

YASKAWA AC Drive 1000-Series Option PROFINET Installation Manual

Type: SI-EP3

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

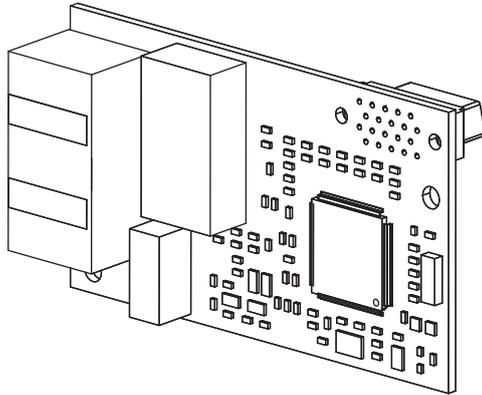


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1 Preface and Safety

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 the SI-EP3 option:

SI-EP3 Option

	Yaskawa AC Drive 1000-Series Option SI-EP3 PROFINET Installation Manual Manual No: TOEP YEACOM 07□ (This manual)	Read this manual first. The installation manual is packaged with the SI-EP3 option and contains information required to install the option and set up related drive parameters.
	Yaskawa AC Drive 1000-Series Option SI-EP3 PROFINET Technical Manual Manual No: SIEP YEACOM 07□	The technical manual contains detailed information about the option. In the U.S., access http://www.yaskawa.com to obtain the technical manual. Customers in other areas should contact a Yaskawa representative.

Yaskawa Drive

	Yaskawa AC Drive 1000-Series Quick Start Guide A1000 - TOEPC71061641 P1000 - TOEPYAIP1U01 iQpump1000 - TOEPYAIP1W01	The drive manuals cover basic installation, wiring, operation procedures, functions, troubleshooting, and maintenance information. The manuals also include important information about parameter settings and drive 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.
	Yaskawa AC Drive 1000-Series Technical Manual A1000 - SIEPC71061641 P1000 - SIEPYAIP1U01 iQpump1000 - SIEPYAIP1W01	

◆ Terms

Note: Indicates supplemental information that is not related to safety messages.

Drive: Yaskawa AC Drive 1000-Series

Option: Yaskawa AC Drive 1000-Series SI-EP3 PROFINET option

◆ Registered Trademarks

- All trademarks are the property of their respective owners.

1 Preface and Safety

◆ 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 options and drives without covers or safety shields to illustrate details. Reinstall covers or shields before operating any devices. The option 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 new copies of the manual, contact a 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 operator is responsible for injuries or equipment damage caused from failure to heed the warnings in the manual.

NOTICE

Do not expose the drive to halogen group disinfectants.

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

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

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

Do not modify the drive or option circuitry.

Failure to comply could result in damage to the drive 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.

2 Product Overview

◆ About This Product

The SI-EP3 option connects the 1000-series drives to a PROFINET network and facilitates the exchange of data.

This manual explains the handling, installation and specifications of this product.

The SI-EP3 option is a simple, networking solution that reduces the cost and time to wire and install factory automation devices, while providing interchangeability of like components from multiple vendors.

By installing the option to a drive, it is possible to do the following from a PROFINET master device:

- Operate the drive
- Monitor the operation status of the drive
- Change parameter settings.

SI-EP3 is PROFINET Conformance Class A certified.

◆ Applicable Models

The option can be used with the drive models in [Table 1](#).

Table 1 Applicable Models

Drive Series	Drive Model Number	Software Version <1>
A1000	CIMR-A□2A□□□□	VSA90101□
	CIMR-A□4A□□□□	
	CIMR-A□5A□□□□	VSA90504□ VSA90101□
	CIMR-A□4A0930~1200	VSA903014 and greater
iQpump1000	CIMR-PW2A□□□□	VSA8550 and greater
	CIMR-PW4A□□□□	
	CIMR-PW5A□□□□	VSA903750 and greater
	CIMR-PW4A0930~1200	
P1000	CIMR-PU2A□□□□	VSA8500 and greater
	CIMR-PU4A□□□□	
	CIMR-PU5A□□□□	
	CIMR-PU4A0930~1200	VSA903700 and greater

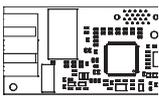
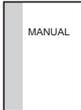
<1> See “PRG” on the drive nameplate for the software version number.

3 Receiving

Please perform the following tasks upon receipt of the option:

- Inspect the option for damage. Contact the shipper immediately if the option appears damaged upon receipt.
- Verify receipt of the correct model by checking the model number printed on the name plate of the option package.
- Contact your supplier if you have received the wrong model or the option does not function properly.

◆ Option Package Components

Description:	Option	Ground Wire	Screws (M3)	LED Label	Installation Manual
—					
Quantity:	1	1	3	1	1

◆ Tools Required for Installation

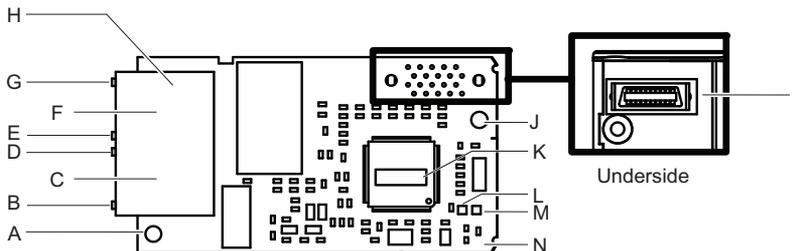
- A Phillips screwdriver (M3 metric/#1, #2 U.S. standard size*) is required to install the option and remove drive front covers.
- Diagonal cutting pliers. (required for some drive models)
- A small file or medium grit sandpaper. (required for some drive models)

*Screw sizes vary by drive capacity. Select a screwdriver appropriate for the drive capacity.

Note: Tools required to prepare option networking cables for wiring are not listed in this manual.

4 Option Components

◆ SI-EP3 PROFINET Option



A – Ground Terminal and installation hole <1>

B – CN1 Port 2 LED (10/100) <2>

C – CN1 Port 2

D – CN1 Port 2 LED (LINK/ACT) <2>

E – CN1 Port 1 LED (10/100) <2>

F – CN1 Port 1

G – CN1 Port 1 LED (LINK/ACT) <2>

H – PROFINET cable connection

I – Option connector CN5

J – Installation hole

K – SI-EP3 Firmware Label
VST-□□□□

L – LED (NS) <2>

M – LED (MS) <2>

N – PROFINET PCB

<1> The ground wire provided in the option shipping package must be connected during installation.

<2> Refer to Option LED Display on page 12 for details on the LEDs.

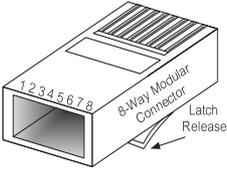
Figure 1 Option (Top View)

◆ Terminal CN1

The communication connector on the option is a modular RJ45 female connector designated CN1.

CN1 is the connection point for a customer supplied male Ethernet network communication cable.

Table 2 Male, 8-way Ethernet Modular Connector (Customer Supplied)

Male Ethernet 8-Way Modular Connector	Pin	Description
	1 (Pair 2)	Transmit data (TXD) +
	2 (Pair 2)	Transmit data (TXD) -
	3 (Pair 3)	Receive data (RXD) +
	4 (Pair 1)	Not used <I>
	5 (Pair 1)	Not used <I>
	6 (Pair 3)	Receive data (RXD) -
	7 (Pair 4)	Not used <I>
	8 (Pair 4)	Not used <I>

<I> Not used for 10 Mbps and 100 Mbps networks.

4 Option Components

◆ Option LED Display

The option has six LEDs:

Bi-color Status LEDs:

- Module status (MS) red/green
- Network status (NS) red/green

PROFINET LEDs:

- Network speed-10/100 yellow
- Link status and network activity-Link/Act green

The operational states of the option LEDs after the power-up diagnostic LED sequence is completed are described in [Table 3](#). The states with a number in parenthesis are the number of pulses of 250 ms on, 250 ms off cycles, followed by 500 ms off, then repeating the cycle. Wait at least 2 seconds for the power-up diagnostic process to complete before verifying LED states.

