XCD-SX910UV

Progressive Scan | 1/2 Type CCD | Square Pixels | C Lens Mount | SXGA Output | IEEE-1394 Digital Output | Normal Shutter

External Trigger Shutter | Long Exposure | Partial Scan | UV Sensitivity | Lead-Free Solder
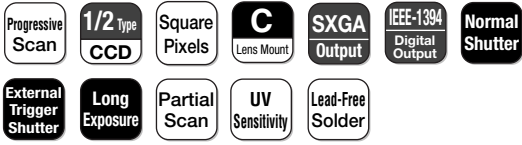
XCD igital | Ps | Digital output | Connection Diagram P92

Outline

The XCD-SX910UV is a high-resolution monochrome camera modules with ultraviolet sensitivity.
The XCD-SX910UV is a new model features an expanded UV range, lead-free solder, and a partial scan function.
It uses IEEE 1394 digital interface for image output, and are suitable for industrial applications that require highly accurate image capturing.
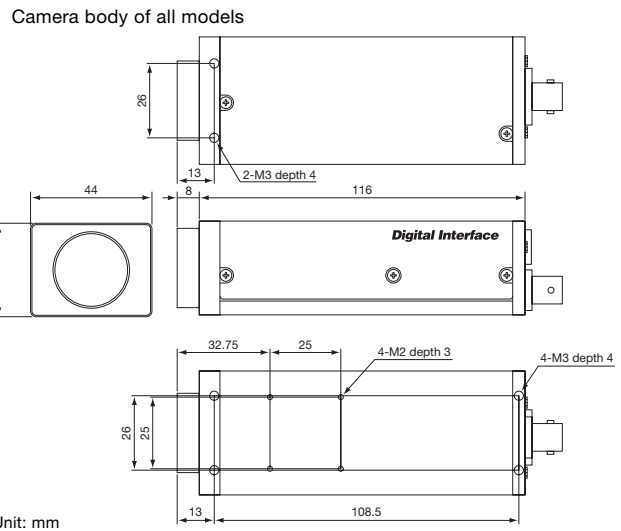
Features

- 1/2 type progressive scanning CCD
- High-resolution SXGA 1,280 (H) X 960 (V)
- Square pixels
- UV sensitivity 190 nm to 380 nm (deep-UV sensitivity)
- C-mount system
- Frame rate 15/7.5/3.75/1.875 fps
- Black & White (Monochome) 16-bit mode
- Partial scan function: 256 zones (16 x 16 selectable zones)
- External trigger shutter
- Digital camera protocol:
  1394-based Digital Camera Specification (Ver. 1.30)
- Dimension : 44 (W) x 33 (H) x 116 (D) mm
- Mass: 250g
- High shock and vibration tolerant
- Lead-Free solder

Accessories

- Tripod adaptor
  - VCT-ST70I

Dimensions

Camera body of all models

26
13
44
8
2-M3 depth 4
116
33
Digital Interface
32.75
25
4-M2 depth 3
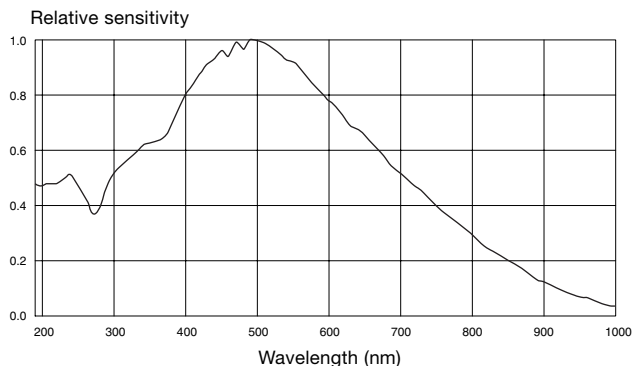4-M3 depth 4
26
25
13
108.5

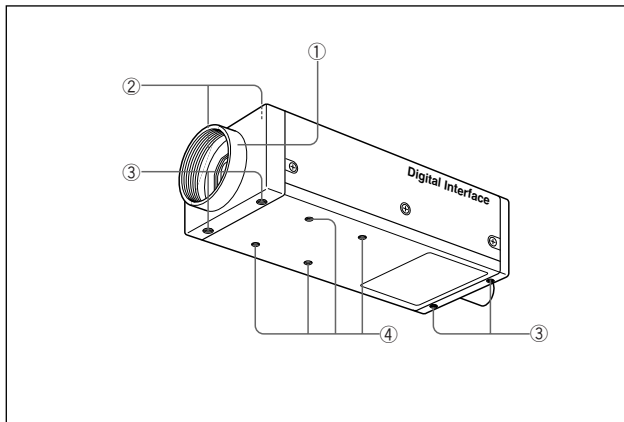Unit: mm

Spectral Sensitivity Characteristics

Relative Sensitivity

The relative sensitivity of the camera is determined by the permeability of the optical filter, and the spectroscopic sensitivity characteristics of the CCD mounted in the camera. Thus the relative sensitivity of a camera can be found by looking at the product of the permeability properties of the optical filter and the spectroscopic sensitivity characteristics of the CCD. This time, the optical filter used in the XCD-SX910UV will allow 200 to 1000 nm wavelength waves to pass, but for the most part, however, it doesn't depend on the wavelength, but instead utilizes a certain permeability ratio. So the relative sensitivity of the camera is more or less the same as the spectroscopic sensitivity of the CCD.

