

Intelligent Camera

Technical Manual

XCI-SX100/XCI-SX100C
XCI-V100/XCI-V100C

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Trademarks

- CompactFlash™ is a trademark of SanDisk Corporation in the United States and other countries.
- VIA Eden and VIA Eden ULV are trademarks of VIA Technologies, Inc. in the United States and other countries.

Overview

This camera (XCI-SX100/SX100C/V100/V100C) is a black and white (XCI-SX100/V100) or color (XCI-SX100C/V100C) intelligent camera that can capture and process images, and control peripheral devices by itself.

Features

High image quality

Equipped with 1/3-type progressive scan CCDs, the XCI-SX100/SX100C can produce outstanding picture quality and high-resolution SXGA images (1,250,000 pixels) and the XCI-V100/V100C can capture clear images in VGA resolution (330,000 pixels).

High-performance x86-compatible processor

- VIA Eden ULV processor with 1 GHz internal clock speed. MMX-, SSE-, SSE2-, and SSE3-compatible. Low power consumption.
- 512 MB DDR2 SDRAM

PC standard input/output interface

- LAN connector
- VGA-compatible monitor (Analog RGB) output connector
- Hi-speed USB (USB 2.0) connector

Electronic shutter function

Shutter speed can be selected from among a variety of available speeds.

External trigger shutter function (2 to 1/50,000 sec.)

You can obtain a freeze frame by inputting an external trigger signal. This function is useful for shooting a fast-moving object clearly.

Partial scan

The camera module can limit the effective video output area to achieve high frame rates, enabling high-speed image processing.

Binning (XCI-SX100/V100 only)

Through vertical binning (combining two vertically adjacent pixels), you can decrease the data volume for sensor output images while retaining the entire angle of view, thereby increasing the image processing speed. Through horizontal binning (combining two horizontally adjacent pixels), you can obtain video outputs with higher sensitivity.

Excellent Picture Quality

XCI-SX100C/V100C has a color interpolation algorithm that produces highly detailed images.

Auto iris

With the lens-control signal output from the 6-pin auto iris port, the camera module can control a connected DC iris lens. If you remove the C mount adaptor, the camera module can support a CS mount DC iris lens.

Body fixing

Four screw holes to be used to install the camera are provided both on the top and the bottom of the camera. Installing the camera module on the front panel minimizes deviation of the optical axis.

Tripod

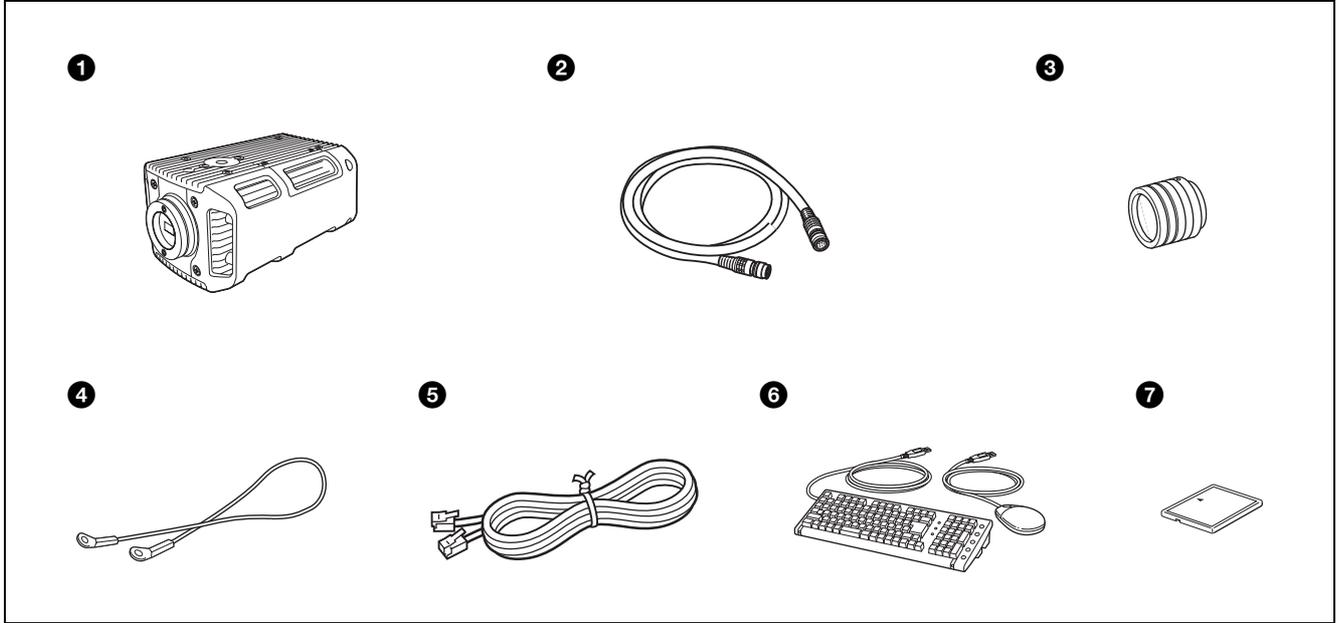
You can mount the camera on a tripod by tightening the tripod screws.

System Components

An Intelligent Camera XCI-SX100/SX100C/V100/V100C system can include the following optional products.

Note

The DC-700 camera adapter is not recommended, as its power supply may become insufficient depending on the camera operation mode. Use a power supply that is at least 12 V, 2 A (24 VA).



1 Intelligent Camera

This is a high-resolution camera equipped with a CCD and built-in x86-compatible CPU.

2 CCXC-12P02N (2 m, 6.6 ft)/05N (5 m, 16.4 ft)/10N (10 m, 32.8 ft)/25N (25 m, 82 ft) camera cable (commercially available from Sony)

This is attached to the DC IN connector of the camera and is used for power supply and trigger-signal input/output.

3 Lens (commercially available)

Use a lens appropriate for the camera module and your needs.

Note

When using a CS mount lens, be sure to remove the C mount adaptor on the camera. In addition, a separate 4-pin to 6-pin conversion cable is required when using a DC iris lens.

4 Fall-prevention wire rope (supplied)

This is attached to one of the auxiliary holes (top), using the supplied screw.

Note

Always use the fall-prevention wire rope to secure the camera when installing the camera to a ceiling.

5 LAN cable (enhanced category 5) (commercially available)

This is attached to the LAN connector of the camera and is used to access a network.

Note

Do not connect the LAN cable to a network where excess voltage is present.

6 USB mouse/keyboard (commercially available)

Use a mouse or keyboard that supports USB.

Note

When using a USB device other than a mouse or keyboard, make sure that the device is self-powered.

