XCD-V50 NEW
XCD-V50CR NEW

Progressive Scan | 1/3 Type CCD | Square Pixels | C Lens Mount | VGA Output | IEEE-1394 Digital Output | IEEE-1394b Digital Output

Normal Shutter | External Trigger Shutter | Long Exposure | Lead-Free Solder | *1 B/W | *2 RAW Mode Output

*1:XCD-V50
*2:XCD-V50CR

Connection Diagram P92

Outline

The XCD-V50 and XCD-V50CR are 1/3 type IT progressive scan CCD-equipped digital video camera modules for industrial applications. IEEE1394b-2002 is used for the digital interface to achieve a transfer speed of 800 Mbps. Use of a digital signal eliminates image degradation, extremely important in image processing for industrial applications. Also, the use of a square pixel CCD eliminates the need for aspect ratio conversion in the image processor. The strong anti-vibration characteristics enable the modules to be embedded in a variety of industrial verification/image input devices.

Features

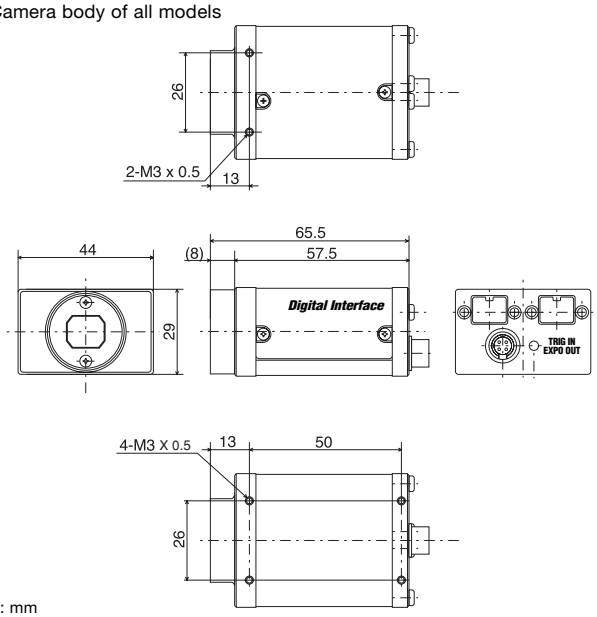
- Square pixel/whole pixel read out is ideal for image processing applications
- Equipped with IEEE1394b-2002 high-speed digital interface port
- Frame rate: 60/30/15 fps
- External trigger: [Trigger_mode_0]
  [Trigger_mode_1]
- C-mount
- High vibration resistance
- Monochrome 16-bit mode (lower 14 bits valid)
- Low power consumption
- Daisy chain
- RAW data output (XCD-V50CR)

Accessories

- C-mount LENS
  - ●VCL-08YM
  - ●VCL-12YM
  - ●VCL-16Y-M
  - ●VCL-25Y-M
  - ●VCL-50Y-M
- Tripod adaptor
  - ●VCT-ST701

Dimensions

Camera body of all models



Unit: mm

IEEE1394

■What is IEEE1394?

IEEE1394 is a serial bus standard for exchanging digital data. This standard was set up by the IEEE and is defined by “IEEE Std. 1394-1995 IEEE Standard for a High Performance Serial Bus”. The interface enables transfer speeds of up to 400 Mbps, making it possible to handle image signals with large amounts of data. Also, real-time transfer (isochronous transfer) using up to 64 channels is possible, and the bandwidth and time allocation of the transfer amount is secured. Devices can be connected/disconnected while the power is ON, and terminators such as SCSI and ID settings are unnecessary.

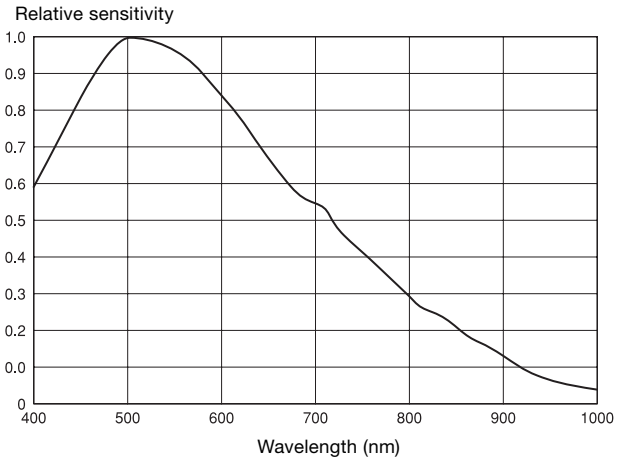
■What is IEEE1394b?

