

mitsubishi

AJ65SBT-CLB CC-Link- CC-Link/LT Bridge Module

User's Manual
(Hardware)

AJ65SBT-CLB

Thank you for buying the Mitsubishi programmable controller
MELSEC Series

Prior to use, please read both this manual and detailed manual
thoroughly to fully understand the product.



MODEL	AJ65SBT-CLB-U-HW
MODEL CODE	13JP11
IB(NA)-0800240-C(0804)MEE	

● SAFETY PRECAUTIONS ●

(Be sure to read these instructions before using the product.)

Before using this product, read this manual and the relevant manuals introduced in this manual carefully and handle the product correctly with full attention to safety.

Note that these precautions apply only to this product. Refer to the user's manual of the CPU module for the PLC system safety precautions.

In this manual, the safety instructions are ranked as "DANGER" and "CAUTION".




DANGER

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 minor or moderate injury or property damage.

Note that the failure to observe  CAUTION level instructions may also lead to serious results according to the circumstances.

Be sure to observe the precautions of both levels to ensure personal safety.

Please keep this manual in accessible place and be sure to forward it to the end user.

[DESIGN PRECAUTIONS]

DANGER

- When there are communication problems with the data link, the data for the master module will be held.
Configure an interlocking circuit in a sequence program so that the safety of the overall system is always maintained.

CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other.
They should be installed 100mm (3.9inch) or more from each other.
Not doing so could result in noise that would cause erroneous operation.
- Do not write data to the "reserved areas" of the remote I/O and remote devices.
Doing so can pose the risk of malfunctioning the product.

[INSTALLATION PRECAUTIONS]

CAUTION

- Use each product in an environment as specified in the “general specification” in the detailed manual.
Using the PLC outside the range of the general specifications may result in electric shock, fire or malfunction, or may damage or degrade the product.
- Securely fix the product to a DIN rail or securely fix it with the Module mounting screw.
Not doing so can cause a drop or malfunction.
- Do not touch the conducted area or electric parts of the product.
Doing so may cause product malfunctioning or breakdowns.

[WIRING PRECAUTIONS]

CAUTION

- For the CC-Link/LT, use the cables specified by the CC-Link Partner Association. The performance of the CC-Link/LT cannot be assured if any other cables than the specified are used.
Also, observe the network wiring specifications given in Chapter 2. Normal data communication is not guaranteed if the wiring is not conducted according to the specifications.
- Be sure to shut off all phases of the external power supply used by the system before installation or wiring.
Not doing so can cause the product to be damaged or malfunction.
- Always ground the FG terminal to the protective ground conductor.
Not doing so can cause a malfunction.
- Wire the product correctly after confirming the rated voltage and pin layout of the product.
Not doing so can cause a fire or failure.
- Ensure that no foreign matter such as chips and wire-offcuts enter the product.
Foreign matter can cause a fire, failure or malfunction.

[WIRING PRECAUTIONS]

CAUTION

- Be sure to fix the wires or cables by ducts or clamps when connecting them to the module. Failure to do so may cause damage of the module or the cables due to accidental pull or unintentional shifting of the cables, or malfunctions due to poor contact of the cable.
- Do not install the control lines together with the communication cables, or bring them close to each other. Failure to do so may cause malfunctions due to noise.
- When disconnecting the communication and power supply cables from the module, do not hold and pull the cable part.
Disconnect the cables after loosening the screws in the portions connected to the module. Pulling the cables connected to the module can damage the module and cables or can cause a malfunction due to a cable connection fault.

[STARTING AND MAINTENANCE PRECAUTIONS]

CAUTION

- Do not touch the pin while the power is on. Doing so may cause malfunction.
- Be sure to shut off all phases of the external power supply used by the system before cleaning.
Not doing so can cause the product to fail or malfunction.
- Never disassemble or modify the product.
This may cause breakdowns, malfunctioning, injury and/or fire.
- Do not drop the product or give it hard impact since its case is made of resin.
Doing so can damage the product.
- Be sure to shut off all phases of the external power supply used by the system before mounting or dismounting the product to or from the panel.
Not doing so can cause the product to fail or malfunction.
- Before handling the module, always touch grounded metal, etc. to discharge static electricity from the human body.
Failure to do so can cause the module to fail or malfunction.

[DISPOSAL PRECAUTIONS]

CAUTION

- When disposing of this product, treat it as industrial waste.

