IAI
Quality and Innovation

RCM-GW Gateway Unit

First Step Guide Third Edition

Thank you for purchasing our product.
Make sure to read the Safety Guide and detailed Instruction Manual as well as this First Step Guide to ensure correct use.
This Instruction Manual is original.

Warning : Read the instruction manual carefully and follow the instruction manual when handling this equipment.
Please downloaded the user's manual from our website.
You can download it free of change. User registration is required for first time users.
URL:www.iai-robot.co.jp/data_dl/CAD_MANUAL/
Keep a printout of the introduction manual near the equipment in which this product is installed so that it can be checked at all times, or display it on your computer, tablet terminal, etc. so that you can check it immediately.
If you need a bound copy of the instruction manual, order it from the nearest sales office listed in the First Step Guide or at the end of the instruction manual. It will be provided for a fee.

Product Check

A standard configuration of this product is comprised of the following parts.
If you find any fault in the contained model or any missing parts, contact us or our distributor.

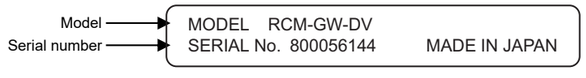
1. Parts

No.	Part Name		Model	Remarks
1	Controller Main Body		Refer to "How to read the model plate" and "How to read the model".	
Accessories				
2	Fieldbus Connector	DeviceNet type	SMSTB2.5/5-ST-5.08AU (Supplier : PHOENIX CONTACT)	
		CC-Link type		
		PROFIBUS type	Prepare Dsub 9-pin (female) connector.	
3	SIO Communication Connector Plug		MC1.5/6-ST-3.5 (Supplier : PHOENIX CONTACT)	Applicable Cable Size 0.3mm^2 (AWG22)
4	Power Supply Input Connector Plug		MC1.5/4-ST-3.81 (Supplier : PHOENIX CONTACT)	Applicable Cable Size 1.25mm^2 (AWG16)
5	Terminal Resistance	DeviceNet type	Please prepare separately	121Ω±1% 1/4W
		CC-Link type	130Ω1/2W, 110Ω1/2W enclosed one unit each	
		PROFIBUS type	Built-in (selected on terminal resistance switch)	
6	First Step Guide		ME0272	
7	Safety Guide		M0194	

2. Instruction Manuals related to this product

No.	Name	Manual No.
1	DeviceNet Gateway Unit RCM-GW-DV Instruction Manual	ME0168
2	CC-Link Gateway Unit RCM-GW-CC Instruction Manual	ME0169
3	PROFIBUS Gateway Unit RCM-GW-PR Instruction Manual	ME0177
4	ACON-C/CG Controller Positioner Type Instruction Manual	ME0176
5	ACON-SE Controller Serial Communication Type Instruction Manual	ME0171
6	PCON-C/CG/CF Controller Positioner Type Instruction Manual	ME0170
7	PCON-SE Controller Serial Communication Type Instruction Manual	ME0163
8	SCON Controller Instruction Manual	ME0161
9	ERC2 Actuator with integrated Controller Instruction Manual (SIO type)	ME0159

3. How to read the model plate



4. How to read the model

- **RCM-GW-DV : DeviceNet Gateway Unit**
- **RCM-GW-CC : CC-Link Gateway Unit**
- **RCM-GW-PR : PROFIBUS Gateway Unit**

Basic Specifications

1. RCM-GW-DV

Item		Specification					
DeviceNet type	Communication Protocol	DeviceNet2.0 (certified interface)					
	For Communication	Master/Slave Connection		Bit Strobe			
				Polling			
				Cyclic			
	Baud Rate	500k/250k/125kbps					
	Communication Cable Length (Note 1)	Baud Rate	Max. Network Length	Max. Branch Line Length	Total Branch Line Length		
		500kbps	100m	6m	39m		
		250kbps	250m		78m		
		125kbps	500m		156m		
		(Note) When DeviceNet dedicated thick cable is used					
	Number of Occupied Nodes	1 node					
	Communication Power Supply	Voltage 24V DC±10% Current Consumption 60mA Externally Supplied (Supplied from DeviceNet communication cable side)					
	Communications Cable	DeviceNet dedicated cable					

Note 1 Refer to the instruction manuals for the master unit and the mounted programmable logic controller (stated as PLC from now on) when a T-junction communication is to be conducted.

2. RCM-GW-CC

Item		Specification					
CC-Link type	Communication Protocol	CC-Link Ver1.10/Ver2 (Note 1)					
	Baud Rate	10M/5M/2.5M/625k/156kbps					
	Communication System	Broadcast polling system					
	Synchronization System	Frame synchronization system					
	Transmission Path Format	Bus format (EIA RS485 conformance 3-line type)					
	Error Control System	CRC ($X^{16}+X^{12}+X^5+1$)*1					
	Number of Occupied Stations	Remote Device Station [Refer to Field Network Wirings and Settings Section]					
	Communication Cable Length (Note 2)	Baud Rate	10Mbps	5Mbps	2.5Mbps	625kbps	156kbps
		Total Cable Length	100m	160m	400m	900m	1200m
	Communications Cable	CC-Link dedicated cable					

Note 1 When the host CC-Link master unit is Ver.1, the available RCM-GW-CC is limited to Ver.1.10. Even if the host CC-Link master unit is Ver.2, RCM-GW-CC Ver.1.10 is connectable, but the available functions are limited.
[Refer to 5. Operation Modes and Main Functions [2] RCM-GW-CC or Instruction Manual]
Note 2 Refer to the instruction manuals for the master unit and the mounted programmable logic controller (stated as PLC from now on) when a T-junction communication is to be conducted.
*1 CRC : Cyclic Redundancy Check It is a data error detection method often used for the synchronous transmission

3. RCM-GW-PR

Item		Specification					
PROFIBUS type	Communication Protocol	PROFIBUS-DP (RS485 conformance)					
	Communication System	Hybrid System (Master-Slave System or Token Passing System)					
	Baud Rate	9.6k to 12Mbps (Automatic Following to the Master)					
	Communication Cable Length (Type A Cable)	Baud Rate	12/6/3Mbps	1.5Mbps	500kbps	187.5kbps	93.75/45.45/ 19.2/9.6kbps
		Total Cable Length	100m	200m	400m	1000m	1500m
	Number of Occupied Nodes	1 node					
	Communications Cable	Type A Cable for PROFIBUS-DP (Standard EN50170)					