An extension of the IEEE1394a-2000 standard, IEEE1394b-2002 features a 3.2-Gbps maximum transfer speed and long-distance transmission. Five types of cables – STP, UTP, POF, HPCF, and GOF – are used, and the transmission speed and cable length are regulated for each type. A beta mode exclusively for 1394b and a legacy mode that is compatible with 1394a are available, enabling interconnection with a 1394a network.

*The Institute of Electrical and Electronics Engineers, Inc.

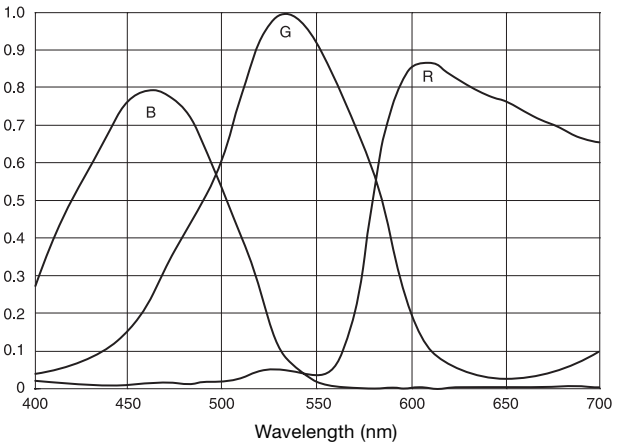
Spectral Sensitivity Characteristics

●XCD-V50



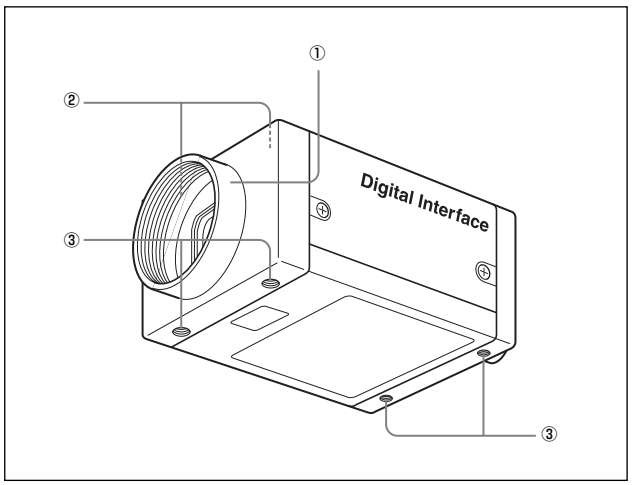
(Lens characteristics included, and light source characteristics excluded.)

●XCD-V50CR



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

Location and Function of Parts and Controls

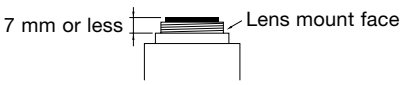


① Lens mount (C-mount)

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 (Top)

③ Reference holes (Bottom)

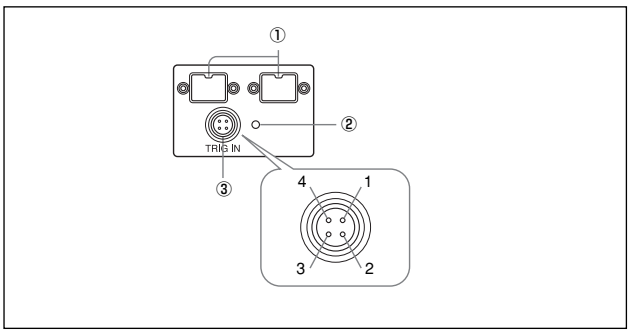
These precision screw holes are for locking the camera module. Locking the camera module into these holes secures the optical axis alignment.

Four screw reference holes of ③ can be used as the tripod adapor screw holes, too. Screw the tripod adaptor VCT-ST70I into the four screw holes when you use a tripod.