Revisions

* The manual number is noted at the lower left of the back cover.

Print Date	*Manual Number	Revision
Oct.,2002	IB(NA)-0800240-A	First printing
Nov.,2004	IB(NA)-0800240-B	<u>Correction</u> SAFETY PRECAUTIONS, Section 2.1, 5.1.4, 5.1.5
Apr.,2008	IB(NA)-0800240-C	<u>Correction</u> Manuals, Compliance with the EMC Directive and the Low Voltage Directive, Section 2.1, 2.2.1, 5.1

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Manuals

The following table list the manuals related to this product.
You can order it os necessary.

Detailed Manual

Manual name	Manual No. (Model code)
AJ65SBT-CLB CC-Link - CC-Link/LT Bridge Module User's Manual	SH-080362E (13R63)

Relerant Manual

Manual name	Manual No. (Model code)
CC-Link System Master/Local Module type AJ61BT11/A1SJ61BT11 User's Manual	IB-66721 (13J872)
CC-Link System Master/Local Module type AJ61QBT11/A1SJ61QBT11 User's Manual	IB-66722 (13J873)
CC-Link System Master/Local Module type QJ61BT11N User's Manual	SH-080394E (13JR64)
Type A80BDE-J61BT11 CC-Link System Master/Local Interface Board User's Manual (For SW4DNF-CCLINK-B)	IB-0800175 (13JR28)
Type Q80BD-J61BT11N CC-Link System Master/Local Interface Board User's Manual (For SW1DNC-CCBD2-B)	SH-080527ENG (13JR77)

Compliance with the EMC Directive and the Low Voltage Directive

(1) For programmable controller system

To configure a system meeting the requirements of the EMC and Low Voltage Directives when incorporating the Mitsubishi programmable controller (EMC and Low Voltage Directives compliant) into other machinery or equipment, refer to the "EMC AND LOW VOLTAGE DIRECTIVES" chapter of the User's Manual for the CPU module used. The CE mark, indicating compliance with the EMC and Low Voltage Directives, is printed on the rating plate of the programmable controller.

(2) For the product

For the compliance of this product with the EMC and Low Voltage Directives, refer to the "CC-Link module" section in the "EMC AND LOW VOLTAGE DIRECTIVES" chapter of the User's Manual for the CPU module used.

1. Overview

This manual describes the specifications, part names, settings, etc. of the AJ65SBT-CLB CC-Link - CC-Link/LT bridge module (hereafter abbreviated to the AJ65SBT-CLB) used as a remote device station in a CC-Link system.

After unpacking, confirm that the following product is contained.

Item name	Number of items
AJ65SBT-CLB CC-Link - CC-Link/LT bridge module	1

2. Specification

2.1 Performance specifications

The following table indicates the performance specifications of the AJ65SBT-CLB.

Refer to the detailed manual for the general specifications.

Item		Specifications			
CC-Link side	Station type	Remote device station			
	CC-Link Version	Ver.1.10			
	Number of occupied stations	2 stations	64 points each for RX and RY (16 points are used in the system) 8 points each for RWr and RWw		
		4 stations	128 points each for RX and RY (16 points are used in the system) 16 points each for RWr and RWw		
		8 stations (4 occupied stations × 2 modules)	256 points each for RX and RY (32 points are used in the system) 32 points each for RWr and RWw		
	AJ65SBT-CLB connection position	No restrictions			
External connection system	One-touch connector for communication [transmission circuit] (5-pin, insulation displacement type connector plug is sold separately) <Option> Online connector for communication: A6CON-LJ5P				
CC-Link/LT side		4-point mode	8-point mode	16-point mode	
	Control specifications	Maximum number of link points Number in parentheses assumes use of the same I/O addresses	224 points (448 points)		
		Number of link points per station Number in parentheses assumes use of the same I/O addresses	4 points (8 points)	8 points (16 points)	16 points (32 points)
	Communication specifications	Transmission speed	2.5Mbps/625kbps/156kbps		
		Communication method	Broadcast polling method		
Transmission path format		T-branch system			
Error control system		CRC			
Number of connected modules		56 modules			
Remote station number		1 to 56			
AJ65SBT-CLB connection position		Connected at the end of the main line			
RAS functions		Network diagnosis, internal loopback diagnosis, slave station separation, automatic return to system			
Connection cable *1	Dedicated flat cable (0.75mm ² × 4) *4, VCTF cable *3, High flexible cable *4				

