YASKAWA

YASKAWA 1000-Series Option

MECHATROLINK-II

Installation Manual

Type: SI-T3

To properly use the product, read this manual thoroughly and retain for easy reference, inspection, and maintenance. Ensure the end user receives this manual.

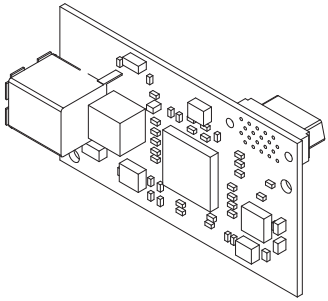
安川1000シリーズオプション

MECHATROLINK-II 通信

取扱説明書

形　式 SI-T3

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MANUAL NO. TOBP C730600 50C

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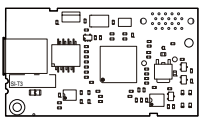
1 Preface and Safety

Yaskawa manufactures products used as components in a wide variety of industrial systems and equipment. The selection and application of Yaskawa products remain the responsibility of the equipment manufacturer or end user. Yaskawa accepts no responsibility for the way its products are incorporated into the final system design. Under no circumstances should any Yaskawa product be incorporated into any product or design as the exclusive or sole safety control. Without exception, all controls should be designed to detect faults dynamically and fail safely under all circumstances. All systems or equipment designed to incorporate a product manufactured by Yaskawa must be supplied to the end user with appropriate warnings and instructions as to the safe use and operation of that part. Any warnings provided by Yaskawa must be promptly provided to the end user. Yaskawa offers an express warranty only as to the quality of its products in conforming to standards and specifications published in the Yaskawa manual. NO OTHER WARRANTY, EXPRESS OR IMPLIED, IS OFFERED. Yaskawa assumes no liability for any personal injury, property damage, losses, or claims arising from misapplication of its products.

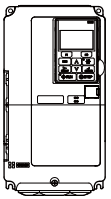
◆ Applicable Documentation

The following manuals are available for SI-T3 MECHATROLINK-II Option:

Option

	**YASKAWA 1000 Series Option MECHATROLINK-II Installation Manual (this book) Manual No.: TOBP C730600 50**	Read this manual first. The installation manual is packaged with the option and contains information required to install the option and set up related unit parameters.
	YASKAWA AC Drive-Option Card MECHATROLINK-II Technical Manual Manual No.: SIEP C730600 50	The technical manual contains detailed information about the option. Access the following sites to obtain the technical manual: U.S.: http://www.yaskawa.com Europe: http://www.yaskawa.eu.com Japan: http://www.e-mechatronics.com For questions, contact your local Yaskawa sales office or the nearest Yaskawa representative.
	YASKAWA 1000-Series Option MECHATROLINK-II Technical Manual Manual No.: SIEP C730600 61	

Unit

<table>
<tr>
<td rowspan="4"></td>
<td>YASKAWA AC Drive 1000-Series Quick Start Guide</td>
<td rowspan="4">The unit manuals cover basic installation, wiring, operation procedures, functions, troubleshooting, and maintenance information.
The manuals also include important information about parameter settings and unit tuning.
Access these sites to obtain Yaskawa instruction manuals:
U.S.: http://www.yaskawa.com
Europe: http://www.yaskawa.eu.com
Japan: http://www.e-mechatronics.com
Other areas: contact a Yaskawa representative.</td>
</tr>
<tr>
<td>YASKAWA AC Drive 1000-Series Technical Manual</td>
</tr>
<tr>
<td>YASKAWA D1000 Series Power Regenerative Converter Instruction Manual</td>
</tr>
<tr>
<td>YASKAWA R1000 Series Power Regenerative Unit Instruction Manual</td>
</tr>
</table>

◆ Terms

Note:	Indicates supplementary information that Yaskawa highly recommends be followed, even though equipment may not be at risk.
Unit:	• YASKAWA AC Drive 1000-Series • YASKAWA D1000 Series Power Regenerative Converter • YASKAWA R1000 Series Power Regenerative Unit
Drive:	YASKAWA AC Drive 1000-Series
Energy-Saving Unit:	• YASKAWA D1000 Series Power Regenerative Converter • YASKAWA R1000 Series Power Regenerative Unit
Option:	YASKAWA 1000-Series Option SI-T3 MECHATROLINK-II

◆ Registered Trademarks

- MECHATROLINK-I/MECHATROLINK-II is a registered trademark of the MECHATROLINK Members Association (MMA).
- Other company names and product names listed in this manual are registered trademarks of those companies.

◆ Supplemental Safety Information

Read and understand this manual before installing, operating, or servicing this option. The option must be installed according to this manual and local codes.

The following conventions are used to indicate safety messages in this manual. Failure to heed these messages could result in serious or possibly even fatal injury or damage to the products or to related equipment and systems.

⚠ DANGER

Indicates a hazardous situation, which, if not avoided, will result in death or serious injury.

⚠ WARNING

Indicates a hazardous situation, which, if not avoided, could result in death or serious injury.

⚠ CAUTION

Indicates a hazardous situation, which, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates an equipment damage message.

