IAI
Quality and Innovation

Applicable to Fieldbus

PSEL, ASEL

First Step Guide Seventh 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

The 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 IAI or our distributor.

1. Parts

No.	Part Name		Model	Reference
1	Controller Main Body		Refer to "How to read the model plate", "How to read the model of the controller"	
Accessories				
2	Fieldbus Connector	DeviceNet Type	SMSTB2.5/5-ST-5.08AU (Supplier : PHOENIX CONTACT)	
		CC-Link Type		
		PROFIBUS-DP Type	9-pin D-sub (female) connector.	
		EtherNet/IP Type	Ethernet straight cable (category 5e or above)	
3	Fieldbus Terminal Resistance	DeviceNet Type	Installed if this is the end of the network	121Ω±1%, 1/4W
		CC-Link Type	130Ω1/2W, 110Ω1/2W enclosed one unit each	
		PROFIBUS-DP Type	Installed if this is the end of the network	220Ω1/4W × 1, 390Ω1/4W × 1
		EtherNet/IP Type	Not necessary	
4	Motor Power Supply Plug			
5	System I/O Plug			
6	First Step Guide		ME0263	
7	Safety Guide		M0194	

2. Teaching Tool (to be purchased separately)
A teaching tool such as PC software is necessary to perform commissioning of this product.
Any of the following teaching tools may be used.

No.	Part Name	Model
1	PC Software (with RS232C cable + Emergency Stop Box)	IA-101-X-MW
2	PC Software (with USB converter adapter + RS232C cable + Emergency Stop Box)	IA-101-X-USBMW
3	PC Software (with the cable complying with Safety Category Class 4 specifications + Emergency Stop Box)	IA-101-XA-MW
4	Teaching Pendant	SEL-T
5	Teaching Pendant (with deadman switch)	SEL-TD
6	Teaching Pendant (with deadman switch + TP Adapter (IA-LB-TG))	SEL-TG
7	Teaching Pendant	IA-T-X
8	Teaching Pendant (with deadman switch)	IA-T-XD

3. Instruction Manuals related to this product

No.	Part Name	Manual No.
1	PSEL Controller Instruction Manual	ME0172
2	ASEL Controller Instruction Manual	ME0165
3	PC Software IA-101-X-MW/IA-101-X-USBMW	ME0154
4	Teaching Pendant SEL-T/TD/TG	ME0183
5	Teaching Pendant IA-T-X/XD	ME0160
6	DeviceNet Instruction Manual	ME0124
7	CC-Link Instruction Manual	ME0123
8	PROFIBUS-DP Instruction Manual	ME0153
9	EtherNet/IP Instruction Manual	ME0308

4. How to read the model plate

5. How to read the model of the controller

5.1 PSEL

PSEL – C – 2 – 20PI – 20PIB – DV – 0 – 0 – ABU – H
❶ ❷ ❸ ❹ ❹ ❺ ❻ ❼ ❽ ❾

Model table

❶ Series	❷ Controller Type	❸ Number of axes	❹ Details of axis 1 to axis 2 Motor Size	Encoder type	Brake	❺ Standard I/O	❻ I/O Flat cable length	❼ Power-supply voltage	❽ Simple absolute unit	❾ High Acceleration Transportable Type
PSEL	C (Standard Type) CS (Standard Type)	1 (1-axis) 2 (2-axis)	20P (20 □Size) 28P (28 □Size) 28SP (For RCP2- RA3C) 35P (35 □Size) 42P (42 □Size) 56P (56 □Size)	I (Incremental)	Not Specified (w/o brake) B (w/ brake)	DV (DeviceNet Connection Specifications) CC (CC-Link Connection Specifications) PR (PROFIBUS-DP Connection Specifications) EP (EtherNet/IP Connection Specifications)	0 : None	0 : 24V DC	Not Specified (Not used) ABU (Use)	Not Specified (Standard) H (High Acceleration Type)

5.2 ASEL

ASEL – C – 2 – 30A – 30AB – DV – 0 – 0
❶ ❷ ❸ ❹ ❹ ❺ ❻ ❼

Model table

❶ Series	❷ Controller Type	❸ Number of axes	❹ Details of axis 1 to axis 2 Motor Output	Encoder type	Brake	Home Sensor	High Accel/Decel Type	Low Power consumption Type	❺ Standard I/O	❻ I/O Flat cable length	❼ Power-supply voltage
ASEL	C (Standard Type) CS (Standard Type)	1 (1-axis) 2 (2-axis)	2 (2W) 5 (5W) 10 (10W) 20S (20W Note 1) 20 (20W) 30 (30W)	I (Incremental) A (Absolute)	Not Specified (w/o brake) B (w/ brake)	Not Specified (w/o home sensor) B (Home Sensor)	Not Specified (Standard Type) HA (High Accel/Decel Type)	Not Specified (Standard Type) LA (Power Consumption Type)	DV (DeviceNet Connection Specifications) CC (CC-Link Connection Specifications) PR (PROFIBUS-DP Connection Specifications) EP (EtherNet/IP Connection Specifications)	0 : None	0 : 24V DC

Note 1 For RCA-RA3C/RA3D/RA3R/RGS3C/RGS3D/RGD3C/RGD3D and RCA2-SA4C/TA5C, the motor type should be 20S.