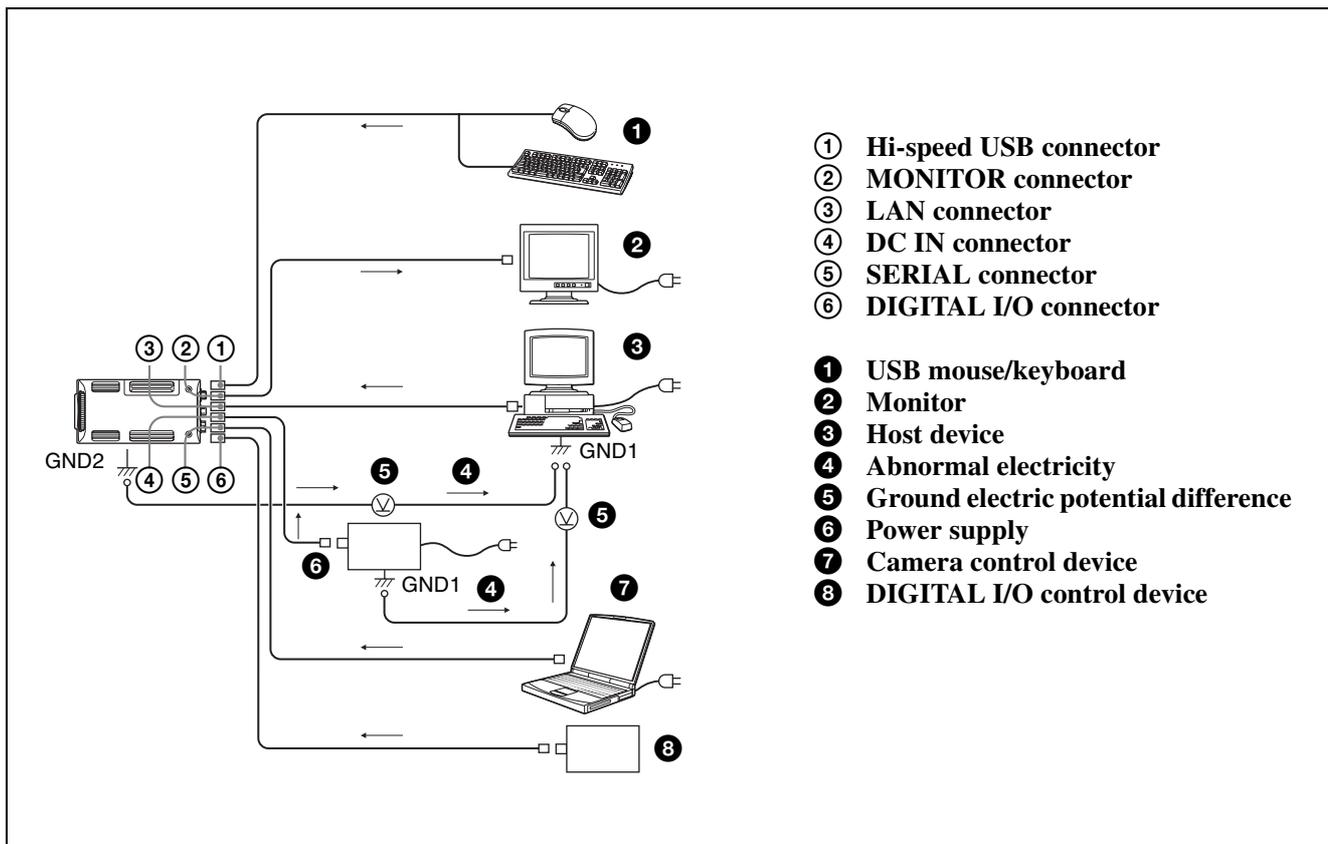
7 CompactFlash (commercially available)

Use a FixedDisk and Industrial type CompactFlash.

Note

Be aware that malfunctions may occur if you use a removable disk.

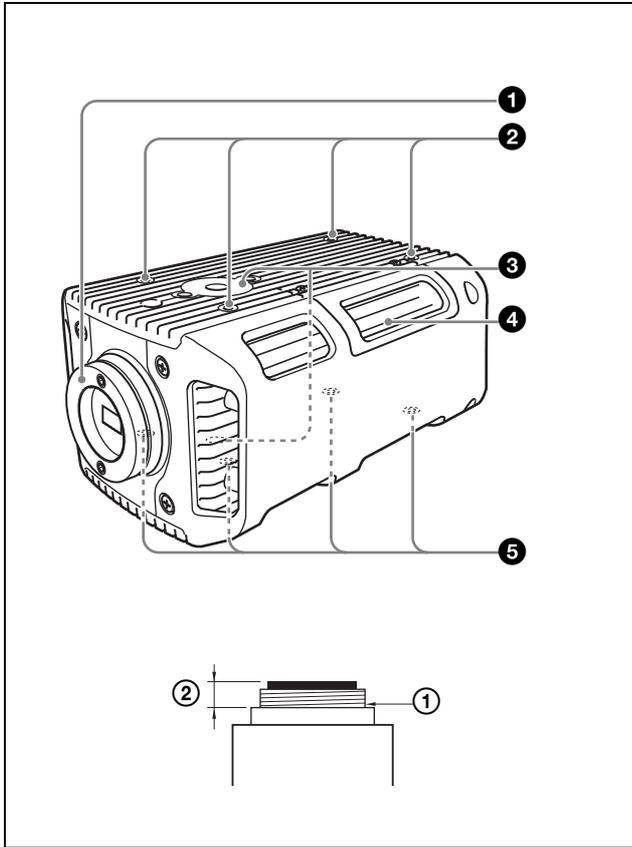
Connection Diagram



- ① Hi-speed USB connector
 - ② MONITOR connector
 - ③ LAN connector
 - ④ DC IN connector
 - ⑤ SERIAL connector
 - ⑥ DIGITAL I/O connector
-
- ① USB mouse/keyboard
 - ② Monitor
 - ③ Host device
 - ④ Abnormal electricity
 - ⑤ Ground electric potential difference
 - ⑥ Power supply
 - ⑦ Camera control device
 - ⑧ DIGITAL I/O control device

Location and Function of Parts and Operation

Front/Top/Bottom



- 1 Lens mount (C mount/CS mount)**
Attach any C mount or CS mount lens, or other optical equipment.

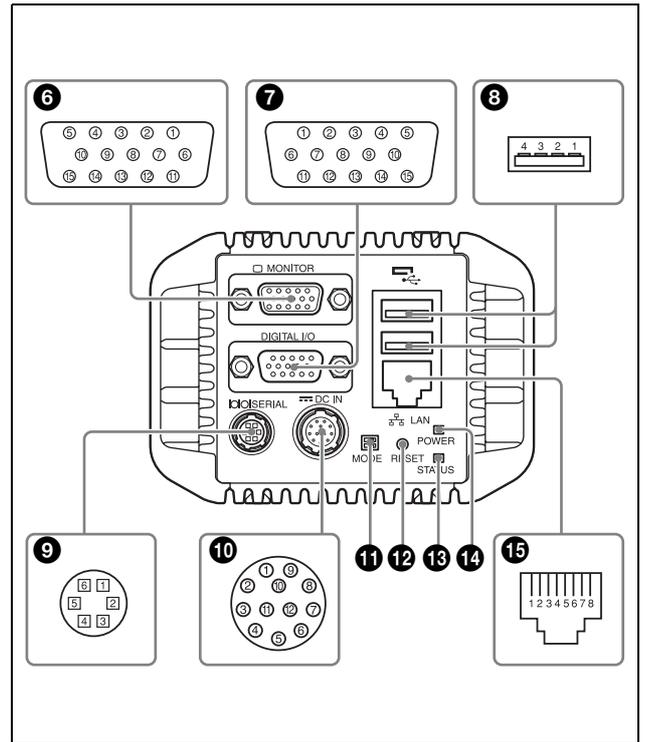
Note

The lens must not project more than the following length-values from the lens mount.

- ① Lens mount face
- ② C mount: 10 mm (13/32 inch) or less
CS mount: 5 mm (7/32 inch) or less

- 2 Fall-prevention wire screw holes (top)/auxiliary reference screw holes (top)**
- 3 Tripod screw holes (top/bottom)**
- 4 CompactFlash slot cover/CompactFlash slot (internal)**
The CompactFlash must be purchased separately.
- 5 Reference holes (bottom)**
These precision screw holes are for locking the camera in place. Using these holes secures the optical axis alignment.

Rear



- 6 MONITOR (monitor output) connector (15-pin, female)**

You can connect a monitor cable to this connector and display your computer's operating system on a multiscan monitor.

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

- 7 DIGITAL I/O connector (15-pin, male)**

You can connect a DIGITAL I/O cable to this connector to transmit data between the camera and the control device.

Pin No.	Signal	Pin No.	Signal
1	ISO_IN1	9	ISO_OUT4
2	ISO_IN2	10	ISO_OUT_COM1
3	ISO_IN3	11	ISO_OUT5
4	ISO_IN4	12	ISO_OUT6
5	ISO_IN_COM	13	ISO_OUT7
6	ISO_OUT1	14	ISO_OUT8
7	ISO_OUT2	15	ISO_OUT_COM2
8	ISO_OUT3		

8 Hi-speed USB (USB 2.0) connector

You can connect a USB mouse/keyboard via this connector to control a camera.

