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CX2000 Installation and Connection Guide

IM 04L31A01-71E 3rd Edition

YOKOGAWA
Yokogawa Electric Corporation

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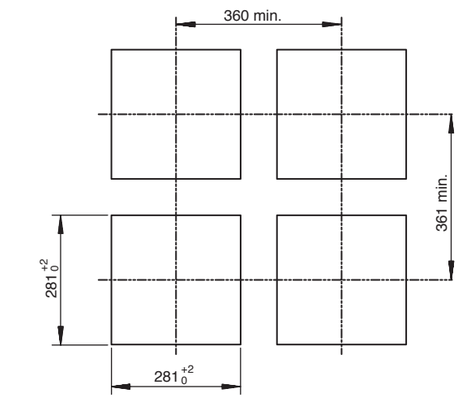
Thank you for purchasing the CX2000.
This manual contains simple explanations about how to install and connect the CX2000. For more information about the procedures described herein, safety precautions, and the CX2000 functions and operation, please refer to the PDF manual found on the provided CD-ROM.

Installation Procedure

1. Cut the instrument panel according to the diagram below.

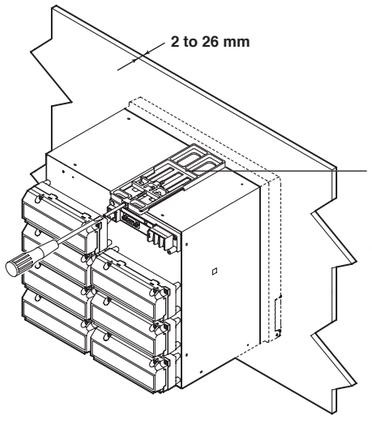
Panel Cut Diagram

Units : mm



2. Insert the CX2000 into the front of the panel.
3. Using the mounting brackets, attach the CX2000 to the panel as shown in the following figure.

   First, attach the two mounting brackets and temporarily fasten the attachment screws. Next, fix the CX2000 in place by tightening the attachment screws with the appropriate torque (0.7 to 0.9 N-m.). As you fasten the screws, press the mounting bracket against the case so that they are in contact with each other.



Attachment position is either top and bottom or left and right

For details about the CX2000 external dimensions, installation environment, and more, please refer to the CX2000 User's Manual (IM 04L31A01-01E) found on the provided CD-ROM.

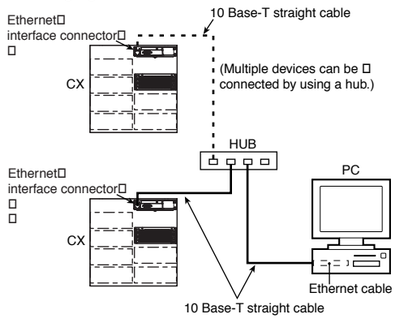
Connection Types and Procedures

There are various terminals and connectors on the rear panel of the CX2000. Connecting them to peripheral devices allows you to perform control and measurement operations. Below are the names of each connector and terminal, as well as connection procedures.

Connecting the Ethernet Interface

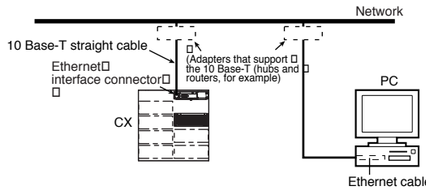
- **When only Connecting to a Hub**

  Connect the CX2000 and the PC through a HUB as shown in the following figure.



- **When Connecting to a Preexisting Network**

  The following figure illustrates an example in which the CX2000 and a PC are connected to the network. When connecting the CX2000 or the PC to a preexisting network such things as the transfer rate and connector type must match. For details, consult your system or network administrator.



Connecting a Monitor to the VGA Output Terminal

(Option /D5)

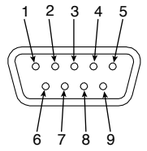
Supported monitors: VGA monitors and multisync monitors with VGA display capability.

1. Turn off the CX2000 and the monitor.
2. Connect the CX2000 and the monitor using an analog RGB cable (D-Sub connector).
3. Turn on the CX2000 and the monitor. The screen of the CX2000 is displayed on the monitor.

