

# ***Intelligent Camera***

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## **Technical Manual**

**XCI-SX1**  
**XCI-V3**

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# Overview

The XCI-SX1/V3 is a monochrome intelligent camera that can capture and process pictures, and control peripheral devices by itself.

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## Features

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### High image quality

The XCI-SX1 (SXGA) has a progressive scan CCD of 1,450,000 pixels. The XCI-V3 (VGA) has a progressive scan CCD of 330,000 pixels. This camera produces high-resolution images. By adopting square pixels, images can be processed using the original aspect ratio without a converting procedure.

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### Various mode settings

You can adjust the following mode settings.

- Gain
- Read mode: normal /binning
- Partial scan
- Shutter: Normal/Trigger shutter
- Shutter speed
- LUT
- 3 × 3 filter (XCI-V3 only)

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### Electronic shutter function

Shutter speed can be selected from variety of available speeds.

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### External trigger shutter function (2 to 1/50000 sec.)

You can obtain a freeze picture by inputting an external trigger. This function is useful to shoot a fast-moving object clearly.

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### Partial scan

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

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### Binning

By binning two pixels that align vertically or horizontally, you can acquire a frame rate twice that of the normal mode vertically, and sensitivity twice that of normal mode horizontally.

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### Built-in processor

- x86 CPU
- 256MB DDR-SDRAM
- 128MB Compact Flash

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### PC standard input/output interface

- LAN connector
- VGA monitor output
- USB connector

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### Body fixing

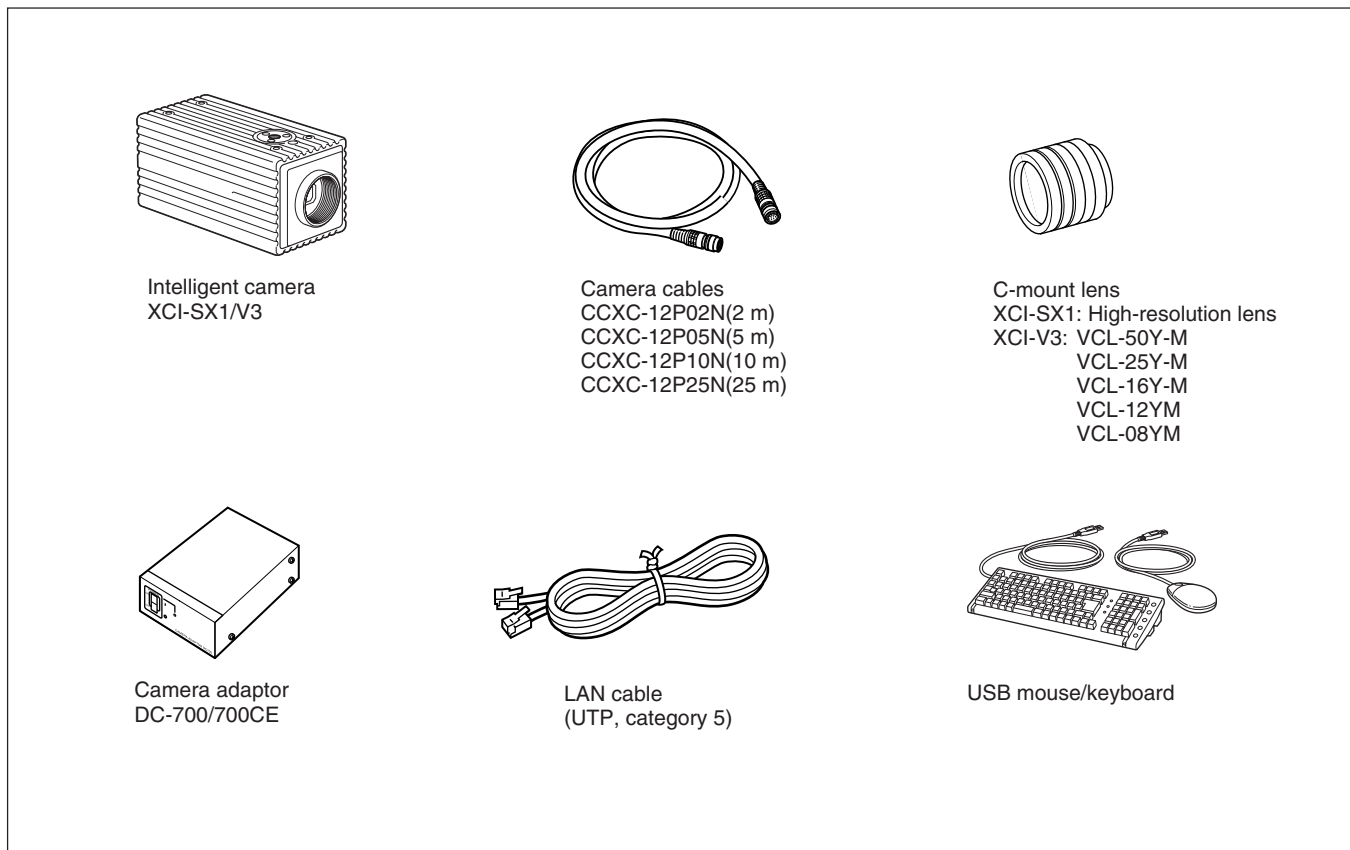
Four screw holes to be used to install the camera are provided both on the top and the bottom of the camera. Installing the camera module on the front panel minimizes deviation of the optical axis.

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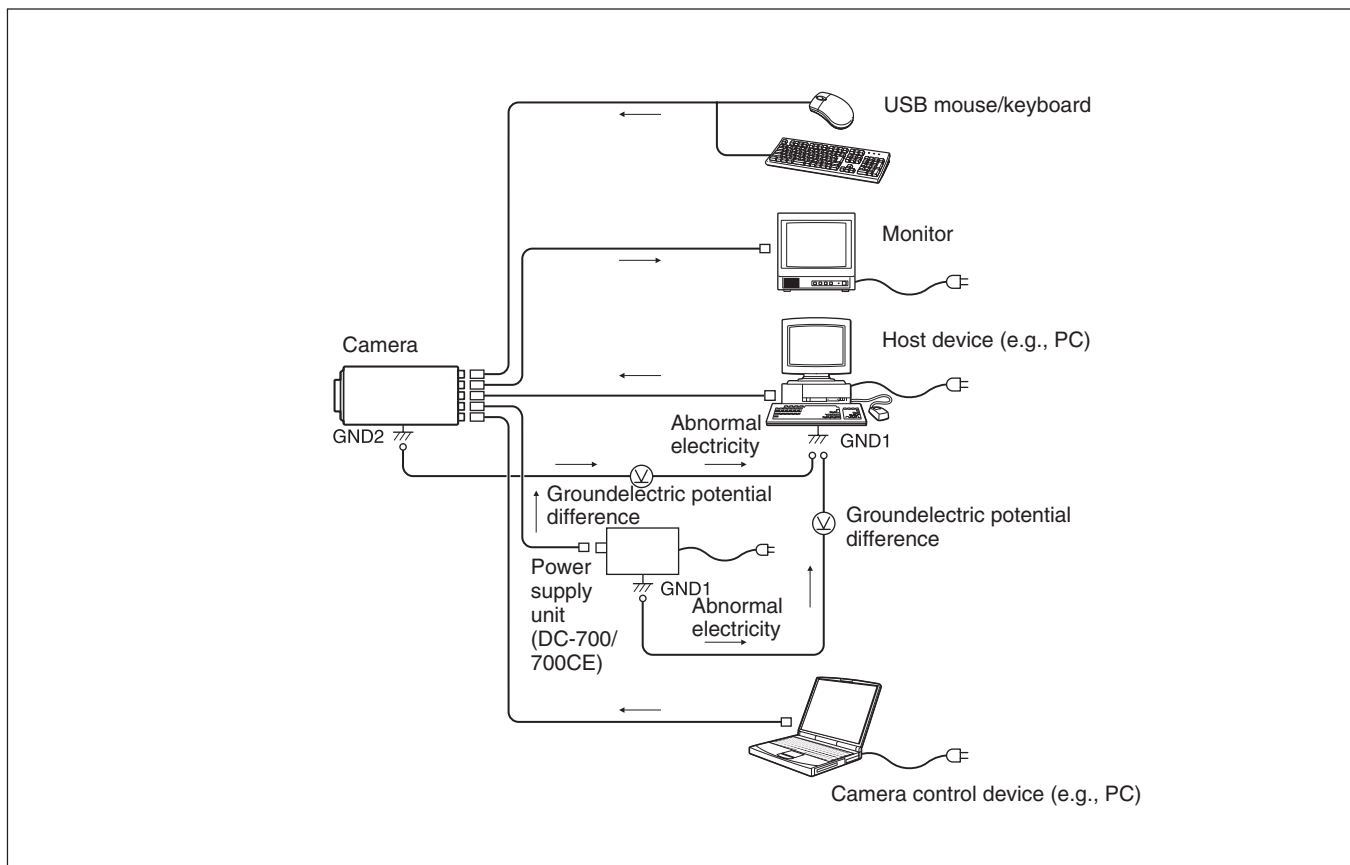
### Tripod hole

You can mount the camera on a tripod by using this hole.

# System Components

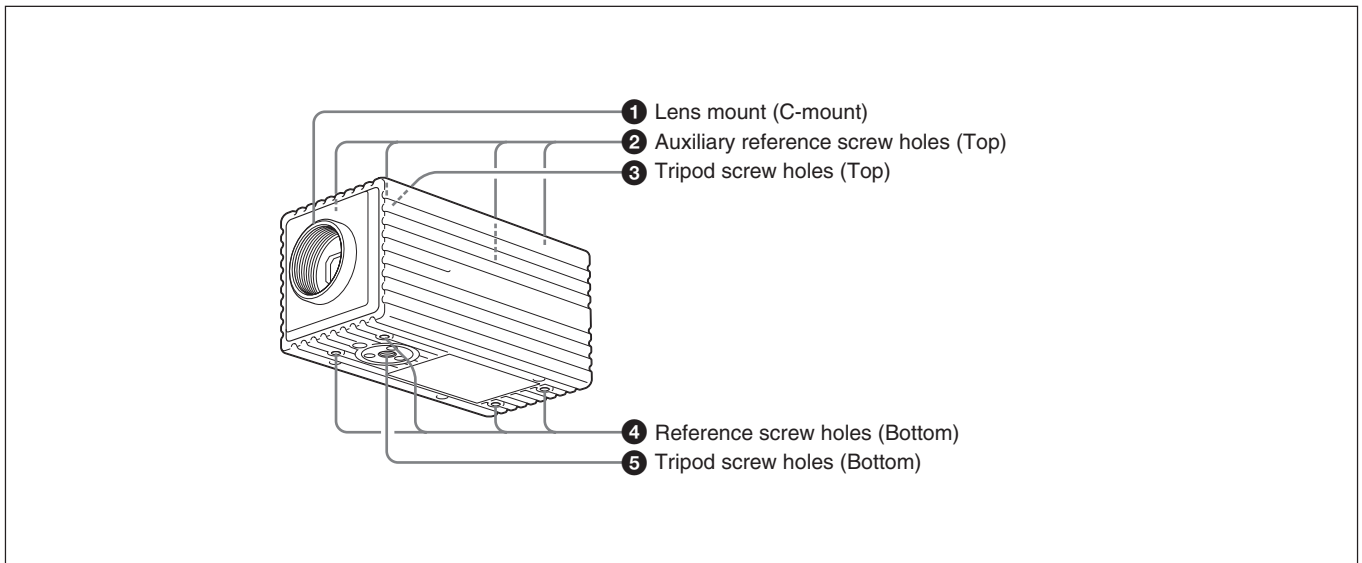


# Connection Diagram



# Location and Function of Parts and Controls

## Front/Top/Bottom



### 1 Lens mount (C-mount)

Attach any C-mount lens or other optical equipment.

