

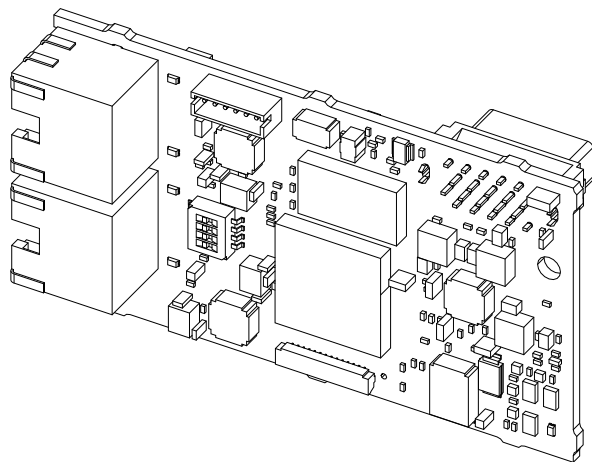
YASKAWA AC Drive Option

PROFINET

Technical Manual

Model JOHB-SMP3

To correctly use the product, read this manual thoroughly and keep it for easy reference, inspection, and maintenance.
Make sure that the end user receives this manual.



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1 Preface and Safety

YASKAWA Electric supplies component parts for use in a wide variety of industrial applications. The selection and application of YASKAWA products remain the responsibility of the equipment designer 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 products designed to incorporate a component part 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 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

Document	Description
JOHB-SMP3 Multi-Protocol EtherNet Quick Setup Procedure Document No. TOBP C730600 0H	Read this manual first. The manual provides information about wiring, settings, functions, and troubleshooting. The manual is packaged together with the product.
YASKAWA AC Drive Option PROFINET Technical Manual Document No. SIEP C730600 0K (This book)	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 Other areas: Check the back cover of these manuals. For questions, contact Yaskawa or a Yaskawa representative.
YASKAWA AC Drive Manuals	Refer to the drive manual to connect with the option. Drive manuals contain basic installation and wiring information in addition to detailed parameter setting, fault diagnostic, and maintenance information. The manuals also include important information about parameter settings and tuning the drive. The Quick Start Guides are packaged with the drive. The most recent versions of these manuals are available for download on our documentation websites: U.S.: http://www.yaskawa.com Europe: http://www.yaskawa.eu.com Japan: http://www.e-mechatronics.com Other areas: Check the back cover of these manuals. For questions, contact Yaskawa or a Yaskawa representative.

◆ Glossary

Term	Definition
Option	YASKAWA AC Drive Option JOHB-SMP3 with DIP switches set for PROFINET
Keypad	<ul style="list-style-type: none"> • HOA Operator • LCD Operator • LED Operator • HOA Keypad • LCD Keypad • LED Keypad
Hex. (Example: 900 (Hex.))	Identifies a unit for hexadecimal number format.

◆ Registered Trademarks

- PROFINET is a registered trademark of PROFIBUS and PROFINET International (PI).
- Trademarks are the property of their respective owners.

◆ 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 This signal word identifies a hazard that will cause serious injury or death if you do not prevent it.

⚠ WARNING This signal word identifies a hazard that can cause death or serious injuries if you do not prevent it.

⚠ CAUTION This signal word identifies a hazardous situation, which, if not avoided, can cause minor or moderate injury.

NOTICE This signal word identifies a property damage message that is not related to personal injury.

■ Section Safety

General Precautions

- The diagrams in this section may include options and drives without covers or safety shields to illustrate details. Be sure to reinstall covers or shields before operating any devices. The option should be used according to the instructions described in this manual.
- The diagrams in this manual are provided as examples only and may not pertain to all products covered by this manual.
- 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.
- Contact Yaskawa or a Yaskawa representative and provide the manual number shown on the front cover to order new copies of the manual.

⚠ DANGER Do not ignore the safety messages in this manual. If you ignore the safety messages in this manual, it will cause serious injury or death. The manufacturer is not responsible for injuries or damage to equipment.

⚠ WARNING Electrical Shock Hazard. Do not modify the drive or option circuitry. Failure to obey can cause serious injury or death, or cause damage to the drive or option and will void warranty. Yaskawa is not responsible for modifications of the product made by the user.

NOTICE Damage to Equipment. Do not use steam or other disinfectants to fumigate wood for packaging the drive. Use alternative methods, for example heat treatment, before you package the components. Gas from wood packaging fumigated with halogen disinfectants, for example fluorine, chlorine, bromine, iodine or DOP gas (phthalic acid ester), can cause damage to the drive.

2 Overview

This option provides a communications connection between the drive and a PROFINET network. The option connects the drive to a PROFINET network and facilitates the exchange of data.

PROFINET is a communications link to connect industrial devices (for example smart motor controllers, operator interfaces, and variable frequency drives) and control devices (for example, programmable controllers and computers) to a network. PROFINET is a simple networking solution. PROFINET decreases the cost and time to wire and install factory automation devices, and it gives the option to interchange like components from other vendors.

PROFINET is an open network standard.

Install the option on a drive to perform the following functions from a PROFINET IO-Controller:

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

JOHB-SMP3 is PROFINET Conformance Class A certified.

◆ Compatible Products

You can use the option with these products:

Table 2.1 Compatible Products

Product Series	Model(s)	Software Version ^{*1}
A1000	CIMR-Ax2Axxxx	≥ 1020
	CIMR-Ax4A0002 - 4A0675	
	CIMR-Ax4A0930, 4A1200	≥ 3015
	CIMR-Ax5Axxxx	≥ 5040 ≥ 1017
U1000	CIMR-UxxAxxxx	≥ 1015
	CIMR-UxxExxxx	
	CIMR-UxxPxxxx	
	CIMR-UxxWxxxx	

Product Series	Model(s)	Software Version ^{*1}
Z1000	CIMR-ZxxAxxxx	≥ 1016
Z1000U	CIMR-ZxxUxxxx	≥ 6113
	CIMR-ZxxExxxx	
	CIMR-ZxxPxxxx	
	CIMR-ZxxWxxxx	
	CIMR-ZxxWxxxx	
CR700	CIPR-CR70xxxxx	≥ 1012
FP605	CIPR-FP65xxxxx	≥ 1010
GA500	CIPR-GA50xxxxx	≥ 1010
GA700	CIPR-GA70xxxxx	≥ 1010
GA800	CIPR-GA80xxxxx	≥ 9010
HV600	CIPR-HV60xxxxx	≥ 1011

*1 Refer to “PRG” on the drive nameplate for the software version number.

Note:

- Refer to the option package labeling in the field designated “PRG (four digit number)” to identify the option software version.
- For Yaskawa customers in the North or South America regions:
If your product is not listed in [Table 2.1](#), refer to the web page below to confirm this manual is correct for your product. The web page provides a list of option manuals by product, and a direct link to download a PDF of the manual.

Scan QR code Or refer to:

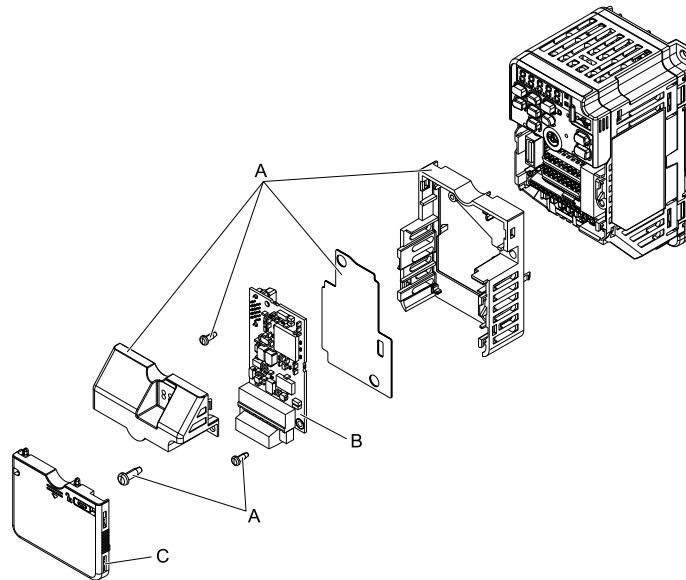
<http://www.yaskawa.com/optionlookup>



◆ **Install the Option on a GA500 Drive**

An option card mounting kit is necessary to install the option on a GA500 drive. The option card mounting kit model is: JOHB-GA50. This kit is sold separately.

Refer to the option card mounting kit manual for more information about installation.



A - Option card mounting kit components (sold separately)

C - Drive front cover

B - Option

Figure 2.1 Option Card Mounting Kit (JOHB-GA50)

3 Receiving

After you receive the option package:

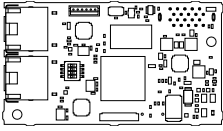





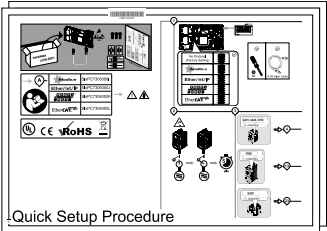
- Make sure that there is no damage to the option and no parts are missing. The Yaskawa warranty does not include damage from shipping. If there is damage to the option or other parts, contact the shipping company immediately.

NOTICE *Damage to Equipment. Do not use damaged parts to connect the drive and the option. Failure to comply could damage the drive and option.*

- Make sure that the model number on the option nameplate and the model number on the purchase order are the same. Refer to [Figure 4.1](#) for more information.
- Contact the distributor where you purchased the option or contact Yaskawa or a Yaskawa representative about any problems with the option.

◆ Option Package Contents

Table 3.1 Contents of Package

Option Contents		Quantity
Option		1
Ground Wire ^{*1}		1
Screws (M3)		3 ^{*2}
LED Labels ^{*3}	1000-Series, Z1000U 	1
	GA500, GA700, GA800, CR700 	1
	Z1000, HV600, FP605 ^{*4} 	1
Quick Setup Procedure		1

*1 GA500, GA700, GA800, and CR700 drives do not use the ground wire.

*2 GA700, GA800, CR700, HV600, and FP605 drives use two screws only.

*3 LED labels are located on this label sheet.

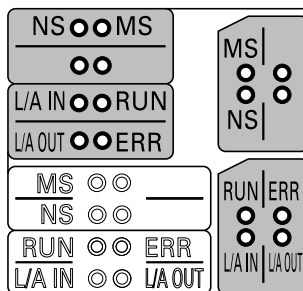


Figure 3.1 LED Label Sheet

4 Option Components

*4 The LED label has transparent background and white letters. Please make sure that you use the correct label for Z1000, HV600, or FP605.

◆ Installation Tools

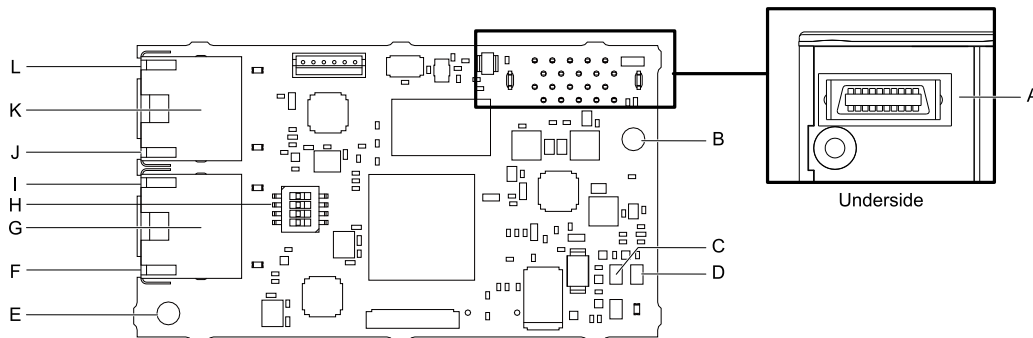
You can use these tools to install the option to the drive:

- A Phillips screwdriver or slotted screwdriver *1.
- Non-conductive tweezers or a tool with a tip width of approximately 0.5 mm (0.02 in) to set DIP switch S1.
- A pair of diagonal cutting pliers.
- A small file or medium-grit sandpaper.

*1 Phillips screw sizes are different for different drive capacities. Prepare different screwdrivers for different screw sizes.

4 Option Components

◆ Option PCB Components



A - Connector (CN5)

B - Installation hole

C - LED (NS) *1

D - LED (MS) *1

E - Ground terminal (FE) and installation hole *2

F - Port 2 LED (10/100) *1

G - Option modular connector CN1B (Port 2) (RJ45)

H - DIP switch S1

I - Port 2 LED (LINK/ACT) *1

J - Port 1 LED (10/100) *1

K - Option modular connector CN1A (Port 1) (RJ45)

L - Port 1 LED (LINK/ACT) *1

Figure 4.1 Option PCB Components

*1 Refer to [Option LED States on page 11](#) for more information about the LEDs.

*2 Connect the included ground wire during installation. The ground wire is not necessary for installation on GA700, GA800, and CR700 drives. For GA500 drives, connect the included ground wire to the separately-sold communication option case (model: JOHB-GA50).

◆ Communication Connector

Option connections CN1A (Port 1) and CN1B (Port 2) are connection points for customer-supplied PROFINET network communication cables. These ports accept customer-supplied male 8-way ethernet modular RJ45 connectors.

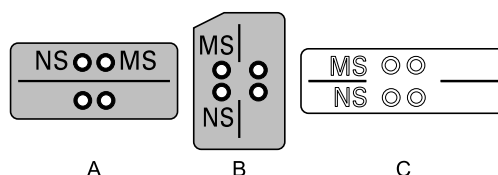
Table 4.1 Male 8-way Ethernet Modular Connector (Customer-Supplied)

Male 8-way Ethernet 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
	5 (Pair 1)	Not used
	6 (Pair 3)	Receive data (RXD) -
	7 (Pair 4)	Not used
	8 (Pair 4)	Not used

◆ Option LED States

The option has four LEDs:

- Bi-color Status LEDs:
 - Module status (MS) red/green
 - Network status (NS) red/green
- Ethernet Port LEDs (2 each):
 - Network speed-10/100 green
 - Link status and network activity-Link/Act green



A - 1000-Series, Z1000U

B - GA500, GA700, GA800, CR700

C - Z1000, HV600, FP605 *1

Figure 4.2 Option LED Labels

*1 LED label has transparent background and white letters. Please make sure that you use the correct label for Z1000, HV600, or FP605.

Wait 2 seconds minimum for the power-up diagnostic process to complete before you verify the LED states. Table 4.2 shows the operating status of the option LEDs after the power-up diagnostic LED sequence is complete. The number in parentheses in the "Display" column is the number of pulses of 250 ms ON and 250 ms OFF. When the ON and OFF pulses complete for the number of times in parentheses, LED will be 500 ms OFF, then repeat the cycle of ON and OFF for the number of times.

Refer to Table 4.3 for more information about the LEDs.

Table 4.2 Option LED States

LED Name	Indication		Operating State	Description
	Color	Display		
MS	-	OFF	Power supply off	There is no power 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	Set by the hardware configuration tool for identification purposes.
	Red	ON	Default MAC or bad webpage configuration.	The default MAC address is programmed or the option detected an issue with the webpage configuration.
	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 (5)	EF0 (Forced Fault)	Forced fault from the network.
	Red/Green	Flashing	Option self-test	The option is in self-test mode.
NS	-	OFF	Power supply OFF or Offline	-
	Green	ON	Connected	Connection established with IO-Controller and in RUN mode.
	Green	Flashing	Connected and stopped	Connection established with IO-Controller and in STOP mode.
	Red	Flashing (1)	Lost communication	Host communication is temporarily lost.
	Red	Flashing (2)	Lost link	No link detected to network.
	Red	Flashing (3)	IP configuration error	The configured IP addresses are incompatible. The IP Address (F7-01 to F7-04) does not agree with the Subnet Mask (F7-05 to F7-08) and/or the Gateway Address (F7-09 to F7-12). This will clear the fault automatically.
10/100 *1	Green	OFF	10 Mbps is established	-

5 Installation Procedure

LED Name	Indication		Operating State	Description
	Color	Display		
LINK/ACT *1	Green	ON	100 Mbps is established	
	-	OFF	Link is not established	
	Green	ON	Link is established	
	Green	Flashing	Link is established and there is network activity	

*1 To verify LED states, you must remove the drive front cover. Do not touch the drive main circuit terminal or circuit boards when you remove the drive front cover.

■ Power-Up Diagnostics

An LED test is performed each time the drive is powered up. The initial boot sequence can take several seconds. After the LEDs complete the diagnostic LED sequence, the option is successfully initialized. The LEDs then assume operational conditions as shown in [Table 4.3](#).