Table 3 Option LED States

Name	Indication		Operating Status	Remarks
	Color	Status		
MS (visible through drive cover)	–	OFF	Power supply OFF	Power is not being supplied to the drive.
	Green	ON	Option operating	The option is operating normally and initialization is complete.
	Green	Flashing (1)	Diagnostics	Diagnostic data available.
	Green	Flashing (2)	Configuration tool	Identified by a configuration tool.
	Red	ON	Default MAC or fatal error occurred.	Default MAC address has been programmed or the option has detected an unrecoverable error.
	Red	Flashing (1)	Configuration error (non-fatal)	Configuration error.
	Red	Flashing (2)	No IP (non-fatal)	No IP address assigned.
	Red	Flashing (3)	No station name (non-fatal)	No station name assigned.
	Red	Flashing (4)	Init failure (non-fatal)	Failed to initialize module.
Green/ Red	Flashing	Option self-test	The option is in self-test mode.	

Name	Indication		Operating Status	Remarks
	Color	Status		
NS (visible through drive cover)	–	OFF	Offline or Power supply OFF	–
	Green	ON	Connected	Connection established with I/O controller and in RUN mode.
	Green	Flashing	Connected and stopped	Connection established with I/O controller and in STOP mode.
	Red	ON	BUS fault	Unrecoverable BUS fault.
	Red	Flashing (1)	Lost communication	Host communication is temporarily lost.
	Red	Flashing (2)	Lost link	No link detected to network.
10/100 (visible at cable ports)	Yellow	OFF	10 Mbps is established	–
	Yellow	ON	100 Mbps is established	–
LINK/ACT (visible at cable ports)	Green	OFF	Link is not established	–
	Green	ON	Link is established	–
	Green	Flashing	Link is established and there is network activity	–

■ Power-Up Diagnostics

An LED test is performed each time the drive is powered up. The initial boot sequence may take several seconds. After the LEDs have completed the diagnostic LED sequence, the option is successfully initialized. The LEDs then assume operational conditions as shown in [Table 3](#).

Table 4 Power-Up Diagnostic LED Sequence

Sequence	Module Status (MS)	Network Status (NS)	Time (ms)
1	Green	OFF	250
2	Red	OFF	250
3	Green	OFF	-
4	Green	Green	250
5	Green	Red	250
6	Green	OFF	-

5 Installation Procedure

◆ Section Safety

DANGER

Electrical 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 drive, wait at least five minutes after all indicators are off, measure the DC bus voltage to confirm safe level, and check for unsafe voltages before servicing. The internal capacitor remains charged after the power supply is turned off. The charge indicator LED will extinguish when the DC bus voltage is below 50 Vdc.

WARNING

Electrical Shock Hazard

Do not remove the option cover while the power is on.

Failure to comply could result in death or serious injury.

The diagrams in this section may include options and drives without covers or safety shields to show details. Be sure to reinstall covers or shields before operating any devices. Use the option 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 circuit boards while the power to the drive is on.

Failure to comply could result in death or serious injury.

WARNING

Do not use damaged wires, stress the 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, drive, and circuit boards.

Failure to comply may result in ESD damage to circuitry.

Never shut the power off while the drive is running or outputting voltage.

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

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 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 drive.

Properly connect all pins and 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.

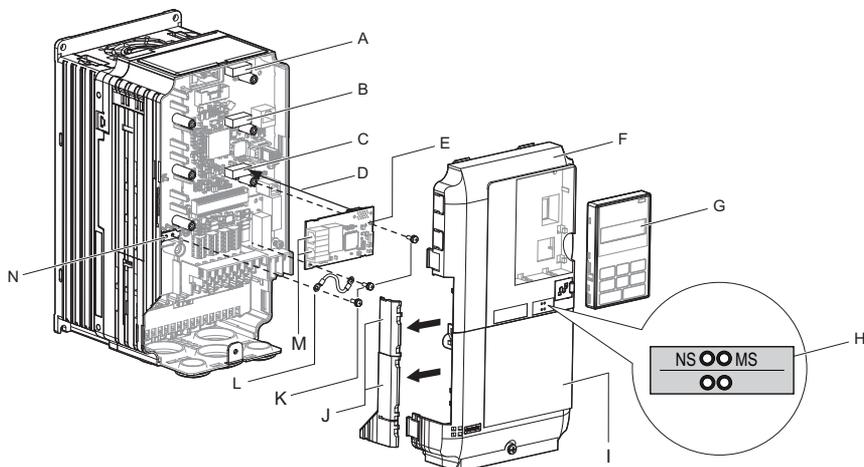
Failure to comply may result in damage to the option.

5 Installation Procedure

◆ Prior to Installing the Option

Prior to installing the option, wire the drive, make necessary connections to the drive terminals, and verify that the drive functions normally without the option installed. Refer to the product manual packaged with the drive for information on wiring and connecting the drive.

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



- | | |
|---------------------------------------|-------------------------------------|
| A – Connector CN5-C | H – LED label |
| B – Connector CN5-B | I – Drive terminal cover |
| C – Connector CN5-A | J – Removable tabs for wire routing |
| D – Insertion point for CN5 connector | K – Included screws |
| E – SI-EP3 option | L – Ground wire |
| F – Drive front cover | M – PROFINET cable connection CN1 |
| G – Digital operator | N – Drive grounding terminal (FE) |

Figure 2 Drive Components with Option

◆ Installing the Option

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

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

DANGER! *Electrical Shock Hazard. Do not connect or disconnect wiring while the power is on. Failure to comply will result in death or serious injury. Before installing the option, disconnect all power to the drive. The internal capacitor remains charged even after the power supply is turned off. The charge indicator LED will extinguish when the DC bus voltage is below 50 Vdc. To prevent electric shock, wait at least five minutes after all indicators are off and measure the DC bus voltage level to confirm safe level.*

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

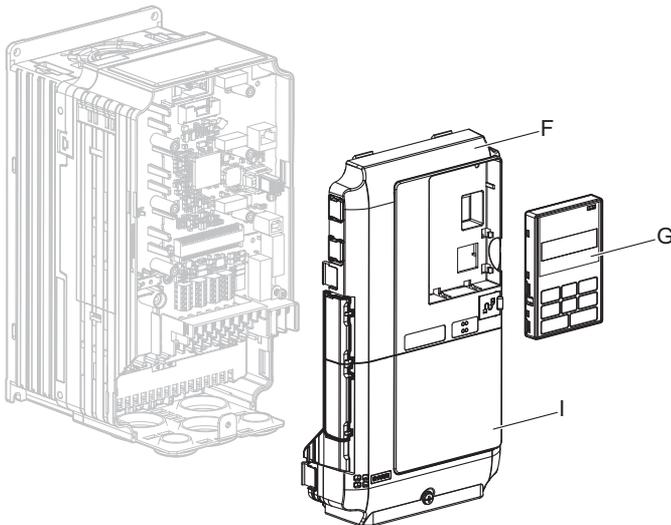


Figure 3 Remove the Front Covers and Digital Operator

5 Installation Procedure

2. With the front covers and digital operator removed, apply the LED label (H) in the appropriate position on the drive top front cover (F).

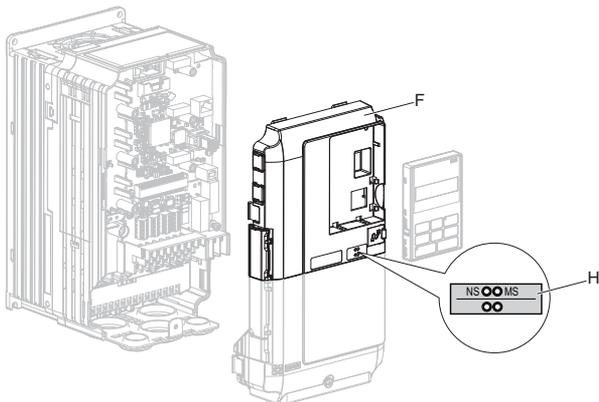


Figure 4 Apply the LED Label

3. Insert the option (E) into the **CN5-A** connector (C) located on the drive and fasten it using one of the included screws (K).

