MITSUBISHI ELECTRIC

General-Purpose AC Servo

MELSERVO-J3 Series

Built-in Positioning Function

MODEL(SERVO AMPLIFIER)

MR-J3- _T

MODEL(CC-LINK IE FIELD NETWORK INTERFACE UNIT)

MR-J3-T10

SERVO AMPLIFIER
INSTRUCTION MANUAL
(CC-Link IE Field Network interface)

● Safety Instructions ●

Please read the instructions carefully before using the equipment.

Do not attempt to install, operate, maintain or inspect the equipment until you have read through this Instruction Manual and appended documents carefully and can use the equipment correctly. Do not use the servo amplifier and servo motor until you have a full knowledge of the equipment, safety information and instructions.

In this Instruction Manual, the safety instruction levels are classified into "WARNING" and "CAUTION".

⚠ WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight injury to personnel or may cause physical damage.

Note that the CAUTION level may lead to a serious consequence according to conditions.
Please follow the instructions of both levels because they are important to personnel safety.
What must not be done and what must be done are indicated by the following diagrammatic symbols.

🚫	Indicates what must not be done. For example, "No Fire" is indicated by 🚫.
⬤	Indicates what must be done. For example, grounding is indicated by ⏚.

In this Instruction Manual, instructions at a lower level than the above, instructions for other functions, and so on are classified into "POINT".
After reading this installation guide, keep it accessible to the operator.

1. Transportation and installation

⚠ CAUTION

● Transport the products correctly according to their mass.

● Stacking in excess of the limited number of product packages is not allowed.

● Install the servo amplifier and servo motor in a load-bearing place in accordance with the Instruction Manual.

● Do not get on or put heavy load on the equipment.

● Install the equipment in the specified direction.

● Provide an adequate protection to prevent screws and other conductive matter, oil and other combustible matter from entering the unit.

● This unit is a precision instrument. Do not drop or strike the unit. Isolate it from all impact loads.

● Store and use this unit in the environment conditions described in the section 1.3.

● When the equipment has been stored for an extended period of time, contact your local sales office.

2. Wiring

⚠ CAUTION

● Wire the equipment correctly and securely. After wiring, check again for incorrect wiring and tightening of terminal screws, etc. Otherwise, the servo motor may operate unexpectedly.

3. Usage

⚠ CAUTION

● Immediately shut off the power supply if smoke, abnormal noise, or odor arises from this unit.

● Disassembly and repair must be performed by a qualified person.

● Do not modify the equipment.

4. Corrective actions

⚠ CAUTION

● When any alarm has occurred, eliminate its cause, ensure safety, and deactivate the alarm before restarting operation.

● Provide an adequate protection to prevent unexpected restart after an instantaneous power failure.

5. Maintenance, inspection and parts replacement

⚠ CAUTION

● Do not touch connector contacts and leads of the IC and other devices.

● Do not place the unit on a metal object which is vulnerable to electric leakage, or on a wooden object where static electricity may be charged. Do not place the unit on the object made of materials such as plastic and vinyl.

● Do not perform an insulation resistance test (megger test) at inspection.

6. General instruction

●To illustrate details, the equipment in the diagrams of this Instruction Manual may have been drawn without covers and safety guards. When the equipment is operated, the covers and safety guards must be installed as specified. Operation must be performed in accordance with this Instruction Manual.

«About the manuals»

You must have this Instruction Manual and the following manuals to use this unit. Ensure to prepare them to use the unit safely.

Relevant manuals

Manual name	Manual number
MR-J3-_T Servo Amplifier Instruction Manual	SH(NA)030058
MELSERVO Servo Motor Instruction Manual (Vol.2)	SH(NA)030041
EMC Installation Guidelines	IB(NA)67310

«Wiring»

Wires mentioned in this instruction manual are selected based on the ambient temperature of 40 °C (104 °F).

MEMO

CONTENTS

1. FUNCTIONS AND CONFIGURATION

| POINT |
| --- |
| ●CC-Link IE Field Network communication function is available for the MR-J3-_T servo amplifiers of which software version is B0 or above. |

1.1 Summary

This instruction manual explains about MR-J3-T10 CC-Link IE Field Network interface unit. Refer to MR-J3-_T Servo Amplifier Instruction Manual for the information not given in this manual.
Always use MR-J3-T10 with an MR-J3-_T. MR-J3-T10 enables an MR-J3-_T to connect to the CC-Link IE Field Network by being attached to the MR-J3-_T.
The CC-Link IE Field Network communication function is exclusive of the CC-Link communication function. It cannot be used with the CC-Link communication function at the same time.

1.2 System configuration
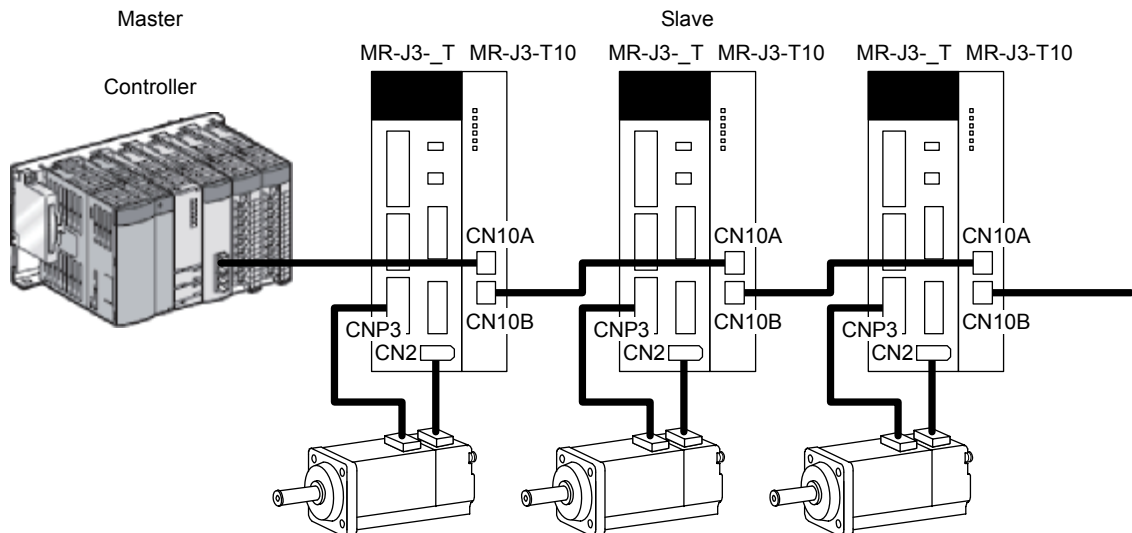
1.3 Standard specifications

Model			MR-J3-T10
Control circuit power supply	Voltage		5 V DC (supplied from the servo amplifier)
	Rated current [A]		0.8
I/O interfaces			CC-Link IE Field Network interface
Number of communication ports			2 (CN10A connector/CN10B connector)
Structure			Natural-cooling, open (IP rating: IP 00)
Environment	Ambient temperature	Operation	0 °C to 55 °C (non-freezing)
		Storage	-20 °C to 65 °C (non-freezing)
	Ambient humidity	Operation	90 %RH or less (non-condensing)
		Storage	
	Ambience		Indoors (no direct sunlight), free from corrosive gas, flammable gas, oil mist, dust and dirt
	Altitude		1000 m or less above sea level
	Vibration resistance		5.9 m/s^2 at 10 Hz to 55 Hz (X, Y and Z axes)
Mass [g]			150

1.4 Rating plate

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MITSUBISHI        AC SERVO
MODEL  MR-J3-T10
         IP00 MANUAL IB-0300171



SERIAL : ****
                              PASSED
  MITSUBISHI ELECTRIC CORPORATION
  MADE IN JAPAN
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← Model
← IP rating Installation guide

← Serial number

1.5 Connector/interface

MR-J3-T10
PUSH

RUN
ERR.
D LINK
SD
RD
L.ERR

CN10A — CC-Link IE Field Network communication connector (CN10A)

CN10B — CC-Link IE Field Network communication connector (CN10B)

PUSH
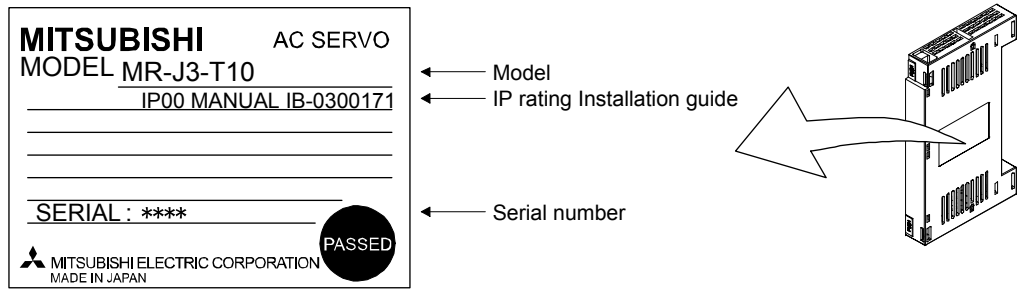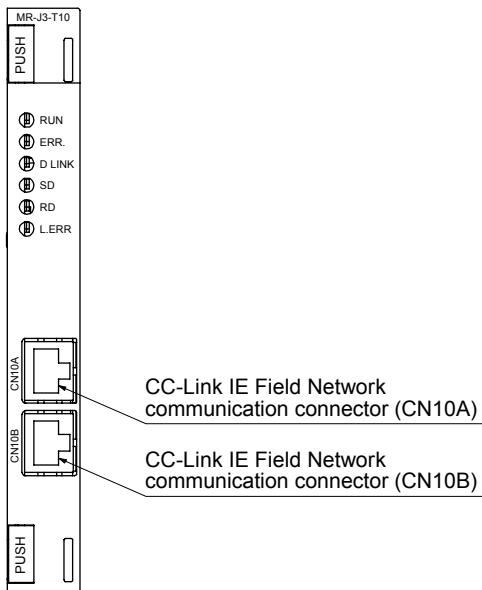
For the wiring of CC-Link IE Field Network, use the following wiring tools recommended by the CC-Link Partner Association.

Items	Description
Cable type	Shielded twisted pair cable (Category 5e)
Standard	One of the following standards must be met. ・IEEE802.3 1000BASE-T ・ANSI/TIA/EIA-568-B (Category 5e)
Connector	Category 5e or more RJ-45 plug

Commercially available products (as of April 2012)

Model	Manufacturer	Contact (Note)
SC-E5EW(-L) (Note 1)	Mitsubishi Electric System & Service	email: oss-ip@melsc.jp

Note. The SC-E5EW cable is for in-enclosure and indoor uses. The SC-E5EW-L cable is for outdoor use.