Item		Specifications	
Common	Module mounting screw	M4 × 0.7mm × 16mm or more screw Tightening torque range 78 to 108N · cm DIN rail can also be used for mounting.	
	Module mounting direction	Can be mounted in any of six orientations. (No restrictions on mounting directions)	
	24VDC power supply *2	Voltage	24VDC externally supplied (20.4V DC to 26.4V DC, ripples within 5%)
		Current consumption	0.075A (24V DC)
		Start-time current	0.165A (24V DC)
	Level of protection	IP2X	
	Weight	0.09kg	

*1 Performance of the CC-Link/LT cannot be guaranteed for use of cables other than the dedicated flat cables, VCTF cables and high flexible cables.

*2 Supplied by a CC-Link/LT dedicated power supply or power supply adaptor.

*3 For VCTF cable specifications, see Table 2.1.

*4 Use the dedicated flat cables and high flexible cables accredited by the CC-Link Partner Association.

CC-Link Partner Association's website: <http://www.cc-link.org/>

Table 2.1 VCTF cable specifications (Extract from JIS C 3306)

Type	No. of cores	Conductor			Insulator thickness	Sheath thickness	Conductor resistance (20 °C)
		Nominal cross-sectional area	Composition No. of wires/wire diameter	Outside diameter			
Vinyl cabtyre, Round cord	4	0.75mm ²	30/0.18mm	1.1mm	0.6mm	1.0mm	25.1Ω/km

2.2 Network wiring specifications

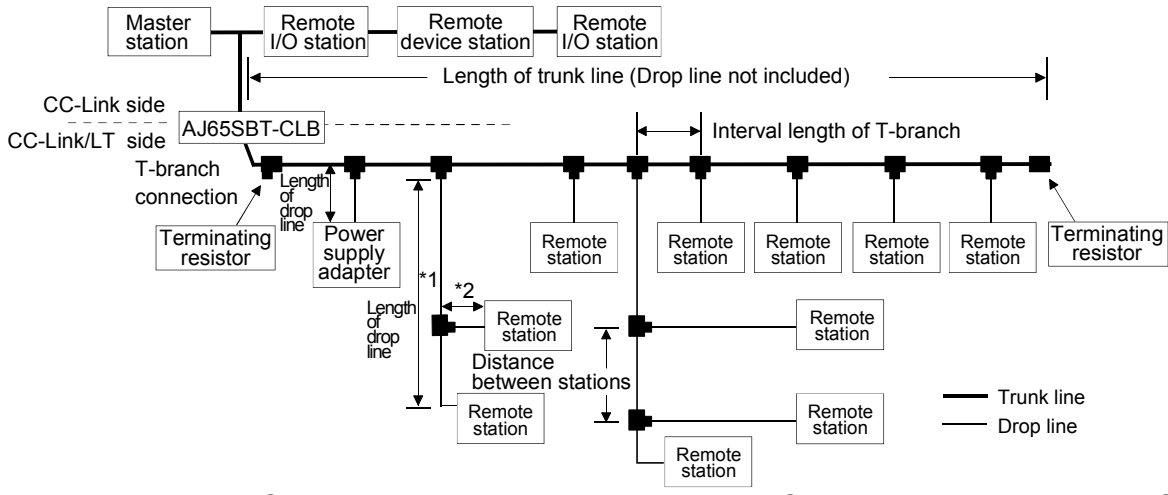
2.2.1 CC-Link network wiring specifications

For the network wiring specifications of CC-Link, refer to the user's manual of the used master module.

2.2.2 CC-Link/LT network wiring specifications

This section describes the system configuration of the CC-Link/LT.

