IAI
Quality and Innovation

Applicable to Fieldbus

SCON
First Step Guide Third Edition

Thank you for purchasing our product.
Make sure to read the Safety Guide and detailed Instruction Manual (CD/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 CD/DVD Manual included in the box this device was packaged in. It should be retained with this device at all times.
A hardcopy of the 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 (The option is excluded.)

No.	Part Name		Model	Reference
1	Controller Main Body		Refer to "How to read the model plate", "How to read controller model"	
Accessories				
2	Fieldbus Connector	DeviceNet Specifications	SMSTB2.5/5-ST-5.08AU (Maker : Phoenix Contact)	
		CC-Link Specifications		
		PROFIBUS Specifications	Prepare D-sub 9-pin (female) connector.	
		CompoNet Specifications	Prepare flat cable connector dedicated for CompoNet.	
		MECHATROLINK Specifications	Connector recommended for MECHATROLINK-II.	
3	System I/O Plug		FMC1.5/4-ST-3.5 (Maker : Phoenix Contact)	Applicable Cable Size 0.5mm^2 (AWG20)
4	Power Supply Plug for Brake		MC1.5/2-ST-3.5 (Maker : Phoenix Contact)	
5	AC Power Supply plug		MSTB2.5/6-STF-5.08 (Maker : Phoenix Contact)	Applicable Cable Size 2.0mm^2 (AWG14)
6	Absolute Battery		AB-5	Enclosed in Absolute Type
7	First Step Guide			
8	Instruction Manual (CD/DVD)			
9	Safety Guide			

2. Teaching Tool (Option)
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 such as PC software.

No.	Part Name	Model
1	PC Software (RCS232C converter adapter and external equipment communication cable are included)	RCM-101-MW
2	PC Software (USB converter adapter, USB cable and external equipment communication cable are included)	RCM-101-USB
3	Touch Panel Teaching	CON-PT
4	Touch Panel Teaching (Dead-man Switch is included)	CON-PD
5	Touch Panel Teaching (Dead-man Switch and TP Adapter (RCB-LB-TG) are included)	CON-PG
6	Teaching Pendant	CON-T
7	Teaching Pendant (Dead-man Switch and TP Adapter (RCB-LB-TG) are included)	CON-TG
8	Simplified Teaching Pendant	RCM-E
9	Data Setter	RCM-P
10	Touch Panel Indicator (for SCON-C)	RCM-PM-01

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

No.	Name	Manual No.
1	SCON-C Controller Instruction Manual	ME0161
2	SCON-CA Controller Instruction Manual	ME0243
3	CC-Link (Remote I/O Type) Instruction Manual (for SCON-C)	ME0123
4	CC-Link (High Performance Type) Instruction Manual (for SCON-CA)	ME0254
5	DeviceNet (Remote I/O Type) Instruction Manual (for SCON-C)	ME0124
6	DeviceNet (High Performance Type) Instruction Manual (for SCON-CA)	ME0256
7	PROFIBUS-DP (Remote I/O Type) Instruction Manual (for SCON-C)	ME0153
8	PROFIBUS-DP (High Performance Type) Instruction Manual (for SCON-CA)	ME0258
9	CompoNet (High Performance Type) Instruction Manual (for SCON-CA)	ME0220
10	MECHATROLINK (High Performance Type) Instruction Manual (for SCON-CA)	ME0221
11	PC Software RCM-101-MW/ RCM-101-USB Instruction Manual	ME0155
12	Touch Panel Teaching CON-PT/PD/PG Instruction Manual	ME0227
13	Teaching Pendant CON-T/TG Instruction Manual	ME0178
14	Simplified Teaching Pendant RCM-E Instruction Manual	ME0174
15	Data Setter RCM-P Instruction Manual	ME0175
16	Touch Panel Indicator RCM-PM-01 (for SCON-C)	ME0182

4. How to read the model plate

5. How to read controller model

SCON-CA-20 I HA-DV-2-0

<Series>
<Type>
C : Standard Type
CA : High Performance Type
<Motor Type>
20 : 20W
30D : 30W (Excluding RS)
30R : 30W (for RS)
60 : 60W
100 : 100W
100S : 100W (LSA)
150 : 150W
200 : 200W
200S : 200W (LSA)
300S : 300W (LSA)
400 : 400W
600 : 600W
750 : 750W
750S : Equipped with loadcell RCS2-RA13R
<Encoder Type>
I : Incremental
A : Absolute
<Option>
No Indication : Standard Type
HA : High Acceleration/Deceleration Type
<Power-supply Voltage>
1 : Single-Phase 100V AC
2 : Single-Phase 200V AC
<I/O Cable Length>
0 : Equipped with no cable
2 : 2m
3 : 3m
5 : 5m
<I/O Type>
NP : NPN Specification (Sink Type) (Standard)
PN : PNP Specification (Source Type)
DV : DeviceNet Connection Type
CC : CC-Link Connection Type
PR : PROFIBUS Connection Type
CN : CompoNet Connection Type(Note)
ML : MECHATROLINK Connection Type(Note)
(Note) Specified only for SCON-CA

