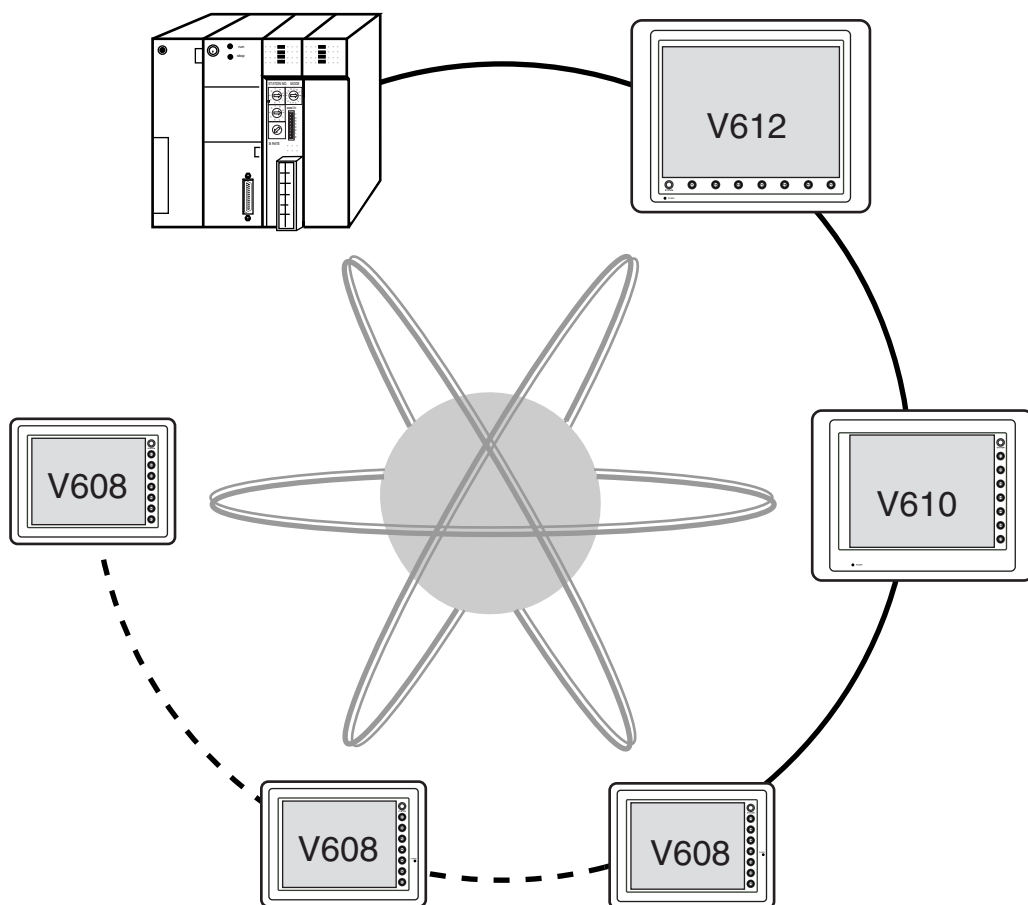


Specifications for Communication Unit

CC-Link



Contents

Chapter 1 Overview	1-1
Chapter 2 Specifications	2-1
CC-Link communication specifications	2-1
Compatible PLC and applicable master/local unit	2-2
Chapter 3 Settings at the V6 side and wiring	3-1
Installation to the V6 and the settings	3-1
■ Interface unit	3-1
■ Dimensions of CC-Link I/F unit	3-1
■ How to install a CC-Link I/F unit	3-2
Settings at CC-Link I/F unit side	3-3
■ Outline of the CC-Link I/F unit	3-3
■ Settings of transmission speed	3-3
■ Mode setting	3-3
■ Station number setting	3-3
■ Condition setting	3-4
■ Wiring	3-4
Wiring	3-5
Chapter 4 Connection to the PLC	4-1
Available memory	4-1
Settings of the master station	4-2
■ Setting of master • local unit AJ61BT11/A1SJ61BT11/AJ61QBT11/A1SJ61QBT11	4-2
■ Parameter setting	4-3
[Sample program]	4-4
Notes	4-5
■ Master • local unit	4-5