Table 4.3 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 examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, measure for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.*

⚠ WARNING *Electrical Shock Hazard. Do not operate the drive when covers are missing. Replace covers and shields before you operate the drive. Use the drive only as specified by the instructions. Some figures in this section include drives without covers or safety shields to more clearly show the inside of the drive. If covers or safety shields are missing from the drive, it can cause serious injury or death.*

⚠ WARNING *Electrical Shock Hazard. Only let approved personnel install, wire, maintain, examine, replace parts, and repair the drive. If personnel are not approved, it can cause serious injury or death.*

⚠ WARNING *Electrical Shock Hazard. Do not remove covers or touch circuit boards while the drive is energized. If you touch the internal components of an energized drive, it can cause serious injury or death.*

⚠ WARNING *Electrical Shock Hazard. Do not use damaged wires, put too much force on the wiring, or cause damage to the wire insulation. Damaged wires can cause serious injury or death.*

⚠ WARNING *Fire Hazard. Tighten all terminal screws to the correct tightening torque. Connections that are too loose or too tight can cause incorrect operation and damage to the drive. Incorrect connections can also cause death or serious injury from fire.*

NOTICE *Damage to Equipment. When you touch the option, make sure that you observe correct electrostatic discharge (ESD) procedures. If you do not follow procedures, it can cause ESD damage to the drive circuitry.*

NOTICE *Damage to Equipment. Do not de-energize the drive while the drive is outputting voltage. Incorrect equipment sequencing can cause damage to the drive.*

NOTICE *Do not operate a drive or connected equipment that has damaged or missing parts. You can cause damage to the drive and connected equipment.*

NOTICE *Use Yaskawa connection cables or recommended cables only. Incorrect cables can cause the drive or option to function incorrectly.*

NOTICE *Damage to Equipment. Correctly connect the connectors. Incorrect connections can cause malfunction or damage to the equipment.*

NOTICE *Damage to Equipment. Make sure that all connections are correct after you install the drive and connecting peripheral devices. Incorrect connections can cause damage to the option.*

◆ Settings for DIP Switch S1

Use the DIP switch S1 on the option to select the communication protocol.

Use non-conductive tweezers or a tool with a tip width of approximately 0.5 mm (0.02 in) to set DIP switch S1.

Figure 5.1 shows the default settings for DIP switch S1.

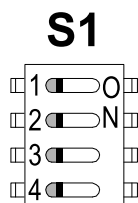


Figure 5.1 Default Settings for DIP Switch S1

When you use PROFINET, set DIP switch S1 as shown in Figure 5.2.

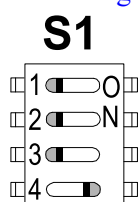


Figure 5.2 PROFINET Settings for DIP Switch S1

Note:

If you set the DIP switch for a different protocol, it will erase all user-entered data from the JOHB-SMP3, including the Station Name.

◆ Procedures to Install and Wire Options on a Drive

Procedures to install and wire the option are different for different drive models.

Refer to Table 5.1 to check the procedures to install and wire the option on a drive.

Table 5.1 Procedures to Install and Wire Options on a Drive

Product Series	Procedures to Install and Wire Options on a Drive	Page
A1000	Procedure A	13
U1000	Procedure A	13
Z1000U	Procedure A	13
Z1000	Procedure B	15
GA500	*1	-
GA700	Procedure C	17
GA800	Procedure C	17
CR700	Procedure C	17
HV600	Procedure D	18
FP605	Procedure D	18

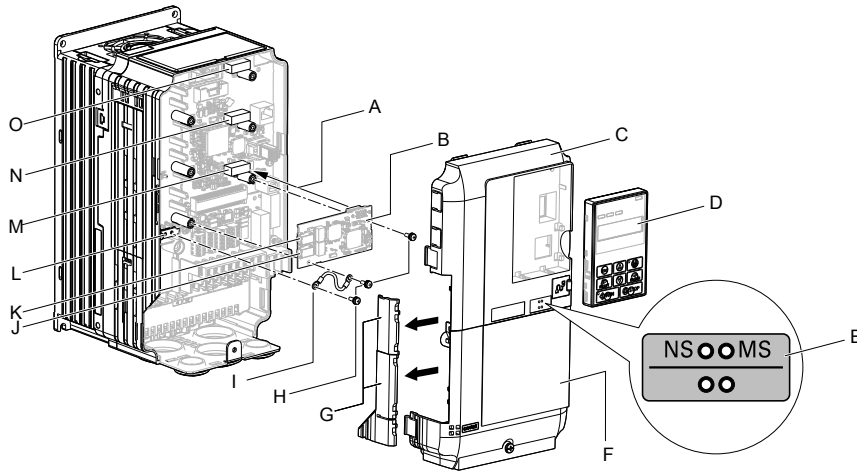
*1 To install the option on GA500 drives, use the option mounting kit (JOHB-GA50) and manual.

■ Procedure A

This section shows the procedure to install and wire the option on a 1000-series drive.

Prepare the Drive for the Option

Correctly wire the drive as specified by the manual packaged with the drive. Make sure that the drive functions correctly. Refer to the drive manuals for more information.



- | | |
|--|---|
| <p>A - Insertion point for CN5 connector
 B - Option
 C - Drive front cover
 D - Keypad
 E - LED label
 F - Drive terminal cover
 G - Removable tabs for wire routing
 H - Included screws</p> | <p>I - Ground wire
 J - Option modular connector CN1B (Port 2) (RJ45)
 K - Option modular connector CN1A (Port 1) (RJ45)
 L - Drive grounding terminal (FE)
 M - Connector CN5-A
 N - Connector CN5-B (Not available for communication option installation.)
 O - Connector CN5-C (Not available for communication option installation.)</p> |
|--|---|

Figure 5.3 Drive Components with Option

Install the Option

⚠ DANGER *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, measure for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.*

NOTICE *Damage to Equipment. When you touch the option, make sure that you observe correct electrostatic discharge (ESD) procedures. If you do not follow procedures, it can cause ESD damage to the drive circuitry.*

Note:

You can only install this option into the CN5-A connector on the drive control board.

1. Shut off power to the drive and wait for the time specified on the drive warning label at a minimum. Make sure that the charge indicator LED is unlit, then remove the keypad and front cover. Refer to the drive manuals for more information.
2. Remove the keypad (D), front cover (C), and terminal cover (F).
3. Put the LED label (E) in the correct position on the drive front cover (C).
4. Install the option (B) into the CN5-A connector (M) on the drive and use the included screws (H) to put it in place.
5. Use one of the remaining included screws (H) to connect one end of the ground wire (I) to the ground terminal (L). Use the last remaining included screw (H) to connect the other end of the ground wire (I) to the remaining ground terminal and installation hole on the option (B).
Tighten the screws to a correct tightening torque:
 - 0.5 N·m to 0.6 N·m (4.4 lbf-in to 5.3 lbf-in)

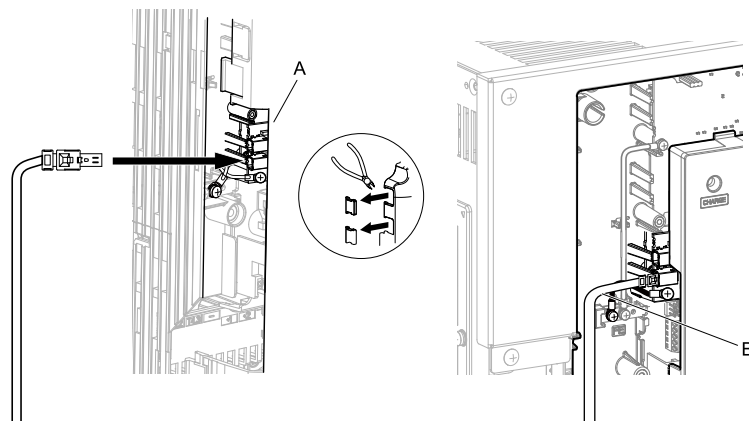
Note:

The drive has only two ground terminal screw holes. When you connect three options, two options will share one ground terminal.

6. Route the option wiring.
Procedures to wire the option are different for different drive models.
 - You can route the option wiring through openings on the front cover of some models. Remove the perforated tabs on the left side of the front cover as shown in Figure 5.4-A to create the necessary openings on these models. To prevent damage to the cable from the cut end, treat the cut surface with sandpaper.
 - Route the option wiring inside the enclosure as shown in Figure 5.4-B.
Refer to the drive manuals for more information.

Note:

Isolate communication cables from main circuit wiring and other electrical and power lines.



- A - Route wires through the openings provided on the left side of the front cover. ^{*1}** **B - Use the open space provided inside the drive to route option wiring.**

Figure 5.4 Wire Routing Examples

*1 If there is wiring outside the enclosure, the drive will not meet Enclosed wall-mounted type (IP20/UL Type 1) requirements.

7. Firmly connect the Ethernet communication cables to CN1B (Port 2) (J), and/or CN1A (Port 1) (K). Isolate communication cables from main circuit wiring and other electrical and power lines. Make sure that you firmly connect the cable end. Refer to [Communication Cable Specifications on page 20](#) for more information.
8. Reattach the front cover (C), terminal cover (F), and keypad (D). Refer to the drive manuals for more information.

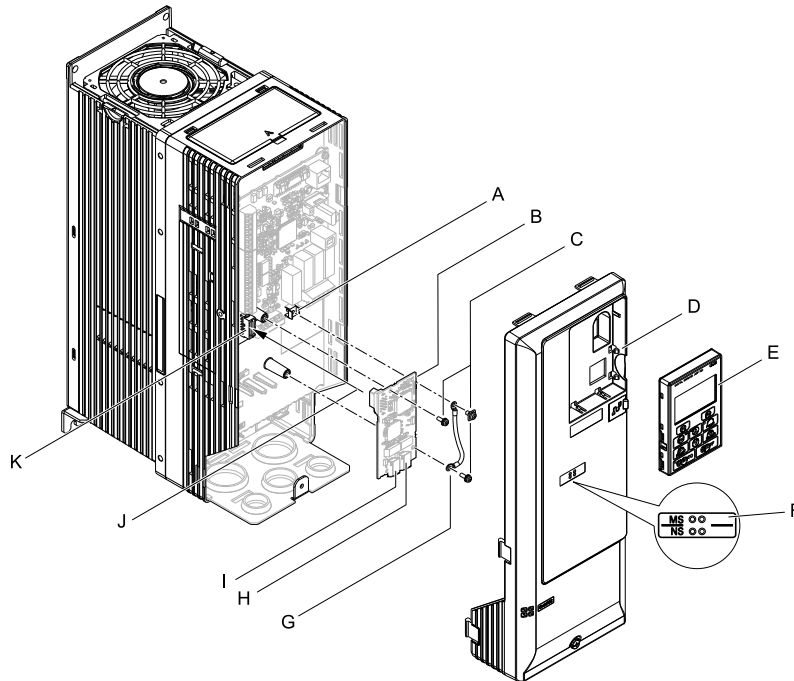
NOTICE Do not pinch cables between the front covers and the drive. Failure to comply could cause erroneous operation.
9. Set drive parameters in [Related Drive Parameters on page 22](#) for correct option performance.

■ Procedure B

This section shows the procedure to install and wire the option on a Z1000 drive.

Prepare the Drive for the Option

Correctly wire the drive as specified by the manual packaged with the drive. Make sure that the drive functions correctly. Refer to the drive manuals for more information.



- | | |
|--|--|
| A - Drive grounding terminal (FE) | G - Ground wire |
| B - Option | H - Option modular connector CN1B (Port 2) (RJ45) |
| C - Included screws | I - Option modular connector CN1A (Port 1) (RJ45) |
| D - Drive front cover | J - Insertion point for CN5 connector |
| E - Keypad | K - Connector CN5 |
| F - LED label | |

Figure 5.5 Drive Components with Option

Install the Option

⚠ DANGER *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, measure for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.*

NOTICE *Damage to Equipment. When you touch the option, make sure that you observe correct electrostatic discharge (ESD) procedures. If you do not follow procedures, it can cause ESD damage to the drive circuitry.*

- Shut off power to the drive and wait for the time specified on the drive warning label at a minimum. Make sure that the charge indicator LED is unlit, then remove the keypad and front cover. Refer to the drive manuals for more information.
- Remove the keypad (E) and front cover (D).
- Put the LED label (F) in the correct position on the drive front cover (D).
- Install the option (B) into the CN5 connector (K) on the drive and use one of the included screws (C) to put it in place.
- Use one of the remaining included screws (C) to connect one end of the ground wire (G) to the ground terminal (A). Use the last remaining included screw (C) to connect the other end of the ground wire (G) to the remaining ground terminal and installation hole on the option (B).
Tighten the screws to a correct tightening torque:
 - 0.5 N·m to 0.6 N·m (4.4 lbf·in to 5.3 lbf·in)
- Firmly connect the Ethernet communication cables to CN1B (Port 2) (H), and/or CN1A (Port 1) (I). Isolate communication cables from main circuit wiring and other electrical and power lines. Make sure that you firmly connect the cable end. Refer to [Communication Cable Specifications on page 20](#) for more information.
- Reattach the drive front cover (D) and the keypad (E). Refer to the drive manuals for more information.

NOTICE *Do not pinch cables between the front covers and the drive. Failure to comply could cause erroneous operation.*

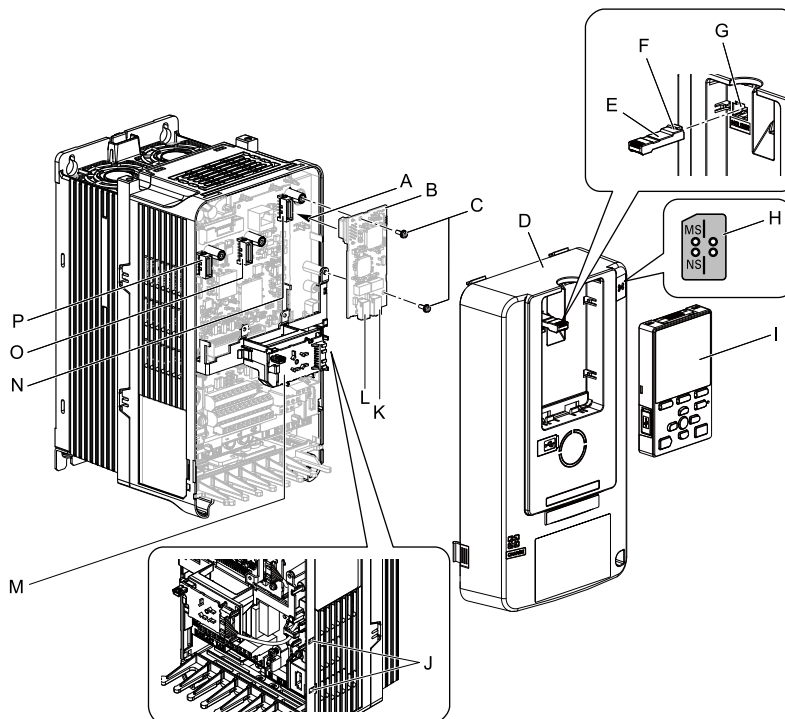
8. Set drive parameters in [Related Drive Parameters on page 22](#) for correct option performance.

■ Procedure C

This section shows the procedure to install and wire the option on a GA700, GA800 or CR700 drive.

Prepare the Drive for the Option

Correctly wire the drive as specified by the manual packaged with the drive. Make sure that the drive functions correctly. Refer to the drive manuals for more information.



- | | |
|---------------------------------------|--|
| A - Insertion point for CN5 connector | I - Keypad |
| B - Option | J - LED Status Ring board temporary placement holes |
| C - Included screws | K - Option modular connector CN1B (Port 2) (RJ45) |
| D - Drive front cover | L - Option modular connector CN1A (Port 1) (RJ45) |
| E - Keypad connector | M - LED Status Ring board |
| F - Keypad connector tab | N - Connector CN5-A |
| G - Holder | O - Connector CN5-B (Not available for communication option installation.) |
| H - LED label | P - Connector CN5-C (Not available for communication option installation.) |

Figure 5.6 Drive Components with Option

Install the Option

⚠ DANGER *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, measure for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.*

NOTICE *Damage to Equipment. When you touch the option, make sure that you observe correct electrostatic discharge (ESD) procedures. If you do not follow procedures, it can cause ESD damage to the drive circuitry.*

Note:

You can only install this option into the CN5-A connector on the drive control board.

1. Put the LED label (H) in the correct position on the drive front cover (D).
2. Shut off power to the drive and wait for the time specified on the drive warning label at a minimum. Make sure that the charge indicator LED is unlit, then remove the keypad and front cover. Refer to the drive manuals for more information.

3. Remove the keypad (I) and front cover (D).

Note:

Remove the keypad, then move the keypad connector (E) to the holder (G) on the drive, then remove the front cover.

4. Carefully remove the LED Status Ring board (M) and put it in the temporary placement holes (J) on the right side of the drive.
Refer to the drive manuals for more information.

NOTICE Do not remove the LED Status Ring board cable connector. If you disconnect the LED Status Ring board, it can cause incorrect operation and damage to the drive.

5. Install the option (B) into the CN5-A connector (N) on the drive and use the included screws (C) to put it in place.
Tighten the screws to a correct tightening torque:
 - 0.5 N·m to 0.6 N·m (4.4 lbf·in to 5.3 lbf·in)

Note:

1. A ground wire is not necessary. Do not use the ground wire.
2. Only two screws are necessary to install the option on a GA700, GA800, and CR700 drive.

6. Firmly connect the Ethernet communication cables to CN1B (Port 2) (K), and/or CN1A (Port 1) (L).
Isolate communication cables from main circuit wiring and other electrical and power lines. Make sure that you firmly connect the cable end. Refer to [Communication Cable Specifications on page 20](#) for more information.

Note:

Maximum transmission distance is 100 m (328 ft). Minimum wiring distance between stations is 0.2 m (7.9 in).

7. Reattach the LED Status Ring board (M), front cover (D), and keypad (I).
Refer to the drive manuals for more information.

NOTICE Do not pinch cables between the front cover or the LED Status Ring board and the drive. Failure to comply could cause erroneous operation.

Note:

- Replace the keypad connector (E), then install the keypad.
- Put the keypad connector tab (F) into the holder when you install the keypad connector to the holder.