4. Common Specifications

Item		Specification
Power Supply		24V DC±10%
Current Consumption		MAX. 300mA
Heat Generation		7.2W
Connectable Models		ERC2, PCON-C/CG/SE, ACON-C/CG/SE, SCON
Number of Max. Controllable Axes		16-axis (There is a limitation for RCM-GW-CC depending on the Operation Mode [Refer to 5. Operation Modes and Main Functions [2] RCM-GW-CC or Instruction Manual])
For Communication	Communication Protocol	RS485 conformance
	Communication System	Start-Stop Synchronization System Half-Duplex Communication
	Baud Rate	230.4kbps
	Error Control System	Non parity bit, CRC*1
	Communication Cable Length	Total Cable Length 100m or less
	Communications Cable	Twisted-pair shielded cable (Recommended : Taiyo Cabletec Corporation K-SB/20276 × Length [m] 2P × AWG22)
Environment	Surrounding air temperature	0 to 40°C
	Surrounding humidity	85%RH or less (non-condensing)
	Surrounding environment	[Refer to Installation Environment section]
	Surrounding storage temperature	–10 to 65°C
	Surrounding storage humidity	90%RH or less (non-condensing)
	Vibration durability	XYZ Each direction 10 to 57Hz Pulsating amplitude 0.035mm (continuous) 0.075mm (intermittent) 57 to 150Hz 4.9m/s^2 (continuous) 9.8m/s^2 (intermittent)
	Protection class	IP20
Cooling Method		Natural air-cooling
Insulation Resistance		Between power supply terminal and FG 500V DC 10MΩ or more
Product Life		(Reference) 5 to 10 years: It varies significantly by the effects of the usage condition (especially temperature).
External Dimensions		35W × 178.5H × 68.1D [mm]
Weight		Approx. 480g

*1 CRC : Cyclic Redundancy Check It is a data error detection method often used for the synchronous transmission

5. Operation Modes and Main Functions

Operation Mode can be selected on the mode switch located on the front panel. [Refer to Field Network Wirings and Settings Section]

[1] RCM-GW-DV

Main Functions	Position Number Specification Mode	Direct Numeric Specification Mode	Command Specification Mode	
			Positioner Operation	Simplified Direct Value Operation
Position Data Direct Specification Movement	×	○	△(Note 1)	○
Velocity and Acceleration Direct Setup	×	○	△(Note 1)	△(Note 1)
Pressing Operation	○	○	△(Note 1)	△(Note 1)
Current Position Reading	×	○	△(Note 2)	○
Number of Positions Specification (Note4)	○	×	○	×
Completed Position Number Reading	○	×	○	○
Signal Reading for Each Status	○	○	○	○
Number of Max. Connectable Axes	16	16	16	16
Number of Selectable (Valid) Axes	0 to 15	0 to 15	0 to 15	0 to 15
Max. Value for Position Data Specification (mm or deg)	Position Table Setting	9999.99(Note 3)	9999.99(Note 3)	9999.99(Note 3)

[2] RCM-GW-CC

Main Functions	Position Number Specification Mode	Direct Numeric Specification Mode			Command Specification Mode	
		Position Data Limit Mode	Normal Positioning Mode	Pressing Available Mode	Positioner Operation	Simplified Direct Value Operation
Position Data Direct Specification Movement	×	○	○	○	△(Note 1)	○
Velocity and Acceleration Direct Setup	×	×	○	○	△(Note 1)	△(Note 1)
Pressing Operation	○	×	×	○	△(Note 1)	△(Note 1)
Current Position Reading	×	○	○	○	△(Note 2)	○
Number of Positions Specification (Note4)	○	×	×	×	○	×
Completed Position Number Reading	○	×	×	×	○	○
Number of Max. Connectable Axes	14	14	7	3	16	16
Number of Selectable (Valid) Axes	0 to 13	0 to 13	0 to 6	0 to 2	0 to 15	0 to 15
Max. Value for Position Data Specification (mm or deg)	Position Table Setting	327.67	327.67	9999.99(Note 3)	9999.99(Note 3)	9999.99(Note 3)
RCM-GW-CC Ver1.10 Corresponding Model	○				×	
RCM-GW-CC Ver2 Corresponding Model	○					

[3] RCM-GW-PR

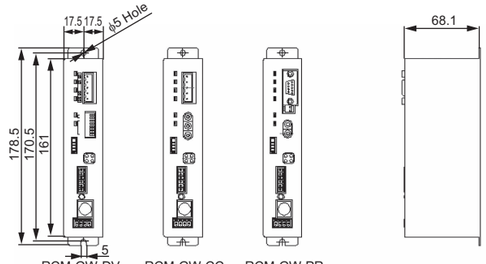
Main Functions	Position Number Specification Mode	Direct Numeric Specification Mode	Command Specification Mode	
			Positioner Operation	Simplified Direct Value Operation
Position Data Direct Specification Movement	×	○	△(Note 1)	○
Velocity and Acceleration Direct Setup	×	○	△(Note 1)	△(Note 1)
Pressing Operation	○	○	△(Note 1)	△(Note 1)
Current Position Reading	×	○	△(Note 2)	○
Number of Positions Specification (Note 4)	○	×	○	×
Completed Position Number Reading	○	×	○	○
Signal Reading for Each Status	○	○	○	○
Number of Max. Connectable Axes	16	16	16	16
Number of Selectable (Valid) Axes	0 to 15	0 to 15	0 to 15	0 to 15
Max. Value for Position Data Specification (mm or deg)	Position Table Setting	9999.99(Note 3)	9999.99(Note 3)	9999.99(Note 3)

Note 1 Although an operation cannot be performed with specifying values directly, it is available to operate by rewriting the data on the position table from the write command.
Please note, however, that the EEPROM has a 100,000 write limitation. Consider the effect of this mode with regard to product lifespan.
Note 2 Direct reading cannot be performed since it is not the constant output. However, reading is available from the read command.
Note 3 This is the maximum value that can be written to the data field; however, the maximum value input should not exceed the actuator stroke.
Note 4 The number of available positions varies according to which PIO pattern is selected through the Operation Mode parameter.

