XCI-SX1 NEW

Intelligent | All-in-One | Progressive Scan | 1/2 Type CCD | Square Pixels | C Lens Mount | SXGA Output

Normal Shutter | PCレス | External Trigger Shutter | Long Exposure | Partial Scan | Lead-Free Solder

All-in-One INTELLIGENT Ps

Connection Diagram P92

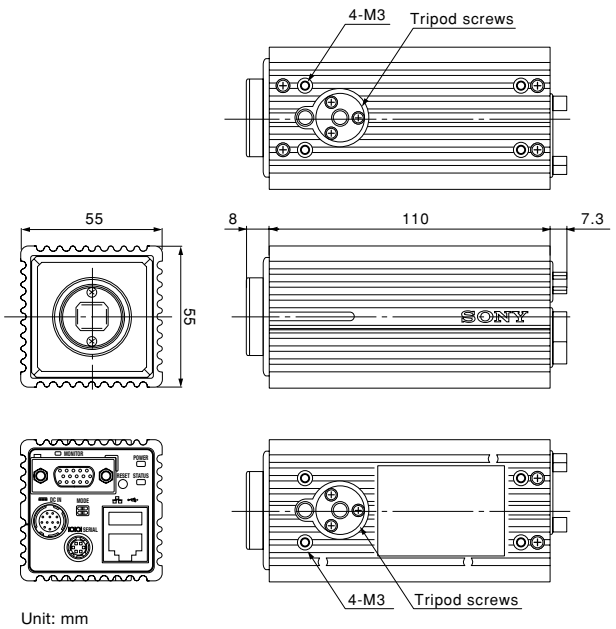
Outline

The XCI-SX1 is an intelligent camera equipped with a built-in x86 CPU, enabling it to perform image loading, image processing, and peripheral device control on its own. The use of open architecture contributes to the realization of one-of-a-kind image processing software and application software based on the built-in OS. The camera features a space-efficient design.

Accessories

- Compact camera adaptor (power supply)
  - ●DC-700/DC-700CE
- 12-pin camera cable
  - ●CCXC-12P02N (2 m)
  - ●CCXC-12P05N (5 m)
  - ●CCXC-12P10N (10 m)
  - ●CCXC-12P25N (25 m)

Dimensions



Unit: mm

Features

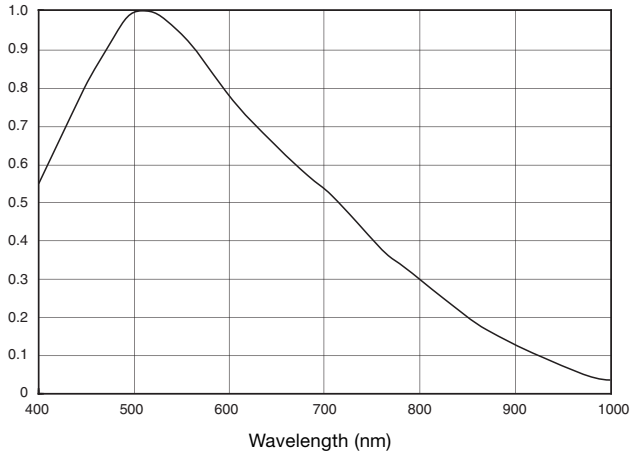
- All-in-one compact body
  Dimensions: 55 (H) x 55 (W) x 110 (D) mm
- Built-in x86 CPU
  Can run the image processing applications that are installed on the Compact Flash and which run on general PCs.
- Built-in PC-standard interface
  By connecting a mouse, keyboard, and multi-scan monitor to the USB 1.1 and VGA monitor ports, development and system setup of PC-free image processing applications is possible. It is also possible to connect to a host PC via LAN (10Base-T/100Base-TX) to download software and perform camera image monitoring.
- Effective lines: 1280 (H) x 1024 (V) (SXGA)
  Equipped with a high-resolution 1/2 type IT progressive scan CCD with square pixel/whole pixel output, ideal for high-resolution image processing applications.
- Standard sensor output frame rate: 15 fps
- Binning function
  - Vertical/horizontal pixel blending
    Vertical binning (blending 2 lines) improves image processing speed by reducing the amount of sensor output image data and maintaining the whole field angle, and horizontal binning (blending 2 pixels) enables image output with improved sensitivity.
- Partial scan function
  Horizontal/vertical partial scanning is performed only for the area required for the standard number of effective lines (SXGA), reducing the amount of data and enabling faster image output. This contributes to a faster image processing speed.
  - Vertical partial scan
    Possible to read out any contiguous area consisting of the 32 areas that make up the 1,024 lines in the vertical direction.
  - Horizontal partial scan
    Possible to read out 3 blocks or more of the 10 areas that make up the 1,280 lines in the horizontal direction.
- Input voltage: Compatible with DC +12 V, +24 V
- 128 MB CompactFlash installed
- 256 MB DDR-SDRAM
- Compatible with TCP/IP, HTTP, FTP
- Equipped with Digital I/O and RS-232C interface
  Communication with peripheral devices is possible.
- Built-in Linux kernel
  SDK for Linux and camera driver for Windows are available.