Pin No.	Signal	Pin No.	Signal
1	VBUS	3	D+
2	D-	4	GND

9 SERIAL / Auto iris connector (6-pin)

You can connect a serial cable to this connector to control a camera from a camera-control device. You can connect a DC iris lens to control the lens from a camera.

Pin No.	Signal	Pin No.	Signal
1	TXD	4	IRIS_CONTROL-
2	RXD	5	IRIS_CONTROL+
3	GND	6	IRIS_DRIVE+

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

You can connect a camera cable (not supplied) to this connector to input the +12 V DC power supply.

Pin No.	Signal	Pin No.	Signal
1	GND	7	NC
2	VCC	8	GND
3	GND	9	VCC
4	NC	10	Exposure pulse output* (strobe output)
5	GND	11	Trigger pulse input
6	NC	12	GND

* Delay can be controlled via strobe delay.

11 MODE switches

For service use. Both switches are set to the left side as the factory setup.

Note

If either of these switches is set to the right side, the camera will not start normally.

12 RESET switch

This is a hardware reset switch. Push to restart the camera.

13 STATUS LED

Lights in red when the BIOS is starting up.

14 POWER LED

Lights green when the power is on.

15 LAN connector

You can connect a LAN cable to this connector to input/output a signal to/from the host device/the camera.

Pin No.	Signal	Pin No.	Signal
1	TRD+ (0)	5	TRD- (2)
2	TRD- (0)	6	TRD- (1)
3	TRD+ (1)	7	TRD+ (3)
4	TRD+ (2)	8	TRD- (3)

Notes

- For safety, do not connect the connector for peripheral device wiring that might have excessive voltage to this port.
- When you connect the LAN cable of the unit to peripheral device, use a shielded-type cable to prevent malfunction due to radiation noise.

Installation

Notes on Installing the Camera

The camera body is designed to externally dissipate heat built up internally during operation.

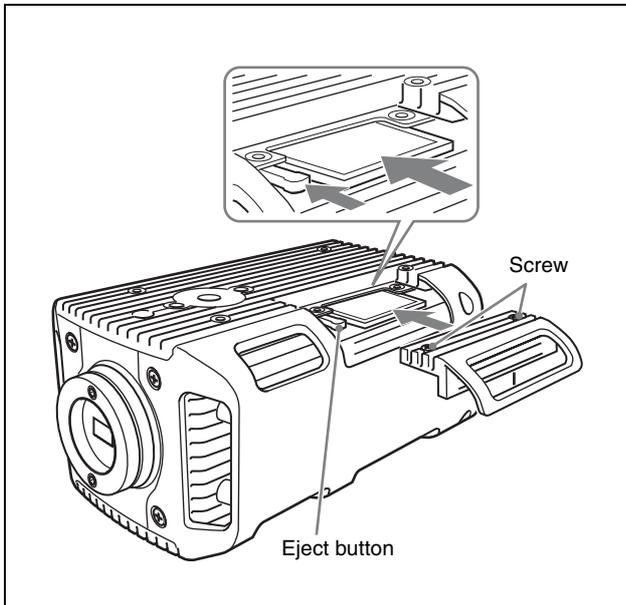
Install the camera as shown below to promote heat dissipation and retain optimum performance of the camera.

- using a suspension support
- using a tripod
- using a metal plate

Note

Do not attach to a board made of wood, resin, etc. that may block heat dissipation.

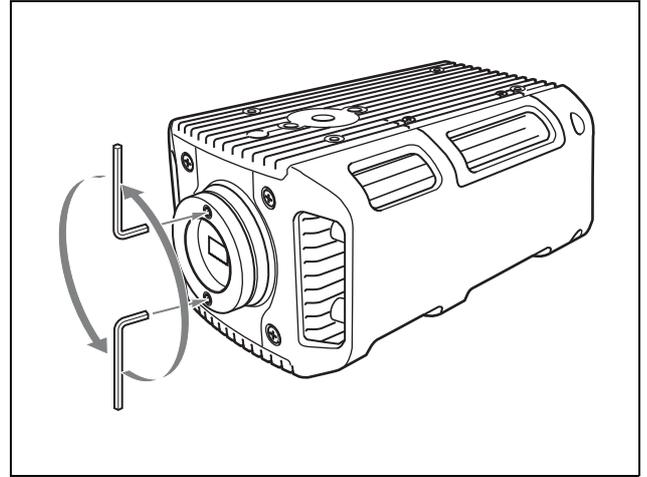
Inserting the CompactFlash



- 1 Loosen the two screws and remove the cover.
- 2 Press the eject button and insert the CompactFlash slot.
- 3 Mount the cover to the camera module, pressing the CompactFlash slot with the cover inside.
- 4 Fasten the two screws to secure the cover.

Fitting the CS Mount Lens

This camera module supports a C mount lens as the factory setup. If you will be using a CS mount lens, perform the following steps:



- 1 Insert two 3- mm Allen wrenches (commercially available) through the screw-recess holes of the C mount adaptor.
- 2 Turn the Allen wrenches counterclockwise.
- 3 Remove the C mount adaptor.

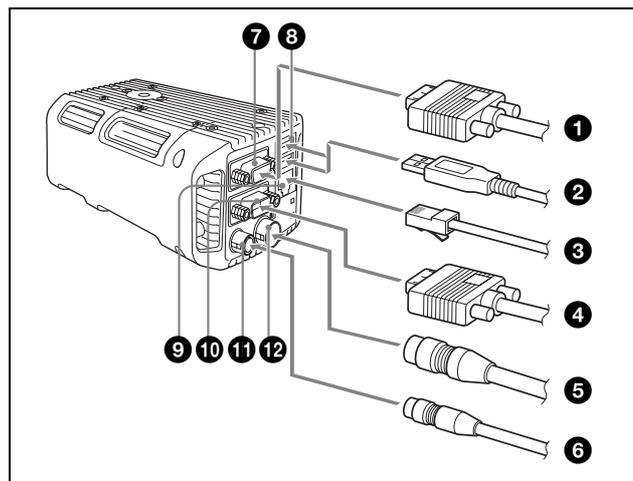
If you need to use the C mount adaptor again, follow steps 1 to 3 in reverse order.

Note

When you fit the C mount adaptor again after removal, a flange focal length may change. When refitting the mount, turn the wrenches while applying about 2.5 Nm of torque.

Connecting the Camera Cable

Connect the camera cable to the DC IN connector. Also, if needed, connect the LAN cable to the LAN connector, the monitor cable to the MONITOR connector, the serial cable to the SERIAL connector, the DIGITAL I/O cable to the DIGITAL I/O connector, and the USB mouse/keyboard to one of the USB connectors respectively. When you connect the monitor cable or DIGITAL I/O cable, plug the cable connector into the monitor connector or DIGITAL I/O connector until they snap into place, holding them. Then tighten the fixing screws placed on both sides of the cable connector.



- | | |
|---------------------|--------------------------|
| ① Monitor cable | ⑦ MONITOR connector |
| ② USB cable | ⑧ Hi-speed USB connector |
| ③ LAN cable | ⑨ LAN connector |
| ④ DIGITAL I/O cable | ⑩ DIGITAL I/O connector |
| ⑤ Camera cable | ⑪ SERIAL connector |
| ⑥ Serial cable | ⑫ DC IN connector |

Connect the other end of ⑤ to the power supply. Also, if needed, connect ① to the monitor, ③ to the host device, ④ to the DIGITAL I/O control device, and ⑥ to the camera control device.

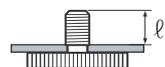
Note

Looseness of the fixing screws may cause poor connection and damage the camera module or cables. Fasten the fixing screws.

Using a Tripod

Use a tripod screw with a protrusion ℓ extending from the installation surface, as follows, and tighten it, using a screwdriver.