#### Note

The lens must not project more than 10 mm (13/32 inch) from the lens mount.

### 2 Auxiliary reference screw holes (Top)

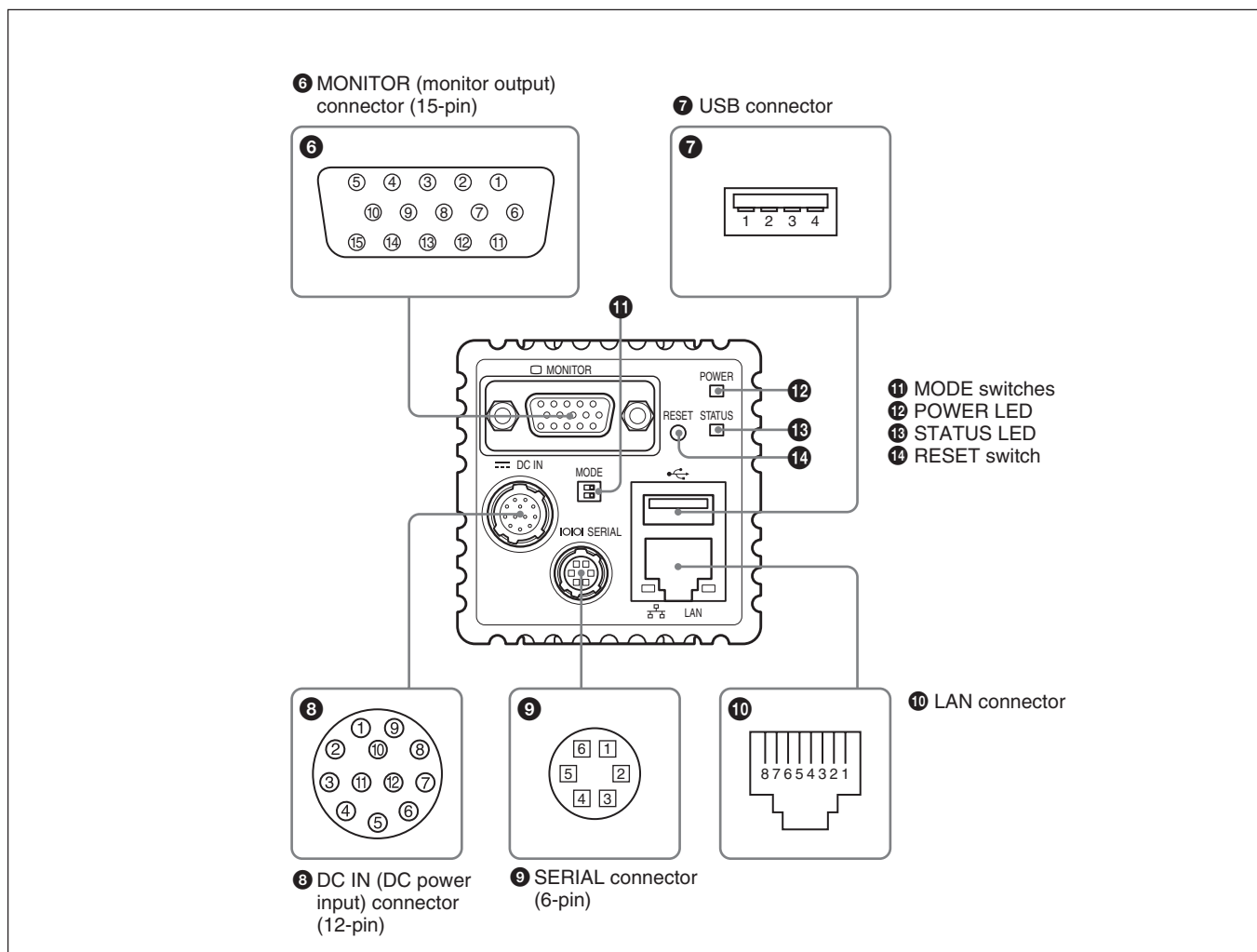
### 3 Tripod screw holes (Top)

### 4 Reference screw holes (Bottom)

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

### 5 Tripod screw holes (Bottom)

# Rear



## 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	HD output
6	Ground	14	VD output
7	Ground	15	NC
8	Ground		

## 7 USB connector

You can connect a USB mouse/keyboard to this connector to control 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	7	TTL output
2	+12 V DC	8	Ground
3	Ground	9	ISO output -
4	ISO output +	10	Exposure pulse output
5	Ground	11	Triger pulse input
6	TTL input	12	Ground

**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 input +
2	RXD	5	ISO input -
3	Ground	6	XCI-SX1: NC XCI-V3: TTL output 2

**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**

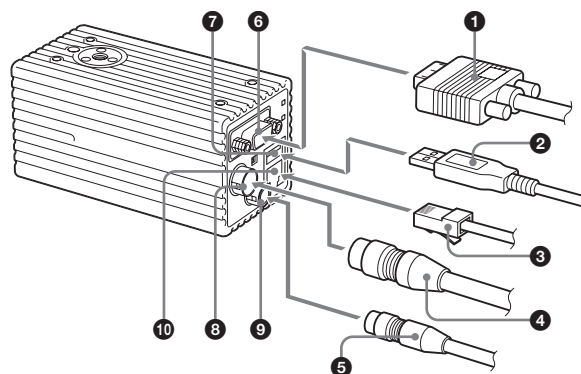
Lights in green when power is input.

**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. 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**

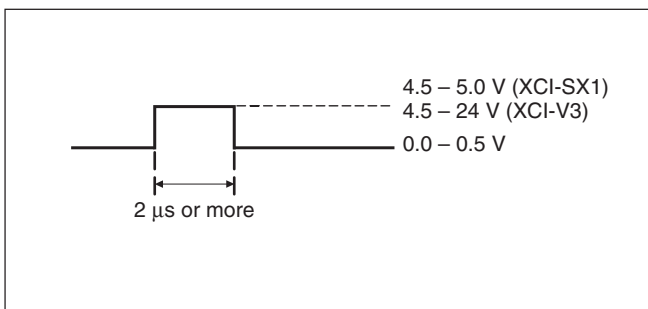
Make sure to supply power to the camera module and confirm that the camera module is operating before inputting a trigger signal. If you input external signals to a camera module without the power supplied, this may cause a malfunction of the camera module.

# Functions

## Input Specification

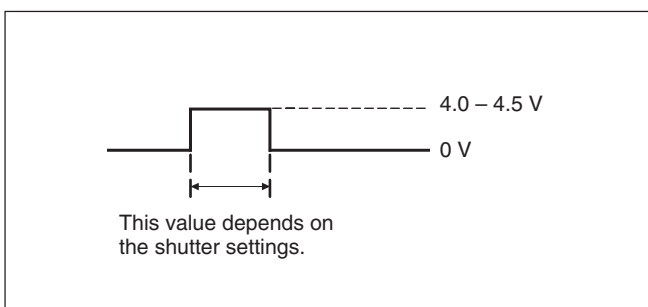
The voltages and pulse widths are values that are measured by the DC IN (12-pin) and SERIAL (6-pin) connectors on the rear of the camera.

### Trigger input (DC IN 12-pin connector)



### Exposure output (DC IN 12-pin connector)

The amplitude level is the measure of central tendency terminated with 10 kΩ.



## About the camera functions

This unit has the following camera modes. Set your required camera mode in the GUI application in accordance with your requirements. For details regarding operation of the GUI application, see page 13.

Mode	Application
Normal mode	To output continuous normal images To capture a high-speed moving object with vivid clarity
Trigger mode	To capture a high-speed moving object with vivid clarity
Binning mode	To output images at a higher frame rate or higher sensitivity
Partial scan mode	To output images at a higher frame rate

## Normal mode

This mode can be set on the SHUTTER screen in the GUI application for camera settings.

For the XCI-SX1, output of all individual video signals [1280 (H) × 1024 (V)] is at 15 frames per second as continuous video.

For the XCI-V3, output of all individual video signals [640 (H) × 480 (V)] is at 60 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, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/25000, 1/50000, Trigger Width] (sec)

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### 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]:

$$\text{XCI-SX1: } T[s] = \text{Trigger width} + 6\mu\text{s}$$

$$\text{XCI-V3: } T[s] = \text{Trigger width} + 5\mu\text{s}$$

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.

- $1 \times 2$  (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.  
For the XCI-SX1, the output data size becomes 1280 (H)  $\times$  512 (V).  
For the XCI-V3, the output data size becomes 640 (H)  $\times$  240 (V).
- $2 \times 1$  (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.  
For the XCI-SX1, the output data size becomes 640 (H)  $\times$  1024 (V).  
For the XCI-V3, the output data size becomes 320(H)  $\times$  480 (V).
- $2 \times 2$  (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.  
For the XCI-SX1, the output data size becomes 640 (H)  $\times$  512 (V).  
For the XCI-V3, the output data size becomes 320 (H)  $\times$  240 (V).

## Partial scan mode

This mode can be set using the HIGH RATE SCAN screen in the GUI application for camera settings. In this mode, the desired rectangle area is read out, and the redundant image area is transmitted at high speed to raise the frame rate. The read out area can be set separately as an effective image area vertically and horizontally. For the XCI-SX1, the effective image area is vertically divided into 32 areas and horizontally divided into 10 areas. You can select a specific portion among those from 1 block to 32 blocks vertically in

units of one block separately or successively, and 3 blocks to 10 blocks horizontally in minimum units of successive 3 blocks. For the XCI-V3, the effective area is vertically divided into 16 areas and horizontally divided into 10 areas. You can select a specific portion among those from 1 block to 16 blocks vertically. Partial scan can be individually set in a horizontal or vertical direction. The tables below show approximate frame rate values when the partial scan mode is used.