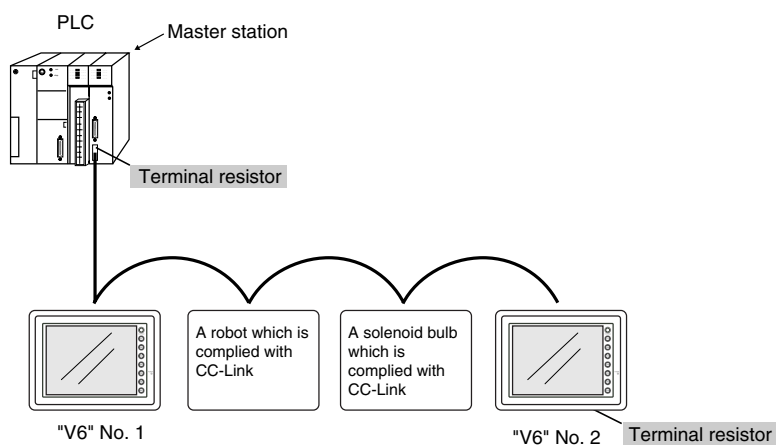
Chapter 5 Screen data editing	5-1
System setting	5-1
■ Selecting PLC type	5-1
■ Communication parameters	5-1
 Chapter 6 Errors	 6-1
Output signal status when the V6 has an error	6-1
Error messages on the V6 unit	6-1
■ Station Number Error	6-1
■ Word Writing to Op. Relay (Mitsubishi A series only.)	6-2
■ I/F Board Err	6-2
Checking errors by the LED display	6-2

1

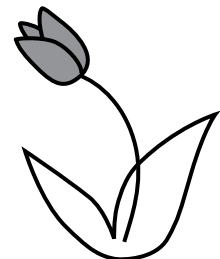
Overview

- ◎CC-Link is a network which was developed by Mitsubishi Electric Corp.
The V6 works as a local station (intelligent device station).
- ◎Likewise the communication with a link unit, it is possible for the V6 to communicate with the PLC without communication program.
- ◎It is capable to connect multiple remote/local stations to one PLC master station at high speed as below.

<Example> System configuration including 2 sets of V6



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2

Specifications

CC-Link communication specifications

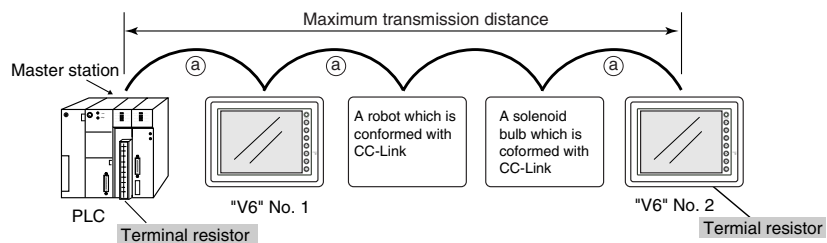
V6 series works as an intelligent device station.

Please refer to "Mitsubishi Control & Communication-Link System Master Local Module User's Manual" for further information.

Items	Specifications				
	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
Transmission speed	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
* Maximum transmission distance	1200m	600m	200m	150m	100m
Maximum number of modules	26 (intelligent device station)				
Number of occupied stations	1 station or 4 stations (switched by DIP switch) 1 station : 2 words each of RX/RX, 4 words each of RWw/RWr 4 stations : 8 words each of RX/RX, 16 words each of RWw/RWr				
Transmission method	Poring method				
Synchronous method	Frame synchronous method				
Signed method	NRZI (Non Return to Zero Inverted) method				
Transmission path	Bus (RS-485)				
Transmission format	Conform to HDLC				
Error control system	CRC				
Cable	Twist shielded cable (refer to P3-5 for recommended cable)				

- * The maximum transmission distance is vary according to the transmission speed.

The length of the cable between the stations, indicated as (a), should be at least 2m at any speed of the transmission.



Compatible PLC and applicable master/local unit

The communication unit which is compatible with the V6 is as follows.
Please refer to "MITSUBISHI Control & Communication-Link System Master Local Module User's Manual" for further information.