Basic Specifications

PSEL Specifications

Specification Item		Single-Axis Type		2-Axis Type	
Control Power Source Voltage		24V DC ±10%			
Motor Power Source Voltage		24V DC ±10%			
Control Power Capacity		1.2A			
Motor Power Capacity Note 1	Actuator	Rated	MAX. Note 2	Rated	MAX. Note 2
	20, 28P, 28SP Motor	0.4A	2.0A	0.8A	4.0A
	35, 42, 56P Motor	1.2A		2.4A	
Heat Generation		14.4W			
Transient Power Cutoff Durability		0.5ms			
Insulation Resistance		500V DC 10MΩ or more			
Insulation Strength		500V AC for 1min (Between all power terminals and FG)			
Axis Control System		AC Full-digital Servo			
Encoder Resolution		800Pulse/rev			
Battery for Backup		For System Memory Backup : Manufactured by our company AB-5 (Option)			
Program language		Super SEL language			
Max. Number of program steps		2000 steps			
Max. Number of position		1500 positions			
Max. Number of programs		64 programs			
Max. Number of multitask programs		8 programs			
Data storage device		Flash ROM + SRAM battery backup (Option)			
Data input method		Teaching pendant or PC software			
Serial Communication Interface		RS232C : 1CH · · Dedicated protocol (at AUTO Mode) or for connection to PC software			
USB Interface		1CH (B Connector) · · Dedicated protocol (at AUTO Mode) or for connection to PC software			
Communication cable length	RS232C	15m or less			
	USB	5m or less			
Fieldbus Port		1 channel Complying with the standards for each field bus (Refer to the Wiring diagram for the connector). Either of DeviceNet / CC-Link / PROFIBUS-DP / EtherNet/IP			
System I/O		Emergency-stop input, safety gate input			
Protective functions		Overvoltage, motor over current, motor overload, driver temperature error, and Encoder error etc.			
Drive-source cutoff method		Internal Relay			
Environment	Ambient air temperature	0 to +40°C			
	Ambient humidity	10 to 95%RH (non-condensing)			
	Ambient environment	Free of corrosive gases, especially, no excessive dust			
	Ambient storage temperature	–25 to 70°C, batteries (option) excluded			
	Ambient storage humidity	10 to 95%RH (non-condensing)			
	Vibration strength	XYZ directions 10 to 57Hz Pulsating amplitude 0.035mm (continuous) 0.075mm (intermittent) 57 to 150Hz 4.9m/s² (continuous) 9.8m/s² (intermittent)			
	Impact	147mm/s², 11ms Semi-sine wave pulse three times to each of the directions X, Y and Z			
Protection class		IP20			
Cooling method		Natural Air Cooling			
Weight		440g			
External dimensions		(Refer to External Dimensions Section)			

Note 1 Inrush current of the control power when the power is turned ON, is about 30.0A for 5ms both for single axis type and 2-axis type.
Note 2 After the servo-motor is turned ON, the excitation detection operation is performed. Excitation phase detection is performed after power-on. In such a case, the current becomes maximum (About 100ms).
However, after the motor driving power is turned OFF, when the motor driving power is turned ON again, about 6.0A of current passes for single axis type and 12.0A of current for 2-axis type. (for approx. 1 to 2ms)

Select a +24V DC power supply preferably offering "peak load support", or one with sufficient inrush capacity.

ASEL Specifications

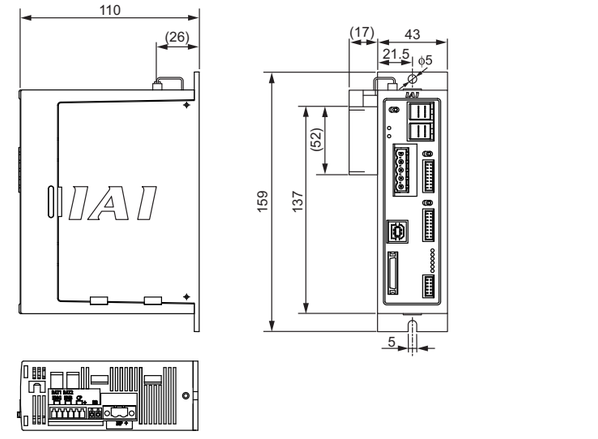
Specification Item			Single-Axis Type				2-Axis Type			
Control Power Source Voltage			24V DC ±10%							
Motor Power Source Voltage			24V DC ±10%							
Control Power Capacity			1.2A							
Motor Power Capacity Note 1	Actuator		Standard Type / High Accel/Decel Type		Low Power Consumption Type		Standard Type / High Accel/Decel Type		Low Power Consumption Type	
			Rated	MAX. Note 2	Rated	MAX. Note 3	Rated	MAX. Note 2	Rated	MAX. Note 3
	RCA/RCA2	10W	1.3A	4.4A	1.3A	2.5A	2.6A	8.8A	2.6A	5.0A
		20W [Model code mark: 20]	1.3A	4.4A	1.3A	2.5A	2.6A	8.8A	2.6A	5.0A
		30W	1.3A	4.0A	1.3A	2.2A	2.6A	8.0A	2.6A	4.4A
		20W [Model code mark: 20S]	1.7A	5.1A	1.7A	3.4A	3.4A	10.2A	3.4A	6.8A
	RCL	2W	0.8A	4.6A			1.6A	9.2A		
		5W	1.0A	6.4A			2.0A	12.8A		
		10W	1.3A	6.4A			2.6A	12.8A		
Heat Generation			14.4W							