### Frame rate tables when V-binning is OFF (XCI-SX1)

		Number of vertical effective lines (L)															
		32	64	96	128	160	192	224	256	288	320	352	384	416	448	480	512
Number of horizontal effective pixels (PIX) when horizontal partial scan (HPS) is ON	384	119	103	92	82	74	68	63	58	54	51	48	45	43	40	38	37
	512	113	98	87	78	71	65	60	55	51	48	45	43	40	38	36	35
	640	108	94	83	74	67	62	57	53	49	46	43	41	38	37	35	33
	768	103	89	79	71	64	59	54	50	47	44	41	39	37	35	33	32
	896	98	85	76	68	61	56	52	48	45	42	39	37	35	33	32	30
	1024	94	82	72	65	59	54	50	46	43	40	38	36	34	32	30	29
	1152	90	79	70	62	57	52	48	44	41	38	36	34	32	31	29	28
	1280	87	76	67	60	54	50	46	42	40	37	35	33	31	29	28	27
When HPS is OFF		86	74	66	59	53	49	45	42	39	36	34	32	31	29	28	26

(Unit: fps)

		Number of vertical effective lines (L)															
		544	576	608	640	672	704	736	768	800	832	864	896	928	960	992	1024
Number of horizontal effective pixels (PIX) when horizontal partial scan (HPS) is ON	384	35	34	32	31	30	29	28	27	26	25	24	24	23	22	22	21
	512	33	32	31	29	28	27	26	25	25	24	23	22	22	21	21	20
	640	32	30	29	28	27	26	25	24	23	23	22	21	21	20	20	19
	768	30	29	28	27	26	25	24	23	22	22	21	20	20	19	19	18
	896	29	28	27	26	25	24	23	22	21	21	20	19	19	18	18	17
	1024	28	27	25	24	24	23	22	21	20	20	19	19	18	18	17	17
	1152	27	25	24	23	23	22	21	20	20	19	18	18	17	17	16	16
	1280	26	25	24	23	22	21	20	20	19	18	18	17	17	16	16	15
When HPS is OFF		25	24	23	22	21	21	20	19	19	18	17	17	16	16	16	15

(Unit: fps)

**Frame rate tables when V-binning is ON (XCI-SX1)**

		Number of vertical effective lines (L)															
		16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256
<b>Number of horizontal effective pixels (PIX) when horizontal partial scan (HPS) is ON</b>	384	130	122	114	107	102	96	92	87	83	80	76	73	71	68	66	63
	512	124	115	108	102	96	91	87	83	79	76	73	70	67	65	62	60
	640	118	110	103	97	92	87	83	79	75	72	69	66	64	62	59	57
	768	112	105	98	93	88	83	79	75	72	69	66	63	61	59	57	55
	896	107	100	94	89	84	80	76	72	69	66	63	61	58	56	54	52
	1024	103	96	90	85	80	76	72	69	66	63	60	58	56	54	52	50
	1152	99	92	87	82	77	73	70	66	63	61	58	56	54	52	50	48
	1280	95	89	83	78	74	70	67	64	61	58	56	54	52	50	48	46
When HPS is OFF		94	87	82	77	73	69	66	63	60	57	55	53	51	49	47	46

(Unit: fps)

		Number of vertical effective lines (L)															
		272	288	304	320	336	352	368	384	400	416	432	448	464	480	496	512
<b>Number of horizontal effective pixels (PIX) when horizontal partial scan (HPS) is ON</b>	384	61	59	57	56	54	53	51	50	48	47	46	45	44	43	42	40
	512	58	56	55	53	51	50	49	47	46	45	44	43	42	41	40	38
	640	55	54	52	50	49	48	46	45	44	43	42	41	40	39	38	36
	768	53	51	50	48	47	45	44	43	42	41	40	39	38	37	36	35
	896	51	49	47	46	45	43	42	41	40	39	38	37	36	35	35	33
	1024	48	47	45	44	43	42	40	39	38	37	36	36	35	34	33	32
	1152	47	45	44	42	41	40	39	38	37	36	35	34	33	33	32	30
	1280	45	43	42	41	40	38	37	36	35	34	34	33	32	31	31	29
When HPS is OFF		44	43	41	40	39	38	37	36	35	34	33	32	32	31	30	29

(Unit: fps)

**Frame rate table when V-binning is OFF (XCI-V3)**

		Number of vertical effective lines (L)															
		30	60	90	120	150	180	210	240	270	300	330	360	390	420	450	480
<b>Number of horizontal effective pixels (PIX) when horizontal partial scan (HPS) is ON</b>	192	419	333	277	236	206	183	165	149	137	126	117	109	102	96	91	86
	256	396	315	262	224	195	173	156	141	129	119	111	103	97	91	86	81
	320	376	299	248	212	185	164	148	134	123	113	105	98	92	86	81	77
	384	357	284	236	202	176	156	140	127	117	107	100	93	87	82	77	73
	448	341	271	225	192	168	149	134	121	111	102	95	89	83	78	74	70
	512	325	259	215	183	160	142	128	116	106	98	91	85	79	75	70	67
	576	311	248	206	176	153	136	122	111	102	94	87	81	76	71	67	64
	640	299	237	197	168	147	130	117	106	97	90	83	78	73	68	65	61
When HPS is OFF		299	237	197	168	147	130	117	106	97	90	83	78	73	68	65	61

(Unit: fps)

**Frame rate table when V-binning is ON (XCI-V3)**

		Number of vertical effective lines (L)															
		15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240
<b>Number of horizontal effective pixels (PIX) when horizontal partial scan (HPS) is ON</b>	192	550	478	423	379	344	314	289	268	250	234	220	207	196	186	177	169
	256	520	452	400	359	325	297	274	254	236	221	208	196	186	176	168	160
	320	493	429	379	340	308	282	259	240	224	210	197	186	176	167	159	151
	384	469	408	361	323	293	268	247	229	213	199	187	177	167	159	151	144
	448	447	389	344	308	279	255	235	218	203	190	179	168	159	151	144	137
	512	427	371	329	294	267	244	225	208	194	182	171	161	152	144	137	131
	576	409	356	314	282	255	233	215	199	186	174	163	154	146	138	132	125
	640	392	341	302	270	245	224	206	191	178	167	157	148	140	133	126	120
When HPS is OFF		392	341	302	270	245	224	206	191	178	167	157	148	140	133	126	120

(Unit: fps)

# *GUI application*

This unit has a graphical user interface (GUI) that allows you to easily set camera functions and modes on an SXGA monitor.

The GUI application can be operated by a USB mouse connected with this unit.

The following settings can be accomplished by using this application:

- Display of camera images
- Setting of camera device
- Settings of time and keyboard options
- Setting of network
- Setting of serial communication speed

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## **Before starting the GUI application**

**1** Connect the following with this unit:

- Camera adaptor DC-700/700CE
- Computer monitor compatible with SXGA images (1280 × 1024)
- USB mouse

Connect a USB keyboard or LAN cable with this unit if needed.

**2** Turn on the power to the camera adaptor.


This unit is powered on and the POWER LED on the rear panel lights in green.

When this unit boots up, the GUI application is automatically displayed on the monitor.

# Basic operation

To operate the GUI application, connect and use a USB mouse (use left clicks only).

When you connect a USB keyboard with this unit, shortcut keys can be used.

Regarding specific shortcut keys for each screen, refer to the HELP information by clicking on the  on upper right of the screen.

## To move to a desired screen

Select an icon on the tool bar located at the top of the screen.

When you connect a USB keyboard, you can move to a desired screen by pressing the underlined letter of an icon and the Ctrl key in the keyboard simultaneously.



The current selected screen is one with the icon in yellow on the tool bar.

### 1 HOME button

Press this icon to move to the HOME screen.

### 2 CAMERA setting tool bar

Press the icon corresponding to the screen to which you want to move for the camera settings.

Camera images can be displayed on the following screens:

**SHUTTER:** Shutter mode and shutter speed

**GAIN/LUT:** Gain and LUT (look up table)

**HIGH RATE SCAN:** High rate scan (partial scan of an image and binning)

**ADMIN:** Camera settings made at the factory (pedestal level and CDS gain)

### Note

The ADMIN screen is exclusively for service personnel. If the CDS gain or pedestal level is changed, the performance of the camera may be degraded. Refer all such adjustments to qualified service personnel.

### 3 SETUP tool bar

Press the icon corresponding to the screen to which you want to move for settings except camera settings.

**GENERAL:** Date, time, Web monitor and keyboard settings

**NETWORK:** Network functions

**SERIAL I/F:** Serial communication speed

### 4 Camera image display area

A camera image is displayed here on the HOME, SHUTTER, GAIN/LUT, HIGH RATE SCAN, and ADMIN screens.

### Note

The CCD pixels of the XCI-SX1/V3 are in the 256-level gray scale. However, the camera images are displayed on the monitor in 16-bit RGB mode. Strictly speaking, display of 256-level camera images is not possible.

# HOME screen

This screen is used for displaying the system conditions and initializing each setting.



## 1 System information display area

The following system information is displayed on the HOME screen:

### Version

- **Hardware:** Hardware version
- **Software:** Software version

### Network

- **Hostname:** Host name
- **IP Address:** IP address
- **MAC Address:** MAC address

**Serial Baud Rate:** Communication speed for the serial interface

**Serial Number:** Production serial number

## 2 Initialization setting area

Each setting can be initialized in this area. Select an item you want to initialize and click the APPLY button or APPLY&SAVE button.

The following items to be initialized by selecting the appropriate radio buttons:

**Default (Camera):** The basic settings (SHUTTER, GAIN/LUT and HIGH RATE SCAN) for the camera are returned to the factory default settings.

**Default (Network):** The network settings are returned to the factory default settings.

**Default (All):** All the settings are returned to the factory default settings. (The pedestal and CDS gain settings are not affected.)

**Saved Settings:** All the settings are returned to the currently saved settings. The pedestal and CDS gain settings are not affected.)

When you click the APPLY&SAVE button, the current settings are applied and saved. The saved values are applied the next time you boot the system.

### Note

Depending on your network setting, the message “MAC Address: Unknown” may be displayed after selecting “Default (Network)” or “Default (All)” and clicking the APPLY&SAVE button. This is not malfunction.

## 3 REBOOT SYSTEM button

This button is used to reboot the system.

## 4 FULL SCREEN button

This button is used to display a camera image on the full screen.

## 5 ? (HELP) button

This button is used to display HELP information.

## Shortcut keys

When you connect a USB keyboard with this unit, you can use the following shortcut keys in the HOME screen:

Shortcut	Applicable button
Alt + P	APPLY
Alt + V	APPLY & SAVE
Alt + R	REBOOT SYSTEM
Alt + F	FULL SCREEN
Alt + H	HELP

# SHUTTER screen

This screen is used for setting the shutter mode and shutter speed.

You can select one of the following two shutter modes:

- Monitoring mode
- Trigger mode



## 1 Monitoring (normal mode) setting area

**XCI-SX1:** In normal mode all individual video signals [1280 (H) × 1024 (V)] are output continuously at 15 frames per second. You can select one of the following shutter speeds in normal mode: [OFF, 2, 1, 1/30, 1/60, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/25000, 1/50000, 1/100000] (sec)

**XCI-V3:** In normal mode all individual video signals [640 (H) × 480 (V)] are output continuously at 60 frames per second. You can select one of the following shutter speeds in normal mode: [2, 1, 1/15, 1/30, 1/60, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/25000, 1/50000, 1/100000] (sec)

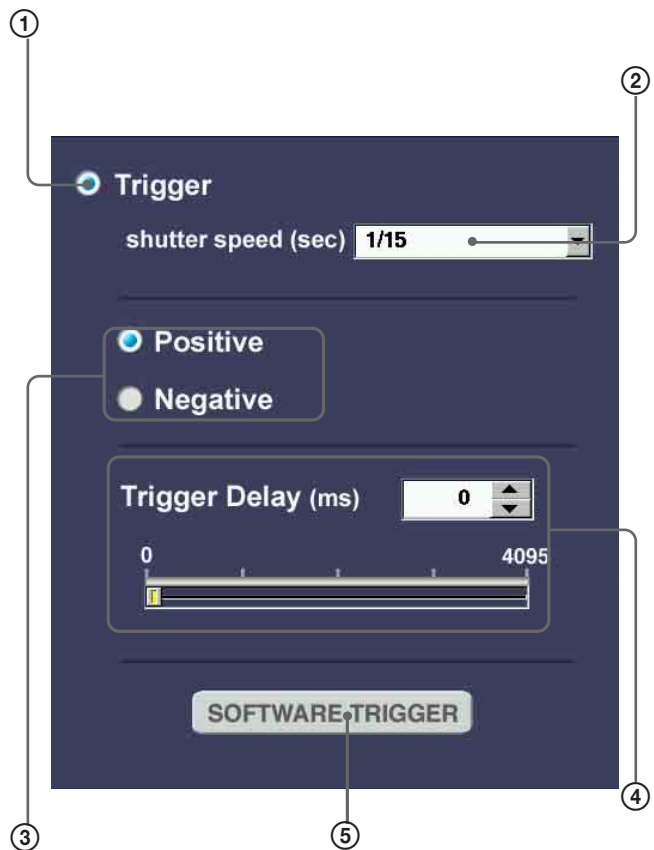
## 2 Trigger (trigger mode) setting area

In trigger mode video signals begin accumulating by synchronizing with the external trigger input. The video signals are output after the exposure is finished. The monitor displays a still image of the camera immediately after clicking the trigger mode radio button.