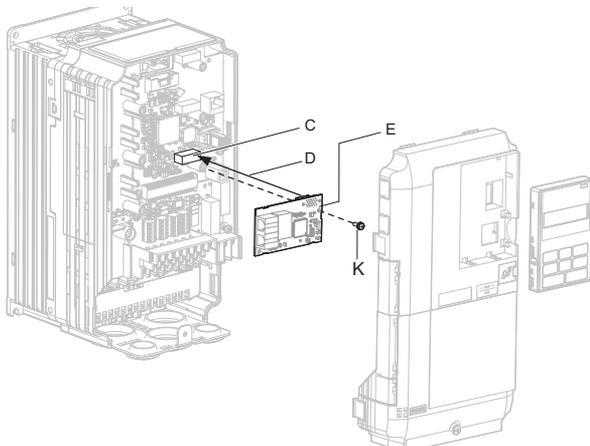


Figure 5 Insert the Option

4. Connect the ground wire (L) to the ground terminal (N) using one of the remaining provided screws (K). Connect the other end of the ground wire (L) to the remaining ground terminal and installation hole on the option (E) using the last remaining provided screw (K) and tighten both screws to 0.5 ~ 0.6 nm or (4.4 ~ 5.3 in lbs).

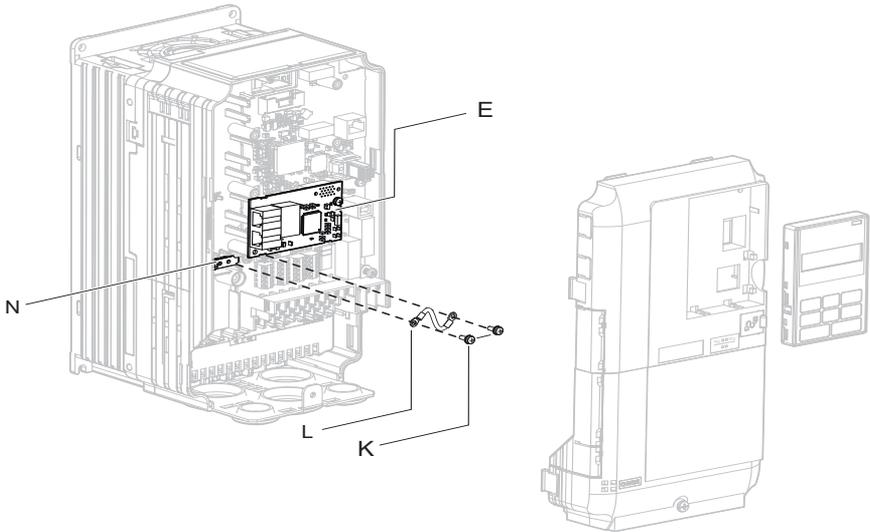


Figure 6 Connect the Ground Wire

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

5 Installation Procedure

■ Wiring the Option

5. Route the option wiring.

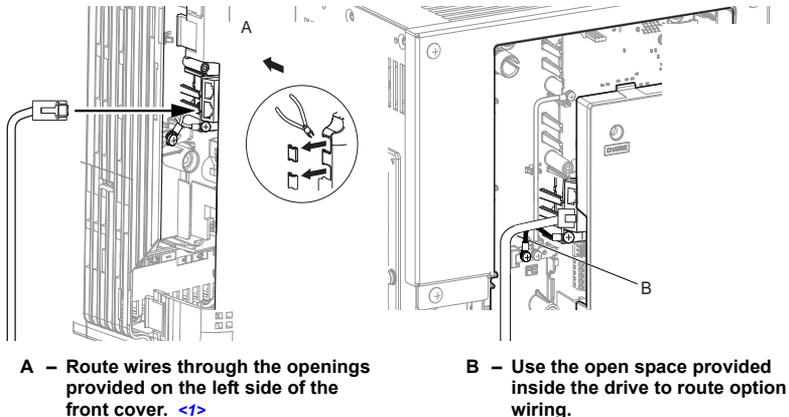
Depending on the drive model, some drives may require routing the wiring through the side of the front cover to the outside to provide adequate space for the wiring. In these cases, using diagonal cutting pliers, cut out the perforated openings on the left side of the drive front cover. Sharp edges along the cut out should be smoothed down with a file or sand paper to prevent any damage to the wires.

5.a Route the PROFINET CAT 5e cable inside the enclosure for drives that do not require routing through the front cover. Refer to [Table 5](#) and [Figure 7](#) to determine the proper wire routing by drive model.

Table 5 Model-Specific Cable Routing

Model CIMR-□□	Wire Routing <1>	
	Through Front Cover	Inside Drive
2A0004 to 0040; 4A0002 to 0023; 5A0003 to 0011	Figure 7 (A)	-
2A0056 and above; 4A0031 and above; 5A0023 and above.	-	Figure 7 (B)

<1> Refer to [Figure 7](#) for examples of the different wire routing techniques.



<1> The drive will not meet NEMA Type 1 requirements if wiring is exposed outside the enclosure.

Figure 7 Wire Routing Examples

- Connect the PROFINET CAT 5e communication cable to the option connector (CN1) port 1.
To connect the option to a network, firmly connect RJ45 8-pin Shielded Twisted Pair CAT 5e cable(s) into the modular connector ports (see [Figure 7](#)). Refer to [Network Topology and Connections on page 21](#).

NOTICE: Do not connect or disconnect the communication cable while the drive is powered up or while the drive is in operation. Failure to comply may cause a static discharge, which will cause the option card to stop working properly. Cycle power on the drive and option card to reestablish functionality.

■ Network Topology and Connections

The dual RJ45 network ports on the option board act as a switch to allow for flexibility in cabling topology. For example, a traditional star network topology may be employed by using a single port on the option board. Alternatively, a daisy-chained approach may be employed by using both RJ45 ports. This second approach reduces the requirements of central switch ports.

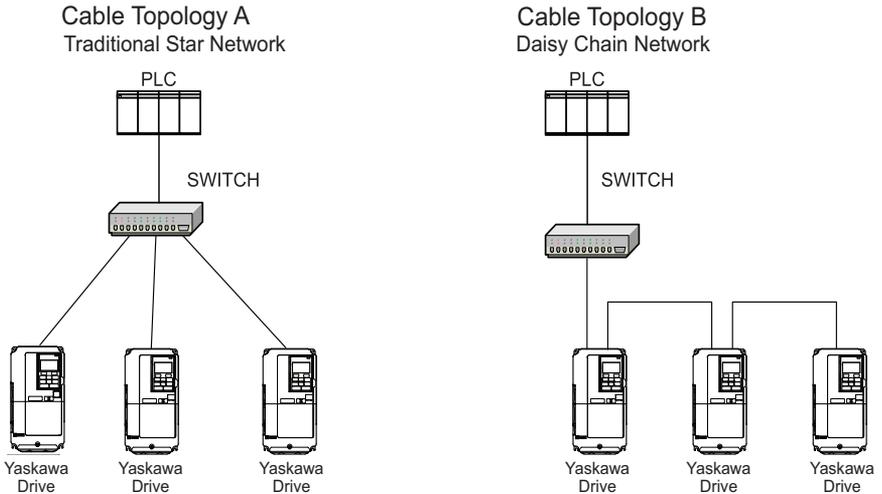


Figure 8 Topology Options

Communication Cable Specifications

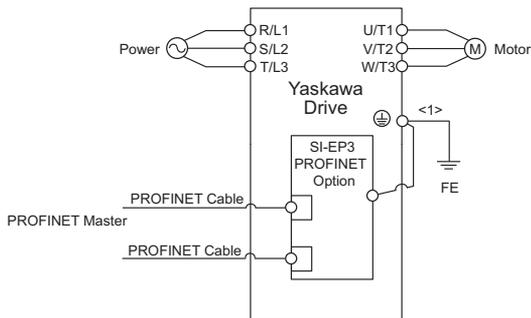
Use cables recommended for PROFINET. Using a cable not specifically recommended may cause the option or drive to malfunction.

