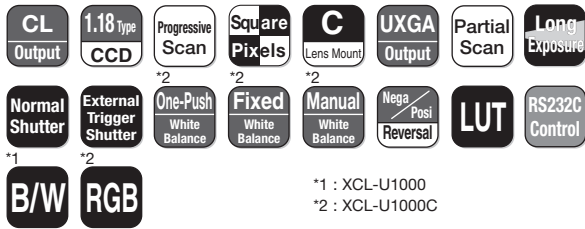


XCL-U1000 (B/W)

XCL-U1000C (Color)

Connection Diagram **PSG**

Outline

The XCL-U1000 and XCL-U1000C are vibration-resistant video camera modules equipped with digital video interface that output image data using the LVDS signal. These black/white and color models are housed in a same body. The adoption of a compact Camera Link connector enables the image digital output at 15 fps.

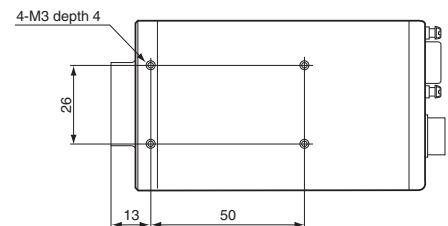
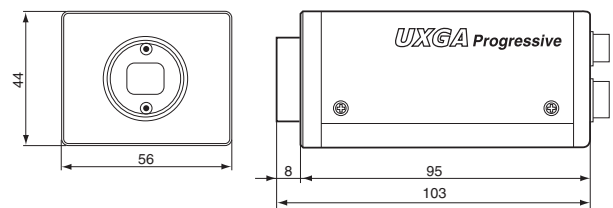
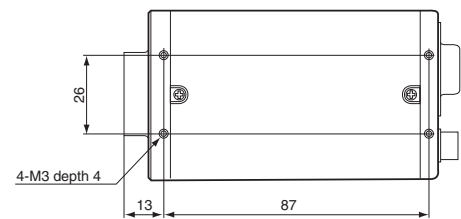
Features

- 1/1.8-type PS CCD with square pixels
- UXGA image (1,600 × 1,200 pixels) captures video at 15 fps
- Readout mode: Normal/Binning (XCL-U1000 only)
- Shutter: Normal/External trigger shutter
- Monitor output
- White balance (XCL-U1000C only)
 - Auto/Manual/Preset selectable
- Matrix function for accurate color reproduction (XCL-U1000C only)
- High shock and vibration resistance
- C-mount lens
- RS-232C Control
- High sensitivity
 - XCL-U1000 : 400 lx at F 5.6
 - XCL-U1000C : 2,000 lx at F8
- Digital output Camera Link (non-PoCL)
 - XCL-U1000 : 10 bit
 - XCL-U1000C : RGB 24 bits

Accessories

- Compact camera adaptor
 - DC-700/700CE
- 12-pin camera cable (CE standard)
 - CCXC-12P02N (2 m)
 - CCXC-12P05N (5 m)
 - CCXC-12P10N (10 m)
 - CCXC-12P25N (25 m)
- Tripod adaptor
 - VCT-ST70I

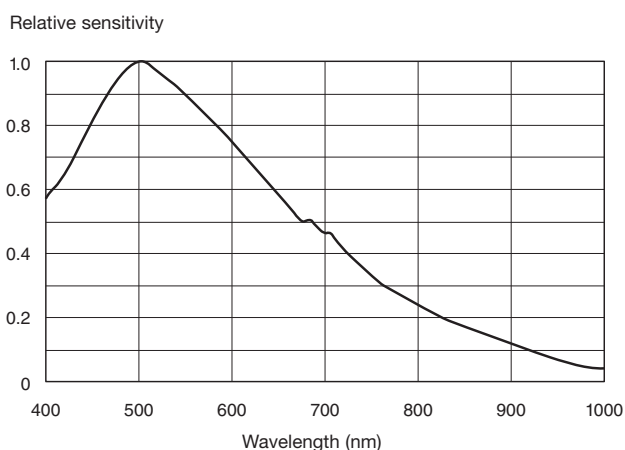
Dimensions



Unit: mm

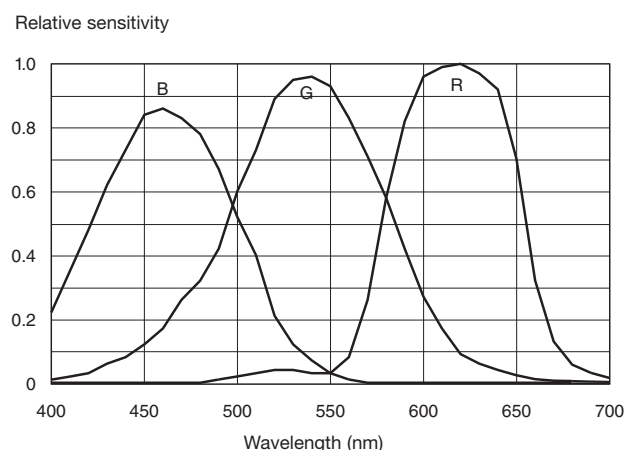
Spectral Sensitivity Characteristics

• XCL-U1000 (Typical Values)



(Lens characteristics and light source characteristics excluded.)