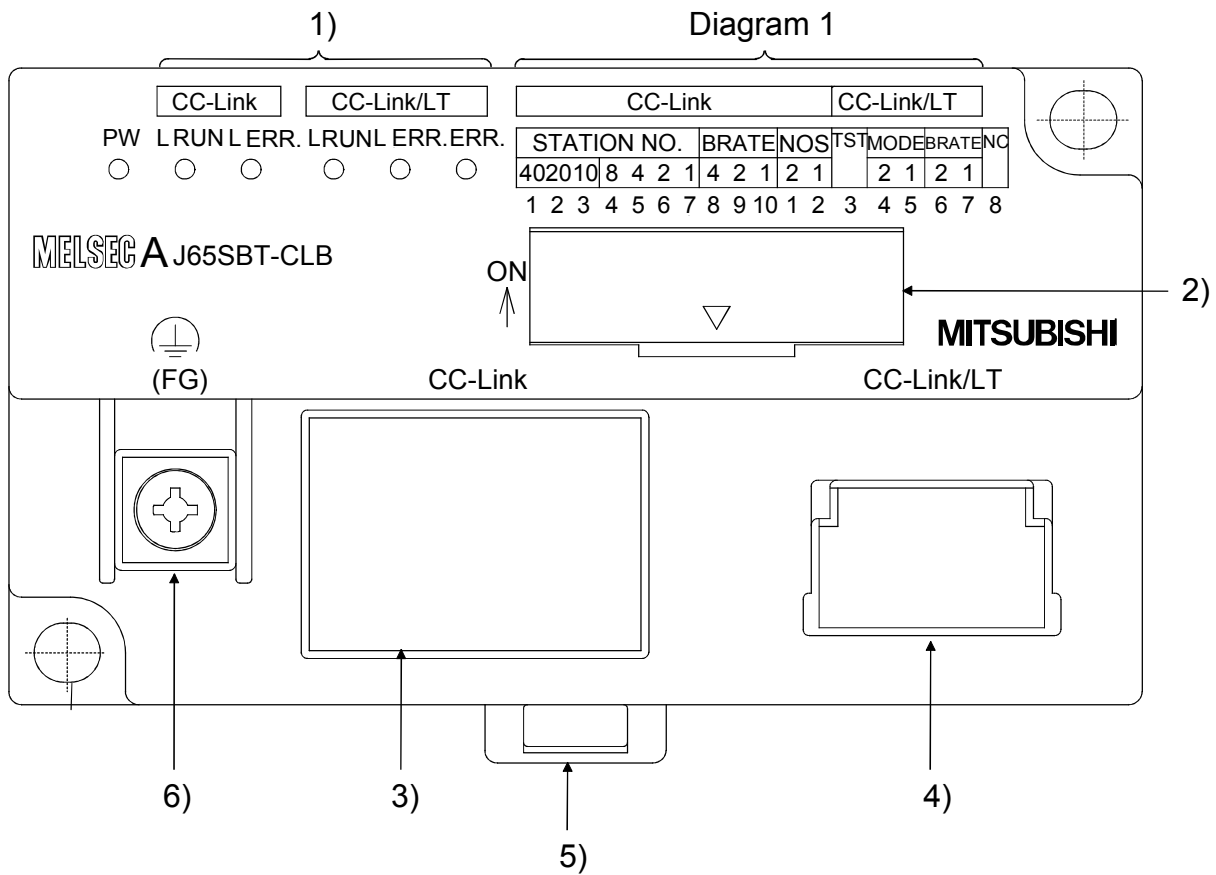
Item	Specifications			Remarks
Transmission speed	2.5 Mbps	625 kbps	156 kbps	—
Distance between stations	Not limited			—
Max. no. of connectable modules per drop line	8 modules			—
Length of trunk line	35 m	100 m	500 m	Cable length between terminating resistors. Length of drop lines not included
T-branch interval	Not limited			—
Max. length of drop line	4 m	16 m	60 m	Max. cable length per branch line
Overall length of drop lines	15 m	50 m	200 m	Total length of all drop lines



*1 The length of drop line includes the length of 2. (The max. length of drop line and overall length of drop lines include the length of 2.)

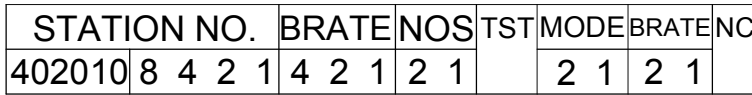
3. Part names and setting

This chapter describes part names.

