MCV28US

Intuitive Vision System

CV-X Series

Setup Manual

(Area Camera Edition)

Read this manual before use.
Keep this manual in a safe place for future reference.

RS-232C Interface (CV-X300/X400 Series)

The RS-232C port on the system can be used to communicate with external equipment. The system can communicate with external equipment using two communication modes: non-procedural mode or the PLC-Link mode.
The transmitted data will differ depending on the communication mode. Switch modes depending on the environment. Refer to "CV-X Series User's Manual" for more details on the non-procedural mode and switching the communication mode.

NOTICE	The signal GND and power GND are isolated.

RS-232C Port Specifications

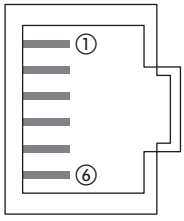
RS-232C basic specifications

- Connector: RJ-11
- Standards: The connected device must comply with EIA (Electronic Industries Association) RS-232C standards.

Item	Compatibility
Communication System	Full-duplex
Synchronous system	Asynchronous
Transmission Code	ASCII (Part binary code)
Data-bit Length	8-bit
Stop-bit Length	1-bit/2-bit
Parity Check	None/odd/even
Communication speed	9600/19200/38400/57600/115200/ 230400 bps
Delimiter	CR/CR+LF
Flow Control	None, CTS/RTS
Maximum cable length	15 m

Connector specifications

The specifications of the RS-232C port on the controller are as follows:



(Controller Side)

No.	Signal	Signal Description	Signal direction
1	CS (CTS)	Data Transmission Permission	Output
2	Not used	—	—
3	SD (TXD)	Data Transmission	Input
4	SG (GND)	GND	—
5	RD (RXD)	Data Reception	Output
6	RS (RTS)	Data Transmission Request	Input

Reference

Since the controller uses the RS-232C modem definition, SD is assigned to input and RD is assigned to output.

Cameras that can be Connected (CV-X300/X400 Series)

The cameras that can be connected as well as the maximum connectable number are listed by each model of the CV-X300/X400 Series in the table below.

Camera		Camera connection	CV-X402/ CV-X302	CV-X422/ CV-X322	CV-X452/ CV-X352	CV-X472	CV-X482*1	CV-X480LJ*1
Area camera	CA-035C/035M, CA-H035C/H035M, CA-HS035C/HS035M, CV-035C/035M, CV-H035C/H035M, CV-S035C/S035M	Camera port on the controller or CA-E100	2	2 (4)*2	2 (4)*2	2 (4)*2	(4)*2	×
	CA-H048CX/H048MX, CA-HX048C/HX048M		2*3*4	2 (4)*2*3*4	2 (4)*2*3*4	2 (4)*2*3	(4)*2*3	×
	CA-200C/200M, CA-H200C/H200M, CA-HS200C/HS200M, CV-200C/200M, CV-H200C/H200M, CV-S200C/S200M		×	2 (4)*2	2 (4)*2	2 (4)*2	(4)*2	×
	CA-H200CX/H200MX, CA-HX200C/HX200M		×	2 (4)*2*3*4	2 (4)*2*3*4	2 (4)*2*3	(4)*2*3	×
	CA-H500C/H500M, CV-H500C/H500M		×	×	2 (4)*2	2 (4)*2	(4)*2	×
	CA-H500CX/H500MX, CA-HX500C/HX500M		×	×	2 (4)*2*3*4	2 (4)*2*3	(4)*2*3	×
	CA-H2100C/H2100M		×	×	×	2 (4)*2	(4)*2	×
LJ-V Series head	LJ-V7020/V7020K/ V7060/V7060K/V7080/ V7200/V7300	CA-E100LJ	×	×	×	×	(4)*2*5	(2)*2*5
		CA-E110LJ*6	×	×	×	×	(4)*2*5	×

*1 For the CV-X482/X480LJ, the controller has no camera port, so at least one camera input unit is necessary.

*2 The number in the parentheses is the maximum number of cameras that can be connected by adding the camera expansion unit (CA-E100 or CA-E100LJ/E110LJ).

*3 The CV-X400 Series controller supports the LumiTrax light and the MultiSpectrum light. For more details about these lights, see the CV-X Series User's Manual.

*4 CV-X302/X322/X352 do not support capturing in LumiTrax mode and MultiSpectrum mode.