■ General Safety

General Precautions

- The diagrams in this section may include units without covers or safety shields to illustrate details. Be sure to reinstall covers or shields before operating any devices. The option board should be used according to the instructions described in this manual.
- Any illustrations, photographs, or examples used in this manual are provided as examples only and may not apply to all products to which this manual is applicable.
- The products and specifications described in this manual or the content and presentation of the manual may be changed without notice to improve the product and/or the manual.
- When ordering a new copy of the manual, contact your Yaskawa representative or the nearest Yaskawa sales office and provide the manual number shown on the front cover.

⚠ DANGER

Heed the safety messages in this manual.

Failure to comply will result in death or serious injury.

The operating company is responsible for any injuries or equipment damage resulting from failure to heed the warnings in this manual.

NOTICE

Do not modify the unit or option circuitry.

Failure to comply could result in damage to the unit or option and will void warranty.

YASKAWA is not responsible for any modification of the product made by the user. This product must not be modified.

Do not expose the unit to halogen group disinfectants.

Failure to comply may cause damage to the electrical components in the option.

Do not pack the unit in wooden materials that have been fumigated or sterilized.

Do not sterilize the entire package after the product is packed.

2 Product Overview

◆ About This Product

MECHATROLINK-II Option (Model: SI-T3) is designed for connecting a unit to a field network using the MECHATROLINK protocol.

When installing the MECHATROLINK-II Option to a unit, it is possible to do the following from a MECHATROLINK master device:

- operate the unit
- monitor the operation status of the unit
- change parameter settings

◆ Applicable Models

The option can be used with the unit models in ***Table 1***.

Table 1 Applicable Models

Unit Series	Unit Model Number	MECHATROLINK Slave Name	SI-T3 Software Version
A1000	CIMR-A□□A□□□□	MECHATROLINK Drive slave	≥ 6100
D1000	CIMR-D□□A□□□□	Intelligent I/O slave	≥ 6105
R1000	CIMR-R□□A□□□□		

Note: **1.** Make sure that SI-T3's software version is 6105 and later when installing it to D1000 or R1000.
2. MECHATROLINK-II commands deffer between Intelligent I/O slave devices and MECHATROLINK Drive slave devices. For details, refer to unit instruction manual.

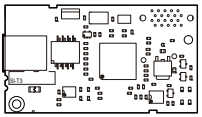
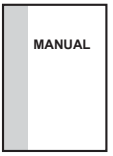
3 Receiving

Please perform the following tasks after receiving the MECHATROLINK-II Option:

- Inspect the MECHATROLINK-II Option for damage.
  If the MECHATROLINK-II Option appears damaged upon receipt, contact the shipper immediately.
- Verify receipt of the correct model by checking the information on the PCB (see ***Figure 1***).
- If you have received the wrong model or the MECHATROLINK-II Option does not function properly, contact your supplier.

◆ Contents and Packaging

Table 2 Contents of Package

Description:	Option	Ground Cable	Screws (M3)	LED Label	Installation Manual
–					
Quantity:	1	1	3	1	1

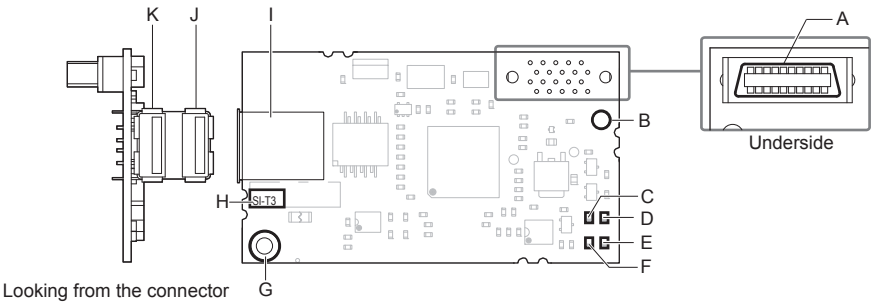
◆ Tools Required for Installation

- A Phillips screwdriver (M3 metric/#2 U.S. standard size <1>) is required to install the option and remove unit front covers.
- Diagonal cutting pliers. (required for some unit models)
- A small file or medium grit sandpaper. (required for some unit models)

<1> Select a screwdriver appropriate for the unit capacity.

4 MECHATROLINK-II Option Components

◆ MECHATROLINK-II Option



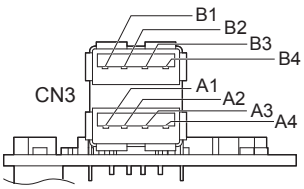
A – Connector (CN101)
B – Installation hole
C – LED (ERR)
D – LED (RUN)
E – LED (TX)
F – LED (RX)
G – Ground terminal (installation hole)
H – Model number
I – Communication cable connector (CN3)
J – Connector B
K – Connector A

Figure 1 Option

Note: For details on the LEDs, Refer to *MECHATROLINK-II Option LED Display on page 12*.