Connecting the Serial Interface

- **RS-232 (When Connecting to a Computer or Other Such Devices)**

  Verify that the CX2000 has an RS-232 connector, and then connect a serial cable to it. Connect the other end of the serial cable to the other device.

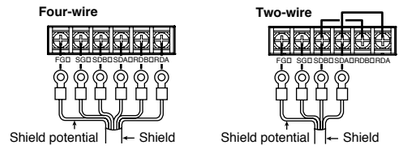


Pin No.	Signal Name	Signal Meaning
2	RD (Received Data)	Received data from the connected device. Input signal.
3	SD (Send Data)	Send data to the connected device. Output signal.
5	SG (Signal Ground)	Signal ground.
7	RS (Request to Send)	Handshaking signal used when receiving data from the connected device. Output signal.
8	CS (Clear to Send)	Handshaking signal used when sending data to the connected device. Input signal.

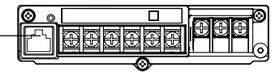
* Pins 1, 4, 6, and 9 are not used.

- **RS-422/485 (When Connecting to a PLC, Temperature Controller or Other Such Devices)**

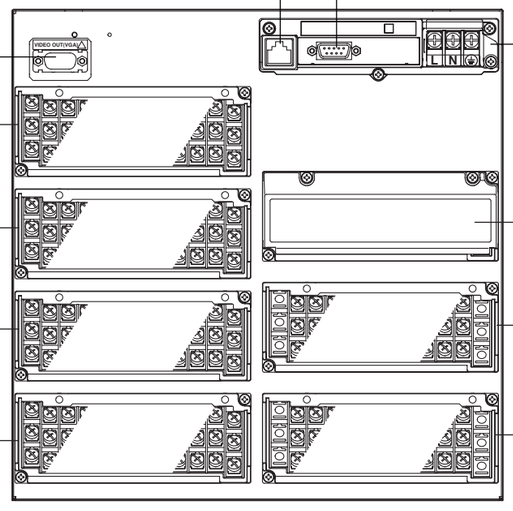
  Verify that the CX2000 has an RS-422/485 connector, and then connect the crimp connectors (for 4-mm screws) to the terminal strip as illustrated on the right. Do not expose more than 5 cm of the cable surface from the shield.



With an RS-422/485



CX2000 Rear Panel **With an RS-232**



Loop 1 and 2 control output terminal block
Magnet switch, SSR, Contact input (6), R1 Contact output (6)

Loop 3 and 4 control output terminal block
Magnet switch, Contact input (6), R2 Contact output (6)

Loop 5 and 6 control output terminal block
Contact input (6), R3 Contact output (6)

Option terminal block (Options /A6, /A4F, /A4FR, /A6R, /CST1,and /TPS4)

Connecting Input/Output Connectors

When connecting various input/output connectors for control or measurement, proceed as described below.
Connect the crimp connectors (for 4-mm screws) to the terminal strip.

1. Turn off the CX2000 and remove the terminal cover.
2. Wire the signal wires to the terminals.
   Attach the terminal cover and secure it with the screws.

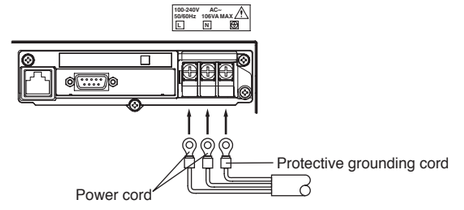
Connecting the Power Supply

⚠ **When using electrical wiring, be certain to follow the safety recommendations prescribed in the CX2000 User's Manual.**

Use a power supply that meets the following conditions:

Rated supply voltage:	100 to 240 VAC
Supply voltage range used:	90 to 132, 180 to 264 VAC
Rated supply voltage frequency:	50/60 Hz
Permitted supply voltage frequency range:	50/60 Hz ± 2%
Maximum power consumption:	75 VA (100 V), 106 VA (240 V)

1. Turn OFF the CX2000 and open the cover (transparent) for the power supply wires.
2. Connect the power cord and the protective ground cord to the power supply terminals.



3. Close the cover (transparent) for the power supply wires and secure it in place with screws.

For the power supply specifications and connection method of the 24VDC/ ACpower supply option, please refer to the CX2000 User's Manual.