Specification Item			Single-Axis Type	2-Axis Type
Transient Power Cutoff Durability			0.5ms	
Insulation Resistance			500V DC 10MΩ or more	
Insulation Strength			500V AC for 1min (Between all power terminals and FG)	
Axis Control System			AC Full –digital Servo	
Encoder Resolution	RCA		800Pulse/rev	
	RCA2	RCA2-□□□N	1048Pulse/rev	
		Other than RCA2-□□□N	800Pulse/rev	
	RCL	RA1L, SA1L, SA4L, SM4L	715Pulse/rev	
		RA2L, SA2L, RA5L, SA5L	855Pulse/rev	
		RA3L, SA3L, RA6L, SA6L	1145Pulse/rev	
Battery for Backup			For Absolute Data Backup : Manufactured by our company AB-5	
			For System Memory Backup : Manufactured by our company AB-5 (Option)	
Program language			Super SEL language	
Max. Number of program steps			2000 steps	
Max. Number of position			1500 positions	
Max. Number of programs			64 programs	
Max. Number of multitask programs			8 programs	
Data storage device			Flash ROM + SRAM battery backup (Option)	
Data input method			Teaching pendant or PC software	
Serial Communication Interface			RS232C : 1CH · · Dedicated protocol (at AUTO Mode) or for connection to PC software	
USB Interface			1CH (B Connector) · · Dedicated protocol (at AUTO Mode) or for connection to PC software	
Communication cable length	RS232C		15m or less	
	USB		5m or less	
Fieldbus Port			1 channel Complying with the standards for each field bus (Refer to the wiring diagram for the connector). Either of DeviceNet / CC-Link / PROFIBUS-DP / EtherNet/IP	
System I/O			Emergency-stop input, safety gate input	
Protective functions			Overvoltage, motor over current, motor overload, driver temperature error, and Encoder error etc.	
Drive-source cutoff method			Internal Relay	
Environment	Ambient air temperature		0 to +40°C	
	Ambient humidity		10 to 95%RH (non-condensing)	
	Ambient environment		Free of corrosive gases, especially, no excessive dust	
	Ambient storage temperature		–25 to 70 degrees (batteries (option) excluded)	
	Ambient storage humidity		10 to 95%RH (non-condensing)	
	Vibration strength		XYZ directions 10 to 57Hz Pulsating amplitude 0.035mm (continuous) 0.075mm (intermittent) 57 to 150Hz 4.9m/s² (continuous) 9.8m/s² (intermittent)	
	Impact		147mm/s², 11ms Semi-sine wave pulse three times to each of the directions X, Y and Z	
Protection class			IP20	
Cooling method			Natural Air Cooling	
Weight			450g	
External dimensions			(Refer to External Dimensions Section)	

Note 1 Inrush current of the control power when the power is turned ON, is about 30.0A for 5ms both for single axis type and 2-axis type.
Note 2 It is the maximum current in accelerating or decelerating.
Note 3 The current reaches its maximum level when the servo-motor exciting phase is detected which is to be performed in the first servo-motor turning ON processing after the power injection. (Normal: Approx. 1 to 2s, Max.: 10s)

Select a +24V DC power supply preferably offering "peak load support", or one with sufficient inrush capacity.

External Dimensions



* The dimensions are the same no matter of single axis type, double axis type or the type of the fieldbus.
* The above figure shows the condition where the system memory backup battery (option) is attached.

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]

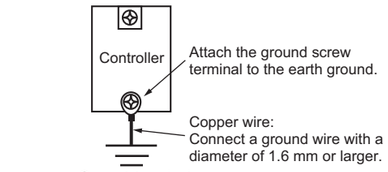
When using the product in any of the locations specified below, provide a sufficient shield.
- Location subject to electrostatic noise
- Location where a high electrical or magnetic field is present
- Location with the mains or power lines passing nearby

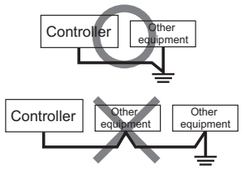
2. Storage and Preservation Environment

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)



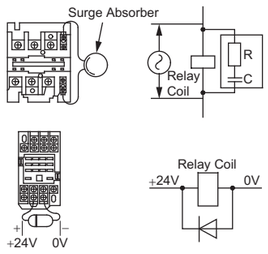


Do not share the ground wire with or connect to other equipment. Ground each controller seperately.

2. Precautions regarding wiring method
   1) Twist the wires for the 24V DC power unit.
   2) Separate the communication line from the power line.