◆ Communication Connector

Table 3 Communication Connector

MECHATROLINK-II Connector	Connector	Pin No.	Signal Name	I/O	Function
	A	A1	(NC)	–	Not used.
		A2	SRD–	I/O	Send/receive data (–)
		A3	SRD+	I/O	Send/receive data (+)
		A4	(NC)	–	Not used.
		Shell	SLD	–	Shield
	B	B1	(NC)	–	Not used.
		B2	SRD–	I/O	Send/receive data (–)
		B3	SRD+	I/O	Send/receive data (+)
		B4	(NC)	–	Not used.
		Shell	SLD	–	Shield

Note: Both connectors A and B are available for the same functions.

◆ MECHATROLINK-II Option LED Display

The MECHATROLINK-II Option has four LEDs that indicate the option or communication status.

■ Checking LED Operation

Table 4 LED Display

LED	Color	Display	Status	Remarks
RUN	Green	ON	Power supply on	SI-T3 has been successfully powered up
		OFF	No power	• The unit has no power • SI-T3 is not properly connected to the unit, or SI-T3 has no power • An internal, self-diagnostic error occurred in the SI-T3
ERR	Red	ON	Connection error	• SI-T3 is not properly connected to the unit • Communication error
		Flashing	SI-T3 error	Error found during SI-T3's self-diagnostic check
		OFF	Normal operation	• SI-T3 is properly connected to the unit • Communication normal
TX	Green	ON	Sending data	Data is being sent (LED may appear to be flashing)
		OFF	Not sending data	• No data is being sent • During reset
RX	Green	ON	Receiving data	Data is being received (LED may appear to be flashing)
		OFF	Not receiving data	• No data is being received • During reset

5 Installation Procedure

◆ Section Safety

⚠ DANGER

Electric Shock Hazard

Do not connect or disconnect wiring while the power is on.

Failure to comply will result in death or serious injury.

Disconnect all power to the unit and wait at least the amount of time specified on the unit front cover safety label.

After all indicators are off, measure the DC bus voltage to confirm safe level, and check for unsafe voltages before servicing. The internal capacitor of the units or corresponding parts remain charged after the power supply is turned off.

⚠ WARNING

Electrical Shock Hazard

Do not remove the front cover of the unit while the power is on.

Failure to comply could result in death or serious injury.

The diagrams in this section may include units without covers or safety shields to show details. Be sure to reinstall covers or shields before operating any devices. The option board should be used according to the instructions described in this manual.

Do not allow unqualified personnel to use equipment.

Failure to comply could result in death or serious injury.

Maintenance, inspection, and replacement of parts must be performed only by authorized personnel familiar with installation, adjustment, and maintenance of this product.

Do not touch the option while operating the unit.

Failure to comply could result in death or serious injury.

⚠ WARNING

Do not use damaged wires, place excessive stress on wiring, or damage the wire insulation.

Failure to comply could result in death or serious injury.

Fire Hazard

Tighten all terminal screws to the specified tightening torque.

Loose electrical connections could result in death or serious injury by fire due to overheating of electrical connections.

NOTICE

Damage to Equipment

Observe proper electrostatic discharge (ESD) procedures when handling the option, unit, and circuit boards.

Failure to comply may result in ESD damage to circuitry.

Never shut the power off while the unit is operating.

Failure to comply may cause the application to operate incorrectly or damage the unit.

Do not operate damaged equipment.

Failure to comply may cause further damage to the equipment.

Do not connect or operate any equipment with visible damage or missing parts.

Do not use unshielded communications cable for control wiring.

Failure to comply may cause electrical interference resulting in poor system performance.

Use shielded twisted-pair wires and ground the shield to the ground terminal of the unit.

NOTICE

Properly connect connectors.

Failure to comply may prevent proper operation and possibly damage equipment.

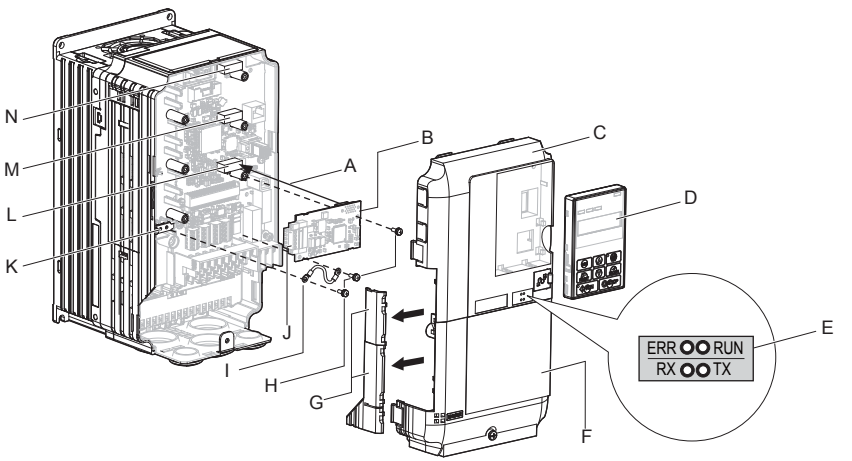
Check wiring to ensure that all connections are correct after installing the option and connecting any other devices.