*5 For one camera input unit, up to two LJ-V Series heads (limited to the same model) can be connected. However, the capture timing and number of capture lines of the LJ-V Series heads connected to the same camera input unit will be the same.

*6 The CA-E110LJ is a camera input unit that also supports LJ-V Series luminance output type sensor heads (sensor heads whose models end in "B").

Controller Unit (CV-X352/X322/X302)

Controller model[*1]			CV-X352	CV-X322	CV-X302
Camera input			2 color/monochrome area cameras (mixed connection possible)		
			With the connection of 1 unit of the optional area camera input unit CA-E100, up to 4 cameras can be connected in total (mixed connection possible)		
	Trigger input		Simultaneous capture by up to 4 cameras/individual capture can be selected. (when CA-E100 is not connected, simultaneous capture is by up to 2 cameras)		Can select from simultaneous/individual capture with up to 2 cameras
Supported cameras/ Number of pixels			With CA-035C/035M/H035C/H035M/HS035C/HS035M connected • 310 k pixel mode: 640(H) x 480(V), approx. 310,000 pixels • 240 k pixel mode: 512(H) x 480(V), approx. 240,000 pixels		
			With CV-035C/035M/H035C/H035M/S035C/S035M connected • 310 k pixel mode: 640(H) x 480(V), approx. 310,000 pixels • 240 k pixel mode: 512(H) x 480(V), approx. 240,000 pixels		
			With CA-H048CX/H048MX/HX048C/HX048M connected • 470 k pixel mode: 784(H) x 596(V), approx. 470,000 pixels • 310 k pixel mode: 640(H) x 480(V), approx. 310,000 pixels • 240 k pixel mode: 512(H) x 480(V), approx. 240,000 pixels		
			With CA-200C/200M/H200C/H200M/HS200C/HS200M connected • 2 mega-pixel mode: 1600(H) x 1200(V), approx. 1.92 mega-pixels • 1 mega-pixel mode: 1024(H) x 960(V), approx. 980,000 pixels		
			With CV-200C/200M/H200C/H200M/S200C/S200M connected • 2 mega-pixel mode: 1600(H) x 1200(V), approx. 1.92 mega-pixels • 1 mega-pixel mode: 1024(H) x 960(V), approx. 980,000 pixels		
			With CA-H200CX/H200MX/HX200C/HX200M connected • 2 mega-pixel mode: 1600(H) x 1200(V), approx. 1.92 mega-pixels		
			With CA-H500C/H500M connected • 5 mega-pixel mode: 2432(H) x 2050(V),approx. 4.99 mega-pixels		
			With CV-H500C/H500M connected • 5 mega-pixel mode: 2432(H) x 2050(V),approx. 4.99 mega-pixels		
			With CA-H500CX/H500MX/HX500C/ HX500M connected • 5 mega-pixel mode: 2432(H) x 2040(V),approx. 4.96 mega-pixels • 2 mega-pixel mode: 1600(H) x 1200(V),approx. 1.92 mega-pixels		
Main processor for image processing			DSP		
Number of setting registrations			Up to 1000 settings (depending on SD card capacity and setting contents) for SD card 1 and SD card 2 individually and external switching is possible		
Number of reference images			Each setting supports 900 images per camera (depending on SD card capacity), compress and save functions, and image registration of position adjusted images		
Memory card			• SD card slot x 2 • Supports OP-87133 (512 MB: standard equipment on the SD1 slot for the CV-X322/X302), CA-SD1G (1 GB: standard equipment on the SD1 slot for the CV-X352), CA-SD4G (4 GB), and CA-SD16G (16 GB)		
Interface	Control input	External trigger input	4 points (2 of which support special function assignment) Input rating: 26.4 V max., 3 mA min., simultaneous/individual capture with up to 4 cameras is possible		4 points (2 of which support special function assignment) Input rating: 26.4 V max., 3 mA min., simultaneous/individual capture with up to 2 cameras is possible
			Can set individual trigger delays (0 to 999 ms) for each trigger input		
		Control input	16 points (4 of which support special function assignment) Input rating: 26.4 V max., 2 mA min.		
	Control output	Common output	27 points (11 of which support special function assignment includes 4 high speed outputs), photo MOSFET[*2], 50 mA max. (30 V max.)		
		Total status output	1 point, photo MOSFET[*2], 50 mA max. (30 V max.) Supports total status hold control, and one-shot output (1 to 9999 ms)		
	Monitor output		Analog RGB Output, XGA 1024 × 768 (24 bit color, 60 Hz)		
	Operation indicator		Power, ERROR LED display		
	RS-232C		Can switch between the function of numerical value output and control input/output, and the function of CA series touch panel interface, supports a max. baud rate of up to 230400 bps (Cannot be used with PLC-Links using the RS-232C port)		