Basic Specifications

List of Specifications

Item		Less than 400W	400W or more
Corresponding Motor Capacity		20W to 399W	400W to 750W
Power-supply Voltage		Single-Phase 100 to 115V AC (Power fluctuation within ±10%) Single-Phase 200 to 230V AC (Power fluctuation within ±10%)	Single-Phase 200 to 230V AC (Power fluctuation within ±10%)
Rush Current*1	Power-supply Voltage 100V AC	20A (Controller side), 70A (Drive side)	
	Power-supply Voltage 200V AC		20A (Controller side), 80A (Drive side)
Load Capacity		Refer to Power Capacity and Heat Generation	
Leak Current*2		3.0mA Primary side when noise filter is connected to power supply line	
Heat Generation		Refer to Power Capacity and Heat Generation	
Power Supply Frequency		50/60Hz	
PIO Power Supply*3		24V DC±10%	
Power Supply for Electromagnetic Brake (for actuator equipped with brake)		24V DC±10% 1A (MAX.) (supplied from external equipment)	
Transient Power Cutoff Durability	SCON-C	10ms (50Hz), 8ms (60Hz)	
	SCON-CA	20ms (50Hz), 16ms (60Hz)	
Motor Control System		Sine Wave PWM Vector Current Control	
Corresponding Encoder		Incremental Serial Encoder, Absolute Serial Encoder, ABZ (UVW) Parallel Encoder	
Actuator Cable Length		MAX. 20m	
Serial Communication Interface		RS485 : 1CH ... based on Modbus Protocol RTU/ASCII Speed : 9.6 to 230.4Kbps Control available with serial communication in the modes other than the pulse train	
External Interface	PIO Specifications	Signal I/O dedicated for 24V DC (selected from NPN/PNP) … Input 16 ports max., output 16 ports max.	
	Fieldbus Specification	DeviceNet/CC-Link/PROFIBUS/CompoNet/MECHATROLINK …Each dedicated controller [Refer to each Fieldbus Instruction Manual]	
Cable Length	PIO	MAX. 10m	
	RS485	Total cable length 100m or less.	
	Fieldbus	Refer to each Fieldbus specification	
Data Setting and Input		PC Software, Touch Panel Teaching, Teaching Pendant	
Data Retention Memory	SCON-C	Saves position data and parameters to non-volatile memory (Limitation in number of writing 100,000 times)	
	SCON-CA	Saves position data and parameters to non-volatile memory (There is no limitation in number of writing)	
Operation Mode		Positioner Mode/Pulse Train Control Mode (selected by Pulse Train Mode Changeover Switch on Front Panel)	
Number of Positions in Positioner Mode		Standard 64 points, maximum 512 points (PIO Type), 768 points (only for SCON-CA Fieldbus Type) (Note) Number of positions differs depending on the selection in PIO pattern and fieldbus operation mode.	
Pulse Train Control Mode (Dedicated for PIO Specifications)	Input Pulse Frequency SCON-C	Differential System (Line Driver System) : MAX. 500Kpps	
	Input Pulse Frequency SCON-CA	Differential System (Line Driver System) : MAX. 2.5Mpps	
	Input Pulse Frequency Common to C/CA	Open Collector Type : 200Kpps max. (under condition AK-04 is used)	
	Command Pulse Multiplying Factor (Electrical Gear : A/B)	1/50 < A/B < 50/1 Setting Range of A and B (set to parameter) : 1 to 4096	
Feedback Pulse (Dedicated for PIO Specifications)	SCON-C	Differential System (Line Driver System) : MAX. 500Kpps (Linear output available up to 109Kpps)	
	SCON-CA	Differential System (Line Driver System) : MAX. 2.5Mpps	
	Common to C/CA	Open Collector Type : MAX. 500Kpps (under condition JM-08 is used)	
LED Display (mounted on Front Panel)		PWR (green) : Controller in normal condition, SV (green) : Servo on, ALM (orange) : Alarm generated, EMG (red) : Emergency Stop	
Electromagnetic Brake Compulsory Release Switch (mounted on Front Panel)		Switching NOM (standard)/BK RLS (compulsory release)	
Insulation Resistance		500V DC 100MΩ or more	
Insulation Strength		1,500V AC for 1 min. (Note) Withstand voltage of force control loadcell is 50V DC	
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	-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	
Weight		Approx. 800g	Approx. 1100g
Cooling Method		Natural air-cooling	Forced Air Cooling
External Dimensions		58W × 194H × 121D [mm]	72W × 194H × 121D [mm]

*1 In-rush current will flow for approximately 20msec after the power is turned on (at 40°C).
Note that the value of in-rush current differs depending on the impedance of the power supply line.
*2 Leak current varies depending on the capacity of connected motor, cable length and the surrounding environment. Measure the leak current at the point where a ground fault circuit interrupter is to be installed when leakage protection is conducted.
A ground fault circuit interrupter needs to be selected carefully considering the purposes of prevention of fire and protection of human.
Use the harmonic type (for inverter) for the ground fault circuit interrupter.
*3 It is not necessary to supply power to PIO when operating with using Fieldbus (DeviceNet, CC-Link, PROFIBUS, CompoNet or MECHATROLINK), ROBONET, Gateway Unit or SIO Converter without using PIO. In this case, set the parameter No. 74 (PIO Power Supply Monitor) to "1" (Invalid). It will generate the error code No. 0CF (I/O 24V Power Supply Error) if the setting is not done.

Power Capacity and Heat Generation

Rated Power Capacity = Motor Power Capacity + Control Power Capacity
Peek Max. Power Capacity = Peek Max. Motor Power Capacity + Control Power Capacity

Actuator Motor Type	Motor Power Capacity [VA]	Peek Max. Motor Power Capacity [VA]	Control Power Capacity [VA]	Rated Power Capacity [VA]	Peek Max. Power Capacity [VA]	Heat Generation [W]
20	26	78	48	74	126	30
30D (Excluding RS)	46	138		94	186	31
30R (for RS)	138	414		186	462	33
60	138	414		186	462	33
100	234	702		282	750	35
100S (LSA)	283	851		331	899	36
150	328	984		376	1032	37
200	421	1263		469	1311	38
200S (LSA excluding LSA-N15H)	486	1458		534	1506	38
200S (LSA-N15H)	773	2319		821	2367	56
300S (LSA)	662	1986		710	2034	40
400	920	2760		968	2808	45
600	1164	2328		1212	2376	56
750	1521	3042		1569	3090	58
750S		4563			4611	

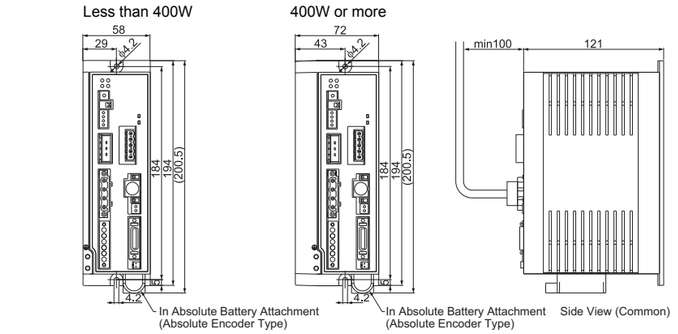
RS : Rotary Shaft LSA : Linear Actuator

Selection of Circuit Interrupter

- 3 times of the rated current flows to the controller during the acceleration/deceleration. Select an interrupter that does not trip with this value of current. If a trip occurs, select an interrupter that possesses the rated current of one grade higher. (Refer to the operation characteristics curves in the product catalog.)
- Select an interrupter that does not trip with the in-rush current. (Refer to the operation characteristics curves in the product catalog.)
- Consider the current that enables to cutoff the current even when a short circuit current is flown for the rated cutoff current.
Rated Interrupting Current > Short Circuit Current = Primary Power Capacity / Power Voltage
Consider margin for the rated current on the circuit breaker.