Applicable PLC	Master or Local Unit
MELSEC AnU/AnA/AnN	AJ61BT11
	A1SJ61BT11
MELSEC QnA	AJ61QBT11
	A1SJ61QBT11

3

Settings at the V6 side and wiring

3

Installation to the V6 and the settings

Installation to the V6 and the settings

■ Interface unit

Our CC-Link I/F unit is required for CC-Link communication with V6.

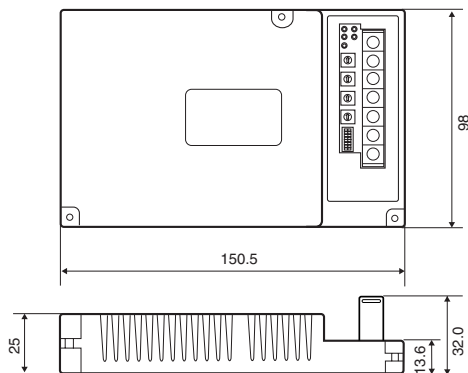
Select the following CC-Link I/F unit in accordance with the model of the V6.

V6 unit	CC-Link I/F unit
V612	CU-02
V610	
V608	

■ Dimensions of CC-Link I/F unit

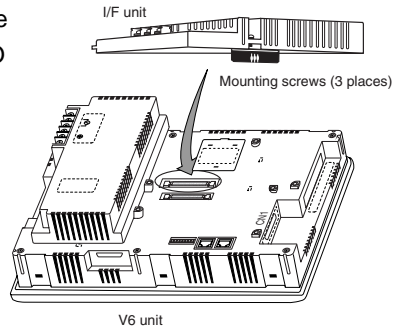
CU-02

(unit : mm)

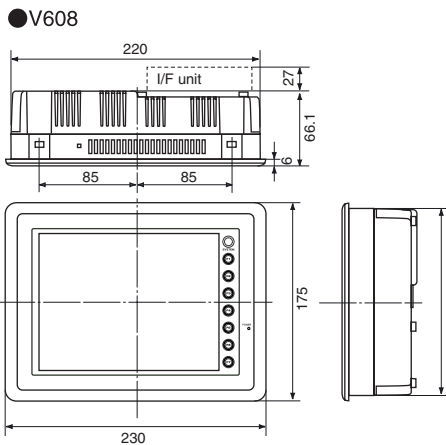
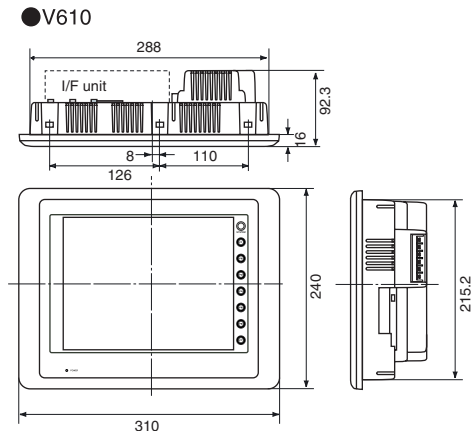
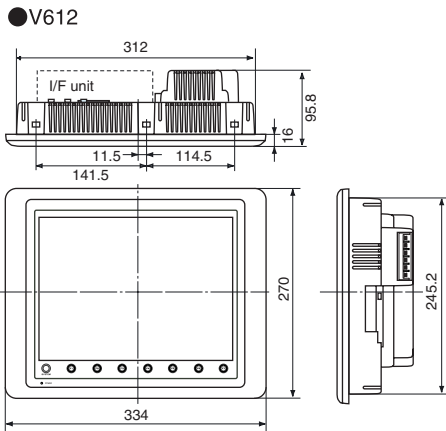