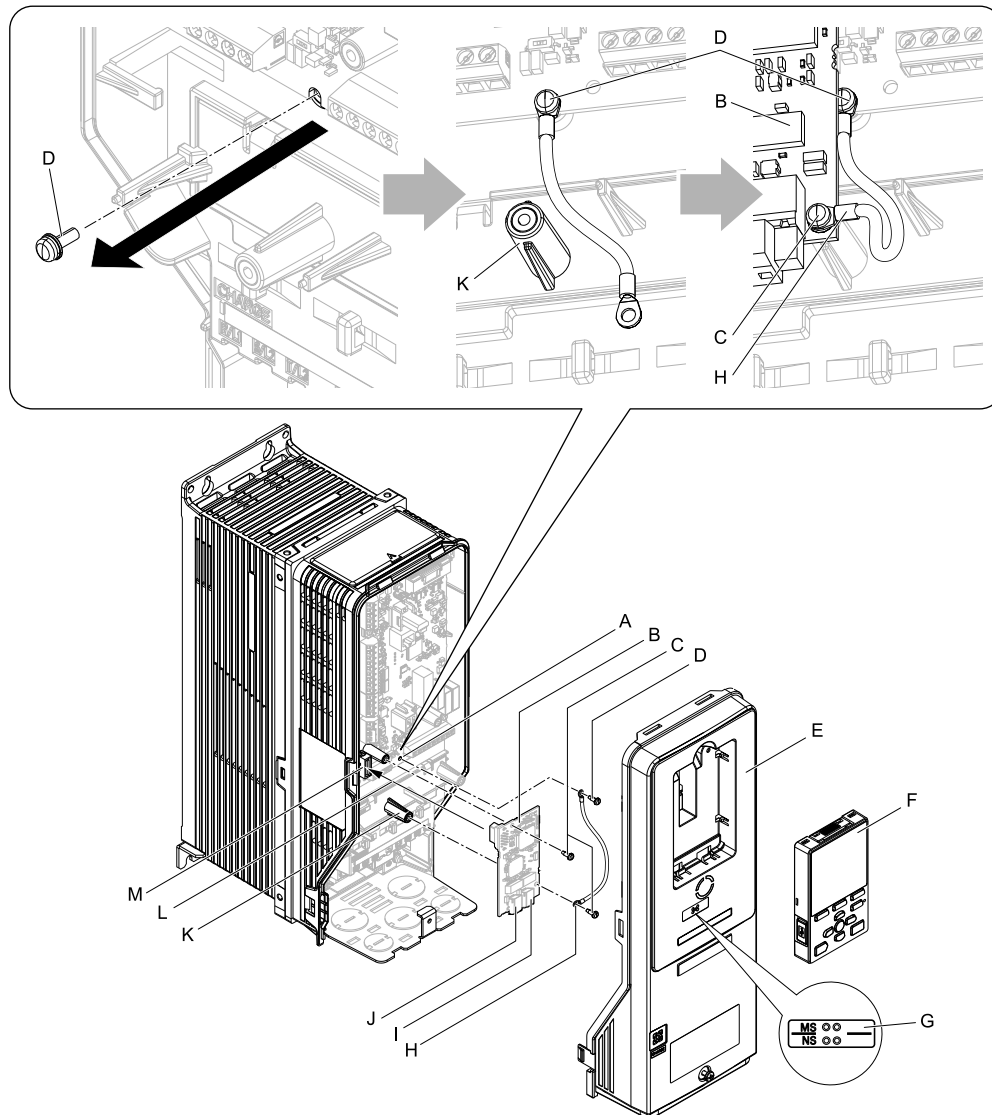
8. Set drive parameters in [Related Drive Parameters on page 22](#) for correct option performance.

■ Procedure D

This section shows the procedure to install and wire the option on an HV600 or FP605 drive.

Prepare the Drive for the Option

Correctly wire the drive as specified by the manual packaged with the drive. Make sure that the drive functions correctly. Refer to the drive manuals for more information.



A - Drive grounding terminal (FE)

B - Option

C - Included screws

D - Ground screw

E - Drive front cover

F - Keypad

G - LED label

H - Ground wire

I - Option modular connector CN1B (Port 2) (RJ45)

J - Option modular connector CN1A (Port 1) (RJ45)

K - Stud

L - Insertion point for CN5 connector (HV600: CN5, FP605: CN5-A)

M - Connector CN5 (HV600: CN5, FP605: CN5-A)

Figure 5.7 Drive Components with Option

Install the Option

⚠ DANGER *Electrical Shock Hazard. Do not examine, connect, or disconnect wiring on an energized drive. Before servicing, disconnect all power to the equipment and wait for the time specified on the warning label at a minimum. The internal capacitor stays charged after the drive is de-energized. The charge indicator LED extinguishes when the DC bus voltage decreases below 50 Vdc. When all indicators are OFF, measure for dangerous voltages to make sure that the drive is safe. If you do work on the drive when it is energized, it will cause serious injury or death from electrical shock.*

NOTICE *Damage to Equipment. When you touch the option, make sure that you observe correct electrostatic discharge (ESD) procedures. If you do not follow procedures, it can cause ESD damage to the drive circuitry.*

1. Shut off power to the drive and wait for the time specified on the drive warning label at a minimum. Make sure that the charge indicator LED is unlit, then remove the keypad and front cover. Refer to the drive manuals for more information.
2. Remove the keypad (F) and front cover (E).
3. Put the LED label (G) in the correct position on the drive front cover (E).

4. Remove the screw (D) installed in the drive grounding terminal (A).
5. Use the screw (C) installed in the FE ground terminal of the drive (A) to connect one end of the included ground wire (H) to the ground terminal on the drive.
Route ground wire on the right side of the stud (K).
Tighten the screw to a correct tightening torque:
 - 0.5 N·m to 0.6 N·m (4.4 lbf·in to 5.3 lbf·in)
6. Install the option (B) into the CN5 connector (M) (HV600: CN5, FP605: CN5-A) on the drive and use one of the included screws (C) to put it in place.
Tighten the screw to a correct tightening torque:
 - 0.5 N·m to 0.6 N·m (4.4 lbf·in to 5.3 lbf·in)

Note:

Only two screws are necessary to install the option on HV600 and FP605 drives.

7. Use one of the remaining included screws (C) to connect the ground wire (H) to the ground terminal and installation hole on the option (B).
Refer to [Figure 5.7](#) for instruction about crimp terminal orientation and wire routing.
Tighten the screw to a correct tightening torque:
 - 0.5 N·m to 0.6 N·m (4.4 lbf·in to 5.3 lbf·in)
8. Firmly connect the Ethernet communication cables to CN1B (Port 2) (I), and/or CN1A (Port 1) (J).
Isolate communication cables from main circuit wiring and other electrical and power lines. Make sure that you firmly connect the cable end. Refer to [Communication Cable Specifications on page 20](#) for more information.
9. Reattach the drive front cover (E) and the keypad (F).
Refer to the drive manuals for more information.
NOTICE Do not pinch cables between the front covers and the drive. Failure to comply could cause erroneous operation.
10. Set drive parameters in [Related Drive Parameters on page 22](#) for correct option performance.

◆ Communication Cable Specifications

Yaskawa recommends using shielded Cat5e cable or better. The Yaskawa warranty does not cover other cable types.

Option Connection Diagram

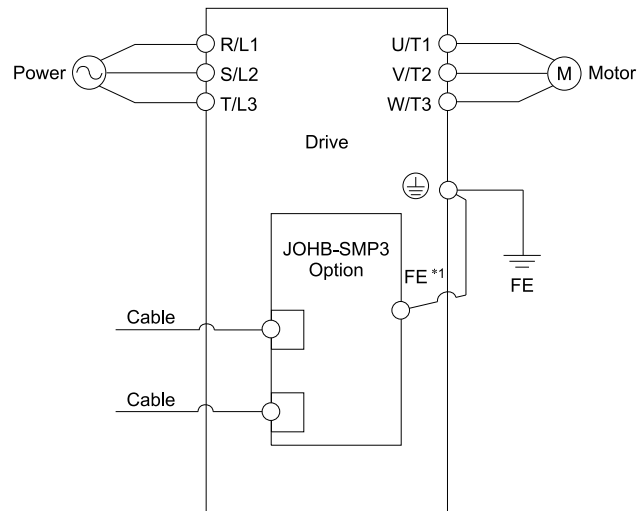


Figure 5.8 Option Connection Diagram

*1 Connect the specified ground wire for installations on 1000-series, GA500, HV600, and FP605 drives. The ground wire is not necessary for installation on GA700, GA800, or CR700 drives.

Communication Topology Specifications

Drives equipped with the JOHB-SMP3 option can be connected to network in either star or line topology.

- **Star Topology**
Use either one of the communication connectors CN1A (Port 1) or CN1B (Port 2).
- **Daisy-Chained Topology**
Use the communication connectors CN1A (Port 1) and CN1B (Port 2) at the same time. A switch is not necessary for this connection.

Note:

- This option does not support STP (Spanning Tree Protocol), RSTP (Rapid Spanning Tree Protocol), or MRP (Media Redundancy Protocol).
- If the link speed of Port 1 is different than the link speed of Port 2, it will trigger a *PA1 [PLC Alarm 1]* and the drive will not send data between the ports. To prevent this alarm, set *F7-14 = 1 [Duplex Mode Selection = Auto/Auto (Auto Negotiation/Auto Negotiation)]* and set the two connected nodes to the same link speed, and make sure that *F7-15 ≠ 101 or 102 [Communication Speed Selection ≠ 10/100 Mbps (10 Mbps/100 Mbps) or 100/10 Mbps (100 Mbps/10 Mbps)]*.

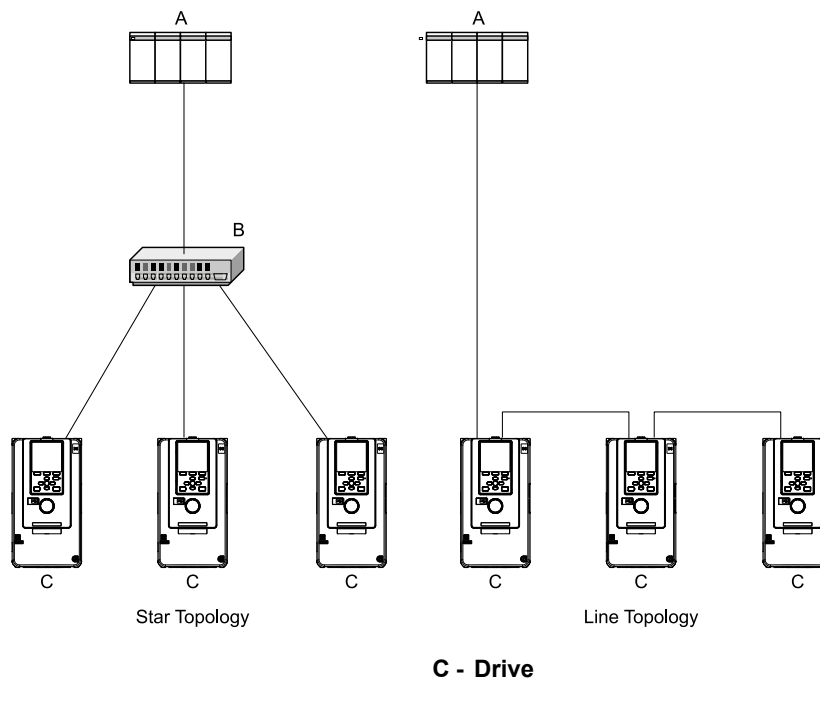


Figure 5.9 Communication Cable Wiring

◆ GSDML File

To facilitate network implementation, the GSDML file can be downloaded directly from the JOHB-SMP3 card using a standard web interface. Refer to *PROFINET Page on page 49* for more information.

You can also obtain a GSDML file from one of the following websites depending on your region:

- U.S.: <http://www.yaskawa.com>
- Europe: <http://www.yaskawa.eu.com>
- Japan: <http://www.e-mechatronics.com>
- Other areas: Check the back cover of these manuals.

For questions, contact Yaskawa or a Yaskawa representative.

Note:

Download the GSDML file for YASKAWA AC Drive Option JOHB-SMP3. If you download an incorrect GSDML file, this product will not operate as an IO-Device in the network.

6 Related Drive Parameters

These parameters set the drive for operation with the option. Make sure that the parameter settings in this table are correct before you start network communications.

Note:

- Hex.: MEMOBUS addresses that you can use to change parameters over network communication are represented in hexadecimal numbers.
- Expert: Some monitors are available in Expert Mode only. When $A1-01 = 3$ [Access Level Selection = Expert Level], Expert Mode monitors can be displayed on the keypad.

No. (Hex.)	Name	Description	Default (Range)
b1-01 (0180)	Frequency Reference Selection 1	Selects the input method for frequency reference. 0 : Keypad 1 : Analog Input 2 : Memobus/Modbus Communications 3 : Option PCB 4 : Pulse Train Input Note: • Set $b1-01 = 3$ to use the IO-Controller to control the frequency reference of the drive. • The default setting is different for different drives. Refer to the instruction manual of your specific drive for more information.	1 (0 - 4)
b1-02 (0181)	Run Command Selection 1	Sets the input method for the Run command. 0 : Keypad 1 : Digital Input 2 : Memobus/Modbus Communications 3 : Option PCB 7 : AUTO Command + Term Run 8 : AUTO Command + Serial Run 9 : AUTO Command + Option Run Note: • Set $b1-02 = 3$ or 9 to start and stop the drive with the IO-Controller using serial communications. • The setting range is different for different drives. Refer to the instruction manual of your specific drive for more information.	1 (0 - 9)
F6-01 (03A2)	Communication Error Selection	Selects drive response when the drive detects a <i>bUS</i> [Option Communication Error] error during communications with the option. 0 : Ramp to Stop 1 : Coast to Stop 2 : Fast Stop (Use C1-09) 3 : Alarm Only 4 : Alarm (Run at $d1-04$) 5 : Alarm - Ramp Stop Note: • When you set this parameter to 3 or 4, the drive will continue operation after it detects a fault. Separately prepare safety protection equipment and systems, for example fast-stop switches. • Refer to the drive manual to know if settings 4 and 5 are available. • The setting range for 1000-Series drives is different for different software versions. Refer to the Peripheral Devices & Options section of the drive instruction manual for more information. • Changes to this parameter take effect immediately. It is not necessary to cycle power on the drive.	1 (0 - 5)
F6-02 (03A3)	Comm External Fault (EF0) Detect	Selects the conditions at which <i>EF0</i> [Option Card External Fault] is detected. 0 : Always Detected	0 (0, 1)

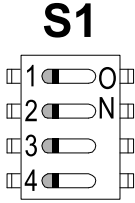
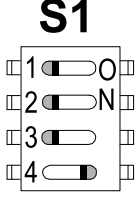
No. (Hex.)	Name	Description	Default (Range)
		1 : Detected during RUN Only	
F6-03 (03A4)	Comm External Fault (EF0) Select	Selects the operation of the drive when EF0 [Option Card External Fault] is detected. 0 : Ramp to Stop 1 : Coast to Stop 2 : Fast Stop (Use C1-09) 3 : Alarm Only Note: When you set this parameter to 3, the drive will continue operation after it detects a fault. Separately prepare safety protection equipment and systems, for example fast stop switches.	1 (0 - 3)
F6-06 (03A7)	Torque Reference/Limit by Comm	Selects whether to enable or disable the torque reference and torque limit received from the communication option. 0 : Disabled 1 : Enabled Note: • Control method availability of this parameter is different for different product series. –1000-Series Parameter is available when A1-02 = 3, 6, 7 [Control Method Selection = Closed Loop Vector, PM Advanced Open Loop Vector, PM Closed Loop Vector]. When you enable this parameter, d5-01 [Torque Control Selection] sets the drive to read the value as the Torque Limit value or the Torque Reference value. d5-01 = 0 [Speed Control]: Torque Limit d5-01 = 1 [Torque Control]: Torque Reference When A1-02 = 6 [Control Method Selection = PM Advanced Open Loop Vector], the drive reads this value as the Torque Limit. –GA500 Parameter is available when A1-02 = 2, 6, 8 [Control Method Selection = Open Loop Vector PM Advanced Open Loop Vector, EZ Vector Control]. The drive reads this value as the Torque Limit. –GA700, GA800 Parameter is available when A1-02 = 2, 3, 4, 6, 7, 8 [Control Method Selection = Open Loop Vector, Closed Loop Vector, Advanced Open Loop Vector, PM Advanced Open Loop Vector, PM Closed Loop Vector, EZ Vector Control]. When you enable this parameter, d5-01 [Torque Control Selection] sets the drive to read the value as the Torque Limit value or the Torque Reference value. d5-01 = 0 [Speed Control]: Torque Limit d5-01 = 1 [Torque Control]: Torque Reference When A1-02 = 2, 8 [Control Method Selection = Open Loop Vector, EZ Vector Control], the drive reads this value as the Torque Limit. –CR700 Parameter is available when A1-02 = 2, 3, 4 [Control Method Selection = Open Loop Vector, Closed Loop Vector, Advanced Open Loop Vector]. –HV600, FP605 Torque Limit is enabled when A1-02 = 8 [Control Method Selection = EZ Vector Control]. • If the PLC does not supply a torque reference or torque limit when F6-06 = 1 [Torque Reference/Limit by Comm = Enabled], the motor cannot rotate.	0 (0, 1)
F6-07 (03A8)	Multi-Step Ref @ NetRef/ ComRef	0 : Disable Multi-Step References 1 : Enable Multi-Step References Note: Default setting of F6-07 is 1 for GA500.	0 (0, 1)
F6-08 (036A)	Comm Parameter Reset @Initialize	Selects whether communication-related parameters F6-xx and F7-xx are set back to original default values when you use parameter A1-03 [Initialize Parameters] to initialize the drive. 0 : No Reset - Parameters Retained 1 : Reset - Back to Factory Default Note: When you set F6-08 to 1 and you then use A1-03 to initialize the drive, the drive will not change this setting value.	0 (0, 1)
F6-14 (03BB)	Bus Error Auto Reset	Enables and disables the automatic reset of a bUS [Option Communication Error] fault. 0 : Disabled 1 : Enabled Note: • This parameter is not available in all 1000-series drives. • Changes to this parameter take effect immediately. It is not necessary to cycle power on the drive.	0 (0, 1)
F6-15 (0B5B)	Comm. Option Parameters Reload	Sets when the drive will activate the F6-xx/F7-xx communications-related parameters that you changed. Use this parameter as an alternative to cycling power to the drive to active parameters. 0 : Reload at Next Power Cycle 1 : Reload Now 2 : Cancel Reload Request Note: • F6-15 is reset to 0 after setting 1 or 2. • This parameter is not available in all 1000-series drives. • Changes to this parameter take effect immediately. It is not necessary to cycle power on the drive.	0 (0 - 2)
F7-01 (03E5)	IP Address 1	Sets the static/fixed IP address. Sets the most significant octet. Note: • This parameter is only effective when F7-13 = 0 [Address Mode at Startup = Static]. • All IP Addresses must be unique.	192 (0 - 255)