●XCD-SX910UV
(Typical Values)

Relative sensitivity

Wavelength (nm)
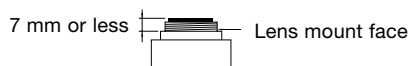
Location and Function of Parts and Controls

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.

7 mm or less ⊢ Lens mount face

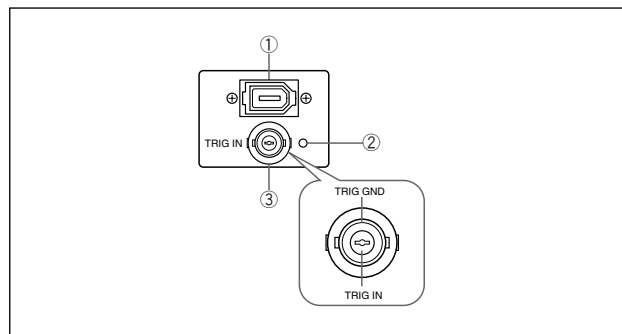② **Reference holes (Top)**

③ **Reference holes (Bottom)**

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

④ **Tripod adaptor screw holes**

Screw the tripod adaptor VCT-ST70I into the four screw holes when you use a tripod.

Rear Panel

① **CAMERA connector**

Connect the IEEE1394 camera cable (supplied) to this connector.

② **Pilot lamp**

This lamp indicates the camera module operation states:
OFF: Camera power OFF
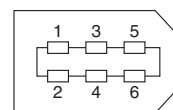Green: Camera power ON / Video signal output OFF
Orange: Camera power ON / Video signal output ON

④ **TRIG IN/Exposure OUT connector**

Connect the trigger signal generator (trigger output connector) to this connector.
When trigger is OFF, or software trigger is ON, a signal that indicates the exposure time is output from the BNC connector of the camera.

Connector Pin Assignments

1: Power
2: Power (GND)
3: TPB-
4: TPB+
5: TPA-
6: TPA+

Specifications

	XCD-SX910UV
Image device	1/2 type progressive scan IT CCD
Effective picture elements	1,392 (H) x 1,040 (V): 1,450,000 pixels
Effective lines/Output image size	1,280 (H) x 960 (V) / SXGA
UV sensitivity	190nm to 380nm
Unit Cell size	4.65 μm (H) x 4.65 μm (V)
Lens mount	C mount
Digital interface	IEEE 1394-1995
Protocol	IIDC 1394-based Digital Camera Specification Version1.30
Transfer rate	400 Mbps/200 Mbps/100 Mbps
Frame rate	15/7.5/3.75/1.875 frames/s
Gain control	Auto/Manual (0 to 24 dB)
Gamma	γ=1 (Fix.)
Shutter speed	1/100,000 to 17.5 s (Absolute value control possible)
External trigger shutter	Available (Trigger mode 0, 1)
Partial scan function	256 zones (16 x 16)
Power requirements	DC +8 to +30 V (from IEEE 1394 camera cable)
Power consumption	4.0 W (12 V)
Dimensions	44 (W) x 33 (H) x 116 (D) mm
Mass	250 g
Operating temperature	-5 to 45 ℃
Storage temperature	-30 to 60 ℃
Performance guarantee temperature	0 to 40 ℃
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	59,549 hrs. (approx. 6.8 years) (excluding CCD)
Regulation	UL60950, FCC class B Personal somputers and peripherals, ICES-003 class B Digital Device, CE (EN61326/97 + AI/98) Australia EMC (AS4251.1 + AS4252.1)
Supplied accessories	Lens mount cap (1), Operation instructions (1), Cable (1), Clamp filter (2)

Shutter

This camera allows both Manual and Auto Shutter setting.
The variable range extends from 10 microseconds to 17.5 seconds; relative control values are indicated by a 12-bit integer, and absolute control values are indicated using a 32-bit floating point value.
The shutter settings for the XCD-SX910CR/SX910UV/SX910 and XCD-X710CR/X710 are the same, but these settings differ from some of those for the XCD-SX900 or XCD-X700.
The relationship between the parameter and the exposure time is given by the following formulas.
Where

P = Parameter (003h ~ 424h)

E = Exposure time (s)

$P \geq 3 ~ \leq 1000$

$$E = \frac{P^2}{1000000} \qquad ①$$

$P > 1000 ~ P \leq 1150$

$$E = (P - 1000) * 0.1 + 1 \qquad ②$$

Setting examples

3 (003h) :	9 µs (1/100000)
32 (020h) :	1 ms (1/1000)
100 (064h) :	10 ms (1/100)
1000 (3E8h) :	1 s
1010 (3F2h) :	2 s
1150 (47Eh) :	16 s

When Auto Shutter is selected, the exposure time is adjusted automatically, based on the brightness of the subject. At this time, the reference level (target point) is set in the AutoExposure register.