Limitation in Number of Positions by PIO Pattern Select		ERC2 Standard, PCON-C/CG/SE, ACON-C/CG and SCON						ERC2-SE ACON-SE PCON-SE
		PIO Pattern (Parameter No.25)						
		0	1	2	3	4	5	
ERC2	Operation Type	Standard	Solenoid Valve Type	Zone Signal Type	Position Zone Type	SIO	–	SIO Type
	Position Number Specification Mode	8	×	16	16	64	–	64
	Command Specification Mode	8	×	16	16	64	–	64
PCON ACON SCON	Operation Type	Positioning Mode	Teaching Mode	256-point Mode	512-point Mode	Electromagnetic Valve Mode 1	Electromagnetic Valve Mode 2	SIO Type
	Position Number Specification Mode	64	64	256	512	7	×	64
	Command Specification Mode	64	64	256	512	7	×	64

[Refer to the instruction manual of each controller for PIO pattern details.]

External Dimensions



RCM-GW-DV RCM-GW-CC RCM-GW-PR
(Note) Dimensions are the same for all the models.

Installation Environment

This product is capable for use in the environment of pollution degree 2*1 or equivalent.
*1 Pollution Degree 2 : Environment that may cause non-conductive pollution or transient conductive pollution by frost. (IEC60664-1)

1. Installation Environment

Do not use this product in the following environment.

- Location where the surrounding air temperature exceeds the range of 0 to 40°C
- Location where condensation occurs due to abrupt temperature changes
- Location where relative humidity exceeds 85%RH
- Location exposed to corrosive gases or combustible gases
- Location exposed to significant amount of dust, salt or iron powder
- Location subject to direct vibration or impact
- Location exposed to direct sunlight
- Location where the product may come in contact with water, oil or chemical droplets
- Environment that blocks the air vent [Refer to Installation and Noise Elimination Section]

When using the product in any of the locations specified below, provide a sufficient shield.

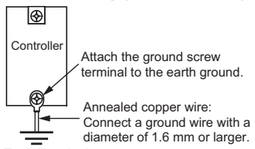
- Location subject to electrostatic noise
- Location where high electrical or magnetic field is present
- Location with the mains or power lines passing nearby

2. Storage and Preservation Environment

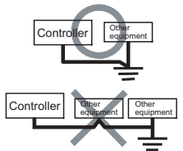
The storage and preservation environment should comply with the same standards as those for the installation environment. In particular, when the machine is to be stored for a long time, pay close attention to environmental conditions so that no condensation forms. Unless specially specified, moisture absorbency protection is not included in the package when the machine is delivered. In the case that the machine is to be stored and preserved in an environment where condensation is anticipated, take the condensation preventive measures from outside of the entire package, or directly after opening the package.

Installation and Noise Elimination

1. Noise Elimination Grounding (Frame Ground)



Earth Terminal
Class D grounding
(Grounding resistance at 100Ω or less)



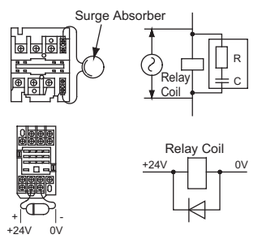
Do not share the ground wire with or connect to other equipment. Ground each controller.

2. Precautions regarding wiring method

(1) Twist the wires for the 24V DC power unit.
(2) Separate the communication line from the power line.

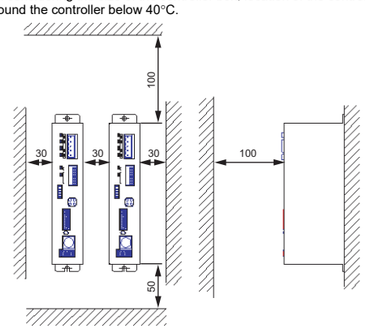
3. Noise Sources and Elimination

Carry out noise elimination measures for power devices on the same power path and in the same equipment.
The following are examples of measures to eliminate noise sources.
(1) AC solenoid valves, magnet switches and relays
[Measure] Install a Surge absorber parallel with the coil.
(2) DC solenoid valves, magnet switches and relays
[Measure] Install a diode parallel with the coil. Use a DC relay with a built-in diode.

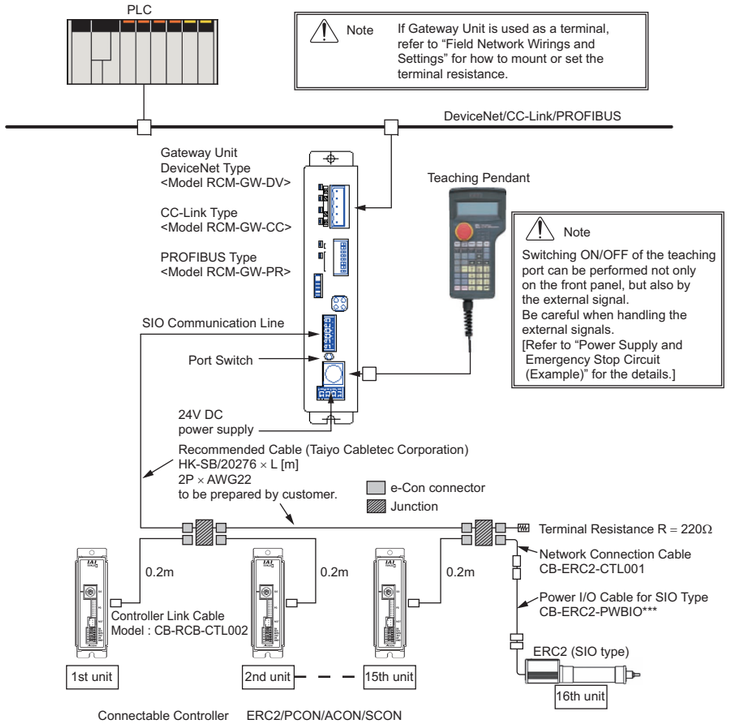


4. Heat Radiation and Installation

Design and Build the system considering the size of the controller box, location of the controller and cooling factors to keep the ambient temperature around the controller below 40°C.