The displayed image will be updated each time when inputting external trigger signals or clicking the SOFTWARE TRIGGER button.

## Note

The SOFTWARE TRIGGER button is effective when the trigger polarity is set to Positive.



1 Trigger mode selection radio button

2 Shutter speed selection pull down  
You can select one of the following shutter speeds in trigger mode:  
[1/15, 2, 1, 1/30, 1/60, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/25000, 1/50000, Trigger Width] (sec)

3 Trigger polarity selection radio buttons  
These are used to set the polarity of external trigger signals.

**Positive:** To set it positive

**Negative:** To set it negative

4 Trigger delay setting area

This is used to set the start time of exposure to delay the trigger input to this unit.  
You can set a delay time from the following range in units of 1 millisecond.  
[0 to 4095] (ms)



**Note**

When the cycle of the input trigger is smaller than the trigger delay value set, the image is not output correctly. Pay attention to this fact when you set the trigger delay value.

**⑤ SOFTWARE TRIGGER button**

This button is used to capture an image immediately after pressing the button.

**③ SAVE button**

This button is used to save the currently set values.

**④ CANCEL button**

This button is used to cancel changes.

**⑤ Note button**

This button is used to display the trigger instruction.

**⑥ FULL SCREEN button**

This button is used to display a camera image on the full screen.

**⑦ ? (HELP) button**

This button is used to display HELP information.

**Shortcut keys**

When you connect a USB keyboard with this unit, you can use the following shortcut keys in the SHUTTER screen:

Shortcut	Applicable button
Alt + W	SOFTWARE TRIGGER
Alt + S	SAVE
Alt + C	CANCEL
Alt + F	FULL SCREEN
Alt + H	HELP

When you press the Alt and S keys on the keyboard to save, the confirmation guidance is displayed on the screen. You can press one of the following keys to be assigned:

**ENTER:** Press the ENTER key if it's OK.

**ESC:** Press the ESC key if you want to cancel.

# GAIN/LUT (Look Up Table) screen

This screen is used for setting the camera gain and gamma.



**① GAIN up down counter**

You can set the gain of this unit from the following range in units of 1 dB: [0 to 18] (dB)

**② LUT radio buttons**

The look up table is used to change the gamma setting of this unit.

You can select one of the following settings using a radio button:

- $\gamma = 1$  (OFF)
- $\gamma = 0.45$
- $\gamma = 2.2$
- Reverse
- Binarization

Binarization is selected for changing the look up table to binary.

You can set the threshold within the following range of the threshold up down counter: [1 to 1023]

**③ SAVE button**

This button is used to save the currently set values.

**④ CANCEL button**

This button is used to cancel changes.

**5 FULL SCREEN button**

This button is used to display a camera image on the full screen.

**6 ? (HELP) button**

This button is used to display HELP information.

**Shortcut keys**

When you connect a USB keyboard with this unit, you can use the following shortcut keys in the GAIN/LUT screen:

Shortcut	Applicable button
Alt + S	SAVE
Alt + C	CANCEL
Alt + F	FULL SCREEN
Alt + H	HELP

# HRS (High Rate Scan) screen

This screen is used for setting the partial scan function and binning of the camera.



**1 Frame Rate (fps)**

The ideal value of the frame rate transmitted from CCD is displayed.

**Note**

This value is the frame rate estimated based on the tables on pages 10, 11 and 12 not the frame rate of the actual display on the screen.

**2 Vertical binning/partial scan setting area**

**Partial Scan check-off box:** You can select a specific portion of the image by using the partial scan function. Check off this box to display 2 sliders in the outer frame of the camera image. In order to specify the area for partial scan, drag any of the 2 sliders on the left sides of the image with the mouse.

**Top and Bottom:** These boxes display the line positions of the top and bottom lines of the displayed image.

**Binning check-off box:** Check off this box to set binning.

**3 Horizontal binning/partial scan setting area**

**Partial Scan check-off box:** You can select a specific portion of the image by using the partial scan function. Check off this box to display 2 sliders in the outer frame of the camera image. In order to specify the area for partial scan, drag any of the 2 sliders on the bottom sides of the image with the mouse.

**Left and Right:** These boxes display the pixel positions of the right and left lines of the displayed image.

**Binning check-off box:** Check off this box to set binning.

**4 SAVE button**

This button is used to save the currently set values.

**5 CANCEL button**

This button is used to cancel changes.

**6 FULL SCREEN button**

This button is used to display a camera image on the full screen.

**7 ? (HELP) button**

This button is used to display HELP information.

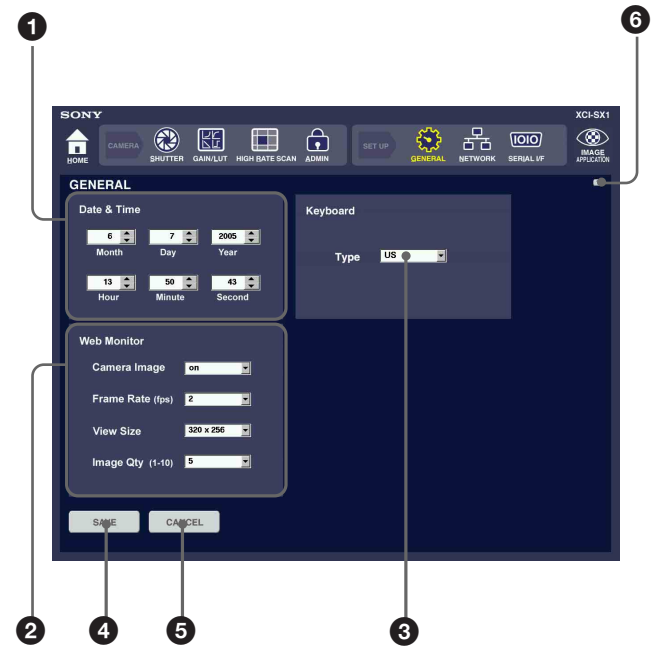
**Shortcut keys**

When you connect a USB keyboard with this unit, you can use the following shortcut keys in the HRS screen:

Shortcut	Applicable button
Alt + W, Alt + Z	Vertical movement of the top slider (W: Upward, Z: Downward)
Alt + I, Alt + M	Vertical movement of the bottom slider (I: Upward, M: Downward)
Alt + A, Alt + D	Horizontal movement of the left slider (A: To the left, D: To the right)
Alt + J, Alt + L	Horizontal movement of the right slider (J: To the left, L: To the right)
Alt + V	To select Vertical Partial Scan
Alt + E	To select Vertical Binning
Alt + P	To select Horizontal Partial Scan
Alt + O	To select Horizontal Binning
Alt + S	SAVE
Alt + C	CANCEL
Alt + F	FULL SCREEN
Alt + H	HELP

**GENERAL screen**

This screen is used for setting time, Web monitor functions and keyboard.



**1 Date & Time**

Date and time can be set using the up down counters.

**2 Web Monitor**

This unit has a Web server function. Using this function, a camera image can be displayed in the Internet browser on an external PC.

**Camera Image:** Set this “on” to display a camera image on the Internet browser.

**Frame Rate (fps):** Set the frame rate.

**View Size:** Set the image size.

**Image Quality (1-10):** Quality of the JPEG compression (When the value is larger, the compression rate is smaller.)

**3 Keyboard**

Keyboard options to be used. Select US or JP.

**4 SAVE button**

This button is used to save the currently set values.

**5 CANCEL button**

This button is used to cancel changes.

**6 ? (HELP) button**

This button is used to display HELP information.

## Shortcut keys

When you connect a USB keyboard with this unit, you can use the following shortcut keys in the GENERAL screen:

Shortcut	Applicable button
Alt + M	Month
Alt + S	SAVE
Alt + C	CANCEL
Alt + H	HELP

You can move between the items in the screen by pressing the tab key.

## NETWORK screen

This screen is used for setting the XCI-SX1/V3 when connecting it to a LAN.

This screen consists of three areas for the following settings:

- LAN (Local Area Network)
- SNMP (Simple Network Management Protocol)
- NTP (Network Time Protocol)



### 1 LAN

The basic settings for connecting to the network are made in this area.

**DHCP Mode:** Set if you obtain the IP address automatically from the DHCP server or a fixed IP address.

**Host Name:** Host name

**IP Address:** Fixed IP address

**Network Mask:** Network mask

**Gateway Address:** Gateway address

**DNS Address:** DNS server address

### Notes

- At the factory, the DHCP Mode is set to Auto and the XCI-SX1/V3 gets an IP address from a DHCP server automatically. When there is no DHCP server on your network, set DHCP Mode to Off and input the fixed IP address.
- Reboot the XCI-SX1/V3 when the network settings are changed after getting the IP address from the DHCP server.

### 2 SNMP (Simple Network Management Protocol)

The setting to make the agent service effective is made in this area.

**SNMP Mode:** Select “On” to make the agent service effective.

**TRAP Destination:** SNMP management station address used to receive trap notifications

**Community:** Community name administrated by the SNMP manager

**Description:** Description of this unit

**Location:** Location of this unit

**Contact:** Administrator contact information

**3 NTP (Network Time Protocol)**

The protocol setting to synchronize the internal clock of this unit with the NTP server is made in this area. Input the time zone and effective NTP server. Press the SYNCHRONIZE button to synchronize.

**NTP Mode:** Select “On” to synchronize internal clock with by the NTP server.

**Time Zone:** Select your time zone.

**Timeout:** Timeout value

**Sync Interval:** Renewal cycle

**NTP Server:** NTP server address

**Notes**

- When NTP mode is set to “On”, you cannot change the date and time in the GENERAL screen.
- When the network you are using is in your intranet proxy connection environment, you cannot connect this unit with a NTP server on the Internet. Therefore, specify the NTP server operated in the intranet.

**4 SYNCHRONIZE button**

This button is used to activate the synchronization of the set values.

**5 SAVE button**

This button is used to save the currently set values.

**6 CANCEL button**

This button is used to cancel changes.

**7 ? (HELP) button**

This button is used to display HELP information.

**8 Software Keyboard**

Enters alphabets or numbers.

**Shortcut keys**

When you connect a USB keyboard with this unit, you can use the following shortcut keys in the NETWORK screen:

Shortcut	Applicable button
Alt + D	DHCP
Alt + N	SYNCHRONIZE
Alt + S	SAVE
Alt + C	CANCEL
Alt + H	HELP

You can move between the items in the screen by pressing the tab key.

**SERIAL I/F screen**

This screen is used for setting the serial interface communication speed.



**1 Baud Rate**

Set the baud rate here.