Gain

Both Manual and Auto Gain setting are available with this camera. The variable range extends from 0 to 18 dB 0 to 24 dB, and the unit is designed so that the gain can be subdivided and set to any of 640 steps.
At the factory default setting, the gain is set to 0 dB.
When Auto gain is selected, the gain is adjusted automatically, based on the brightness of the subject. At this time, the reference level (target point) is set in the AutoExposure register.
The XCD-SX910CR/SX910UV/SX910 and XCD-X710CR/X710 are not compatible with the XCD-SX900 and XCD-X700 in Gain settings.
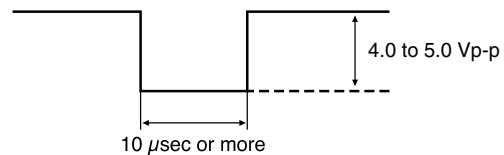
*: If you set the gain to +18 dB or higher, the S/N ratio will be severely degraded. Note this characteristic when you use the XCD-SX910UV/SX910/X710.

Trigger Shutter

Trigger shutter is useful for capturing images in response to a trigger that starts the exposure to match a preset timing. It can also be used to capture an image using multiple cameras with the same timing. When a trigger shutter is used, the required trigger is input via the BNC connector on the rear panel. The input signal is a 5-volt negative pulse. The falling edge of the signal is detected as the trigger, and the unit is equipped with an exposure time consisting of the shutter parameter set as trigger mode 0, and trigger mode 1 that controls the exposure timing using the width of the trigger signal pulse. When trigger mode 0 is used, the minimum width of the trigger is 10 microseconds. When trigger mode 1 is used, there is no limit to the exposure time.

This unit can also be used with a software trigger that issues the trigger signal via a software command. Both trigger mode 0 and trigger mode 1 can be used with software triggers.
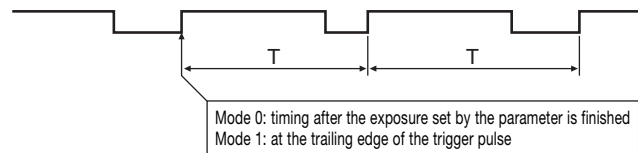
Trigger shutter

4.0 to 5.0 Vp-p

10 µsec or more

• Input impedance: 10 kΩ

■ When using Trigger mode

When this camera is set to accept a trigger at the fastest possible timing, it can accept overlap of the next trigger signal in the midst of video transmission.
For this reason, a tigger inhibition period is not available. Thus, if a trigger signal is input before the CCD can change to the state where it can accept exposures, multiple exposures can occur, and it cannot capture the correct image. Make sure that the following conditioons are met when the trigger is activated.

(However, partial activation can be used if the following conditions are exceeded.)

T   T

Mode 0: timing after the exposure set by the parameter is finished
Mode 1: at the trailing edge of the trigger pulse

XCD-SX910UV : T≧1/15 sec

On Light Sources

This camera is sensitive to ultraviolet light in the 400 nm or less. At the same time, it is sensitive to visible and infrared light above 400 nm in wavelength. So, when shooting a subject illuminated only by ultraviolet light, the visible light or infrared light shining on the subject or entering the camera, can have an influence on the image output. In order to obtain an accurate image, some sort of screening equipment will be needed to deal with both the visible and the infrared light.

If you use ultraviolet light as a light source, use light waves in the appropriate range for the camera sensitivity. Depending on the amount of light, wavelengths shorter than 350 nm can have an effect on the human body. Be especially careful to read the Operating Instructions to obtain a full understanding of how to properly use your light source.

In addition, there are safety considerations when using ultraviolet light, involving light reflected off the camera and light shining around at random. Be sure to take all necessary safety precautions when you use ultraviolet light as a light source.

When you switch back and forth using ultraviolet light and visible light with the same camera, due to aberrations in the lens, there may be some differences in the focus when you use ultraviolet light and when you use visible light.
On the XCD-SX910UV, the flange-back is 17.526 mm with ultraviolet light having a wavelength of 300 nm, as the default.

Non-TV Format

B/W Model

TV Format
Color Model

Intelligent

Digital Interface
IEEE1394

Camera Link compatible

Accessories

Color PTZ Model

Color Camara Block