Failure to comply may result in damage to the option.

◆ Prior to Installing the Option

Prior to installing the option, wire the unit, make necessary connections to the unit terminals, and verify that the unit functions normally without the option installed. Refer to the Quick Start Guide packaged with the unit for information on wiring and connecting the unit.

Figure 2 shows an exploded view of the unit with the option and related components for reference.



A – Insertion point for CN101 connector
B – SI-T3 option
C – Unit front cover
D – Digital operator
E – LED label
F – Unit terminal cover
G – Removable tabs for wire routing
H – Included screws
I – Ground wire
J – Option modular connector CN3
K – Unit grounding terminal (FE)
L – Connector CN5-A
M – Connector CN5-B (Not available for the option.)
N – Connector CN5-C (Not available for the option.)

Figure 2 Unit Components with Option

◆ Installing the Option

Remove the front covers of the unit before installing the option. Refer to the unit instruction manual for directions on removing the front covers. Cover removal varies depending on unit size. This option can be inserted only into the **CN5-A** connector located on the unit control board.

DANGER! *Electrical Shock Hazard. Disconnect all power to the unit and wait at least the amount of time specified on the unit front cover safety label. After all indicators are off, measure the DC bus voltage to confirm safe level, and check for unsafe voltages before servicing to prevent electric shock. The internal capacitor remains charged even after the power supply is turned off.*

1. Shut off power to the unit, wait the appropriate amount of time for voltage to dissipate, then remove the digital operator (D) and front covers (C, F). Front cover removal varies by model.

NOTICE: *Damage to Equipment. Observe proper electrostatic discharge (ESD) procedures when handling the option, unit, and circuit boards. Failure to comply may result in ESD damage to circuitry.*

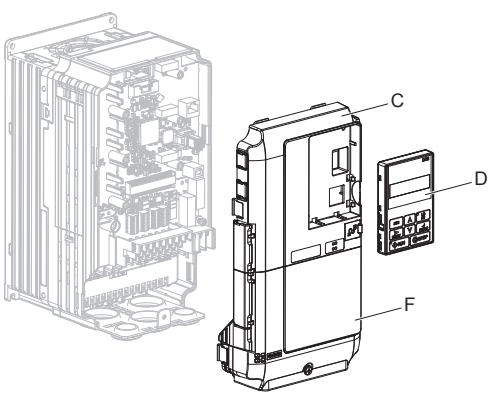


Figure 3 Remove the Front Covers and Digital Operator

2. With the front covers and digital operator removed, apply the LED label (E) in the appropriate position on the unit top front cover (C).

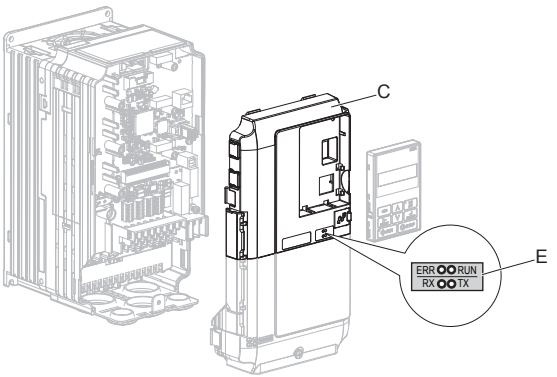


Figure 4 Apply the LED Label

3. Insert the option (B) into the **CN5-A** connector (L) located on the unit and fasten it using one of the included screws (H).

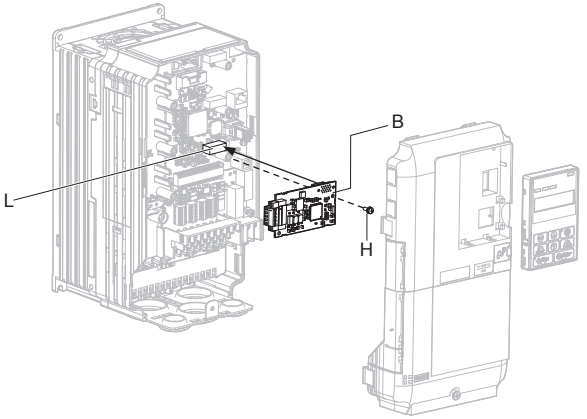


Figure 5 Insert the Option

4. Connect the ground wire (I) to the ground terminal (K) using one of the remaining provided screws (H). Connect the other end of the ground wire (I) to the remaining ground terminal and installation hole on the option (B) using the last remaining provided screw (H) and tighten both screws to 0.5 to 0.6 N·m (4.4 to 5.3 in lbs).