Control input terminal block

Measurement input terminal block (CH1 to 10)

Measurement input terminal block (CH11 to 20)

Arrangement of the Input/Output Terminals

Input/Output Assignments of the Analog Control Input Terminal Block

There are 10 input terminals. The PV inputs (PV) and remote inputs (RSP) are assigned as shown in the following figure depending on the number of loops used and the control mode. The following figure denotes the three terminals (/b, +/A, -/B) of a single column using a single cell. In addition, of the 12 columns of terminals, the columns at each end that have no terminal screws are omitted because they are not used.

- **6 Loops**

PV, PV1, PV2: measurement input, (RSP): remote input□
(not used during program control), □: unused terminal

LOOP4		LOOP6	LOOP3		LOOP2		LOOP5	LOOP1		[Control mode setting]
2	1	1	2	1	2	1	1	2	1	
(RSP)	PV	PV	(RSP)	PV	(RSP)	PV	PV	(RSP)	PV	← During single-loop control
□	PV	□	(RSP)	PV	□	PV	□	(RSP)	PV	← During cascade control
PV2	PV1	□	PV2	PV1	PV2	PV1	□	PV2	PV1	← During loop control with□ PV switching

- **4 Loops**

PV, PV1, PV2: measurement input, (RSP): remote input□
(not used during program control), □: unused terminal

LOOP4		LOOP6	LOOP3		LOOP2		LOOP5	LOOP1		[Control mode setting]
2	1	1	2	1	2	1	1	2	1	
(RSP)	PV	PV	(RSP)	PV	(RSP)	PV	PV	(RSP)	PV	← During single-loop control
□	PV	□	(RSP)	PV	□	PV	□	(RSP)	PV	← During cascade control
PV2	PV1	□	PV2	PV1	PV2	PV1	□	PV2	PV1	← During loop control with□ PV switching

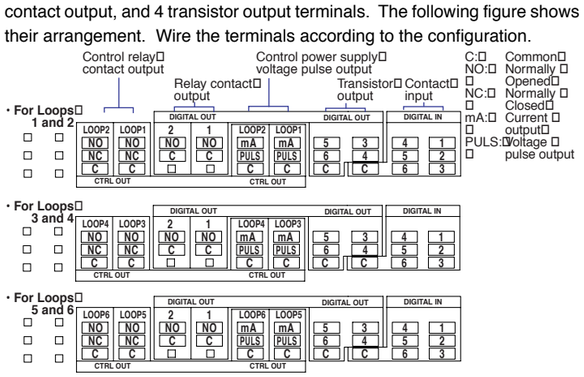
- **2 Loops**

PV, PV1, PV2: measurement input, (RSP): remote input□
(not used during program control), □: unused terminal

LOOP4		LOOP3			LOOP2		LOOP1			[Control mode setting]
2	1	3	2	1	2	1	3	2	1	
(RSP)	PV	□	(RSP)	PV	(RSP)	PV	□	(RSP)	PV	← During single-loop control
□	PV	□	(RSP)	PV	□	PV	□	(RSP)	PV	← During cascade control
PV2	PV1	(RSP)	PV2	PV1	PV2	PV1	(RSP)	PV2	PV1	← During loop control with□ PV switching

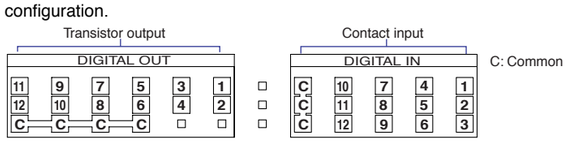
Terminal Arrangements of the Control Output Terminal Block

Each block has a control output containing 2 loops of current output, voltage pulse output, and relay contact output terminals, 6 contact input, 2 relay contact output, and 4 transistor output terminals. The following figure shows their arrangement. Wire the terminals according to the configuration.



Terminal Arrangements of the Control DIO Expansion Terminal Block (Option Terminal Block Provided with the /CST1 Option)

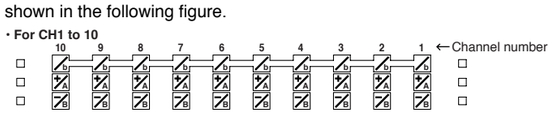
12 contact input and 12 transistor contact output terminals are arranged as shown in the following figure. Wire the terminals according to the configuration.