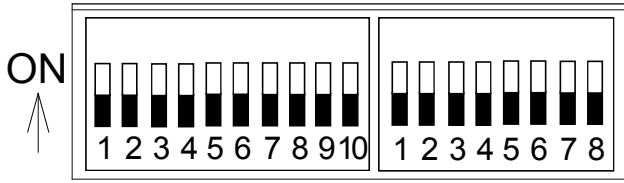


Number	Name	Description		
1)	LED display	Shows the module status by turning the LED on/off.		
		LED name	Description	
			CC-Link side	CC-Link/LT side
		PW	On: Module normal Off: Module fault or not supplied with power	
		L RUN	On: Data link communication normal Off: Data link communication off (time-out)	<During normal operation> On: Data link being executed Off: Data link stopped <In self-loopback test mode> On: Self-loopback test completed. Off: Self-loopback test failed
L ERR.	On: CC-Link side switch setting fault Data link communication fault Flicker: CC-Link side switch setting is changed during operation. Off: No faults	<During normal operation> On: Data link error station (detected) Station outside control range detected Flicker: Data link error stations (all stations) Off: No faults <In self-loopback test mode> On: Self-loopback test failed Off: Self-loopback test completed		
ERR.	—	Setting error detection On: CC-Link/LT side switch setting fault Flicker: CC-Link/LT side switch setting is changed during operation. Off: No faults		

Diagram 1



1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 ← Case silkscreen No.*



*: The case silkscreen No. and switch silkscreen No. correspond to each other.

← Switch silkscreen No.*

Number	Name	Description																																																																															
	Station number setting switches (CC-Link side) STATION NO.	<p>Use the switches in STATION NO. "10", "20" and "40" to set the tens of the station number. Use the switches in STATION NO. "1", "2", "4" and "8" to set the units of the station number.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Station Number</th> <th colspan="3">Tens</th> <th colspan="4">Units</th> </tr> <tr> <th>40</th> <th>20</th> <th>10</th> <th>8</th> <th>4</th> <th>2</th> <th>1</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>2</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>OFF</td> </tr> <tr> <td>3</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>ON</td> </tr> <tr> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>10</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>11</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> <td>⋮</td> </tr> <tr> <td>63</td> <td>ON</td> <td>ON</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>ON</td> </tr> </tbody> </table> <p>The switches are all factory-set to OFF. The station number can be set within the range 1 to 63 when two stations are occupied, 1 to 61 when four stations are occupied, or 1 to 57 when eight stations (four occupied stations × two modules) are occupied. Setting a value other than the above will result in a setting error. (The "L ERR." LED on the CC-Link side is lit.)</p>	Station Number	Tens			Units				40	20	10	8	4	2	1	1	OFF	OFF	OFF	OFF	OFF	OFF	ON	2	OFF	OFF	OFF	OFF	OFF	ON	OFF	3	OFF	OFF	OFF	OFF	OFF	ON	ON	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	10	OFF	OFF	ON	OFF	OFF	OFF	OFF	11	OFF	OFF	ON	OFF	OFF	OFF	ON	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	63	ON	ON	OFF	OFF	OFF	ON	ON
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3	OFF	OFF	OFF	OFF	OFF	ON	ON																																																																										
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11	OFF	OFF	ON	OFF	OFF	OFF	ON																																																																										
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2)	Transmission speed setting switches (CC-Link side) B RATE	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Setting Value</th> <th colspan="3">Setting Switches</th> <th rowspan="2">Transmission Speed</th> </tr> <tr> <th>4</th> <th>2</th> <th>1</th> </tr> </thead> <tbody> <tr> <td>0 (factory-set)</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>156 kbps</td> </tr> <tr> <td>1</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>625 kbps</td> </tr> <tr> <td>2</td> <td>OFF</td> <td>ON</td> <td>OFF</td> <td>2.5 Mbps</td> </tr> <tr> <td>3</td> <td>OFF</td> <td>ON</td> <td>ON</td> <td>5.0 Mbps</td> </tr> <tr> <td>4</td> <td>ON</td> <td>OFF</td> <td>OFF</td> <td>10 Mbps</td> </tr> </tbody> </table> <p>Setting a value other than the above will result in a setting error. (The "L ERR." LED on the CC-Link side is lit.)</p>	Setting Value	Setting Switches			Transmission Speed	4	2	1	0 (factory-set)	OFF	OFF	OFF	156 kbps	1	OFF	OFF	ON	625 kbps	2	OFF	ON	OFF	2.5 Mbps	3	OFF	ON	ON	5.0 Mbps	4	ON	OFF	OFF	10 Mbps																																														
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Number	Name and appearance	Description																		
2)	Self-loopback test setting switch (CC-Link/LT side) TST	OFF: Normal operation mode (factory-set) ON: Self-loopback test mode																		
	Point mode setting switches (CC-Link/LT side) MODE	<table border="1"> <thead> <tr> <th rowspan="2">Setting Value</th> <th colspan="2">Setting Switches</th> <th rowspan="2">Points</th> </tr> <tr> <th>2</th> <th>1</th> </tr> </thead> <tbody> <tr> <td>0 (factory-set)</td> <td>OFF</td> <td>OFF</td> <td>8 points</td> </tr> <tr> <td>1</td> <td>OFF</td> <td>ON</td> <td>4 points</td> </tr> <tr> <td>2</td> <td>ON</td> <td>OFF</td> <td>16 points</td> </tr> </tbody> </table> <p>Setting a value other than the above will result in a setting error. (The "L ERR." LED on the CC-Link/LT side is lit.)</p>	Setting Value	Setting Switches		Points	2	1	0 (factory-set)	OFF	OFF	8 points	1	OFF	ON	4 points	2	ON	OFF	16 points
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0 (factory-set)	OFF	OFF	156 kbps																	
1	OFF	ON	625 kbps																	
2	ON	OFF	2.5 Mbps																	
3)	One-touch connector for communication	A one-touch connector for communication line connection. Connect two optional one-touch connector plugs for communication to the connectors during wiring top and bottom.																		
4)	CC-Link/LT Interface connector	Connector for CC-Link/LT communication line connection.																		
5)	DIN rail hook	Used to mount the module to the DIN rail.																		
6)	FG terminal	Ground terminal																		