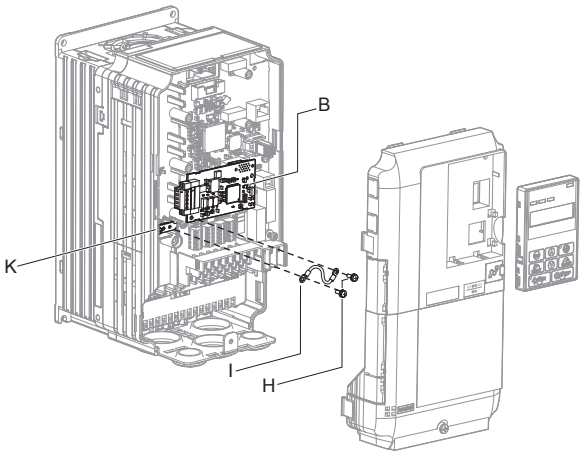


Figure 6 Connect the Ground Wire

Note: There are two screw holes on the unit for use as ground terminals (K). When connecting three options, two ground wires will need to share the same unit ground terminal.

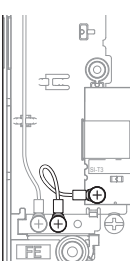


Figure 7 Connecting the Ground Terminal

5. Route the option wiring.
Depending on the unit model, some unit may require routing the wiring through the side of the front cover to the outside to provide adequate space for the wiring. Refer to the Peripheral Devices & Options section of the unit instruction manual for more information on wire routing of specific models.
Route the wiring through the side of the front cover to the outside. In these cases, using diagonal cutting pliers, cut out the perforated openings on the left side of the unit front cover as shown in ***Figure 8***-A. Sharp edges along the cut out should be smoothed down with a file or sand paper to prevent any damage to the wires.
Route the wiring inside the enclosure as shown in ***Figure 8***-B for units that do not require routing through the front cover.

Note: **1.** Separate communication cables from main circuit wiring and other electrical lines.
2. Connect the terminator (model No.: JEPMC-W6022-E) to the option modular connector (CN3) on the end unit of the communication lines.

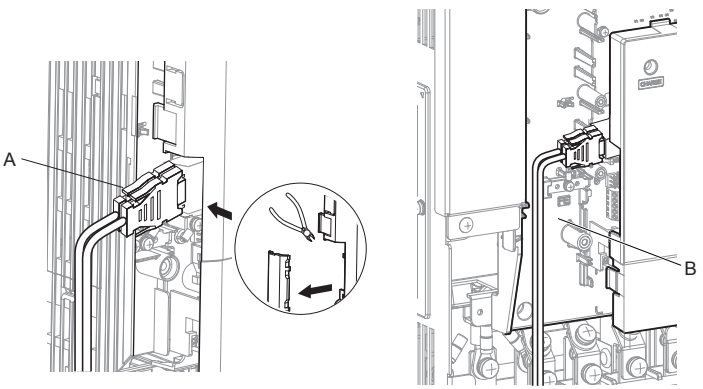


Figure 8 Wire Routing Examples

6. Insert the MECHATROLINK-II communications cables into the master's option modular female connector (CN3), then connect the option to a network. Ensure the cable end is firmly connected.

Communication Cable Specifications
Only use cable recommended for MECHATROLINK-II. Using a cable not specifically recommended may cause the option or unit to malfunction.

Connection Diagram

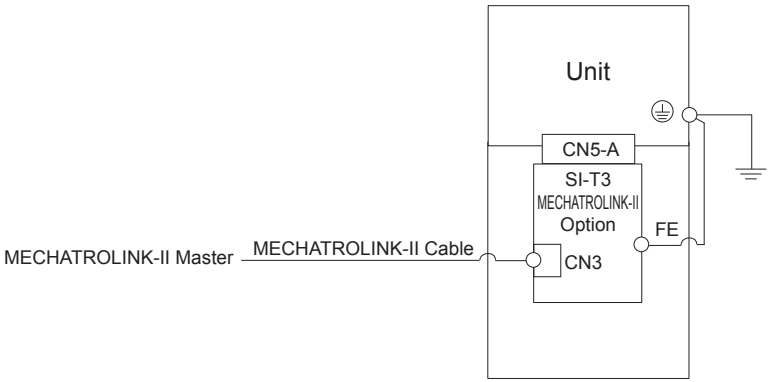


Figure 9 Wiring Diagram

7. Replace and secure the front covers of the unit (C, F) and replace the digital operator (D).

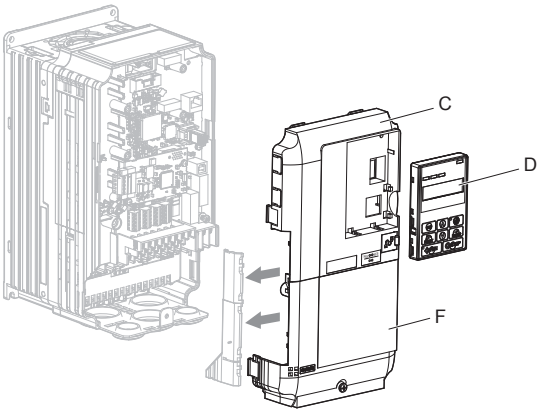


Figure 10 Replace the Front Covers and Digital Operator

Note: Take proper precautions when wiring the option so that the front covers will easily fit back onto the unit. Make sure no cables are pinched between the front covers and the unit when replacing the covers.