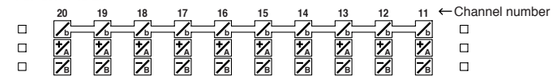


Arrangement of the Measurement Input/Output Terminals

Terminal Arrangements of the Measurement Input Terminal Block

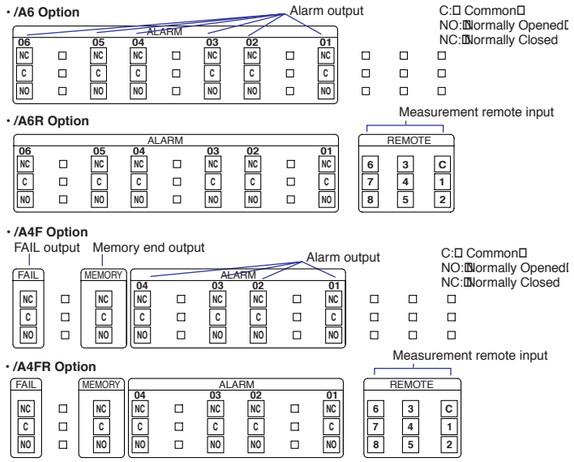
Ten measurement input terminals are available on each terminal block as shown in the following figure.





Terminal Arrangements of the Measurement Alarm Option Terminal Block

The measurement alarm option terminal block is the terminal block that you specified as an option (/CST1) at the time of purchase. The following four types are available.



Label on the Terminal Cover

A label indicating the terminal arrangement is affixed to the front and back of the terminal cover of each terminal block.

Label on the Front of the Terminal Cover

The terminal numbers used to check the connection (not the numbers used in the settings) are written on the label on the front of the terminal cover (see the following figure).

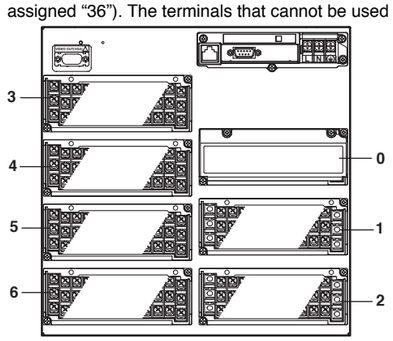
- **For the 6 Loop Analog Control Input Terminal Block**

	LOOP4		LOOP6	LOOP3		LOOP2		LOOP5	LOOP1		CAT II ⚠
□	031	028	025	022	019	016	013	010	007	004	□
□	032	029	026	023	020	017	014	011	008	005	□
□	033	030	027	024	021	018	015	012	009	006	□

- **For the Control Expansion DIO Terminal Block**

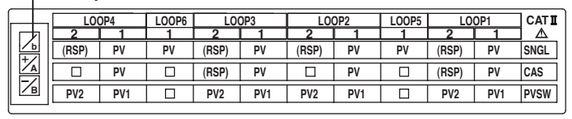
DIGITAL OUT						CAT II ⚠	DIGITAL IN				
634	631	628	625	622	619	□	613	610	607	604	601
635	632	629	626	623	620	□	614	611	608	605	602
636	633	630	627	□	□	□	615	612	609	606	603

The terminal numbers are unique three-digit numbers. The highest digit indicates the arrangement position of the terminal block shown in the following figure; the lower two digits indicate the terminal position within the terminal block (top right terminal is assigned “01”; bottom left terminal is assigned “36”). The terminals that cannot be used are indicated as “□”.



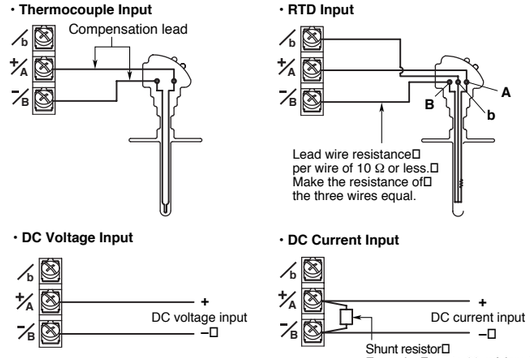
Label on the Back Cover of the Terminal Cover

Indicates the type of input/output signal for each connector. Below is an illustration of a six-loop control analog terminal block.