• XCL-U1000C (Typical Values)

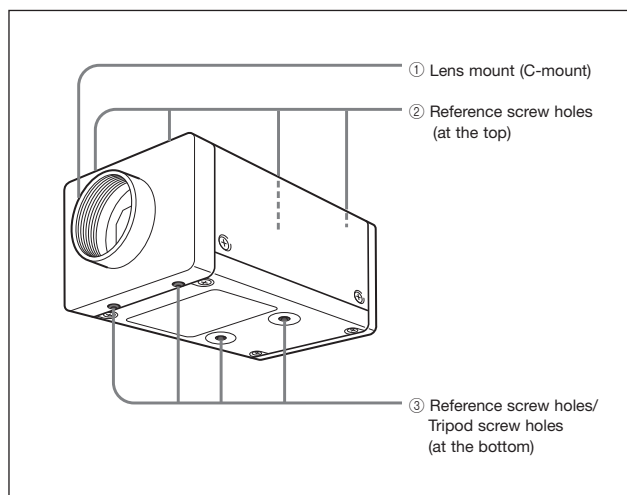


(Lens characteristics and light source characteristics excluded.)

Specifications

	XCL-U1000	XCL-U1000C
Camera		
Image type	B/W	Color
Image sensor	1/1.8-type Progressive scan IT CCD	
Number of effective pixels (H) × (V)	1,628 × 1,236	
Cell size (H) × (V)	4.4 μm × 4.4 μm	
Standard output pixels (H) × (V)	1,600 × 1,200	
Color filter	—	Color mosaic
Frame rate	15 fps	
Minimum illumination	2 lx (Iris: F1.4, Gain: 18 dB, Shutter: 1/15 s)	4 lx (Iris: F1.4, Gain: 18 dB, Shutter: 1/15 s)
Sensitivity	F5.6 (400 lx, Gain: 0 dB)	F8 (2000 lx, Gain: 0 dB)
SNR	1 step (Lens close, Gain: 0 dB, 8 bits)	
Gain	Manual: 0 dB to 18 dB	
Shutter speed (Normal)	2 sec to 1/10,000 sec	
White balance	—	Pre-set, Manual, One Push, AWB
Reference video output level	940 steps	235 steps
Reference pedestal level	64 steps	16 steps
Output signal frequency	15 Hz (Normal mode)	
Monitor output (analog output)	Reference video output level: 700 mV, HD frequency: 75 kHz positive, VD frequency: 60 Hz positive	
Camera Features		
Readout modes	Normal, Binning (1 × 2), Partial scan	Normal/Partial scan
Readout features	Binarization, Gamma (arbitrary setting), Gray scale	Binarization, Gamma (arbitrary setting), Color bar feature
Synchronization	Hardware trigger	
Trigger modes	Edge Detection, Exposure time setting by trigger width	
External trigger shutter speed	Edge detection mode: 1/15 sec to 1/10,000 sec Trigger Width: 1 sec to 1/10,000 sec	
Partial scanning	OFF/ON (Vertical 1/16 V to 15/16 V)	
Detail	OFF/ON	
Color matrix	—	OFF/ON
Interface		
Video data output	10 bit, digital	24 bit, RGB Color, digital
Digital interface	LVDS	
Camera specification	non-PoCL, Base Configuration, CameraLink® Version 1.0	
Output data clock	36 MHz	
General		
Lens mount	C-mount	
Flange focal length	17.526 mm	
Power requirements	DC +12 V (10.5 V to 15.0 V)	
Power consumption	5.5 W	
Operating temperature	-5°C to +45°C	
Performance guarantee temperature	0°C to 40°C	
Storage temperature	-30°C to +60°C	
Operating humidity	20% to 80% (no condensation)	
Storage humidity	20% to 95% (no condensation)	
Vibration resistance	10 G (20 Hz to 200 Hz)	
Shock resistance	70 G	
Dimensions (W × H × D)	56 × 44 × 95 mm (not including projecting parts)	
Mass	250 g	
MTBF	49,059 hours (Approx. 5.6 years)	
Regulations	UL60950-1+CSA C22.2 No60950, FCC/ICES-003: Class A, CE: EN61326, AS/NZ: EN61326, VCCI: FCC Class A, KC: KN22/KN24: Class A	
Supplied accessories	Lens mount cap (1), Operating Instructions (1)	

Location and Function of Parts and Controls

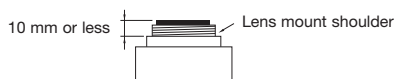


① Lens mount (C-mount)

Attach any C-mount lens or other optical equipment.