8. Set unit parameters in ***Table 5*** for proper option performance.

◆ MECHATROLINK-II Communications Cables

Wire the MECHATROLINK-II communications cables to the communications connector (CN3). Install MECHATROLINK-II communications cables apart from main-circuit wiring and other electrical and power lines.

Note: **1.** For communications cables, use special shielded twisted-pair cables for MECHATROLINK communications.
Recommended cable: JEPMC-W6002-□□-E ***<1>***
JEPMC-W6003-□□-E (with a core) ***<1>***
2. Connect the terminator (model No.: JEPMC-W6022-E) on the end of the communication lines.
3. Maximum transmission distance is 50 m (1969.0 in.). Minimum wiring distance between stations is 0.5 m (19.7 in.).

<1> □□ is the length (m).

6 MECHATROLINK Option Unit Parameters

Confirm proper setting of the all parameters in ***Table 5*** before starting network communications.

Table 5 Parameter Settings

INV: Drive Parameter, CNV: Energy-Saving Unit Parameter

No.	INV	CNV	Name	Description	Values
b1-01 *<1>*	○	–	Frequency Reference Selection 1	Selects the frequency reference input source. 0: Operator - Digital preset speed d1-01 to d1-17 1: Terminals - Analog input terminal A1 or A2 2: MEMOBUS/Modbus communications 3: Option PCB 4: Pulse Input (Terminal RP)	Default: 1 Range: 0 to 4
b1-02 *<1> <2>*	○	○	Run Command Selection 1	Selects the run command input source. 0: Digital Operator - RUN and STOP keys 1: Digital input terminals S1 to S8 2: MEMOBUS/Modbus communications 3: Option PCB	Default: 1 Range: 0 to 3
b1-18 *<2> <3>*	–	○	Voltage Reference Source	Selects the voltage reference input source 0: Digital Operator - RUN and STOP keys 1: Control circuit terminals (analog input) 2: MEMOBUS/Modbus communications 3: Option PCB 7: Input voltage based control 1 8: Input voltage based control 2	Default: 8 Range: 0 to 3, 7, 8
F6-01 *<4>*	○	○	Communications Error Operation Selection	Determines unit response when a bUS error is detected during communications with the MECHATROLINK-II Option	–
				When installed to drives: 0: Ramp to stop. Decelerate to stop using the deceleration time in C1-02. 1: Coast to stop. 2: Fast Stop. Decelerate to stop using the deceleration time in C1-09. 3: Alarm only.	Default: 1 Range: 0 to 3
				When installed to energy-saving units: 1: Stop 3: Alarm Only	Default: 1 Range: 1, 3
F6-02	○	○	External Fault from Comm. Option Detection Selection	Sets the condition for external fault detection (EF0) 0: Always detected. 1: Detection during run only.	Default: 0 Range: 0, 1

INV: Drive Parameter, CNV: Energy-Saving Unit Parameter

No.	INV	CNV	Name	Description	Values
F6-03 <4>	○	○	External Fault from Comm. Option Operation Selection	Determines unit response for external fault input (EF0) detection during MECHATROLINK-II communication	–
				When installed to drives: 0: Ramp to stop. Decelerate to stop using the deceleration time in C1-02. 1: Coast to stop. 2: Fast Stop. Decelerate to stop using the deceleration time in C1-09. 3: Alarm only.	Default: 1 Range: 0 to 3
				When installed to energy-saving units: 1: Stop 3: Alarm Only	Default: 1 Range: 1, 3
F6-06	–	○	Torque Reference/ Torque Limit Selection from Communications Option	Enables or disables the torque reference or torque limit. 0: Enabled 1: Disabled	Default: 0 Range: 0, 1
F6-07	○	–	Multi-Step Speed Enable/Disable Selection when NetRef/ ComRef is Selected	Selects the treatment of multi-step speed inputs when the NetRef command is set. 0: Multi-step speed reference disabled (Same as F7) 1: Multi-step speed reference enabled (Same as V7)	Default: 0 Range: 0, 1
F6-08	○	○	Reset Communication Parameters	Determines which communication-related parameters are set back to their original default values when the unit is initialized. 0: Do not reset F6-☐☐ parameters when the unit is initialized using parameter A1-03. 1: Rest F6-☐☐ parameters when the unit is initialized using parameter A1-03. **Note:** Setting this parameter does not affect communication-related parameters.	Default: 0 Range: 0, 1
F6-20 <5>	○	○	MECHATROLINK Station Address	When installed to drives, sets the station address. <6>	Default:21H Min.: 20H Max.: 3FH
				When installed to energy-saving units, sets the station address. <7>	Default: 61H Min.: 60H Max.: 7FH
F6-21 <5>	○	○	MECHATROLINK Frame Size	Sets the frame size when the MECHATROLINK-II option has been installed. 0: 32 byte 1: 17 byte	Default: 0 Range: 0, 1
F6-22 <5>	○	○	MECHATROLINK Link Speed	Sets the link speed when the MECHATROLINK-II option has been installed. 0: 10 Mbps 1: 4 Mbps	Default: 0 Range: 0, 1