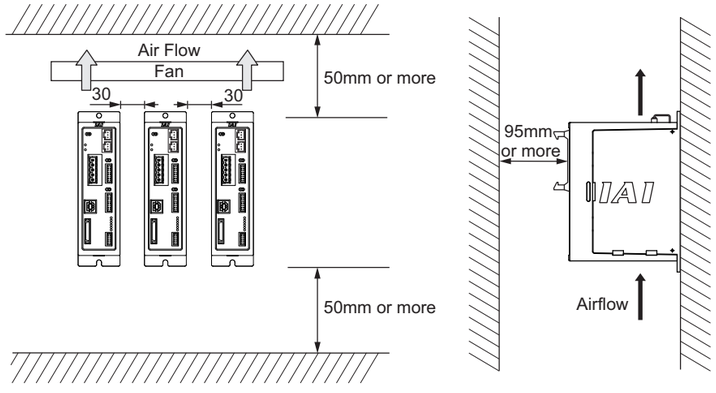
3. Noise Sources and Elimination

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.



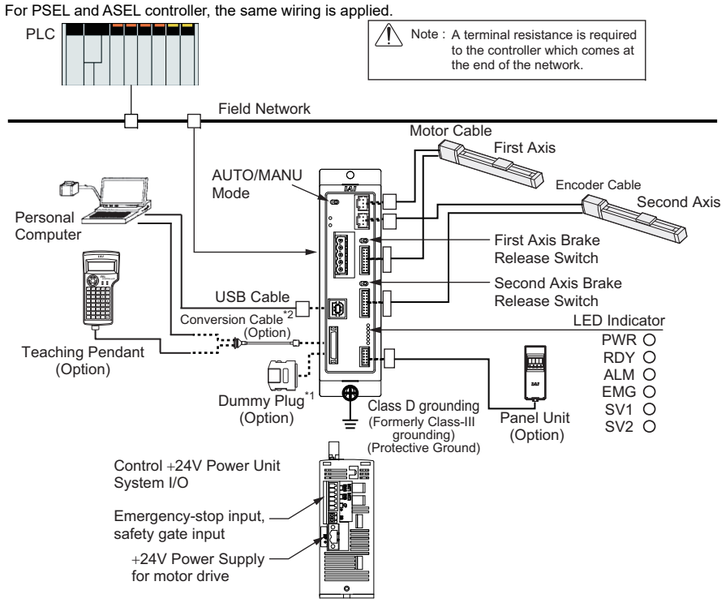
4. Heat Radiation and Installation

Conduct design and manufacture in consideration of the control box size, controller layout and cooling in such a way that the temperature around the controller will be 40°C or less.



Wiring

For PSEL and ASEL controller, the same wiring is applied.



Warning : When the PC is connected to the controller using the USB cable, the emergency stop box can not be connected. In the case of stop in an emergency, process it in the system.

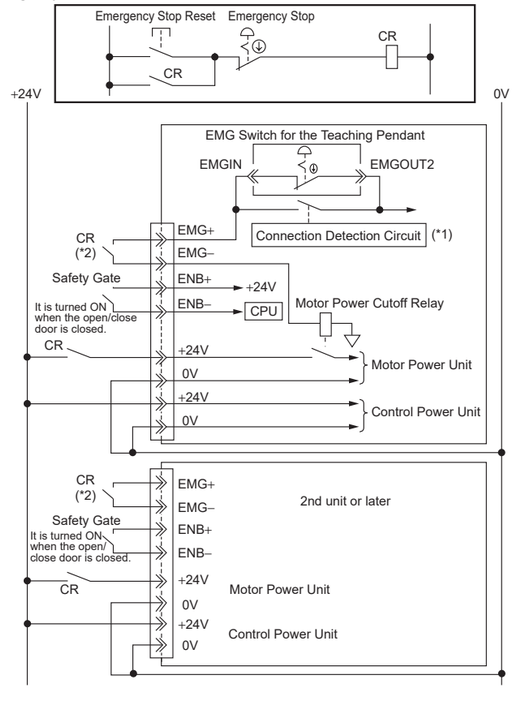
*1 When the PC is connected to the controller using the USB cable, it is required to attach the dummy plug(*2) to the controller to short the Safety Gate Signal for the PC application software and teaching pendant.

*2 The conversion cable and dummy plug differ depending on the model code of PSEL and ASEL.

Type	Applicable Conversion Cable	Applicable Dummy Plug
PSEL-C ASEL-C	CB-SEL-SJ002	DP-3
PSEL-CS ASEL-CS	CB-SEL-SJS002	DP-4S

Power Supply and Emergency Stop Circuit

Shown is an example when two or more controllers on the whole system emergency stop circuit, are stopped in an emergency.

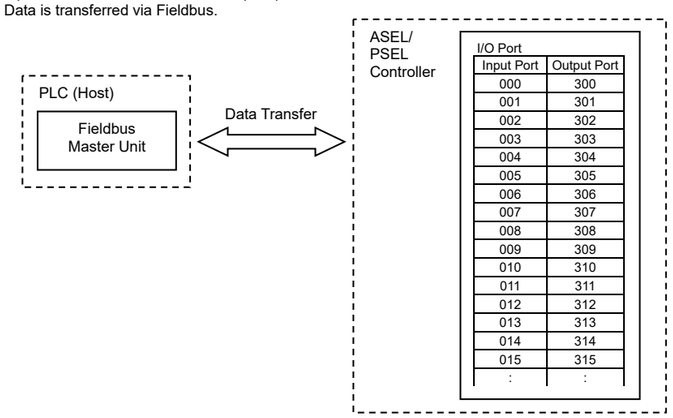


*1 The connection of the teaching pendant is automatically recognized using the controller.
*2 For the CR contacts between EMG "+" and EMG "–", use 24V DC, 0.5A/contact or more.
*3 When the safety category requirements include the motor driving source interception, connect CR.