The CC-Link IE controller network cable cannot be used for the CC-Link IE Field Network.

1.6 Contents of the package

Contents	Quantity
MR-J3-T10 CC-Link IE Field Network interface unit	1
MR-J3-T10 Installation Guide (IB(NA)0300159)	1
ZCAT1730-0730 data line filer (TDK) (Note 1)	2
Connector cover for CN10A/CN10B/CN3 (Note 2)	3

Note 1. Use the data line filters on the cables connected to the CN10A and CN10B connectors.

2. Two of the connector covers are already mounted on the CN10A and CN10B connectors when the product is shipped from the factory. The other connector cover is for the CN3 connector of the MR-J3-_T servo amplifier.

1.7 Installation and removal of the unit

⚠ WARNING	●Before installing or removing the unit, turn off the power and wait for 15 minutes or more until the charge lamp turns off. Then, confirm that the voltage between P (+) and N (-) is safe with a voltage tester and others. Otherwise, an electric shock may occur. In addition, when confirming whether the charge lamp is off or not, always confirm it from the front of the servo amplifier.

| ⚠ CAUTION	●Avoid installing and removing the unit repeatedly. Any contact failure of the connector may be caused. ●Avoid unsealing the unit to be free of dust and dirt against the connector except installing. Make sure to use the pre-packing when storing. ●Avoid using the unit of which the hook and knobs for fixing are damaged. Any contact failure of the connector may be caused. ●When installing and removing the unit to the MR-J3-500T or more, avoid dropping out the installing screw inside it. Otherwise, it may cause a malfunction. ●When installing and removing the unit to the MR-J3-500T or more, avoid damaging the control board by the fixing plate. Otherwise, it may cause a malfunction. ●Make sure to tighten the unit with the enclosed installing screws when installing.

POINT

●The internal circuits of the servo amplifier and the unit may be damaged by static electricity. Always take the following precautions.
・Ground human body and work bench.
・Do not touch the conductive areas, such as connector pins and electrical parts, directly by hand.

(1) MR-J3-350T or less/MR-J3-200T4 or less

(a) Installation of the unit
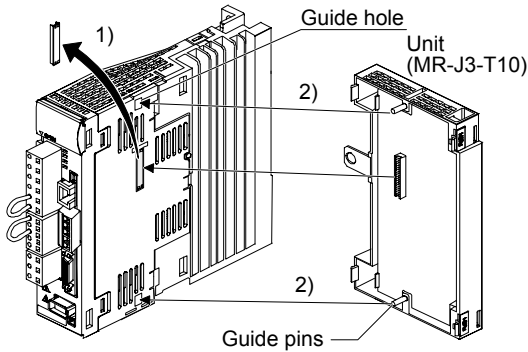
1) Remove the cover of connector for connecting an option. Make sure to store the removed cover.
2) Find the guide hole on the side of the servo amplifier. To the guide hole, insert the unit's guide pins.
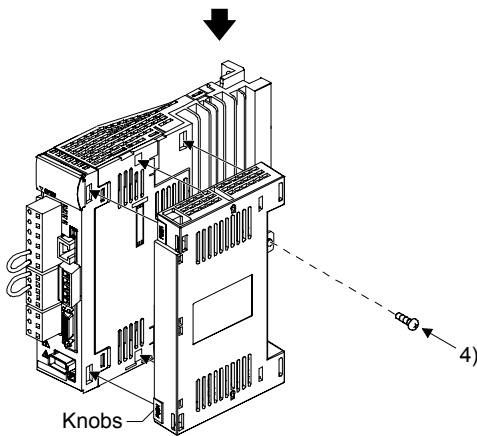
3) Push the unit until the knobs click.
4) Tighten the unit with the enclosed installing screw (M4).

(b) Removal of the unit
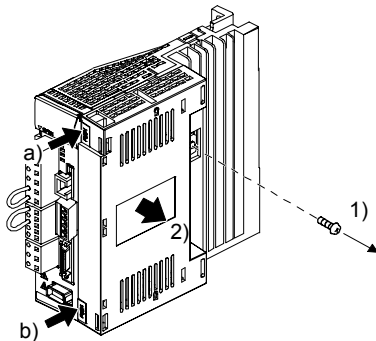
1) Remove the installing screw.
2) Keep pushing the knobs (a) , b)) and pull out the unit to the arrow direction. Avoid pulling out the unit while it is tightened with the installation screw.

When removing the unit, make sure to reinstall the cover of connector for connecting an option to avoid dust and dirt.

(2) MR-J3-350T4/MR-J3-500T(4)/MR-J3-700T(4)

    (a) Removal of the side cover

Keep pushing the knobs (a) , b)) and pull out the side cover to the arrow direction.

    (b) Installation of the unit
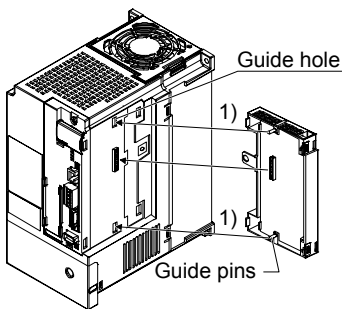
1) Find the guide hole on the side of the servo amplifier. To the guide hole, insert the unit's guide pins.
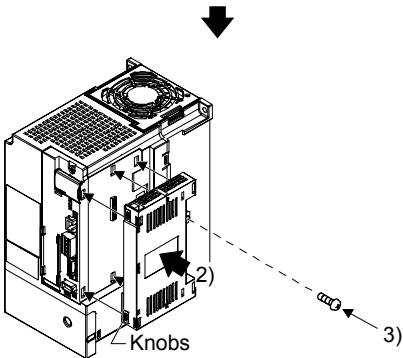
2) Push the unit until the knobs click.
3) Tighten the unit with the enclosed installing screw (M4).

    (c) Removal of the unit
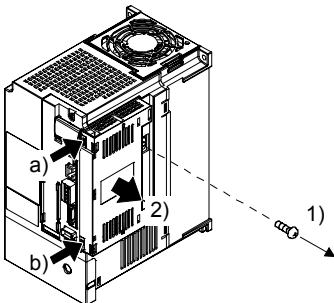
1) Remove the installing screw.
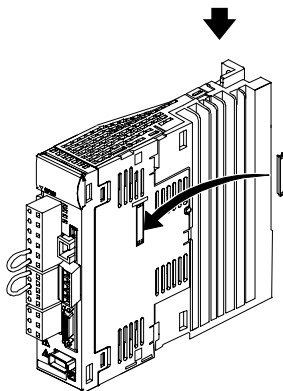2) Keep pushing the knobs (a) , b)) and pull out the unit to the arrow direction. Avoid pulling out the unit while it is tightened with an installation screw.
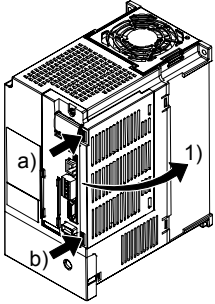
1. FUNCTIONS AND CONFIGURATION

(d) Installation of the side cover

Hook of the side cover
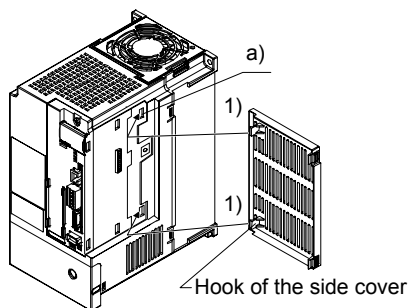
Knob

1) Insert the side cover setting tabs into the sockets a) of servo amplifier.
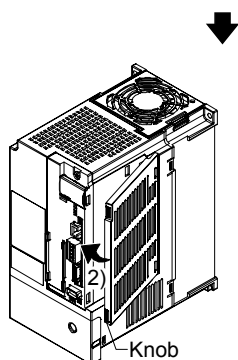
2) Push the side cover at the supporting point a) until the knob clicks.

(3) MR-J3-11KT(4) to MR-J3-22KT(4)

⚠ CAUTION ● Avoid touching any remained burr after cutting off the part a) of the case. Otherwise, injury may occur.

The installing screw holes for the MR-J3-11KT(4) to MR-J3-22KT(4) are covered at shipping. When installing the unit for the first time, cut off the part a) of the case after removing the side cover. When cutting off the part a), avoid damaging the case of the servo amplifier. After cutting off it, inside of the servo amplifier has been exposed even though the side cover and the unit are installed. Avoid unwanted parts from entering through the opened area into the servo amplifier. For installing or removing the unit, refer to (2) in this section. The side cover structure is the same for MR-J3-11KT(4) to MR-J3-22KT(4) and for this unit. Install or remove the side cover with the same way as for the unit. However, the installing screw for the side cover is unnecessary.
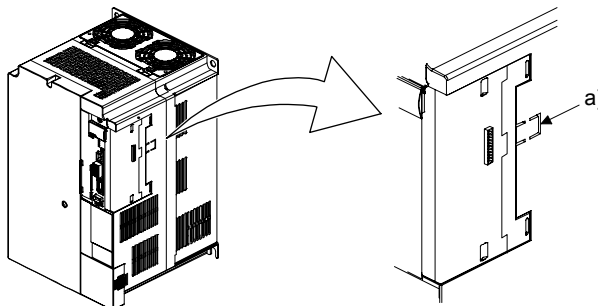
2. I/O SIGNAL CONNECTION EXAMPLE

⚠CAUTION	● This chapter describes an example of connecting I/O signals. For details of MR-J3-_T signals and how to connect them, be sure to refer to the chapter 4 of MR-J3-_T Servo Amplifier Instruction Manual. ● Connecting the CC-Link IE Field Network cable to the CN3 connector on MR-J3-_T causes malfunctions in network devices. Pay attention when connecting the CC-Link IE Field Network cable because the CN3, CN10A, and CN10B connectors have the same shape.

> POINT
> ● Use MR Configurator of MRZJW3-SETUP221E (software version C4 or above).
>   Use MR Configurator2 of SW1DNC-MRC2-E (software version 1.10L or above).