4. Mounting and Installation

4.1 Handling instruction

This section explains the handling instruction of the module.

Be careful not to drop it or expose the module case to strong impact, since it is made of resin.

4.2 Installation environment

Use the module in the environment that meets the general specifications described in the tailed manual.

Failure to observe this instruction can cause an electric shock, fire, malfunction, damage to the product, or deterioration.

Tighten the module mounting screws and terminal block screw within the following ranges.

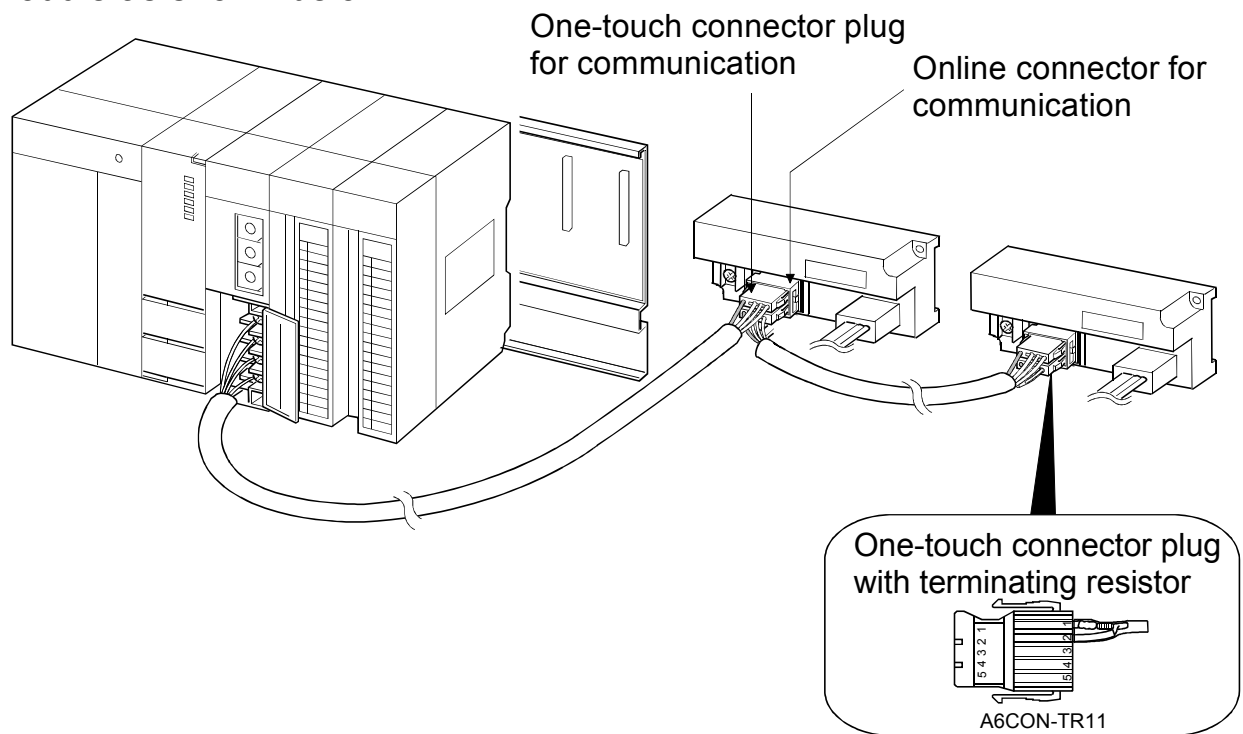
Screw Location	Tightening Torque Range
Module mounting screw (M4 screw)	78 to 108 N · cm
FG terminal block terminal screw (M3 screw)	42 to 58 N · cm