■ How to install a CC-Link I/F unit

- Remove a dust protection seal being pasted behind a V6, and mounting the CC-Link I/F unit, then fix it with the mounting screws (M3 X 8) at 3 places as shown in the right diagram.
- Wire the communication cable. When V6 is the terminal device, place the terminating resistor, 130 Ω 1/2W (terminal color: red) for FANC-SBH, 110 Ω 1/2W (terminal color: yellow) for FANC-SB, between the DA and DB. (Both FANC-SBH and FANC-SB are the cables for CU-02 made by KURAMO ELECTRONICS CO., LTD.) Please refer to P3-5 for further information.
- In the V608 case, insert a spacer attached to the I/F unit at the mounting hole of the upper left, and fix it with the mounting screws (M3 X 15) attached to the I/F unit. (Torque: 3 ~ 5 kgf•cm)



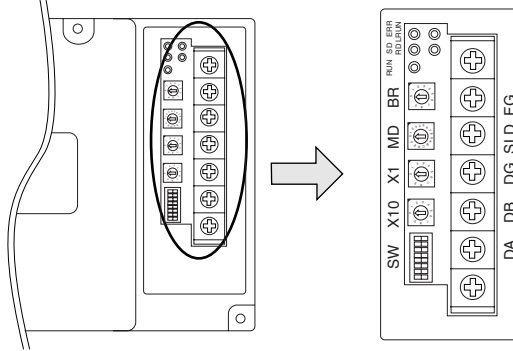
Dimensions when the I/F unit is mounted to the V6
(Unit: mm)



Settings at CC-Link I/F unit side

■ Outline of the CC-Link I/F unit

The CC-Link I/F is as follows;



3
Setting at CC-Link I/F unit side

■ Settings of transmission speed

Set the transmission speed. This should be the same speed as that of the master station.

B R

B RATE	
0	156K
1	625K
2	2.5M
3	5M
4	10M

■ Mode setting

Set the operation status of the CC-Link I/F unit.
Set to "0" for the online status.

M D

■ Station number setting

Set the station number.
The setting of the station number is as follows;
<Example> Station number 1

Station No.

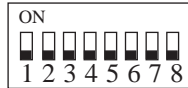
X1

X10

■ Condition setting

Set the operation condition.

Set all the switches to the OFF position except for the SW5. The SW5 is used for setting the number of the occupied station to 1 or 4.



1	OFF	Fixed (Local station)
2	OFF	Unusable (Always OFF)
3	OFF	Unusable (Always OFF)
4	OFF	Fixed (Clear)
5	OFF	OFF : occupies 1 station ON : occupies 4 stations
6	OFF	Unusable (Always OFF)
7	OFF	Unusable (Always OFF)
8	OFF	Fixed (Intelligent mode)

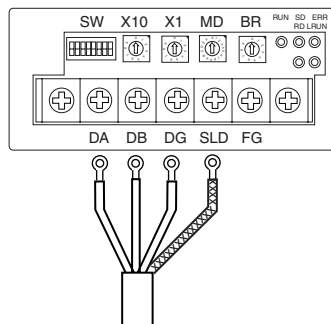
◇ The number of the occupied station

The remote input/output and the remote register are decided in accordance with the setting of the number of the occupied station. Regarding assignment of the remote input/output and the remote register, refer to P4-1.

Station	Remote input/output	Remote register
1 station	RX 2 words	RWw 4 words
	RY 2 words	RWr 4 words
4 stations	RX 8 words	RWw 16 words
	RY 8 words	RWr 16 words

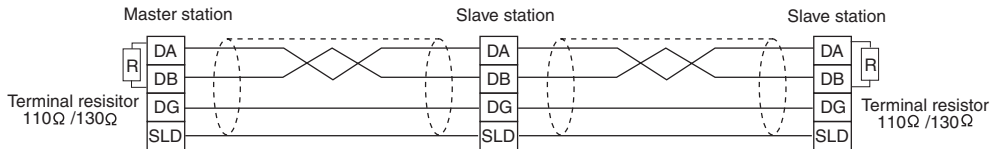
■ Wiring

Wiring is as shown below. Regarding the information on the wire, refer to the next page.



Wiring

For communication cable, use twist shielded cable. The wiring is shown as below. Connect terminal resistors ($110\ \Omega/130\ \Omega$) at both ends.



● Cable

It is advised to use maker-recommended cable. Improper communication may occur by using the cable other than such recommended cable.