2 - 1
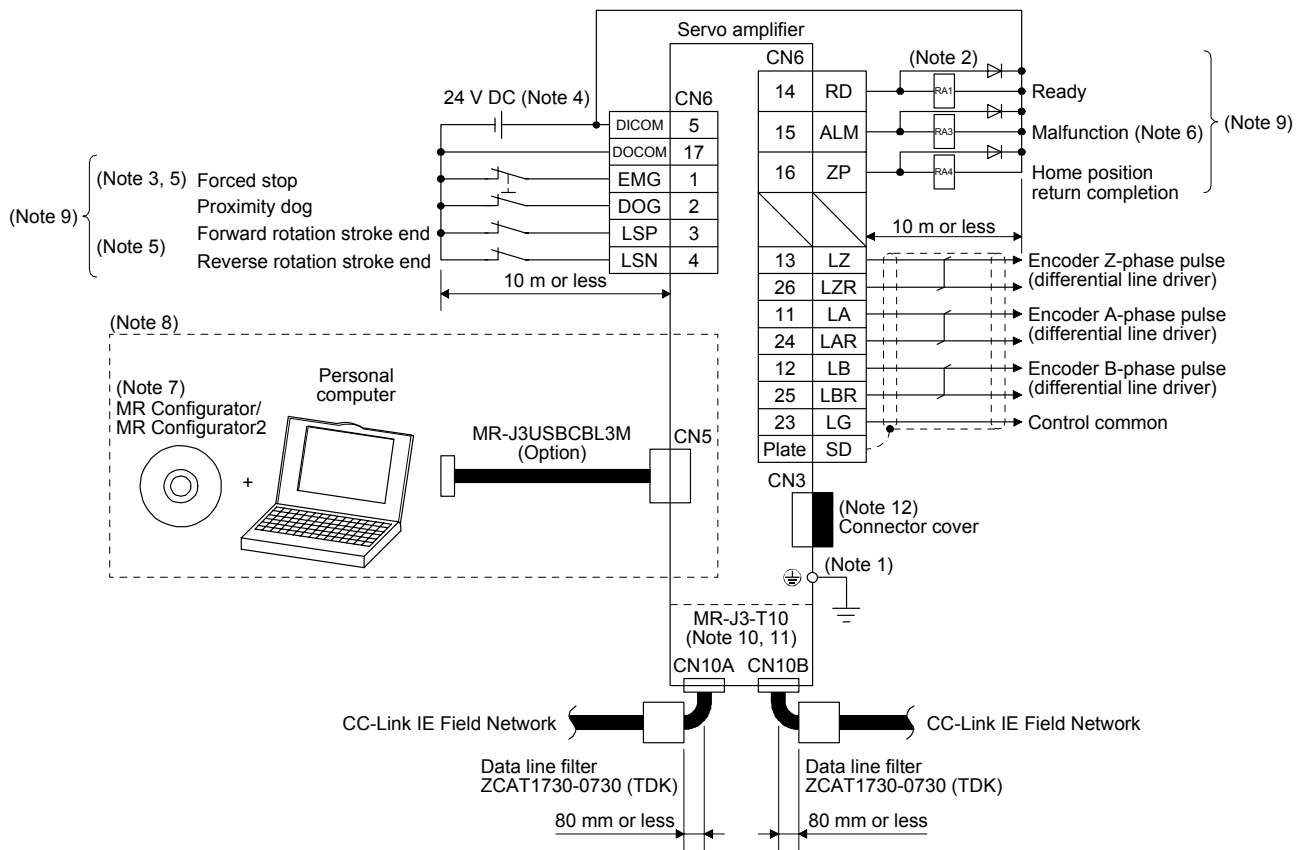
2. I/O SIGNAL CONNECTION EXAMPLE

Note 1. To prevent an electric shock, always connect the protective earth (PE) terminal (marked ⏚) of the servo amplifier to the protective earth (PE) of the cabinet.

2. Connect the diode in the correct direction. If it is connected reversely, the servo amplifier will be faulty and will not output signals, disabling EMG (Forced stop) and other protective circuits.

3. The forced stop switch (normally closed contact) must be installed.

4. Supply 24 V DC ± 10% 150 mA current for interfaces from the outside. 150 mA is the value applicable when all I/O signals are used. The current capacity can be decreased by reducing the number of I/O points. Refer to section 4.8.2 (1) in MR-J3-_T Servo Amplifier Instruction Manual that gives the current value necessary for the interface.

5. When starting operation, always turn on EMG (Forced stop) and LSP/LSN (Forward/Reverse rotation stroke end). (Normally closed contact)

6. ALM (Malfunction) turns on in normal alarm-free condition.

7. Use MR Configurator of MRZJW3-SETUP221E (software version C4 or above). Use MR Configurator2 of SW1DNC-MRC2-E (software version 1.10L or above).

8. Personal computers or parameter units can also be connected via the CN3 connector, enabling RS-422 communication. Note that using the USB communication function (CN5 connector) prevents the RS-422 communication function (CN3 connector) from being used, and vice versa. They cannot be used together.
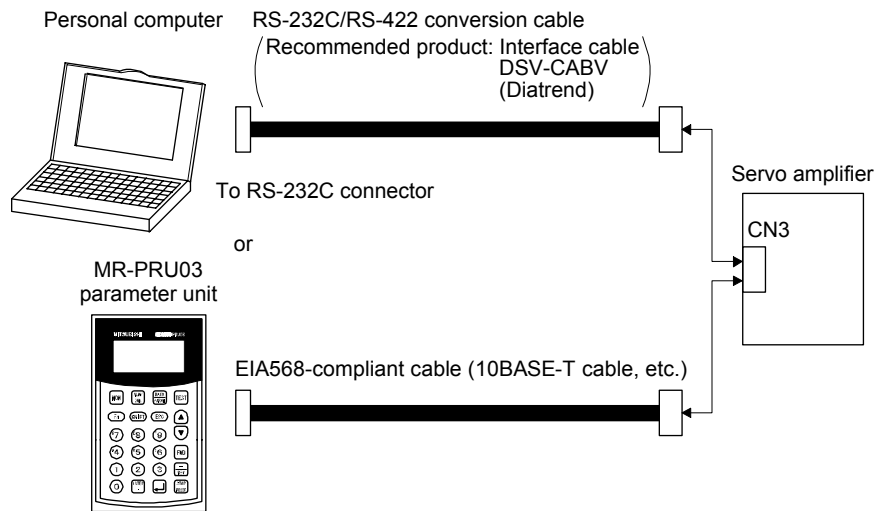
9. This diagram is for sink I/O interface. For source I/O interface, refer to section 4.8.3 in MR-J3-_T Servo Amplifier Instruction Manual.

10. Note that using the CC-Link IE Field Network communication function prevents the CC-Link communication function from being used, and vice versa. They cannot be used together.

11. Connecting the CC-Link IE Field Network cable to the CN3 connector of MR-J3-_T causes malfunctions in network devices. Pay attention when connecting the CC-Link IE Field Network cable because the CN3, CN10A, and CN10B connectors have the same shape. Connector covers are mounted on the CN10A and the CN10B connectors when the product is shipped from the factory. Remove those connector covers to connect the CC-Link IE Field Network cables.

12. To avoid incorrect connection, set a connector cover, which is supplied with MR-J3-T10, to the CN3 connector of MR-J3-_T.

3. PARAMETERS

⚠CAUTION	●The MR-J3-_T parameters during CC-Link IE Field Network communication are the same with the parameters during CC-Link communication, except for [Pr. Po34] and [Pr. Po35]. Refer to the chapter 6 of MR-J3-_T Servo Amplifier Instruction Manual for the details of the parameters not listed in this chapter.

> **POINT**
> ●Parameter whose symbol is preceded by * is made valid with the following conditions.
>   *: After setting the parameter, turn off the power and then on again.

3.1 Basic setting parameters [Pr. PA_ _]

No.	Symbol	Name	Initial value	Unit
PA01	*STY	Control mode	0000h	
PA02	*REG	Regenerative option	0000h	
PA03	*ABS	Absolute position detection system	0000h	
PA04	*AOP1	Function selection A-1	0000h	
PA05	*FTY	Feeding function selection	0000h	
PA06	*CMX	Electronic gear numerator	1	
PA07	*CDV	Electronic gear denominator	1	
PA08	ATU	Auto tuning mode	0001h	
PA09	RSP	Auto tuning response	12	
PA10	INP	In-position range	100	μm
PA11	TLP	Forward rotation torque limit	100.0	%
PA12	TLN	Reverse rotation torque limit	100.0	%
PA13		This parameter is not used. Do not change this value by any means.	0002h	
PA14	*POL	Rotation direction selection	0	
PA15	*ENR	Encoder output pulses	4000	pulse/rev
PA16		This parameter is not used. Do not change this value by any means.	0	
PA17			0000h	
PA18			0000h	
PA19	*BLK	Parameter write inhibit	000Ch	

3. PARAMETERS

3.2 Gain/filter parameters [Pr. PB_ _]

No.	Symbol	Name	Initial value	Unit
PB01	FILT	Adaptive tuning mode (adaptive filter II)	0000h	
PB02	VRFT	Vibration suppression control tuning mode (advanced vibration suppression control)	0000h	
PB03		This parameter is not used. Do not change this value by any means.	0000h	
PB04	FFC	Feed forward gain	0	%
PB05		This parameter is not used. Do not change this value by any means.	500	
PB06	GD2	Load to motor inertia ratio	7.0	Multiplier
PB07	PG1	Model loop gain	24	rad/s
PB08	PG2	Position loop gain	37	rad/s
PB09	VG2	Speed loop gain	823	rad/s
PB10	VIC	Speed integral compensation	33.7	ms
PB11	VDC	Speed differential compensation	980	
PB12		This parameter is not used. Do not change this value by any means.	0	
PB13	NH1	Machine resonance suppression filter 1	4500	Hz
PB14	NHQ1	Notch shape selection 1	0000h	
PB15	NH2	Machine resonance suppression filter 2	4500	Hz
PB16	NHQ2	Notch shape selection 2	0000h	
PB17		Automatic setting parameter		
PB18	LPF	Low-pass filter setting	3141	rad/s
PB19	VRF1	Vibration frequency for vibration suppression control	100.0	Hz
PB20	VRF2	Resonance frequency for vibration suppression control	100.0	Hz
PB21		This parameter is not used. Do not change this value by any means.	0.00	
PB22			0.00	
PB23	VFBF	Low-pass filter selection	0000h	
PB24	*MVS	Slight vibration suppression control selection	0000h	
PB25		This parameter is not used. Do not change this value by any means.	0000h	
PB26	*CDP	Gain switching selection	0000h	
PB27	CDL	Gain switching condition	10	
PB28	CDT	Gain switching time constant	1	ms
PB29	GD2B	Load to motor inertia ratio after gain switching	7.0	Multiplier
PB30	PG2B	Gain changing position loop gain	37	rad/s
PB31	VG2B	Gain changing speed loop gain	823	rad/s
PB32	VICB	Gain switching speed integral compensation	33.7	ms
PB33	VRF1B	Vibration frequency for vibration suppression control after gain switching	100.0	Hz
PB34	VRF2B	Resonance frequency for vibration suppression control after gain switching	100.0	Hz
PB35		This parameter is not used. Do not change this value by any means.	0.00	
PB36			0.00	
PB37			100	
PB38			0	
PB39			0	
PB40			0	
PB41			1125	
PB42			1125	
PB43			0004h	
PB44			0000h	
PB45			0000h	