CR Contact Capacity	: 24V DC 160mA or more
CR Load Current	: 160mA ≥ 10mA (current consumption caused by emergency stop circuit of each unit) × Total Number of PSEL and ASEL Units

I/O Port

I/O port is a place where the data inside the master unit and ASEL/PSEL controllers is sent and received.
1 port can handle data of 1 contact (1 bit).
Data is transferred via Fieldbus.



- I/O Mapping
  At delivery, the I/O port numbers and their functions are show below for the ASEL/PSEL controller.
  The port numbers and their function assignments can be changed in the I/O parameters.
  [Please refer to the "ASEL/PSEL Controller Instruction Manual" for the details.]

	Port No.	Function		Port No.	Function
Input	016	Program select (RPG No.1)	Input	008	General-purpose Input
	017	Program select (RPG No.2)		009	General-purpose Input
	018	Program select (RPG No.4)		010	General-purpose Input
	019	Program select (RPG No.8)		011	General-purpose Input
	020	Program select (RPG No.10)		012	General-purpose Input
	021	Program select (RPG No.20)		013	General-purpose Input
	022	Program select (RPG No.40)		014	General-purpose Input
	023	Software reset (Restart)		015	General-purpose Input
	000	Program Start	Output	300	Alarm Output
	001	General-purpose Input		301	Ready Output
	002	General-purpose Input		302	General-purpose Output
	003	General-purpose Input		303	General-purpose Output
	004	General-purpose Input		304	General-purpose Output
	005	General-purpose Input		305	General-purpose Output
	006	General-purpose Input		306	General-purpose Output
	007	General-purpose Input		307	General-purpose Output

(Note) Number of I/O ports is:

Input	000 to 299 (MAX. 300 points)
Output	300 to 599 (MAX. 300 points)

Initial Setting (I/O parameter)

No.	Parameter Name	Initial Value (Reference)	Input Range	Reference
1	I/O Port Allocation Type	1	0, 1	0: Fixed Allocation 1: Automatic Allocation (Order of Priority : Field Bus Port) →Standard I/O Board (Slot 1)
14	Number of Network I/F Card Remote Input Ports	64	0 to 256	Multiples of 8 Set up the number of input ports to be used for Fieldbus. For No. 14 and 15, choose the greater number and input the same value.
15	Number of Network I/F Card Remote Output Ports	64	0 to 256	Multiples of 8 Set up the number of output ports to be used for Fieldbus. For No. 14 and 15, choose the greater number and input the same value.
16	Network I/F Module Fix-Allocated Input Port Start No.	0	–1, 0 to 299	Multiples of 8 (Unavailable when it is negative figure) Set the top port number of the input ports used for Fieldbus.
17	Network I/F Module Fix-Allocated Output Port Start No.	300	–1, 300 to 599	Multiples of 8 (Unavailable when it is negative figure) Set the top port number of the output ports used for Fieldbus.
18	Network I/F Module Error Monitor	1	0 to 5	0: No Monitoring 1: Monitoring [Note] It is able to operate on the teaching tool without an alarm generation if it is set to "No Monitoring" even if it is not connected to the network at the startup. Make sure to put the setting back when a change is made.

The occupied address area on the PLC side is determined by the number of used inputs and outputs.
Refer to the instruction manual of the master unit for the details.

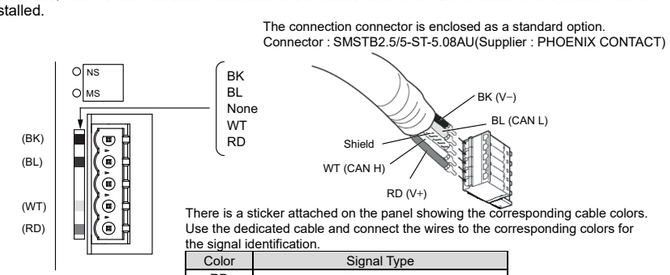
DeviceNet

- Specification

Item	Specification			
Communication Protocol	DeviceNet2.0 (Certified Interface)			
For Communication	Master/Slave Connection	Bit Strobe		
		Polling		
		Cyclic		
Baud Rate	500k/250k/125kbps			
Communication Cable Length (Note1)	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 cable is used			
No. of Occupied Nodes	1 node			
Communication Power Supply	Voltage 24V DC±10% Current Consumption 60mA Externally Supplied (Supplied from DeviceNet communication cable side)			
Communication Cable	Dedicated cable for DeviceNet			

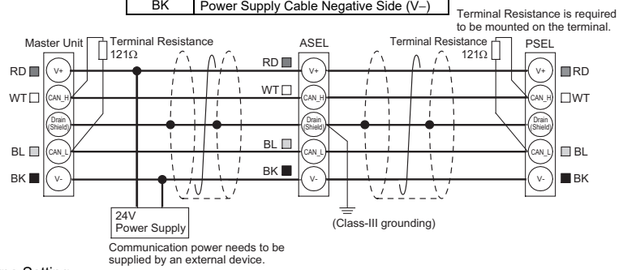
Note 1 Refer to the Instruction Manuals for the master unit and the mounted programmable logic controller (stated as PLC from now on) when a T-junction communication is to be conducted.