* Linux is a registered trademark of Linus Torvalds.
Windows is a registered trademark of Microsoft corporation.

Spectral Sensitivity Characteristics

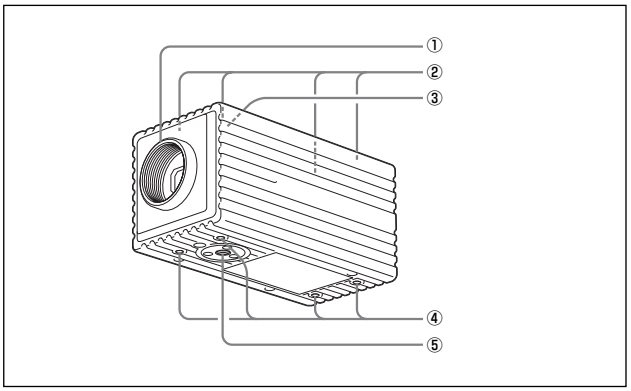
(Typical Values)

Relative sensitivity



(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 (9/32 inch) from the lens mount.

② Auxiliary reference holes (Top)

③ Tripod holes (Top)

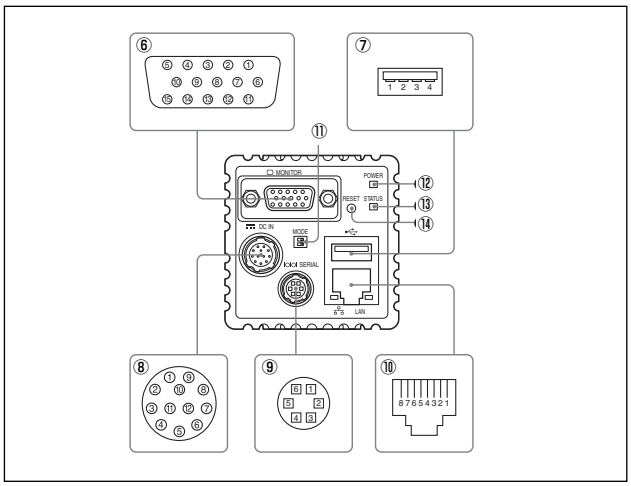
④ Reference holes (Bottom)
These precision screw holes are for locking the camera. Locking the camera into these holes secures the optical axis alignment.

⑤ Tripod holes (Bottom)

Specifications

	XCI-SX1
Image device	1/2 type IT progressive scan CCD
Effective picture elements	1,280 (H) x 1,024 (V) (SXGA)
Cell size	4.65 µm (H) x 4.65 µm (V)
Frame rate	15 fps @ SXGA
Video output	8 bit
Gain	Manual (0 to 18 dB, 1 dB steps)
Shutter speed	2 to 1/50,000 sec (Trigger mode) , 2 to 1/100,000 sec (Normal mode)
Binning	Vertical/horizontal binning
Partial scan	Vertical random read scan: 32 to 1,024 lines, 32-line steps Horizontal random read scan: 384 to 1,280 pixels, 128-pixel steps Frame rate (example): 34 fps (VGA), 21 fps (XGA)
External trigger	Mode: Pulse edge detection, pulse width detection Delay function: 0 to 4 sec (1 ms steps) Exposure start delay amount: 10 µs max.
Lookup table	Luminance value conversion (gamma correction, 2 values, negative/positive reversal, etc.)
CPU	x86, AMD Geode GX533, 400 MHz
Memory	256 MB DDR-SDRAM, 128 MB CompactFlash
OS	Linux (Kernel version 2.4.18)
LAN	10Base-T/100Base-TX, Network protocol: TCP/IP (IPv4), HTTP, FTP
Monitor output	D-sub 15-pin multi-scan monitor support
USB	Version 1.1
Serial interface	RS-232C
Digital I/O	TTL IN/OUT, Isolated IN/OUT, Trigger IN, Exposure OUT
Lens mount	C-mount
Minimum illumination	4 lx (F1.4, +18 dB gain)
Power requirements	10.5 to 26.4 V
Power consumption	7.8 W
Dimensions	55 (W) x 55 (H) x 110 (D) mm
Mass	400 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 to 200 Hz)
Shock resistance	70 G
MTBF	37,931 hrs (Approx. 4.3 years)
Regulatory compliance	UL60950, FCC Class A, VCCI Class A, IC Class A, CE (EN61326 Class A + EN55024), Australia (AS/N254251.2)
Supplied accessories	Lens mount cap, Operating instructions

Rear Panel/Connector Pin Assignments



⑥ MONITOR (monitor output) connector (15-pin)

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

Note

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

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	H output
6	Ground	14	V output
7	Ground	15	NC
8	Ground		

⑦ USB connector

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

Pin No.	Signal	Pin No.	Signal
1	VBUS	3	D+
2	D–	4	Ground

⑧ 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.

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

⑨ SERIAL connector (6-pin)

You can connect a serial cable to this connector to control a camera from a camera control device (e.g., PC).

