

# XCL-U1000 (B/W) XCL-U1000C (Color)



\*XCL-U1000C



## Outline

Sony's new XCL Series equipped with a digital video interface that conforms to the Camera Link™ industry standard.

These new cameras enable the capture of high-speed, high resolution images while simplifying connectivity to machine-vision systems with its standard 3M MDR 26-pin cable.

The XCL-U1000 and XCL-U1000C cameras incorporate a 1/1.8-type progressive scan CCD that produce detailed, UXGA resolution images (1,600 x 1,200 pixels).

Sony's XCL Series of high-performance and feature-rich cameras is the ideal solution for today's wide range of machine vision applications.

## Features

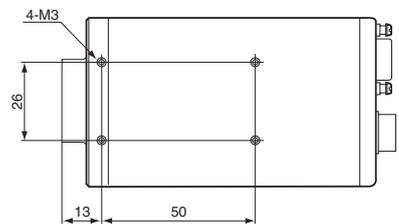
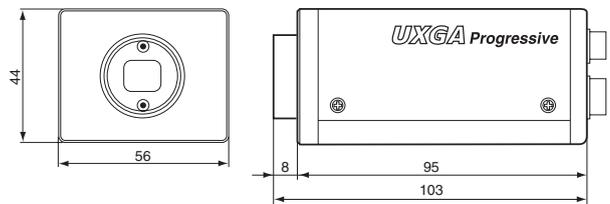
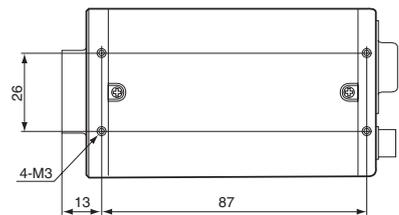
- 1/1.8-type progressive scanning CCD with square pixels
- UXGA image (1,600 x 1,200 pixels) captures video at 15 fps
- High sensitivity
  - XCL-U1000 : 400 lx at F 5.6
  - XCL-U1000C : 2,000 lx at F8
- Digital output
  - XCL-U1000 : LVDS 10 bit
  - XCL-U1000C : LDVS R/G/B 8 bit
- Camera Link standard conformity
- Monitor output
- External trigger shutter : 1/15 to 1/10,000 sec.
- C-mount lens
- Partial scanning
- Binning function (XCL-U1000)
- White balance (XCL-U1000C)
  - Auto/Manual/Preset selectable
- Matrix function for accurate color reproduction (XCL-U1000C)
- High shock and vibration resistance

## 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

Camera body of all models



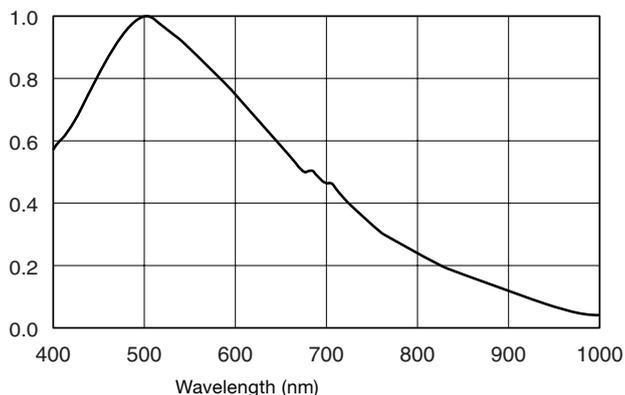
Unit: mm

## Spectral Sensitivity Characteristics

### ●XCL-U1000

(Typical Values)

Relative sensitivity

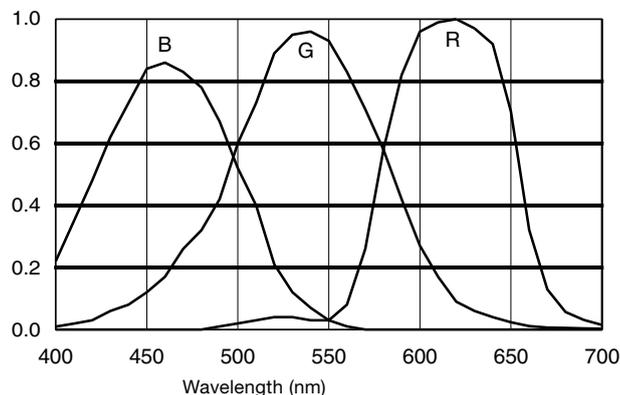


(Lens characteristics included, and light source characteristics excluded.)