You can select one of the following baud rates: [4800, 9600, 19200, 38400, 57600, 115200] (bps)

**2 SAVE button**

This button is used to save the currently set values.

**3 CANCEL button**

This button is used to cancel changes.

**4 ? (HELP) button**

This button is used to display HELP information.

**Shortcut keys**

When you connect a USB keyboard with this unit, you can use the following shortcut keys in the SERIAL I/F screen:

Shortcut	Applicable button
Alt + S	SAVE
Alt + C	CANCEL
Alt + H	HELP

# External Control Commands

## Overview

The XCI-SX1/V3 can be controlled externally from a host device via a serial communication and telnet using such communication softwares as “HyperTerminal” or “Tera Term.”

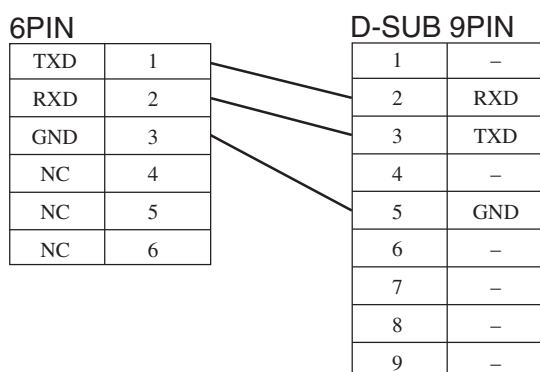
## Serial Communication Specifications

The serial communication system for the XCI-SX1/V3 is an asynchronous method compliant with RS-232C. The following table shows the transmission control specifications.

Baud rate	115200/57600/38400/19200/9600/4800 [bps] Default setting: 38400 [bps]
Data bits	8
Parity	None
Stop bit	1
Flow control	None
Authentication	None

The external interface for serial communication is RS-232C DCE (Data Communication Equipment) whose connector form is D-sub 9pin(male). When connecting the XCI-SX1/V3 to a PC, use a cross cable.

## XCI-SX1/V3 RS-232C connection



## Telnet Communication Specifications

The following table shows the specification for telnet communication.

Port Number	23
Authentication	login, password authentication

For the login, use the following login account.

user: admin  
password: 1227

## Telnet Authentication Specification

When you access the XCI-SX1/V3 from external equipment, the following message appears on the monitor.

SMARTCAM Telnet Server  
SMARTCAM login:

Enter the login account and then the password.

SMARTCAM Telnet Server  
SMARTCAM login: admin  
password: \*\*\*\*\*

**Note**

The password entered is replaced with “\*” on the monitor.

When you enter the correct password, the following message appears and the external command input is validated.

Welcome to the Sony Smart Camera  
Configuration Environment

When you enter a login account other than “admin” or the wrong password, the following message appears.

Login incorrect

**Note**

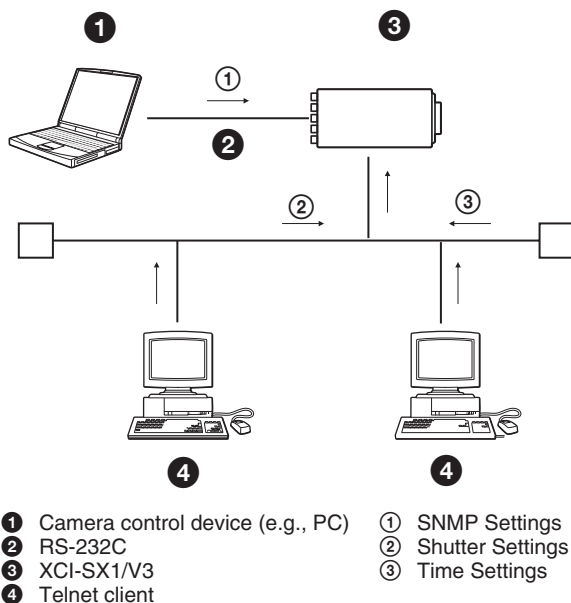
If you enter the wrong password three times in a row, the following message appears and the telnet connection is disconnected.

Login incorrect  
bye.

Depending on your telnet client software, this message may not appear and the window may just close.

## Multiple Session Specification

The XCI-SX1/V3 can be controlled via an RS-232C or telnet connection asynchronously and can be controlled via telnet in multiple sessions separately.



## Command Format

To send a command, input a command name and parameters and press [Enter] (<CR(Carriage Return)> or <CR+LF(Line Feed)>) key.

Command inputs are echoed back to the 23rd port of telnet/RS-232C except when the XCI-SX1/V3 is transferring the LUT binary.

**Notes**

- Input characters are case-sensitive.
- Input decimal numbers for parameters.
- Maximum number of commands that can be input is 256 (except in Transparent mode).

## Command Specification

The XCI-SX1/V3 returns an echo to valid inputs: letters of the alphabet, numbers, “-,” spaces, backspaces and [ENTER] (<CR> or <CR+LF>).

Input of letters and symbols other than these above are all ignored.

- When command execution is completed normally, the response message to each command is displayed.
- If an invalid command is input, the following messages are displayed.  
error: invalid command or parameter.<CR>  
Type ‘--help’ to display all possible commands.<CR>
- When no parameter is input for a command with parameters, the current status of the command is displayed.
- When “--help” is input instead of parameters for a command with parameters, the help of the command is displayed.
- When the Enter key is pressed with no command input, only the carriage return is carried out.

The commands described in this chapter are valid when the GUI application is operating.

# Command Specifications

This section describes the details of control commands available for the XCI-SX1/V3, classified by category.

The underlined words of the [Command] represent parameters.

The bold words of the <Example> represent commands, and the others the response to the command.

## Serial Communication Setting

### ■ Baud Rate Setting

[Command] setup serial BRATE  
 [Parameter] BaudRATE: 4800, 9600, 19200, 38400, 57600, 115200  
 [Process] Sets the serial baud rate.  
 <Example> Setting the serial baud rate to 115200 bps  
**setup serial 115200<CR>**  
 setup save complete serial<CR>

### ■ Current Baud Rate Setting

[Command] setup serial  
 [Process] Displays the current baud rate.

### ■ Help of the Baud Rate Setting

[Command] setup serial --help  
 [Process] Displays the help of the Baud Rate Setting command.

## Network Settings

### ■ LAN Settings

[Command] setup lan DHCP/HOST/IP/NET/GTW/DNS  
 [Parameter] DHCP: auto, off  
 HOST: Host Name  
 IP: IP Address  
 NETmask: Net Mask  
 GaTeWay: Gateway Address  
 DNS: DNS Address  
 [Process] Sets up the network.  
 <Example> • Getting the IP address from the DHCP server  
**setup lan auto<CR>**  
 setup save complete lan<CR>  
 warning: the network will be restarted...<CR>  
 you may have to re-login if you are linked via telnet...<CR>

- Setting the fixed IP address (1)  
**setup lan off/SMARTCAM/11.22.33.44/255.255.255.0/55.66.77.88/1.2.3.4<CR>**  
 setup save complete lan<CR>
- Setting the fixed IP address (2)  
**setup lan off//111.22.33.44//<CR>**  
 setup save complete lan<CR>

### Note

- The currently set value is applied to a parameter for which no specific value is input.
- If you change a network setting, reboot the XCI-SX1/V3.

### ■ Use the default LAN Setting

[Command] setup lan default  
 [Process] Uses the default settings for the following items.

- Mailer
- NTP
- LAN
- SNMP

<Example> Restoring the default settings  
**setup lan default<CR>**  
 setup save complete lan<CR>  
 the network will be restarted... you may have to re-login if you are linked via telnet...<CR>

### Note

If you change a network setting, reboot the XCI-SX1/V3.

### ■ Current LAN Setting

[Command] setup lan  
 [Process] Displays the current LAN setting.

### ■ Help of the LAN Setting

[Command] setup lan --help  
 [Process] Displays the help of the LAN Setting command.

## SNMP Settings

### ■ SNMP Settings

[Command] setup snmp SNM/TRP/COM/DSC/LOC/CTC  
 [Parameter] SNmp Mode: off, on  
 TRaP: TRAP address  
 COMmunity: Community name  
 DeSCription: System Description  
 LOCation: System Location  
 ConTaCt: System Contact  
 [Process] Makes SNMP settings.



- <Example>
- Example of settings for SNMP (1)  
**setup snmp on/11.22.33.44/public/  
Sony Smart Camera/Tokyo/  
9876<CR>**  
setup save complete snmp<CR>  
setup applying new SNMP  
settings...<CR>
  - Example of settings for SNMP (2)  
**setup snmp on////Shinagawa  
Office/mail@contact.com<CR>**  
setup save complete snmp<CR>
  - Setting the SNMP to OFF  
**setup snmp off<CR>**  
setup save complete snmp<CR>

**Note**

The currently set value is applied to the parameter for which no specific value is input.

- Current SNMP Setting  
[Command] setup snmp  
[Process] Displays the current SNMP setting.
- Help of the SNMP Setting  
[Command] setup snmp --help  
[Process] Displays the help of the SNMP Setting command.
- SNMP Mailer Settings  
[Command] setup mailer mode/rcpt address  
[Parameter] Mailer mode: off, on  
Recipient Address: e-mail address  
(user@domain-name.com)  
You can input the multiple e-mail  
addresses separated by commas.  
[Process] Sets up the SNMP Mailer.  
<Example> Setting the mailer to ON  
**setup mailer on/add1@domain.com,  
add2@domain.com<CR>**  
setup save complete mailer<CR>

**Note**

The currently set value is applied to a parameter for which no specific value is input.

- Current SNMP Mailer Setting  
[Command] setup mailer  
[Process] Displays the current SNMP mailer  
setting.
- Help of the SNMP Mailer Setting  
[Command] setup mailer --help  
[Process] Displays the help of the SNMP Mailer  
Setting command.

---

**NTP Settings**

- NTP Settings  
[Command] setup ntp NTP/TZ/TO/SERV/SYNC  
[Parameter] NTP: on, off  
TimeZone: City time zone String  
(Refer to the GUI application)  
TimeOut: Server request timeout in  
seconds (1 to 10 [sec] )  
SERVer: IP address or hostname of the  
NTP server  
SYNC: Interval to synchronization  
time with the NTP server (1hour,  
6hours, 12hours, 24hours)  
[Process] Sets the system clock connected the  
NTP server  
<Example> Set the NTP Clock Synchronization to  
ON  
**setup ntp on/asia:tokyo//  
11.22.33.44/24hours<CR>**  
setup save complete ntp<CR>
- NTP Synchronization Test  
[Command] setup ntp test  
[Process] Tests the system clock  
synchronization.  
<Example> Synchronizing the clock with the NTP  
server  
**setup ntp test<CR>**  
setup ntp sync complete<CR>  
offset: -0.390111 sec<CR>
- Current NTP Setting  
[Command] setup ntp  
[Process] Displays the current NTP setting.
- Help of the NTP Setting  
[Command] setup ntp --help  
[Process] Displays the help of the NTP Setting  
command.

---

**Date Settings**

- Date Settings  
[Command] setup date DATE  
[Parameter] DATE: MM-DD-YYYY  
[Process] Set the date.  
<Example> Setting the date to October 1st 2006  
**setup date 10-01-2006<CR>**  
setup save complete date<CR>
- Current Date Setting  
[Command] setup date  
[Process] Displays the current date.

- Help of the Date Setting
  - [Command] `setup date --help`
  - [Process] Displays the help of the Date Setting command.