3. PARAMETERS

3.3 Extension setting parameters [Pr. PC_ _]

3.3.1 Parameter list

No.	Symbol	Name	Initial value	Unit
PC01		This parameter is not used. Do not change this value by any means.	0000h	
PC02	*ZTY	Home position return type	0000h	
PC03	*ZDIR	Home position return direction	0001h	
PC04	ZRF	Home position return speed	500	r/min
PC05	CRF	Creep speed	10	r/min
PC06	ZST	Home position shift distance	0	μm
PC07	*ZPS	Home position return data	0	× 10^{STM}μm
PC08	DCT	Moving distance after proximity dog	1000	× 10^{STM}μm
PC09	ZTM	Stopper type home position return stopper time	100	ms
PC10	ZTT	Stopper type home position return torque limit value	15.0	%
PC11	CRP	Rough match output range	0	× 10^{STM}μm
PC12	JOG	Jog speed	100	r/min
PC13	*STC	S-shaped acceleration/deceleration time constant	0	ms
PC14	*BKC	Backlash compensation	0	pulse
PC15		This parameter is not used. Do not change this value by any means.	0000h	
PC16	MBR	Electromagnetic brake sequence output	100	ms
PC17	ZSP	Zero speed	50	r/min
PC18	*BPS	Alarm history clear	0000h	
PC19	*ENRS	Encoder output pulses selection	0000h	
PC20	*SNO	Station number setting	0	station
PC21	*SOP	RS-422 communication function selection	0000h	
PC22	*COP1	Function selection C-1	0000h	
PC23		This parameter is not used. Do not change this value by any means.	0000h	
PC24	*COP3	Function selection C-3	0000h	
PC25		This parameter is not used. Do not change this value by any means.	0000h	
PC26	*COP5	Function Selection C-5	0000h	
PC27		This parameter is not used. Do not change this value by any means.	0000h	
PC28	*COP7	Function selection C-7	0000h	
PC29		This parameter is not used. Do not change this value by any means.	0000h	
PC30	*DSS	Remote register-based position/speed specifying system selection	0000h	
PC31	LMPL	Software limit +	0	× 10^{STM}μm
PC32	LMPH			
PC33	LMNL	Software limit -	0	× 10^{STM}μm
PC34	LMNH			
PC35	TL2	Internal torque limit 2	100.0	%
PC36		This parameter is not used. Do not change this value by any means.	0000h	
PC37	*LPPL	Position range output address +	0	× 10^{STM}μm
PC38	*LPPH			
PC39	*LNPL	Position range output address -	0	× 10^{STM}μm
PC40	*LNPH			
PC41		This parameter is not used. Do not change this value by any means.	0000h	
PC42			0000h	
PC43			0000h	
PC44			0000h	
PC45			0000h	
PC46			0000h	
PC47			0000h	
PC48			0000h	
PC49			0000h	
PC50	*COPA	Function selection C-A	0000h	

3. PARAMETERS

3.3.2 Detail description

> **POINT**
>
> ●The parameter names of [Pr. PC50] is not displayed with the following versions of MR Configurator/MR Configurator2. However, this setting value is changeable. Follow the instructions in this Instruction Manual to set a value.
> ・MRZJW3-SETUP221E: software version C3 or below
> ・SW1DNC-MRC2-E: software version 1.09K or below

No.	Symbol	Name and function	Initial value	Setting range	Unit
PC50	*COPA	Function selection C-A ☐ 0 0 0 [AL. 8D CC-Link IE communication error] extended function selection 0: No extended function 1: Delayed [AL. 8D] detection 　Use [Pr. PD25] to set how long to delay the occurrence timing of [AL. 8D].	0000h	Refer to Name and function column.	

3. PARAMETERS

3.4 I/O setting parameters [Pr. PD_ _]

3.4.1 Parameter list

No.	Symbol	Name	Initial value	Unit
PD01	*DIA1	Input signal automatic on selection 1	0000h	
PD02		This parameter is not used. Do not change this value by any means.	0000h	
PD03	*DIA3	Input signal automatic on selection 3	0000h	
PD04	*DIA4	Input signal automatic on selection 4	0000h	
PD05		This parameter is not used. Do not change this value by any means.	0000h	
PD06	*DI2	Input signal device selection 2 (CN6-2)	002Bh	
PD07	*DI3	Input signal device selection 3 (CN6-3)	000Ah	
PD08	*DI4	Input signal device selection 4 (CN6-4)	000Bh	
PD09	*DO1	Output signal device selection 1 (CN6-14)	0002h	
PD10	*DO2	Output signal device selection 2 (CN6-15)	0003h	
PD11	*DO3	Output signal device selection 3 (CN6-16)	0024h	
PD12	DIN1	External DI function selection 1	0C00h	
PD13		This parameter is not used. Do not change this value by any means.	0000h	
PD14	DIN3	External DI function selection 3	0800h	
PD15		This parameter is not used. Do not change this value by any means.	0000h	
PD16	*DIAB	Input polarity selection	0000h	
PD17		This parameter is not used. Do not change this value by any means.	0000h	
PD18			0000h	
PD19	*DIF	Input filter setting	0002h	
PD20	*DOP1	Function selection D-1	0010h	
PD21		This parameter is not used. Do not change this value by any means.	0000h	
PD22	*DOP3	Function selection D-3	0000h	
PD23		This parameter is not used. Do not change this value by any means.	0000h	
PD24	*DOP5	Function selection D-5	0000h	
PD25	A8DT	[AL. 8D CC-Link IE communication error] detection time	0000h	ms
PD26		This parameter is not used. Do not change this value by any means.	0000h	
PD27			0000h	
PD28			0000h	
PD29			0000h	
PD30			0000h	

3. PARAMETERS

3.4.2 Detail description

> POINT
>
> ●The parameter names of [Pr. PD25] is not displayed with the following versions of MR Configurator/MR Configurator2. However, this setting value is changeable. Follow the instructions in this Instruction Manual to set a value.
> ・MRZJW3-SETUP221E: software version C3 or below
> ・SW1DNC-MRC2-E: software version 1.09K or below

No.	Symbol	Name and function	Initial value	Setting range	Unit
PD25	A8DT	[AL. 8D CC-Link IE communication error] detection time Selecting the [AL. 8D] detection time in [Pr. PC50] activates the time setting of [AL. 8D]. It is 10 ms when [Pr. PC50] = "0". Convert a decimal value to a hexadecimal value for input. The setting range is up to 1000 ms. A set value is limited within the setting range. For example) If "03E8h" is set, the set value becomes 1000 ms. The converted decimal value of "1388h" is 10000 ms, but it is limited to 1000 ms, which is the upper limit of the setting range. ⚠CAUTION ●If [AL. 8D CC-Link IE communication error] does not have to be detected, use the communication time-out setting in the initial setting. When you change the setting value, do not set an unnecessarily long time period. Doing so interferes swift stop operation at an occurrence of [AL. 8D CC-Link IE communication error].	0000h	0000h to 03E8h	ms

3. PARAMETERS

3.5 Option unit parameters [Pr. Po_ _]

3.5.1 Parameter list

No.	Symbol	Name	Initial value	Unit
Po01		This parameter is not used. Do not change this value by any means.	0000h	
Po02			0302h	
Po03			0905h	
Po04			2524h	
Po05			2026h	
Po06			0427h	
Po07			0807h	
Po08			2726h	
Po09			0423h	
Po10			2101h	
Po11			0000h	
Po12			0000h	
Po13			0000h	
Po14			0001h	
Po15			0	
Po16			0	
Po17			0	
Po18			0	
Po19			0	
Po20			0	
Po21			0	
Po22			0	
Po23			0000h	
Po24			0050h	
Po25			0200h	
Po26			0	
Po27			0	
Po28			0	
Po29			0000h	
Po30			0000h	
Po31			0000h	
Po32			0000h	
Po33			0000h	
Po34	*STNO	CC-Link IE communication station number selection	0000h	
Po35	*NWNO	CC-Link IE communication network number	0000h	

3. PARAMETERS

3.5.2 Detail description

> **POINT**
>
> ●The parameter names of [Pr. Po34] and [Pr. Po35] are not displayed with the following versions of MR Configurator/MR Configurator2. However, their setting values are changeable. Follow the instructions in this Instruction Manual to set a value.
> ・MRZJW3-SETUP221E: software version C3 or below
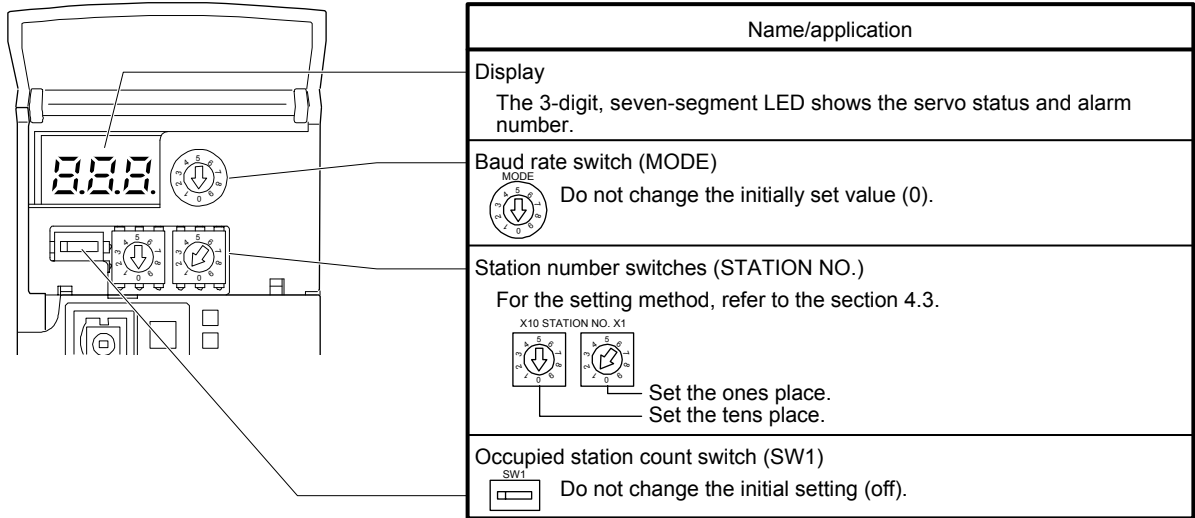> ・SW1DNC-MRC2-E: software version 1.09K or below