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



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–)



- Network Type Setting
  The I/O Parameter No. 225 “Network I/F Module Control” has been set to “2_H” (DeviceNet) when the unit is delivered. (Therefore, the setting is not necessary.)
- Node Addresses
  Station number is set with parameter.
  Set the node address to I/O Parameter No. 226 “Network I/F Module Communication Attribute 1” The setting range is from 0 to 63. (Set in delivery : 0)
  (Note) “D75: Fieldbus Parameter Error” would occur if the set address is out of the allowable range.
- Baud Rate Setting
  There is no need to set the baud rate since it automatically follows the master setting.

(Note) Make sure to reboot the controller after the parameter setting is complete, and do not forget to turn the mode changeover switch to “AUTO” side.

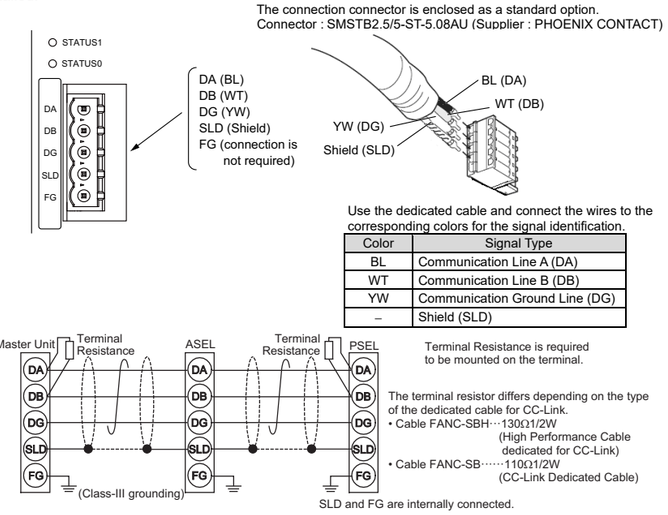
CC-Link

- Specification

Item	Specification					
Communication Protocol	CC-Link Ver1.10					
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					
No. of Occupied Stations	Remote Device Station [Refer to Field Network Wirings and Settings Section]					
Communication Cable Length(Note1)	Baud Rate	10Mbps	5Mbps	2.5Mbps	625kbps	156kbps
	Total Cable Length	100m	160m	400m	900m	1200m
Communication Cable	Dedicated cable for CC-Link					

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

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



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)

- Network Type Setting
  The I/O Parameter No. 225 “Network I/F Module Control” has been set to “1_H” (CC-Link) when the unit is delivered. (Therefore, the setting is not necessary.)
- Node Addresses
  Set the station number to I/O Parameter No. 226 “Network I/F Module Communication Attribute 1”. The setting range is from 1 to 63. (Set in delivery : 0)
  (Note) “D75: Fieldbus Parameter Error” would occur if either of the occupied stations is set to a station number 0 or more than 65.
- Baud Rate Setting
  Set the baud rate to the bits 0 to 3 in I/O Parameter No. 227 “Network I/F Module Communication Attribute 2”.
  The setting range is from 0 to 4_H.

(Note) Set the baud rate to match with the setting in the master station.

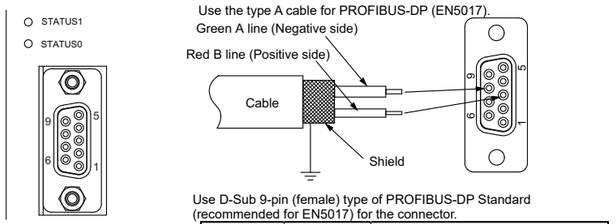
Value set in I/O parameter No.227	Baud Rate [bps]
0	156k
1	625k
2	2.5M
3	5M
4 (Set in delivery)	10M

PROFIBUS-DP

- Specification

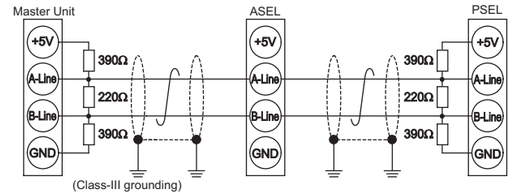
Item	Specification					
Communication Protocol	PROFIBUS-DP (RS485 conformance)					
Communication System	Hybrid System (Master-Slave System or Token Passing System)					
Baud Rate	9.6k to 12Mbps (Automatically follows the master)					
Communication Cable Length (Type A Cable)	Baud Rate	12/6/3Mbps	1.5Mbps	500kbps	187.5kbps	93.75/45.45/ 19.2/9.6kbps
	Total Cable Length	100m	200m	400m	1000m	1500m
No. of Occupied Nodes	1 node					
Communication Cable	Type A Cable for PROFIBUS-DP (Standard EN50170)					

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

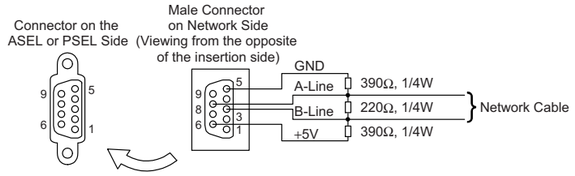


Use D-Sub 9-pin (female) type of PROFIBUS-DP Standard (recommended for EN5017) for the connector.