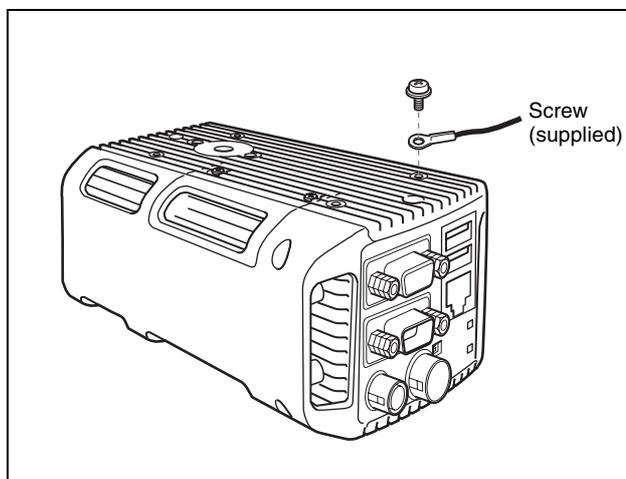
ℓ : 4.3 mm to 5 mm (0.17 inches to 0.20 inches)



Attaching the Fall-Prevention Wire Rope

Warning

- If you want to install the camera at a height such as on a ceiling, entrust the installation to an experienced contractor or installer.
- If you install the camera at a height, ensure that the installation location and its material are strong enough to support the weight, and then install the camera securely. Insufficient support may cause the camera to fall, resulting in damage to the camera and severe injuries.
- To prevent the camera from falling, be sure to attach the supplied wire rope.
- If you install the camera at a height, check periodically, at least once a year, to ensure that the connection has not loosened. If conditions warrant, perform this periodic check more frequently.



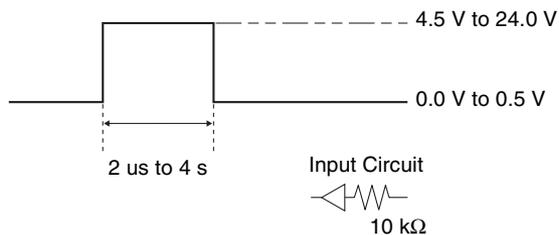
- 1 Attach the fall-prevention wire rope (supplied) to the camera module, using the supplied screw.
- 2 Attach the other end of the fall-prevention wire rope to a junction box, etc. (screw not supplied)

Notes

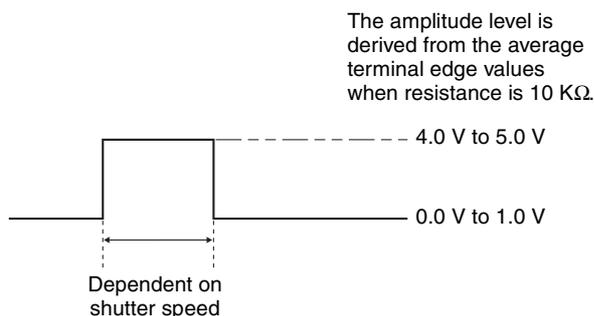
- The fall-prevention wire rope is very important for fall prevention. Perform the procedure correctly.
- Use the screws supplied with the XCI-SX100/SX100C/V100/V100C. Using screws other than those supplied may cause damage inside the camera module.

I/O Specifications

Trigger input (12-pin connector)

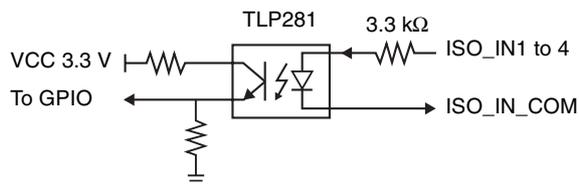


Exposure output (12-pin connector)



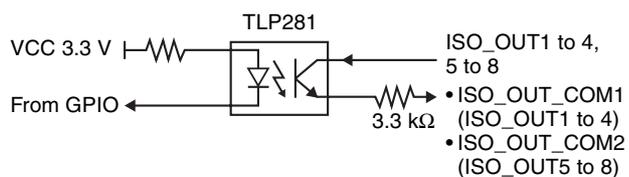
ISO_IN (15-pin connector)

Use external power ranging from +5 Vdc to +25 Vdc. The following is an input circuit diagram.



ISO_OUT (15-pin connector)

Use external power ranging from +5 Vdc to +25 Vdc. The following is an output circuit diagram.

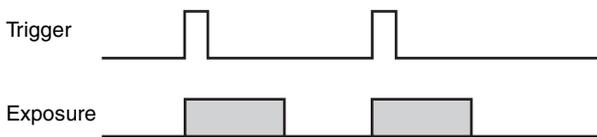


Trigger Shutter

The trigger shutter modes allow images to be captured in response to triggers, and start exposure at a preset timing. You can also use the modes to capture images from multiple cameras using the same timing. The triggers necessary for trigger shutter are input via the 12-pin connector on the rear panel. The input signal is a 5 to 24 V positive/negative pulse.

Trigger edge mode

The camera detects the leading edge of the external trigger signal and starts exposure. The exposure duration is determined by the shutter parameter.

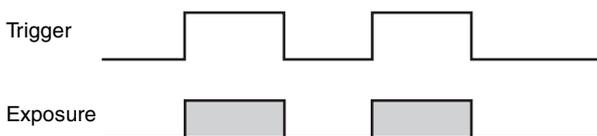


Trigger width mode

The exposure duration varies based on the width of the external trigger input. The following formula represents the exposure duration T[s].

$$T[s] = \text{trigger width} + 10 \text{ us (XCI-SX100/SX100C)}$$

$$T[s] = \text{trigger width} + 9 \text{ us (XCI-V100/V100C)}$$



Trigger Inhibition

When a trigger is input to multiple cameras simultaneously, you configure specific cameras to block the trigger. Exposure does not start on cameras for which the trigger has been blocked.

Trigger Polarity

Selects the polarity of the trigger input to the camera. You can select from Positive and Negative. The following diagram is an example of when Positive is selected.



Software Trigger

The camera generates a trigger internally, and captures a single still image at a preset timing.

Note

This function is enabled only when the shutter mode is set to trigger mode. This software trigger function is enabled even when the trigger inhibition function is in use.

Trigger Delay

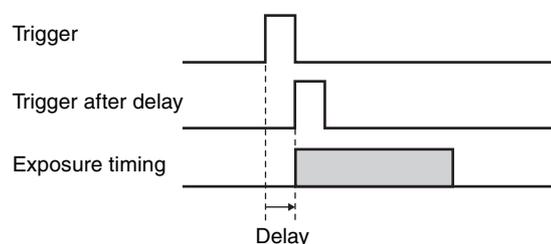
By configuring a trigger delay time, you can delay the timing in which exposure starts after a trigger is input to the camera. This allows precise adjustment of the timing in which images are captured when multiple cameras are installed.

Available trigger delay settings

0 to 4 s (1 ms steps)

Note

If the period of the input trigger is too short in relation to the configured trigger delay, the images will not output properly.

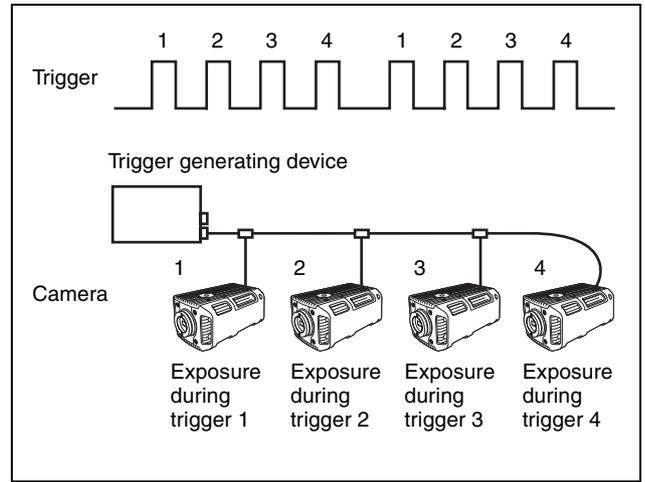
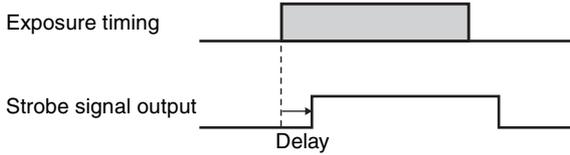


Strobe Delay

A strobe control signal is assigned to the tenth pin on the 12-pin connector, allowing direct control of light-emission from a strobe connected to the camera. In addition, you can configure a delay in the timing for light-emission in relation to the timing for exposure.