Rated Current for Circuit Interrupter > (Rated Motor Power Capacity [VA] + Control Power Capacity [VA]) / AC Input Voltage × Safety Margin (reference 1.2 to 1.4 times)

External Dimensions



(Note) Shown above is the drawing of DviceNet and CC-Link. Dimensions should be the same for other models.

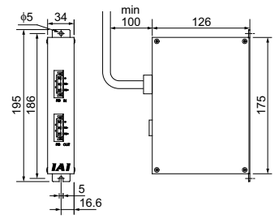
Regenerative Resistor Unit (Option) : REU-1, REU-2

This is a unit that converts the regenerative current to heat when the motor decelerates.

[Specification]

Item		Specification
Body Size		W34mm × H195mm × D126mm
Body Weight		0.9kg
Internal Regenerative Resistor		235Ω 80W
Accessories	REU-1 (2nd unit or later)	Controller Connection Cable (Model Code CB-ST-REU010) 1m
	REU-2 (First Unit)	Controller Connection Cable (Model Code CB-SC-REU010) 1m

[Appearance]



[Reference Connectable Quantity]

Motor Wattage	Connectable Number of Regenerative Resistor Units
Horizontal Mount/Vertical Mount	
to 99W	Not Required
100 to 399W, 100 to 300S	1
400 to 750W	2

(Note 1) This is a reference for the case when the actuator is ran forward and backward on 1,000mm stroke with the operation duty 50% under the rated acceleration/deceleration speed and rated load.
(Note 2) It is necessary to have the regenerative resistor listed above when the operation duty is above 50%.
The maximum quantity of the external regenerative resistor units that can be connected is as stated below:
• 2 units for less than 400W • 4 units for 400W or more

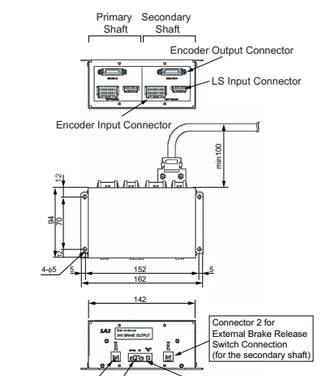
Brake Box (Option) : RCB-110-RA13-0

This is applied on NS Actuator and RCS-RA13R with brake.
1 unit of Brake Box possesses brakes for 2 shafts.

[Specification]

Item	Specification
Body Size	W162 × H94 × D65.5mm
Power Voltage and Current	24V DC±10% 1A
Connection Cable	Encoder Cable (Model Code CB-RCS2-PLA010) 1m

[Appearance]



[24V Power Supply Connector]

Connector on Cable Side (Enclosed in standard package)	MC1.5/2-STF-3.5 (Phoenix Contact)		
Applicable Cable	AWG28 to 16		
Terminal Assignment	Pin No.	Signal	Explanation
	1	0V	Power Supply Grounding for Brake Excitation
	2	24VIN	For Brake Excitation and 24V Power Supply

[Connectors 1 and 2 for external brake release switch connection]

Connected Equipment	Brake Release Switch		
Connector on Cable Side (Please prepare separately)	XAP-02V-1 (Contact BXA-001T-P0.6) (JST)		
Switch Rating	30V DC Minimum Current 1.5mA		
Terminal Assignment	Pin No.	Signal	Explanation
	1	BKMRL	Brake Release Switch Input
	2	COM	Power Supply Output for Brake Release Switch Input

(Note) Short circuit of pin No. 1 and 2 of this connector releases the brake compulsorily.
Same as the brake release switch on SCON main unit, it is possible to release the brake.
Do not keep the compulsory release condition while in automatic operation.

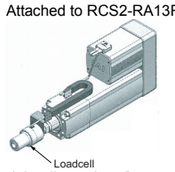
Loadcell (Dedicated Option for SCON-CA)

This is the pressing force measurement unit that is used for the force control.
This is used by connecting to the actuator corresponding to the force control.

[Specification]

Item	Specification	
Loadcell System	Strain Gauge	
Rated Capacity	20000N	
Allowable Overload	200%R.C*1	
Loadcell Accuracy	±1%R.C*1	
Temperature Drift	Zero	±0.2%R.C/10°C
	Output	±0.1%R.C/10°C
Applicable Temperature Range	0 to 40°C	

Attached to RCS2-RA13R



*1 R.C.: Rated Capacity
[Refer to RCS2-RA13R Instruction Manual for details of how to attach and the dimensions.]

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)

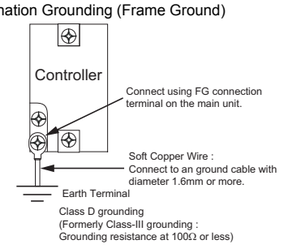
1. Installation Environment
   Do not use this product in the following environment
   - Location where the surrounding air temperature exceeds the range of 0 to 40°C
   - Location where condensation occurs due to abrupt temperature changes
   - Location where relative humidity exceeds 85%RH
   - Location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

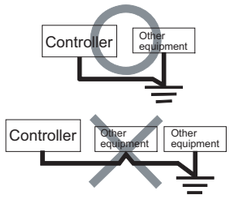
   When using the product in any of the locations specified below, provide a sufficient shield.
   - Location subject to electrostatic noise
   - Location where high electrical or magnetic field is present
   - Location with the mains or power lines passing nearby

2. Storage Environment
   - Storage 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)

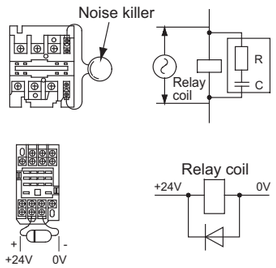




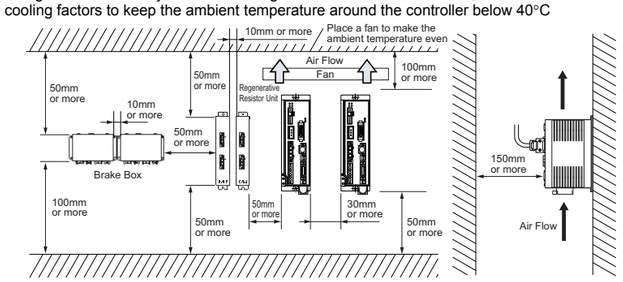
Do not share the ground wire with or connect to other equipment. Ground each controller.