No.	Symbol	Name and function	Initial value	Setting range	Unit
Po34	*STNO	CC-Link IE communication station number selection Use this parameter to set the station number of the servo amplifier. Convert a decimal value to a hexadecimal value for input. If you are using an automatic station number, which is designated by the master station, do not change the initial value "0000h". If you are designating a station number, set a value in the range of 1 to 120 (0001h to 0078h). A value higher the maximum value will trigger [AL. 37 parameter error]. For example) The setting value "0078h" sets the station number of 120. The setting value "0079h" or a higher will trigger [AL. 37 parameter error].	0000h	0000h to 0078h	
Po35	*NWNO	CC-Link IE communication network number Use this parameter to set the network number of the servo amplifier. Convert a decimal value to a hexadecimal value for input. The network number is 1 at the initial value of "0000h". The maximum setting value for the network number is 239. A value higher than the maximum value will trigger [AL. 37 parameter error]. For example) The setting value "00EFh" sets the station number of 239. The setting value "012Ch" will trigger [AL. 37 parameter error]. If an automatic number has been selected with [Pr. Po34] and the rotary switch on the MR-J3-_T, this parameter setting is ignored. Instead, the network number transmitted from the master station is used.	0000h	0000h to 00EFh	

4. DISPLAY/OPERATING PARTS

4.1 MR-J3-_T servo amplifier

4.1.1 Explanation on the display/operating parts

Name/application
Display The 3-digit, seven-segment LED shows the servo status and alarm number.
Baud rate switch (MODE) Do not change the initially set value (0).
Station number switches (STATION NO.) For the setting method, refer to the section 4.3. X10 STATION NO. X1 Set the ones place. Set the tens place.
Occupied station count switch (SW1) Do not change the initial setting (off).

4.1.2 Display details

On the servo amplifier display (three-digit, seven-segment display), check the status of communication with the CC-Link IE controller at power-on, check the station number, and diagnose a fault at occurrence of an alarm.
The table below shows the details.

Display	Status	Description
b##	CC-Link IE communication waiting	・Power of the servo amplifier was switched on at the condition that the power of the CC-Link IE master module is off. ・CC-Link IE master module is faulty.
(Note 1) d##	Ready	Servo-on has been performed after initialization, and it is ready for operation. (The display appears for 2 s.)
(Note 1) C##	Not ready	Initialization is in progress, or an alarm has occurred.
(Note 2) $$$	Drive enabled	The drive enabled condition has lasted for 2 s after turning on RYn1 (servo-on).
(Note 3) A**	Alarm/Warning	The alarm No./warning No. that occurred is displayed.
888	CPU Error	CPU watchdog error has occurred.
(Note 4) b00	(Note 4) Test operation mode	JOG operation, positioning operation, program operation, DO forced output, and 1 step feed
(Note 1) d##. C##.		Motor-less operation

Note 1. ## denotes any of symbols or numerals of -- or 00 to C0 and what it means is listed below.

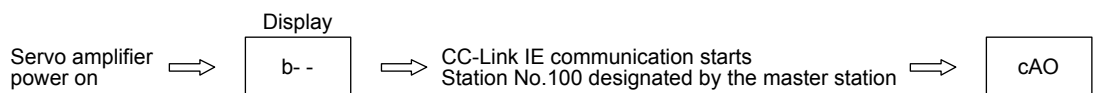| ##	Description
00	Set to the test operation mode.
--	For the station No. 0 (unset), refer to section 4.1.3.
01	Station No. 1
02	Station No. 2
:	:
:	:
99	Station No. 99
A0	Station No. 100
:	:
:	:
A9	Station No. 109
b0	Station No. 110
:	:
:	:
b9	Station No. 119
c0	Station No. 120

2. $$$ indicates the number of the point table No. being executed. $$$ is a number between 0 and 255.
3. ** indicates the warning/alarm No.
4. MR Configurator/MR Configurator2 or an MR-PRU03 parameter unit is required.

4.1.3 Unspecified station number

If 0 (unspecified) is set as the station number, the communication is performed with the station number set by the master station.

Display

Servo amplifier power on ⟹ b- - ⟹ CC-Link IE communication starts Station No.100 designated by the master station ⟹ cAO

4. DISPLAY/OPERATING PARTS

4.2 MR-J3-T10 IE Field Network interface unit

The table below shows the detailed description of the communication alarm display area. MR-J3-T10 has eight LEDs.

Table 4.1 LED display description

No.	LED	Name	LED status	Description
1	RUN	Operating status	Lit	Operating normally (RUN status)
			Extinguished	Hardware fault (WDT error)
2	D LINK	Cyclic communication status	Lit	Linking data (cyclic transmitting)
			Flashing	Data not linked (after parameter frame received)
			Extinguished	Data not linked (disconnecting)
3	SD	Network transmission status	Lit	Data transmitting
4	RD	Network reception status	Lit	Data receiving
5	ERR.	Unit error status	Lit	Unit error
			Extinguished	Nothing abnormal
6	L ERR.	Communication error status	Lit	Receiving abnormal data. Or, data is looped back to its own station.
7	L ER (port 1/2)	Communication error status	Lit	Receiving abnormal data. Or, data is looped back to its own station.
8	LINK (port 1/2)	Link status	Lit	Linking up

The table below shows display pattens for different statuses.

No.	Status	RUN	D LINK	ERR.	L ERR.	L ER (port)	LINK (port)	Servo amplifier display
1	Failure at start	●	●	○	-	-	-	A74 A37 A8d
2	Normal (condition before communication connection)	○	●	●	●	●	-	b**
3	Normal (condition before cyclic commutation established)	○	◎	●	●	●	-	b**
4	Normal (during cyclic communication)	○	○	●	●	●	-	c**
5	Failure occurred (communication disabled due to faulty MR-J3-T10)	○	●	○	●	●	-	A74
6	Failure occurred (cyclic communication stopped due to faulty MR-J3-T10)	○	◎	○	●	●	-	A74
7	Failure occurred (WDT error)	●	●	○	-	-	-	A74
8	Failure occurred (option card come off)	●	●	●	●	●	●	A75
9	Failure occurred (cyclic communication stopped due to incorrect setting)	○	◎	○	●	●	-	A9d
10	Failure occurred (abnormal data received, data looped back)	○	-	○	○	-	-	A9E
11	Failure occurred (disconnection due to twisted pair cable came off)	○	●	○	●	●	-	A8d
12	Failure occurred (cyclic data not received)	○	○	○	●	●	-	A8d
13	Failure occurred (abnormal station/network number designated by the master)	○	-	○	●	●	-	A8d
14	Reserved station specification	○	◎	○	●	●	-	A8d

(○: lit, ●: extinguished, ◎: flashing, -: refer to Table 4.1.)

4. DISPLAY/OPERATING PARTS

4.3 Selecting the station number and network number

(1) How to number the stations
Set the servo station numbers before powering on the servo amplifiers. Station numbers may be set within the range 1 to 120.

(2) Station number setting method

    (a) Use the station number switches (RSW1, RSW2) on the front face of the MR-J3-_T to select a station number between 1 to 64. In the initial status, the station number is set to station 1. When the station number is set to 0, communication is performed with the station number designated by the master station.

X10 STATION NO. X1

Set the ones place.
Set the tens place.
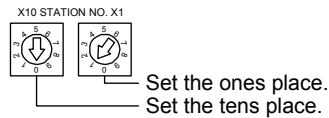
    (b) Use [Pr. Po34] to select the station number 65 or above. In this case, the setting made by the station number switches is ignored.

    (c) A station number command from a master module through CC-Link IE Field Network has a priority over the command sources (a) and (b). For how to use the master station to designate a station number to a servo amplifier, refer to the user's manual of the CC-Link IE Field Network master/local module.

(3) Network number setting
Use [Pr. Po35] to set a network number to a servo amplifier. The network number can be set between 1 and 239. When the station number is set to 0, communication is performed with the station number designated by the master station. In the initial status, 0 is set. For how to use the master station to designate a network number, refer to the user's manual of the CC-Link IE Field Network master/local module.

5. TROUBLESHOOTING

POINT

● This chapter describes about the alarms and warnings, which are different from the ones displayed in the CC-Link communication operation. Refer to the chapter 11 of MR-J3-_T Servo Amplifier Instruction Manual for the alarms and warnings not listed in this chapter.

● The alarm names of [AL. 74] and [AL. 75] are not displayed with the following versions of MR Configurator/MR Configurator2, and the alarms of CC-Link communication are displayed for [AL. 8D], [AL. 97], [AL. 9D], and [AL. 9E]. Replace the alarm cause, etc. to the ones listed in this instruction manual.
・MRZJW3-SETUP221E: software version C3 or below
・SW1DNC-MRC2-E: software version 1.09K or below

5. TROUBLESHOOTING

5.1 Alarm and warning list

After its cause has been removed, the alarm can be deactivated in any of the methods marked ○ in the alarm deactivation column. The alarm is automatically canceled after removing the cause of occurrence.