6 Related Drive Parameters

No. (Hex.)	Name	Description	Default (Range)
		<ul style="list-style-type: none"> You must cycle power to the drive for the changes to take effect. For non-1000 series drives, you can set $F6-15 = 1$ [<i>Comm. Option Parameters Reload = Reload Now</i>]. 	
F7-02 (03E6)	IP Address 2	Sets the static/fixed IP address. Sets the second most significant octet. Note: <ul style="list-style-type: none"> This parameter is only effective when $F7-13 = 0$ [<i>Address Mode at Startup = Static</i>]. All IP Addresses must be unique. You must cycle power to the drive for the changes to take effect. For non-1000 series drives, you can set $F6-15 = 1$ [<i>Comm. Option Parameters Reload = Reload Now</i>]. 	168 (0 - 255)
F7-03 (03E7)	IP Address 3	Sets the static/fixed IP address. Sets the third most significant octet. Note: <ul style="list-style-type: none"> This parameter is only effective when $F7-13 = 0$ [<i>Address Mode at Startup = Static</i>]. All IP Addresses must be unique. You must cycle power to the drive for the changes to take effect. For non-1000 series drives, you can set $F6-15 = 1$ [<i>Comm. Option Parameters Reload = Reload Now</i>]. 	1 (0 - 255)
F7-04 (03E8)	IP Address 4	Sets the static/fixed IP address. Sets the fourth most significant octet. Note: <ul style="list-style-type: none"> This parameter is only effective when $F7-13 = 0$ [<i>Address Mode at Startup = Static</i>]. All IP Addresses must be unique. You must cycle power to the drive for the changes to take effect. For non-1000 series drives, you can set $F6-15 = 1$ [<i>Comm. Option Parameters Reload = Reload Now</i>]. 	20 (0 - 255)
F7-05 (03E9)	Subnet Mask 1	Sets the static/fixed Subnet Mask. Sets the most significant octet. Note: <ul style="list-style-type: none"> This parameter is only effective when $F7-13 = 0$ [<i>Address Mode at Startup = Static</i>]. All IP Addresses must be unique. You must cycle power to the drive for the changes to take effect. For non-1000 series drives, you can set $F6-15 = 1$ [<i>Comm. Option Parameters Reload = Reload Now</i>]. 	255 (0 - 255)
F7-06 (03EA)	Subnet Mask 2	Sets the static/fixed Subnet Mask. Sets the second most significant octet. Note: <ul style="list-style-type: none"> This parameter is only effective when $F7-13 = 0$ [<i>Address Mode at Startup = Static</i>]. All IP Addresses must be unique. You must cycle power to the drive for the changes to take effect. For non-1000 series drives, you can set $F6-15 = 1$ [<i>Comm. Option Parameters Reload = Reload Now</i>]. 	255 (0 - 255)
F7-07 (03EB)	Subnet Mask 3	Sets the static/fixed Subnet Mask. Sets the third most significant octet. Note: <ul style="list-style-type: none"> This parameter is only effective when $F7-13 = 0$ [<i>Address Mode at Startup = Static</i>]. All IP Addresses must be unique. You must cycle power to the drive for the changes to take effect. For non-1000 series drives, you can set $F6-15 = 1$ [<i>Comm. Option Parameters Reload = Reload Now</i>]. 	255 (0 - 255)
F7-08 (03EC)	Subnet Mask 4	Sets the static/fixed Subnet Mask. Parameter F7-08 sets the fourth most significant octet. Note: <ul style="list-style-type: none"> This parameter is only effective when $F7-13 = 0$ [<i>Address Mode at Startup = Static</i>]. All IP Addresses must be unique. You must cycle power to the drive for the changes to take effect. For non-1000 series drives, you can set $F6-15 = 1$ [<i>Comm. Option Parameters Reload = Reload Now</i>]. 	0 (0 - 255)
F7-09 (03ED)	Gateway Address 1	Sets the static/fixed Gateway address. Sets the most significant octet. Note: <ul style="list-style-type: none"> This parameter is only effective when $F7-13 = 0$ [<i>Address Mode at Startup = Static</i>]. All IP Addresses must be unique. You must cycle power to the drive for the changes to take effect. For non-1000 series drives, you can set $F6-15 = 1$ [<i>Comm. Option Parameters Reload = Reload Now</i>]. 	192 (0 - 255)
F7-10 (03EE)	Gateway Address 2	Sets the static/fixed Gateway address. Sets the second most significant octet. Note: <ul style="list-style-type: none"> This parameter is only effective when $F7-13 = 0$ [<i>Address Mode at Startup = Static</i>]. All IP Addresses must be unique. You must cycle power to the drive for the changes to take effect. For non-1000 series drives, you can set $F6-15 = 1$ [<i>Comm. Option Parameters Reload = Reload Now</i>]. 	168 (0 - 255)
F7-11 (03EF)	Gateway Address 3	Sets the static/fixed Gateway address. Sets the third most significant octet. Note: <ul style="list-style-type: none"> This parameter is only effective when $F7-13 = 0$ [<i>Address Mode at Startup = Static</i>]. All IP Addresses must be unique. You must cycle power to the drive for the changes to take effect. For non-1000 series drives, you can set $F6-15 = 1$ [<i>Comm. Option Parameters Reload = Reload Now</i>]. 	1 (0 - 255)
F7-12 (03F0)	Gateway Address 4	Sets the static/fixed Gateway address. Parameter F7-12 sets the fourth most significant octet. Note: <ul style="list-style-type: none"> This parameter is only effective when $F7-13 = 0$ [<i>Address Mode at Startup = Static</i>]. All IP Addresses must be unique. You must cycle power to the drive for the changes to take effect. For non-1000 series drives, you can set $F6-15 = 1$ [<i>Comm. Option Parameters Reload = Reload Now</i>]. 	1 (0 - 255)
F7-13 (03F1)	Address Startup Mode	Selects how the option address is set. 0 : Static (Use F7-01 to F7-12 to set.) 1 : BOOTP (PLC will assign IP Address) 2 : DHCP (PLC will assign IP Address)	2 (0 - 2)

No. (Hex.)	Name	Description	Default (Range)
		<p>Note:</p> <ul style="list-style-type: none"> You must cycle power to the drive for the changes to take effect. For non-1000 series drives, you can set $F6-15 = 1$ [Comm. Option Parameters Reload = Reload Now]. The PLC will assign the IP addresses when $F7-13 = 1$ or 2. 	
F7-14 (03F2)	Duplex Mode Selection	<p>Sets duplex mode settings (Port 1 (CN1A)/Port 2 (CN1B)). Set this parameter to 1 or 2 for PROFINET. Set $F7-15 = 100$ [Communication Speed Selection = 100/100 Mbps (100 Mbps/100 Mbps)] if you set this parameter to 2.</p> <p>0 : Half/Half (Half Duplex/Half Duplex) 1 : Auto/Auto (Auto Negotiation/Auto Negotiation) 2 : Full/Full (Full Duplex/Full Duplex) 3 : Half/Auto (Half Duplex/Auto Negotiation) 4 : Half/Full (Half Duplex/Full Duplex) 5 : Auto/Half (Auto Negotiation/Half Duplex) 6 : Auto/Full (Auto Negotiation/Full Duplex) 7 : Full/Half (Full Duplex/Half Duplex) 8 : Full/Auto (Full Duplex/Auto Negotiation)</p> <p>Note:</p> <p>You must cycle power to the drive for the changes to take effect. For non-1000 series drives, you can set $F6-15 = 1$ [Comm. Option Parameters Reload = Reload Now].</p>	1 (0 - 8)
F7-15 (03F3)	Communication Speed Selection	<p>Sets the communications speed (Port 1 (CN1A)/Port 2 (CN1B)). Set this parameter to 100 for PROFINET.</p> <p>10 : 10/10 Mbps (10 Mbps/10 Mbps) 100 : 100/100 Mbps (100 Mbps/100 Mbps) 101 : [Not Used/No function] 10/100 Mbps (10 Mbps/100 Mbps) 102 : [Not Used/No function] 100/10 Mbps (100 Mbps/10 Mbps)</p> <p>Note:</p> <ul style="list-style-type: none"> $F7-15$ is only effective when the port is set to half or full duplex in $F7-14$ [Duplex Mode Selection]. You must cycle power to the drive for the changes to take effect. For non-1000 series drives, you can set $F6-15 = 1$ [Comm. Option Parameters Reload = Reload Now]. 	10 (10 - 102)
F7-16 (03F4)	Timeout Value	<p>Sets the <i>bUS</i> fault delay time to the drive after the option detects a <i>bUS</i> fault to let the network condition self-correct.</p> <p>Note:</p> <ul style="list-style-type: none"> This parameter is not available in all 1000-series drives. Changes to this parameter take effect immediately. It is not necessary to cycle power on the drive. 	0.0 s (0.0 s - 30.0 s)
F7-23 - F7-27 (03FB - 03FF) F7-28 - F7-32 (0370 - 0374)	Dynamic Out Param 1 to 10 for CommCard	<p>Sets configurable outputs 1 to 10 that are used in some of the PROFINET I/O modules. Each parameter contains a MEMOBUS/Modbus address. The values received from the PLC for the configurable outputs will be written to this corresponding MEMOBUS / Modbus addresses. A MEMOBUS/Modbus address value of 0 means that the value received from the PLC for the configurable outputs will not be written to any MEMOBUS/Modbus register.</p>	0 (-)
F7-33 - F7-42 (0375 to 037E)	Dynamic In Param 1 to 10 for ComCard	<p>Sets configurable inputs 1 to 10 which are used in some of the PROFINET I/O modules. Each parameter contains a MEMOBUS/Modbus address. The values sent to the PLC via the configurable inputs will be read from the corresponding MEMOBUS/Modbus addresses. A MEMOBUS/Modbus address value of 0 means that the value sent for the configurable inputs is not defined by the user, therefore the option default register value will be returned.</p>	0 (-)
H5-11 (043C)	Communications ENTER Function Selection (Function common to communication option)	<p>Sets when an Enter command is necessary to use MEMOBUS/Modbus communications to change parameter values.</p> <p>0 : Parameter changes are activated when ENTER command is written 1 : Parameter changes are activated immediately. No ENTER command is necessary.</p>	0 (0, 1)
o1-03 (0502)	Frequency Display Unit Selection	<p>Sets the display units for the frequency reference and output frequency. Changes to this parameter take effect immediately. It is not necessary to cycle power on the drive.</p> <p>0 : 0.01Hz units 1 : 0.01% units 2 : min⁻¹ (r/min) unit 3 : User Units (o1-09 -o1-11)</p>	0 (0 - 3)

Table 6.1 Option Monitor

No.	Name	Description	Range
U4-75	Communication OPT Protocol	<p>Shows the setting of DIP switch S1.</p> <ul style="list-style-type: none"> 70 = All switches OFF (incorrect for PROFINET)  <p>S1</p> <ul style="list-style-type: none"> 71 to 77 = Incorrect for PROFINET 78 = Switch 4 ON, all others OFF (correct for PROFINET)  <p>S1</p> <ul style="list-style-type: none"> 79 to 7F = Other switch positions that are incorrect for PROFINET <p>Note: Not all drive software versions will display this monitor. Contact Yaskawa or your nearest sales representative for more information.</p>	00 - FF (Hex.)
U4-76 - U4-78	MAC Address 1	<p>Shows the main MAC Address.</p> <ul style="list-style-type: none"> U4-76: First octet, Second octet U4-77: Third octet, Fourth octet U4-78: Fifth octet, Sixth octet <p>Note: Not all drive software versions will display this monitor. Contact Yaskawa or your nearest sales representative for more information.</p>	0000 - FFFF (Hex.)
U4-79 - U4-81 Expert	MAC Address 2	<p>Shows the second MAC Address.</p> <ul style="list-style-type: none"> U4-79: First octet, Second octet U4-80: Third octet, Fourth octet U4-81: Fifth octet, Sixth octet <p>Note: Not all drive software versions will display this monitor. Contact Yaskawa or your nearest sales representative for more information.</p>	0000 - FFFF (Hex.)
U4-82 - U4-84 Expert	MAC Address 3	<p>Shows the third MAC Address.</p> <ul style="list-style-type: none"> U4-82: First octet, Second octet U4-83: Third octet, Fourth octet U4-84: Fifth octet, Sixth octet <p>Note: Not all drive software versions will display this monitor. Contact Yaskawa or your nearest sales representative for more information.</p>	0000 - FFFF (Hex.)
U6-80 - U6-83	Option IP Address 1 - 4	<p>Shows the currently available local IP Address.</p> <ul style="list-style-type: none"> U6-80: First octet U6-81: Second octet U6-82: Third octet U6-83: Fourth octet 	0 - 255
U6-84 - U6-87	Online Subnet 1 - 4	<p>Shows the currently available subnet mask.</p> <ul style="list-style-type: none"> U6-84: First octet U6-85: Second octet U6-86: Third octet U6-87: Fourth octet 	0 - 255
U6-88 - U6-91	Online Gateway 1 - 4	<p>Shows the currently available gateway address.</p> <ul style="list-style-type: none"> U6-88: First octet U6-89: Second octet U6-90: Third octet U6-91: Fourth octet 	0 - 255
U6-92	Online Speed	Shows CN1A Port 1 link speed currently available.	10: 10 Mbps 100: 100 Mbps
U6-93	Online Duplex	Shows CN1A Port 1 duplex setting currently available.	0: Half/Half 1: Full/Full

No.	Name	Description	Range
U6-94	OPT SPARE 1	Shows CN1B Port 2 link speed currently available.	10: 10 Mbps 100: 100 Mbps
U6-95	OPT SPARE 2	Shows CN1B Port 2 duplex setting currently available.	0: Half/Half 1: Full/Full
U6-97	OPT SPARE 4	Shows the PROFINET-specific software version. (when DIP switches are set for PROFINET) Shows overall JOHB-SMP3 software version (when DIP switches are all OFF)	-
U6-98	First Fault	Shows first option fault.	-
U6-99	Current Fault	Shows current option fault.	-

7 PROFINET Messaging

◆ PROFINET Overview

This section describes the communication profile used between the PROFINET I/O network and the option. The JOHB-SMP3 can be configured by the hardware configuration tool (customer supplied) to use either the Yaskawa-specific set of control and status words or the Yaskawa P-Drive profile. By default, the JOHB-SMP3 uses the Yaskawa-specific profile. The Yaskawa-specific control word allows for simple run/stop/reverse control. The Yaskawa-specific status word contains simple bit-mapped status information. Optionally, the Yaskawa P-Drive profile can be selected. Selecting the Yaskawa P-Drive profile forces the Yaskawa P-Drive run/stop sequence and re-maps the control and status word definitions to be compatible with Yaskawa P-Drive.

◆ Yaskawa Vendor-Specific Control and Status Words

■ The Control Word and the Status Word

The contents of the Control Word and the Status Word are detailed in [Table 7.1](#). The Control and Status Words are always the first words (Word 0) regardless of the selected telegram.

■ Frequency Reference

Frequency Reference is a 16-bit word containing the desired output frequency. The default units for this word are 0.01 Hz (example: 1234 → 12.34 Hz reference). You can use *o1-03 [Frequency Display Unit Selection]* and *o1-10 [User Units Maximum Value]* to change the units of the frequency reference.

■ Output Frequency

Output Frequency is a 16-bit word containing the current output frequency of the drive. The default units for this word are 0.01 Hz (example: 1234 → 12.34 Hz reference). You can use *o1-03 [Frequency Display Unit Selection]* and *o1-10 [User Units Maximum Value]* to change the units of the output frequency. The Output Frequency is always the second word (Word 1) of the "produce" telegram, regardless of the selected telegram.