Available strobe delay settings

0 to 4 ms (1 us steps)



Input wave diagram when the trigger pulse is input to four cameras

One Trigger Two Frame Capture Mode

This camera can capture two sequential frames of an image in response to a single trigger input. The shutter speed can be configured for each frame. Since internal triggers are continuously generated, this function is also available during monitoring (free run) mode.

The following settings can be configured here.

- Configure individual shutter speeds for the first and second frames.
- Automatically configure the shutter speed for first frame to a value that is incremental to the shutter speed manually configured for the second frame.

Trigger Counter

A built-in trigger counter allows the camera to count the number of input pulses for external triggers. Counter values can be confirmed and reset.

Shared Trigger Function

This camera is equipped with shared trigger function that allows multiple cameras to be operated sequentially in response to a single trigger input.

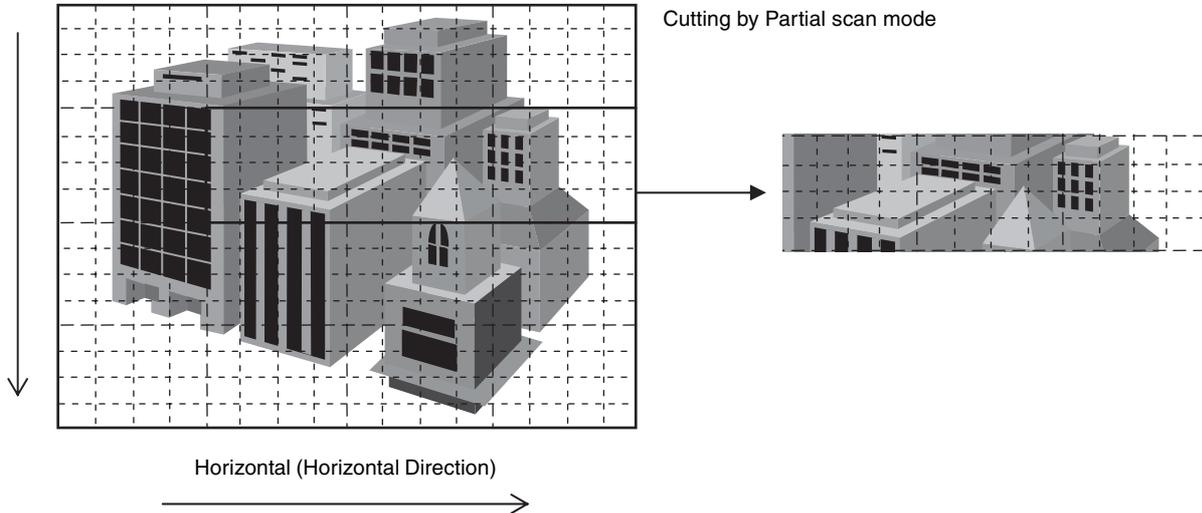
For each fixed number of triggers that are input (trigger cycle), each camera performs one shooting operation.

Partial Scan Mode

The partial scan is a function for outputting part of a whole image as a region of interest on the whole image. Only rectangles can be selected. The screen cannot be cut in convex and L shapes.

You can select from the unit cells that are created from dividing the entire image into 16 rows and 16 columns.

Vertical (Vertical Direction)



Number of blocks in vertical direction	Frame rate			
	XCI-SX100, XCI-SX100C		XCI-V100, XCI-V100C	
	Normal	Binning (XCI-SX100 only)	Normal	Binning (XCI-V100 only)
16	30	60	91	180
15	32	63	96	188
14	34	66	102	198
13	36	70	109	208
12	39	75	116	220
11	42	80	125	234
10	45	86	134	249
9	49	92	146	266
8	55	100	160	286
7	61	110	176	309
6	69	121	197	332
5	79	135	222	369
4	92	152	256	408
3	112	174	301	456
2	141	204	366	518
1	191	247	466	599

Normal mode

1 block = 60 lines (XCI-SX100 and XCI-SX100C)

1 block = 30 lines (XCI-V100 and XCI-V100C)

Binning mode

1 block = 30 lines (XCI-SX100)

1 block = 15 lines (XCI-V100)

Note

The number of blocks in the horizontal direction of a partial scan does not affect the frame rate.

However, be aware that the shutter speed has priority and will affect the frame rate in cases where the shutter is slower than the reciprocal of the frame rate. (The frame rate will be equal to the reciprocal of the shutter speed in such cases.)

Binning Mode (Black and White Models Only)

By combining data for adjacent pixels using the CCD, you can increase sensitivity and double the frame rate. Two types of binning are available for selection: 1×2 binning where pixels in the output image are combined in the vertical direction only, and 2×2 binning where pixels in the image are combined both vertically and horizontally. (In horizontal binning, the sensitivity is doubled but the frame rate does not change.)

1×2 binning XCI-SX100 : 1280×480 , 60 fps

XCI-V100 : 640×240 , 180 fps

2×2 binning XCI-SX100 : 640×480 , 60 fps

XCI-V100 : 320×240 , 180 fps

Note

The frame rate also depends on the shutter speed.

White Balance Adjustment Function (Color Models Only)

This camera is equipped with a manual configuration mode, two preset modes, and two auto configuration modes for white balance adjustment.

Manual Configuration Mode

A mode that allows you to adjust the white balance by manually configuring the R-gain, G-gain, and B-gain parameters.

3200K Preset Mode

A preset white balance configuration mode ideal for use with 3200K lighting.

5600K Preset Mode

A preset white balance configuration mode ideal for use with 5600K lighting.

One-Push White Balance Mode

A mode in which the white balance is automatically adjusted in response to a one-push trigger. In locations with fixed lighting, the white balance can be adjusted by using a gray chart or blank sheet of paper as a shooting subject.

Note

The white balance cannot be adjusted if the image is too bright or too dark.

ATW Mode

A mode in which the white balance is automatically adjusted based on data from the image. This mode is ideal for shooting natural landscapes or shooting with a wide-angle lens.

The camera may be unable to adjust the white balance when shooting images composed only of specific colors or when zoomed in on a subject. In addition, colors may appear to slowly fade when shooting objects with unbalanced colors. In such cases, use one-push white balance mode.

Note

The white balance cannot be adjusted if the image is too bright or too dark.

Detection Area Settings

This camera obtains the data necessary for automatic adjustment of exposure and white balance from the image itself.

You can select the location of the detection areas from which luminance data and color data are obtained (luminance detection areas and color detection areas).

Note

To enable automatic white balance adjustment, an image must have the proper exposure. The camera obtains exposure data from the luminance detection area. To enable the white balance function to operate properly, place the luminance detection area and color detection area in the same location.

Exposure Adjustment Function

This camera allows exposure adjustment through use of gain control and iris control functions.

Gain Control Function

This function allows you to adjust the exposure by adjusting the gain. The following modes can be selected.

Manual gain

Manually configure gain values to adjust the image brightness.

Auto gain

Automatically adjust the image brightness. You can also use the EV compensation function to set compensation between -2.0 EV and $+2.0$ EV in 0.25 EV steps.

Iris Control Function

This function allows you to adjust the exposure using the lens iris. Use a DC iris lens and adjust the iris.

Notes

- Video iris type lenses are not compatible.
- You cannot manually operate the iris.

Auto iris function

Automatically adjust the iris to adjust the image brightness. You can also use the EV compensation function to set compensation between -2.0 EV and $+2.0$ EV in 0.25 EV steps.

Lens adjustment function

This camera is equipped with a function that allows precise adjustment of auto iris lens movement for DC iris lenses. You can make precise adjustments to image brightness and lens movement speed with this function.

Detection Area Settings

This camera obtains the data necessary for automatic exposure adjustment from the image itself. You can select the location of the detection area from which luminance data is obtained (luminance detection area).