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 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 Noise killer 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

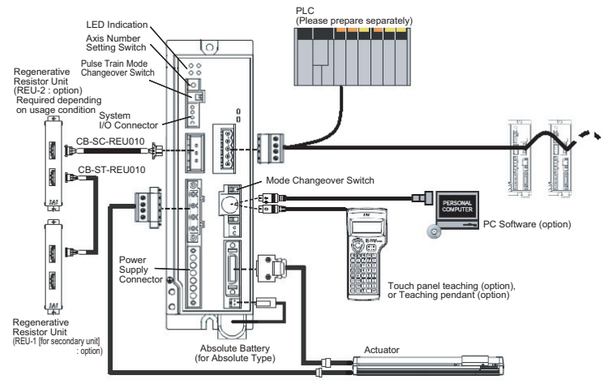


4. Heat Radiation and Installation
   Design and Build the system considering the size of the controller box, location of the controller and cooling factors to keep the ambient temperature around the controller below 40°C

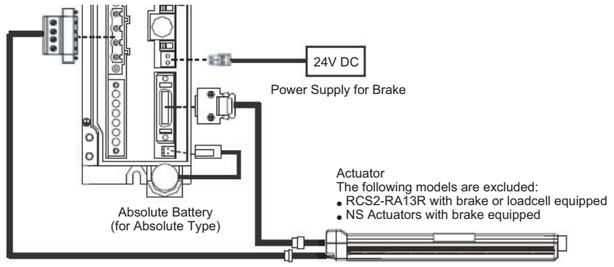


Connection Diagram

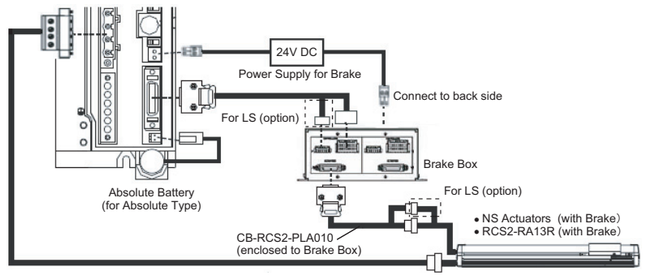
- Standard



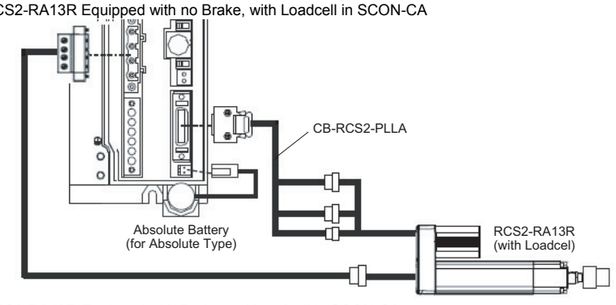
- For Models Equipped with brake Except for RCS2-RA13R and NS Actuators



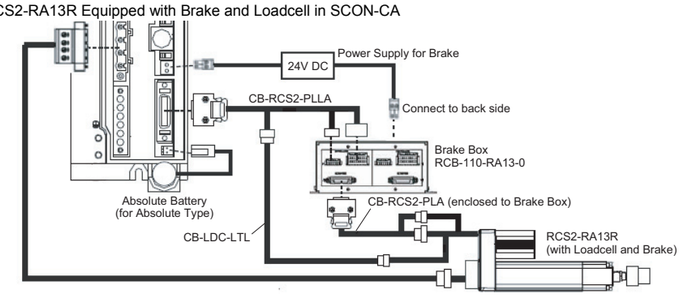
- RSC2-RA13R Equipped with Brake, with no Loadcell, or NS Actuators with Brake



- RCS2-RA13R Equipped with no Brake, with Loadcell in SCON-CA

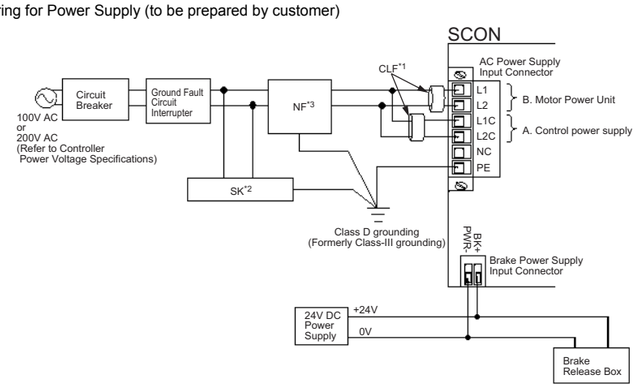


- RCS2-RA13R Equipped with Brake and Loadcell in SCON-CA



Power Supply and Emergency Stop Circuit

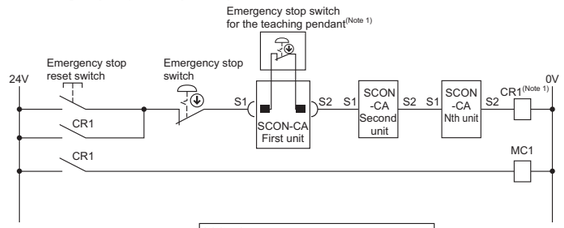
- Wiring for Power Supply (to be prepared by customer)

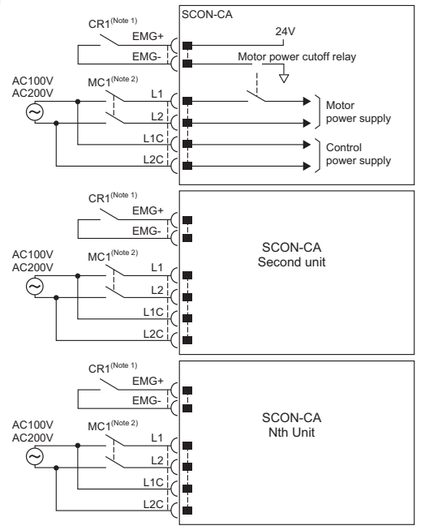


Power consumption of SCON varies depending on the connected actuator, etc. Select the circuit breaker that suits to the specification.
[Refer to Basic Specifications]
A ground fault circuit interrupter needs to be selected carefully considering the purposes of prevention of fire and protection of human.
Have a measurement of the leak current where a ground fault circuit interrupter is to be installed.
Use the "harmonic type" for the ground fault circuit interrupter.
*1 CLF : Clamp Filter … It is recommended to attach it to improve noise immunity.
*2 SK : Surge Killer … It is recommended to attach it to improve noise immunity.
*3 NF : Noise Filter … Make sure to install it. It is recommended to have it installed within 0.3m of the cable length from SCON.