INV: Drive Parameter, CNV: Energy-Saving Unit Parameter

No.	INV	CNV	Name	Description	Values
F6-23 <5> <8>	○	–	MECHATROLINK Monitor Selection (E)	Sets the MECHATROLINK-II monitor (E).	Default: 0H Min.: 0H Max.: FFFFH
F6-24 <5> <9>	○	–	MECHATROLINK Monitor Selection (F)	Sets the MECHATROLINK-II monitor (F).	Default: 0H Min.: 0H Max.: FFFFH
F6-25	○	–	Operation Selection at Watchdog Error (E5)	Determines unit response when an E5 error is detected during communications with the MECHATROLINK-II Option 0: Ramp to stop. Decelerate to stop using the deceleration time in C1-02. 1: Coast to stop. 2: Fast Stop. Decelerate to stop using the deceleration time in C1-09. 3: Alarm only.	Default: 1 Range: 0 to 3
F6-26	○	○	MECHATROLINK bUS Errors Detected	Sets the number of option communication errors (bUS).	Default: 2 Min.: 2 Max.: 10

<1> To start and stop the drive with the MECHATROLINK master device using serial communications, set b1-02 to 3. To control the frequency reference of the drive via the master device, set b1-01 to 3.
<2> To start and stop D1000 with the MECHATROLINK master device using the voltage reference of the D1000, set b1-18 to 3.
<3> This parameter is available in the D1000.
<4> If set to 3, then the unit will continue to operate when a fault is detected. Take proper measures such as installing an emergency stop switch.
<5> Power must be cycled in order for any setting changes to take affect.
<6> All station addresses must be unique. If set to 20 or 3F, a Station Address Error (AEr) will occur and the ERR light will turn on.
<7> All station addresses must be unique. If set to 60 or 7F, a Station Address Error (AEr) will occur and the ERR light will turn on.
<8> Setting byte 10 of INV_CTL to 0EH enables the register set by F6-23. Byte 11 and 12 of the response data enable the register content set by F6-23.
Refer to the SI-T3 Technical Manual for detail.
<9> Setting byte 10 of INV_CTL to 0FH enables the register set by F6-24. Byte 11 and 12 of the response data enable the register content set by F6-24.
Refer to the SI-T3 Technical Manual for detail.

7 Troubleshooting

◆ Unit-Side Error Codes

Unit-side error codes appear on the unit's operator. Causes of the errors and corrective actions are listed in ***Table 6***.
For additional error codes that may appear on the operator screen, refer to the instruction manual for the unit the MECHATROLINK-II Option is connected to.

■ Faults

Both bUS (MECHATROLINK-II Option Communication Error) and EF0 (External Fault Input from the MECHATROLINK-II Option) can appear as an alarm or as a fault. Unit parameters can determine these responses between an alarm and a fault. When a fault occurs, the digital operator ALM LED remains. When an alarm occurs, the digital operator ALM LED flashes.

If communication stops while the unit is running, answer the following questions to help remedy the fault:

- Is the MECHATROLINK-II Option properly installed?
- Is the communication line properly connected to the MECHATROLINK-II Option? Is it loose?
- Is the PLC program working? Has the PLC CPU stopped?
- Did a momentary power loss interrupt communications?

Table 6 Fault Display and Possible Solutions

Operator Display		Fault Name
bUS	bUS	MECHATROLINK-II Option Communication Error
		After establishing initial communication, the connection was lost. Only detected when the run command or frequency reference is assigned to the option (b1-03 = 3 or b1-02 = 3).
Cause		**Possible Solution**
Master controller (PLC) has stopped communicating.		Check for faulty wiring. ⇒ Correct any wiring problems.
Communication cable is not connected properly.		
A data error occurred due to noise		Check the various options available to minimize the effects of noise. ⇒ Take steps to counteract noise in the control circuit wiring, main circuit lines, and ground wiring. ⇒ If a magnetic contactor is identified as a source of noise, install a surge absorber to the contactor coil. ⇒ Use cables specified.
MECHATROLINK-II Option is damaged.		⇒ If there are no problems with the wiring and the error continues to occur, replace the MECHATROLINK-II Option.

Operator Display		Fault Name
E5	E5	MECHATROLINK-II Watchdog Timer Error
		The watchdog has timed out.
Cause		**Possible Solution**
Data has not been received from the PLC, triggering the watchdog timer.		⇒ Execute DISCONNECT or ALM_CLR, then issue a CONNECT command or SYNC_SET command and proceed to phase 3.
Operator Display		**Fault Name**
EF0	EF0	External Fault Input from MECHATROLINK-II Option
		The alarm function for an external device has been triggered.
Cause		**Possible Solution**
An external fault is being sent from the master controller (PLC).		⇒ Remove the cause of the external fault. ⇒ Reset the external fault input from the PLC device.
Problem with the PLC program		⇒ Check the program used by the PLC and make the appropriate corrections.
Operator Display		**Fault Name**
oFA00	oFA00	MECHATROLINK-II Option Fault (CN5-A)
		MECHATROLINK-II Option is not properly connected.
Cause		**Possible Solution**
Non-compatible option connected to the unit		⇒ Connect an option that is compatible with the unit. ⇒ When an option is installed to the energy-saving unit, check the option software version is 6105 or later.
Operator Display		**Fault Name**
oFA01	oFA01	MECHATROLINK-II Option Fault (CN5-A)
		MECHATROLINK-II Option is not properly connected.
Cause		**Possible Solution**
Problem with the connectors between the unit and MECHATROLINK-II Option		⇒ Turn the power off and check the connectors between the unit and MECHATROLINK-II Option.
Operator Display		**Fault Name**
oFA30 to oFA43	oFA30 to oFA43	MECHATROLINK-II Option Fault (CN5-A)
		Communication ID error
Cause		**Possible Solution**
MECHATROLINK-II Option hardware fault		⇒ Replace the MECHATROLINK-II Option. Contact Yaskawa for assistance.