Note

You cannot use both the auto gain function and the auto iris function at the same time. When both functions are enabled, the auto gain function is given priority.

Lookup Table

The lookup table of this camera consists of 1,024 entries of 10-bit inputs and 10-bit outputs.

The lookup table allows you to configure a gamma curve or binarization.

The parameters that can be configured are as follows.

- 0: Equivalent of $\gamma=1$
- 1: Equivalent of $\gamma=0.45$
- 2: Equivalent of $\gamma=2.2$
- 3: Reverse
- 4: Binarization (1 to 1,023 threshold)

Filter Function

This camera allows simple image processing on the hardware using the 5×5 image filter. On color models, individual configuration of RGB filter coefficients is possible. Images before and after filter processing can also be transferred to memory simultaneously.

VIDEO Format

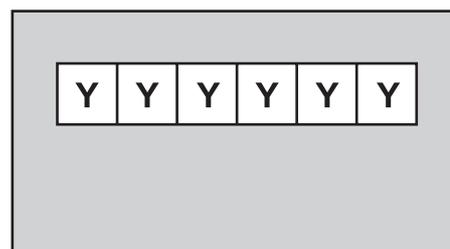
In order to support various types of image processing libraries, this camera is equipped with multiple formats for image transfer.

Ten output modes are available for color models, and two output modes are available for black and white models.

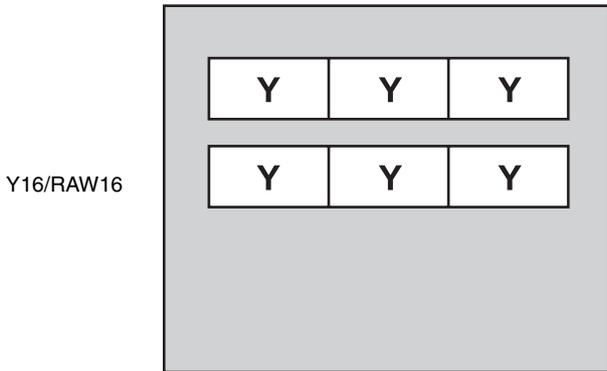
The output modes that can be selected are as follows.

- Y8: An output mode that uses Y8 bit to represent 1 pixel.
- RAW8 (color models only): An output mode without color processing that uses 8 bits to represent 1 pixel.

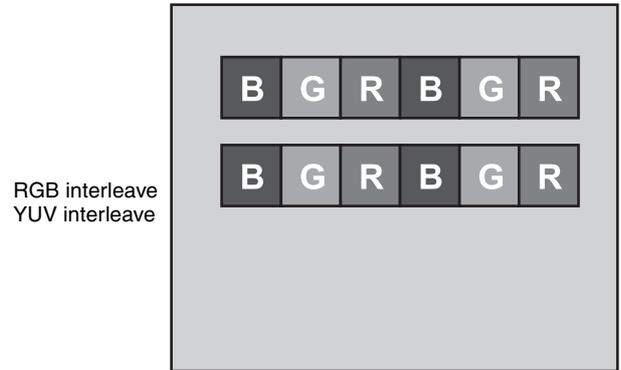
Y8/RAW8



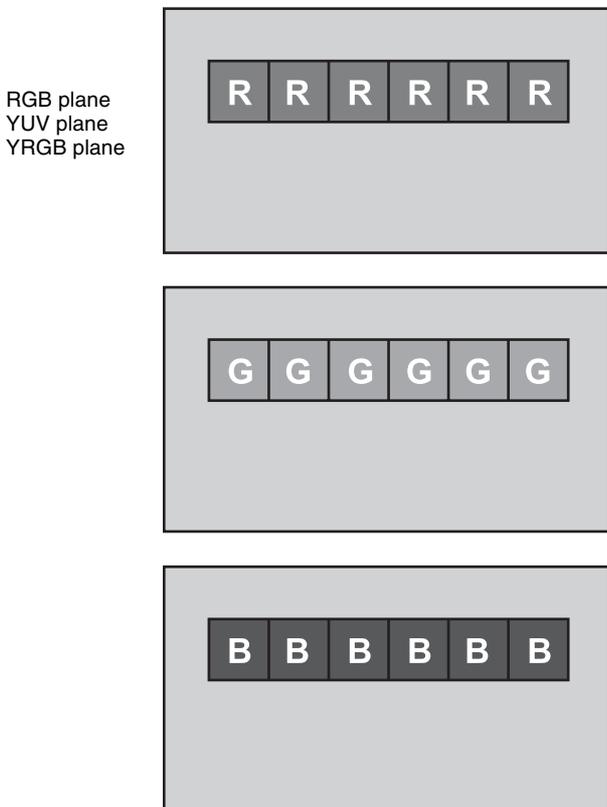
- **Y16:**
An output mode that uses Y10 bit to represent 1 pixel.
- **RAW16 (color models only):**
An output mode without color processing that uses 10 bits to represent 1 pixel.



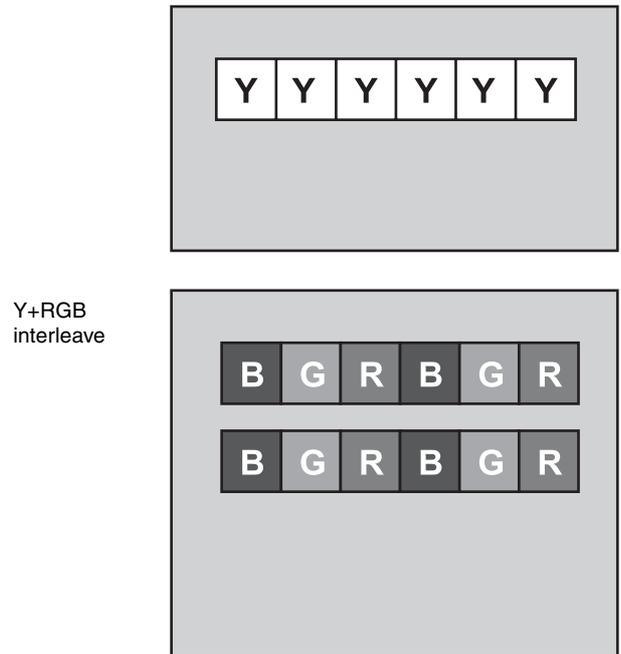
- **BGRi (color models only):**
A mode that uses 8 bits each to represent the B/G/R for 1 pixel and outputs to a single buffer area layer.
- **YUVi (color models only):**
A mode that uses 8 bits each to represent the Y/U/V for 1 pixel and outputs to a single buffer area layer.



- **RGBp (color models only):**
A mode that uses 8 bits each to represent the R/G/B for 1 pixel and outputs to each respective R/G/B buffer area.
- **YUVp (color models only):**
A mode that uses 8 bits each to represent the Y/U/V for 1 pixel and outputs to each respective Y/U/V buffer area.
- **Y+RGBp (color models only):**
A mode that processes Y8 and RGBp simultaneously.



- **Y+BGRi (color models only):**
A mode that processes Y8 and BGRi simultaneously.



Note on switching video formats

Never switch video formats while data transfer is in progress, as doing so may result in malfunction.

Buffer Lock

This camera allows you to lock (write-protect) frames of previously captured images.

Watchdog Timer

This camera has a watchdog timer. You set the watchdog timer with the software.

If the watchdog timer is set and the timer is not reset within the specified interval, the system will restart. You can also configure GPIO outputs to coincide with the system restart.

The following items can be configured for this function.