Parts Name		Maker	Model
CLF	Clamp Filter	TDK	ZCAT3035-1330
SK	Surge Protector	Okaya ELECTRIC CO.,LTD	R·A·V-781BWZ-2A
NF	Noise Filter	SOSHIN ELECTRIC CO.,LTD	NF2010A-UP
		DENSEI-LAMBDA	MC1210

- Wiring for Emergency Stop Input
  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.





Note 1 When the teaching pendant is not connected, S1 and S2 become short-circuited inside the controller.
Note 2 Connect a contactor to L1 and L2 terminals for external power cutoff by the emergency stop if the motor power is required to be cut off externally to comply with the Safety Categories.
Note 3 The rating for the emergency stop signal to turn ON/OFF at contact CR1 is 24V DC and 10mA.
Note 4 For CR1, select the one with coil current 0.1A or less.

Operation Modes and Functions (in common for each Fieldbus)

The following operation modes are available to select for the operation.

(1) Remote I/O Mode : This is the mode to perform operation by PIO (24V I/O) with Fieldbus.
(2) Position / Simple Direct Mode : This is the mode to perform operation by indicating the target position by inputting the value directly. The values of the position data already registered for the speed, acceleration/deceleration and positioning band are to be used in this mode.
(3) Semi-Direct Mode : This is the operation mode to indicate the speed, acceleration/deceleration and pressing current, as well as the target position, by inputting the values directly.
(4) Full-Direct Mode : This is the operation mode to indicate all related to the position control by inputting the values directly.
(5) Remote I/O Mode 2 : This is the mode that the function to read the current position and the current speed is added to Remote I/O.
(6) Position / Simple Direct Mode 2 : This is the mode corresponding to the force control function instead of the teaching and zone functions in (2).
(7) Semi-Direct Mode 2 : This is the mode that enables to read the loadcell data instead of reading the command current value in (3).
(8) Remote I/O Mode 3 : This is the mode that the function to read the current position and loadcell data is added to (1) functions.
(9) Semi-Direct Mode 3 : This is the mode that equips the vibration control function instead of the jog function in (3).

Operation Modes and Main Functions

Corresponding Type	All Types	CA Type							
Main Functions	Remote I/O Mode(Note3)	Position / Simple Direct Mode	Semi-Direct Mode	Full-Direct Mode	Remote I/O Mode 2	Position / Simple Direct Mode 2	Semi-Direct Mode 2	Remote I/O Mode 3	Semi-Direct Mode 3
Number of Occupied Channels (DeviceNet)	1	4	8	16	6	4	8	6	8
Number of Occupied Stations (CC-Link)	1	1	2	4	1	1	2	1	2
Occupied Bytes (PROFIBUS)	2	8	16	32	12	8	16	12	16
Occupied Bytes (CompoNet)	2	8	16	32	12	8	16	12	16
Position No. Designated Operation	○	○	×	×	○	○	×	○	×
Position Data Designated Operation	×	○(Note 1)	○	○	×	○(Note 1)	○	×	○
Speed, Acceleration and Deceleration Direct Designation	×	×	○	○	×	×	○	×	○
Pressing Operation	○	○	○	○	○	○	○	○	○
Current Position Reading	×	○	○	○	○	○	○	○	○
Current Speed Reading	×	×	○	○	×	×	○	×	○
Completed Position No. Reading	○	○	×	×	○	○	×	○	×
Max. Number of Position Tables	512	768	Not Applicable	Not Applicable	512	768	Not Applicable	512	Not Applicable
Force Control	△(Note 2)	×	×	○	△(Note 2)	○	○	○	×
Vibration Control	○	○	×	○	○	○	×	○	○
Servo Gain Changeover	○	○	○	○	○	○	×	○	○

(Note 1) Operation is to be performed with designating the position No. for the position data except for Position Data.
(Note 2) It is available when the PIO pattern is set on either 6 or 7 in SCON-CA.
(Note 3) SCON-CA is not compatible with SCON-C (Remote I/O Station) for CC-Link type since it is the remote device station.

DeviceNet

● Specification

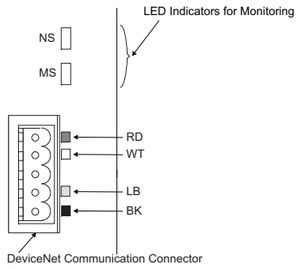
Item	Specification			
Communication Protocol	DeviceNet2.0			
	Group 2 Dedicated Server			
	Network-Powered Insulation Node			
Baud Rate	Automatically follows the Master			
Communication System	Master-Slave System (Bit Strobe or Polling)			
Number of Occupied Channels	MAX. 16CH (Input, Output)			
Number of Connectable Nodes	MAX. 63 nodes			
Communication Cable Length*2	Baud Rate	Max. Network Length	Total Branch Line Length	Max. Branch Line Length
	500kbps	100m	39m	6m
	250kbps	250m	78m	
	125kbps	500m	156m	
Communication Cable	Apply the dedicated cable			
Connector*1	MSTBA2.5/5-G-5.08AUM by Phoenix Contact			
Consumption Current of Communication Power Supply	60mA			
Communication Power Supply	DC24V (Supplied from DeviceNet)			

*1 The cable-end connector is a standard accessory. (SMSTB2.5/5-ST-5.08AU by Phoenix Contact)
*2 Refer to the Instruction Manuals of the master unit and the mounted PLC for T-junction communication

● LED Indicators for Monitoring

LED	Color	Illumination Status	Explanation
MS	GN	Steady Light	In normal operation
		Blinking	A hardware error occurred. Condition sometimes recovers after the power reboot.
	OR	Steady Light	A hardware error occurred. Board must be replaced.
		Blinking	An error occurred in the user settings. It is just a simple error such like configuration error. It can be recovered with a rebuild of the settings.
	–	Off	Power is not supplied during DeviceNet initializing.
NS	GN	Steady Light	Connection is established and the communication under normal condition
		Blinking	Online but network connection is not yet established. Communication is stopped. (Network is in normal condition)
	OR	Steady Light	Node address duplication or bus-off state was detected. Communication is not possible.
		Blinking	Communication error (Communication time-out is detected.)
	–	Off	Not online. DeviceNet Power is not supplied.

● SCON-CA Interface Area

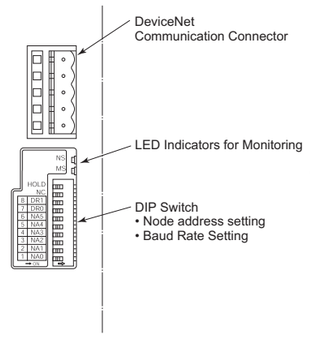


• Station Number Setting (Pay attention not to duplicate)
Station number is set with parameter.
Set Parameter No. 85 “NADR : Fieldbus Node Address” with using the PC software for RC.
Available range for Setting : 0 to 63 (It is set to 63 at the delivery.)