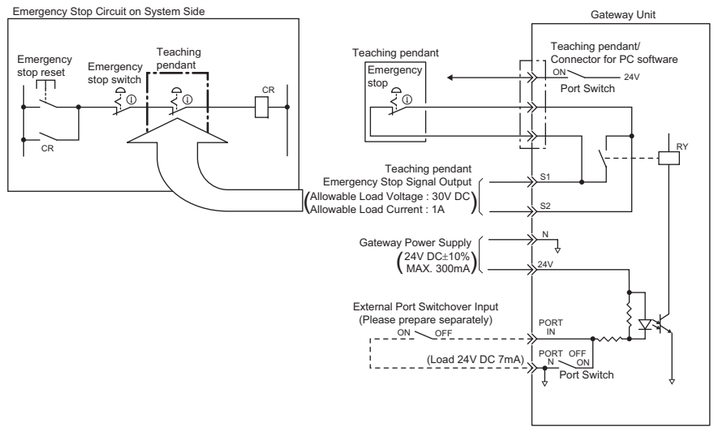
System Configuration (Example)



Note : Have the 0V line in common for the 24V power supply for each controller (except for SCON).

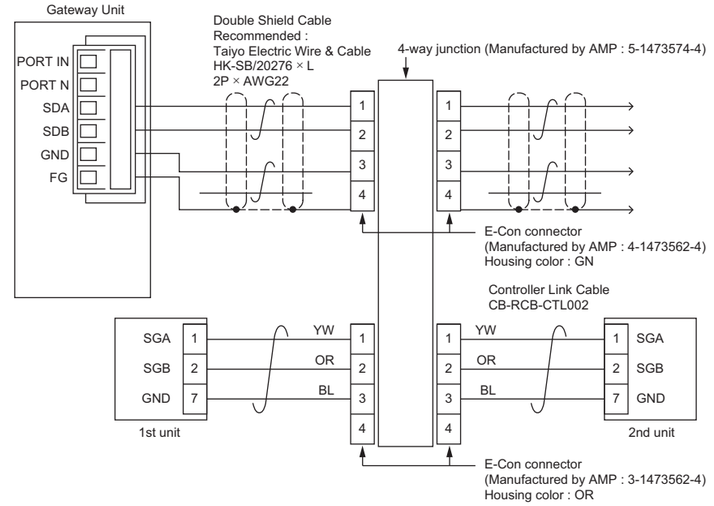
Power Supply and Emergency Stop Circuit (Example)

There is no emergency stop function for Gateway Unit. Perform the emergency stop using the control on the system side. CR is an emergency stop relay for the entire system. While the connector port for the teaching pendant and PC is on, the contact signal of the emergency stop switch can be output externally, thus the emergency stop circuit of the system can be constructed. Also, Switching on/off of the port can be performed not only on the port switch on the main unit of Gateway Unit, but also by the external signal. Shown below is the relation between switching on/off of the port and the emergency stop signal output.



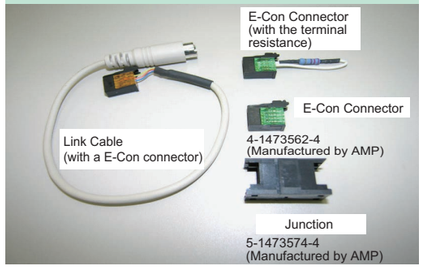
External Port Switchover Input	Port Switch	Emergency Stop Signal Output (Push Button Switch)	Teaching pendant/ Connector Port for PC
OFF	OFF	Disable (ON)	Disable
ON	OFF	Enable (Always ON = b contact)	Enable
OFF	ON		
ON	ON		

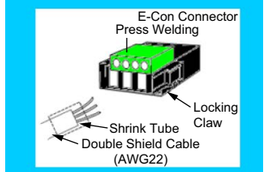
SIO Communication Line Wiring Layout

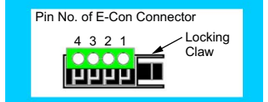


There should be no problem to have a terminal block connection instead of a 4-way junction.
Use a terminal block connection or direct-joint connection if there is a concern that a faulty connection may occur as a result of using the E-Con connector.

■ Controller Link Cable
(enclosed with E-Con connector, junction and terminal resistance)
Model CB-RCB-CTL002

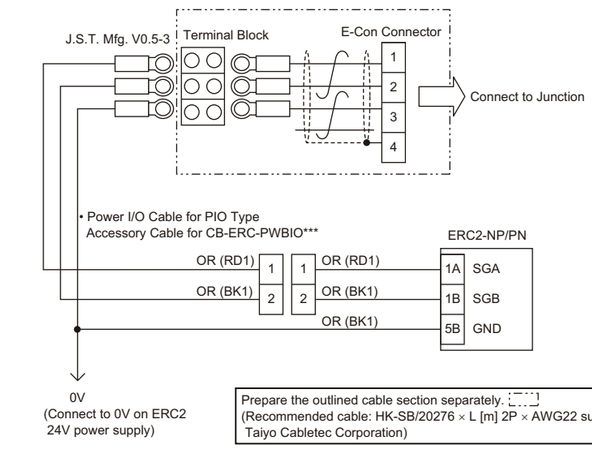






- Make sure to select the right cable size.
- Do not peel off the sheath.

For ERC2 (PIO type)
For SIO Type, connection to a 4-way junction is available with the network connection cable (CB-ERC2-CTL001).
For PIO Type, perform the wiring as shown below with using a device such as a terminal block.

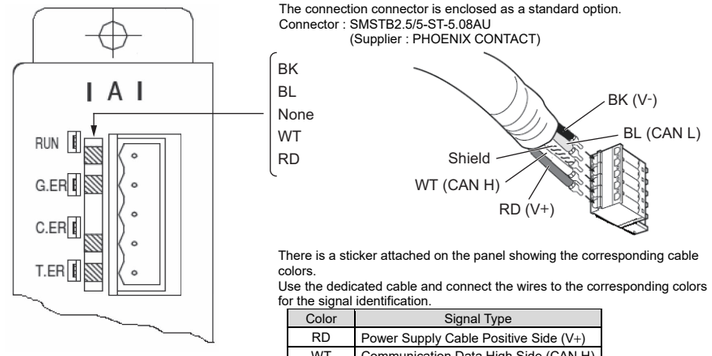


Field Network Wirings and Settings

1. DeviceNet (RCM-GW-DV)

[1] Wiring

For details, refer to the Instruction Manuals of the master unit and PLC in which in the master unit is installed.