**Note**

You can set the DATE settings when NTP setting is set to off.

When NTP setting is set to on, the following messages are displayed.

```

setup date 10-01-2006<CR>
warning: NTP mode is currently set to
on; please turn it off to
manually set the date.<CR>

```

---

## Time Settings

- Time Settings
  - [Command] `setup time TIME`
  - [Parameter] `TIME: HH:MM:SS`
  - [Process] Sets the time.
  - <Example> Setting the time to 15:00:00
 

```

setup time 15:00:00<CR>
setup save complete time<CR>

```

**Note**

Time Setting is available only when the NTP Setting is set to OFF.

When the NTP Setting is set to ON, the following message appears.

```

setup time 15:00:00<CR>
warning: NTP mode is currently set to
on; please turn it off to
manually set the time.<CR>

```

- Current Time Setting
  - [Command] `setup time`
  - [Process] Displays the current time.
- Help of the Time Setting
  - [Command] `setup time --help`
  - [Process] Displays the help of the Time Setting command.

---

## Web Monitor Settings

- Web Monitor Settings
  - [Command] `setup web MON/RATE/SIZE/QUA`
  - [Parameter] `MONitor: on, off`
  - `frame RATE: 1 to 5 (1 step)`
  - `view SIZE: 320, 160`
  - `image QUALity: 1 to 10 (1 step)`
  - [Process] Sets the Web monitor.
  - <Example> Example of the Web monitor settings
 

```

setup web on/2/320/5<CR>
setup web complete<CR>

```

- Current Web Monitor Setting
  - [Command] `setup web`
  - [Process] Displays the current web monitor setting.

- Help of the Web Monitor Setting
  - [Command] `setup web --help`
  - [Process] Displays the help of the Web Monitor Setting command.

---

## Camera Administrator: CDS Gain Settings

- CDS Gain Settings
  - [Command] `cds GAIN`
  - [Parameter] `GAIN: 0 to 63 (1step)`
  - [Process] Sets the CDS gain manually.
  - <Example> Example of the CDS gain setting
 

```

cds 63<CR>
camera cds complete<CR>

```
- Auto CDS Gain Settings
  - [Command] `cds AUTO`
  - or
  - `cds AUTO X Y`
  - [Parameter] `AUTO: auto`
  - `X: x-coordinate of the start point of the rectangular area of the image data to be used for adjustment`
  - `Y: y-coordinate of the start point of the rectangular area of the image data to be used for adjustment`
  - \*The size of the rectangular area of the image to be adjusted is 160 × 128 for the XCI-SX1 and 80 × 64 for the XCI-V3. You are allowed to not input the X and Y parameters. (When the X and Y parameters are not input, the rectangular area of the image data to be used for adjustment is the center of the image area.)
  - [Process] Sets the CDS gain automatically.
  - <Example> Adjusting the CDS gain automatically using the x-coordinate and y-coordinate of the top left point of the rectangular area
 

```

cds auto 560 448<CR>
camera cds complete<CR>

```
- Current CDS Gain Setting
  - [Command] `cds`
  - [Process] Displays the current CDS gain setting.
- Help of the CDS Gain Setting
  - [Command] `cds --help`
  - [Process] Displays the help of the CDS Gain Setting command.

---

## Camera Administrator: Pedestal Level Setting

### ■ Pedestal Level Setting

[Command] pedestal LVL

[Parameter] LeVeL: 0 to 255 (1step)

[Process] Sets the pedestal level.

<Example> Setting the pedestal level to 128  
**pedestal 128<CR>**  
 camera pedestal complete<CR>

### ■ Auto Pedestal Level Settings

[Command] pedestal AUTO or pedestal AUTO  
X Y

[Parameter] AUTO: auto

X: x-coordinate of the start point of the rectangular area of the image data to be used for adjustment

Y: y-coordinate of the start point of the rectangular area of the image data to be used for adjustment

\*The size of the rectangular area of the image to be adjusted is 160 × 128 for the XCI-SX1 and 80 × 64 for the XCI-V3. You are allowed to not input the X and Y parameters. (When the X and Y parameters are not input, the rectangular area of the image data to be used for adjustment is the center of the image area.)

[Process] Adjusts the pedestal level automatically.

<Example> Adjusting the pedestal level automatically using the x-coordinate and y-coordinate of the top left point of the rectangular area  
**pedestal auto 560 448<CR>**  
 camera pedestal complete<CR>

### ■ Current Pedestal Level Setting

[Command] pedestal

[Process] Displays the current pedestal level.

### ■ Help of the Pedestal Level Setting

[Command] pedestal --help

[Process] Displays the help of the Pedestal Level Setting command.

---

## Camera Shutter: Shutter Mode Setting

### ■ Shutter Mode Setting

[Command] shutter -m MODE

or  
 shutter soft

[Parameter] MODE: monitor, trigger

[Process] Sets the shutter mode and generates a software trigger.

<Example> • Setting the shutter mode to monitor mode  
**shutter -m monitor<CR>**  
 camera shutter mode complete<CR>  
 • Generating a software trigger  
**shutter soft<CR>**  
 camera shutter mode complete<CR>

### Note

A software trigger function is valid only when the shutter mode is set to trigger mode.

### ■ Current Shutter Mode Setting

[Command] shutter -m

[Process] Displays the current shutter mode.

### ■ Help of the Shutter Mode Setting

[Command] shutter -m --help

[Process] Displays the help of the Shutter Mode Setting command.

---

## Camera Shutter: Shutter Speed Setting

### ■ Shutter Speed Settings

[Command] shutter -s SPD

[Parameter] SPeED: 2, 1, 1/15, 1/30, 1/60, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/25000, 1/50000, 1/100000(t-width) [sec]

[Process] Sets the shutter speed.

<Example> Setting the shutter speed to 1/30 sec  
**shutter -s 1/30<CR>**  
 camera shutter speed complete<CR>

### ■ Current Shutter Speed Setting

[Command] shutter -s

[Process] Displays the current shutter speed.

### Note

For the XCI-SX1, when the shutter speed is set to 1/15 sec, the display depends on the shutter mode currently set.

- When the shutter mode is set to “monitor”  
**shutter -s<CR>**  
 shutter -s off<CR>
- When the shutter mode is set to “trigger”  
**shutter -s<CR>**  
 shutter -s 1/15<CR>

### ■ Help of the Shutter Speed Setting

[Command] shutter -s --help

[Process] Displays the help of the Shutter Speed Setting command.

---

## Camera Shutter: Trigger Polarity Setting

- Trigger Polarity Setting
  - [Command] shutter -p POL
  - [Parameter] POLarity: posi, nega
  - [Process] Sets the polarity of the external trigger pulse.
  - <Example> Setting the trigger pulse to positive  
**shutter -p posi<CR>**  
camera shutter polarity complete<CR>
  
- Current Trigger Polarity Setting
  - [Command] shutter -p
  - [Process] Displays the current polarity of the external trigger pulse.
  
- Help of the Trigger Polarity Setting
  - [Command] shutter -p --help
  - [Process] Displays the help of the Trigger Polarity Setting command.

---

## Camera Shutter: Trigger Delay Setting

- Trigger Delay Setting
  - [Command] shutter -d DLY  
or  
tdly DLY
  - [Parameter] DeLaY: 0 to 4095 [ms] (1 step)
  - [Process] Sets the trigger delay.
  - <Example> Setting the trigger delay to 100 ms  
**shutter -d 100<CR>**  
camera shutter delay complete<CR>
  
- Current Trigger Delay Setting
  - [Command] shutter -d  
or  
tdly
  - [Process] Displays the current trigger delay.
  
- Help of the Trigger Delay Setting
  - [Command] shutter -d --help  
or  
tdly --help
  - [Process] Displays the help of the Trigger Delay Setting command.

---

## Camera Shutter: All Settings

- Camera Shutter Settings
  - [Command] shutter -m MODE -s SPD -p POL  
-d DLY
  - [Parameter] MODE: monitor, trigger  
SPeeD: 2, 1, 1/15, 1/30, 1/60, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/25000, 1/50000, 1/100000 (t-width) [sec]  
POLarity: posi, nega  
DeLaY: 0 to 4095 [ms]
  - [Process] Makes the multiple camera settings at a once.
  - <Example> Setting the shutter mode to trigger mode, shutter speed to 1/100 sec, trigger pulse to negative, trigger delay to 300 ms  
**shutter -m trigger -s 1/100 -p nega -d 300 <CR>**  
camera shutter complete<CR>

- Current Camera Shutter Setting
  - [Command] shutter
  - [Process] Displays the current camera shutter setting.
  
- Help of the Camera Shutter Setting
  - [Command] shutter --help
  - [Process] Displays the help of the Camera Shutter Setting command.

---

## Camera Look up Table: GAMMA Settings

- GAMMA Settings
  - [Command] lut GAM -t THR
  - [Parameter] GAMma: off, 0.45, 2.2, reverse, bin  
THReshold: 1 to 1023 (available only when the gamma is set to bin)
  - [Process] Sets the gamma of the LUT (look up table).
  - <Example>
    - Setting  $\gamma = 1$  (OFF)  
**lut off<CR>**  
camera gamma complete<CR>
    - Setting the gamma to binarization (threshold to 512)  
**lut bin -t 512<CR>**  
camera gamma complete<CR>

- Transferring the LUT Binary
  - [Command] lut transfer
  - [Process] Transfers the binary file of 1024 bytes using the Kermit protocol.

<Example> **lut transfer<CR>**  
 G-Kermit CU-1.00, Columbia  
 University, 1999-12-25  
 Escape back to your local Kermit and  
 give a SEND command.

KERMIT READY TO  
 RECEIVE...<CR>

#### Note

To stop the transfer, press Ctrl + C.

- Current GAMMA Setting
  - [Command] lut
  - [Process] Displays the gamma value of the Look-up Table.
- Help of the GAMMA Setting
  - [Command] lut --help
  - [Process] Displays the help of the GAMMA Setting command.
- LUT Inquiry
  - [Command] lut query
  - [Process] Dumps the LUT setting presently set to the computer.

---

## Camera Gain Control Setting

- GAIN Setting
  - [Command] gain GAIN
  - [Parameter] GAIN: 0 to 18 [dB] (1 step)
  - [Process] Sets the gain.
- <Example> Setting the gain to 18 dB  
**gain 18<CR>**  
 camera gain complete<CR>
- Current GAIN Setting
  - [Command] gain
  - [Process] Displays the current gain value.
- Help of the GAIN Setting
  - [Command] gain --help
  - [Process] Displays the help of the GAIN Setting command.

---

## Camera BINNING Settings

- BINNING Settings
  - [Command] binning VALUE
  - [Parameter] VALUE: 0 to 3  
 0: Horizontal = OFF, Vertical = OFF  
 1: Horizontal = OFF, Vertical = ON  
 2: Horizontal = ON, Vertical = OFF  
 3: Horizontal = ON, Vertical = ON
  - [Process] Sets the binning.
- <Example> Setting both the Horizontal and Vertical to OFF  
**binning 0<CR>**  
 camera binning complete<CR>
- Current BINNING Setting
  - [Command] binning
  - [Process] Displays the current binning setting.
- Help of the BINNING Setting
  - [Command] binning --help
  - [Process] Displays the help of the BINNING Setting command.

