IAI
Quality and Innovation

Applicable Fieldbus
(DeviceNet, CC-Link, PROFIBUS-DP, EtherNet/IP, EtherCAT, PROFINET-IO)

RCM-P6GW(G)／RCM-P6HUB

RCP6S Fieldbus Communication

First Step Guide First Edition

Thank you for purchasing our product.
Make sure to read the Safety Guide and detailed Instruction Manual (DVD) included with the product in addition to this First Step Guide to ensure correct use.
This Instruction Manual is original.

Warning : Operation of this equipment requires detailed installation and operation instructions which are provided on the DVD Manual included in the box this device was packaged in. It should be retained with this device at all times.
A copy of the DVD Manual can be requested by contacting your nearest IAI Sales Office listed at the back cover of the Instruction Manual or on the First Step Guide.

Product Check

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

1. Parts

No.	Part Name	Model	Number	Remarks
1	Controller Main Body	Refer to each instruction manual of an actuator.	-	
2	Gateway Unit	Refer to “How to read the model plate”, “How to read the model”.	1	
Accessories				
3	Hub Unit (Option)	Refer to “How to read the model plate”, “How to read the model”.	-	
4	Drive Cutoff Connector	FKCN2.5/4-STF-5.0 (two unit) (Supplier : PHOENIX CONTACT)	2	Recommended cable size 1.25 to 0.5mm² (AWG16 to 20)
5	System I/O Connector	DFMC1.5/7-ST-3.5 (Supplier : PHOENIX CONTACT)	1	Recommended cable size • Breake Release Input 1.25 to 0.5mm² (AWG16 to 20) • Other than above 1.25 to 0.3mm² (AWG16 to 22)
6	Dummy Plug	DP-5	1	For the safety category compliant type (RCP-P6GWG)
7	DeviceNet Connector (For DeviceNet Type)	MSTB2.5/5-STF-5.08 AU M (Supplier : PHOENIX CONTACT)	1	Prepare a terminal resistance separately if this controller is to be allocated at the terminal.
8	CC-Link Connector (For CC-Link Type)	MSTB2.5/5-STF-5.08 AU (Supplier : PHOENIX CONTACT)	1	Terminal resistance (130Ω1/2W, 110Ω1/2W) enclosed one unit each
9	Safety Guide		1	
10	First Step Guide		1	
11	Instruction Manual (DVD)		1	

* Select the cable thickness allowable for the current figured out in the <Calculation of 24V DC Power Capacity, Number of Connectable Axes>.

Drive Cutoff Connector

System I/O Connector

Dummy Plug (DP-5)

DeviceNet Connector

CC-Link Connector

CC-Link Connector Enclosed Terminal Resistance

2. Teaching Tool (Please purchase separately)

A teaching tool such as PC software is necessary when performing the setup for position setting, parameter setting, etc. that can only be done on the teaching tool. Please prepare either of the following teaching tools.

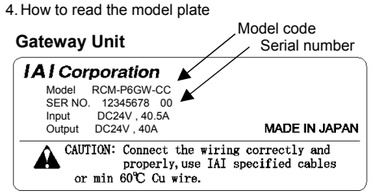
No.	Part Name	Model
1	PC Software (Includes RS232C Exchange Adapter + Peripheral Communication Cable)	RCM-101-MW
2	PC Software (Includes USB Exchange Adapter + USB Cable + Peripheral Communication Cable)	RCM-101-USB
3	Teaching Pendant (Touch Panel Teaching)	TB-01
4	Teaching Pendant (Touch Panel Teaching with deadman switch)	TB-01D
5	Teaching Pendant (Dead man’s switch right mounted touch panel teaching)	TB-01DR
6	Teaching Pendant (Touch Panel Teaching)	CON-PTA
7	Teaching Pendant (Touch Panel Teaching with deadman switch)	CON-PDA
8	Teaching Pendant (Touch Panel Teaching with deadman switch + TP Adapter (RCB-LB-TG))	CON-PGA

3. Instruction manuals related to this product, which are contained in the instruction manual (DVD).

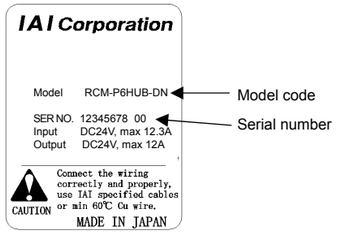
No.	Part Name	Model
1	Instruction Manual for the RCP6S Fieldbus Communication	ME0349
2	Instruction Manual for the Serial Communication [for Modbus]	ME0162
3	Instruction Manual for the RCP6S Slider Type	ME3749
4	Instruction Manual for the RCP6S Wide Slider Type	ME3750
5	Instruction Manual for the RCP6S Rod Type	ME3751
6	Instruction Manual for the RCP6S Wide Rod Type	ME3752
7	Instruction Manual for the RCP6S Radial Cylinder Type	ME3753
8	Instruction Manual for the RCP6S Table Type	ME3754
9	PC Software RCM-101-MW/RCM-101-USB Instruction Manual	ME0155
10	Touch Panel Teaching CON-PTA/PDA/PGA Instruction Manual	ME0295
11	Touch Panel Teaching TB-01, TB-01D, TB-01DR Applicable for Position Controller Instruction Manual	ME0324

4. How to read the model plate

Gateway Unit



Hub Unit



5. How to read controller model code

Gateway Unit

RCM - P6GW - CC

- P6GW : Standard Type
- P6GWG : Safety Categories Complied
- CC : CC-Link Connection Type
- DN : DeviceNet Connection Type
- PR : PROFIBUS-DP Connection Type
- EP : EtherNet/IP Connection Type
- EC : EtherCAT Connection Type
- PRT : PROFINET-IO Connection Type

Hub Unit

RCM - P6HUB - DN

- P6HUB : Standard Type
- (Not Specified) : Screw Attachment Type
- DN : DIN Rail Mounting Type