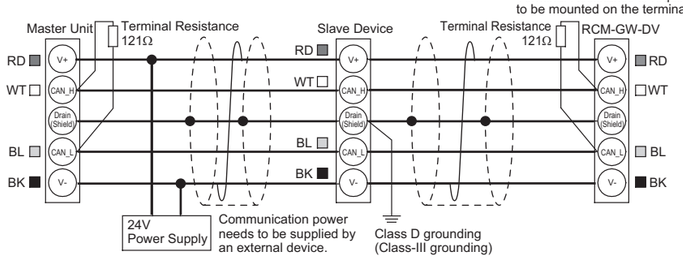
The connection connector is enclosed as a standard option.
Connector : SMSTB2.5/5-ST-5.08AU
(Supplier : PHOENIX CONTACT)

BK
BL
None
WT
RD

There is a sticker attached on the panel showing the corresponding cable colors.
Use the dedicated cable and connect the wires to the corresponding colors for the signal identification.

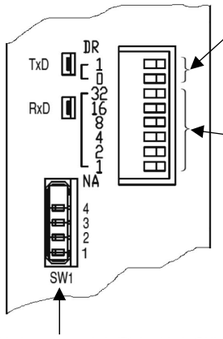
Color	Signal Type
RD	Power Supply Cable Positive Side (V+)
WT	Communication Data High Side (CAN H)
–	Shield
BL	Communication Data Low Side (CAN L)
BK	Power Supply Cable Negative Side (V–)

Terminal Resistance is required to be mounted on the terminal.



[2] Settings for DeviceNet Communication and Operation Modes

Turn off the power before performing this operation. Also, refer to Instruction Manual for the details of the modes.



Baud rate setting switch (Left side is ON) ○ : ON × : OFF

Baud Rate [bps]	DR1	DR0
125k	×	×
250k	×	○
500k	○	×

Baud rate is the communication speed, and its unit is bps (bit/sec).
It is necessary that all the settings of the devices have to be the same in one DeviceNet.

Node address setting switch (Left side is ON) ○ : ON × : OFF

Address	NA32	NA16	NA8	NA4	NA2	NA1
0	×	×	×	×	×	×
1	×	×	×	×	×	○
2	×	×	×	×	○	×
3	×	×	×	×	○	○
⋮	⋮	⋮	⋮	⋮	⋮	⋮
62	○	○	○	○	○	×
63	○	○	○	○	○	○

The settings have to be made in binary values. Ordinary, the master unit is to be set to 63.

Mode setting switch (Right side is ON) ○ : ON × : OFF

No.	Mode		Max. Number of Connectable Axes	Mode Setting Switch 4	3	2	1	Number of PLC I/O Bytes*1 Input	Output
1	Position Number specification mode		16	×	×	○	×	48	48
2	Direct numeric specification mode		4	×	×	×	×	28	52
3			6	×	○	×	×	40	76
4			8	○	×	×	×	52	100
5			10	○	○	×	○	64	124
6			16	○	○	×	×	100	196
7	Command specification mode	Large	16Note 1	×	×	×	○	160	160
8		Middle		×	×	×	○	128	128
9		Small		○	×	×	○	64	64

Note 1 The numbers of bytes stated in the table above is the maximum data size that can be handled in each mode. This limits the number of connectable axes. The input and output data size is affected by the total number of the positioner operation axes and simple direct operation axes.

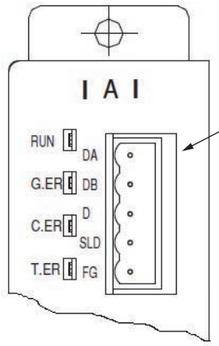
PLC input = Fixed value (18 bytes) + Number of Positioner Operation Axes × 2 bytes + Number of Simple Direct Operation Axes × 6 bytes
PLC output = Fixed value (18 bytes) + Number of Positioner Operation Axes × 2 bytes + Number of Simple Direct Operation Axes × 8 bytes

*1 Number of PLC I/O Bytes: Number of data register occupied by PLC ⇒ 2 bytes = 1 word = 1ch

2. CC-Link (RCM-GW-CC)

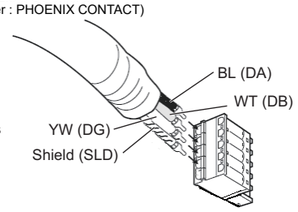
[1] Wiring

For details, refer to the Instruction Manuals of the master unit and PLC in which in the master unit is installed.



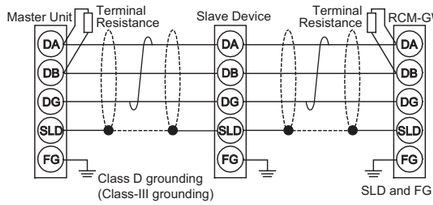
The connection connector is enclosed as a standard option.
Connector : SMSTB2.5/5-ST-5.08AU
(Supplier : PHOENIX CONTACT)

DA (BL)
DB (WT)
DG (YW)
SLD (Shield)
FG (connection is not required)



Use the dedicated cable and connect the wires to the corresponding colors for the signal identification.

Color	Signal Type
BL	Communication Line A (DA)
WT	Communication Line B (DB)
YW	Communication Ground Line (DG)
–	Shield (SLD)



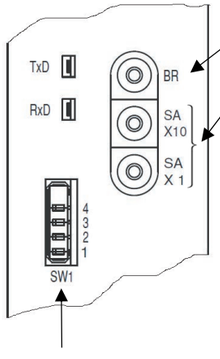
Terminal Resistance is required to be mounted on the terminal.

The terminal resistor differs depending on the type of the dedicated cable for CC-Link.
• Cable FANC-SBH···130Ω1/2W (High Performance Cable dedicated for CC-Link)
• Cable FANC-SB·····110Ω1/2W (CC-Link Dedicated Cable)

SLD and FG are internally connected.

[2] Settings for CC-Link Communication and Operation Modes

Turn off the power before performing this operation. Also, refer to Instruction Manual for the details of the modes.



Baud rate setting switch

Station number setting switch

Switch	Description
BR	[Baud rate setting switch] It establishes the communication speed. The setting more than 5 is invalid. 156k, 625k, 2.5M, 5M, 10M
SA × 10 SA × 1	[Station number setting switch] Valid settable range is from 1 to 64. SA × 10····· It is to set the digit of ten's place. SA × 1····· It is to set the digit of one's place. (Example) When setting the station number 12: Set 1 to SA × 10. Set 2 to SA × 1.