The use of CAT5e or equivalent Shielded Twisted Pair (STP) cable is recommended.

5 Installation Procedure

7. Use the second communication cable port to daisy chain a series of drives where applicable. Refer to [Figure 8](#).

■ Connection Diagram



<1> The ground wire provided in the option shipping package must be connected during installation.

Figure 9 Wiring Diagram

8. Replace and secure the front covers of the drive (F, I) and replace the digital operator (G).

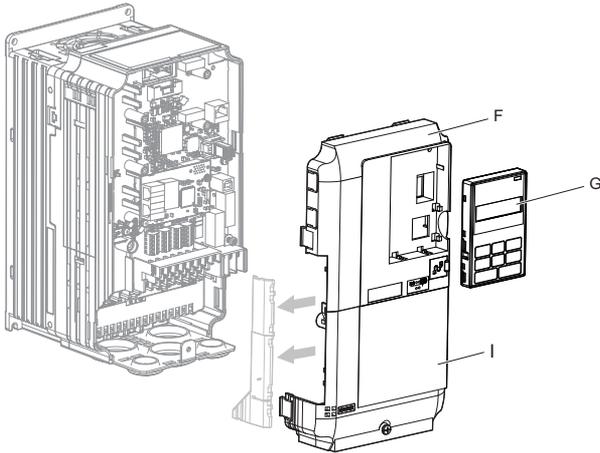


Figure 10 Replace the Front Covers and Digital Operator

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

9. Set drive parameters in [Table 6](#) for proper option performance.

◆ GSDML Files

For easy network implementation of drives equipped with the SI-EP3 option, a GSDML file can be obtained from:

U.S.: <http://www.yaskawa.com>

Other areas: Contact a Yaskawa representative.

6 Option Related Drive Parameters

The following parameters are used to set up the drive for operation with the option. Parameter setting instructions can be found in the drive product manual.

Confirm proper setting of the all parameters in [Table 6](#) before starting network communications.

Table 6 Parameter Settings

No.	Name	Description	Default
b1-01 </>	Frequency Reference Selection	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)	1 (Set to 3 for PROFINET)
b1-02 </>	Run Command Selection	Selects the run command input source. 0: Digital Operator - RUN and STOP keys 1: Digital input terminals S1 to S7 2: MEMOBUS/Modbus communications 3: Option PCB	1 (Set to 3 for PROFINET)
F6-01	Operation Selection after Communications Error	Determines drive response when a bUS error is detected during communications with the option. 0: Ramp to Stop 1: Coast to Stop 2: Fast-Stop 3: Alarm Only </> 4: Alarm (d1-04) </> </> 5: Alarm Ramp to Stop </> </>	1
F6-02	External Fault Detection Conditions (EF0)	Sets the condition for external fault detection (EF0). 0: Always detected 1: Detected only during operation	0
F6-03	Stopping Method for External Fault from Communication Option Board	Determines drive response for external fault input (EF0) detection during communication. 0: Ramp to Stop 1: Coast to Stop 2: Fast-Stop 3: Alarm Only </>	1
F6-07	NetRef/ComRef Selection Function	0: Multi-step speed reference disabled 1: Multi-step speed reference allowed	1
F6-08	Reset Communication Related Parameters	Determines if communication-related parameters F6-□□ and F7-□□ are set back to original default values when the drive is initialized using parameter A1-03. 0: Do not reset F6-□□ and F7-□□ parameters 1: Reset F6-□□ and F7-□□ parameters Note: Setting this parameter does not affect communication-related parameters.	0

6 Option Related Drive Parameters

No.	Name	Description	Default
F6-14 <>	bUS Error Auto Reset	0: Disabled 1: Enabled	0
F7-01 to F7-04	IP Address	Sets static IP address of the SI-EP3 option when parameter F7-13=0. Note: Parameter F7-01 sets the most significant octet.	192 168 1 20
F7-05 to F7-08	Subnet Mask	Sets static Subnet Mask of network connection. Note: Parameter F7-05 sets the most significant octet	255 255 255 0
F7-09 to F7-12	Gateway Address	Sets static Gateway address of network connection. Note: Parameter F7-09 sets the most significant octet.	192 168 1 1
F7-13	Address Mode at Startup	Selects how the option address is set. 0: Static 2: DCP	2
F7-14	Duplex Mode Selection	Selects duplex mode setting. 0: Half duplex forced 1: Auto-negotiate duplex mode and communication speed 2: Full duplex forced 3: Half (port 1)/Auto (port 2) <> 4: Half (port 1)/Full (port 2) <> 5: Auto (port 1)/Half (port 2) <> 6: Auto (port 1)/Full (port 2) <> 7: Full (port 1)/Half (port 2) <> 8: Full (port 1)/Auto (port 2) <>	1
F7-15	Communication Speed Selection	Sets the communication speed. 10: 10 Mbps 100: 100 Mbps 101: 10 (port 1)/100 Mbps (port 2) <> 102: 100 (port 1)/10 Mbps (port 2) <>	Default: 10 Range: 10; 100 to 102
F7-16 <>	Communication Loss Timeout	Sets the timeout value for communication loss detection in tenths of a second. A value of 0 disables the connection timeout. Example: An entered value of 100 represents 10.0 seconds.	Default: 0.0 s Min.: 0.0 s Max.: 30.0 s
F7-23 to F7-27	Dynamic Output Assembly Parameters (SI-EP3 Firmware Version VST800250)	Configurable outputs 1 to 5. If a value other than 0 is assigned to parameters F7-23 to F7-27 and F7-33 to F7-37 by the drive, that value will take precedent over a value set by the configuration software. If the value in the drive is 0 (default), the value from the configuration software will be used.	0
	Dynamic Output Assembly Parameters (SI-EP3 Firmware Version VST800251)	Configurable outputs 1 to 5. If a value other than 0 is assigned in the configuration software, those values will be used, otherwise, the values of the drive parameters set in parameters F7-23 to F7-27 and F7-33 to F7-37 will be used.	

6 Option Related Drive Parameters

No.	Name	Description	Default
F7-33 to F7-37	Dynamic Input Assembly Parameters (SI-EP3 Firmware Version VST800250)	Configurable inputs 1 to 5. If a value other than 0 is assigned to parameters F7-23 to F7-27 and F7-33 to F7-37 by the drive, that value will take precedent over a value set by the configuration software. If the value in the drive is 0 (default), the value from the configuration software will be used.	0
	Dynamic Input Assembly Parameters (SI-EP3 Firmware Version VST800251)	Configurable outputs 1 to 5. If a value other than 0 is assigned in the configuration software, those values will be used, otherwise, the values of the drive parameters set in parameters F7-23 to F7-27 and F7-33 to F7-37 will be used.	
H5-11	Communications ENTER Function Selection	Select the function for the ENTER command that saves parameter data to the drive. 0: Parameter changes are activated when ENTER command is written 1: Parameter changes are activated immediately without use of ENTER command	1

- <1> To start and stop the drive with the option master device using serial communications, set b1-02 to 3. To control the drive frequency reference via the master device, set b1-01 to 3.
- <2> If F6-01 is set to 3, 4, or 5, then the drive will continue to operate when a bUS fault is detected. Take proper safety measures, such as installing an emergency stop switch.
- <3> The availability of this feature/function is depends on drive model, software version and Profinet firmware version. Refer to [Table 15](#) for specifics relating to your drive.