	No.	Name	Alarm deactivation				No.	Name
			Power off to on	(Note 3) MR Configurator/ MR Configurator2 Parameter unit	(Note 2) Alarm reset	Warning	90	Home position return incomplete warning
Alarm	10	Undervoltage	○	○	○		92	Battery cable disconnection warning
	12	Memory error 1 (RAM)	○				96	Home position setting warning
	13	Clock error	○				97	Next station warning
	15	Memory error 2 (EEP-ROM)	○				98	Software limit warning
	16	Encoder error 1 (at power-on)	○				99	Stroke limit warning
	17	Board error	○				9D	CC-Link IE warning 1
	19	Memory error 3 (Flash-ROM)	○				9E	CC-Link IE warning 2
	1A	Motor combination error	○				9F	Battery warning
	20	Encoder error 2	○				E0	Excessive regeneration warning
	24	Main circuit error	○	○	○		E1	Overload warning 1
	25	Absolute position erased	○				E3	Absolute position counter warning
	30	Regenerative error	(Note 1) ○	(Note 1) ○	(Note 1) ○		E6	Servo forced stop warning
	31	Overspeed	○	○	○		E8	Cooling fan speed reduction warning
	32	Overcurrent	○				E9	Main circuit off warning
	33	Overvoltage	○	○	○		EC	Overload warning 2
	35	Command pulse frequency error	○	○	○		ED	Output watt excess warning
	37	Parameter error	○					
	45	Main circuit device overheat	(Note 1) ○	(Note 1) ○	(Note 1) ○			
	46	Servo motor overheat	(Note 1) ○	(Note 1) ○	(Note 1) ○			
	47	Cooling fan error	○					
	50	Overload 1	(Note 1) ○	(Note 1) ○	(Note 1) ○			
	51	Overload 2	(Note 1) ○	(Note 1) ○	(Note 1) ○			
	52	Error excessive	○	○	○			
	61	Operation alarm	○	○	○			
	74	Option card error	○					
	75	Option card error 2	○					
	8A	Serial communication time-out error	○	○	○			
	8D	CC-Link IE communication error	○	(Note 4) ○	(Note 4) ○			
	8E	Serial communication error	○	○	○			
	888	Watchdog	○					

Note 1. Wait for about 30 minutes as cooling time after removing the cause of occurrence, then deactivate the alarm.
2. Turns on RY (n + 1) A or RY (n + 3) A.
3. Clicking the "Alarm reset" button on the "Alarm display" screen of MR Configurator/MR Configurator2 allows an alarm to be deactivated.
   Pressing the "STOP RESET" key of the parameter unit allows an alarm to be deactivated.
4. Deactivation of the alarm may not be possible. Refer to the section 5.2 for details.

5. TROUBLESHOOTING

5.2 Remedies for alarms

When an alarm occurs, ALM (Malfunction) switches on and the dynamic brake is operated to stop the servo motor. At this time, the display indicates the alarm No.
Remove the cause of the alarm in accordance with this section. MR Configurator/MR Configurator2 may be used to refer to the cause.

No.	Name	Description	Cause	Action
74	Option card error	MR-J3-T10 is not properly recognized.	MR-J3-T10 faulty.	Replace the MR-J3-T10.
75	Option card error 2	MR-J3-T10 is not properly recognized.	Connection failure of MR-J3-T10.	Check the connection between MR-J3-T10 and a servo amplifier.
8D	CC-Link IE communication error	Normal communication with the master station cannot be made.	1. The station number is set to 65 or higher.	Set the station within the range 1 to 64, and turn the power on.
			2. The station number is set to a value other than 1 to 120 with the master station.	Set a value in the range 1 to 120 with the master station. After the cause has been removed, the alarm can be deactivated with a reset.
			3. The network number is set to a value other than 1 to 239 with the master station.	Set a value in the range 1 to 239 with the master station. After the cause has been removed, the alarm can be deactivated with a reset .
			4. The transmission status is abnormal.	Review the wiring. After the cause has been removed, the alarm can be deactivated with a reset.
			5. CC-Link IE Field Network connector has come off.	1. Connect the cable or connector correctly. 2. Repair or change the CC-Link IE Field Network cable. After the cause has been removed, the alarm can be deactivated with a reset.
			6. CC-Link IE Field Network cable wiring incorrect.	
			7. CC-Link IE Field Network cable faulty.	
			8. Noise entered the CC-Link IE Field Network cable.	Take the noise reduction measures. After the cause has been removed, the alarm can be deactivated with a reset.
			9. A reserved station has been selected by the master station, and the cyclic communication has stopped.	Deselect the reserved station with the master station.

5. TROUBLESHOOTING

5.3 Remedies for warnings

If [AL. 98 Software limit warning] and [AL. E6 Servo forced stop warning] occur, the servo off status is established. If any other warning occurs, operation can be continued but an alarm may take place or proper operation may not be performed.

Remove the cause of warning according to this section. Use MR Configurator/MR Configurator2 to refer to a factor of warning occurrence.

No.	Name	Description	Cause	Action
97	Next station warning (out of setting range warning)	Setting error of point table/next station/speed selection	A number for point table/next station/speed selection has been set with the master station.	For the point table/next station/speed selection, set a number within the setting range with the master station.
9D	CC-Link IE warning 1	The station number switch or baud rate switch setting has been changed after power-on.	1. The station number switch setting has been changed after power-on.	Return to the setting at power-on.
			2. The setting at the master station side is incorrect.	Review the setting on the master station side.
9E	CC-Link IE warning 2	Communication error with the cable.	1. The transmission status is abnormal.	Take the noise reduction measures.
			2. CC-Link IE Field Network connector has come off.	1. Connect the cable or connector correctly. 2. Change the CC-Link IE Field Network cable.
			3. CC-Link IE Field Network cable wiring incorrect.	
			4. CC-Link IE Field Network cable faulty.	
			5. Communication with the master station is abnormal.	Review the communication setting on the master station side.
			6. Data is looped back to its own station in a ring connection.	1. Connect the cable or connector correctly. 2. Change the CC-Link IE Field Network cable.

6. DIMENSIONS

(1) MR-J3-T10

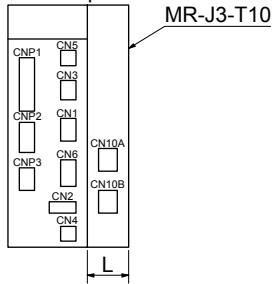[Unit: mm]

5 × 6 mounting hole for grounding

Rating plate
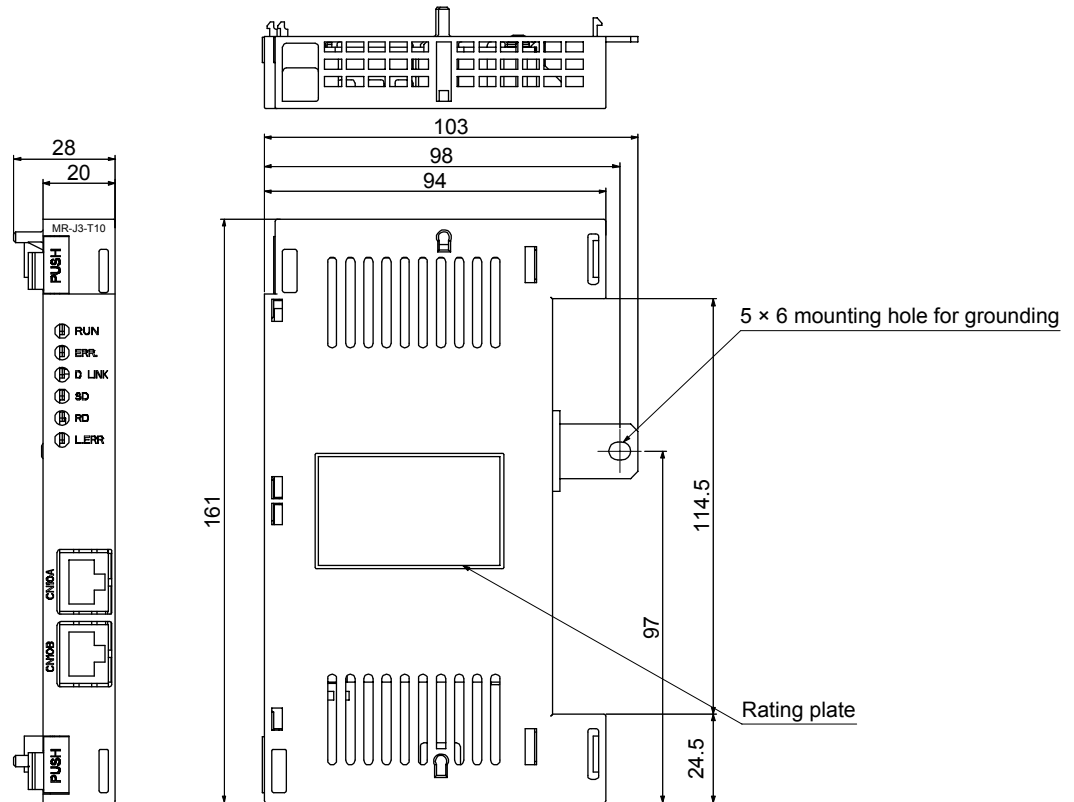
Mass: 0.15 kg

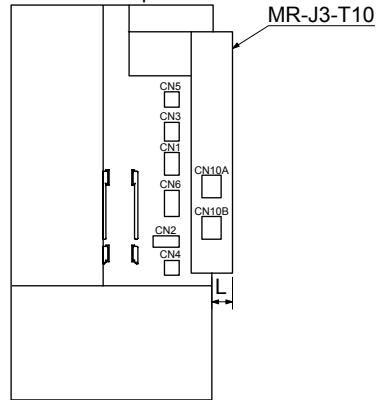# 6. DIMENSIONS

(2) When the unit is mounted on a servo amplifier

100 V/200 V 0.1 kW to 3.5 kW
400 V 0.6 kW to 2 kW
Servo amplifier

MR-J3-T10

200 V 5 kW/7 kW
400 V 3.5 kW to 7 kW
Servo amplifier

MR-J3-T10

Servo amplifier	L [mm]
MR-J3-10T1 to MR-J3-401 MR-J3-10T to MR-J3-100T MR-J3-60T4 to MR-J3-100T4	20
MR-J3-200TN/MR-J3-350T MR-J3-200T4	15
MR-J3-500T/MR-J3-700T MR-J3-350T4 to MR-J3-700T4	10
MR-J3-11KT to MR-J3-22KT MR-J3-11KT4 to MR-J3-22KT4	0

7. CC-LINK IE FIELD NETWORK COMMUNICATION FUNCTION

7.1 System configuration

Item	CC-Link IE Field Network
Network topology	Line/start/ring
Variable communication speed	1 Gbps
Transmission speed between stations	100 m
Number of connected units	Max. 120

7.2 Communication specifications

Item	Description
Device type	CC-Link IE Field Network intelligent device station
Number of communication ports	2 ports (RJ45-1000BASE-T)
Cyclic communication	Receiving control signal (RY) 128 points, control data (RWw) 16 points Transmitting control signal (RY) 128 points, control data (RWr) 16 points

7.3 I/O device

Most devices used in CC-Link IE Field Network communication are the same with the devices used in CC-Link communication with two occupied stations. However, some device numbers have been changed. The devices, of which device numbers are different from the numbers in CC-Link communication, are shaded.