5. Wiring

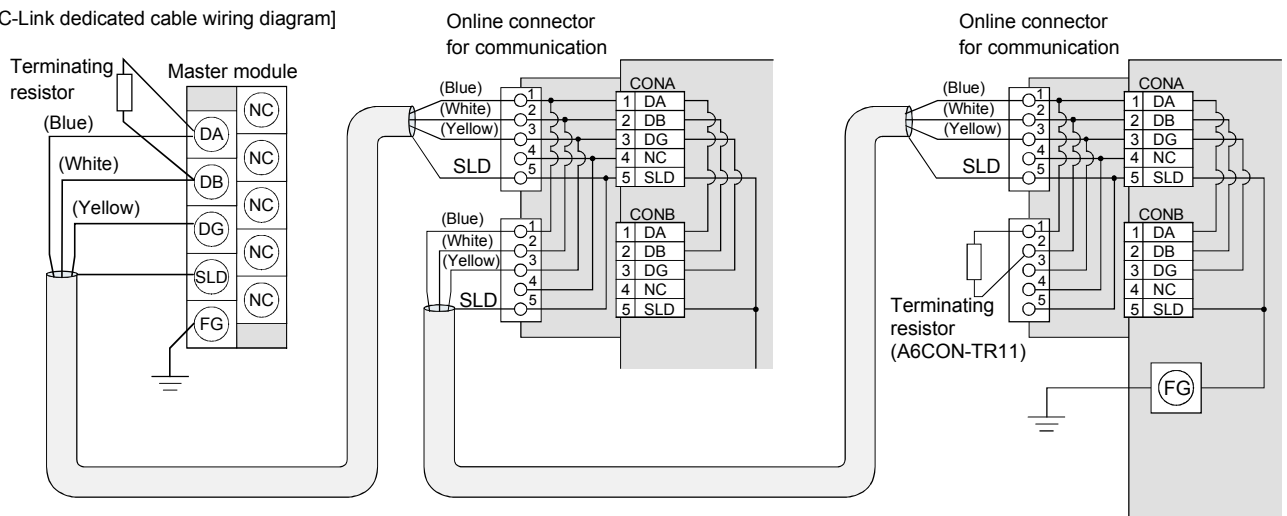
5.1 Wiring of data link cables

5.1.1 Connection of the CC-Link dedicated cables

Connect the CC-Link dedicated cable between the AJ65SBT-CLB and master module as shown below.



[CC-Link dedicated cable wiring diagram]



Ver. 1.10 Compatible CC-Link dedicated cable (FANC-110SBH,CS-110,FA-CBL200PSBH)

Point

- For this module, use the Ver. 1.10-compatible CC-Link dedicated cable (FANC-110SBH,CS-110,FA-CBL200PSBH). You cannot use the Ver. 1.10-compatible CC-Link dedicated cables other than the above types, CC-Link dedicated cables or CC-Link dedicated, high-performance cables.
- The shield wire of the CC-Link dedicated cable should be connected to “SLD” in each module, and both ends should be grounded through “FG”. “SLD” and “FG” are connected inside the module.

5.1.2 How to wire the CC-Link one-touch connector plug

For details of how to wire the one-touch connector plug, refer to the AJ65SBT-CLB CC-Link - CC-Link/LT Bridge Module User's Manual.

5.1.3 Connection of modules by CC-Link/LT connection cables

For details of how to connect the modules by the CC-Link/LT connection cables, refer to the AJ65SBT-CLB CC-Link - CC-Link/LT Bridge Module User's Manual.