6 Option Related Drive Parameters

Table 7 Option Monitors

No.	Name	Description	Value Range
U6-80 to U6-83	Online IP Address	SI-EP3 IP Address, U6-80 is the most significant octet.	0 to 255
U6-84 to U6-87	Online Subnet	Subnet, U6-94 is the most significant octet.	0 to 255
U6-88 to U6-91	Online Gateway	Gateway, U6-88 is the most significant octet.	0 to 255
U6-92	Online Speed	Port 1 Link Speed	10, 100
U6-93	Online Duplex	Port 1 Duplex Setting	0: Half, 1: Full
U6-94	Online Duplex	Port 2 Link Speed	0: Half, 1: Full
U6-95	Online Duplex	Port 2 Duplex Setting	0: Half, 1: Full
U6-98	First Fault	First Option Board Fault	-
U6-99	Current Fault	Current Option Board Fault	-

7 Web Interface

The web server interface to the drive option through port 80 allows management of diagnostic information through a standard web browser. The web page is a Java applet that creates a tabbed web page. The available tabs include:

Note: PCs must have Java SE 6 Update 14 or later installed to view the web pages. PCs without Java will display web pages with limited features.

Web page interface screens are shown for all SI-EP3 firmware versions, VST800251 and for VST800250 and prior.

Refer to SI-EP3 Firmware Update on page 42 to update SI-EP3 option firmware, if the web interface pages associated with VST800251 are needed

Table 8 Web Server Interface Web Page Tabs

Tab Name	SI-EP3 Option Firmware Version Web Page Tab Availability			
	VST800250 and Prior	Page No.	VST800251 and Later	Page No.
HTML Home Page (Main)	-	-	✓	29
Main	✓	30	✓	31
Drive Status	✓	32	✓	32
Network	✓	33	✓	33
Email Alerts	✓	34	✓	34
Doc Links	✓	36	-	-
Parameter Access <1>	✓	37	✓	37
Configuration <1>	✓	38	✓	38
Custom Tab	✓	40	✓	41

<1> The Parameter Access Tab and Configuration Tab are only accessible after entering a valid password.

◆ Web Server Interface

Access the web server interface by typing the IP address of the SI-EP3 option in a web browser address.

Example: "http://192.168.1.20"

The SI-EP3 IP Address is available using drive digital operator to access Option Monitors U6-80 to U6-83. *Refer to Option Monitors on page 27.*

■ HTML Home Page (SI-EP3 firmware version VST800251 and later)

The main HTML home page provides basic drive and option data and a link to an enhanced web page.



Refresh the page to update values.

Main

Device Information

Protocol	Profinet
IP Address	192.168.1.36
MAC ID	00:20:B5:01:00:01
Serial Number	Panel1
Product Name	SI-EP3
Option Firmware Version	VST850251
Drive Model	CIMR-VU2A0004
Drive Firmware Version	1021
Profinet Station Name	Panel1

Network Status

Msg Tx OK	132687
Msg Rx OK	133425
Msg Tx Dropped	0
Msg Rx Dropped	0
Msg Tx Errors	0
Msg Rx Errors	0
Current Connections	1
Collisions	0
Tx Retry	0

[Launch Enhanced Website](#)

To run the "Enhanced Website", [Java](#)® must be enabled in your browser. If a connection to the Internet is not available, a change in the Java configuration is required: set "All Programs / Java / Configure Java / Advanced Tab / Perform certificate checks on" to "Do not check".

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Figure 11 HTML Home Page

7 Web Interface

■ Main Tab (SI-EP3 firmware version VST800250 and prior)

The Main tab shows basic option information such as IP address, MAC address, and firmware version.



The screenshot displays the YASKAWA web interface. At the top, the YASKAWA logo is visible. Below the logo is a navigation menu with tabs: Main, Drive Status, Network, Doc links, Email Alerts, Parameter Access, Configuration, and Custom. The 'Main' tab is selected. The main content area shows 'Device Information' with the following details:

Protocol:	Profinet
Station Name:	
IP Address:	192.168.0.100
MAC ID:	0:20:B5:24:12:3B
Product Name:	SI-EP3
Option Serial Number:	123456789
Option Firmware Version:	VST800250
Drive Model:	CIMR-AU4A0009
Drive Firmware Version:	1016

Figure 12 Main Tab View

■ Main Tab (SI-EP3 firmware version VST800251 and later)

The Main tab shows basic option information such as IP address, MAC address, and firmware version.



The screenshot displays the YASKAWA web interface. At the top center is the YASKAWA logo. Below it is a navigation bar with four tabs: "Email Alerts", "Parameter Access", "Configuration", and "Custom". The "Main" tab is selected and highlighted in blue. Below the navigation bar, there are two sub-tabs: "Drive Status" and "Network". The "Device Information" section is highlighted in a light blue box and contains the following details:

Protocol:	Profinet
Station Name:	Rolling1
IP Address:	192.168.1.41
MAC ID:	00:20:B5:00:00:1
Product Name:	SI-EP3
Option Serial Number:	RollingDrive1
Option Firmware Version:	VST850251
Drive Model:	CIMR-VU2A0001
Drive Firmware Version:	1022

Figure 13 Main Tab View

7 Web Interface

■ Drive Status Tab

The Drive Status tab shows basic I/O information and drive state information.



Email Alerts	Parameter Access	Configuration	Custom
Main	Drive Status	Network	Doc links

Drive Status	Drive Signals	Fault Information
Status: Ready	Frequency Ref: 0.0 Hz	Active: None
State: Stopped	Output Frequency: 0.0 Hz	
Direction: Forward	Output Current: 0.0 A	
	DC Bus Voltage: 307 V	
	Torque Reference: 0%	

Multi-function Inputs	Multi-function Outputs	Analog Input Signals
Terminal S1: OFF	Output MA/MB-MC: OFF	Input Terminal A1: 0%
Terminal S2: OFF	Output P1 - PC: ON	Input Terminal A2: 0%
Terminal S3: OFF	Output P2 - PC: OFF	
Terminal S4: OFF		
Terminal S5: OFF		
Terminal S6: OFF		
Terminal S7: OFF		

Figure 14 Drive Status Tab View

■ Network Tab

The Network tab shows the status of the option network traffic and the status of open I/O connections.

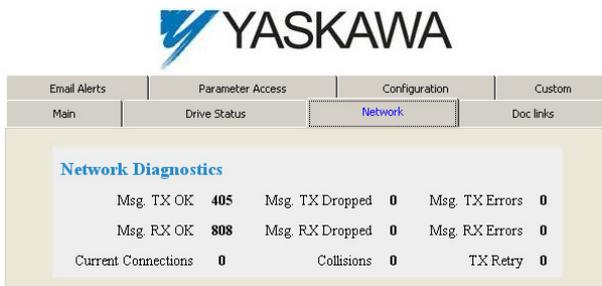


Figure 15 Network Tab View

Table 9 Network Monitor Descriptions

Network Monitor	Explanation
Msg Tx OK	Cumulative number of messages transmit successfully from SI-EP3.
Msg Rx OK	Cumulative number of messages received successfully to SI-EP3.
Current Connections	Current number of open connections.
Control Connection Delta Time	The time between the last two writes to the Control register, MEMOBUS/Modbus address 0001H.
Msg Tx Dropped	Cumulative number of messages dropped due to output network buffer being full and unable to hold the new message.
Msg Rx Dropped	Cumulative number of messages dropped due to input network buffer being full and unable to hold the new message.
Collisions	Cumulative number of collisions (half duplex only) reported by the MAC/PHY (Media Access Control/Physical Connection).
Msg Tx Errors	Cumulative number of transmit underruns and transmit stops reported by the MAC/PHY.
Msg Rx Errors	Cumulative number of receive overruns, receive stops, and receive error frames reported by the MAC/PHY.
Tx Retry	Cumulative number of transmits in which the 1st attempt was delayed due to busy medium reported by the MAC/PHY.
Note: Cumulative counters are reset when the power supply is cycled.	