Ordinary, the master unit is to be set to 00.

Mode setting switch (Right side is ON) ○ : ON × : OFF

No.	Mode		Max. Number of Connectable Axes	Mode setting switch 4	3	2	1	PLC Master Unit Setting Ver.1 Number of occupied stations	Ver.2 Number of occupied stations	Ver.2 Extended Cyclic Setting
1	Position number specification mode		14	×	×	○	×	4	4	1
2	Direct numeric specification mode	Position Data Limit Mode	14	×	×	×	×	4	4	1
3		Normal Positioning Mode	7	×	○	×	×	4	4	1
4		Pressing Available Mode	3	×	○	○	×	4	4	1
5	Command specification mode	Large	16	×	×	×	○		3	2
6		Middle		×	○	×	○		3	4
7		Small		○	×	×	○		2	8

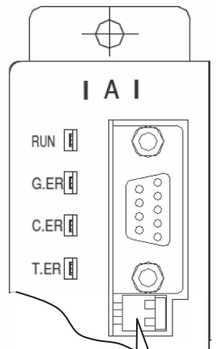
Note 1 Although the actual number of used input and output words is as shown below, the areas assigned by the number of occupied stations set to the master unit and the extended cyclic settings cannot be used for other purposes. Refer to Instruction Manual for the details of the address assignment.

No.	Mode		Remote I/O GW→PLC (RX)	Remote I/O PLC (RY)→GW	Data Register GW→PLC (RWr)	Data Register PLC (RWw)→GW
1	Position number specification mode		7 words	7 words	9 words	9 words
2	Direct numeric specification mode	Position Data Limit Mode	7 words	7 words	16 words	16 words
3		Normal Positioning Mode	7 words	7 words	16 words	16 words
4		Pressing Available Mode	2 words + 1 byte	6 words	6 words + 2 bytes	14 words
5	Command specification mode	Large	9 words	9 words	38 words	49 words
6		Middle	9 words	9 words	35 words	45 words
7		Small	9 words	9 words	17 words	21 words

3. PROFIBUS (RCM-GW-PR)

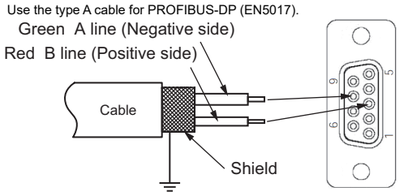
[1] Wiring

For details, refer to the Instruction Manuals of the master unit and PLC in which in the master unit is installed.



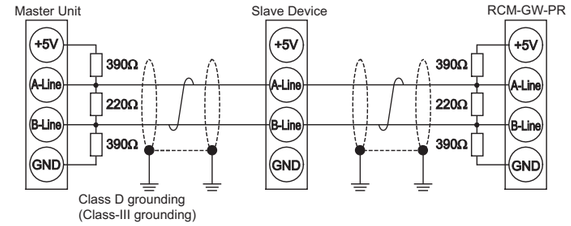
Terminal Resistance Setting Switch

Use the type A cable for PROFIBUS-DP (EN5017).



Use D-Sub 9-pin (female) type of PROFIBUS-DP Standard (recommended for EN5017) for the connector.

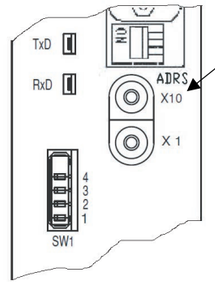
Pin No.	Signal Name	Detail
1	NC	Unconnected
2	NC	Unconnected
3	B-Line	Communication line B (Positive side)
4	NC	Unconnected
5	GND	Signal grounding
6	+5V	+5V output
7	NC	Unconnected
8	A-Line	Communication line A (Negative side)
9	NC	Unconnected
Housing	Shield	Cable Shield



Note : RCM-GW-PR is equipped with a built-in terminal resistance. If RCM-GW-PR is connected as the terminal, turn the terminal resistance setting switch ON. If a connector that is equipped with a terminal resistance is used or RCM-GW-PR is not located on the terminal, keep the switch turned OFF.

[2] Settings for PROFIBUS Communication and Operation Modes

Turn off the power before performing this operation. Also, refer to Instruction Manual for the details of the modes.



Node address setting switch

Switch	Description
ADRS ×10 ×1	[Station number setting switch] Valid settable range is from 3 to 32. × 10····· It is to set the digit of ten's place. × 1····· It is to set the digit of one's place. (Example) When setting the station number 12: Set 1 to × 10. Set 2 to × 1.

Typically, the master unit is to be set to 02.
Node address 00 is either for the monitor or for the inspection functions while 01 is for monitoring devices.
Set numbers within the range up to 32 at the maximum in the order of 03, 04, 05, … from the closer to the further from the master unit.

Mode setting switch (Right side is ON) ○ : ON × : OFF

No.	Mode		Max. Number of Connectable Axes	Mode Setting Switch 4	3	2	1	Number of PLC I/O Bytes*1 Input	Output
1	Position number specification mode		16	×	×	○	×	48	48
2	Direct numeric specification mode		4	×	×	×	×	28	52
3			6	×	○	×	×	40	76
4			8	○	×	×	×	52	100
5			10	○	○	×	○	64	124
6			16	○	○	×	×	100	196
7	Command specification mode	Large	16Note 1	×	×	×	○	160	160
8		Middle		×	○	×	○	128	128
9		Small		○	×	×	○	64	64

Note 1 The numbers of bytes stated in the table above is the maximum data size that can be handled in each mode. This limits the number of connectable axes. The input and output data size is affected by the total number of the positioner operation axes and simple direct operation axes.

PLC input = Fixed value (18 bytes) + Number of Positioner Operation Axes × 2 bytes + Number of Simple Direct Operation Axes × 6 bytes
PLC output = Fixed value (18 bytes) + Number of Positioner Operation Axes × 2 bytes + Number of Simple Direct Operation Axes × 8 bytes

*1 Number of PLC I/O Bytes: Number of data register occupied by PLC ⇒ 2 bytes = 1 word = 1ch

Starting Procedures

When using this product for the first time, pursue work while making sure to avoid omission and incorrect wiring by referring to the procedure below. “PC” stated in this section means “PC software”.
This section explains the procedure for starting up the Gateway Unit. For the settings and wiring of each of the individual devices, controllers, and actuators connected to the network, refer to the individual device's Instruction Manual.