Basic Specifications

Built-in Controller

Specification Item			Details of Specifications	
Number of Controlled Axes			1-axis	
Power-supply Voltage			24V DC±10%	
Control Power Capacity			0.3A (Built-in Controller only)	
Load Current (Including current consumption for control)	Motor Type	28P, 35P, 42P, 56P	High-thrust function is disabled	Setup Unavailable
			High-thrust function is enabled	MAX. 3.2A
		56SP, 60P		MAX. 5.7A
Power Supply for Electromagnetic Brake (for actuator equipped with brake)			24V DC±10% 0.15A *(Note) 0.7A is required for 0.2sec at brake release.*	
Heat Generation			5W (Motor type 28P, 35P, 42P, 56P) 19.2W (Motor type 56SP, 60P)	
Rush Current (Note 1)			8.3A with in-rush current protection circuit (Motor type 28P, 35P, 42P, 56P) 10A with in-rush current protection circuit (Motor type 56SP, 60P)	
Motor Control System			Weak field-magnet vector control	
Corresponding Encoder			Battery-less absolute encoder Resolution 8192pulse/rev	
Actuator Cable Length			MAX. 20m	
Serial Communication (SIO Port)			RS485: 2CH (based on Modbus Protocol RTU/ASCII) Based on ASCII is 1CH Speed: 9.6 to 230.4Kbps	
External Interface			Fieldbus connection *(Note) Connection of gateway unit is necessary separately.* CC-Link, DeviceNet, PROFIBUS-DP, EtherCAT, EtherNet/IP, PROFINET-IO	
Data Setting and Input			PC software, Touch panel teaching	
Data Retention Memory			Saves position data and parameters to non-volatile memory (There is no limitation in number of writing.)	
LED Display			SV (GR) / ALM (RD): Servo ON / Alarm generated and emergency stop	
Insulation Resistance			500V DC 10MΩ or more	
Protection Function against Electric Shock			Class I basic insulation	
Cooling Method			Natural air-cooling	

Note 1 In-rush current will flow for approximately 1 to 5msec after the power is turned on (at 40℃). The value of inrush current differs depending on the impedance of the power supply line.

Gateway Unit

Specification Item	Details of Specifications
Number of Controlled Axes	MAX. 16-axes (Four axes for gateway unit itself)
Power-supply Voltage	24V DC ±10%
Control Power Capacity	0.6A (Gateway unit itself 0.3A+Fieldbus module 0.3A)
Cooling Method	Natural air-cooling
Emergency-stop Input	B contact input
Enable Input	None
T.P. Enable Input	Equipped
Enable Operation	Servo OFF or shutdown (Select the parameter)
Backup Memory	FRAM (256kbit), No limitation in number of writing
Calendar Function	Equipped (Data retained for ten days after power cutoff)
Gateway Board LED Display	SYS LED×1 (RUN/ALM), EMG LED×1, MODE LED×1 (AUTO/MANU), T.ERR LED×1, C.ERR LED×1, Status LED lamp for each fieldbus module LED×2
Tool Connection	T/P connector : RS485 1ch (based on Modbus protocol) USB connector : USB 1ch
Electromagnetic Brake Compulsory Release Feature	System I/O connector: External breake release signal input (24V DC) * Used only when RCP6S connected directly to gateway. Invalid when hub connected.
Protection Function against Electric Shock	Class I basic insulation
Insulation Strength	500V DC 10MΩ
Mass	250g
External Dimensions	35W×115H×123D

Hub Unit

Specification Item	Details of Specifications
Number of Controlled Axes	MAX. 4-axes
Power-supply Voltage	24V DC ±10%
Control Power Capacity	0.3A (Hub unit itself)
Motor Power Capacity	Total connected axes MAX. 12A
Cooling Method	Natural air-cooling
Emergency-stop Input	None
Enable Input	None
T.P. Enable Input	None
Enable Operation	None
Backup Memory	None
Calendar Function	None
LED Display	System status LED×1 (RUN/ALM), Axis status LED×4 (RUN/ALM)
Tool Connection	None
Electromagnetic Brake Compulsory Release Feature	Breake release switch×4
Protection Function against Electric Shock	Class I basic insulation
Insulation Strength	500V DC 10MΩ
Mass	80g
External Dimensions	30W×115H×45D

Specification of Environment (Built-in Controller/Gateway Unit/Hub Unit in Common)

Specification Item		Details of Specifications
Environment	Surrounding Air Temperature	0 to 40°C
	Surrounding Humidity	85%RH or less (non-condensing)
	Surrounding Environment	Refer to Installation Environment
	Surrounding Storage Temperature	-20 to 70°C
	Usage Altitude	85%RH or less (non-condensing)
	Protection Class	1,000m or lower above sea level
	Vibration Durability	Frequency 10 to 57Hz / Swing width: 0.075mm Frequency 57 to 150Hz / Acceleration: 9.8m/s² XYZ Each direction Sweep time: 10 min. Number of sweep: 10 times
	Shock Resistance	Dropping height 800mm 1 corner, 3 edges and 6 surfaces
	Pollution Degree	Pollution degree 2
	Protection Class	IP20

<The Calculation of 24V DC Power Capacity, Number of Connectable Axes>

To calculate the number of axes connectable to one unit of the gateway unit and the current amperage of 24V DC, figure out (1) to (5) below and follow (6).

(1) The Calculation of Number of Connectable Axes, and Motor Current Consumption
Condition 1: Sum total of motor current consumption connectable to one unit of hub unit
Condition 2: Number of controlled axes connectable to corresponding 1 unit: 4-axes or less
* By adjusting the number of connected axes or motor type, select the connected axes so each hub unit satisfies the formulas below.
● Sum total of motor current consumption for hub unit= Motor current consumption of 1st axis
+ Motor current consumption of 2nd axes (if connected)
+ Motor current consumption of 3rd axes (if connected)
+ Motor current consumption of 4th axes (if connected) ≤ 12.8A·····1)
● Sum total of motor current consumption = Motor current consumption of hub unit 1st unit
+ Motor current consumption of hub unit 2nd units (if connected)
+ Motor current consumption of hub unit 3rd units (if connected)
+ Motor current consumption of hub unit 4th units (if connected)·····2)

(2) Control Power Current Consumption:
0.3A × Number of actuator + 0.6A (Gateway unit) + 0.3A × Number of hub unit·····3)

(3) Current Consumption at Excitation Phase Detection:
Add the inrush current for all connected axes.·····4)

(4) Rush Current: 8.3A (Motor type 28P, 35P, 42P, 56P) / 10A (Motor type 56SP, 60P)·····5)

(5) Current Consumption of Brake Release Power: Number of actuators with brake × 0.07A·····6)
* When servo is on, it should be 0.5sec or less, after that retaining of released status should be 0.1A/axis.