- The time interval before the system restarts (1 ms to 64 s)
- Positive/negative and pulse/level selections for GPIO output

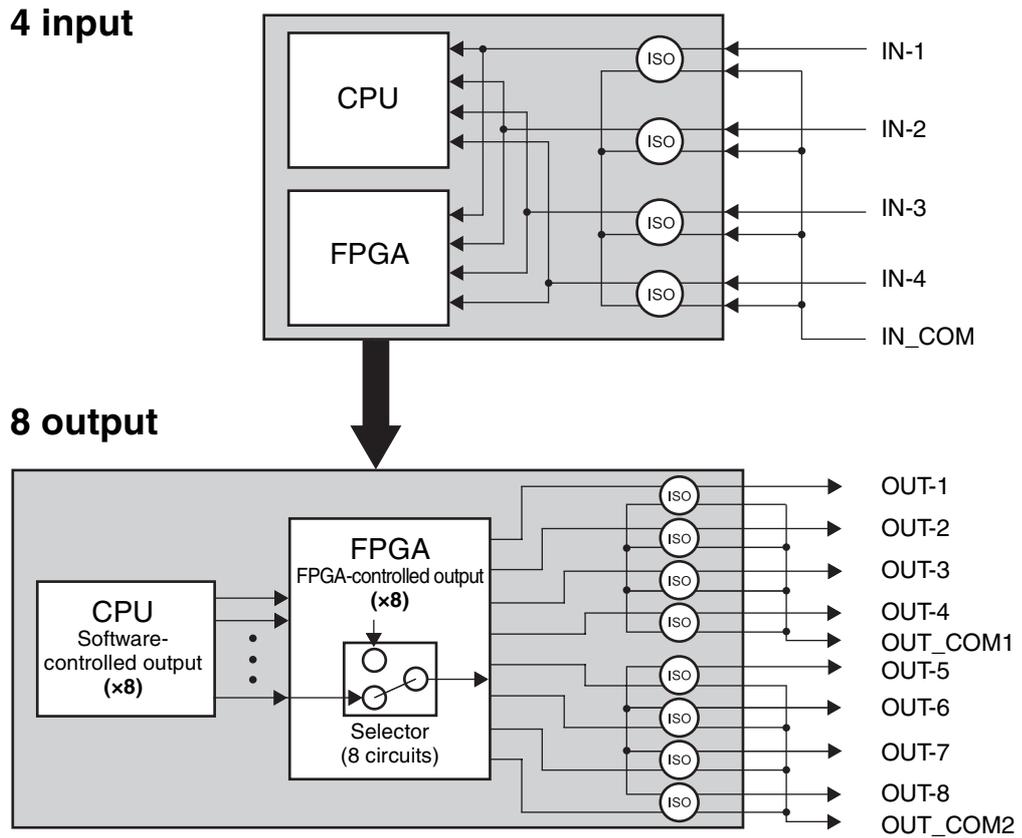
Notes

- Based on your operating environment (the amount of delay in the operating system and applications you are using), configure the appropriate time interval for restarting the system and appropriate timing for resetting the watchdog timer in applications.
- Proper shutdown procedures through software are not performed when the system restarts in response to the watchdog timer. As a result, the file system of the CompactFlash may be damaged depending on your operating system or applications. Be sure to take proper precautions such as configuring a protection (EWF, CHKDSK, etc.) for the CompactFlash.

GPIO Function

The 15-pin connector on the rear panel of the camera is equipped with four digital inputs and eight digital outputs. The input is connected to both the signal processing FPGA for the camera and the x86 CPU. Digital inputs, delayed digital inputs, external trigger inputs, and GPIO outputs from the x86 CPU can be selected for the output.

You can select output signals individually for the eight digital outputs.



Notes on the Camera Operations

If Frame Rate Decrease Occurs

On this camera, frame rate may decrease depending on your shutter settings.

- a When the exposure time is shorter than one frame, and the exposure time setting is shortened using the shutter

In this case, the camera tends to skip 1 frame image, resulting in a decrease in the frame rate. Keep this in mind when using an application that switches exposure times frequently.

- b With a long exposure
In long exposure mode, the exposure time is set longer than the image transmission cycle. In this case, frame rate decreases according to the exposure time.

When Using Trigger Mode

This camera is set to accept a trigger at the fastest possible timing and it can accept overlap of the next trigger signal during video transmission as the default setting. 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. Design the trigger generation circuit so that the trigger cycle is not faster than necessary.

For the same reason, a malfunction may occur when noise overlaps a trigger signal. In this case, suppress noise in the trigger generation circuit.

Accuracy of Auto White Balance

This camera integrates the R, G and B levels within the area specified by the AWB detection area, and adjusts the R and B gains so as to equalize each level. For this reason, the correct white balance is obtained when a white subject is shot on the whole detection area. The correct color reproduction may not be obtained during a normal scene shooting.

Note on CompactFlash

This camera does not perform proper shutdown procedures through software when the system restarts in response to the watchdog timer, or when the external power source is cut off. As a result, the file system of the CompactFlash may be damaged depending on your operating system or applications. Be sure to take proper precautions such as configuring a protection (EWF, CHKDSK, etc.) for the CompactFlash.

Error Message during BIOS Startup

When starting up the BIOS for the first time after purchase or after prolonged periods of disuse, a "SystemError" message may appear. Although this camera is equipped with an RTC (real-time clock), it is not equipped with a backup battery. As a result, the clock may stop and the above error message may appear after prolonged periods of disuse. This message indicates that the clock time is incorrect. To correct the clock, connect a mouse and keyboard, select Run Setup, and then adjust the calendar and clock settings in the BIOS setup screen. To proceed without adjusting the clock, select Continue. The BIOS will then start up properly.

Specifications

Imaging sensor system

	XCI-SX100/SX100C	XCI-V100/V100C
Pickup device	1/3-type 1.25 million pixel PS IT CCD	1/3-type 0.33 million pixel PS IT CCD
Output picture elements (horizontal/vertical)	1,280 × 960	640 × 480
Chip size (horizontal/vertical)	6.26 mm × 5.01 mm	5.79 mm × 4.89 mm
Unit cell size (horizontal/vertical)	3.75 μm × 3.75 μm	7.4 μm × 7.4 μm
CCD vertical drive frequency	29.7 kHz	46.154 kHz
CCD horizontal drive frequency	49.302 MHz	36.0 MHz
Frame rate	30 fps	90 fps
LUT	10-bit input/10-bit output, Five default tables ($\gamma=1, 0.45, 2.2$ / Binarization / negative-positive inversion)	
Shutter speed	Monitoring mode: 2 to 1/100,000 sec., External trigger mode: 2 to 1/50,000 sec.	

Processor and interface system

CPU	VIA Eden ULV (x86-compatible) Internal Operating Frequency: 1 GHz MMX, SSE, SSE2, SSE3 L1 caches 64 KB × 2/L2 caches 128 KB
Memory	Type: DDR2-400, Size: 512 MB
LAN	10Base-T/100Base-TX/1000Base-T
USB	Hi-speed USB (USB 2.0)

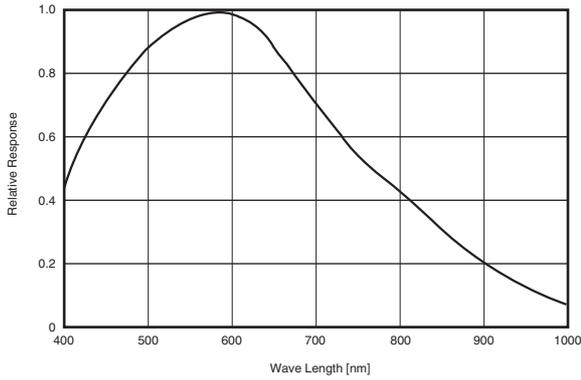
Optical system and others

Lens mount	C mount/CS mount (standard: C mount)	
Flange focal length	17.526 mm (in air)/12.5 mm (in air)	
Video output	VGA to UXGA Vertical frequency: 60 Hz	
Sensitivity	SX100: 400 lx, F5.6 SX100C: 2,000 lx, F5.6	V100: 400 lx, F5.6 V100C: 2,000 lx, F5.6
Minimum illumination	SX100: 2 lx or less (gain: +18 dB, F1.4) SX100C: 20 lx or less (gain: +18 dB, F1.4)	V100: 2 lx or less (gain: +18 dB, F1.4) V100C: 20 lx or less (gain: +18 dB, F1.4)
Gain	0 dB to +18 dB	
Read mode	Normal mode Binning mode (XCI-SX100/V100 only) Partial scan mode	
Shutter	External trigger shutter	
Power	+12 V DC (range: 10.5 V to 26.4 V)	
Power consumption	SX100: 17.4 W SX100C: 18.2 W	V100: 17.4 W V100C: 18.2 W
Operating temperature	-5 °C to +45 °C (23 °F to 113 °F)	
Storage temperature	-30 °C to +60 °C (-22 °F to 140 °F)	
Operating temperature humidity	20% to 80% (no condensation)	
Storage temperature humidity	20% to 95% (no condensation)	
Vibration resistance	10 G (20 Hz to 200 Hz, when using the reference holes)	
Shock resistance	70 G	
External dimension (w/h/d)	94 × 70 × 140 mm (3 3/4 × 2 7/8 × 5 5/8 inches), not including projecting parts	
MTBF	SX100: 18,951 hours (approx. 2.2 years) SX100C: 18,945 hours (approx. 2.2 years)	V100: 18,856 hours (approx. 2.2 years) V100C: 18,850 hours (approx. 2.2 years)
Mass	760 g (1 lb 9 oz)	
Accessories	Lens mount cap (1) Fall-prevention wire rope (1) Fall-prevention wire screw M3 × 8 (1) Operating Instructions (1)	