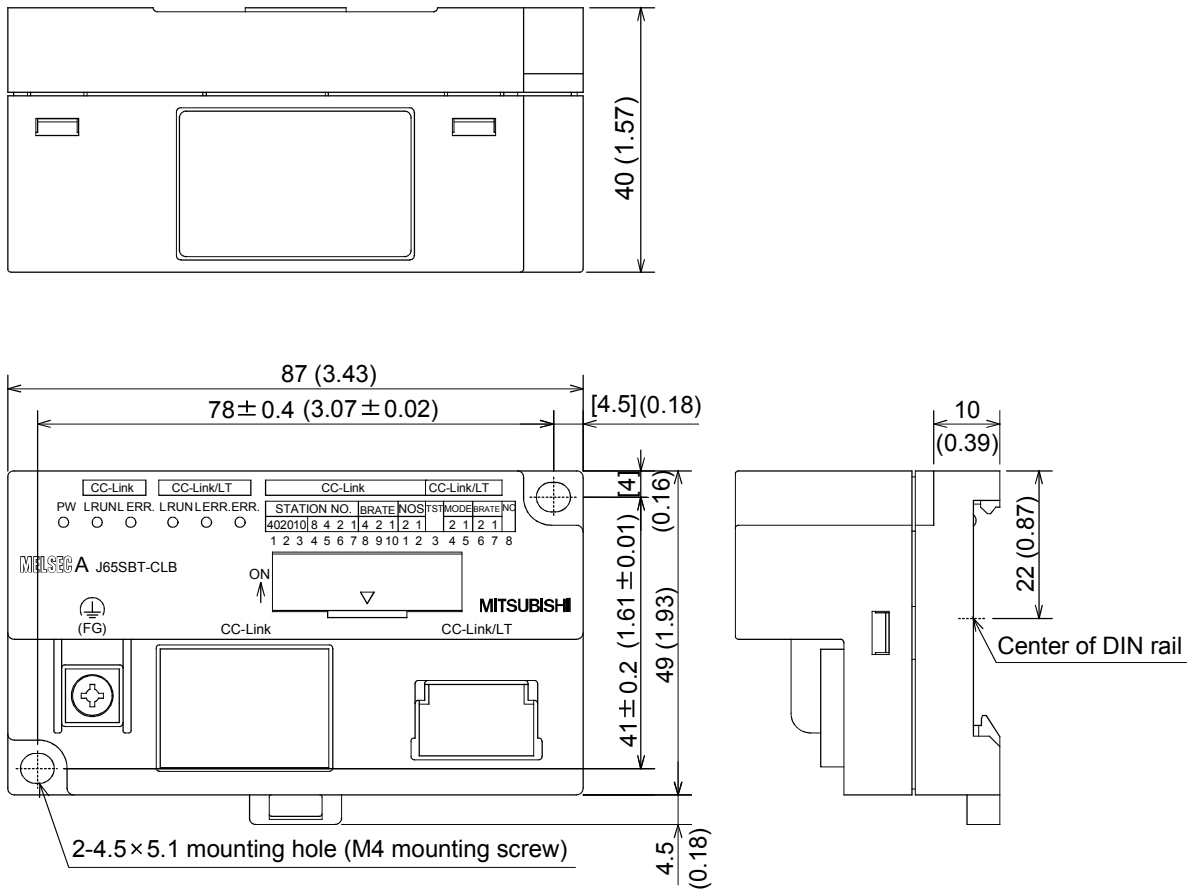
- (1) The station number is not relevant to the order of connecting the connection cables.
- (2) Be sure to place the AJ65SBT-CLB at one end of the main line. Also, connect the AJ65SBT-CLB side terminating resistor within 20cm of the AJ65SBT-CLB.
- (3) Always connect terminating resistors at both ends of the CC-Link/LT trunk line.
- (4) For required number of the connectors, refer to the AJ65SBT-CLB CC-Link - CC-Link/LT Bridge Module User's Manual.

5.1.4 How to mount the CC-Link/LT connection cable connector

For details of how to mount the CC-Link/LT connection cable connector, refer to the AJ65SBT-CLB CC-Link - CC-Link/LT Bridge Module User's Manual.

6. External Dimensions

[AJ65SBT-CLB]



Unit:mm(inch)

Warranty

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

For safe use

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- This product has been manufactured under strict quality control. However, when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

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