Pin No.	Signal	Pin No.	Signal
1	TXD	4	ISO output +
2	RXD	5	ISO output -
3	Ground	6	NC

⑩ LAN connector

You can connect a LAN cable to this connector to output a video signal to the host device.

Pin No.	Signal	Pin No.	Signal
1	TD+	5	NC
2	TD-	6	RD-
3	RD+	7	NC
4	NC	8	NC

⑪ MODE switches

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

Note

If either of these switches is set to the right side, the camera doesn't start normally.

⑫ POWER LED

Lights in green when power is input.

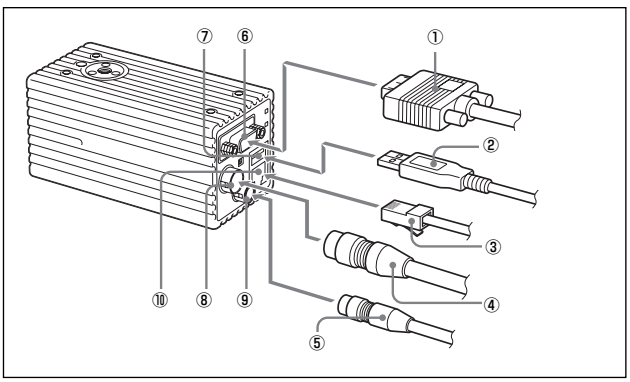
⑬ STATUS LED

Lights in red when the BIOS is starting up.

⑭ RESET switch

Push to restart the camera.

Connecting the cables



① Monitor cable
② USB cable
③ LAN cable
④ Camera cable
⑤ Serial cable
⑥ MONITOR connector
⑦ USB connector
⑧ DC IN connector
⑨ SERIAL connector
⑩ LAN connector

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, and the USB mouse/keyboard to the USB connector respectively.
When you connect the monitor cable, turn the two fastening screws to secure the cable tightly.

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

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.

Normal Mode

This mode can be set on the SHUTTER screen in the GUI application for camera settings.
Output of all individual video signals [1280 (H) X 1024 (V)] is at 15 frames per second as continuous video.
Continuous normal images can be captured in this mode.
When you set the shutter speed higher, you can capture the high-speed movement of objects with vivid clarity.

Trigger Mode

This mode can be set on the SHUTTER screen in the GUI application for camera settings. In this mode video signals begin to accumulate by synchronizing with external trigger input.
The video signals are output after the exposure is finished.
The high-speed movement of objects can be captured with vivid clarity in this mode. Set the shutter speed in accordance with the recording conditions.

Select the shutter speed from the following:
[2, 1, 1/15, 1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/25000, 1/50000, Trigger Width] (sec)

When selecting Trigger Width
The mode is set to trigger pulse width detection mode.
The following is the formula for the shutter speed T[s]:

T[s] = Trigger width + 6us

You can also set the following on the SHUTTER screen in the GUI application for camera settings:

- **Trigger polarity**
  This is set to select a trigger input polarity for the camera.

- **Trigger delay function**
  This function is to delay trigger input to this unit, so the exposure start time can be delayed until the set time.
  You can fine adjust the capture timing without changing the camera position even after the camera is installed.

  Trigger delay setting range:
  [0 to 4 (sec)] (In units of 1ms)

- **Software trigger function**
  A trigger is generated within this unit to capture a still image at any timing.

Binning Mode

This mode can be set on the HIGH RATE SCAN screen in the GUI application for camera settings.
This mode is used to increase the frame rate and/or sensitivity by adding pixels in both vertical and horizontal directions.
Select one of the following modes depending on the binning method.

- **1 X 2 (V-binning) mode**
  In this mode the frame rate almost doubles and the data volume becomes half by adding two vertical lines.
  When the shutter speed is set, the sensitivity almost doubles.
  The output data size becomes 1280 (H) X 512 (V).

- **2 X 1 (H-binning) mode**
  In this mode the sensitivity almost doubles and the data volume becomes half by adding two horizontal pixels.
  As the horizontal synchronization signal frequency is the same as when in normal mode, the frame rate doesn't change.
  The output data size becomes 640 (H) X 1024 (V).

- **2 X 2 (HV-binning) mode**
  In this mode the frame rate and sensitivity almost double and the data volume becomes 1/4 by adding two vertical lines and two horizontal pixels.
  Moreover, when the shutter speed is set, the sensitivity almost doubles again.
  The output data size becomes 640 (H) X 512 (V).

High Rate Scan Mode

This mode can be set on the HIGH RATE SCAN screen in the GUI application for camera settings.
In this mode the effective image area is vertically divided into 32 and horizontally divided into 10 to read out any area as an effective image. A redundant image area is transmitted at high speed to raise the frame rate.
High rate scan can be set in a horizontal or vertical direction individually.
The tables below show approximate frame rate values when the high rate scan mode is used.

External Control Command

The XCI-SX1 can be controlled externally from a host device via a serial communication and telnet using such communication softwares as "HyperTerminal" or "Tera Term."