7.3.1 I/O devices for a programmable controller CPU

(1) Bit device (master station → servo amplifier RY)

(Note 1) Device No.	CC-Link (1 station) RY (32 points)	CC-Link (2 stations) RY (64 points)	CC-Link IE Field RY (128 points) (Note 2)
RYn0	Servo-on	Servo-on	Servo-on
1	Forward rotation start	Forward rotation start	Forward rotation start
2	Reverse rotation start	Reverse rotation start	Reverse rotation start
3	Proximity dog	Proximity dog	Proximity dog
4	Forward rotation stroke end	Forward rotation stroke end	Forward rotation stroke end
5	Reverse rotation stroke end	Reverse rotation stroke end	Reverse rotation stroke end
6	Automatic/manual selection	Automatic/manual selection	Automatic/manual selection
7	Temporary stop/restart	Temporary stop/restart	Temporary stop/restart
8	Monitor output execution demand	Monitor output execution demand	Monitor output execution demand
9	Instruction code execution demand	Instruction code execution demand	Instruction code execution demand
A	Point table No. selection 1	Point table No. selection 1	Reserved
B	Point table No. selection 2	Point table No. selection 2	Reserved
C	Point table No. selection 3	Point table No. selection 3	Reserved
D	Point table No. selection 4	Point table No. selection 4	Reserved
E	Point table No. selection 5	Point table No. selection 5	Reserved
F	Clear	Clear	Clear
RY (n + 1) 0	Reserved	Reserved	Reserved
1	Reserved	Reserved	Reserved
2	Reserved	Reserved	Reserved
3	Reserved	Reserved	Reserved
4	Reserved	Reserved	Reserved
5	Reserved	Reserved	Reserved
6	Reserved	Reserved	Reserved
7	Reserved	Reserved	Reserved
8	Reserved	Reserved	Reserved
9	Reserved	Reserved	Reserved
A	Reset	Reserved	Reserved
B	Reserved	Reserved	Reserved
C	Reserved	Reserved	Reserved
D	Reserved	Reserved	Reserved
E	Reserved	Reserved	Reserved
F	Reserved	Reserved	Reserved

(Note 1) Device No.	CC-Link (1 station) RY (32 points)	CC-Link (2 stations) RY (64 points)	CC-Link IE Field RY (128 points) (Note 2)
RY (n + 2) 0		Position command execution demand	Position command execution demand
1		Speed command execution demand	Speed command execution demand
2		Reserved	Reserved
3		Point table No. selection 6	Reserved
4		Point table No. selection 7	Reserved
5		Point table No. selection 8	Reserved
6		Internal torque limit selection	Internal torque limit selection
7		Proportional control	Proportional control
8		Gain switching	Gain switching
9		Reserved	Reserved
A		Position/speed specifying system selection	Position/speed specifying system selection
B		Absolute value/incremental value selection	Absolute value/incremental value selection
C		Reserved	Reserved
D		Reserved	Reserved
E		Reserved	Reserved
F		Reserved	Reserved
RY (n + 3) 0		Reserved	Reserved
1		Reserved	Reserved
2		Reserved	Reserved
3		Reserved	Reserved
4		Reserved	Reserved
5		Reserved	Reserved
6		Reserved	Reserved
7		Reserved	Reserved
8		Reserved	Reserved
9		Reserved	Reserved
A		Reset	Reset
B		Reserved	Reserved
C		Reserved	Reserved
D		Reserved	Reserved
E		Reserved	Reserved
F		Reserved	Reserved

Note 1. "n" depends on the station number setting.

2. The number of bit device points is fixed to 128. If a point other than 128 is set, [AL. 9D] will occur. Device No. RY (n + 4) to RY (n + 7) are reserved.

7. CC-LINK IE FIELD NETWORK COMMUNICATION FUNCTION

(2) Bit device (servo amplifier → master station RX)

(Note 1) Device No.	CC-Link (1 station) RX (32 points)	CC-Link (2 stations) RX (64 points)	CC-Link IE Field RX (128 points) (Note 2)
RXn0	Ready	Ready	Ready
1	In-position	In-position	In-position
2	Rough match	Rough match	Rough match
3	Home position return completion	Home position return completion	Home position return completion
4	Limiting torque	Limiting torque	Limiting torque
5	Reserved	Reserved	Reserved
6	Electromagnetic brake interlock	Electromagnetic brake interlock	Electromagnetic brake interlock
7	Temporary stop	Temporary stop	Temporary stop
8	Monitoring	Monitoring	Monitoring
9	Instruction code execution completion	Instruction code execution completion	Instruction code execution completion
A	Warning	Warning	Warning
B	Battery warning	Battery warning	Battery warning
C	Travel completion	Travel completion	Travel completion
D	Dynamic brake interlock	Dynamic brake interlock	Dynamic brake interlock
E	Position range output	Position range output	Position range output
F	Reserved	Reserved	Reserved
RX (n + 1) 0	Reserved	Reserved	Reserved
1	Reserved	Reserved	Reserved
2	Reserved	Reserved	Reserved
3	Reserved	Reserved	Reserved
4	Reserved	Reserved	Reserved
5	Reserved	Reserved	Reserved
6	Reserved	Reserved	Reserved
7	Reserved	Reserved	Reserved
8	Reserved	Reserved	Reserved
9	Reserved	Reserved	Reserved
A	Malfunction	Reserved	Reserved
B	Remote station communication ready	Reserved	Reserved
C	Reserved	Reserved	Reserved
D	Reserved	Reserved	Reserved
E	Reserved	Reserved	Reserved
F	Reserved	Reserved	Reserved
RX (n + 2) 0		Position command execution completion	Position command execution completion
1		Speed command execution completion	Speed command execution completion
2		Point table No. output 1	Reserved
3		Point table No. output 2	Reserved
4		Point table No. output 3	Reserved
5		Point table No. output 4	Reserved
6		Point table No. output 5	Reserved
7		Point table No. output 6	Reserved
8		Point table No. output 7	Reserved
9		Point table No. output 8	Reserved
A		Reserved	Reserved
B		Reserved	Reserved
C		Reserved	Reserved
D		Reserved	Reserved
E		Reserved	Reserved
F		Reserved	Reserved

7 - 4

(Note 1) Device No.	CC-Link (1 station) RX (32 points)	CC-Link (2 stations) RX (64 points)	CC-Link IE Field RX (128 points) (Note 2)
RX (n + 3) 0		Reserved	Reserved
1		Reserved	Reserved
2		Reserved	Reserved
3		Reserved	Reserved
4		Reserved	Reserved
5		Reserved	Reserved
6		Reserved	Reserved
7		Reserved	Reserved
8		Reserved	Reserved
9		Reserved	Reserved
A		Malfunction	Malfunction
B		Remote station communication ready	Remote station communication ready
C		Reserved	Reserved
D		Reserved	Reserved
E		Reserved	Reserved
F		Reserved	Reserved

Note 1. "n" depends on the station number setting.

2. The number of bit device points is fixed to 128. If a point other than 128 is set, [AL. 9D] will occur. Device No. RX (n + 4) to RX (n + 7) are reserved.

(3) Word device (master station → servo amplifier RWw)

(Note 1) Device No.	CC-Link (1 station) RWw (4 points)	CC-Link (2 stations) RWw (8 points)	CC-Link IE Field RWw (16 points) (Note 3)
RWwn0	Monitor 1	Monitor 1	Monitor 1
1	Monitor 2	Monitor 2	Reserved
2	Instruction code	Instruction code	Monitor 2
3	Writing data	Writing data	Reserved
4		Position command data lower 16 bits /Point table No.	Instruction code
5		Position command data upper 16 bits	Writing data
6		Speed command data/Point table No.	Point table No. selection (Note 2)
7		Reserved	Reserved
8			Position command data lower 16 bits /Point table No.
9			Position command data upper 16 bits
A			Speed command data/Point table No.
B			Reserved
C			Reserved
D			Reserved
E			Reserved
F			Reserved

Note 1. "n" depends on the station number setting.

2. If an out-of-range value is set to Point table No. selection, [AL. 97] will occur.

3. The number of word device points is fixed to 16. If a point other than 16 is set, [AL. 9D] will occur.

7. CC-LINK IE FIELD NETWORK COMMUNICATION FUNCTION

(4) Word device (servo amplifier → master station RWr)

(Note 1) Device No.	CC-Link (1 station) RWr (4 points)	CC-Link (2 stations) RWr (8 points)	CC-Link IE Field RWr (16 points) (Note 2)
RWrn0	Monitor 1 data	Monitor 1 data lower 16 bits	Monitor 1 data lower 16 bits
1	Monitor 2 data	Monitor 1 data upper 16 bits	Monitor 1 data upper 16 bits
2	Respond code	Respond code	Monitor 2 data lower 16 bits
3	Reading data	Reading data	Monitor 2 data upper 16 bits
4		Reserved	Respond code
5		Monitor 2 data lower 16 bits	Reading data
6		Monitor 2 data upper 16 bits	Point table No. output
7		Reserved	Reserved
8			Reserved
9			Reserved
A			Reserved
B			Reserved
C			Reserved
D			Reserved
E			Reserved
F			Reserved

Note 1. "n" depends on the station number setting.
    2. The number of word device points is fixed to 16. If a point other than 16 is set, [AL. 9D] will occur.

7.3.2 I/O devices for a programmable controller CPU during indexer positioning operation

(1) Bit device (master station → servo amplifier RY)

(Note 1) Device No.	CC-Link (1 station) RY (32 points)	CC-Link (2 stations) RY (64 points)	CC-Link IE Field RY (128 points) (Note 2)
RYn0	Servo-on	Servo-on	Servo-on
1	Start	Start	Start
2	Rotation direction specifying	Rotation direction specifying	Rotation direction specifying
3	Reserved	Reserved	Reserved
4	Reserved	Reserved	Reserved
5	Reserved	Reserved	Reserved
6	Operation mode selection 1	Operation mode selection 1	Operation mode selection 1
7	Operation mode selection 2	Operation mode selection 2	Operation mode selection 2
8	Monitor output execution demand	Monitor output execution demand	Monitor output execution demand
9	Instruction code execution demand	Instruction code execution demand	Instruction code execution demand
A	Next station selection 1	Next station selection 1	Reserved
B	Next station selection 2	Next station selection 2	Reserved
C	Next station selection 3	Next station selection 3	Reserved
D	Next station selection 4	Next station selection 4	Reserved
E	Next station selection 5	Next station selection 5	Reserved
F	Reserved	Reserved	Reserved
RY (n + 1) 0	Reserved	Reserved	Reserved
1	Reserved	Reserved	Reserved
2	Reserved	Reserved	Reserved
3	Reserved	Reserved	Reserved
4	Reserved	Reserved	Reserved
5	Reserved	Reserved	Reserved
6	Reserved	Reserved	Reserved
7	Reserved	Reserved	Reserved
8	Reserved	Reserved	Reserved
9	Reserved	Reserved	Reserved
A	Reset	Reserved	Reserved
B	Reserved	Reserved	Reserved
C	Reserved	Reserved	Reserved
D	Reserved	Reserved	Reserved
E	Reserved	Reserved	Reserved
F	Reserved	Reserved	Reserved