7 Web Interface

■ Email Alerts Tab

The Email Alerts tab allows the user to configure four Email Fault/Alarm conditions. When the condition is true, one email will be sent to the provided email address. Another email will not be sent until the condition becomes false and then true again. A 30-second timer prevents emails from being sent when conditions reoccur immediately after being removed. The timer helps limit the amount of emails sent regarding the same intermittent condition and helps to reduce network traffic by reducing emails about reoccurring errors.

Main	Drive Status	Network	Doc links	Email Alerts	Parameter Access	Configuration	Custom
<input type="checkbox"/> Email Active Conditional Email 1							
Condition: Frequency Reference >= 3000 OR < 0 Hz							
Address: 4140000000@email.uscc.net Subject: This works							
Message: Is this saved							
<input type="checkbox"/> Email Active Conditional Email 2							
Condition: Frequency Reference >= 3000 OR < 0 Hz							
Address: 4140000000@email.uscc.net Subject: Got this fault							
Message: Hello you, this is a fault, another coming in 30 seconds hopefully.							
<input type="checkbox"/> Email Active Conditional Email 3							
Condition: Frequency Reference < 0 AND < 0 Hz							
Address: ToAddress3@ToDomain3 Subject: Subject3							
Message: Text3							
<input type="checkbox"/> Email Active Conditional Email 4							
Condition: Frequency Reference < 0 AND < 0 Hz							
Address: ToAddress4@ToDomain4 Subject: Subject4							
Message: This is the text for Fault 1.							
Save to device				Cancel and reload			

Figure 16 Email Alerts Tab View

Procedure: Conditional Email Set-up

1. Define the condition that will trigger the email by selecting a monitor parameter, a comparator, and a value. Set up comparator values for the range of values to check in the chosen condition. If choosing only one condition and no OR or AND are needed, set the "OR/AND" drop-down selection to "NotUsed".
2. Enter the email address where the alert will be sent.
3. Enter the message that will appear in the email contents.
4. Enter the email subject.
5. Click the "Email Active" check box to enable the alert.

Clicking "Save to device" will save the entered information into the option memory.

Clicking "Cancel and reload" will cancel any pending edits and display the most recently saved settings from the option board.

7 Web Interface

■ Doc Links Tab (SI-EP3 firmware version VST800250 and prior)

The Doc links tab contains links to the option documentation on the Yaskawa website.



Email Alerts	Parameter Access	Configuration	Custom
Main	Drive Status	Network	Doc links

Document	Description	Link
Installation Guide	SI-EP3/V Profinet for V1000	
Technical Guide	SI-EP3/V Profinet for V1000	
Installation Guide	SI-EP3 Profinet for A1000/E1000/T1000	
Technical Guide	SI-EP3 Profinet for A1000/E1000/T1000	

NOTE: INTERNET CONNECTION REQUIRED TO ACCESS DOCUMENTS

Figure 17 Doc Links View

■ Parameter Access Tab

The Parameter Access tab allows the user to read and write parameters from the drive. Write access is restricted until a valid password is entered.



Main	Drive Status	Network	Doc links	Email Alerts	Parameter Access	Configuration	Custom
------	--------------	---------	-----------	--------------	------------------	---------------	--------

Modbus Parameters

Modbus Address (hex):

Decimal Value:

Hex Value:

Status: **Waiting**

Figure 18 Parameter Access Tab View

The MEMOBUS/Modbus address for the drive parameter being accessed must be entered in hexadecimal. The number must begin with “0x” to signify hexadecimal.

Clicking “Read” will load and display the current value of the given MEMOBUS/Modbus Address. Clicking “Set” will save the given value to the given MEMOBUS/Modbus address.

After a “Read” or “Set” command is given, Status will display “Waiting” while the action is being carried out, then “Complete” is displayed when finished.

7 Web Interface

■ Configuration Tab

The Configuration tab sets web page behavior parameters. Access is restricted unless a valid password is entered.

The screenshot displays the YASKAWA Configuration Tab web interface. At the top, the YASKAWA logo is visible. Below it is a navigation bar with tabs: Main, Drive Status, Network, Doc links, Email Alerts, Parameter Access, Configuration (selected), and Custom. The main content area is divided into four sections:

- Security Login:** Includes a Password field, a Log out button, and a Status: **Logged in**.
- Change Password:** Includes New Password and Confirm Password fields, a Change password button, and a Status: **Idle**.
- Option Card:** Includes Applet Refresh Rate (ms) set to 1000 ms, radio buttons for Disabled (selected) and Enabled, Parameter Security radio buttons for Enabled (selected) and Disabled, a Save Option Card Parameters button, and a Status: **Idle**.
- Email Settings:** Includes Email Server IP (192.168.1.10), Email Port (25), and From' Email Address (sample@sample), with a Submit Email Parameters button.

A large button at the bottom reads "Save Configuration Parameters To Flash".

Figure 19 Configuration Tab View

Security Login

Enter a valid password and click “Log in”. The button text will change to “Log out” and the status will change to “Logged in”.

Note: The default security password is “yaskawa”.

This password can be changed in the “Change Password” section of the tab. Entering a valid password allows access to the settings in the Configuration tab, Email Alerts tab, and the Parameter Access tab.

Change Password

To change the password, enter the new password in the “New Password:” and “Confirm Password:” text boxes then click “Change password”. The Status display will change to “Idle” then “Changing Password” then “Password Changed”. If the passwords in the two text boxes do not match, the Status will display “Passwords don’t match”.

Option Card

The values displayed in the various tabs are refreshed at the rate defined in the “Applet Refresh Rate (ms)” text box. Enter values in the range of 1000 ms to 65.535 seconds.

Parameter Security can be enabled or disabled by clicking one of the radio buttons. When “Disabled” is selected, no password is necessary and all functions in the web pages will be available. When “Enabled” is selected, a valid password must be entered to edit email settings and to write parameters.

Email Settings

The “Email Server IP” text box must contain the IP address of the email server. The subnet address is configured in drive parameters F7-05 through F7-08. The configured email alerts will use the server at this address when sending emails.

Enter the email server port in the “Email Port” text box.

The value in the “From’ Email Address” text box identifies the origin of the email alerts to the recipient.

Click “Submit Email Parameters” to save the email settings to the option.

Click “Save Configuration Parameters to Flash” to save the entered values from this tab into non-volatile memory. These values will then be remembered after cycling power.

General Settings

Click “Save Options Card Parameters” to save the Applet Refresh Rate and the Parameter Security settings to the option.

7 Web Interface

■ Custom Tab (SI-EP3 firmware version VST800250 and prior)

The Custom tab displays a selection of quick setting parameters.



Main	Drive Status	Network	Doc links
Email Alerts	Parameter Access	Configuration	Custom

Drive Startup

Frequency Source:

Control Source:

Acceleration Time: sec

Deceleration Time: sec

Frequency Upper Limit: %

Frequency Lower Limit: %

Graph Monitor Address:

Y

X

Monitor Value [x: Time, y: Value]

Figure 20 Custom Tab View

■ Custom Tab (SI-EP3 firmware version VST800251 and later)

The Custom tab displays a selection of quick setting parameters.



Main	Drive Status	Network	
Email Alerts	Parameter Access	Configuration	Custom

Graph Monitor

Graph Monitor Address:

Drive Startup

(b1-01) Frequency Source: ▾

(b1-02) Control Source: ▾

(c1-01) Acceleration Time: sec

(c1-02) Deceleration Time: sec

(d2-01) Frequency Upper Limit: %

(d2-02) Frequency Lower Limit: %

Monitor Value [x: Time, y: Value (Default: Output Frequency)]

Figure 21 Custom Tab View

7 Web Interface

◆ SI-EP3 Firmware Update

The Profinet SI-EP3 firmware can be updated to the most recent version.

1. Navigate to this URL:
<https://www.yaskawa.com/pycprd/partner/fmw-network-communications>
2. Enter your Partner Login credentials.
3. Download Communication Option Flash Write Procedure manual no.TOEPYAICOM14 for instructions on how to update the SI-EP3 firmware.
4. Download the *.YFlash file for your specific communication option to your PC.