(6) Selection of Power Supply:
Usually, the rated current is to be approximately 1.2 times higher than the total of Control Power 2) + 3) + 6) above considering approximately 30% of margin to the load current.
However, considering the inrush currents 4), 5), even though it is a short time, select a power supply with "sufficient peak load capacity.
Inrush current of 4) to 5) from occurring at the same time by having the timing of emergency stop release (turning the motor power on) and timing to turn the servo on shifted (Note 1) from each other and so on. Huge current flow of the same time may cause a transient voltage drop.
Be careful especially when selecting a power source equipped with remote sensing.

Note 1 The timing to turn the servo on can be tuned in Parameter No. 165 "Latency after Shutdown Release".
(Note) *Ensure motor and control power supplies reference the same potential when using multiple power supplies.*

(Reference) Selection of Power Supply Protection Circuit Breaker

It is recommended that the power supply protection is conducted on the primary side (AC power side) of the 24V DC power supply unit. When selecting the protection breaker, consider the rated cutoff current of the circuit breaker so a cutoff is surely performed even in the case of inrush current of 24V DC power supply unit or a short-circuit of the power supply.
• Rated Breaking Current > Short-circuit Current = Primary Power Supply Capacity / Power Voltage
• (Reference) In-rush Current of IAI Power Supply Unit PS241 = 50 to 60A, 3msec

● DeviceNet Interface

Item	Specification			
Communication Protocol	DeviceNet2.0			
	Group 2 dedicated server			
	Network-powered insulation node			
Baud Rate	Automatically follows the master			
Communication System	Master-slave system (Polling)			
Number of Occupied Channels	Max. 72CH (Input, Output)			
Number of Occupied Nodes	1 Node			
Communication Cable Length (Note 1)	Baud Rate	Max. Network Length	Total Branch Line Length	Max. Branch Line Length
	500kbps	100m	39m	6m
	250kbps	250m	78m	
	125kbps	500m	156m	
Communications Cable	Use the dedicated cable.			
Connector (Note 2)	MSTB2.5/5-GF-5.08 AU (Manufactured by PHOENIX CONTACT or equivalent)			
Consumption Current of Communication Power Supply	60mA			
Communication Power Supply	24V DC (Supplied from DeviceNet)			

Note 1 For T branch communication, refer to the Instruction Manuals for the master unit and programmable logic controller (PLC) to be mounted.
Note 2 The cable-side connector is a standard accessory.

● CC-Link Interface

Item	Specification					
Communication Protocol	CC-Link ver1.10 or ver2.00					
Station Type	Remote device station (MAX. four stations occupied)					
Baud Rate	10M/5M/2.5M/625k/156kbps					
Communication System	Broadcast polling system					
Number of Occupied Stations	Max. 63stations					
Communication Cable Length (Note 1)	Baud Rate (bps)	10M	5M	2.5M	625k	156k
	Total Cable Length (m)	100	160	400	900	1200
Communications Cable	Apply the dedicated cable					
Connector (Note 2)	MSTB2.5/5-GF-5.08 AU (Manufactured by PHOENIX CONTACT or equivalent)					

Note 1 For T branch communication, refer to the Instruction Manuals for the master unit and PLC to be mounted.
Note 2 The cable-side connector is a standard accessory.

● PROFIBUS-DP Interface

Item	Specification
Communication Protocol	PROFIBUS-DP
Baud Rate	Automatically follows the master
Communication System	Hybrid System (Master-slave system or token passing system)
Occupied Area	Max. 144bytes (Input, Output)
Number of Occupied Stations	Max. 32stations/segment 126stations are available by the repeater

Item	Specification		
Communication Cable Length	MAX. Total Network	Baud Rate	Cable Type
	100m	3,000/6,000/12,000kbps	Type A cable
	200m	1,500kbps	
	400m	500kbps	
	1000m	187.5kbps	
	1200m	9.6/19.2/93.75kbps	
Communications Cable	Equipped with shield twist pair cable AWG18		
Connector (Note 1)	9-pin female D-sub connector		
Transmission Path Format	Bus/Tree/Star		

Note 1 Please prepare a 9-pin male D-sub connector for the cable-end connector.

● EtherNet/IP Interface

Item	Specification
Communication Protocol	IEC61158 (IEEE802.3)
Baud Rate	10BASE-T/100BASE-T (Autonegotiation setting is recommended)
Communication Cable Length	Follows EtherNet/IP specifications (Distance between hub and each node: 100m max.)
Number of Connection	Follows master unit
Available Node Addresses for Setting	0.0.0.0 to 255.255.255.255
Communications Cable (Please prepare separately)	Category 5e or more (Double shielded cable braided with aluminum foil recommended)
Connector	RJ45 connector × 1pc

● EtherCAT Interface

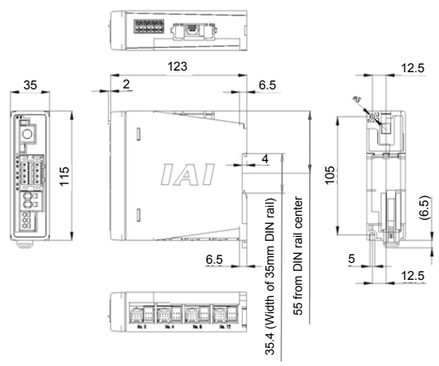
Item	Specification
Communication Protocol	IEC61158 type 12
Physical Layer	100Base-TX (IEEE802.3)
Baud Rate	Automatically follows the master
Communication Cable Length	Follows EtherCAT® specifications (Distance between each node: 100m max.)
Slave Type	I/O slave
Available Node Addresses for Setting	0 to 65535
Communications Cable (Please prepare separately)	Category 5e or more (Double shielded cable braided with aluminum foil recommended)
Connector	RJ45 connector × 2pcs (Input × 1, Output × 1)
Connect	Daisy chain only