### ●XCL-U1000C

(Typical Values)

Relative sensitivity

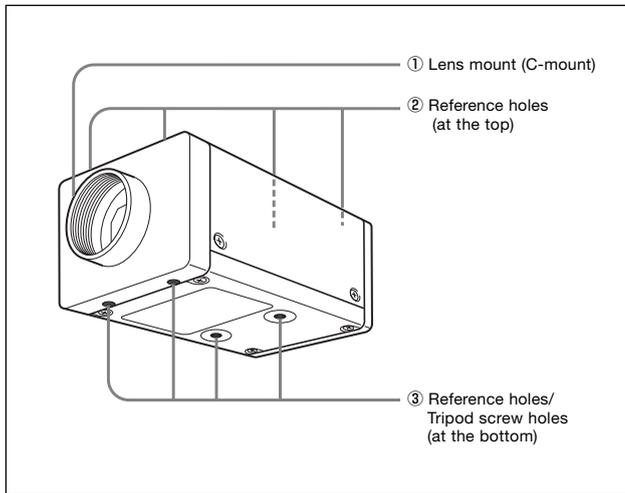


(Lens characteristics included, and light source characteristics excluded.)

## Specifications

	XCL-U1000	XCL-U1000C
Type	B/W	Color
Image device	1/1.8 type Progressive scan IT CCD	
Effective picture elements (H x V)	1628 (H) x 1236 (V)	
Effective lines (H x V)	1600 (H) x 1200 (V)	
Output image size	UXGA	
Cell size	4.4(H) x 4.4 (V) μm	
Lens mount	C-mount	
Sync system	Internal	
Video output	Digital output	
Digital output	LVDS 10 bit	LDVS R/G/B 8bit
Reference video output level	940 steps	235 steps
Reference pedestal level	64 steps	16 steps
Monitor output (analog output)	Reference video output level: 700 mV HD frequency: 75 kHz positive VD frequency: 60 kHz positive	
Output data clock	15 Hz	
Sensitivity	400 lx F5.6	2000 lx F8
Minimum illumination	2 lx (GAIN +18dB, F1.4)	4 lx (GAIN +18dB, F1.4)
Gain	0 to +18 dB	
Gamma	OFF/ON	
Read mode	Normal/Binning/High rate scan	Normal/High rate scan
Frame rate	15 fps	
Output data clock	36 MHz	
Shutter mode	Normal/External trigger shutter	
Normal shutter speed	1 to 1/10,000 s	
External trigger shutter	1/15 to 1/10,000 s	
High rate scan	ON/OFF (Vertical 1/16V to 15/16V)	
Bining	Vertical (1 x 2)	—
Detail	ON/OFF	ON/OFF
White balance	—	Pre-set/Manual/AWB
Matrix	—	ON/OFF
Power requirements	DC12 V	
Power consumption	5.5 W	
Dimensions (W x H x D)	56 (W) x 44 (H) x 95 (D) mm	
Mass	250 g	
Operating temperature	-5 to +45 °C	
Storage temperature	-30 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, 20 minutes for each direction-X, Y, Z)	
Shock resistance	70 G	
MTBF	49,059 hrs.	
Regulation	UL60950, VCCI Class B, FCC Class B, CE(EN61326/97+A1/98), Australia EMC(AS4251.1+AS4252.1)	
Supplied accessories	Lens mout cap(1) Operating Instructions(1)	

## Location and Function of Parts and Controls

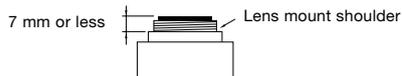


### ① Lens mount (C-mount)

Attach any C-mount lens or other optical equipment.