● Recommended cables

Makers	Model names
KURAMO ELECTRONICS	FANC-SB (0.5sq X 3)
KURAMO ELECTRONICS	FANC-SBH (0.5sq X 3)

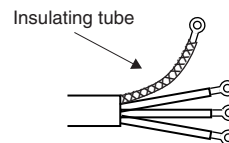
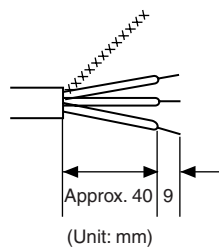
<Selection of FANC-SB and FANC-SBH>

- (1) FANC-SB and FANC-SBH cannot be mixed.
- (2) FANC-SBH can be used at longer distance if transmission speed is 5Mbps or less.
- (3) The terminal resistor is supplied with the CC-Link I/F unit (CU-02). Use $110\ \Omega$, 1/2W (color: yellow) when using FANC-SB. Use $130\ \Omega$, 1/2W (color : red) when using FANC-SBH.

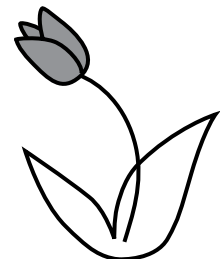
● How to process the cable

Process the cable as follows:

- (1) Remove sheath.
- (2) Crimp connectors.



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4

Connection to the PLC

Available memory

The memory used for switches, lamps or data display is as follows:

	Memory	Bit Write	TYPE *1)	Remarks
D	(Data register)	×	0	
W	(Link register)	×	1	
R	(File register)	×	2	
TN	(Timer/Current value)	×	3	
CN	(Counter/Current value)	×	4	
M	(Internal relay)	×	6	
L	(Keep relay)	×	7	
B	(Link relay)	×	8	
X	(Input relay)	×	9	
Y	(Output relay)	×	10	
TS	(Timer/Contact)	×	11	
TC	(Timer/Coil)	×	12	
CS	(Counter/contact)	×	13	
CC	(Counter/Coil)	×	14	
SD	(Special register)	×	16	QnA only
SM	(Special relay)	×	17	QnA only
SB	(Special link relay)	×	18	QnA only
SW	(Special link register)	×	19	QnA only
RX	(Input relay)	○	56	
RY	(Output relay)	○	57	
RWr	(Input register)	○	58	
RWw	(Output register)	○	59	

*1) TYPE is used for assigning the indirect memory.

* Cyclic transmission is performed when specifying by RX/RX/RWr/RWw, and trangent transmission is performed when specifying by other memories.

* Note

In case of CC-Link communication, bit access from the intelligent device station is supported by "RX" and "RWr." When assigning other memory devices as switch output memory, the output action differ from that of from the link unit.

Momentary -> Reads one word which includes target bit, then sets the target bit to 1. After that, OR the word, then write the result to the PLC again.

Momentary W -> Writing is processed by the unit of word. Only the target bit is 1, and remaining 15 bits are 0.

Settings of the master station

Set the master station as follows:

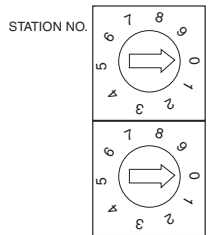
■ Setting of master • local unit

AJ61BT11/A1SJ61BT11/AJ61QBT11/A1SJ61QBT11

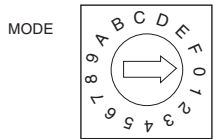
For further information on the master • local unit, please refer to "CC-Link System Master • Local Module User's Manual."

The setting required to connect to V6 is described as below.

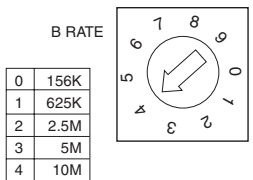
- (1) Station number setting switches
Set to "00" at the master station.



- (2) Mode setting switch
Set the operation status of the master • local unit.
Set to "0" (Host station, online, auto recovery).



- (3) Transmission speed setting switch
Set the transmission speed.



(4) Condition setting switches

Set the operation condition. Set all the SW to OFF status.