● PROFINET-IO Interface

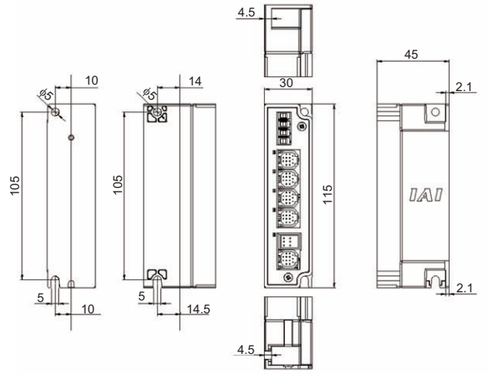
Item	Specification
Communication Protocol	IEC61158 (IEEE802.3), IEC61784
Baud Rate	100Mbps
Communication Cable Length	Distance between each segment: 100m Max.
Number of Connection	Follows master unit
Available Node Addresses for Setting	0.0.0.0 to 255.255.255.255
Communications Cable (Please prepare separately)	Category 5 or more (Double shielded cable braided with aluminum foil recommended)
Connector	RJ45 connector × 1pc
GSDML File Version	Ver 2.3

External Dimensions

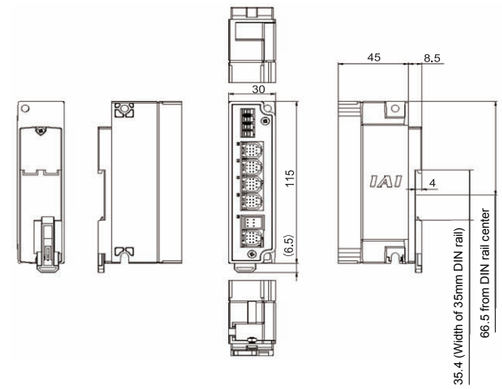
Gateway Unit (Attachment Screws and Attachment DIN Rail Type)



Hub Unit Attachment Screws Type



Hub Unit Attachment DIN Rail Type



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).

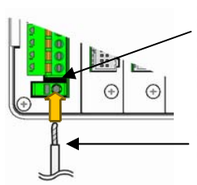
1. Installation Environment
Do not use this product in the following environment.
- Location where the surrounding air temperature exceeds the range of 0 to 40°C
- Location where condensation occurs due to abrupt temperature changes
- Location where relative humidity exceeds 85%RH
- Location exposed 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 Noise Elimination and Mounting Method]

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
- Storage and preservation environment follows the installation environment. Especially in a long-term storage, consider to avoid condensation of surrounding air.
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 in an environment where dew condensation is anticipated, take the condensation preventive measures from outside of the entire package, or directly after opening the package.

Installation and Noise Elimination

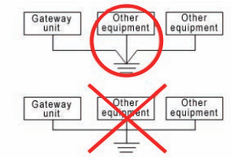
1. Noise Elimination Grounding (Frame Ground)



Connect the ground line to the FG terminal block on the controller unit.
Put a tool such as a screwdriver into the square slot and connect the line.

Copper wire: Connect a ground wire with a diameter of 1.6 mm ($2mm^2$: AWG 14) or larger.

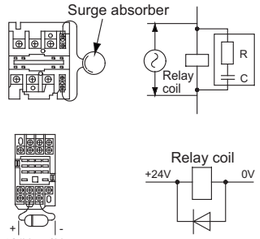
Earth Terminal
Grounding resistance at 100Ω or less (Class D grounding)



Do not share the ground wire with or connect to other equipment. Ground wach unit.

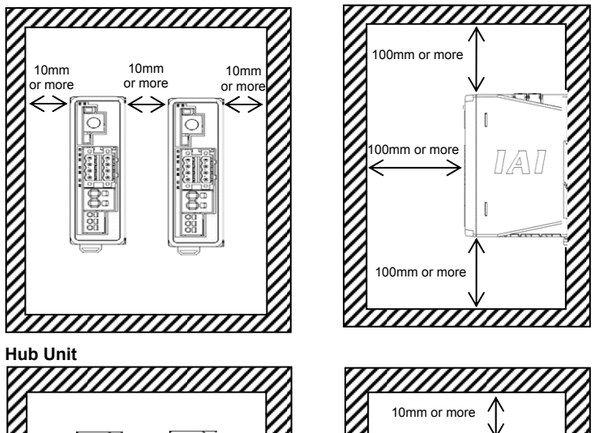
2. Precautions regarding wiring method
   1) Wire is to be twisted for the 24V DC power supply.
   2) Separate the signal and encoder lines from the power supply and power lines.

3. Noise Sources and Elimination
   Carry out noise elimination measures for electrical 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] Mount the windings and diodes in parallel. Select a diode built-in type for the DC relay.

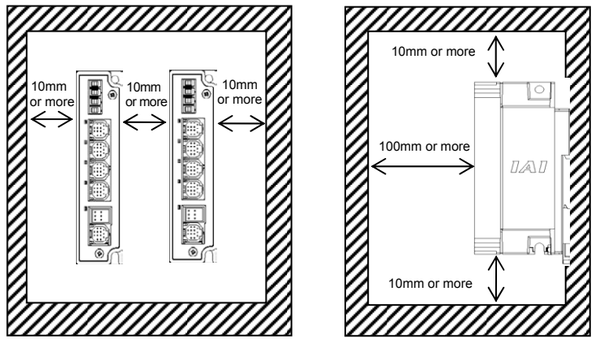


4. Cooling Factors and Installation
   Design and Build the system considering the size of the controller box, location of the controller and cooling factors to keep the surrounding temperature around the controller below 40°C.
   Pay a special attention to the battery unit since the performance of it would drop both in the low and high temperatures.
   Keep it in an environment in the room temperature as much as possible. (Approximately 20°C is the recommended temperature.)