Table 7.1 Yaskawa-Specific Control Word and Status Word

Yaskawa-Specific Control Word		Yaskawa-Specific Status Word	
Bit	Description	Bit	Description
0	Forward Run	0	Running
1	Reverse Run	1	Zero Speed
2	External Fault (EF0)	2	Reverse Operation
3	Fault Reset	3	Reset Signal Input Active
4	Multi-Function Input 1	4	Speed Agree
5	Multi-Function Input 2	5	Ready

Yaskawa-Specific Control Word		Yaskawa-Specific Status Word	
Bit	Description	Bit	Description
6	Multi-Function Input 3	6	Alarm
7	Multi-Function Input 4	7	Fault
8	Multi-Function Input 5	8	<i>oPE</i> Fault
9	Multi-Function Input 6	9	During Undervoltage
10	Multi-Function Input 7	10	Motor 2 Selected
11	Multi-Function Input 8 ^{*1}	11	Zero Servo Complete (not available on all drives)
12	Not Used	12	Not Used
13	Not Used	13	Not Used
14	Not Used	14	Net Reference
15	Not Used	15	Net Control

*1 Bit 11 is not used for the GA500 and other drives that only have 7 digital input terminals.

◆ Yaskawa P-Drive Communication Profile

■ The Control Word and the Status Word

The contents of the Control Word and the Status Word are detailed in [Table 7.2](#) and [Table 7.3](#) respectively. The drive states are presented in the Yaskawa P-Drive State Machine ([Figure 7.1](#)).

The Control and Status Words are always the first words (Word 0) regardless of the selected telegram.

Table 7.2 Control Word (STW) for Yaskawa P-Drive Communication Profile

Bit	Name	Value	Proceed to STATE/Description
0	ON	1	Proceed to READY TO OPERATE.
	OFF1	0	Emergency OFF. Proceed to OFF1 ACTIVE; proceed further to READY TO SWITCH ON unless other interlocks (OFF2, OFF3) are active.
1	OFF2	1	Continue operation (OFF2 inactive).
		0	Emergency OFF. Proceed to OFF2 ACTIVE; proceed further to SWITCH ON INHIBIT.
2	OFF3	1	Continue operation (OFF3 inactive).
		0	Emergency stop. Proceed to OFF3 ACTIVE; proceed further to SWITCH-ON INHIBIT.
3	OPERATION_ENABLE	1	Proceed to ENABLE OPERATION.
		0	Inhibit operation. Proceed to OPERATION INHIBIT.
4	RAMP_OUT_ZERO	1	Normal operation. Proceed to RAMP FUNCTION GENERATOR: ENABLE OUTPUT.
		0	Stop according to selected stop type.
5	RAMP_HOLD	1	Normal operation.
		0	Halt ramping (Ramp Function Generator output held). Proceed to RAMP FUNCTION GENERATOR: ENABLE ACCELERATOR.
6	RAMP_IN_ZERO	1	Normal operation. Proceed to OPERATING. Note: This bit is effective only if the fieldbus interface is set as the source for this signal by drive parameters.
		0	Force Ramp Function Generator input to zero.
7	RESET	0 -> 1	Fault reset if an active fault exists. Proceed to SWITCH ON INHIBIT.
		0	(Continue normal operation)
8	INCHING_1	-	Inching 1. (Not supported)
9	INCHING_2	-	Inching 2. (Not supported)
10	REMOTE_CMD	1	Network control enabled.
		0	Network control disabled.
11 - 15	-	-	Reserved

Table 7.3 Status Word (ZSW) for the Yaskawa P-Drive Communication Profile

Bit	Name	Value	Proceed to STATE/Description
0	RDY_ON	1	READY TO SWITCH ON.
		0	NOT READY TO SWITCH ON.
1	RDY_RUN	1	READY TO OPERATE.
		0	OFF1 ACTIVE.
2	RDY_REF	1	ENABLE OPERATION.
		0	DISABLE OPERATION.
3	TRIPPED	1	FAULT.
		0	No fault.
4	OFF_2_STA	1	OFF2 inactive.
		0	OFF2 ACTIVE.
5	OFF_3_STA	1	OFF3 inactive.
		0	OFF3 ACTIVE.
6	SWC_ON_INHIB	1	SWITCH-ON INHIBIT ACTIVE.
		0	SWITCH-ON INHIBIT NOT ACTIVE.
7	ALARM	1	Warning/Alarm.
		0	No Warning/Alarm.
8	SPEED_ERROR	1	WITHIN TOLERANCE.
		0	OUT OF TOLERANCE.
9	REMOTE	1	Drive control location: REMOTE.
		0	Drive control location: LOCAL.
10	AT_SETPOINT	1	OPERATING. Actual value equals reference value (i.e., within tolerance limits).
		0	Actual value differs from reference value (i.e., outside tolerance limits).
11 - 13	-	-	Reserved
14 *1	Safe Torque Off	1	Motor coasts to stop if either terminal H1 or H2 is OFF, or both terminals H1 and H2 are OFF for Safe Disable input.
		0	Both terminals H1 and H2 are OFF for Safe Disable input.
14 *2	-	-	Reserved
15	-	-	Reserved

*1 Bit 14 is available if Control/Status is set to 1: Yaskawa P-Drive in [Table 8.1](#).

*2 Bit 14 is not available if Control/Status is set to 2: Yaskawa P-Drive (Legacy) in [Table 8.1](#).

■ Frequency Reference

The Frequency reference is a 16-bit word containing a sign bit and a 15-bit integer. A negative reference (indicating reverse direction of rotation) is formed by calculating the two's complement from the corresponding positive reference. The reference value is the desired output frequency.

The default units for this word are 0.01 Hz (example: 1234 → 12.34 Hz reference).

You can use *o1-03* [*Frequency Display Unit Selection*] and *o1-10* [*User Units Maximum Value*] to change the units of the frequency reference.

The Frequency Reference is always the second word (Word 1) of the "consume" telegram, regardless of the selected telegram.

⚠ WARNING *Sudden Movement Hazard. Do not set o1-03 = 3 and o1-10 > 32,767 at the same time. This word is a 15-bit signed integer, and incorrect parameter settings can cause serious injury or death from reverse rotation at incorrect speeds.*

■ Output Frequency

Output Frequency is a 16-bit word containing the current output frequency (*UI-02*) of the drive.

The default units for this word are 0.01 Hz (example: 1234 → 12.34 Hz reference).

You can use *o1-03* [*Frequency Display Unit Selection*] and *o1-10* [*User Units Maximum Value*] to change the units of the output frequency.

The Output Frequency is always the second word (Word 1) of the “produce” telegram, regardless of the selected telegram.

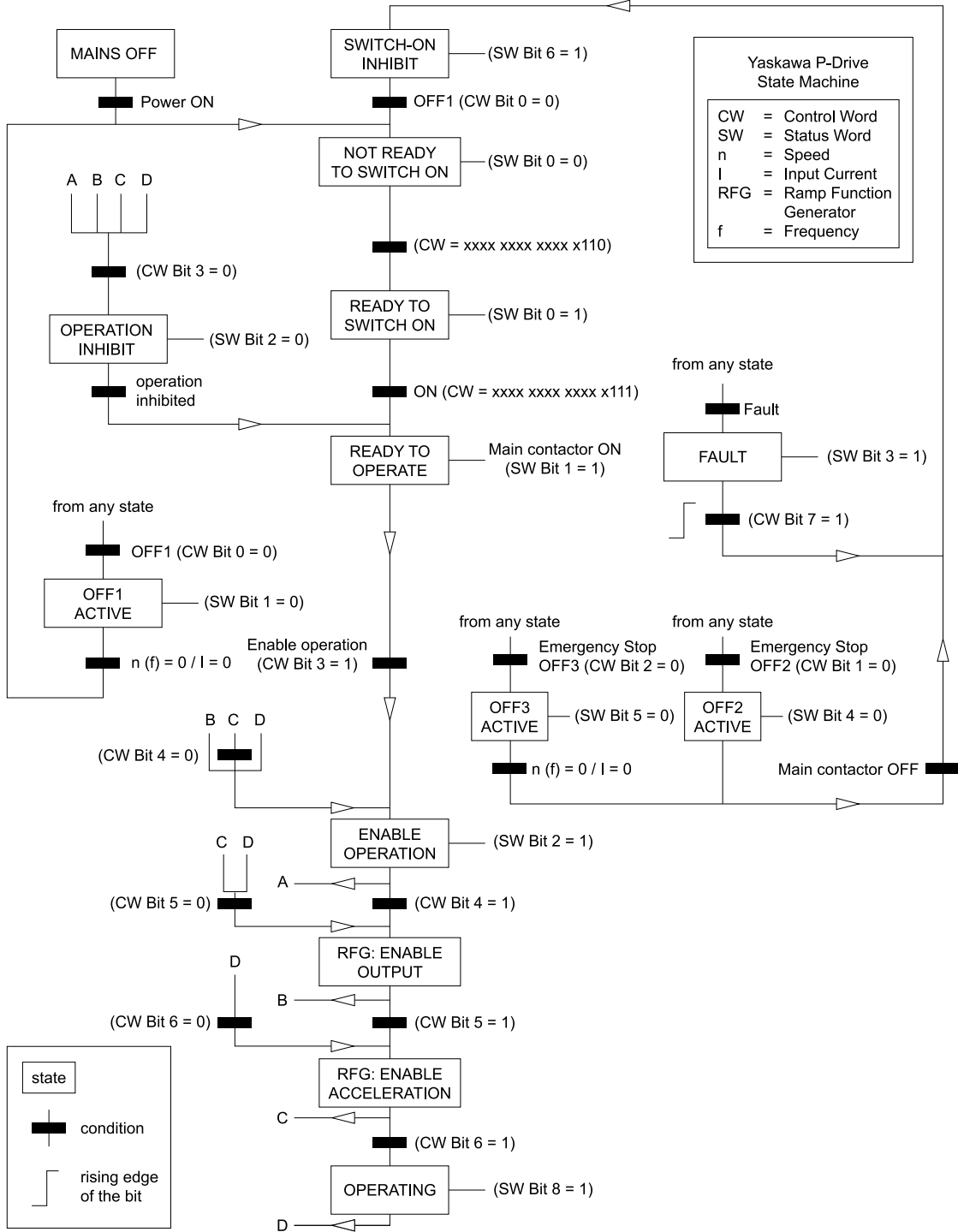


Figure 7.1 Yaskawa P-Drive State Machine

8 Communication

This section describes the PROFINET IO messaging used in communication with the drive.

For detailed information on PROFINET IO communication, refer to PROFINET specification Application Layer protocol for decentralized periphery and distributed automation v2.0 available at www.profibus.com.

◆ Introduction to PROFINET IO

PROFINET IO is a fieldbus protocol that enables communication between programmable controllers and distributed field devices on an Ethernet network. The protocol classifies devices into IO-Controllers, IO-Supervisors, and IO-Devices, which have a specific collection of services.

PROFINET IO uses three different communication channels to exchange data. The standard UDP/IP and TCP/IP channel is used for parameterization and configuration of devices and for acyclic operations. The Real Time (RT) channel is used for cyclic data transfer and alarms. The third channel, Isochronous Real Time (IRT) channel, is used e.g. in motion control applications (not implemented in the JOHB-SMP3).

PROFINET IO devices are structured in slots and sub-slots, which can contain modules and sub-modules correspondingly. Device specific data is represented in slot 0, module and sub-module specific data is in subsequent slots and sub-slots.

One of the benefits of PROFINET IO is the diagnostics and alarm mechanism. Every module and sub-module provide alarm data to the IO-Controller using the cyclic channel. Diagnostic data can be read non-cyclically from the device by using record data.

Properties and services of a PROFINET IO device are described in a GSD file that is written in General Station Description Markup Language (GSDML). GSD file describes the device specific modules and the method of assigning modules and sub-modules to predefined slots and sub-slots.

Information about how to obtain the GSDML file is contained in [GSDML File on page 22](#).

◆ PROFINET IO in the JOHB-SMP3

The decision to use either the Yaskawa P-Drive control and status words or the Yaskawa-specific control and status words is done in the hardware configuration tool (customer supplied). The default value is the Yaskawa-specific format.

The JOHB-SMP3 uses slots 0 and 1. Slot 0 does not have any sub-slots and the attached DAP module represents the device. Other functional modules and sub-modules described in the GSD file can be assigned to slot 1 and its sub-slots.

- Slot 0 = Device access point (DAP)
- Slot 1, sub-slot 1 = One of the following:
 - Standard Telegram 1
 - Standard Telegram 1 with 5 configurable inputs and outputs
 - 40-Byte IO with 5 configurable inputs and outputs
 - Standard Telegram 1 with 10 configurable inputs and outputs
 - Gateway Module

The services provided by the JOHB-SMP3 option can be defined by using the hardware configuration tool (customer-supplied) or by using the *F7-23 to F7-42* parameters in the drive. For services that are defined using the hardware configuration tool, the associated drive parameter (*F7-23 to F7-42*) will be ignored. To define the services using the *F7-23 to F7-42* parameters, leave the defined services in the hardware configuration tool at a value of 0.

If all *F7-xx* parameters are set to 0, the value from the configuration tool will be used.

The JOHB-SMP3 option provides the following services:

- Cyclic messaging in Yaskawa P-Drive or Yaskawa-specific mode
- Acyclic parameter access mechanism
- Identification & Maintenance functions (I&M0)
- Yaskawa P-Drive parameters
- Diagnostic and alarm mechanism
- Fault buffer mechanism

■ PROFINET Configuration Parameters

PROFINET Configuration Parameters are set through the hardware (PLC) configuration tool. They define the behaviors, features, and some of the data exchanged by the JOHB-SMP3 on the PROFINET network.

Note:

MEMOBUS/Modbus addresses in the drive manuals are shown in hexadecimal. Often, the hardware configuration tool needs this data in decimal format, so conversion will be necessary.

Table 8.1 PROFINET Configuration Parameters

PROFINET Configuration Parameter	Drive Parameter	Description
General Configuration and Feature Parameters		
Control/Status Configuration	-	<p>Selects between the Yaskawa Specific profile (control and status words), and the Yaskawa P-Drive profile (control and status words):</p> <p>0: Yaskawa Specific</p> <ul style="list-style-type: none"> The control and status words are mapped as shown in Table 7.1 Simple run/stop control sequence. <p>1: Yaskawa P-Drive</p> <ul style="list-style-type: none"> The control and status words are mapped as shown in Table 7.2 and Table 7.3. The Yaskawa P-Drive state machine is active. The "Safe Torque Off" digital inputs are monitored by the Yaskawa P-Drive state machine. <p>2: Yaskawa P-Drive (Legacy)</p> <ul style="list-style-type: none"> The control and status words are mapped as shown in Table 7.2 and Table 7.3. The Yaskawa P-Drive state machine is active. The "Safe Torque Off" digital inputs are still active, but they are ignored by the Yaskawa P-Drive state machine. <p>Default Value: Yaskawa Specific</p>
MBTCP Enable ^{*/} (Modbus/TCP)	-	<p>Selects if the Modbus/TCP protocol and port are active. Modbus/TCP is used by the Yaskawa DriveWizard software.</p> <p>0: Enabled</p> <ul style="list-style-type: none"> The Modbus/TCP protocol is enabled and active. Communications with Yaskawa DriveWizard software over the Ethernet network is functional. The Modbus/TCP port (Port 502) is enabled. PROFINET protocol remains enabled. <p>1: Disabled</p> <ul style="list-style-type: none"> The Modbus/TCP protocol is disabled. Communications with Yaskawa DriveWizard software over the Ethernet network is not possible. The Modbus/TCP port (Port 502) is disabled. PROFINET protocol remains enabled. <p>Default Value: Modbus/TCP is Active</p>
Webpage Enable ^{*/}	-	<p>Selects if the built-in web-pages and port (HTTP) are available.</p> <p>0: Enabled</p> <ul style="list-style-type: none"> The built-in web pages are available. The HTTP port (Port 80) is enabled. <p>1: Disabled</p> <ul style="list-style-type: none"> The built-in web pages cannot be accessed. The HTTP port (Port 80) is disabled. <p>Default Value: Web-pages are available</p>
Email Enable ^{*/}	-	<p>Selects if the built-in email notification mechanism and port is enabled.</p> <p>0: Enabled</p> <ul style="list-style-type: none"> The built-in email notification mechanism is enabled. The SMTP port (configurable port number) is enabled. <p>1: Disabled</p> <ul style="list-style-type: none"> The built-in email notification mechanism is disabled. The SMTP port (configurable port number) is disabled. <p>Default Value: Email is enabled.</p>
DriveWizard Network Configurator Enable ^{*/}	-	<p>Selects if the built-in DriveWizard network configurator is enabled.</p> <p>0: Enabled</p> <ul style="list-style-type: none"> The built-in DriveWizard network configurator is enabled. <p>1: Disabled</p> <ul style="list-style-type: none"> The built-in DriveWizard network configurator is disabled. <p>Default Value: DriveWizard network configurator is enabled.</p>
Configurable Outputs (PLC Controller to JOHB-SMP3)		
Configurable Output 1	F7-23	<p>The settings in these 10 parameters configure commands originating from the controller (PLC) and going to the JOHB-SMP3 (drive).</p> <p>Each of these 10 parameters will be populated with a MEMOBUS/Modbus address. Details on command register addresses are in the "MEMOBUS/Modbus Communications Command Data" section of the drive Technical Manual. Example: If the PLC wants to control Torque Limit in the drive, the associated Configurable Output should be set to 0004H.</p> <p>Default Value (all Configurable Outputs): 0</p> <p>Note:</p> <p>When the value in a Configurable Output Parameter is 0 (default), the associated drive parameter (F7-xx) will be used for configuration.</p>
Configurable Output 2	F7-24	
Configurable Output 3	F7-25	
Configurable Output 4	F7-26	
Configurable Output 5	F7-27	
Configurable Output 6	F7-28	
Configurable Output 7	F7-29	
Configurable Output 8	F7-30	

PROFINET Configuration Parameter	Drive Parameter	Description
Configurable Output 9	F7-31	
Configurable Output 10	F7-32	
Configurable Inputs (JOHB-SMP3 to PLC Controller)		
Configurable Input 1	F7-33	<p>The settings in these 10 parameters configure status and feedback originating the JOHB-SMP3 (drive) and going to the controller (PLC).</p> <p>Each of these 10 parameters will be populated with a MEMOBUS/Modbus address. Details on addresses are in the drive Technical Manual. Any valid MEMOBUS/Modbus address can be used: Monitors, Monitor Registers, Parameters, and Command Data.</p> <p>Example: If the PLC wants to monitor the digital inputs on the drive, the associated Configurable Input should be set to 002BH.</p> <p>Default Value (all Configurable Inputs): 0</p> <p>Note: When the value in a Configurable Input Parameter is 0 (default), the associated drive parameter (<i>F7-xx</i>) will be used for configuration.</p>
Configurable Input 2	F7-34	
Configurable Input 3	F7-35	
Configurable Input 4	F7-36	
Configurable Input 5	F7-37	
Configurable Input 6	F7-38	
Configurable Input 7	F7-39	
Configurable Input 8	F7-40	
Configurable Input 9	F7-41	
Configurable Input 10	F7-42	

*1 The values for these PROFINET Configuration Parameters will be maintained through a power loss.