1	OFF	Master station
2	OFF	—
3	OFF	—
4	OFF	Clear
5	OFF	—
6	OFF	—
7	OFF	—
8	OFF	Intelligent mode

Parameter setting

(1) Set the following items at the "Parameter registration area" of the buffer memories in the master station.

(1) Number of connected units (Address 1H)

Sets the number of remote and local station units connected to the master station. (Setting range: 1 to 64)

(2) Number of retries (Address 2H)

Sets the number of retries when there is a communication error.
Default 0003K

(3) Number of automatic return units (Address 3H)

Sets the number of remote and local stations that can be recovered with one link scan.

Default 0001K

(4) Operation specification when CPU is down (Address 6H)

Specifies the data-link status when the master station PC CPU has an error. (0: stop 1: continue)

Default 0000K

(5) Reserved station specification (Address 10H to 13H)

Specifies reserved stations.

(6) Invalid station specification (Address 14H to 17H)

Specifies invalid stations.

(7) Station information (Address 20H to 5FH)

Sets the connected remote and local station type.

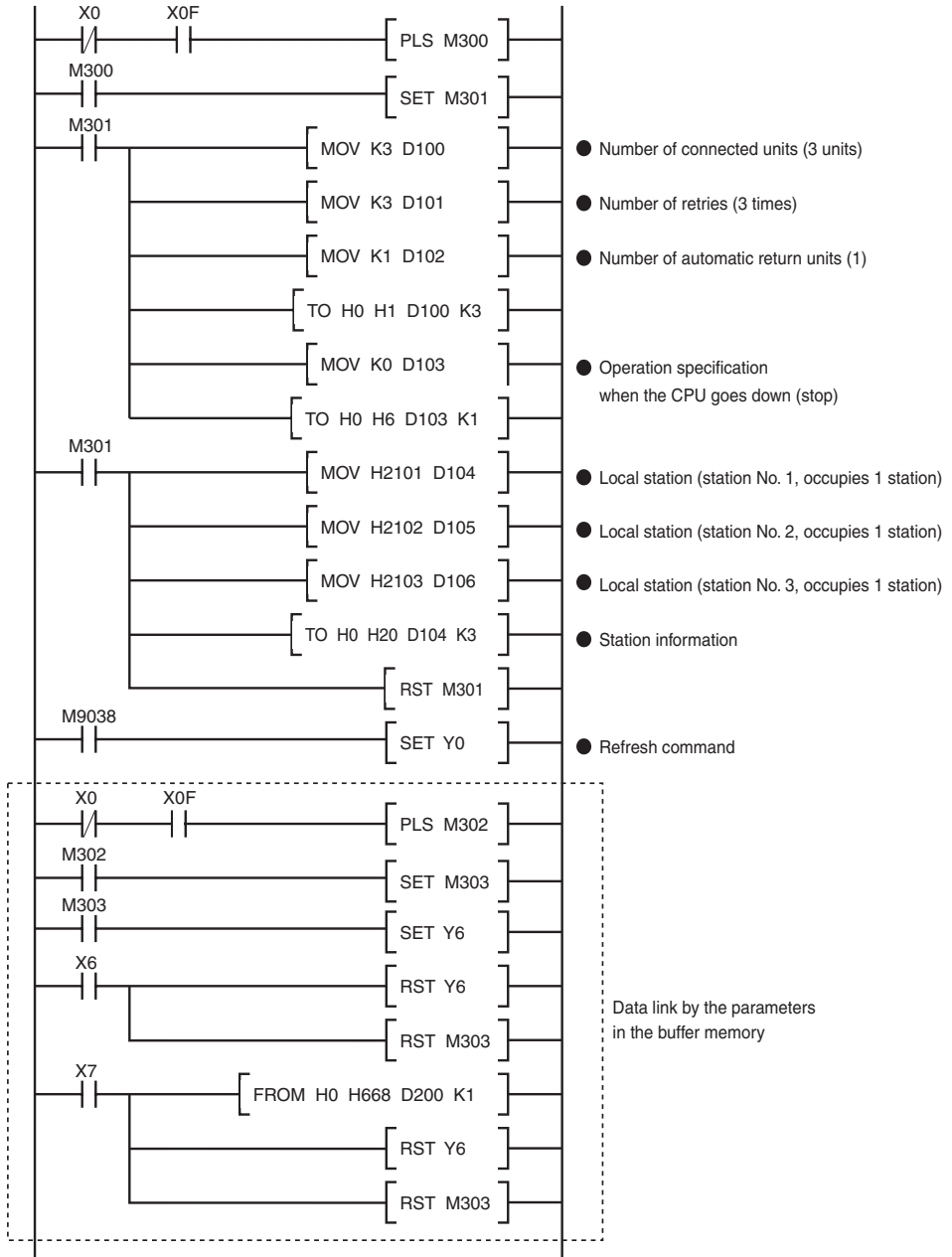
Default 0101H to 0140H

(2)The parameter setting is done by a sequence program.

(Refer to the next page.)

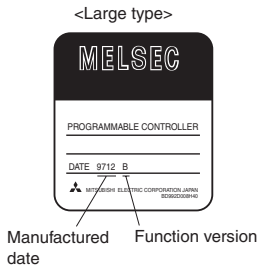
[Sample program]

The sample program in case of installing the master • local unit to the unit No. 0 and connecting 3 units of the V6 (station 1 to station 3).

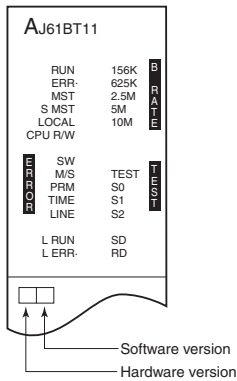


Notes

The function version is indicated in the DATE column of the rated plate.



The software version is indicated by the unit version label on the unit.