#### Note

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



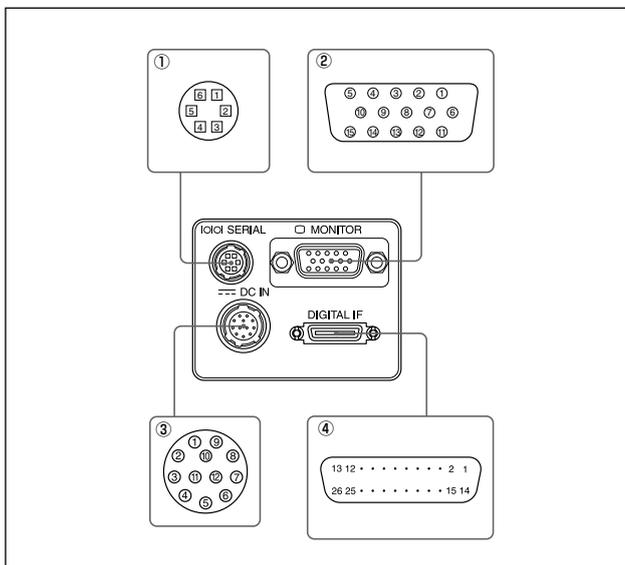
### ② Reference holes (at the top)

### ③ Reference 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

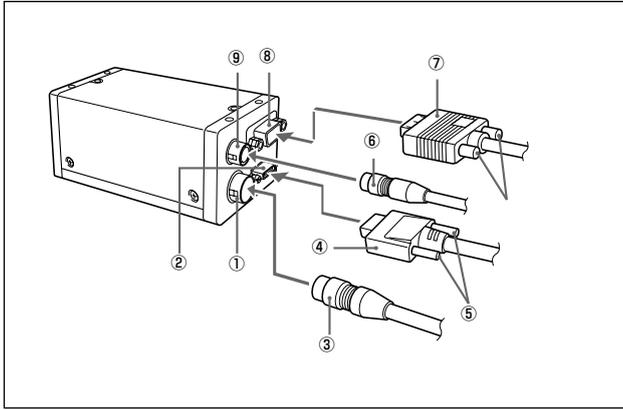
Pin No.	Signal	Pin No.	Signal
1	TXD	4	NC
2	RXD	5	NC
3	Ground	6	NC

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		

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

Pin No.	Digital signal	Pin No.	Digital signal
1	INNER_SHIELD (Ground)	14	INNER_SHIELD (Ground)
2	X0- output (Signal)	15	X0+ output (Signal)
3	X1- output (Signal)	16	X1+ output (Signal)
4	X2- output (Signal)	17	X2+ output (Signal)
5	XCLK- output (Signal)	18	XCLK+ output (Signal)
6	X3- output (Signal)	19	X3+ output (Signal)
7	Ser TC+ (Signal)	20	Ser TC- (Signal)
8	Ser TFG- (Signal)	21	Ser TFG+ (Signal)
9	TRIG- input (Signal)	22	TRIG+ input (Signal)
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 cable 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.

Refer to “Camera Control Command” on page 16 for details on how to send a command, the commands, and their parameters.

Control functions	Description	
Operating mode	Normal/Trigger	
Shutter speed	Normal	1 to 1/10000
	Trigger	Internal setting: 1/15 to 1/10000 Setting by trigger pulse width
Gain	0 to +18 dB	
Binning function	OFF/ON	
Partial Scan function	OFF/ON	
Detail	OFF/ON	
External trigger input	26-pin connector / DC-700 / 700CE	
White balance (XCL-U1000C only)	Preset/Manual/AWB	
Matrix (XCL-U1000C only)	OFF/ON	

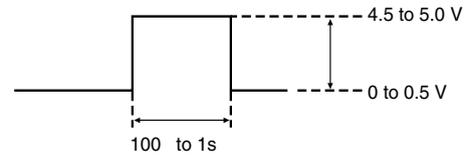
### Note

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.

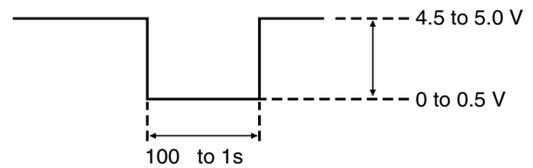
## Trigger Pulse Input Specifications

### 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)

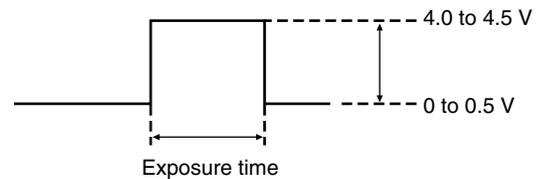
Polarity: positive

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.