Controller model[*1]		CV-X352	CV-X322	CV-X302
Interface (Continued)	PLC link	• Can output numerical values and perform control input/output using the Ethernet or RS-232C port (EtherNet/IP and PROFINET cannot be used in conjunction with PLC-Link. When using the RS-232C port, nonprocedural RS-232C communication cannot be used in conjunction with PLC-Link.) • The following PLCs are supported via link unit:[*3] KEYENCE: KV-7000 Series, KV-5000/3000 Series, KV-1000/700 Series, KV Nano Series Mitsubishi Electric: MELSEC iQ-R/L/Q Series, MELSEC A Series (RS-232C only), MELSEC iQ-F Series, MELSEC FX Series (RS-232C only) OMRON: SYSMAC CJ2/CJ1/CS1/CP1 Series, SYSMAC C Series (RS-232C only) YASKAWA Electric Corporation: MP2000 Series, MP900 Series (RS-232C only)		
	Ethernet	• Can output numerical values and perform control input/output • Connecting to KEYENCE PC application software makes it possible to output measured data and image data to a PC, upload and download settings, and use the remote desktop function. • Supports FTP client and FTP server function • VNC server (for non-PC clients, only displaying the monitor screen is supported) • Supports BOOTP function • 1000BASE-T/100BASE-TX/10BASE-T		
	USB	• Connecting to KEYENCE PC application software makes it possible to output measured data and image data to a PC, upload and download settings, and use the remote desktop function. • USB 2.0 only.		
	EtherNet/IP	• Numerical value and control input/output using the Ethernet port enabled (Cannot be used in conjunction with PLClink / PROFINET). • Cyclic (implicit) communication (max. 1436 bytes) possible. Message communication possible. • Maximum connections: 32. • In conformity with conformance test Version.CT15.		
	PROFINET	• Numerical value and control input/output using the Ethernet port enabled (Cannot be used in conjunction with PLClink / EtherNet/IP). • Cyclic communication (max. 1408 bytes) possible. Aperiodic (record data) communication possible. • In conformity with Conformance Class A		
	SNTP	By connecting to an SNTP server, the date and time of the controller can be automatically adjusted.		
	Mouse	Possible to control every kind of menu via the dedicated mouse (OP-87506: included with the controller)		
	Touch Panel	Possible to operate settings via CA series touch panel using RS-232C port (The nonprocedural communication and PLC-Links that use the RS-232C port cannot be used.)		
	USB HDD	By connecting a HDD (maximum 2 TB) to the dedicated USB port (USB 3.0 and bus powered compatible: rated output 900 mA), various kinds of data including image data can be output		
	VisionDataStorage	Data, including image data, can be output by connecting a VisionDataStorage (sold separately) via the dedicated VisionDataStorage USB cable (OP-88263)		
Illumination control		By connecting the optional illumination expansion unit CA-DC40E/DC50E, the lighting and light intensity of the LED illumination can be controlled.[*4]		
Cooling fan		None		
Language		Switched among English, Japanese, Simplified Chinese, Traditional Chinese, Korean, Thai, German, French, Italian, Mexican Spanish, Indonesian, Vietnamese, and Brazilian Portuguese		
Rating	Power supply voltage	24 V DC ±10%		
	Current consumption	3.8 A		2.4 A
Environmental resistance	Ambient temperature	0 to +45°C (DIN rail mounted)/0 to +40°C (Bottom mounted)		
	Relative humidity	35 to 85% RH (no condensation)		
Weight		Approx. 1600 g		

*1 The letters that follow the model numbers describe differences in the software. For details, see the "CV-X Series User's Manual".

*2 Either positive common connecting which is compatible with NPN input instruments, or negative common connecting which is compatible with PNP input instruments is feasible.

*3 Models that are equipped with an Ethernet port on the CPU unit support direct connection with the Ethernet port.

*4 Connect up to 8 illumination expansion units (note that the maximum allowable number of CA-DC50E units is two).