■ Yaskawa JOHB-SMP3 PROFINET I/O Modules

In the JOHB-SMP3, there are 5 different I/O Modules that can be used. The particular module used is set within the hardware (PLC) configuration tool.

Std Tgm 1 (Standard Telegram 1)

Table 8.2 Std Tgm 1 Consume

Word (16 bits)	Description	Notes
0	Control Word	Yaskawa-Specific or Yaskawa P-Drive, selectable through the hardware configuration tool.
1	Frequency Reference	<p>The default units are 0.01Hz. (ex: 1234 → 12.34 Hz)</p> <ul style="list-style-type: none"> For Yaskawa P-Drive only this is a bi-polar value: A negative reference commands reverse operation. Units can be changed using drive parameters <i>o1-03</i> and <i>o1-10</i>.

Table 8.3 Std Tgm 1 Produce

Word (16 bits)	Description	Notes
0	Status Word	Yaskawa-Specific or Yaskawa P-Drive, selectable through the hardware configuration tool.
1	Output Frequency	<p>The default units are 0.01Hz. (ex: 1234 → 12.34 Hz)</p> <ul style="list-style-type: none"> For Yaskawa P-Drive only this is a bi-polar value: A negative reference commands reverse operation. Units can be changed using drive parameters <i>o1-03</i> and <i>o1-10</i>.

Std Tgm 1 + 5 PZD (Standard Telegram 1 + 5 Configurable Inputs & Outputs)

Table 8.4 Std Tgm 1 + 5 Consume

Word (16 bits)	Description	Notes
0	Control Word	Yaskawa-Specific or Yaskawa P-Drive, selectable through the hardware configuration tool.
1	Frequency Reference	<p>The default units are 0.01Hz. (ex: 1234 → 12.34 Hz)</p> <ul style="list-style-type: none"> For Yaskawa P-Drive only this is a bi-polar value: A negative reference commands reverse operation. Units can be changed using drive parameters <i>o1-03</i> and <i>o1-10</i>.
2	Configurable Output 1	Configured by hardware configuration tool or by drive parameter <i>F7-23</i> [<i>Dynamic Out Param 1 for CommCard</i>].
3	Configurable Output 2	Configured by hardware configuration tool or by drive parameter <i>F7-24</i> [<i>Dynamic Out Param 2 for CommCard</i>].
4	Configurable Output 3	Configured by hardware configuration tool or by drive parameter <i>F7-25</i> [<i>Dynamic Out Param 3 for CommCard</i>].
5	Configurable Output 4	Configured by hardware configuration tool or by drive parameter <i>F7-26</i> [<i>Dynamic Out Param 4 for CommCard</i>].
6	Configurable Output 5	Configured by hardware configuration tool or by drive parameter <i>F7-27</i> [<i>Dynamic Out Param 5 for CommCard</i>].

Table 8.5 Std Tgm 1 + 5 Produce

Word (16 bits)	Description	Notes
0	Status Word	Yaskawa-Specific or Yaskawa P-Drive, selectable through the hardware configuration tool.
1	Output Frequency	The default units are 0.01Hz. (ex: 1234 → 12.34 Hz) <ul style="list-style-type: none"> For Yaskawa P-Drive only this is a bi-polar value: A negative reference commands reverse operation. Units can be changed using drive parameters <i>o1-03 and o1-10</i>.
2	Configurable Input 1	Configured by hardware configuration tool or by drive parameter <i>F7-33 [Dynamic In Param 1 for CommCard]</i> .
3	Configurable Input 2	Configured by hardware configuration tool or by drive parameter <i>F7-34 [Dynamic In Param 2 for CommCard]</i> .
4	Configurable Input 3	Configured by hardware configuration tool or by drive parameter <i>F7-35 [Dynamic In Param 3 for CommCard]</i> .
5	Configurable Input 4	Configured by hardware configuration tool or by drive parameter <i>F7-36 [Dynamic In Param 4 for CommCard]</i> .
6	Configurable Input 5	Configured by hardware configuration tool or by drive parameter <i>F7-37 [Dynamic In Param 5 for CommCard]</i> .

Forty Byte IO

Table 8.6 Forty Byte IO Consume

Word (16 bits)	Description	Notes
0	Control Word	Yaskawa-Specific or Yaskawa P-Drive, selectable through the hardware configuration tool.
1	Frequency Reference	The default units are 0.01Hz. (ex: 1234 → 12.34 Hz) <ul style="list-style-type: none"> For Yaskawa P-Drive only this is a bi-polar value: A negative reference commands reverse operation. Units can be changed using drive parameters <i>o1-03 and o1-10</i>.
2	Torque Reference & Torque Limit	Units are 0.1% (ex: 1000 → 100.0%) Torque reference when in torque mode (<i>d5-01 = 1</i>) Torque limit when in speed mode (<i>d5-01 = 0</i>) Requires drive parameter <i>F6-06 = 1 [Torque Reference/Limit by COM = Enabled]</i> *.
3	Torque Compensation	Units are 0.1% (ex: 1000 → 100.0%)
4	Reserved	-
5	Reserved	-
6	Analog Output 1 (Terminal FM)	Refer to the drive Technical Manual MEMOBUS/Modbus register 0007H for details. You must set <i>H4-01 = 0 [Terminal FM Analog Output Select = Not Used]</i> .
7	Analog Output 2 (Terminal AM)	Refer to the drive Technical Manual MEMOBUS/Modbus register 0008H for details. You must set <i>H4-04 = 0 [Terminal AM Analog Output Select = Not Used]</i> .
8	Digital Outputs	Refer to the drive Technical Manual MEMOBUS/Modbus register 0009H for details. You must set <i>H2-0x = F [Not Used]</i> for each output used.
9	Reserved	-
10	Reserved	-
11	Reserved	-
12	Reserved	-
13	Reserved	-
14	Reserved	-
15	Configurable Output 1	Configured by hardware configuration tool or by drive parameter <i>F7-23 [Dynamic Out Param 1 for CommCard]</i> .
16	Configurable Output 2	Configured by hardware configuration tool or by drive parameter <i>F7-24 [Dynamic Out Param 2 for CommCard]</i> .
17	Configurable Output 3	Configured by hardware configuration tool or by drive parameter <i>F7-25 [Dynamic Out Param 3 for CommCard]</i> .
18	Configurable Output 4	Configured by hardware configuration tool or by drive parameter <i>F7-26 [Dynamic Out Param 4 for CommCard]</i> .
19	Configurable Output 5	Configured by hardware configuration tool or by drive parameter <i>F7-27 [Dynamic Out Param 5 for CommCard]</i> .

Table 8.7 Forty Byte IO Produce

Word (16 bits)	Description	Notes
0	Status Word	Yaskawa-Specific or Yaskawa P-Drive, selectable through the hardware configuration tool.
1	Output Frequency	The default units are 0.01Hz. (ex: 1234 → 12.34 Hz) <ul style="list-style-type: none"> For Yaskawa P-Drive only this is a bi-polar value: A negative reference commands reverse operation. Units can be changed using drive parameters <i>o1-03</i> and <i>o1-10</i>.
2	Torque Reference	Units are 0.1% (ex: 1000 → 100.0%) Drive monitor <i>U1-09</i> .
3	PG Count Value	Units are 0 to 65535 encoder counts. Drive monitor <i>U6-18</i> .
4	Motor Speed	The default units are 0.01Hz. (ex: 1234 → 12.34 Hz) Units can be changed using drive parameters <i>o1-03</i> and <i>o1-10</i> . Drive monitor <i>U1-05</i> .
5	Frequency Reference Monitor	The default units are 0.01Hz. (ex: 1234 → 12.34 Hz) Units can be changed using drive parameters <i>o1-03</i> and <i>o1-10</i> . Drive monitor <i>U1-01</i> .
6	Output Current	Units are 0.1Amps (ex: 432 → 43.2 Amps) Drive MEMOBUS/Modbus Address: 0026H
7	Analog Input 1	Units are 0.1% (ex: 500 → 50.0%) Drive monitor <i>U1-13</i> .
8	DC Bus Voltage	Units are 1V (ex: 625 → 625 VDC)
9	Fault Code	For information on fault code numbers, refer to the drive Technical Manual - MEMOBUS/Modbus: Fault Trace / Fault History Contents. Drive monitor <i>U2-01</i> .
10	Alarm Code	For information on alarm code numbers, refer to the drive Technical Manual - MEMOBUS/Modbus: Minor Fault/Alarm Contents. Drive MEMOBUS/Modbus Address: 007FH
11	Output Power	Units are 0.01 kW (ex: 345 → 3.45 kW) or 0.1 kW (ex: 345 → 34.5 kW) See drive Technical Manual U1-08 for details about units and scaling. Drive monitor <i>U1-08</i> .
12	Analog Input 2	Units are 0.1% (ex: 500 → 50.0%) Drive monitor <i>U1-14</i> .
13	Digital Inputs	For information on digital input status bit-mapping, see the drive Technical Manual U1-10. Drive monitor <i>U1-10</i> .
14	Analog Input 3	Units are 0.1% (ex: 500 → 50.0%) Drive monitor <i>U1-15</i> .
15	Configurable Input 1	Configured by hardware configuration tool or by drive parameter <i>F7-33</i> [Dynamic In Param 1 for CommCard].
16	Configurable Input 2	Configured by hardware configuration tool or by drive parameter <i>F7-34</i> [Dynamic In Param 2 for CommCard].
17	Configurable Input 3	Configured by hardware configuration tool or by drive parameter <i>F7-35</i> [Dynamic In Param 3 for CommCard].
18	Configurable Input 4	Configured by hardware configuration tool or by drive parameter <i>F7-36</i> [Dynamic In Param 4 for CommCard].
19	Configurable Input 5	Configured by hardware configuration tool or by drive parameter <i>F7-37</i> [Dynamic In Param 5 for CommCard].

Std Tgm 1 + 10 PZD (Standard Telegram 1 + 10 Configurable Inputs & Outputs)

Table 8.8 Std Tgm 1 + 10 Consume

Word (16 bits)	Description	Notes
0	Control Word	Yaskawa-Specific or Yaskawa P-Drive, selectable through the hardware configuration tool.
1	Frequency Reference	The default units are 0.01Hz. (ex: 1234 → 12.34 Hz) <ul style="list-style-type: none"> For Yaskawa P-Drive only this is a bi-polar value: A negative reference commands reverse operation. Units can be changed using drive parameters <i>o1-03</i> and <i>o1-10</i>.
2	Configurable Output 1	Configured by hardware configuration tool or by drive parameter <i>F7-23</i> [Dynamic Out Param 1 for CommCard].
3	Configurable Output 2	Configured by hardware configuration tool or by drive parameter <i>F7-24</i> [Dynamic Out Param 2 for CommCard].
4	Configurable Output 3	Configured by hardware configuration tool or by drive parameter <i>F7-25</i> [Dynamic Out Param 3 for CommCard].

Word (16 bits)	Description	Notes
5	Configurable Output 4	Configured by hardware configuration tool or by drive parameter F7-26 [Dynamic Out Param 4 for CommCard].
6	Configurable Output 5	Configured by hardware configuration tool or by drive parameter F7-27 [Dynamic Out Param 5 for CommCard].
7	Configurable Output 6	Configured by hardware configuration tool or by drive parameter F7-28 [Dynamic Out Param 6 for CommCard].
8	Configurable Output 7	Configured by hardware configuration tool or by drive parameter F7-29 [Dynamic Out Param 7 for CommCard].
9	Configurable Output 8	Configured by hardware configuration tool or by drive parameter F7-30 [Dynamic Out Param 8 for CommCard].
10	Configurable Output 9	Configured by hardware configuration tool or by drive parameter F7-31 [Dynamic Out Param 9 for CommCard].
11	Configurable Output 10	Configured by hardware configuration tool or by drive parameter F7-32 [Dynamic Out Param 10 for CommCard].

Table 8.9 Std Tgm 1 + 10 Produce

Word (16 bits)	Description	Notes
0	Status Word	Yaskawa-Specific or Yaskawa P-Drive, selectable through the hardware configuration tool.
1	Output Frequency	The default units are 0.01Hz. (ex: 1234 → 12.34 Hz) <ul style="list-style-type: none"> For Yaskawa P-Drive only this is a bi-polar value: A negative reference commands reverse operation. Units can be changed using drive parameters o1-03 and o1-10.
2	Configurable Input 1	Configured by hardware configuration tool or by drive parameter F7-33 [Dynamic In Param 1 for CommCard].
3	Configurable Input 2	Configured by hardware configuration tool or by drive parameter F7-34 [Dynamic In Param 2 for CommCard].
4	Configurable Input 3	Configured by hardware configuration tool or by drive parameter F7-35 [Dynamic In Param 3 for CommCard].
5	Configurable Input 4	Configured by hardware configuration tool or by drive parameter F7-36 [Dynamic In Param 4 for CommCard].
6	Configurable Input 5	Configured by hardware configuration tool or by drive parameter F7-37 [Dynamic In Param 5 for CommCard].
7	Configurable Input 6	Configured by hardware configuration tool or by drive parameter F7-38 [Dynamic In Param 6 for CommCard].
8	Configurable Input 7	Configured by hardware configuration tool or by drive parameter F7-39 [Dynamic In Param 7 for CommCard].
9	Configurable Input 8	Configured by hardware configuration tool or by drive parameter F7-40 [Dynamic In Param 8 for CommCard].
10	Configurable Input 9	Configured by hardware configuration tool or by drive parameter F7-41 [Dynamic In Param 9 for CommCard].
11	Configurable Input 10	Configured by hardware configuration tool or by drive parameter F7-42 [Dynamic In Param 10 for CommCard].

Std Tgm 1 + Gateway (Standard Telegram 1 + Gateway Mode)

Using the Gateway Mode, one JOHB-SMP3 can communicate with more than one drive. The JOHB-SMP3 is installed on the master drive, then standard RS-485 (2-wire) MEMOBUS/Modbus protocol is used to connect up to 4 slave drives.

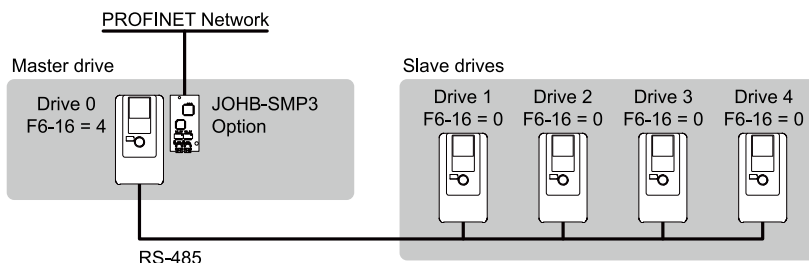


Figure 8.1 Gateway Mode Setup

Note:

Not all Yaskawa drives have the Gateway Mode feature. Refer to the drive Technical Manual for details about gateway mode wiring, setup, and configuration.