Spectral Sensitivity (Relative Response) Parameters

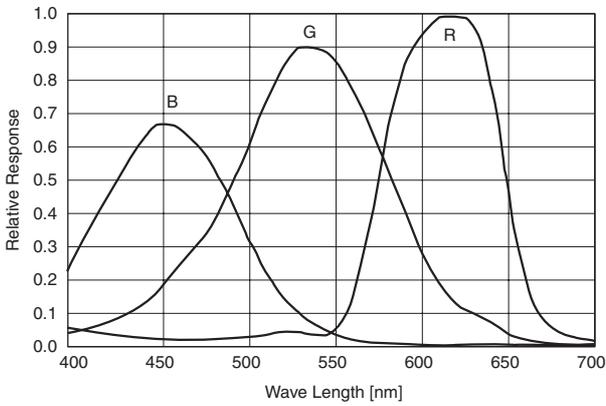
XCI-SX100

Spectral sensitivity (relative response) parameters (without lens and light source parameters)



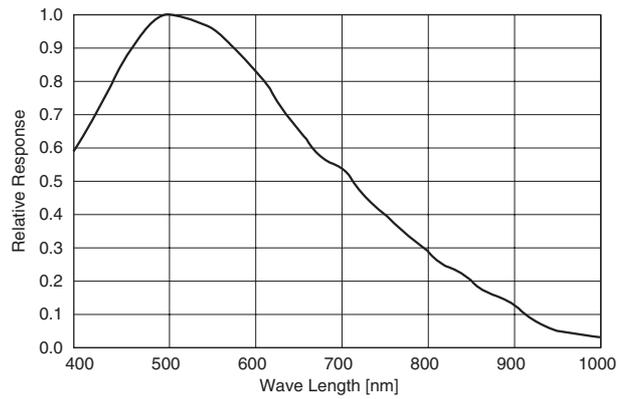
XCI-SX100C

Spectral sensitivity (relative response) parameters (without lens and light source parameters)



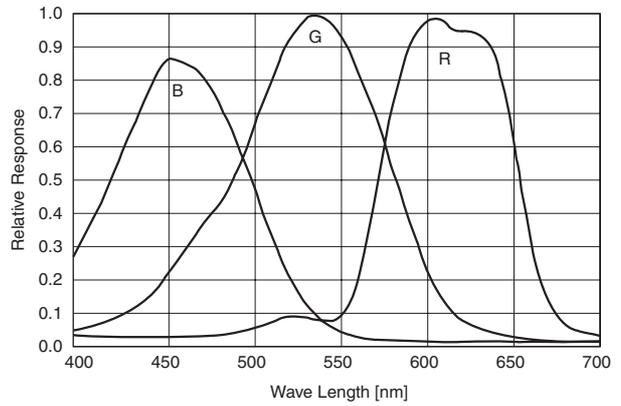
XCI-V100

Spectral sensitivity (relative response) parameters (without lens and light source parameters)

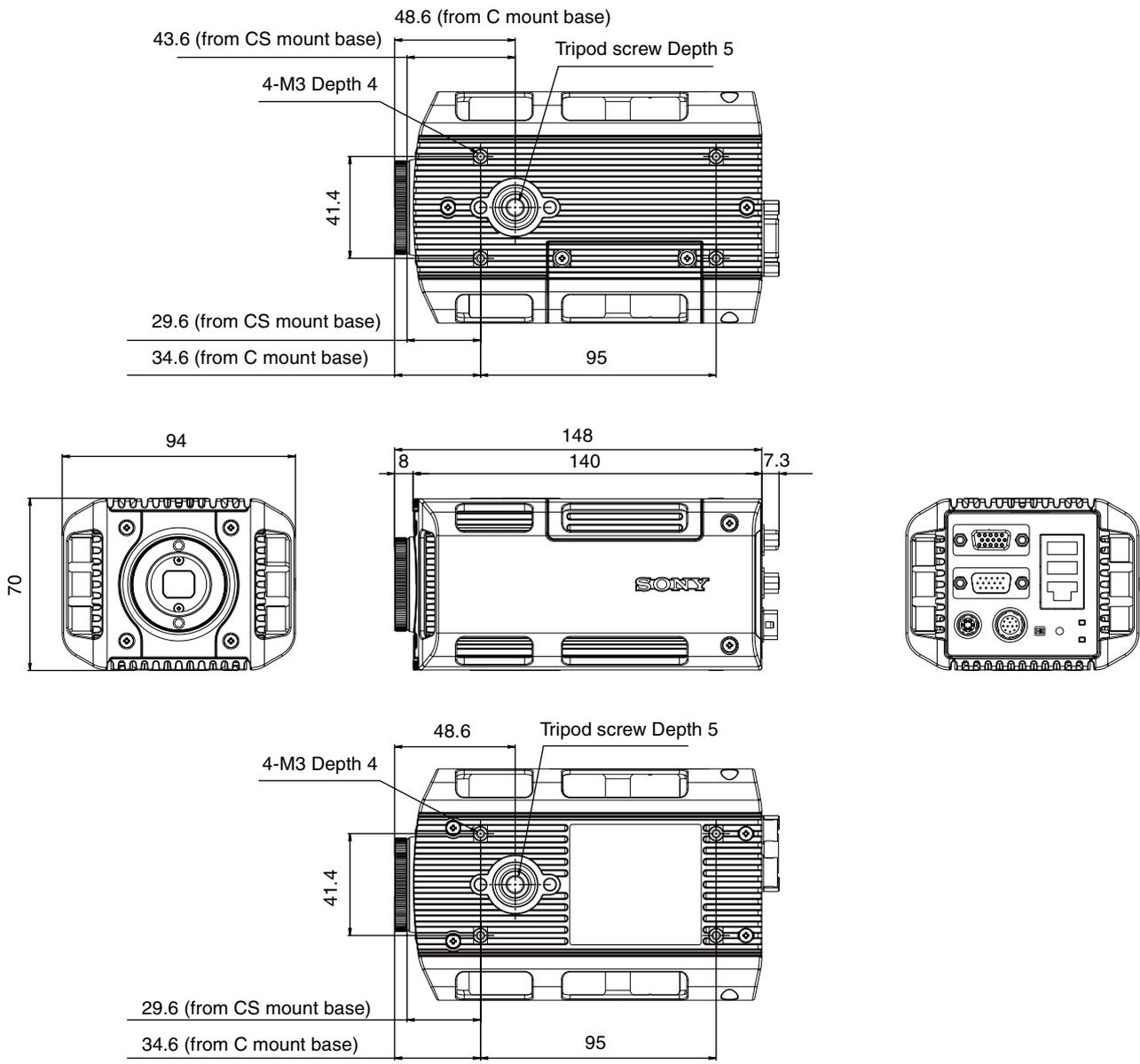


XCI-V100C

Spectral sensitivity (relative response) parameters (without lens and light source parameters)



Dimensions



Unit: mm (inches)

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