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



- Bus Termination
  When connecting to the network terminal, apply a terminal resistor to PROFIBUS-DP Communication Connector as shown below or apply a connector already equipped with a terminal resistor.
  • An example for a connector equipped with a terminal resistor :
  SUBCON-PLUS-PROFIB/AX/SC（PHOENIX CONTACT）
  • Connection of Terminal Resistor



- Network Type Setting
  The I/O Parameter No. 225 “Network I/F Module Control” has been set to “3_H” (PROFIBUS-DP) when the unit is delivered. (Therefore, the setting is not necessary.)
- Node Addresses
  Station number is set with parameter.
  Set the node address to I/O Parameter No. 226 “Network I/F Module Communication Attribute 1”. The setting range is from 0 to 125. (Set in delivery : 1)
  (Note) “D75: Fieldbus Parameter Error” would occur if the set address is out of the allowable range.
- Baud Rate Setting
  There is no need to set the baud rate since it automatically follows the master setting.

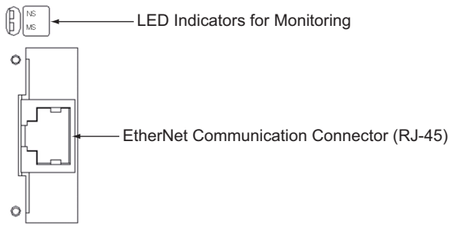
(Note) Make sure to reboot the controller after the parameter setting is complete, and do not forget to turn the mode switch to “AUTO” side.

EtherNet/IP

- Specification

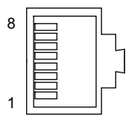
Item	Specification
Device Type	Generic Device
IP Address	1.0.0.1 to 255.255.255.254
Port No.	2222 (UDP), 44818 (TCP/IP)
Baud Rate	10/100 Mbps
Communication Mode	10BASE-T/100 BASE-T Half Duplex / Full Duplex
Communication Cable Length	In accordance with specification at EtherNet/IP (Distance between hub and each nodes: 100 m max.)
Communication Cable	Category 5e or above (Aluminum tape and braided double-shielded cable are recommended.)
Connector	One RJ45 connectors

- Interface



(Note) Refer to the instruction manual for the details of the LED display.

- EherNet/IP Connector



Pin No.	Signal Name	Signal Abbreviation
1	Data transmitted +	TD +
2	Data transmitted -	TD -
3	Data received +	RD +
4	Not used	
5	Not used	
6	Data received -	RD -
7	Not used	
8	Not used	
Connector hood	Protective Ground	FG

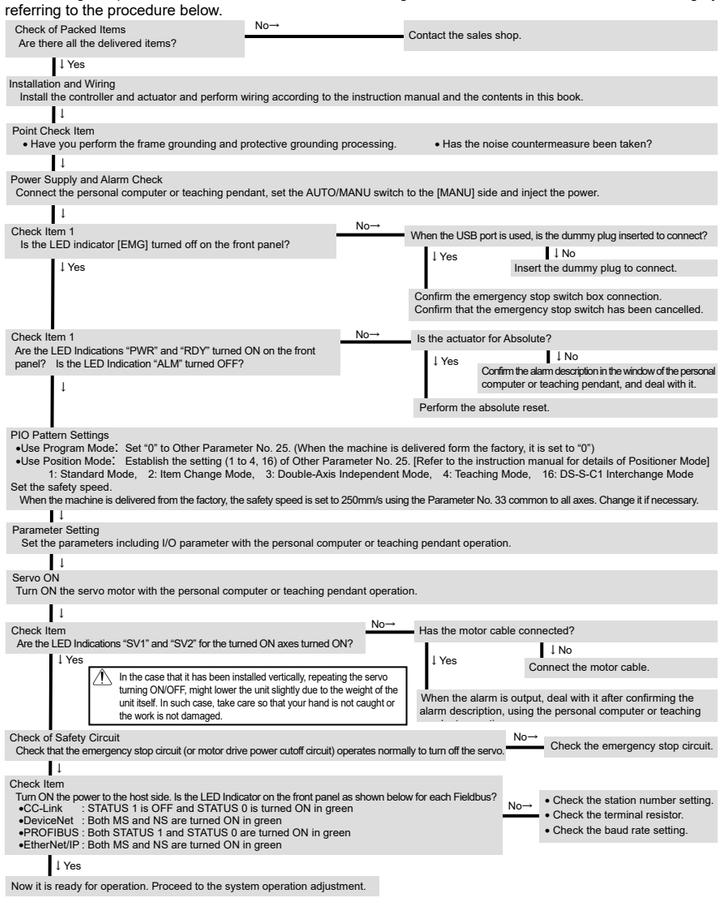
- Network Type Setting
  The I/O Parameter No. 225 “Network I/F Module Control” has been set to “7_H” (EtherNet/IP) when the unit is delivered. (Therefore, the setting is not necessary.)