Table 8.10 Std Tgm 1 + Gateway Consume

Word (16 bits)	Description	Notes
0	Control Word	Yaskawa-Specific or Yaskawa P-Drive, selectable through the hardware configuration tool.
1	Frequency Reference	The default units are 0.01Hz. (ex: 1234 → 12.34 Hz) <ul style="list-style-type: none"> For Yaskawa P-Drive only this is a bi-polar value: A negative reference commands reverse operation. Units can be changed using drive parameters <i>o1-03 and o1-10</i>.
2	Command Source Update (15C5H)	Refer to the Gateway Special Register Specification section in the drive Technical Manual for details about command word mapping, frequency references, and slave read/write commands. These registers are updated when the data sent to them changes. The fastest they can be updated is once every 250 msec.
3	Run Command-Drive 1 (15C6H) *1	
4	Frequency Ref-Drive 1 (15C7H) *2	
5	Run Command-Drive 2 (15C8H) *1	
6	Frequency Ref-Drive 2 (15C9H) *2	
7	Run Command-Drive 3 (15CAH) *1	
8	Frequency Ref-Drive 3 (15CBH) *2	
9	Run Command-Drive 4 (15CCH) *1	
10	Frequency Ref-Drive 4 (15CDH) *2	
11	Slave Address for Reg. Access + Read/Write (15CEH)	
12	Register Number (15CFH)	
13	Data (write register) (15D0H)	
14	Configurable Output 1	Configured by hardware configuration tool or by drive parameter <i>F7-23 [Dynamic Out Param 1 for CommCard]</i> .
15	Configurable Output 2	Configured by hardware configuration tool or by drive parameter <i>F7-24 [Dynamic Out Param 2 for CommCard]</i> .
16	Configurable Output 3	Configured by hardware configuration tool or by drive parameter <i>F7-25 [Dynamic Out Param 3 for CommCard]</i> .
17	Configurable Output 4	Configured by hardware configuration tool or by drive parameter <i>F7-26 [Dynamic Out Param 4 for CommCard]</i> .
18	Configurable Output 5	Configured by hardware configuration tool or by drive parameter <i>F7-27 [Dynamic Out Param 5 for CommCard]</i> .
19	Configurable Output 6	Configured by hardware configuration tool or by drive parameter <i>F7-28 [Dynamic Out Param 6 for CommCard]</i> .
20	Configurable Output 7	Configured by hardware configuration tool or by drive parameter <i>F7-29 [Dynamic Out Param 7 for CommCard]</i> .
21	Configurable Output 8	Configured by hardware configuration tool or by drive parameter <i>F7-30 [Dynamic Out Param 8 for CommCard]</i> .
22	Configurable Output 9	Configured by hardware configuration tool or by drive parameter <i>F7-31 [Dynamic Out Param 9 for CommCard]</i> .
23	Configurable Output 10	Configured by hardware configuration tool or by drive parameter <i>F7-32 [Dynamic Out Param 10 for CommCard]</i> .

*1 The Run-Command (Control) words for all of the slave drives will always remain mapped as defined in the drive Technical Manual and will NOT change over to the Yaskawa P-Drive format.

*2 The Frequency Reference words for all of the slave drives will always remain uni-polar and will NOT change over to the Yaskawa P-Drive format.

Table 8.11 Std Tgm 1 + Gateway Produce

Word (16 bits)	Description	Notes
0	Status Word	Yaskawa-Specific or Yaskawa P-Drive, selectable through the hardware configuration tool.
1	Output Frequency	The default units are 0.01Hz. (ex: 1234 → 12.34 Hz) <ul style="list-style-type: none"> For Yaskawa P-Drive only this is a bi-polar value: A negative reference commands reverse operation.

Word (16 bits)	Description	Notes
		• Units can be changed using drive parameters <i>o1-03</i> and <i>o1-10</i> .
2	Drive Status – Drive 1 (15E7H) ^{*1}	Refer to the Gateway Special Register Specification section in the drive Technical Manual for details about gateway status word mapping, output frequency, and slave read/write commands. The Drive Status and Output Frequency registers (bytes 4 to 19) are updated once every 500 msec. The Modbus window registers (bytes 20 to 25) are updated once every 2 seconds.
3	Output Frequency or Frequency Ref -Drive 1 (15E8H) ^{*2}	
4	Drive Status – Drive 2 (15E9H) ^{*1}	
5	Output Frequency or Frequency Ref -Drive 2 (15EAH) ^{*2}	
6	Drive Status – Drive 3 (15EBH) ^{*1}	
7	Output Frequency or Frequency Ref -Drive 3 (15ECH) ^{*2}	
8	Drive Status – Drive 4 (15EDH) ^{*1}	
9	Output Frequency or Frequency Ref -Drive 4 (15EEH) ^{*2}	
10	Slave Address for Reg. Access +During MEMOBUS process and ErrCode (15EFH)	
11	Register Number (15F0H)	
12	Data (read register) (15FH)	
13	Configurable Input 1	Configured by hardware configuration tool or by drive parameter <i>F7-33</i> [Dynamic In Param 1 for CommCard].
14	Configurable Input 2	Configured by hardware configuration tool or by drive parameter <i>F7-34</i> [Dynamic In Param 2 for CommCard].
15	Configurable Input 3	Configured by hardware configuration tool or by drive parameter <i>F7-35</i> [Dynamic In Param 3 for CommCard].
16	Configurable Input 4	Configured by hardware configuration tool or by drive parameter <i>F7-36</i> [Dynamic In Param 4 for CommCard].
17	Configurable Input 5	Configured by hardware configuration tool or by drive parameter <i>F7-37</i> [Dynamic In Param 5 for CommCard].
18	Configurable Input 6	Configured by hardware configuration tool or by drive parameter <i>F7-38</i> [Dynamic In Param 6 for CommCard].
19	Configurable Input 7	Configured by hardware configuration tool or by drive parameter <i>F7-39</i> [Dynamic In Param 7 for CommCard].
20	Configurable Input 8	Configured by hardware configuration tool or by drive parameter <i>F7-40</i> [Dynamic In Param 8 for CommCard].
21	Configurable Input 9	Configured by hardware configuration tool or by drive parameter <i>F7-41</i> [Dynamic In Param 9 for CommCard].
22	Configurable Input 10	Configured by hardware configuration tool or by drive parameter <i>F7-42</i> [Dynamic In Param 10 for CommCard].
23	Reserved	-

*1 The Drive Status words for all of the slave drives will always remain mapped as defined in the drive Technical Manual and will NOT change over to the Yaskawa P-Drive format.

*2 The Output Frequency/Frequency Reference words for all of the slave drives will always remain uni-polar and will NOT change over to the Yaskawa P-Drive format.

■ Cyclic Messaging

The JOHB-SMP3 supports cycle times of 8 ms to 512 ms.

■ Yaskawa Acyclic Parameter Access Mechanism

All drive parameters can be read and written under address 0x8000 by performing a read or write with the index value of the corresponding parameter address in the drive. Refer to the drive Technical Manual for a list of these parameter addresses.

Example: Read drive parameter *C1-01* [Acceleration Time 1].

The MEMOBUS/Modbus address for *C1-01* (from the drive Technical Manual) is 200 (Hex).

Using the "Read Record" function block in the PLC, enter the value 200 (Hex) (or 512 decimal) into the index field. The function block will then return (via the record field) an integer value like 1000, which represents 10.00 seconds.

Example: Write drive parameter *C1-01 [Acceleration Time 1]*

The MEMOBUS/Modbus address for *C1-01* (from the drive Technical Manual) is 200 (Hex).

Using the "Write Record" function block in the PLC, enter the value 200 (Hex) (or 512 decimal) into the index field. Enter the desired new value, as a 16-bit integer into the record field. If 5.00 seconds is desired, enter a value of 500.

The parameter change will take effect immediately, but will NOT be saved if power is lost.

■ Yaskawa P-Drive Acyclic Parameter Access Mechanism

A Yaskawa P-Drive acyclic parameter access mechanism can be used to access Yaskawa P-Drive parameters and drive parameters using an index of 0xB02E and the structure in Figure 8.2 for write and read requests.

Requests and responses between the IO-Device and the IO-Controller or the IO-Supervisor are transferred with the Record Data Objects.

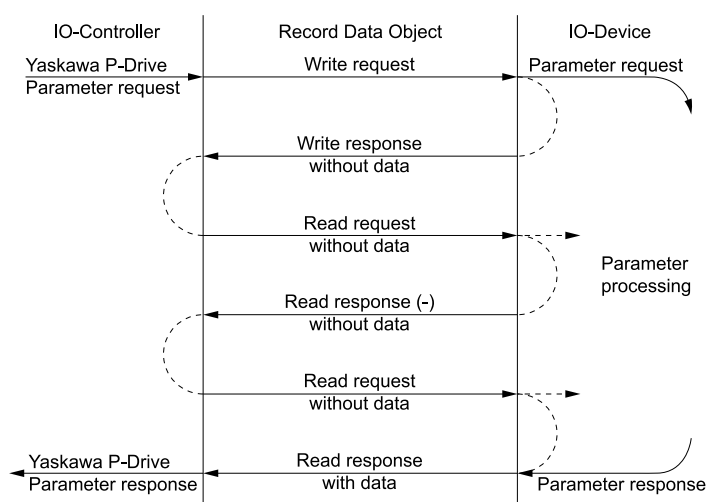


Figure 8.2 Yaskawa P-Drive Acyclic Parameter Access Mechanism Structure

A write request is first sent containing the parameter request.

If the write request is valid, the JOHB-SMP3 acknowledges it with request accepted. The IO-Controller then sends a read request. If the JOHB-SMP3 is still busy performing the internal parameter request, it will return a negative response with the error code "0x11" (State conflict). In this case, the IO-Controller repeats the read request until the JOHB-SMP3 has the Yaskawa P-Drive response data ready.

If the write request is invalid, a negative response is returned with an error code.

Base Mode Parameter Access - Local

The DO-ID field in the Record Data Object request header is not evaluated by the parameter manager. Parameters can be read through any slot in the configuration.

Table 8.12 Response Error Codes

Byte	Value and Meaning
ErrorCode	0xDF (Error Write)
	0xDE (Error Read)
ErrorDecode	0x80 (PNIORW) ErrorCode1 decoded according to Table 8.13. ErrorCode2 is 0.
	0x81 (PNIO) ErrorCode1 and ErrorCode2 decoded according to Table 8.13.
ErrorCode1	Error class and error code (Refer to Table 8.13).
ErrorCode2	-

Table 8.13 ErrorCode1 with PNIORW Decoding

Error class	Meaning	Error Code
0 - 9	Reserved	-
10 (0x0A)	Application	0 = Read error

Error class	Meaning	Error Code
		1 = Write error
		2 = Module failure
		3 - 7 = Reserved
		8 = Version conflict
		9 = Feature not supported
		10 - 15 = User-specific
11 (0x0B)	Access	0 = Invalid index
		1 = Write length error
		2 = Invalid slot
		3 = Type conflict
		4 = Invalid area
		5 = State conflict
		6 = Access denied
		7 = Invalid range
		8 = Invalid parameter
		9 = Invalid type
		10 - 15 = User-specific
12 (0x0C)	Resource	0 = Read constraint conflict
		1 = Write constraint conflict
		2 = Resource busy
		3 = Resource unavailable
		4 - 7 = Reserved
		8 - 15 = User-specific
13 - 15	User-specific	-

Read block is used in read requests and responses. Write block is used in write requests and responses. The request consists of unique identifiers for the connection, addressing information and length of the record data. The response also contains two additional fields for transferring information.

Table 8.14 Structure of the Read and Write Blocks

Field(s)	Description	Range	Type
Service	Request or Response service.	Request (0x00) Response (0x80)	UI8
Operation	Read or Write operation.	Write (0x08) Read (0x09)	UI8
Block length	Length of the block.	0 to 0xFFFF	UI16
ARUID	Identifier <ul style="list-style-type: none"> • time low • time mid • time high and version - clock - node 	-	UI32 UI16 UI16 Octet[2] Octet[6]
API	Application Process Identifier	Device Access Point (0x0000)	UI32
Slot	Slot of the Module Access Point (MAP/PAP)	0x01	UI16
Sub-slot	Sub-slot of the Module Access Point (MAP/PAP)	0x01	UI16
Padding	2 bytes		
Index	Index of the Record Data Object	0x0001 to 0x7FFF 0xB02E	UI16
Data length	Length of the data block	0 to 0xFFFFFFFF	UI32
Additional value 1 (response only)	Field for transferring additional data	-	UI16
Additional value 2 (response only)	Field for transferring additional data	-	UI16

Padding	24 bytes for request, 20 bytes for response.
Data block	Used only with write request and read response.

Data block contains Yaskawa P-Drive specific request or response header.

Table 8.15 Yaskawa P-Drive Request Header

Field(s)	Description	Range	Byte/Word
Request Reference	Unique identification set by the IO-Controller. Changed for each new request.	1 - 255	Byte
Request ID	Request type for the issued block.	Request Parameter (0x01) Change Parameter (0x02)	Byte
DO-ID	To be set to 0x01.	0 - 255	Byte
No. of Parameters	Number of parameters that are present in the request.	1	Byte
Attribute	Type of object being accessed.	Value (0x10)	Byte
No. of Elements	Number of array elements accessed or length of string accessed. Set to 0 if non-array parameters are used.	1	Byte
Parameter Index (group)	Address of the Yaskawa P-Drive parameter that is being accessed. Also "1" is allowed by JOHB-SMP3 to access drive parameters. Drive parameter group when accessing drive parameters.	1 - 65535	Word
Subindex (parameter)	Addresses the first array element of the parameter. Drive parameter number when accessing drive parameters.	0 - 65535	Word
Format */	Refer to Table 8.17 for more information.	-	Byte
Number of Values */	Number of values following.	1	Byte
Values */	The values of the request. In case of odd number of bytes, a zero byte is appended to ensure the word structure of the telegram.	Varies based on value	Refer to Table 8.17 for more information.

*1 Only when Request ID is 0x02 (Change Parameter). The Format, Number of Values, and Value Fields are repeated for other parameters.

Table 8.16 Yaskawa P-Drive Response Header

Field (s)	Description	Range
Response Reference	Mirrored from the request.	1 - 255
Response ID	Response from the IO-Device. In the event that requested services fail, a "not acknowledged" (NAK) response will be indicated.	Request Param OK (0x01), Request Param NAK (0x81), Change Param OK (0x02), Change Param NAK (0x82)
DO-ID	To be set to 1.	0 - 255
No. of Parameters	Number of parameters that are present in the response.	1
Format */	Refer to Table 8.17 for more information.	-
Number of Values */	Number of values following.	1
Values */	The values of the request. When there is an odd number of bytes, a zero byte is appended to ensure the word structure of the telegram.	Varies based on value

*1 Only when Request ID is 0x01 (Request Parameter OK). The Format, Number of Values, and Value Fields are repeated for other parameters.

Table 8.17 Data Types for Format Field

Code	Type
0x00	Reserved
0x01 - 0x36	Standard data types
0x37 - 0x3F	Reserved
0x40	0
0x41	Byte
0x42	Word
0x43	Double word
0x44	Error
0x45 - 0xFF	Reserved

Table 8.18 Yaskawa P-Drive Parameter Request Error Codes

Error #	Meaning	Used at
0x00	Impermissible parameter number	Access to unavailable parameter.
0x01	Parameter value cannot be changed	Change access to a parameter value that cannot be changed.
0x02	Low or high limit exceeded	Change access with value outside the limits.
0x03	Invalid subindex	Access to unavailable subindex.
0x04	No array	Access with subindex to non-indexed parameter.
0x05	Incorrect data type	Change access with value that does not match the data type of the parameter.
0x06	Setting not permitted (can only be reset)	Change access with value unequal to 0 when this is not permitted.
0x07	Description element cannot be changed	Change access to a description element that cannot be changed.
0x09	No description data available	Access to unavailable description (parameter value is available).
0x0B	No operation priority	Change access rights without rights to change parameters.
0x0F	No text array available	Access to text array that is not available (parameter value is available).
0x11	Request cannot be executed because of operating mode	Access is temporarily not possible for reasons outside scope of these instructions.
0x14	Value impermissible	Change access with a value that is within limits but is not permissible for other long-term reasons (parameter with defined single values).
0x15	Response too long	The length of the current response exceeds the maximum transmittable length.
0x16	Parameter address impermissible	Illegal value or value that is not supported for the attribute, number of elements, parameter number or sub-index, or a combination.
0x17	Illegal format	Write request: Illegal format or format of parameter data that is not supported.
0x18	Number of values inconsistent	Write request: Number of values of parameter data does not match number of elements at the parameter address.
0x19	DO nonexistent	Request to DO, which does not exist.
0x65 - 0xFF	Manufacturer-specific	-
0x65	Vendor-specific error	Vendor-specific error.
0x66	Request not supported	Request not supported.
0x67	Communication error	Request cannot be completed because of communication error.
0x6F	Time-out error	Request aborted due to time-out.
0x78	PZD map failure	Parameter cannot be mapped to PZD (size mismatch or non-existent).
0x79	PZD memory failure	Parameter cannot be mapped to PZD (out of memory).
0x7A	Multiple PZD map	Parameter cannot be mapped to PZD (multiple PZD write).
0x8C	Set torque mode error	Cannot change mode to TORQUE (frequency is used).
0x90	Illegal Request ID	The request ID of the response is illegal.

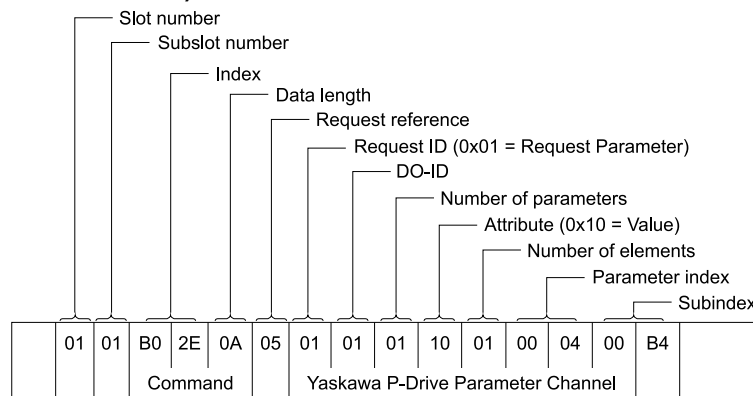
Parameter Data Transfer Examples

The following example shows how parameter data is transferred using the acyclic parameter access mechanism's READ and WRITE.