Note

The lens must not project more than 10 mm from the lens mount.



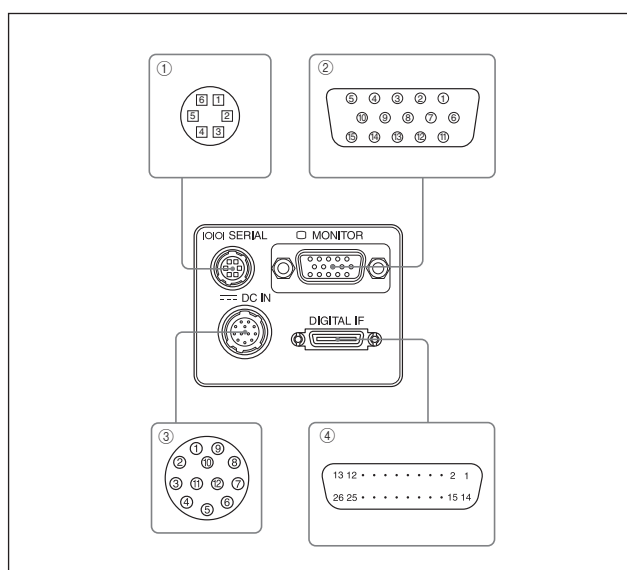
② Reference screw holes (at the top)

③ Reference screw holes/Tripod screw holes (at the bottom)

These precision screw holes are for locking the camera module. Locking the camera module into these holes secures the optical axis alignment.

You can install the camera on a tripod. To install on a tripod, you will need to install a tripod adaptor VCT-ST70I to the camera on the reference holes.

Rear Panel



① RS-232C connector (6-pin)

You can connect a serial cable to this connector to control a camera module from a camera control device.

② Monitor output connector (15-pin)

You can connect a monitor cable to this connector to display an image on a multiscan monitor supporting UXGA resolution.

Note

If you connect a multiscan monitor that does not support UXGA resolution, an image may not be displayed.

③ DC IN (DC power input) connector (12-pin)

You can connect a CCXC-12P05N camera cable to input the +12 V DC power supply. The pin configuration of this connector is as follows.

④ DIGITAL IF (Interface) connector (26-pin)

You can connect a digital interface cable to this connector to control a camera module from a host device utilizing the serial communication protocol while outputting a video signal from the camera module. You can input the external trigger signal via the 26-pin connector and operate a camera module in the external trigger mode. The pin configuration of this connector is as follows.

Note

When operating a camera module by inputting an external trigger signal via the 26-pin connector, be careful about trigger pulse input specifications (DIGITAL IF terminal).

Connector Pin Assignments

① RS-232C connector (6-pin)

Pin No.	Signal	Pin No.	Signal
1	TXD	4	NC
2	RXD	5	NC
3	Ground	6	NC

② Monitor output connector (15-pin)

Pin No.	Signal	Pin No.	Signal
1	R output	9	NC
2	G output	10	Ground
3	B output	11	NC
4	NC	12	NC
5	Ground	13	HD output
6	Ground	14	VD output
7	Ground	15	NC
8	Ground		

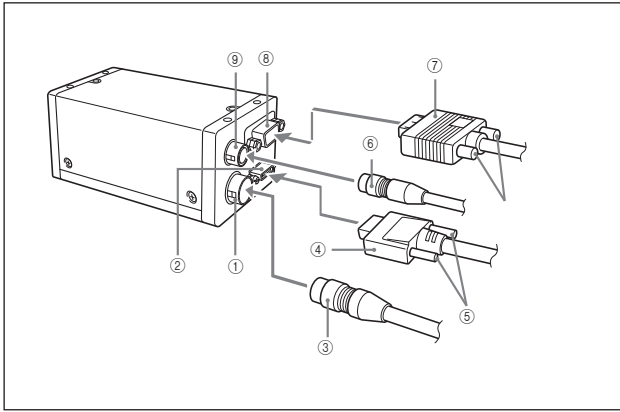
③ DC IN (DC power input) connector (12-pin)