■ Master • local unit

The function and the software version of the master • local unit, AJ61BT11/A1SJ61BT11/AJ61QBT11/A1SJ61QBT1, which can be connected to the V6 mounted with the CC-Link I/F unit, are as follows.

◇ Function version

Use version B or later.

◇ Software version

It is recommended to use version V or later.

The version J to U can also be used, however, take note of the following points.

<Notes on usage of the version J to U> * 1)

(1) If the software version of the master • local unit is J to U, there may be an error in 1:n or n:1 communication using an AnNCPU series such as AnSHCPU, AnSCPU, A0J2CPU(H). 1:1 communication and 1:n/n:1 communication with other series can be performed without problem.

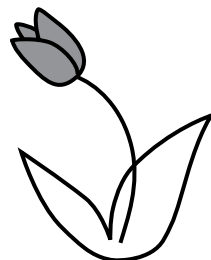
(2) If the software version of the master • local unit is J to P, it is necessary to run the PLC after powering off the V6. Running the PLC before powering on the V6 causes the communication error. (If the PLC is STOP status, the power supply of the V6 and the PLC can be turned on at the same time.)

The function version of the master • local unit	A	B or later
○ : Usable		○
× : Unusable	×	

The function version of the master • local unit	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V or later
○ : Usable															
△ : Refer to *1)	×	×	△	△	△	△	△	△	△	△	△	△	△	△	○
× : Unusable															

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5

Screen data editing

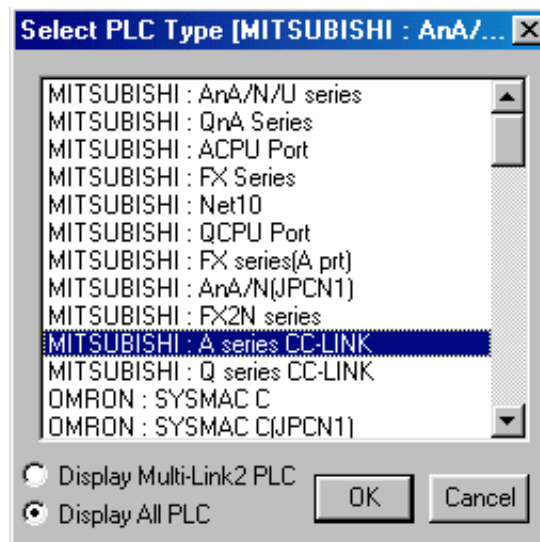
CC-Link is supported by V-SFTE (screen editing software) version 1.2.4.0. (I/F DRV Ver. 1.000) or later.