Gateway Unit

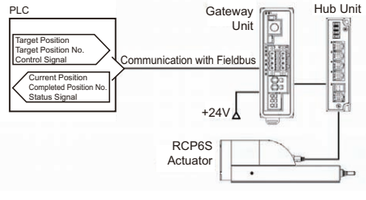
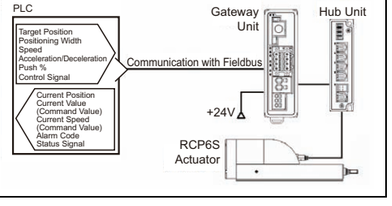


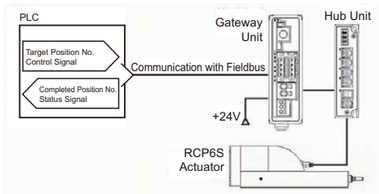
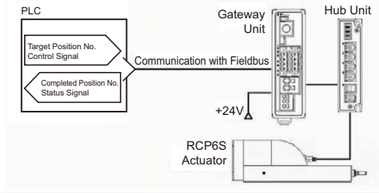
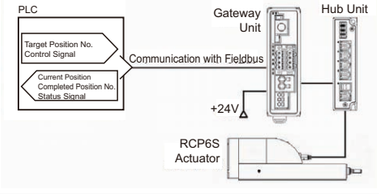
Hub Unit



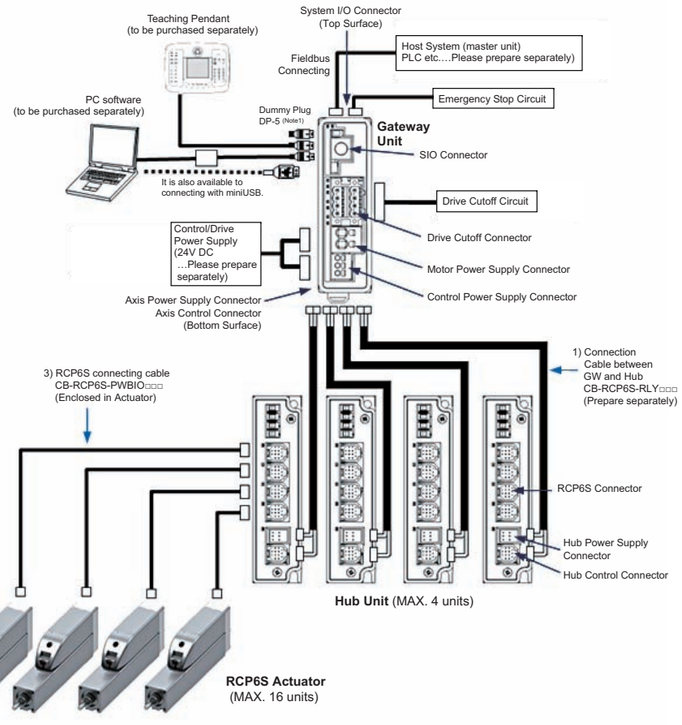
Operation Mode Selected

This controller are available to select from 6 types of operation modes.
The settings are to be established with Gateway Parameter Setting Tool.

Operation Mode	Contents	Overview
Simple Direct Mode	The target position can be indicated directly by inputting a value. Also, monitoring of the current position is available in 0.01mm unit. Those other than the target position are to be indicated in the position table, and the setting can be done for 256 points at maximum.	
Positioner 1 Mode	The 256 points of position data can be registered at the maximum and is able to stop at the registered positions. Also, monitoring of the current position is available in 0.01mm unit.	
Direct Indication Mode	The target position, speed acceleration/deceleration and pressing current limit can be indicated with inputting a number. As well as monitoring of the current position in 0.01mm unit, monitoring of current speed and command current is also available.	

Operation Mode	Contents	Overview
Positioner 2 Mode	This is the operation mode of the position data of 256 points at maximum set in the position table. The monitoring of the current position is not available This mode is that the transferred data is reduced from Positioner 1 Mode.	
Positioner 3 Mode	This is the operation mode of the position data of 256 points at maximum set in the position table. The monitoring of the current position is not available This is the mode to control with the minimized number of signals to perform the positioning operation by reducing the amount of sent and received data from Positioner 2 Mode.	
Positioner 5 Mode	This is the operation mode of the position data of 16 points at maximum set in the position table. It is a mode that enabled to monitor the current position in 0.1mm unit by reducing the transferred data volume and number of position table from Positioner 2 Mode.	

Wiring Diagram

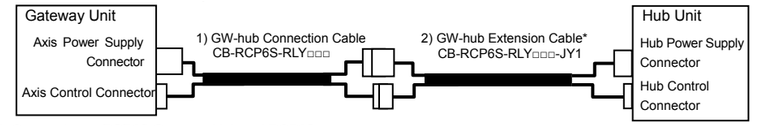


Note 1 For RCM-P6GWG, in case a teaching tool is not connected to SIO connector, have the enclosed dummy plug plugged (DP-5) in the connector.