• 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.

• Operation Mode Setting and Address Assignment
Please refer to the Instruction Manual for DeviceNet (High Performance Type).

● SCON-C Interface Area



• Station Number Setting (Pay attention not to duplicate)
Set the station number using a hexadecimal value with the DIP switch.

1 : ON, 0 : OFF

Node Address	NA5	NA4	NA3	NA2	NA1	NA0
0	0	0	0	0	0	0
1	0	0	0	0	0	1
2	0	0	0	0	1	0
			:			
62	1	1	1	1	1	0
63	1	1	1	1	1	1

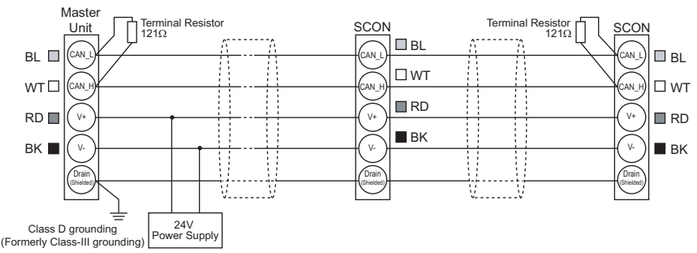
• Baud Rate Setting
Set the baud rate with the DIP switch according to the table below.

1 : ON, 0 : OFF

Baud Rate	DR1	DR0
125kbps	0	0
250kbps	0	1
500kbps	1	0
Setting Prohibited	1	1

• Operation Mode Setting and Address Assignment
Please refer to the Instruction Manual for DeviceNet (Remote I/O Type).

● Wiring



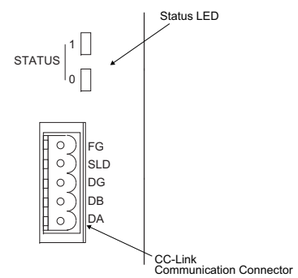
CC-Link

● Specification

Item		Specification					
Communication Protocol		CC-Link Ver1.10					
Station Type	C Type	Remote I/O station (1 station to occupy)					
	CA Type	Remote Device Station (4 stations max. to occupy)					
Baud Rate		10M/5M/2.5M/625k/156kbps					
Communication System		Broadcast Polling System					
Number of Connectable Stations		63 stations max.					
Communication Cable Length*1		Baud Rate (bps)	10M	5M	2.5M	625k	156k
		Total Cable Length (m)	100	160	400	900	1200
Communication Cable		Apply the dedicated cable					
Connector*2		MSTBA2.5/5-G-5.08AU by Phoenix Contact					

*1 Refer to the Instruction Manuals of the master unit and the mounted PLC for T-junction communication
*2 The cable-end connector is a standard accessory. (SMSTB2.5/5-ST-5.08AU by Phoenix Contact)

● SCON-CA Interface Area



• Station Number Setting (Pay attention not to duplicate)
Station number is set with parameter.
Set Parameter No. 85 “NADR : Fieldbus Node Address” with using the PC software for RC.
Available range for Setting : 1 to 64 (It is set to 1 at the delivery.)

• Baud Rate Setting
Set Parameter No. 86 “FBRS : Fieldbus Baud Rate Setting” with using the PC software for RC.

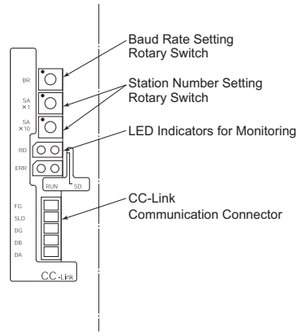
Setting Value	Baud Rate
0 (setting at delivery)	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps

(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.

• Operation Mode Setting and Address Assignment
Please refer to the Instruction Manual for CC-Link (High Performance Type).

Status LED	Color	Illumination Status	Contents of display (Detailed Explanation)
STATUS 1	OR	Steady Light	• An error occurred (CRC Error, Station Number Switch Setting Error, Baud Rate Switch Setting Error) • Since turning the power on or software reset till completion of CC-Link initialization
		Off	• Communication in normal condition
		Blinking	• The station number setting or the baud rate setting is changed during the communication
STATUS 0	GN	Steady Light	• Communicating
		Off	• Not in communication

● SCON-C Interface Area



• Station Number Setting (Pay attention not to duplicate)
Station number can be set with using the Station Number Setting Rotary Switch.
SA × 10 … set the digit of ten’s place
SA × 1 … set the digit of one’s place
(Example) For the case of setting the station number to 12
Set “SA × 10” to “1” and “SA × 1” to “2”.

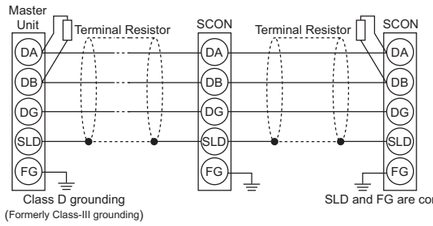
• Baud Rate Setting
Set the baud rate with the baud rate setting rotary switch according to the table below.

Selected Number on Rotary Switch	Baud Rate
0	156kbps
1	625kbps
2	2.5Mbps
3	5Mbps
4	10Mbps
Prohibited to set to 5 or above	Error

• Operation Mode Setting and Address Assignment
Please refer to the Instruction Manual for CC-Link (Remote I/O Type).

Monitor LED	Color	Illumination Status	Contents of display (Detailed Explanation)
RUN	GN	Steady Light	Turns on when communication is started, and turns off when communication is disconnected for the specified time
SD	GN	Steady Light	Blinks while sending data
RD	GN	Steady Light	Blinks while receiving data
ERR	RD	Steady Light	Error in reception data to self station
		Blinking	Setting of Baud Rate Setting Rotary Switch is changed during communication. Setting of Station Number Setting Rotary Switch is changed during communication.