Settings at V-SFTE side for the communication using the CC-Link I/F unit are described as below. For other setting methods or usage, please refer to the "Reference Manual."

System setting

■ Selecting PLC type

[Item] --> [System Setting] --> [PLC Type] --> select [A series CC-LINK] or [Q series CC-LINK].

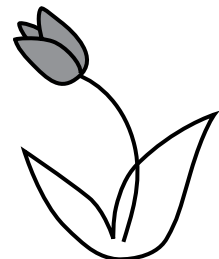


■ Communication parameters

The transmission speed, the station number, and the number of occupied station are set at the CC-Link I/F unit side. (Refer to P3-3.)

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6

Errors

This chapter explains error messages displayed on the V6 and error indication by the LED display.

Output signal status when the V6 has an error

ⓄWhen only the V6 has an error:

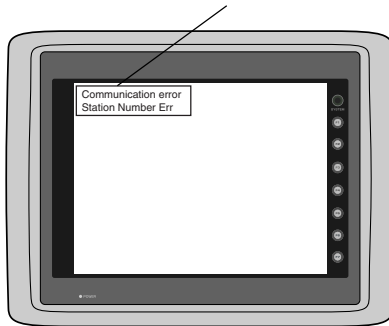
The output signal turns off when the I/O unit (V-I/O, E-I/O) is connected to the V6.

Error messages on the V6 unit

Error messages displayed on the V6 unit during the CC-Link communication is described as below

■ Station Number Error

The message is displayed on the top of the left hand side as shown below during the communication with the PLC.



Contents: The setting of the station number setting switch is not within the available range (1 to 64).

Measures: Change the station number to the number which is available.

■ Word Writing to Op. Relay (Mitsubishi A series only.)

Contents: Writes the data into the special relay (M9000 or later) in word.

(Note: In case of the CC-Link connection, the data can be written into the special relay only in bit)

Measures: Writing in the special relay in word is not supported.

■ I/F Board Err

Contents: There is a fault in the I/F board of the CC-Link I/F unit.

Measures: Consult Hakko's technical support.

Checking errors by the LED display

Check the method of the error by the LED display is explained as below.

No.	● : ON	○ : OFF	◎ : FLASHING		Transmission status (at the unit side)	Corrective action
	L RUN	L ERR.	SD	RD		
1	●	○	●	●	Normal transmission	
2	●	◎	●	●	Normal transmission, but some errors like CRC error occur.	Take measures against noise. Check wiring.
3	●	◎	●	●	Normal transmission, but a fault or a change of either the transmission switch or the station number switch. (Transmission is discontinued with previous settings.)	Re-apply to the power supply. If the L ERR is still flashing, the board may be broken. Please contact to Hakko representative.
4	●	◎	●	○		
5	●	◎	○	●	Response is not enable since the frame to the own station has the CRC error	Check wiring.
6	●	◎	○	○		
7	●	○	●	○		
8	●	○	○	●	The frame to the own station cannot be received.	Check the program at the master station side. Take measures against noise. Check wiring.
9	●	○	○	○		
10	○	◎	●	●	Poring response is performed, but refresh receiving is not completed due to the CRC error etc.	Take measures against noise. Check wiring.
11	○	◎	●	○		
12	○	◎	○	●	The test frame (for the initial transmission) of own station has the CRC error.	Take measures against noise. Check wiring.
13	○	◎	○	○		
14	○	○	●	●		
15	○	○	●	○		
16	○	○	○	●	Waiting for the test data frame. Receiving disable due to no frame to the own station or noise. Receiving is prohibited by S/W.	Check the program at the master station side. Check the station number at V6 side. Take measures against noise.
17	○	○	○	○	The data cannot be received due to the broken wire. Receiving is prohibited by S/W.	Check wiring. Check the mode setting of the CC-LINK I/F unit.
18	○	●	○	○	Inadequate setting of the transmission speed or the station number.	Check the station number of the CC-LINK I/F unit. Check the transmission speed switch.

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