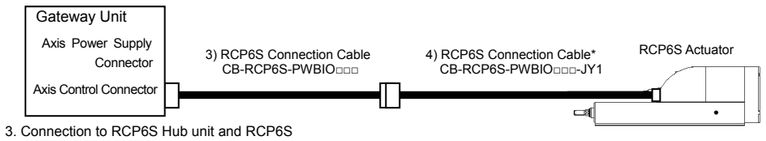
> ⚠ *Caution : Make sure to turn the power to the gateway unit OFF when inserting or removing the connector that connects the PC software or gateway unit to the controller.*
> *Inserting or removing the connector while the power is turned ON causes a gateway unit failure.*

Connection Cable

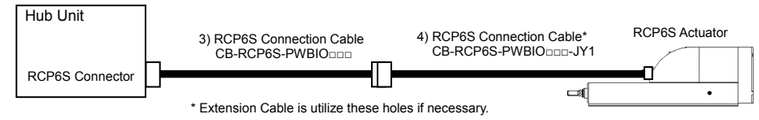
1. Connection to RCP6S Gateway Unit and Hub Unit



2. Connection to RCP6S Gateway Unit and RCP6S



3. Connection to RCP6S Hub unit and RCP6S

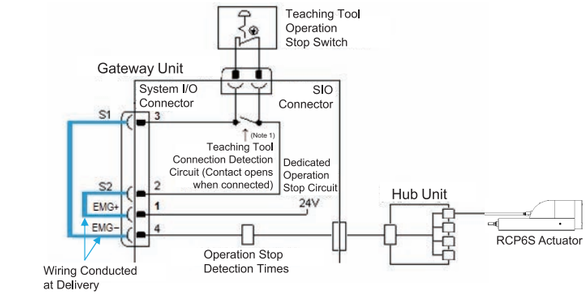


* Extension Cable is utilize these holes if necessary.

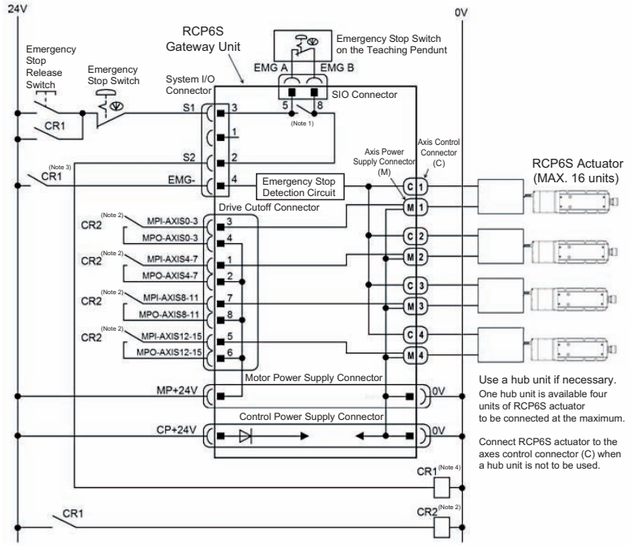
□□□ in the cable model code should be the cable length. e.g.) 030=3m, -RB should be included in the model code when it is the robot cable.
The maximum length should be 10m between the gateway and hub unit.
The maximum length should be 20m from the gateway unit to RCP6S regardless of a hub unit is used or not used.

Power Supply and Emergency Stop Circuit

The following diagram shows an example of how the emergency stop switch for the teaching pendant may be included in the emergency stop circuit you may construct.



Example for shutting off motor power supply externally at emergency stop input.

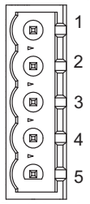


Note 1 RCM-P6GW : When there is nothing plugged in the SIO connector, S1 and S2 are short-circuited inside the controller.
RCM-P6GWG : When there is nothing plugged in the SIO connector, S1 and S2 are not short-circuited.
To make them short-circuited, have the enclosed dummy plug DP-5 plugged in the SIO connector.
Note 2 When the motor power must be disconnected externally for safety category compliance, apply a safety rated relay between MPI-AXIS✳ and MPO-AXIS✳.
Note 3 The rating for the emergency stop signal (EMG-) to turn ON/OFF at contact CR1 is 24V DC and 10mA or less.
Note 4 For CR1, select the one with coil current 0.1A or less.

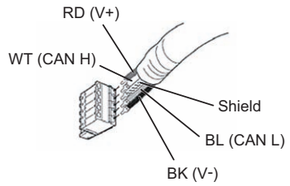
(Note) When supplying the power by turning ON/OFF the 24V DC, keep the 0V being connected and have the +24V supplied/disconnected (cut one side only).

DeviceNet Type

Refer to the instruction manuals for each fieldbus master unit and mounted PLC for the details.

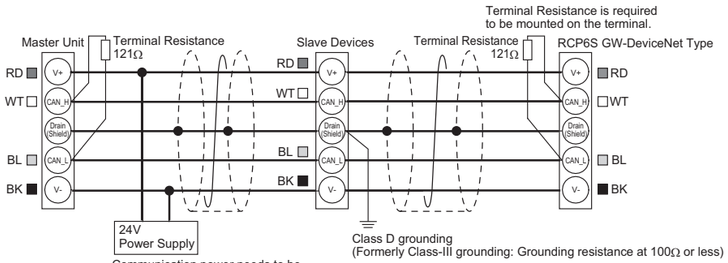


Front View of Connector on Controller side



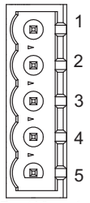
Connector Name	DeviceNet Connector	
Cable Side	MSTB2.5/5-STF-5.08 AU M	Enclosed in standard package Manufactured by PHOENIX CONTACT
Controller Side	MSTB2.5/5-GF-5.08 AU	

Pin No.	Signal Name (Color)	Description	Applicable cable diameter
1	V- (BK)	Power Supply Cable Negative Side	Dedicated cable for DeviceNet
2	CAN L (BL)	Communication Data Low Side	
3	Shield (None)	Shield	
4	CAN H (WT)	Communication Data High Side	
5	V+ (RD)	Power Supply Cable Positive Side	

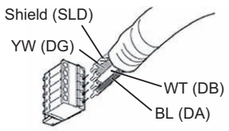


CC-Link Type

Refer to the instruction manuals for each fieldbus master unit and mounted PLC for the details.