● Wiring



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 (Dedicated cable for CC-Link)

PROFIBUS-DP

- Specification

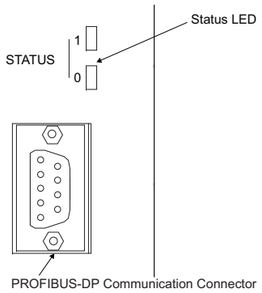
Item	Specification		
Communication Protocol	PROFIBUS-DP		
Baud Rate	Automatically follows the master		
Communication System	Hybrid System (Master-Slave System or Token Passing System)		
Occupied Domain	32 bytes max. (Input, Output)		
No. of Connected Stations	32 stations/segments max. available up to 126 stations with repeater		
Communication Cable Length	Max. Total Network Length	Baud Rate	Cable Type
	100m	12,000/6,000/3,000kbps	Type A Cable
	200m	1,500kbps	
	400m	500kbps	
	1,000m	187.5kbps	
	1,200m	9.6/19.2/93.75kbps	
Communication Cable	STP Cable AWG18		
Connector*1	9-pin Female D-sub Connector		
Transmission Path Format	Bus/Tree/Star		

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

- Communication Connector (Pins No. 1, 2, 4, 7 and 9 are not to be used.)

Pin No.	Description	Contents
3	B-Line	R × D • T × D (positive side communication line)
5	GND	Signal Grounding (insulated)
6	+5V	+5V Output (insulated)
8	A-Line	/R × D • /T × D (negative side signal line)
Housing	Shield	Cable Shield (connected to housing)

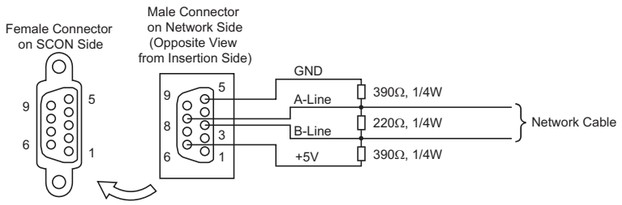
- SCON-CA Interface Area



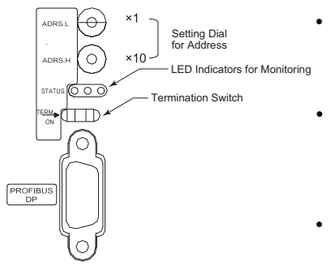
- Station Number Setting
  Station number is set with parameter.
  Set Parameter No. 85 “NADR : Fieldbus Node Address” with using the PC software for RC.
  Available range for Setting : 0 to 125 (It is set to 1 at the delivery.)
- Baud Rate Setting
  There is no need to set the baud rate since it automatically 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.
- Operation Mode Setting and Address Assignment
  Please refer to the Instruction Manual for PROFIBUS-DP (High Performance Type).

Status LED	Color	Illumination Status	Contents of display (Detailed Explanation)
STATUS 1	GN	Steady Light	Online from fieldbus and communication in normal condition.
		Blinking	Offline from fieldbus
	OR	Blinking	Communication error is occurred.
STATUS 0	GN	Steady Light	In normal operation
		Blinking	Getting ready for operation
	OR	Steady Light	An error detected on communication-related hardware during preparing for operation.

- 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



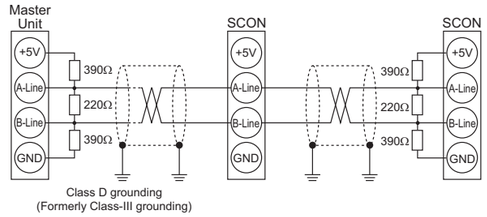
- SCON-C Interface Area



- Selection for Build-in Terminal Resistor Insertion
  A terminal resistor needs to be inserted when SCON is connected to the network terminal. Select on the Termination Switch (TERM ON for built-in terminal resistor insertion) for terminal resistor insertion.
- Station Number Setting (Pay attention not to duplicate)
  Station number can be set on the Setting Dial for Address.
  ADRS.H × 10 … set the digit of ten’s place
  ADRS.L × 1 … set the digit of one’s place
  (Example) For the case of setting the station number to 12
  Set “ADRS.H × 10” to “1” and “ADRS.L × 1” to “2”.
- Baud Rate Setting
  The baud rate automatically follows that of the master.

LED	Color	Illumination Status	Contents of display (Detailed Explanation)
ERR	RD	Steady Light	Either it is offline from Fieldbus or communication error is occurred.
POWER	GN	Steady Light	Power is supplied to PROFIBUS-DP Slave Station.
		Blinking	An error detected on communication-related hardware during preparing for operation.
DIA	Not for use		

- Wiring



CompoNet (Dedicated for SCON-CA)

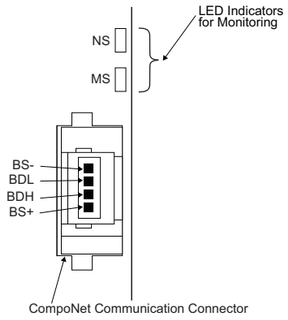
- Specification

Item	Specification
Communication System	CompoNet dedicated protocol
Communication type	Remote I/O Communication
Baud Rate	Automatically follows the master
Communication Cable Length	Follows CompoNet specifications
Slave Type	Word-Mixed Slave
Available Node Addresses for Setting	0 to 63 (Setting conducted on controller parameter)
Communication Cable	Round Cable (JIS C3306, VCTF 2-core) Flat Cable I (with no sheath) Flat Cable II (sheathed)
Connector (controller side)	XW7D-PB4-R (manufactured by OMRON or equiv.)

- LED Indicators for Monitoring

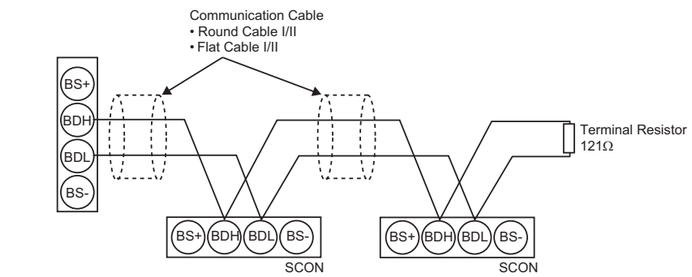
LED	Color	Illumination Status	Explanation
MS	GN	Steady Light	In normal operation
	RD	Steady Light	A hardware error occurred. Board must be replaced.
		Blinking	An error occurred in the user settings. It is just a simple error such like configuration error. It can be recovered with a rebuild of the settings.
	–	Off	Power is not supplied during CompoNet initializing.
NS	GN	Steady Light	Connection is established and the communication under normal condition
		Blinking	Online but network connection is not yet established. Communication is stopped. (Network is in normal condition)
	RD	Steady Light	Duplication of the node address is considered.
		Blinking	Communication error (Communication time-out is detected.)
	–	Off	Not online. Power is not supplied.