---

## Camera Partial Scan Settings

- Partial Scan Settings
  - [Command] -h HORIZONTAL H-START H-WID  
 -v VERTICAL V-START V-HEI
  - [Parameter] HORIZONTAL: off, on  
 H-START: 0 to 7 (Valid when Horizontal is set to on.)  
 H-WIDTH: 0 to 7 (Valid when Horizontal is set to on.)  
 VERTICAL: off, on  
 V-START: XCI-SX1: 0 to 31 (Valid when Vertical is set to on.)  
 XCI-V3: 0 to 15 (Valid when Vertical is set to on.)  
 V-HEIGHT: XCI-SX1: 0 to 31 (Valid when Vertical is set to on.)  
 XCI-V3: 0 to 15 (Valid when Vertical is set to on.)
  - [Process] Sets the partial scan.
- <Example> Setting the partial scan.  
**partial -h on 2 4 -v on 5 20<CR>**  
 camera partial complete<CR>

#### Note

When setting the Partial Scan Setting to ON, input both the start-point and the area at one time.

- Current Partial Scan Setting
  - [Command] partial
  - [Process] Displays the current partial scan setting.

- Help of the Partial Scan Setting
  - [Command] partial --help
  - [Process] Displays the help of the Partial Scan Setting command.

---

## Version Information Request

- Version Information Request
  - [Command] version
  - [Process] Displays the model name and software version.

---

## Status Request

- Status Request
  - [Command] status
  - [Process] Displays the following items.
    - Model Name
    - Hardware Version
    - Software Version
    - Hostname
    - IP Address
    - MAC Address
    - Serial Baud Rate
    - Serial number

---

## Help Request

- Help Request
  - [Command] help

---

## Local Echo Setting

- Local Echo Setting
  - [Command] setup echo ECHO
  - [Parameter] ECHO: off, on
  - [Process] Sets the local echo setting.
  - <Example> Setting the local echo to OFF
    - setup echo off <CR>**
    - setup save complete echo<CR>
- Current Local Echo Setting
  - [Command] setup echo
  - [Process] Displays the current local echo setting.
- Help of the Local Echo Setting
  - [Command] setup echo --help
  - [Process] Displays the help of the Local Echo Setting command.

---

## Reboot Request

- Reboot Request
  - [Command] reboot
  - [Process] Reboots the XCI-SX1/V3.

---

## Factory Default Settings

- Factory Default Setting
  - [Command] setup factory
  - [Process] Sets all the camera setting and Setup values to the factory default setting (except for the CDS gain and pedestal level).

### Note

This command works same as the “Default (All)” on the HOME screen of the GUI application (page 15).

---

## Resetting the Camera Settings

- Resetting the Camera Stettings
  - [Command] setup default
  - [Process] Sets all the camera settings other than CDS gain and pedestal level to the factory setting.

### Note

This command works same as the “Default (Camera)” on the HOME screen of the GUI application (page 15).

---

## Saving the Camera Settings

- Saving the Camera Settings
  - [Command] save
  - [Process] Saves the camera settings (except for the CDS gain, pedestal level, TRGINH and DMAINH).

### Notes

- The camera settings aren't saved until the Save command is received.
- For the XCI-SX1, this command works same as the “SAVE” command of the GUI application and the Web application (only for the camera settings). For the XCI-V3, to save the settings of particular functions of this unit (such as FILTER, and so on), only this command can be used. You cannot use the “SAVE” command of the GUI application or the Web application.

---

## Loading the Camera Settings

- Loading the Camera Settings
  - [Command] load
  - [Process] Loads the camera settings.

### Note

After loading, the camera's basic settings are reconfigured (except for the CDS gain, pedestal level, TRGINH and DMAINH).

---

## Ethernet Mode Setting

- Ethernet Setting
  - [Command] setup ether MODE
  - [Parameter] MODE: auto, 10half, 10full, 100half, 100full
  - [Process] Sets the ethernet mode.
  - <Example> Setting the ethernet mode to 100 Base Half
 

```
setup ether 100half<CR>
setup save complete ether<CR>
warning: the network will be
restarted...<CR>
you may have to re-login if
you are linked via
telnet...<CR>
```

- Current Ethernet Setting
  - [Command] setup ether
  - [Process] Displays the current Ethernet mode.
- Help of the Ethernet Setting
  - [Command] setup ether --help
  - [Process] Displays the help of the Ethernet Setting command.

### Notes

- Reboot the XCI-SX1/V3 after changing the ethernet setting.
- Set this to the same setting as the connected network.

---

## Ideal Figure of fps

- Display the Ideal Figure of fps
  - [Command] fps VB HPS VPS HEND VEND
  - [Parameter] VB (Vertical Binning): 0[off], 1[on]
  - HPS (Horizontal Partial Scan): 0[off], 1[on]
  - VPS (Vertical Partial Scan): 0[off], 1[on]
  - HEND (Horizontal partial scan END): 0-7
  - VEND (Vertical partial scan END):

- 0-31
- [Process] Displays the ideal figure of fps according to the parameters.
- <Example> Ideal fps: 29.30 of 1-1-1-7-31 (v-hs-vs-he-ve)<CR>

- Current Ideal Figure of fps
  - [Command] fps
  - [Process] Displays the ideal value of fps according to the current register setting.
- Help of the Ideal Figure of fps
  - [Command] fps --help
  - [Process] Displays the help of the Ideal Figure of fps command.

---

## Keyboard Setting

- Keyboard Setting
  - [Command] setup kmap TYPE
  - [Parameter] TYPE: en, jp
  - [Process] Sets the keyboard map and preserve the setting.
  - <Example> Setting the layout of the keyboard to English and saving the setting
 

```
setup kmap en<CR>
setup save complete kmap<CR>
```
- Current Keyboard Setting
  - [Command] setup kmap
  - [Process] Displays the current keyboard map setting.
- Help of the Keyboard Setting
  - [Command] setup kmap --help
  - [Process] Displays the help of the Keyboard Setting command.

---

## Camera TRGINH Setting

- TRGINH Setting
  - [Command] trginh VALUE
  - [Parameter] VALUE: on, off
  - on: Invalidates the trigger.
  - off: Validates the trigger
  - [Process] Switches between invalidation and validation of the trigger.
  - <Example> Setting the trigger to invalidation
 

```
trginh on<CR>
camera trginh complete<CR>
```
- Current TRGINH Setting
  - [Command] trginh
  - [Process] Displays the current trginh setting.

- Help of the TRGINH Setting
  - [Command] `trginh --help`
  - [Process] Displays the help of the TRGINH Setting command.

---

## Camera DMAINH Setting

- DMAINH Setting
  - [Command] `dmainh VALUE`
  - [Parameter] VALUE: on, off
    - on: Prohibits the camera block from transferring the image signal.
    - off: Allows transfer of the image signals
  - [Process] Switches between prohibiting and allowing of transfer of the image signals from the camera block to the CPU block.
  - <Example> Prohibiting transfer of the image signal
    - dmainh on<CR>**
    - camera dmainh complete<CR>
- Current DMAINH Setting
  - [Command] `dmainh`
  - [Process] Displays the current dmainh setting.
- Help of the DMAINH Setting
  - [Command] `dmainh --help`
  - [Process] Displays the help of the DMAINH Setting command.

---

## Camera STROBE Setting (XCI-V3 only)

- STROBE Setting
  - [Command] `strobe DELAY`
  - [Parameter] DELAY: -67 to +60 (µs) (1 step)
  - [Process] Sets the strobe delay.
  - <Example> Setting the strobe delay to -10µs
    - strobe -10<CR>**
    - camera strobe delay complete<CR>
- Current STROBE Setting
  - [Command] `strobe`
  - [Process] Displays the current strobe setting.
- Help of the STROBE Setting
  - [Command] `strobe --help`
  - [Process] Displays the help of the STROBE Setting command.

---

## Camera FILTER Setting (XCI-V3 only)

- FILTER Setting
  - [Command] `filter FILTER`
  - [Parameter] FILTER: off, lut, filter1 or filter2
    - off: Invalidates the 3 x 3 filter.
    - lut: The 3 x 3 filter becomes valid. The circuit operation functions in order of LUT and the 3 x 3 filter.
    - filter1 or filter2: The 3 x 3 filter becomes valid. The circuit operation functions in order of the 3 x 3 filter and LUT.
  - [Process] Sets the validation, invalidation, and order of the 3 x 3 filter.
  - <Example> Validating the 3 x 3 filter and the circuit operation functions in order of the 3 x 3 filter and LUT.
    - filter filter1<CR>**
    - camera filter function complete<CR>
- Current FILTER Setting
  - [Command] `filter`
  - [Process] Displays the current filter setting.
- Help of the FILTER Setting
  - [Command] `filter --help`
  - [Process] Displays the help of the FILTER Setting command.

---

## Camera MATRIX Setting (XCI-V3 only)

- MATRIX Setting
  - [Command] `matrix A11 A12 A13 A21 A22 A23  
A31 A32 A33`
  - [Parameter] Axx: -31.9688 to 31.9688 (1/32 of a step)
  - [Process] Sets the 9 matrix coefficients of the 3 x 3 filter.
 
$$\begin{vmatrix} A11 & A12 & A13 \\ A21 & A22 & A23 \\ A31 & A32 & A33 \end{vmatrix}$$
  - <Example> Setting the filter matrix to -1 -1 -1 -1 8 -1 -1 -1 -1
    - matrix -1 -1 -1 -1 8 -1 -1 -1 -1<CR>**
    - camera filter matrix function complete<CR>
- Current MATRIX Setting
  - [Command] `matrix`
  - [Process] Displays the current matrix setting.
- Help of the MATRIX Setting
  - [Command] `matrix --help`
  - [Process] Displays the help of the MATRIX Setting command.



---

## Camera GRAY Setting (XCI-V3 only)

### ■ GRAY Setting

[Command] gray PATTERN

[Parameter] PATTERN: -ccd, pscan, grad1 or grad2

ccd: Outputs CCD image.

pscan: Outputs test pattern 1

grad1: Outputs test pattern 2.

grad2: Outputs test pattern 3.

[Process] Sets the output from among the CCD image and the test patterns.

<Example> Outputting test pattern 1

**gray pscan<CR>**

camera gray test pattern

complete<CR>

### ■ Current GRAY Setting

[Command] gray

[Process] Displays the current gray setting.

### ■ Help of the GRAY Setting

[Command] gray --help

[Process] Displays the help of the GRAY Setting command.

# Specifications

## Specifications

### XCI-SX1

#### Imaging sensor system

Pickup device	Progressive scan 1/2 type CCD
CCD effective picture elements	1392 × 1040 (horizontal/ vertical)
CCD vertical drive frequency	15.995 kHz
CCD horizontal drive frequency	27.0 MHz
Cell size	4.65 × 4.65 μm (horizontal/ vertical)
Chip size	7.6 × 6.2 mm (horizontal/ vertical)
LUT	γ = OFF/ON, REVERSE/ BINARIZATION
Shutter speed	Normal mode: 2 to 1/100000 sec. External trigger mode: 2 to 1/50000 sec.