8 Troubleshooting

◆ Drive-Side Error Codes

Drive-side error codes appear on the drive digital operator. Causes of the errors and corrective actions are listed in [Table 10](#). For additional error codes that may appear on the drive digital operator, refer to the drive Technical Manual.

■ Faults

Both bUS (SI-EP3 option communication error) and EF0 (External fault input from the SI-EP3 option) can appear as an alarm or as a fault. When a fault occurs, the digital operator ALM LED remains lit. When an alarm occurs, the ALM LED flashes.

If communication stops while the drive is running, use the following questions as a guide to help remedy the fault:

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

Table 10 Fault Display and Possible Solutions

LED Operator Display		Fault Name
bUS	bUS	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 (b1-01 = 3 or b1-02 = 3)
Cause		Possible Solution
Master controller (PLC) has stopped communicating		Check that power is supplied to the PLC Check that PLC is not in program mode
Communication cable is not connected properly		Check for faulty wiring Correct any wiring problems
A data error occurred due to noise		Check the various options available to minimize the effects of noise Counteract noise in the control circuit, main circuit, and ground wiring If a magnetic contactor is identified as a source of noise, install a surge absorber to the contactor coil Make sure the cable used meets the PROFINET requirements Make sure the option ground wire is connected between option FE terminal and the drive ground terminal connected to earth ground
Option is damaged		If there are no problems with the wiring and the error continues to occur, replace the option.

8 Troubleshooting

LED Operator Display		Fault Name
EFO	EF0	External fault input from option.
		The alarm function for an external device has been triggered.
Cause		Corrective Action
An external fault is being sent from the upper 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.

LED Operator Display		Fault Name
oFA00	oFA00	Option fault.
		Option is not properly connected.
Cause		Possible Solution
Non-compatible option connected to the drive		Connect an option that is compatible with the drive.

LED Operator Display		Fault Name
oFA01	oFA01	Option fault.
		Option is not properly connected.
Cause		Possible Solution
Problem with the connectors between the drive and option		Turn the power off and check the connectors between the drive and option.

LED Operator Display		Fault Name
oFA03	oFA03	Option fault.
		Option self-diagnostics error.
Cause		Possible Solution
Option hardware fault		Replace the option.

LED Operator Display		Fault Name
oFA04	oFA04	Option fault.
		Option flash write mode.
Cause		Possible Solution
Option hardware fault		Replace the option.

8 Troubleshooting

LED Operator Display		Fault Name
	oFA30 to oFA43	Option Fault (Port A).
		Communication ID error.
Cause		Possible Solution
Option hardware fault		Replace the option.

LED Operator Display		Fault Name
	oFb00	Option fault (CN5-B).
		Non-compatible option is connected.
Cause		Possible Solution
Non-compatible option connected to the drive.		Connect the correct option to CN5-A.

LED Operator Display		Fault Name
	oFb02	Option fault (CN5-B).
		Two of the same options are connected at the same time.
Cause		Possible Solution
Options AI-A3 or DI-A3 were connected to the CN5-B port while an option was already connected to CN5-A.		Only one type of AI-A3 or DI-A3 option can be connected to the drive. The SI-EP3 option can only be connected to CN5-A.

LED Operator Display		Fault Name
	oFc00	Option fault (CN5-C).
		Non-compatible option is connected.
Cause		Possible Solution
Non-compatible option connected to the drive.		Connect the correct option to CN5-A.

LED Operator Display		Fault Name
	oFc02	Option fault.
		Option flash write mode.
Cause		Possible Solution
Options AI-A3 or DI-A3 are connected to the CN5-B port with an option connected to CN5-A.		Only one type of AI-A3 or DI-A3 option can be connected to the drive. The SI-EP3 option can only be connected to CN5-A.

8 Troubleshooting

■ Minor Faults and Alarms

LED Operator Display		Minor Fault Name	
CALL	CALL	Serial communication transmission error.	
		Communication is not established.	
Cause		Possible Solution	Minor Fault (H2-□□ = 10)
Communication wiring is faulty, there is a short circuit, or improper connection		Check for wiring errors: Correct the wiring Remove 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 drive if the fault continues to occur	

■ bUS Error Auto-Reset

bUS Error Auto-Reset Function Description

bUS Error Auto-Reset when configured, allows the drive to automatically recover from a bUS error as a result of a communication loss with the host.

A bUS Error will automatically reset under the following conditions.

- Network communication between the host and the drive is restored. (bUS error removed)
- bUS Error Auto-Reset is enabled as described in this section.

Enabling bUS Error Auto-Reset

Parameter **F6-14**^{<1>} **bUS Error Auto Reset** enables the bUS Error Auto-Reset function. F6-14 becomes available when the option is installed on the drive.

1. Set parameter F6-14 = 1:Enabled
2. Set parameter F6-01 = 0:Ramp to Stop, 1:Coast to Stop, 2:Fast-Stop
3. Set parameter F7-16 = 0.1 to 10.0 seconds (optional)

Enabling bUS Error Auto-Restart (After a Time Delay)

Parameter **F7-16 Communication Loss Timeout** will delay the occurrence of a bUS error condition by the amount of time set in this parameter. F7-16 is set in tenths of seconds. The status LEDs on the option will indicate the bUS error condition immediately upon detection and during the F7-16 delay time. Refer to [Figure 21](#).

- Set parameter F7-16 = 0.1 to 10.0 seconds (0.0 setting disables F7-16) to enable timeout delay.

^{<1>}Available in SI-EP3/V firmware version VST800251 and later. Refer to [Table 15](#) for specifics relating to your drive and drive software version.

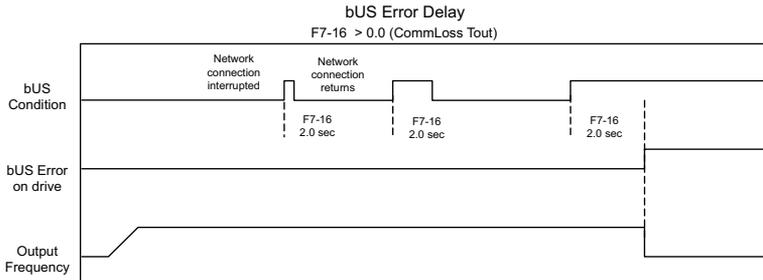


Figure 22 bUS Error Delay Timing Example

Related Parameters

Table 11 Parameters related to bUS Error Auto-Reset Functionality

No. (Addr. Hex)	Name	Description	Default
F6-01 (03A2)	Operation Selection after Communications Error	Determines drive response when a bUS error is detected during communications with the option. 0: Ramp to Stop 1: Coast to Stop 2: Fast-Stop 3: Alarm Only <2> 4: Alarm (d1-04) <5> 5: Alarm Ramp to Stop <5>	1
F6-14 <5> (03BB)	bUS Error Auto Reset	0: Disabled 1: Enabled	0
F7-16 <5> (03F4)	Communication Loss Timeout	Sets the timeout value for communication loss detection in tenths of a second. A value of 0 disables the connection timeout. Example: An entered value of 100 represents 10.0 seconds. Note: A change to this parameter setting is not effective until main power to the drive is cycled.	0.0

<2> If F6-01 is set to 3, then the drive will continue to operate when a bUS error is detected. Use caution and proper safety measures, when installing an emergency stop switch.

<5> The availability of this feature/function depends on drive model, software version and Profinet firmware version. Refer to [Table 15](#) for specifics relating to your drive.

8 Troubleshooting

■ Option Fault Monitors U6-98 and U6-99

The option can declare error/warning conditions via drive monitor parameters on the drive digital operator as shown in [Table 12](#).