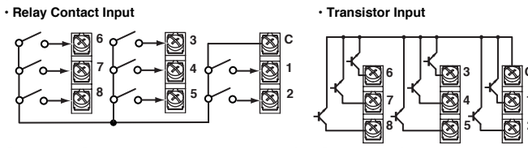
Input Wiring

Measurement Input Wiring

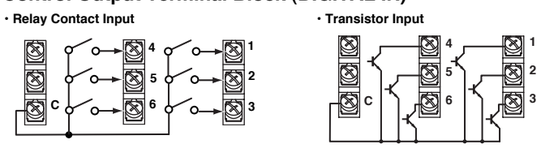


Contact Input (DIGITAL IN/REMOTE) Wiring

- **Measurement Alarm Option Terminal Block Remote Input (REMOTE)**

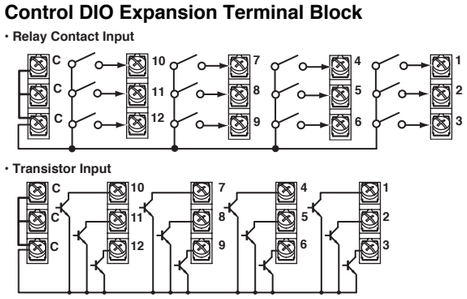


- **Control Output Terminal Block (DIGITAL IN)**



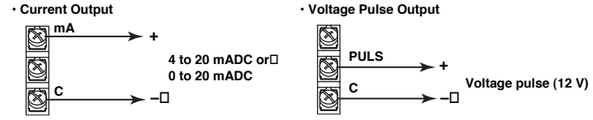
Relay Contact Input/Transistor Input
Input signal: no-voltage contact, open collector
Input condition: ON voltage, under 0.5 V (30 mADC); OFF voltage, leakage current under 0.25 mA
Input format: photocoupler isolation (common)
Withstand voltage: 500 VDC, 1 min (between input terminal and earth)

- **Control DIO Expansion Terminal Block**



Output Wiring

Control Output (LOOP1 to 6) Wiring

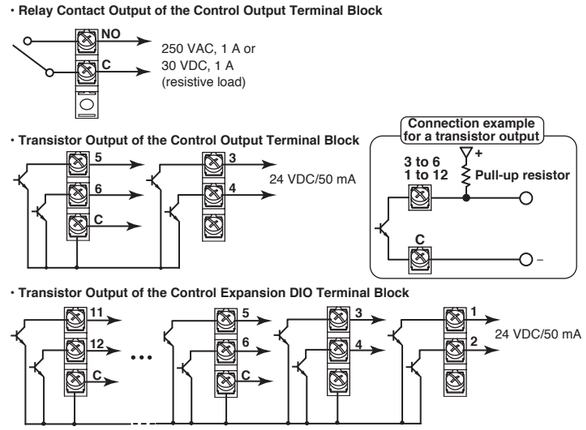


Current Output
Output signal: 4 to 20 mADC or 0 to 20 mADC
Resistive load: 600 Ω or less

Voltage Pulse Output
Output signal: ON voltage=12 VDC
Resistive load: 600 Ω or more

Relay Contact Output
Output signal: NC, NO, COM
Contact rating: 250 VAC (50/60 Hz)/3 A or 30 VDC/3 A (resistive load)

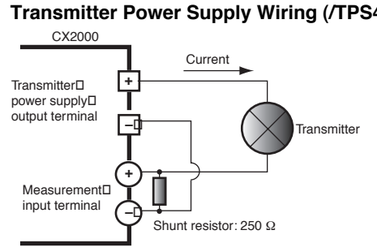
Contact Output (DIGITAL OUT) Wiring



Relay Output
Output form: relay contact
Contact rating: 250 VAC (50/60 Hz)/1 A or 30 VDC/1 A (resistive load)

Transistor Output
Output method: open collector output
Contact rating: 24 VDC/50 mA

Transmitter Power Supply Wiring (/TPS4 Option)



Output
Number of loops: 4
Output voltage: 22.8 to 25.2 V (at rated current load)
Rated output current: 4 to 20 mADC
Maximum output current: 25 mADC (overcurrent protection operating current: approx. 68 mADC)
Maximum length of wiring: 2 km (when using CEV cables)