- Interface Area



- Station Number Setting
  Station number is set with parameter.
  Set Parameter No. 85 “NADR : Fieldbus Node Address” with using the PC software for RC.
  Available range for Setting : 0 to 63 (It is set to 0 at the delivery.)
  (Note) 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.
- Operation Mode Setting and Address Assignment
  Please refer to the Instruction Manual for CompoNet (High Performance Type).

- Wiring



* It is unnecessary to supply the communication power to SCON for CompoNet Type.
However, connect the communication power supply to BS+ and BS– when multi power supply is required.

MECHATROLINK (Dedicated Option for SCON-CA)

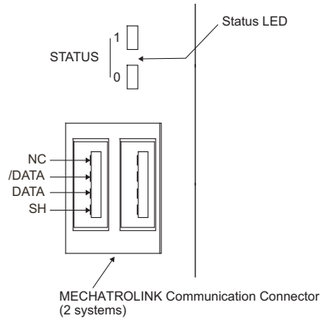
- Specification

Item		Specification
Slave Type		Intelligent I/O
Baud Rate	MECHATROLINK I	4Mbps
	MECHATROLINK II	10Mbps
Max. Transmittable Distance		50m
Min. Distance between Stations		0.5m
Number of Connectable Slaves	MECHATROLINK I	15 stations
	MECHATROLINK II	30 stations (repeater is required for connections of more than 17 stations)
Transmission Frequency		1 to 8ms
Data Length	MECHATROLINK I	17bytes
	MECHATROLINK II	17/32bytes
Settable Node Address Range		61 to 7F [hex]
Communication Cable		STP cable (characteristic impedance 130Ω)
Connector	Controller Side	USB-AR41-T11 (manufactured by DDK or equiv.)

- Status LED

LED	Color	Illumination Status	Explanation
STATUS1	GN	Steady Light	Online from fieldbus and communication in normal condition.
	RD	Steady Light	Communication error is occurred.
	–	Off	Offline from fieldbus
STATUS0	GN	Steady Light	In normal operation
	RD	Steady Light	An error detected on communication-related hardware during preparing for operation.
	–	Off	While in preparation or the power is yet to be supplied.

- Interface Area

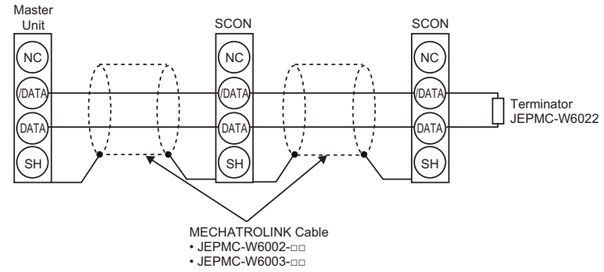


- Node Address Setting
  Node address can be set with the parameter.
  Set Parameter No. 85 “NADR : Fieldbus Node Address” with using the PC software for RC.
  Available range for Setting : 97 to 127 [hex] (It is set to 97 at the delivery.)
- Baud Rate Setting
  Set Parameter No. 86 “FBRS : Fieldbus Baud Rate Setting” with using the PC software for RC.

Setting Value	Baud Rate	Data Length
0	4Mbps (MECHATROLINK I)	17 bytes
1	10Mbps (MECHATROLINK II)	17 bytes
2 (setting at delivery)	10Mbps (MECHATROLINK II)	32 bytes

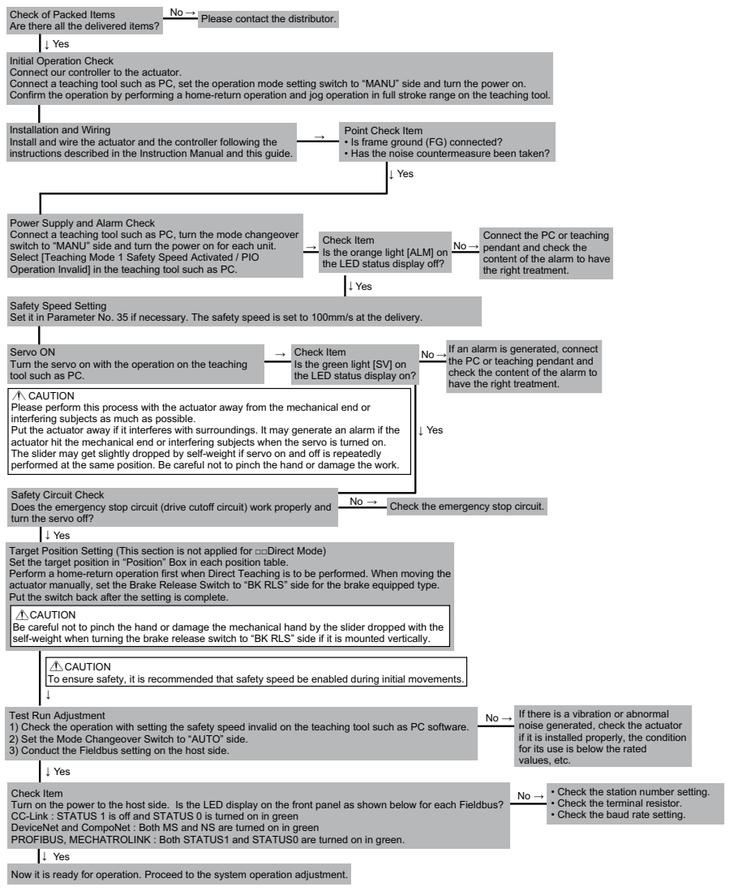
  (Note) Make sure to reboot the controller after the parameter setting is complete, and do not forget to turn the mode changeover switch to “AUTO” side.
- Operation Mode Setting and Address Assignment
  Please refer to the Instruction Manual for MECHATROLINK (High Performance Type).

- Wiring



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”.



Trouble Shooting

In the case an error is occurred, check the operation status on the LED display on the front panel [Refer to Each Fieldbus Section], and also, check the status monitor by connecting a teaching tool such as PC software for RC.
Either of the following alarms will be shown for Fieldbus. Please refer to the Instruction Manual of the controller for other alarms to perform an appropriate treatment.

Code	Error Name	ID (*1)	RES (*2)	Cause / Treatment
0F2	Fieldbus Module Error	05	×	Cause : An error is detected on Fieldbus module Treatment : Check on the parameter
0F3	Fieldbus Module Not Detected	04	×	Cause : Module cannot be detected Treatment : Turn the power off and reboot. Please contact us if the problem is not solved with this action.

(*1) ID → Simple alarm code
(*2) RES → Alarm reset available/unavailable ○: Alarm reset available / ×: Alarm reset unavailable

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