(Note 1) Device No.	CC-Link (1 station) RY (32 points)	CC-Link (2 stations) RY (64 points)	CC-Link IE Field RY (128 points) (Note 2)
RY (n + 2) 0		Position command execution demand	Position command execution demand
1		Speed command execution demand	Speed command execution demand
2		Reserved	Reserved
3		Next station selection 6	Reserved
4		Next station selection 7	Reserved
5		Next station selection 8	Reserved
6		Internal torque limit selection	Internal torque limit selection
7		Proportional control	Proportional control
8		Gain switching	Gain switching
9		Reserved	Reserved
A		Position/speed specifying system selection	Position/speed specifying system selection
B		Reserved	Reserved
C		Speed selection 1	Speed selection 1
D		Speed selection 2	Speed selection 2
E		Speed selection 3	Speed selection 3
F		Reserved	Reserved
RY (n + 3) 0		Reserved	Reserved
1		Reserved	Reserved
2		Reserved	Reserved
3		Reserved	Reserved
4		Reserved	Reserved
5		Reserved	Reserved
6		Reserved	Reserved
7		Reserved	Reserved
8		Reserved	Reserved
9		Reserved	Reserved
A		Reset	Reset
B		Reserved	Reserved
C		Reserved	Reserved
D		Reserved	Reserved
E		Reserved	Reserved
F		Reserved	Reserved

Note 1. "n" depends on the station number setting.

2. The number of bit device points is fixed to 128. If a point other than 128 is set, [AL. 9D] will occur. Device No. RY (n + 4) to RY (n + 7) are reserved.

(2) Bit device (servo amplifier → master station RX)

(Note 1) Device No.	CC-Link (1 station) RX (32 points)	CC-Link (2 stations) RX (64 points)	CC-Link IE Field RX (128 points) (Note 2)
RXn0	Ready	Ready	Ready
1	In-position	In-position	In-position
2	Rough match	Rough match	Rough match
3	Home position return completion	Home position return completion	Home position return completion
4	Limiting torque	Limiting torque	Limiting torque
5	Reserved	Reserved	Reserved
6	Electromagnetic brake interlock	Electromagnetic brake interlock	Electromagnetic brake interlock
7	Temporary stop	Temporary stop	Temporary stop
8	Monitoring	Monitoring	Monitoring
9	Instruction code execution completion	Instruction code execution completion	Instruction code execution completion
A	Warning	Warning	Warning
B	Battery warning	Battery warning	Battery warning
C	Travel completion	Travel completion	Travel completion
D	Dynamic brake interlock	Dynamic brake interlock	Dynamic brake interlock
E	Reserved	Reserved	Reserved
F	Reserved	Reserved	Reserved
RX (n + 1) 0	Reserved	Reserved	Reserved
1	Reserved	Reserved	Reserved
2	Reserved	Reserved	Reserved
3	Reserved	Reserved	Reserved
4	Reserved	Reserved	Reserved
5	Reserved	Reserved	Reserved
6	Reserved	Reserved	Reserved
7	Reserved	Reserved	Reserved
8	Reserved	Reserved	Reserved
9	Reserved	Reserved	Reserved
A	Malfunction	Reserved	Reserved
B	Remote station communication ready	Reserved	Reserved
C	Reserved	Reserved	Reserved
D	Reserved	Reserved	Reserved
E	Reserved	Reserved	Reserved
F	Reserved	Reserved	Reserved
RX (n + 2) 0		Position command execution completion	Position command execution completion
1		Speed command execution completion	Speed command execution completion
2		Station output 1	Reserved
3		Station output 2	Reserved
4		Station output 3	Reserved
5		Station output 4	Reserved
6		Station output 5	Reserved
7		Station output 6	Reserved
8		Station output 7	Reserved
9		Station output 8	Reserved
A		Reserved	Reserved
B		Reserved	Reserved
C		Reserved	Reserved
D		Reserved	Reserved
E		Reserved	Reserved
F		Reserved	Reserved

(Note 1) Device No.	CC-Link (1 station) RX (32 points)	CC-Link (2 stations) RX (64 points)	CC-Link IE Field RX (128 points) (Note 2)
RX (n + 3) 0		Reserved	Reserved
1		Reserved	Reserved
2		Reserved	Reserved
3		Reserved	Reserved
4		Reserved	Reserved
5		Reserved	Reserved
6		Reserved	Reserved
7		Reserved	Reserved
8		Reserved	Reserved
9		Reserved	Reserved
A		Malfunction	Malfunction
B		Remote station communication ready	Remote station communication ready
C		Reserved	Reserved
D		Reserved	Reserved
E		Reserved	Reserved
F		Reserved	Reserved

Note 1. "n" depends on the station number setting.
　　 2. The number of bit device points is fixed to 128. If a point other than 128 is set, [AL. 9D] will occur. Device No. RX (n + 4) to RX (n + 7) are reserved.

(3) Word device (master station → servo amplifier RWw)

(Note 1) Device No.	CC-Link (1 station) RWw (4 points)	CC-Link (2 stations) RWw (8 points)	CC-Link IE Field RWw (16 points) (Note 4)
RWwn0	Monitor 1	Monitor 1	Monitor 1
1	Monitor 2	Monitor 2	Reserved
2	Instruction code	Instruction code	Monitor 2
3	Writing data	Writing data	Reserved
4		Next station No. (Note 2)	Instruction code
5		Reserved	Writing data
6		Speed command data/next station No.	Next station No. selection (Note 3)
7		Reserved	Reserved
8			Next station No. (Note 2)
9			Reserved
A			Speed command data/next station No.
B			Reserved
C			Reserved
D			Reserved
E			Reserved
F			Reserved

Note 1. "n" depends on the station number setting.
　　 2. This device is used to select the remote register-based position/speed specifying method.
　　 3. If an out-of-range value is set to the next station No. selection, [AL. 97] will occur.
　　 4. The number of word device points is fixed to 16. If a point other than 16 is set, [AL. 9D] will occur.

(4) Word device (servo amplifier → master station RWr)

(Note 1) Device No.	CC-Link (1 station) RWr (4 points)	CC-Link (2 stations) RWr (8 points)	CC-Link IE Field RWr (16 points) (Note 2)
RWrn0	Monitor 1 data	Monitor 1 data lower 16 bits	Monitor 1 data lower 16 bits
1	Monitor 2 data	Monitor 1 data upper 16 bits	Monitor 1 data upper 16 bits
2	Respond code	Respond code	Monitor 2 data lower 16 bits
3	Reading data	Reading data	Monitor 2 data upper 16 bits
4		Reserved	Respond code
5		Monitor 2 data lower 16 bits	Reading data
6		Monitor 2 data upper 16 bits	Next station No. output
7		Reserved	Reserved
8			Reserved
9			Reserved
A			Reserved
B			Reserved
C			Reserved
D			Reserved
E			Reserved
F			Reserved

Note 1. "n" depends on the station number setting.
     2. The number of word device points is fixed to 16. If a point other than 16 is set, [AL. 9D] will occur.

7.4 Restrictions on the CC-Link IE Field Network wiring

```
POINT
●This chapter explains about the restrictions that apply to a network change
 during cyclic communication.
```

If communication is disconnected in a line of a network where several servo amplifiers are connected, [AL. 8D CC-Link IE communication error] may occur in the servo amplifiers that are not on the disconnected line. (Refer to figures 7.1 and 7.2.)
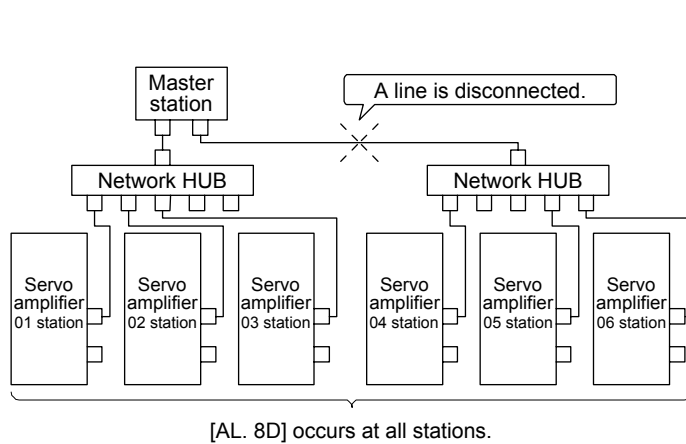
Figure 7.1 When communication is disconnected in a line   Figure 7.2 When a line is newly added
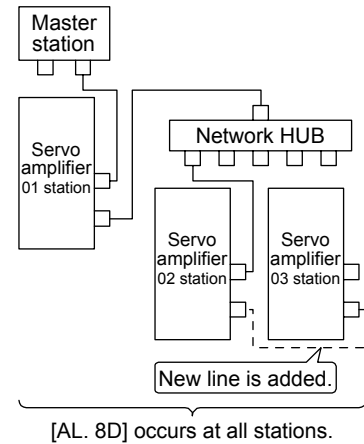
[AL. 8D CC-Link IE communication error] is detected when cyclic transmission stops for a time period longer than the communication time-out detection time of the servo amplifier. Such cyclic transmission stop occurs because of a disconnected/reconnected station due to a shut-off/reconnected network path.
An initial value is set for the communication time-out detection time in consideration of applications that require real-time operation. Therefore, the initial value is shorter than the general time-out detection time for CC-Link IE Field Network devices. (10 ms detection time in the initial value)
If the above initial setting creates inconvenience for an application requiring frequent communication path switching, change the communication time-out detection time setting with [Pr. PC50] and [Pr. PD25].
The communication time-out detection time must be set in accordance with the number of stations connected to the network and the detection time at hub connection changes. Use the following formula as a reference.

Communication time-out detection time [ms]
= (0.08 × (total link points byte) + Ka × (number of stations) + Kb + Kc) / 1000 + 2 ms + 1.5 ms × (number of connected stations) + 3 ms × (number of total HUB ports)
Ka = 25.8, Kb = 655, Kc = 160

```
          ●If [AL. 8D CC-Link IE communication error] does not have to be detected, use the
△CAUTION   communication time-out setting in the initial setting. When you change the setting
           value, do not set an unnecessarily long time period. Doing so interferes swift stop
           operation at an occurrence of [AL. 8D CC-Link IE communication error].
```

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