Pin No.	Signal	Pin No.	Signal
1	Ground	7	NC
2	+12 V DC	8	Ground
3	Ground	9	NC
4	NC	10	Exposure pulse output
5	Ground	11	Trigger pulse input
6	NC	12	Ground

④ DIGITAL IF (Interface) connector (26-pin)

Pin No.	Digital signal	Pin No.	Digital signal
1	INNER_SHIELD (Ground)	14	INNER_SHIELD (Ground)
2	X0- (Output)	15	X0+ (Output)
3	X1- (Output)	16	X1+ (Output)
4	X2- (Output)	17	X2+ (Output)
5	XCLK- (Output)	18	XCLK+ (Output)
6	X3- (Output)	19	X3+ (Output)
7	Ser TC+ (Input)	20	Ser TC- (Input)
8	Ser TFG- (Output)	21	Ser TFG+ (Output)
9	TRIG- (Input)	22	TRIG+ (Input)
10	NC	23	NC
11	NC	24	NC
12	NC	25	NC
13	INNER_SHIELD (Ground)	26	INNER_SHIELD (Ground)

Connecting the Cables



- ① DC IN connector
- ② Digital interface connector
- ③ Camera cable
- ④ Digital interface cable
- ⑤ Fastening screws
- ⑥ Serial cable
- ⑦ Monitor cable
- ⑧ Monitor output connector
- ⑨ RS-232C connector

Connect the camera cable to the DC IN connector and the digital interface cable to the digital interface connector respectively. Also, if needed, connect the monitor cable to the monitor output connector and the serial cable to the RS-232C connector respectively. When you connect the digital interface cable or monitor cable, turn the two fastening screws on the connector to secure the cable tightly.

Connect the other end of the camera cable to the DC-700/700CE and the other end of the digital interface cable to the camera module interface board. Also, if needed, connect the other end of the monitor cable to the monitor and the other end of the serial cable to the camera control device.

About the Camera Control Method

You can control the camera from host device such as a PC. The following table shows the control functions. You can send a command corresponding to the control items, with parameters for the desired settings, if necessary, from the host device to control the camera.

Control functions			Description	
			XCL-U1000	XCL-U1000C
Operating mode			Normal/Trigger	
Shutter speed	Normal		1 sec to 1/10000 sec	
	Trigger	Edge	Internal setting: 1/15 sec to 1/10000 sec	
		Trigger pulse width	Setting by trigger pulse width	
Gain			0 dB to 18 dB	
Binning function			OFF/ON	—
Partial Scan function			OFF/ON	
Detail			OFF/ON	
External trigger input			26-pin connector / 12-pin connector	
White balance			—	Preset Manual One push (auto)
Color Matrix			—	OFF/ON

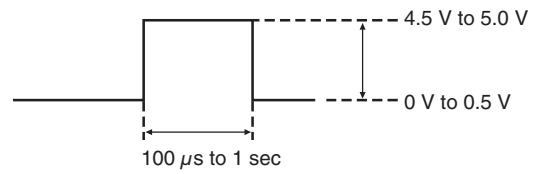
Note

Make sure to supply power to the camera module and confirm that the camera module is operating before inputting a trigger signal. If you input external signals to a camera module without the power supplied, this may cause a malfunction of the camera module.

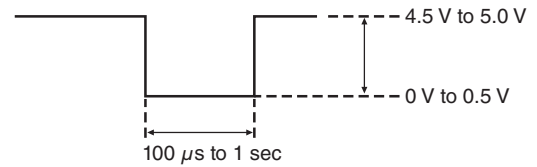
Trigger Pulse Input Specifications

DC IN terminal

(When positive pole is set)



(When negative pole is set)



• Input impedance: 10 kΩ or more

DIGITAL IF terminal

When operating a camera module by inputting an external trigger signal via the 26-pin connector, be sure to input trigger signals that satisfy the following specifications to both of the two terminals.

Trigger signal specifications (conditions)

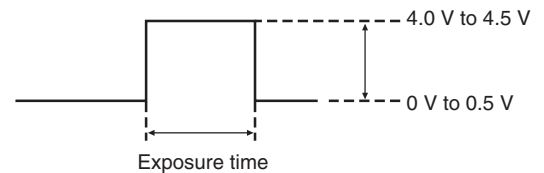
Amplitude: LVDS (output by the 3.3 volt IC)

Polarity: positive

Connection: Input a TRIG (–) signal to the 9th pin
Input a TRIG (+) signal to the 22nd pin



Exposure Output Specifications (DC IN terminal only)



• When terminated at 10 kΩ or more

Exposure output is output as a pulse that indicates exposure time when trigger mode is selected.