- Setting the IP Address
  Have the settings established for I/O Parameters No. 132 to 135 “Network I/F Module Self IP Address”.
  Settable Range:1.0.0.1 to 255.255.255.254 (It is set to “192.168.0.1” when the machine is delivered from the factory.)
- Setting the Subnet Mask
  Have the settings established for I/O Parameters No. 136 to 139 “Network I/F Module Subnet Mask”.
  Settable Range:0.0.0.0 to 255.255.255.255 (It is set to “255.255.255.0” when the machine is delivered from the factory.)
- Setting the Default Gateway
  Have the settings established for I/O Parameters No. 140 to 143 “Network I/F Module Default Gateway”.
  Settable Range:0.0.0.0 to 255.255.255.255 (It is set to “0.0.0.0” when the machine is delivered from the factory.)
- Baud Rate Setting
  Have the settings established for I/O Parameter No. 227 “Network I/F Module Baud Rate”.

(Note) Make sure to reboot the controller after the parameter setting is complete, and do not forget to turn the mode switch to “AUTO” side.

Starting Procedures

When using this product for the first time, work while making sure to avoid omission and incorrect wiring by referring to the procedure below.



Troubleshooting

For ASEL and PSEL, it is possible to check the operation status with the status LEDs on the front panel when an error is occurred.

- In the case of DeviceNet:

LED Indicators for Monitoring				Condition	Treatment
MS		NS			
GN	OR	GN	OR		
Illuminating	–	Illuminating	–	In normal operation	
Illuminating	–	OFF	OFF	Waiting for the completion of the node address duplication check on the master side	• Check if the communication speed of the master is the same as that for all the slave units. Correct the setting and re-start the machine. • Check if the connector is connected correctly.
Illuminating	–	Flashing	–	Waiting for the establishment of the connection with the master	• Check if the master is operated normally. • Check if it has been registered in the master’s scanning list.
–	Illuminating	OFF	OFF	A hardware error occurred.	• Contact our company.
–	Flashing	OFF	OFF	Dip Switch Setting Error	• Check if the communication speed of this unit is the same as that of the master. • Check if the configuration has been set correctly.
Illuminating	–	–	Illuminating	Duplicated node address or Busoff (Communication stop due to frequent data error) detection	• Correct the node address and restart the machine. • Check if there is any noise source close to the unit or the communication cable is not arranged parallel to the power line, and check for the influence of the noise.
Illuminating	–	–	Flashing	Communication Time-out	• Check if the communication speed of this unit is the same as that of the master.
In NS, green light is turned ON and flashes repeatedly or red light and green light flash repeatedly.				Communication Error	• Check if it has been registered in the master’s scanning list. • Check if the I/O area is not duplicated with that of the other slave unit. • Check if the I/O area does not exceed the area permitted by the master unit. (in the case of fixed allocation)

- In the case of CC-Link

STATUS1	STATUS0	Condition
Illuminating	Illuminating	Impossible condition
Illuminating	OFF	• An error occurs. (CRC Error, Station Setting Error or Communication Speed Setting Error) • Since turning the power ON or software reset till completion of CC-Link initialization
OFF	Illuminating	Normal Communication Status
OFF	OFF	Power Failure: Remote station power unit breakdown or communication cable breakage
Flashing	Illuminating	Impossible condition
Flashing	OFF	The station number setting or the baud rate setting is changed during the communication

- In the case of PROFIBUS

LED	Color	Illumination Status	Indication Description (Meaning)
STATUS 1	GN	Illuminating	Online from fieldbus and communication in normal condition.
		Flashing	Offline from fieldbus.
	OR	Flashing	Communication error is occurred.
STATUS 0	GN	Illuminating	In normal operation.
		Flashing	Getting ready for operation.
	OR	Illuminating	An error detected on communication-related hardware during preparing for operation.

- In the case of EtherNet/IP

Name	Illumination Status (Color)	Explanation	
NS	OFF	The power is turned OFF or IP address is not yet set.	
	Illuminating (Green)	Connection has been established and proper communication is in progress.	
	Flashing (Green)	The system is online but connection is not yet established. Communication is stopped (the network is normal). Check the status of the master unit.	
	Illuminating (Red)	A communication error is present. Communication cannot be established because an error, such as duplicate IP addresses, has been detected.	Check the IP address setting, wiring condition of the communication line, power supply for the hub, noise measures, etc.
	Flashing (Red)	A communication error is present. (A communication timeout has been detected.)	
MS	OFF	The power is turned OFF.	
	Illuminating (Green)	Operation is normal. The system is in the scanner (master) control mode.	
	Flashing (Green)	Connection is not yet established with the scanner (master). Check the setting of configuration information. Check if the scanner (master) is idle.	
	Illuminating (Red)	A hardware error is present. The board must be replaced. Please contact IAI.	
	Flashing (Red)	A configuration error, invalid setting or other minor error is present. The problem can be resolved by, for example, setting the problem item or items again.	

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Manual No.: ME0263-7A