Operator Display		Fault Name
oFb00	oFb00	MECHATROLINK-II Option Fault (CN5-B)
		Non-compatible option is connected.
Cause		**Possible Solution**
Non-compatible option connected to the unit.		⇒ Connect the correct option to CN5-A.
Operator Display		**Fault Name**
oFb02	oFb02	MECHATROLINK-II Option Fault (CN5-B)
		Two of the same options are connected at the same time.
Cause		**Possible Solution**
Options AI-A3 or comm. option were connected to the CN5-B port while an option was already connected to CN5-A.		⇒ Only one type of option input card AI-A3 or comm. option can be connected to the unit. Only this option for MECHATROLINK-II can be connected to CN5-A.
Operator Display		**Fault Name**
oFC00	oFC00	MECHATROLINK-II Option Fault (CN5-C)
		Non-compatible option is connected.
Cause		**Possible Solution**
Non-compatible option connected to the unit.		⇒ Connect the correct option to CN5-A.
Operator Display		**Fault Name**
oFC02	oFC02	MECHATROLINK-II Option Fault (CN5-C)
		Two of the same options are connected at the same time.
Cause		**Possible Solution**
Options AI-A3 or comm. option were connected to the CN5-C port while an option was already connected to CN5-A.		⇒ Only one type of option input card AI-A3 or comm. option can be connected to the unit. Only this option for MECHATROLINK-II can be connected to CN5-A.

■ Minor Faults and Alarms

Operator Display		Minor Fault Name	
AEr	AEr	Station Address Error	
		MECHATROLINK-II Option is set to an address outside the allowable setting range.	
Cause		**Possible Solution**	**Minor Fault (H2-☐☐ = 10)**
Address outside the specified address range		⇒ Set F6-20 to an address within the specified range.	YES
Operator Display		**Minor Fault Name**	
CALL	CALL	Serial Communication Transmission Error	
		Communication has not yet been established.	
Cause		**Possible Solution**	**Minor Fault (H2-☐☐ = 10)**
Communication wiring is faulty, there is a short circuit, or something is not connected properly.		Check for wiring errors. ⇒ Correct the wiring. ⇒ Remove and ground shorts and reconnect loose wires.	YES
Programming error on the master side		⇒ Check communications at start-up and correct programming errors.	
Communication circuitry is damaged.		Perform a self-diagnostics check. ⇒ Replace the unit if the fault continues to occur.	

8 Specifications

◆ Specifications

Table 7 Option Specifications

Model	SI-T3
Access mode	Start-stop synchronization, master/slave method
Communication Speed	10 Mbps (MECHATROLINK-II), 4 Mbps (MECHATROLINK-I)
Transmission cycle	When installed to drives: 500 µs to 8 ms <1> When installed to energy-saving unit: 250 µs to 8 ms <2>
Maximum transmission distance	50 m (1969.0 in.) <3>
Minimum wiring distance between stations	0.5 m (19.7 in.)
Data length	17-byte data transmission or 32-byte data transmission <4>
Maximum number of slave stations	30 <3> <5>
Ambient Temperature	-10°C to +50°C (14°F to 122°F)
Humidity	up to 95% RH (no condensation)
Storage Temperature	-20°C to +60°C (-4°F to 140°F) (allowed for short-term transport of the product)
Area of Use	Indoors (free of corrosive gas, airborne particles, etc.)
Altitude	Up to 1000 m (3280 ft.)

<1> For MECHATROLINK-I, a cycle is 2 ms. For MECHATROLINK-II, a cycle is 1 ms to 8 ms for a 32-byte data transmission, and 500 µs to 8 ms for a 17-byte data transmission.
<2> For MECHATROLINK-I, a cycle is 2 ms.
<3> At the maximum transmission distance of 50 m (1969.0 in.), the maximum number of stations is 15.
<4> For MECHATROLINK-I, only a 17-byte data transmission can be selected.
<5> The maximum number of connectable slave stations changes depending on the types and settings of the host master, baud rate, or communications cycle. For details, refer to the manuals of your master.
Communications cycle: Integral multiple of transmission cycles (depending on the host master settings).

◆ Revision History

The revision dates and the numbers of the revised manuals appear on the bottom of the back cover.

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YASKAWA 1000-Series Option

MECHATROLINK-II

Installation Manual

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