use a blower to remove dust from the surface of the lens or optical filter. Clean the exterior with a soft, dry cloth. If the camera is very grimy, apply a cloth soaked in a mild detergent then wipe with a dry cloth. Do not apply organic solvents such as alcohol which may damage the finish.

Typical CCD Phenomena

The following effects on the monitor screen are characteristic of CCD cameras. They do not indicate any fault with the camera module.

Smear

This occurs when you shoot a very bright object such as electric lighting, the sun, or a strong reflection (shown below).



This phenomenon is caused by an electric charge induced by infrared radiation deep in the photosensor. It appears as a vertical smear because the CCD imaging element uses the interline transfer system.

Vertical aliasing

When you shoot vertical stripes or lines, they may appear jagged.

Blemishes

A CCD image sensor consists of an array of individual sensor elements (pixels). A malfunctioning sensor element will cause a single pixel blemish in the picture. (This is not a problem in practice).

White speckle

When you shoot a dark object at high temperature, small white dots may appear all over the image.

Specifications

Imaging system

Pickup device	Interline-transfer CCD
Effective picture elements	
XC-73:	768 × 494 (horizontal/vertical)
XC-73CE:	752 × 582 (horizontal/vertical)
Sensing area	1/3-inch size
Optical blank	43 elements on each horizontal line.
CCD vertical drive frequency	
XC-73:	15.734 kHz ± 1%
XC-73CE:	15.625 kHz ± 1%
CCD horizontal drive frequency	
XC-73:	14.318 MHz
XC-73CE:	14.1875 MHz
Signal system	XC-73: EIA system XC-73CE: CCIR system
Cell size	XC-73: 6.35 × 7.4 μm (horizontal/vertical) XC-73CE: 6.5 × 6.25 μm (horizontal/vertical)
Chip size	6.0 × 4.96 mm (horizontal/vertical)

Synchronization

	Internal/external (automatically switched)
External sync signal	according to input signal)
I/O	S, VS (sync level: 0.3 ^{+0.3} _{-0.15} Vp-p) HD/VD (HD/VD level: 2-5 Vp-p, automatically switched between HD/VD according to input signal, and I/O selection by internal switch)
External sync allowable frequency	± 1% (of horizontal sync frequency)
Jitter	Within ± 50 nsec
Scanning system	XC-73: 525 lines XC-73CE: 625 lines
Video output	2:1 interlace/noninterlace (automatically switched according to input signal)
Horizontal resolution (when using VCL-08YM lens with any iris adjustment from "open" to F11)	1.0 Vp-p, sync negative, 75 ohms unbalanced
Vertical effective lines	XC-73: 485 lines (with 2:1 interlace) XC-73CE: 575 lines (with 2:1 interlace)

Optical system and others

Lens mount	C mount
Flange focal length	17.526 mm

Sensitivity	400 lux, F4 (γ compensation ON, 0 dB)	Power	+12 V DC (Range: 10.5 to 15 V)
Minimum illumination	3.0 lux (AGC mode, F1.4, γ compensation ON)	Power consumption	1.4 W
Video S/N ratio	XC-73: 56 dB XC-73CE: 54 dB	Temperature	Operating: -5 to +45°C (41 to 113°F) Storage: -25 to +60°C (77 to 140°F)
Gain	AGC/Fixed gain/Manual gain control (selected by switch on the rear panel) γ compensation/ $\gamma = 1$ (selected by internal jumpers)	Relative humidity	Operating: 20 to 80% Storage: 20 to 95%
White clip	XC-73: 115 IRE ± 10 IRE XC-73CE: 115 $\pm 10\%$	Vibration resistance	7 G (11 Hz-200 Hz)
Charge accumulation	Frame/Field (switched by internal jumper change)	Shock resistance	70 G
Shutter	Normal shutter/Special shutter (switched by internal jumper change)	External dimension (w/h/d)	44 x 29 x 91.5 mm (1 3/4 x 1 1/4 x 3 5/8 inches) (including external projection)
Shutter speed	Normal shutter: Flickerless 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/10000 sec. (selected by internal switch)	Weight	140 g (5 oz)
	Special shutter: XC-73: 1/1600 to 1/100 sec. XC-73CE: 1/1000 to 1/100 sec. (For the method of changing the shutter speed, refer to the service manual.)	Accessories	Lens mount cap (1) Operating Instructions (1)

Design and specifications are subject to change without notice.

Warranty and Maintenance

For queries on a period and terms of the warranty, contact the store where you purchased the product.

AVERTISSEMENT

Afin d'éviter tout risque d'incendie ou d'électrocution, ne pas exposer cet appareil à la pluie ou à l'humidité.

Avant de faire fonctionner cet appareil, prière de lire entièrement ce mode d'emploi de le conserver à titre de référence ultérieure.