Table 12 Option Fault Monitor Descriptions

Fault Condition	Fault Declared	Status Value (U6-98/U6-99)	Description
No Fault	n/a	0	No faults.
Force Fault	EF0	3	Network sent a message to force this node to the fault state.
Network Link Down	BUS ERROR	1300	No network link to option board.
Network Failure	BUS ERROR	1301	Connection with PLC Timeout.
Default MAC Address	None	1303	Factory default MAC Address programmed into the option. Return for reprogramming.
No IP Address	None	1304	No IP Address has been programmed into the option.
No Station Name	None	1305	No Station Name has been programmed into the option.
Config Error	None	1306	Configuration error on power-up.
Init. Failure	None	1307	Initialize error on power-up.
Permanent Communication Loss	BUS ERROR	1308	Fatal error in MAC/PHY hardware, requires power cycle to recover.

Two drive monitor parameters, U6-98 and U6-99, assist in network troubleshooting:

- U6-98 displays the first declared fault since the last power cycle. U6-98 is only cleared upon drive power-up.
- U6-99 displays the present option SI-EP3 status. U6-99 is cleared upon a network-issued fault reset and upon power-up.

If another fault occurs while the original fault is still active, parameter U6-98 retains the original fault value and U6-99 stores the new fault status value.

■ Option Compatibility

A limited number of options may be simultaneously connected to the drive depending on the type of option. Refer to [Table 13](#) for more information. More details can be found in the Options and Peripheral Devices chapter of the drive Technical Manual.

Table 13 Option Installation Compatibility

Option	Connector	Number of Possible Options
SI-C3, SI-N3, SI-P3, SI-S3, SI-EP3, SI-EN3, SI-EM3 <1>	CN5-A	1
PG-B3, PG-X3	CN5-B, C	2 <2>
DO-A3, AO-A3, AI-A3, DI-A3	CN5-A, B, C	1

<1> When installed in CN5-A, the AI-A3 and DI-A3 options can be used to set the frequency reference or replace the drive analog inputs with higher resolution. When installed in CN5-B or CN5-C, these options can only be used for monitoring; their input levels will be displayed in U1-17 or U1-21 to U1-23.

<2> Use the CN5-C connector when connecting only one option to the drive; use both CN5-B and CN5-C when connecting two options.

9 Specifications

Table 14 Option Specifications

Item	Specification
Model	SI-EP3 option
Option Conformance	Passed PROFINET Conformance Class A
Connector Type	Dual RJ45 8-pin Shielded Twisted Pair CAT 5e cable
Physical Layer Type	Isolated Physical Layer
IP Address Setting	Programmable from drive keypad or network
Communication Speed	Programmable from drive keypad or network: 10/100 Mbps, auto-negotiate.
Number of Connections	1 PLC connection, 1 supervisor connection, 2 web page connections
Duplex Mode	Half-forced, Auto-negotiate, Full-forced
Address Startup Mode	Static, DCP
Ambient Temperature	-10 °C to +50 °C
Humidity	Up to 95% RH (no condensation)
Storage Temperature	-20 °C to +60 °C (allowed for short-term transport of the product)
Area of Use	Indoor (free of corrosive gas, airborne particles, etc.)
Altitude	Up to 1000 m
PROFINET Functions	PROFINET IO Configurable I/O in cyclic messages Drive diagnostic alarms I&M0
IEC Overvoltage Category	Intended for use in "Overvoltage Category II" as specified in IEC 60664-1

◆ Profinet Feature Function Availability by Drive Software Version

The following table details availability of certain software version dependant features or functions when using the Profinet SI-EP3 option with a Yaskawa drive.

**Table 15 Feature/Function Availability by Drive Software Version
(When used with SI-EP3 Firmware VST800251)**

Feature/function	Drive Model No.	Feature/ function is available	Minimum Drive Software Version Required
A1000 Series Model CIMR-AU			
F6-01 - Operation Selection after Communications Error Settings 4 & 5	2A□□□□ 4A□□□□ 5A□□□□	Yes	VSA901021
	4A0930□□□□ 4A1200□□□□	No	N/A
F6-14 - bUS Error Auto Reset	2A□□□□ 4A□□□□ 5A□□□□	Yes	All
	4A0930□□□□ 4A1200□□□□	Yes	VSA903014
F7-14 - Duplex Mode Selection Settings 3 thru 8	2A□□□□ 4A□□□□ 5A□□□□	Yes	VSA901021
	4A0930□□□□ 4A1200□□□□	No	N/A
F7-15 - Communication Speed Selection 101: 10 (port 1)/100 Mbps (port 2) 102: 100 (port 1)/10 Mbps (port 2)	2A□□□□ 4A□□□□ 5A□□□□	Yes	VSA901021
	4A0930□□□□ 4A1200□□□□	No	N/A
F7-16 - Communication Loss Timeout	2A□□□□ 4A□□□□ 5A□□□□	Yes	All
	4A0930□□□□ 4A1200□□□□	Yes	VSA903014

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Feature/function	Drive Model No.	Feature/function is available	Minimum Drive Software Version Required
iQpump1000 Series CIMR-PW			
F6-01 - Operation Selection after Communications Error Settings 4 & 5	2A□□□□ 4A□□□□ 5A□□□□	No	N/A
	4A0930□□□ 4A1200□□□	No	N/A
F6-14 - bUS Error Auto Reset	2A□□□□ 4A□□□□ 5A□□□□	Yes	All
	4A0930□□□ 4A1200□□□	Yes	VSA903750
F7-14 - Duplex Mode Selection Settings 3 thru 8	2A□□□□ 4A□□□□ 5A□□□□	No	N/A
	4A0930□□□ 4A1200□□□	No	N/A
F7-15 - Communication Speed Selection 101: 10 (port 1)/100 Mbps (port 2) 102: 100 (port 1)/10 Mbps (port 2)	2A□□□□ 4A□□□□ 5A□□□□	No	N/A
	4A0930□□□ 4A1200□□□	No	N/A
F7-16 - Communication Loss Timeout	2A□□□□ 4A□□□□ 5A□□□□	Yes	All
	4A0930□□□ 4A1200□□□	Yes	VSA903750
P1000 Series CIMR-PU			
F6-01 - Operation Selection after Communications Error Settings 4 & 5	2A□□□□ 4A□□□□ 5A□□□□	No	N/A
	4A0930□□□ 4A1200□□□	No	N/A
F6-14 - bUS Error Auto Reset	2A□□□□ 4A□□□□ 5A□□□□	Yes	All
	4A0930□□□ 4A1200□□□	Yes	VSA903700

9 Specifications

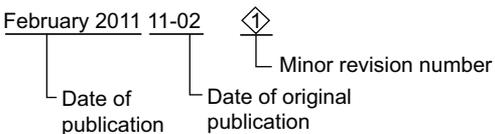
Feature/function	Drive Model No.	Feature/function is available	Minimum Drive Software Version Required
F7-14 - Duplex Mode Selection Settings 3 thru 8	2A□□□□ 4A□□□□ 5A□□□□	No	N/A
	4A0930□□□□ 4A1200□□□□	No	N/A
F7-15 - Communication Speed Selection 101: 10 (port 1)/100 Mbps (port 2) 102: 100 (port 1)/10 Mbps (port 2)	2A□□□□ 4A□□□□ 5A□□□□	No	N/A
	4A0930□□□□ 4A1200□□□□	No	N/A
F7-16 - Communication Loss Timeout	2A□□□□ 4A□□□□ 5A□□□□	Yes	All
	4A0930□□□□ 4A1200□□□□	Yes	VSA903700

9 Specifications

◆ Revision History

Revision dates and manual numbers appear on the bottom of the back cover.

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September 2014	1	5, 6, 7, 8, 9	Updated contents to support SI-EP3 firmware VST800251. Bus tolerance parameters added. New GSDML file.
February 2011	–	–	First edition

YASKAWA AC Drive 1000-Series Option

PROFINET

Installation Manual

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In the event that the end user of this product is to be the military and said product is to be employed in any weapons systems or the manufacture thereof, the export will fall under the relevant regulations as stipulated in the Foreign Exchange and Foreign Trade Regulations. Therefore, be sure to follow all procedures and submit all relevant documentation according to any and all rules, regulations and laws that may apply.

Specifications are subject to change without notice for ongoing product modifications and improvements.

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