Check of Packed Items
Has everything been received?
No→ Contact us or our distributor.

↓ Yes

Installation and Wiring
Following Instruction Manual and this guide, set Gateway Unit and have the wirings for the network and SIO completed.
Also, have all the wirings done for the power supply, actuator motor and encoder cable following the instructions on the Instruction Manual for each controller.

→ Point Check Item
• Is frame ground (FG) connected?
• Has the noise countermeasure been taken?
• Is the terminal treatment conducted on the shielded wire?
• Is the terminal resistance connected?

←Yes

Initial Settings of Gateway Unit
Ensure the settings for the mode, field network baud rate and node addresses (station numbers) comply with the system.

↓

Initial Settings of IAI Controller Connected to Gateway Unit
• Have the settings for axis numbers.
• Have the setting for Parameter No. 16 SIO Baud Rate to 230.4kbps.
• Have the setting for Parameter No. 17 Slave Station Transmitter Activation Minimum Waiting Time to 2msec.
• Have all other necessary parameter settings done.

↓

PLC (Master Unit) Baud Rate
Have the settings for the node addresses (station numbers) and baud rate.

→ Important Check Item
Is the programmed Gateway control sequence complied with the operation mode and the system?

←Yes

Power Supply
1) Supply the power to the IAI controller that is connected to Gateway Unit.
2) Supply the power to Gateway Unit
3) Supply the power to PLC (master unit)

↓

Communication Establishment Check
• Confirm that the communication has been established by checking the monitor LEDs on Gateway Unit.
[Refer to Troubleshooting Section.]
• Are the LEDs turned on in normal condition? Is PLC (master unit) side also in normal condition?
(Note) Refer to the PLC and master unit instruction manuals for the details how to check on the master unit side.

→No Reconfirm all the settings following the procedure in this chart while referring to the Instruction Manual for each unit, controller and PLC.

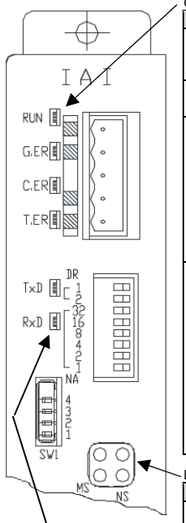
↓ Yes

Communication is established. Move on to the system operation check and adjustment.

Troubleshooting

On Gateway Unit, there are the monitor LEDs for the field network and SIO communication.
You can confirm the communication establishment and also communication errors on these LEDs.

1. DeviceNet (RCM-GW-DV)



Gateway Unit Status Display LEDs

LED	Color	Indication	Description	
RUN	GN	Illuminating	CPU is in process.	
		OFF	The power is OFF or CPU is not working. Please contact us if the LED does not turn ON even after the power is turned ON.	
G.ER	RD	Illuminating	CPU error. Please contact us.	
		OFF	CPU is operating in normal condition.	
C.ER	RD	Illuminating	Either an error is occurred on DeviceNet module or the connection with DeviceNet is not established. Check the communication status LEDs for the connection to DeviceNet, and check the settings and wirings. Even if this LED is ON, the connection to the teaching tool is available as long as RUN is turned ON.	
		Flashing	The port switch is ON. The interval for the flashing should be 1sec.	
		OFF	Status is in normal condition.	
T.ER	RD	Illuminating	There is a communication error occurred to all the axes that are in SIO communication with the connected IAI controller.	• Check the settings in the parameters (No. 16 and 17) for each axis controller. • Check the axis number settings. • Check the wiring connections of SIO communication lines. • Check the terminal resistance devices. • Check the noise prevention equipment.
		Flashing	There is a communication error occurred to one or more of the axes that are in SIO communication with the connected IAI controller.	
		OFF	Status is in normal condition.	

DeviceNet status indicator LEDs (MS: Node condition, NS: Network condition)

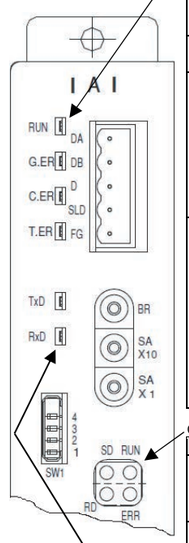
LED	Color	Indication	Description	
MS	GN	Illuminating	The machine is in the normal operation.	
		Flashing	Connection to the master is not established. Check if it has been registered in the master’s scanning list.	
	RD	Illuminating	A hardware error occurred. Board must be replaced. Please contact us.	
		Flashing	There is an error occurred but it is not critical such like a configuration error or incorrect switch settings. It can be recovered with a rebuild of the settings.	
	–	OFF	Power is not supplied.	
NS	GN	Illuminating	The connection has been established and the communication is being performed normally.	
		Flashing	Online but network connection is not yet established. Communication Stop (Network is normal). Check the scan list.	
	RD	Illuminating	A communication error has occurred. The communication cannot be established due to a duplication of node addresses or a Busoff (communication stop due to frequent data error detection).	Check the node address settings, baud rate setting, communication line wiring connections, terminal resistance connections, communication power supply, noise prevention, etc.
		Flashing	A communication error has occurred. (Communication time-out is detected.)	
	–	OFF	The machine is not on-line. The power to the DeviceNet is not supplied.	

Refer to Instruction Manual for the details of the DeviceNet status check.

SIO Communication Status Display LEDs

LED	Color	Indication	Description
TxD	GN	Flashing	Data is being sent (from Gateway Unit to IAI controller).
		OFF	Data sending is being stopped (from Gateway Unit to IAI controller).
RxD	GN	Flashing	Data is being received (from IAI controller to Gateway Unit).
		OFF	Data receiving is being stopped (from IAI controller to Gateway Unit).