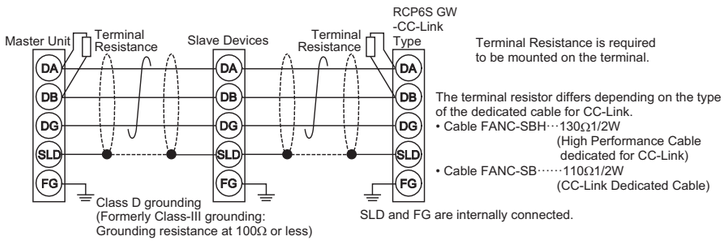


Front View of Connector on Controller side



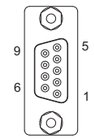
Connector Name	CC-Link Connector	
Cable Side	MSTB2.5/5-STF-5.08 AU	Enclosed in standard package Manufactured by PHOENIX CONTACT
Controller Side	MSTB2.5/5-GF-5.08 AU	

Pin No.	Signal Name (Color)	Description	Applicable cable diameter
1	DA (BL)	Communication Line A	Dedicated cable for CC-Link
2	DB (WT)	Communication Line B	
3	DG (YW)	Digital GND	
4	SLD	Connect the shield of the shielded cable (Connect the FG of the 5 pins and controller FG internally)	
5	FG	Frame Ground (Connect the SLD of the 4 pins and controller FG internally)	

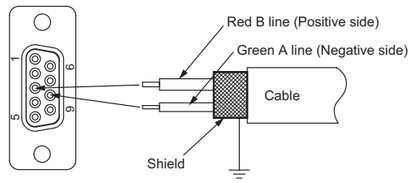


PROFIBUS-DP Type

Refer to the instruction manuals for each fieldbus master unit and mounted PLC for the details.

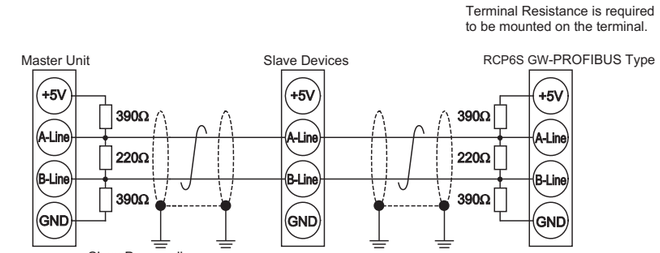


Front View of Connector on Controller side



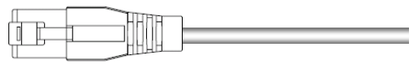
Connector Name	PROFIBUS-DP Connector	
Cable Side	9-pin D-sub Connector (Male)	Please prepare separately
Controller Side	9-pin D-sub Connector (Female)	

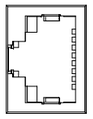
Pin No.	Signal Name	Description	Applicable cable diameter
1	NC	Disconnected	PROFIBUS-DP Dedicated Cable (Type A : EN5017)
2	NC	Disconnected	
3	B-Line	Communication Line B (RS485)	
4	RTS	Request for Sending	
5	GND	Signal GND (Insulation)	
6	+5V	+5V Output (Insulation)	
7	NC	Disconnected	
8	A-Line	Communication Line A (RS485)	
9	NC	Disconnected	



EtherNet/IP Type

Refer to the instruction manuals for each fieldbus master unit and mounted PLC for the details.

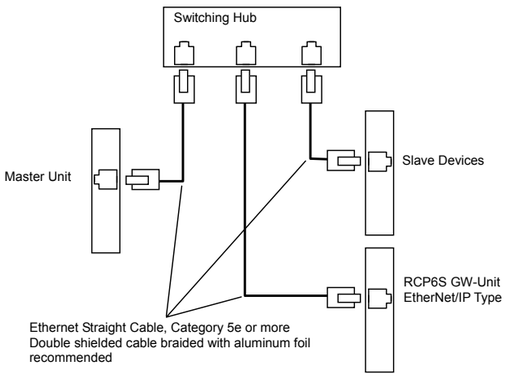




Front View of Connector on Controller side

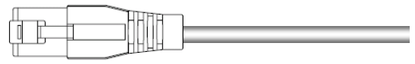
Connector Name	EtherNet/IP Connector	
Cable Side	8P8C Modular Plug	Please prepare separately
Controller Side	8P8C Modular Jack	

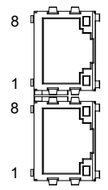
Pin No.	Signal Name	Description	Applicable cable diameter
1	TD+	Data sending +	For Ethernet cable, use a straight STP cable that possesses the performance of Category 5e or more.
2	TD-	Data sending -	
3	RD+	Data receiving +	
4	–	Disconnected	
5	–	Disconnected	
6	RD-	Data receiving -	
7	–	Disconnected	
8	–	Disconnected	



EtherCAT Type

Refer to the instruction manuals for fieldbus master unit and mounted PLC for the details.

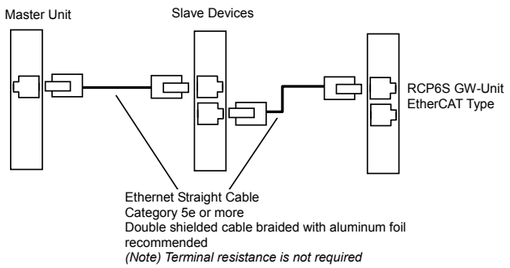




Front View of Connector on Controller side

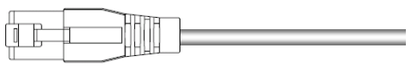
Connector Name	EtherCAT Connector	
Cable Side	8P8C Modular Plug	Please prepare separately
Controller Side	8P8C Modular Jack	

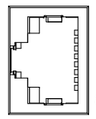
Pin No.	Signal Name	Description	Applicable cable diameter
1	TD+	Data sending +	For Ethernet cable, use a straight STP cable that possesses the performance of Category 5e or more.
2	TD-	Data sending -	
3	RD+	Data receiving +	
4	–	Disconnected	
5	–	Disconnected	
6	RD-	Data receiving -	
7	–	Disconnected	
8	–	Disconnected	



PROFINET-IO Type

Refer to the instruction manuals for fieldbus master unit and mounted PLC for the details.