#### Processor and interface system

CPU	x86 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
USB	USB 1.1 full-speed/low-speed

#### Optical system and others

Lens mount	C-mount
Flange focal length	17.526 mm (in air)
Synchronization	Internal
Video output	Monitor output (analog output) Reference video output level: 700 mV HD frequency: 64 kHz positive VD frequency: 60 Hz positive

Output signal frequency	15 Hz
Effective lines	1280 × 1024 (horizontal/ vertical)
Sensitivity	400 lx, F5.6
Minimum illumination	4 lx (gain: +18 dB, F1.4)
Gain	0 to +18 dB
Read mode	Normal/binning/partial scan
Shutter	External trigger shutter
Power	+12 V DC (Range: +10.5 to 26.4 V)
Power consumption	7.8 W
Operating temperature	-5 to +45 °C (23 to 113 °F)
Storage temperature	-30 to +60 °C (-22 to 140 °F)
Operating relative humidity	20 to 80 % (no condensation)
Storage relative humidity	20 to 95 % (no condensation)
Vibration resistance	10 G (20 Hz to 200 Hz)
Shock resistance	70 G
MTBF	37931 hours (Approx. 4.3 years)
External dimension	55 × 55 × 110 mm (w/h/d) (2 1/8 × 2 1/8 × 4 3/8 inches)
Mass	400 g (14 1/8 oz)
Accessories	Lens mount cap (1) Operating Instructions (1)

Design and specifications are subject to change without notice.

#### IMPORTANT

The nameplate is located on the bottom.

**XCI-V3****Imaging sensor system**

Pickup device	Progressive scan 1/3 type CCD
CCD effective picture elements	659 × 494 (horizontal/vertical)
CCD vertical drive frequency	31.37 kHz
CCD horizontal drive frequency	24.47 MHz
Cell size	7.4 × 7.4 μm (horizontal/vertical)
Chip size	5.79 × 4.89 mm (horizontal/vertical)
LUT	γ = OFF/ON, REVERSE/BINARIZATION
Shutter speed	Normal mode: 2 to 1/100000 sec. External trigger mode: 2 to 1/50000 sec.

**Processor and interface system**

CPU	x86 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
USB	USB 1.1 full-speed/low-speed

**Optical system and others**

Lens mount	C-mount
Flange focal length	17.526 mm (in air)
Synchronization	Internal
Video output	Monitor output (analog output) Reference video output level: 700 mV HD frequency: 64 kHz positive VD frequency: 60 Hz positive
Output signal frequency	60 Hz
Effective lines	640 × 480 (horizontal/vertical)
Sensitivity	400 lx, F5.6
Minimum illumination	1 lx (gain: +18 dB, F1.4)
Gain	0 to +18 dB
Read mode	Normal/binning/partial scan
Shutter	External trigger shutter
Power	+12 V DC (Range: +10.5 to 26.4 V)
Power consumption	7.5 W
Operating temperature	-5 to +45 °C (23 to 113 °F)
Storage temperature	-30 to +60 °C (-22 to 140 °F)
Operating relative humidity	

Storage relative humidity	20 to 80 % (no condensation)
Vibration resistance	10 G (20 Hz to 200 Hz)
Shock resistance	70 G
MTBF	37931 hours (Approx. 4.3 years)
External dimension	55 × 55 × 110 mm (w/h/d) (2 1/8 × 2 1/8 × 4 3/8 inches)
Mass	400 g (14 1/8 oz)
Accessories	Lens mount cap (1) Operating Instructions (1)

Design and specifications are subject to change without notice.

**IMPORTANT**

The nameplate is located on the bottom.

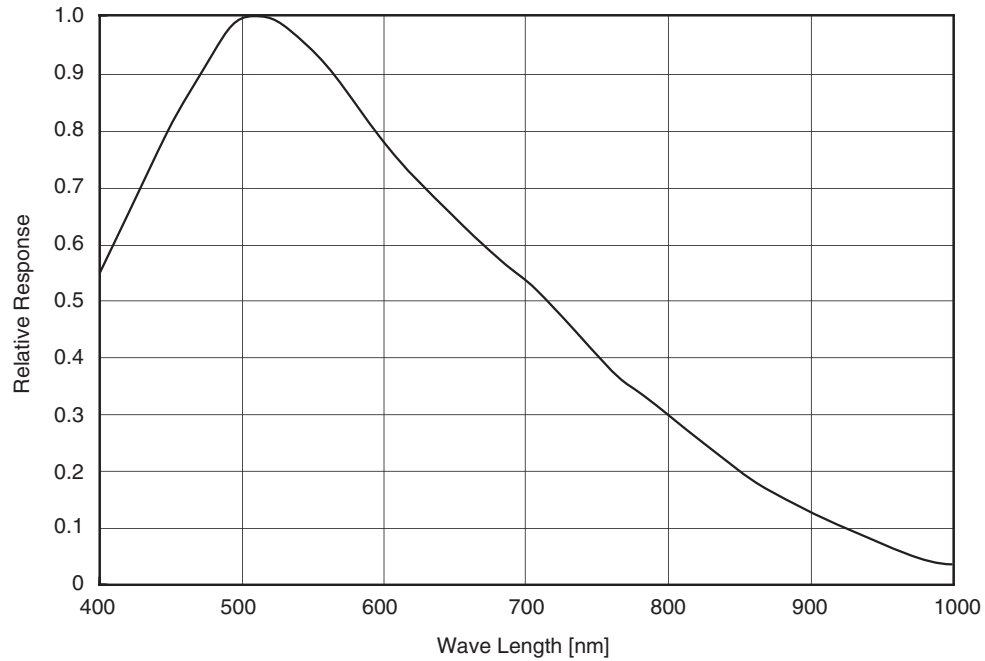
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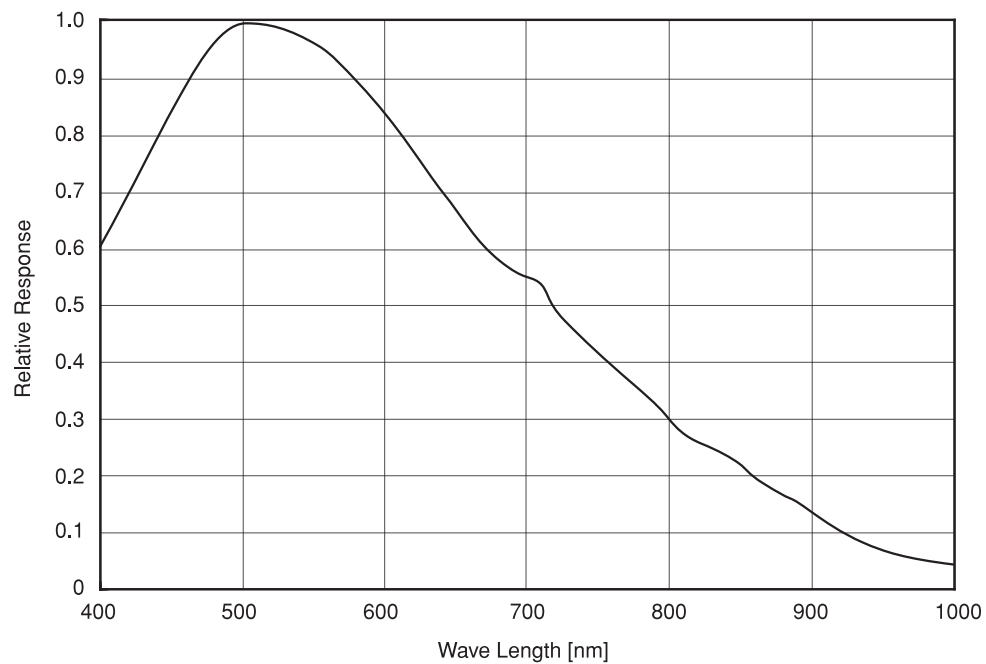
# Spectral Sensitivity Characteristics (Typical Values)

## XCI-SX1



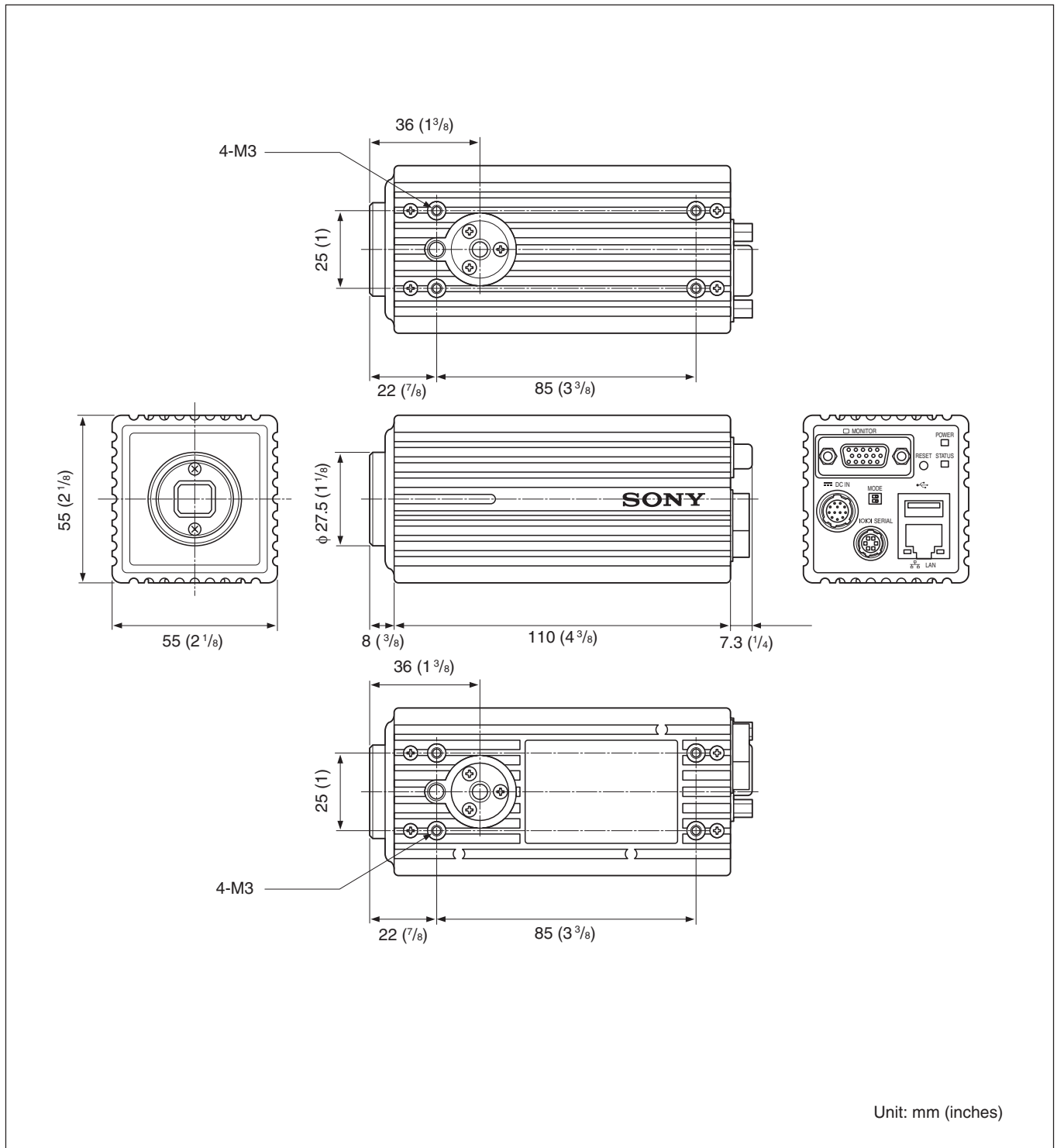
(Lens characteristics included, and light source characteristics excluded.)

## XCI-V3



(Lens characteristics and light source characteristics excluded.)

# Dimensions



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