2. CC-Link (RCM-GW-CC)



Gateway Unit Status Display LEDs

LED	Color	Indication	Description	
RUN	GN	Illuminating	CPU is in process.	
		OFF	The power is OFF or CPU is not working. Please contact us if the LED does not turn ON even after the power is turned ON.	
G.ER	RD	Illuminating	CPU error. Please contact us.	
		OFF	CPU is operating in normal condition.	
C.ER	RD	Illuminating	Either an error is occurred on CC-Link module or the connection with CC-Link is not established. Check the communication status LEDs for the connection to CC-Link, and check the settings and wirings. Even if this LED is ON, the connection to the teaching tool is available as long as RUN is turned ON.	
		Flashing	The port switch is ON. The interval for the flashing should be 1sec.	
		OFF	Status is in normal condition.	
T.ER	RD	Illuminating	There is a communication error occurred to all the axes that are in SIO communication with the connected IAI controller.	• Check the settings in the parameters (No. 16 and 17) for each axis controller. • Check the axis number settings. • Check the wiring connections of SIO communication lines. • Check the terminal resistance devices. • Check the noise prevention equipment.
		Flashing	There is a communication error occurred to one or more of the axes that are in SIO communication with the connected IAI controller.	
		OFF	Status is in normal condition.	

CC-Link status indicator LEDs (MS: Node condition, NS: Network condition)

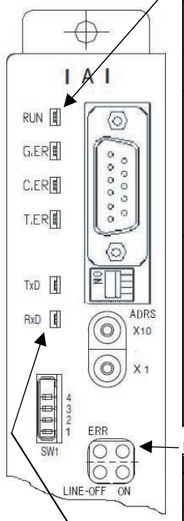
LED	Color	Indication	Description
RUN	GN	Illuminating	The machine is in the normal operation. (Illuminated once communication started)
		OFF	Not in the network or timeout (The illumination is turned off if the communication is shut off for a certain time.)
ERR	RD	Illuminating	Baud rate or station number setting is not correct.
		Flashing	Error in reception data to self station. (CRC error : Data error is detected)
		OFF	Status is in normal condition.
RD	GN	Illuminating	Data is being received.
		OFF	There is no received data.
SD	GN	Flashing	Data is being sent.
		OFF	There is no sent data.

Refer to Instruction Manual for the details of the CC-Link status check.

SIO Communication Status Display LEDs

LED	Color	Indication	Description
TxD	GN	Flashing	Data is being sent (from Gateway Unit to IAI controller).
		OFF	Data sending is being stopped (from Gateway Unit to IAI controller).
RxD	GN	Flashing	Data is being received (from IAI controller to Gateway Unit).
		OFF	Data receiving is being stopped (from IAI controller to Gateway Unit).

3. PROFIBUS (RCM-GW-PR)



Gateway Unit Status Display LEDs

LED	Color	Indication	Description	
RUN	GN	Illuminating	CPU is in process.	
		OFF	The power is OFF or CPU is not working. Please contact us if the LED does not turn ON even after the power is turned ON.	
G.ER	RD	Illuminating	CPU error. Please contact us.	
		OFF	CPU is operating in normal condition.	
C.ER	RD	Illuminating	Either an error is occurred on PROFIBUS module or the connection with PROFIBUS is not established. Check the communication status LEDs for the connection to PROFIBUS, and check the settings and wirings. Even if this LED is ON, the connection to the teaching tool is available as long as RUN is turned ON.	
		Flashing	The port switch is ON. The interval for the flashing should be 1sec.	
		OFF	Status is in normal condition.	
T.ER	RD	Illuminating	There is a communication error occurred to all the axes that are in SIO communication with the connected IAI controller.	• Check the settings in the parameters (No. 16 and 17) for each axis controller. • Check the axis number settings. • Check the wiring connections of SIO communication lines. • Check the terminal resistance devices. • Check the noise prevention equipment.
		Flashing	There is a communication error occurred to one or more of the axes that are in SIO communication with the connected IAI controller.	
		OFF	Status is in normal condition.	

PROFIBUS status indicator LEDs (MS: Node condition, NS: Network condition)

LED	Color	Indication	Description
LINE-ON	GN	Illuminating	Status is on-line.
		OFF	The machine is not on-line.
LINE-OFF	RD	Illuminating	Status is off-line.
		OFF	The machine is not off-line.
ERR	RD	1Hz Flashing	There is a configuration error. (Exanmple) The number of input and output set with the mode setting switch does not match with the number of input and output set with the configuration tool.
		4Hz Flashing	It is a communication board (ASIC) initializing error. Please contact us if the condition does not recover even with a reboot of the power.
		OFF	There is no error.

SIO Communication Status Display LEDs

LED	Color	Indication	Description
TxD	GN	Flashing	Data is being sent (from Gateway Unit to IAI controller).
		OFF	Data sending is being stopped (from Gateway Unit to IAI controller).
RxD	GN	Flashing	Data is being received (from IAI controller to Gateway Unit).
		OFF	Data receiving is being stopped (from IAI controller to Gateway Unit).

IAI
Quality and Innovation

IAI Corporation
Head Office: 577-1 Obane Shimizu-KU Shizuoka City Shizuoka 424-0103, Japan
TEL +81-54-364-5105 FAX +81-54-364-2589
website: www.iai-robot.co.jp/

IAI America, Inc.
Head Office: 2690 W. 237th Street, Torrance, CA 90505
TEL (310) 891-6015 FAX (310) 891-0815
Chicago Office: 110 East State Parkway, Schaumburg, IL 60173
TEL(847) 908-1400 FAX (847) 908-1399
Atlanta Office: 1220 Kennestone Circle, Suite 108, Marietta, GA 30066
TEL (678) 354-9470 FAX (678) 354-9471
website: www.intelligentactuator.com

IAI Industrieroboter GmbH
Ober der Röth 4, D-65824 Schwalbach am Taunus, Germany
TEL 06196-88950 FAX 06196-889524
website: www.iai-automation.com

Technical Support available in Great Britain
LC Automation control & safety
Duttons Way, Shadsworth Business Park, Blackburn, Lancashire, BB1 2QR, United Kingdom
TEL 01254-685900
website: www.lcautomation.com

IAI (Shanghai) Co., Ltd.
SHANGHAI JIAHUA BUSINESS CENTER A8-303, 808, Hongqiao Rd. Shanghai 200030, China
TEL 021-6448-4753 FAX 021-6448-3992
website: www.iai-robot.com

IAI Robot (Thailand) Co., Ltd.
825 PhairojKijja Tower 7th Floor, Debaratana RD., Bangna-Nuea, Bangna, Bangkok 10260, Thailand
TEL +66-2-361-4458 FAX +66-2-361-4456
website:www.iai-robot.co.th

Manual No.: ME0272-3A