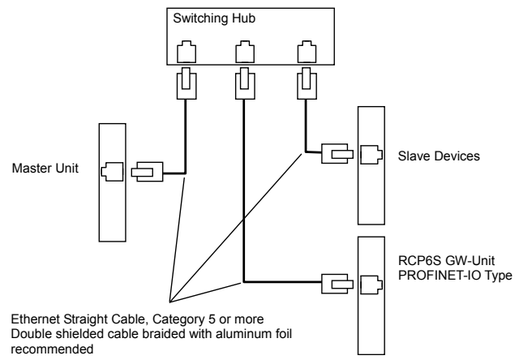




Front View of Connector on Controller side

Connector Name	PROFINET-IO Connector	
Cable Side	8P8C Modular Plug	Please prepare separately
Controller Side	8P8C Modular Jack	

Pin No.	Signal Name	Description	Applicable cable diameter
1	TD+	Data sending +	For Ethernet cable, use a straight STP cable that possesses the performance of Category 5 or more.
2	TD-	Data sending -	
3	RD+	Data receiving +	
4	–	Disconnected	
5	–	Disconnected	
6	RD-	Data receiving -	
7	–	Disconnected	
8	–	Disconnected	



Starting Procedures

When using this product for the first time, make sure to avoid mistakes and incorrect wiring by referring to the procedure below. “PC” stated in this section means “PC software”.

Check of Packed Items
Are all the delivered items present?
No → Contact your local IAI distributor.

↓ Yes

Installation and Wiring
Install the controller and actuator and perform wiring according.

↓

Important Check Item
• Is frame ground (FG) connected? • Has the noise countermeasure been taken?

↓

Power Supply and Alarm Check
Connect the PC software, set the operation mode setting switch to “MANU” side and turn the power ON.
Select [Teaching Mode 1 Safety Speed Activated / Prohibit PIO Startup] in the PC software.

↓

Check Item
Is SYS in Status LEDs turned ON in green?
No → Check the details of the alarm in the PC software to have a counteraction.

↓ Yes

Initial Setting
1) Have the fieldbus and operation mode setting conducted with the gateway parameter setting tool.
2) Set up the parameters (operation patterns) for each axis on the PC software.

↓

Servo ON
Turn the servo ON for all the connected axes by operating the PC.

> ⚠ *Caution*
> *Please perform this process with the actuator away from the mechanical end or interfering objects as much as possible. Move the actuator away from interfering surroundings. It may generate an alarm if the actuator hit the mechanical end or interfering objects when the servo is turned ON.*
> *The slider may get slightly dropped by self-weight if servo ON and OFF is repeatedly performed at the same position. Be careful not to pinch the hand or damage the work.*

↓

Check Item
Is SYS* on the status LED display for the driver on the axis number indicated for the servo-on turned ON in green?
No → If an alarm is generated, check the detail of the alarm on the PC and have an appropriate treatment.

↓ Yes

Check of Safety Circuit
Does the emergency stop circuit (drive cutoff circuit) work properly and turn the servo OFF?
No → Check the emergency stop circuit.

↓ Yes

Setting of Position Data [Except for direct numerical specification mode]
Set the position (*), velocity and acceleration/deceleration in each position table. * Setting is unnecessary in simple direct mode

↓

Test Run Adjustment 1
1) Cancel the emergency stop, do not put a work piece on, set to low speed and check the operation with commands from the PC.
2) Put on a work piece, set to the automatic operation speed, and then check the operation with the command from the PC.

↓

Check Item
Any vibration or abnormal noise?
No → Check if there is any problem with the installation of the actuator and the condition of the actuator use exceeds the ranges of the rated values. Adjust the servo if necessary.

↓ Yes

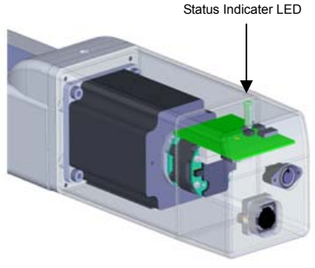
Establish Link to Fieldbus
1) Assign MCON as the host controller [Refer to the instruction manual of the master unit].
2) Put the operation mode setting switch on the front panel to AUTO side, and reboot the power.
3) Once the link with the master unit is established, turn ON MON signal in the gateway control signals.
(While MON Signal is ON, control from fieldbus is available.)

↓

Test Run Adjustment 2
Output an operation command from the host (such as PLC) to check by the system operation.

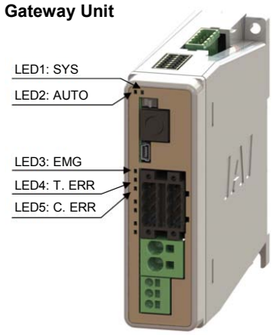
Status Indicater LED

Built-in Controller



Status of LED	Operation Status
OFF	Operation status
	Servo OFF
Red Illuminating	Alarm (Operation Cancellation Level or more)
	In the Emergency Stop
Red Flashing	During Crash Detection
Green Illuminating	Servo ON
Green Flashing	Motor Driving Power Supply OFF
Orange Illuminating	In initializing process when the power is turned on

Gateway Unit



Symbol	LED	Display Color and Operation Status
LED1	SYS	System Status Ready (Green Illuminating), Alarm (Red Illuminating)
LED2	AUTO	Operation Mode (AUTO/MANU) Status Automatic Operation (AUTO) Mode (Green Illuminating)
LED3	EMG	Emergency Stop (EMG) Status Emergency Stop (EMG) (Red Illuminating)
LED4	T. ERR	Bus Communication Error inside Controller T. ERR (Orange Illuminating)
LED5	C. ERR	Fieldbus Network Communication Error C. ERR (Orange Illuminating)

Hub Unit

Symbol	LED	Display Color and Operation Status
LED1	AX3 STS	Axis No.0 to 3 Status Servo OFF (OFF) Servo ON (Green Illuminating) Automatic Servo OFF (Green Flashing) Alarm, Emergency Stop (Red Illuminating) Communication Error (Red Flashing)
LED2	AX2 STS	
LED3	AX1 STS	
LED4	AX0 STS	
LED5	SYS	Hub Unit System Status Ready (Green Illuminating) Standby for Communication Establishment (Green Flashing) Control/Motor Power Voltage Drop (Red Illuminating)

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