Specifications

	XCD-V50	XCD-V50CR
Output	B/W	Color
Image device	1/3 type IT progressive scan CCD	
Effective picture elements	659 (H) x 480 (V)	
Effective lines/Output image size	640 (H) x 494 (V)/VGA	
Cell size	7.4 µm (H) x 7.4 µm (V)	
Lens mount	C-mount (lens sold separately)	
Minimum illumination	4 lx (F0.95, +18 dB gain)	20 lx (F0.96, +18 dB gain)
Digital interface	IEEE1394b-2002	
Protocol	Compliant with IIDC 1394-based Digital Camera Specification Version 1.31	
Transfer rate	800 Mbps/400 Mbps	
Image format	640 x 480 Mono 8 / Mono 16	
Frame rate	15/30/60 fps (Mono 8), 15/30 fps (Mono 16)	
Gain	0 to 18 dB	
γ (gamma correction)	γ=1 (fixed)	
Shutter speed	1/10,000 to 1/15 sec (at 15 fps), 1/10,000 to 1/30 sec (at 30 fps), 1/10,000 to 1/60 sec (at 60 fps)	
External trigger shutter	Available (Trigger mode 0/1)	
Power requirements	DC 8 to 30 V (supplied via IEEE1394b cable)	
Power consumption	2 W (at 12 V)	
Dimensions	44 (W) x 29 (H) x 57.5 (D) mm	
Mass	120 g	
Operating temperature/humidity	-5 to +45 °C / 20 to 80% (no condensation)	
Storage temperature/humidity	-20 to +60 °C / 20 to 95% (no condensation)	
Vibration resistance	10 G (20 to 200 Hz, for 20 min. in Y, Y, and Z directions)	
Shock resistance	70 G	
MTBF	53,982 hrs (Approx. 6.2 years)	
Regulatory compliance	UL60950-1/CSA C22.2 N0.60950-1, FCC Class A Digital Device, ICES-003 Class A Digital Device, CE (EN61326/97 Class A+A1/98+A2/2001), Australia EMC (AS/NZS CISPR22:2002 Class A), VCCI Class A Information Technology Device	
Supplied accessories	Lens mount cap (1), Operating instructions (1), IEEE 1394b cable (1), 4-pin connector for trigger input (1)	

Rear Panel



① **IEEE1394b connectors**
Connect the IEEE1394b 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

③ **TRIG IN (Trigger)/Exposure OUT connector**
Connect the trigger signal generator (trigger output connector) to this connector.
When the external trigger function is set to OFF, a signal indicating the exposure time is output.

Pin No.	Signal
1	EXPO-OUT
2	TRG-GND
3	TRG-IN
4	NC

Shutter

This camera allows Manual Shutter setting.
The relationship between the parameter and the exposure time is given by the following formulas.
Where

P = Parameter (001h to C7ch)
E = Exposure time (μs)

E = (Int (P X 0.64) X 32.55) + 10 [μs]

Setting examples

1 (001h) : 10 μs
48 (030h) : 0.99 ms
480 (1E0h) : 10 ms

Gain

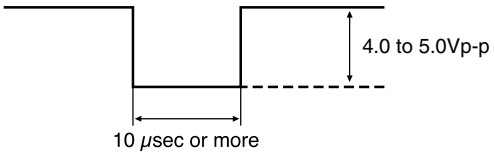
Manual Gain setting is available with this camera.
The variable range extends from 0 to 18 dB, and the unit is designed so that the gain can be subdivided and set to any of 512 steps.
At the factory default setting, the gain is set to 0 dB.

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 4 pin 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.

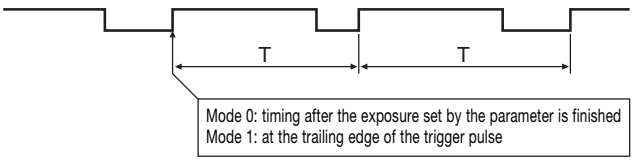
Trigger shutter



• 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 trigger 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 conditions are met when the trigger is activated.



T≧1/30 sec

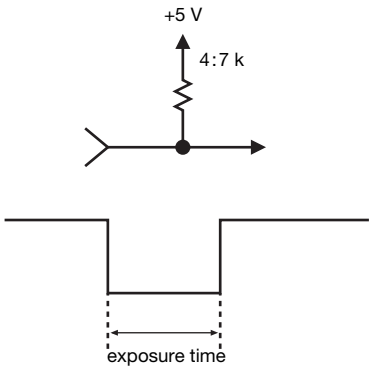
16-bit Mode

The camera supports 16-bit Black & white (Monochrome) mode, but because the output of the AD converter is 14-bit, only the least significant 14 bits of the 16 bits will handle data. The upper 2 bits will be filled with zeros.

00dddd | dddddddd

ExposureOut

When trigger is OFF, or software trigger is ON, a signal that indicates the exposure time is output from the TRIG IN/ Exposure OUT connector of the camera.



The LOW period that is given by an output wave form is an approximate guideline. It does not correspond exactly to the actual exposure time.

White Balance (XCD-V50CR only)

You can adjust the R and B gain with respect to G. Shoot a white object and adjust the two gains to standardize the signal levels of R, G, and B.

Hue (XCD-V50CR only)

You can adjust the G gain. Use this feature when you cannot obtain the correct white balance using the R and B gain.
The following Bayer patterns are available.

G	B
R	G