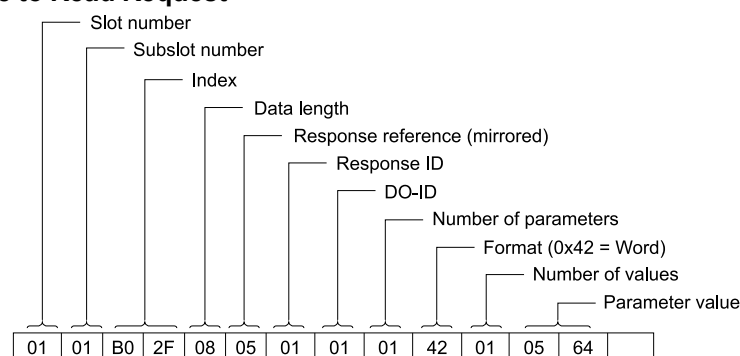
Example 1: Reading a drive parameter

To read a Yaskawa Drive parameter, use the PNU of 1 and the actual address of the parameter in the SubIndex.

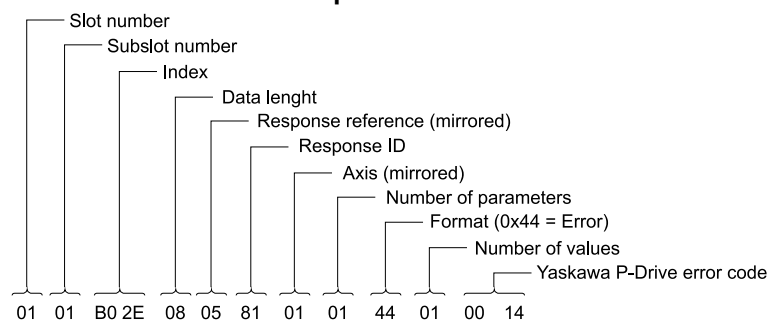
Write Request (Read Parameter Value)



Positive Read Response to Read Request



Negative Response to Yaskawa P-Drive Read Request



Yaskawa P-Drive Profile-Specific Parameters

Yaskawa P-Drive parameters contain data of the drive in standard form. The table below describes the supported Yaskawa P-Drive parameters.

Parameter	Read/Write	Data type	Description
922	Read	Unsigned16	Telegram selection
944	Read	Unsigned16	Fault message counter
947	Read	Array [5] Unsigned16	Fault number. (coded according to DRIVECOM profile) Refer to parameter 945 for information about Subindex Contents.
964	Read	Array [6] Unsigned16	Device identification Subindex Contents 0: Manufacturer 1: Device type 2: Version 3: Firmware date (year) 4: Firmware date (day/month) 5: Number of Drive Objects (DO)
965	Read	Octet String2	Profile number of this device. 0328h = Profile 3, Version 40
967	Read	Unsigned16	Control word (CW)
968	Read	Unsigned16	Status word (SW)
977	Read/Write	Unsigned16	Stores parameters to non-volatile memory Value Description 0: No action 1: Stores parameters Note: The parameter must do a zero-to-one transition and the motor must be stopped.
61000	Read	VisibleString24	Name of station
61001	Read	Unsigned32	IP of station
61002	Read	Array [6] Unsigned8	MAC of station
61003	Read	Unsigned32	Default gateway of station
61004	Read	Unsigned32	Subnet mask of station

Fault Buffer Mechanism

Yaskawa P-Drive profile has a mechanism that can store five fault situations to Yaskawa P-Drive parameters. Fault and diagnostic data, like fault number and fault code can be accessed simultaneously with only one subindex. The mechanism consists of two Yaskawa P-Drive parameters:

- PNU944: Fault message counter
- PNU947: Fault numbers according to value in *U2-01*

◆ Option High Priority Alarm Codes

Refer to the drive Technical Manual for details about each of the PROFINET Option High Priority Alarm Codes (faults) listed in [Table 8.19](#).

These codes are transmitted as Manufacturer Specific Diagnostic high priority alarms that can be seen in the PLC configuration software. These high priority codes are the same codes that appear in the drive manual, except with an offset of 1000 (Hex).

Table 8.19 PROFINET Option High Priority Alarm Codes

Drive Alarm Code (Hex.)	Description	Drive Alarm Code (Hex.)	Description
1002	DC Bus Undervoltage (Uv1)	1026	Zero Servo Fault (SvE)
1003	Control Power Undervoltage (Uv2)	1027	Option Card External Fault (EF0)
1004	Soft Charge Answerback Fault (Uv3)	1028	PID Feedback Loss (FbL)
1005	Short Circuit/IGBT Failure (SC)	1029	Undertorque Detection 1 (UL3)
1006	Ground Fault (GF)	102A	Undertorque Detection 2 (UL4)
1007	Overcurrent (oC)	102B	High Slip Braking Overload (oL7)
1008	Overvoltage (ov)	102C	External Fault (Terminal S9) (EF9)
1009	Heatsink Overheat (oH)	102D	External Fault (Terminal S10) (EF10)
100A	Heatsink Overheat (oH1)	102E	External Fault (Terminal S11) (EF11)
100B	Motor Overload (oL1)	102F	External Fault (Terminal S12) (EF12)
100C	Drive Overload (oL2)	1032	Z Pulse Fault (dv1)
100D	Overtorque Detection 1 (oL3)	1033	Z Pulse Noise Fault Detection (dv2)
100E	Overtorque Detection 2 (oL4)	1034	Inversion Detection (dv3)
100F	Dynamic Braking Transistor Fault (rr)	1035	Inversion Prevention Detection (dv4)
1010	Braking Resistor Overheat (rH)	1036	Output Current Imbalance (LF2)
1011	External Fault (Terminal S3) (EF3)	1037	Motor Step-Out Detected (STPo)
1012	External Fault (Terminal S4) (EF4)	1038	Encoder (PG) Hardware Fault (PGoH)
1013	External Fault (Terminal S5) (EF5)	103B	Speed Search Retries Exceeded (SEr)
1014	External Fault (Terminal S6) (EF6)	1041	Excessive PID Feedback (FbH)
1015	External Fault (Terminal S7) (EF7)	1042	External Fault (Terminal S1) (EF1)
1016	External Fault (Terminal S8) (EF8)	1043	External Fault (Terminal S2) (EF2)
1017	Internal Fan Fault (FAn)	1044	Mechanical Weakening Detection 1 (oL5)
1018	Overspeed (oS)	1045	Mechanical Weakening Detection 2 (UL5)
1019	Speed Deviation (dEv)	1046	Current Offset Fault (CoF)
101A	Encoder (PG) Feedback Loss (PGo)	1047	PLC Fault 1 (PE1)
101B	Input Phase Loss (PF)	1048	PLC Fault 2 (PE2)
101C	Output Phase Loss (LF)	1049	DriveWorksEZ Fault (dWFL)
101D	Motor Overheat (PTC Input) (oH3)	104A	EEPROM Memory DWEZ Data Error (dWF1)
101E	Keypad Connection Fault (oPr)	104B	DriveWorksEZ Fault 2 (dWF2)
101F	EEPROM Write Error (Err)	104C	DriveWorksEZ Fault 3 (dWF3)
1020	Motor Overheat Fault (PTC Input) (oH4)	104D	Output Voltage Detection Fault (voF)
1021	Serial Communications Error (CE)	104E	Braking Resistor Fault (rF)
1022	Option Communication Error (bUS)	104F	Braking Transistor Overload Fault (boL)
1023	SI-F/G Communication Error (E-15)	1050	Motor Overheat (NTC Input) (oH5)
1024	SI-F/G CPU down (E-10)	1051	Low Speed Motor Step-Out (LSo)
1025	Control Fault (CF)	1052	Node Setup Error (nSE)

Drive Alarm Code (Hex.)	Description	Drive Alarm Code (Hex.)	Description
1053	Thermistor Disconnect (THo)	1402	Keypad Battery Low Voltage (bAT)
105A	Underload or Belt Break Detected (UL6)	1405	DC Bus Overvoltage 2 (ov2)
105B	Polarity Judge Timeout (dv7)	140F	Safety Circuit Fault (SCF)
1081	Control Circuit Error (CPF00)	1411	High Level Communications Error (HLCE)
1082	Control Circuit Error (CPF01)	1413	Drive Cooling Fan Fault (FAN1)
1083	A/D Conversion Error (CPF02)	1414	Comparator 1 Limit Fault (CP1)
1084	Control Board Connection Error (CPF03)	1415	Comparator 2 Limit Fault (CP2)
1086	CPU Adjust Error (CPF05)	1416	Bluetooth Communication Fault (bCE)
1087	EEPROM Memory Data Error (CPF06)	1420	PI Aux Feedback Level Loss (AUXFB)
1088	Terminal Board Connection Error (CPF07)	1421	Differential Feedback Exceeded (DIFF)
1089	Terminal Board Connection Error (CPF08)	1422	WIRE Break (FDBKL)
108A	EEPROM Error (CPF09)	1423	High Feedback Sensed (HFB)
108C	RAM Fault (CPF11)	1424	High PI Aux Feedback Level (HIAUX)
108D	FLASH Memory Fault (CPF12)	1425	Low Feedback Sensed (LFB)
108E	Watchdog Circuit Exception (CPF13)	1426	Low PI Aux Feedback Level (LOAUX)
108F	Control Circuit Fault (CPF14)	1427	Loss of Prime (LOP)
1091	Clock Fault (CPF16)	1428	Net IO-Controller Lost (MSL)
1092	Timing Fault (CPF17)	1429	Setpoint Not Met (NMS)
1093	Control Circuit Fault (CPF18)	142A	Output Disconnect (OD)
1094	Control Circuit Fault (CPF19)	142B	Thermostat Fault (VLTS)
1095	Control Circuit Error (CPF20)	1432	Low Water Level (LWL)
1096	Control Circuit Error (CPF21)	1433	High Water Level (HWL)
1097	Hybrid IC Error (CPF22)	1434	VT Overload (VTOL)
1098	Control Board Connection Error (CPF23)	1435	Single Phase Converter Not Ready (SPCNR)
1099	Drive Unit Signal Fault (CPF24)	143A	Wait For Interlock Timeout (FB02)
109A	Terminal Board not Connected (CPF25)	143B	External Fault Bypass (EFB) (FB03)
109B	BB Circuit Error (CPF26)	143D	Motor Overload (FB05)
109C	PWM Set Reg Error (CPF27)	143E	External Overload Motor 1 (FB06)
109D	PWM Pattern Error (CPF28)	143F	External Overload Motor 2 (FB07)
109E	On-Delay Error (CPF29)	1440	Brownout Detected (FB08)
109F	BB On Error (CPF30)	1441	Blackout Detected (FB09)
10A0	ASIC Code Error (CPF31)	1442	Loss of Drive Communications (FB10)
10A1	ASIC Startup Error (CPF32)	1445	Loss of Load Detected (FB13)
10A2	Watch-dog Error (CPF33)	1447	Input Phase Loss (FB15)
10A3	Power/Clock Error (CPF34)	1448	Input Phase Rotation (FB16)
10A4	Ext A/D Conv Error (CPF35)	1449	Load Verify Fault (FB17)
10A5	ASIC COM Error (CPF36)	144A	Welded Bypass Contactor Detected (FB18)
10A6	ASIC COM Error (CPF37)	1452	Option on Drive Detected (FB26)
10A7	EEPROM Data Error (CPF38)	1453	Drive Hardware Error (CPFx OFx) (FB27)
10A8	CPU-ASIC Communication Error (CPF39)	1454	Drive Faulted (FB28)
10B0	FLASH Memory Data Error (CPF47)	1456	Conflicting SW Check UB-99 (FB30)
1401	Keypad Time Not Set (TiM)		

◆ Option Low Priority Alarm Codes

These codes are transmitted as Manufacturer Specific Diagnostic low priority alarms that can be seen in the PLC configuration software. These low priority codes are the same codes that appear in the drive manual, except with an offset of 400 (Hex).

Table 8.20 PROFINET Option Low Priority Alarm Codes

Drive Alarm Code (Hex.)	Description	Drive Alarm Code (Hex.)	Description
0401	Undervoltage (Uv)	0429	Cycle Power to Accept Changes (CyPo)
0402	DC Bus Overvoltage (ov)	042A	Drive Disabled (dnE)
0403	Heatsink Overheat (oH)	042B	Encoder (PG) Hardware Fault (PGoH)
0404	External Overheat (H1-XX=B) (oH2)	0434	High Current Alarm (HCA)
0405	Overtorque 1 (oL3)	0435	Cooling Fan Maintenance Time (LT-1)
0406	Overtorque 2 (oL4)	0436	Capacitor Maintenance Time (LT-2)
0407	FWD/REV Run Command Input Error (EF)	0437	Ctrl Failure/STOP (CF)
0408	Baseblock (bb)	0438	SI-S EEPROM Error (EEP)
0409	External Fault (Terminal S3) (EF3)	0439	External Fault (Terminal S1) (EF1)
040A	External Fault (Terminal S4) (EF4)	043A	External Fault (Terminal S2) (EF2)
040B	External Fault (Terminal S5) (EF5)	043B	Safe Torque OFF Hardware (SToF)
040C	External Fault (Terminal S6) (EF6)	043C	Safe Torque OFF (STo)
040D	External Fault (Terminal S7) (EF7)	043D	Mechanical Weakening Detection 1 (oL5)
040E	External Fault (Terminal S8) (EF8)	043E	Mechanical Weakening Detection 2 (UL5)
040F	Internal Fan Fault (Fan)	043F	PLC Error 1 (PA1)
0410	Overspeed (oS)	0440	PLC Error 2 (PA2)
0411	Speed Deviation (dEv)	0441	Output Voltage Detection Alarm (voF)
0412	Encoder (PG) Feedback Loss (PGo)	0442	IGBT Maintenance Time (90%) (TrPC)
0413	Keypad Disconnect (oPr)	0443	SoftChargeBypassRelay MainteTime (LT-3)
0414	Modbus Communication Error (CE)	0444	IGBT Maintenance Time (50%) (LT-4)
0415	Option Communication Error (bUS)	0445	Braking Transistor Overload (boL)
0416	Serial Comm Transmission Error (CALL)	0447	Input Phase Loss (PF)
0417	Motor Overloaded (oL1)	0448	Motor Overheat (NTC Input) (oH5)
0418	Drive Overloaded (oL2)	0449	DriveWorksEZ Alarm (dWAL)
0419	SI-F/G Communication Error (E-15)	044A	DriveWorksEZ Alarm 2 (dWA2)
041A	Option Card External Fault (EF0)	044B	DriveWorksEZ Alarm 3 (dWA3)
041B	Motor Switch during Run (rUn)	044D	Thermistor Disconnect (THo)
041C	Option Communication Error (bUS)	0455	GF1 Error (GF1)
041D	Serial Comm Transmission Error (CALL)	0462	Customer Safeties (SAFE)
041E	Undertorque Detection 1 (UL3)	0467	Emergency Override FWD (EOF)
041F	Undertorque Detection 2 (UL4)	0468	Emergency Override REV (EOR)
0420	Modbus Test Mode Error (SE)	0469	BAS Interlock (INTLK)
0421	Loss of External Power 24 Supply (L24v)	0481	External Power 24V Supply (EP24v)
0422	Motor Overheat (PTC Input) (oH3)	0484	Shipping Adjustment Required (SUA)
0423	External Fault (Terminal S9) (EF9)	0485	Keypad Battery Low Voltage (bAT)
0424	External Fault (Terminal S10) (EF10)	0487	Comparator 1 Limit Error (CP1)
0425	External Fault (Terminal S11) (EF11)	0488	Comparator 2 Limit Error (CP2)
0426	External Fault (Terminal S12) (EF12)	0489	Keypad Time Not Set (TiM)
0427	PID Feedback Loss (FbL)	048A	Bluetooth Communication Error (bCE)
0428	Excessive PID Feedback (FbH)	0490	Main Fdbk Lost Using Backup Fdbk (Bu-Fb)

Drive Alarm Code (Hex.)	Description	Drive Alarm Code (Hex.)	Description
0491	Backup Fdbk Lost Chk/Repl Xducer (BuFbl)	04A8	Low Suction Pressure (LSP)
0492	Run at H5-34 (CE Go-To-Freq) (CE)	04A9	Low Water In Tank (LWT)
0493	Differential Feedback Exceeded (DIFF)	04B1	Multi-Function Input Setting Err (HV0PE03)
0494	Feedback Loss Wire Break (FDBKL)	04B2	Interlock Open (AL02)
0495	Feedback Loss, Go To Freq b5-83 (FLGT)	04B3	Emergency Override Bypass (AL03)
0496	High PI Aux Feedback Level (HIAUX)	04B9	Restart Delay Active (AL09)
0497	High Feedback Sensed (HIFB)	04BA	Loss of Drive Communications (AL10)
0499	Low PI Aux Feedback Level (LOAUX)	04BD	Loss of Load Detected (AL13)
049A	Low Feedback Sensed (LOFB)	04C0	Input Phase Rotation (AL16)
049B	Loss of Prime (LOP)	04C1	Remote Xfer disabled in reverse (AL17)
049C	Setpoint Not Met (NMS)	04C2	Auto Xfer disabled in reverse (AL18)
049D	Output Disconnect (OD)	04C9	Safety Open (SAFE)
049E	Freq Ref < Minimum Speed (Y1-06) (FR<MS)	04CA	Fire Stat Open (FIRE_ST)
049F	Freq. Reference < Thrust (Y4-12) (FR<TH)	04CB	Freeze Stat Open (FREEZ_ST)
04A1	NETSCAN Waiting for IO-Controller (NETSC)	04CC	Smoke Alarm Active (SMK_ALRM)
04A2	Analog Fbk Lost, Switched to Net (AFBL)	04CD	Over Pressure Detected (OV_PRESS)
04A3	Low PI Aux Fdbk Drive Disabled (AuDis)	04CE	Low Suction Detected (LOW_SUCT)
04A4	PI Aux Feedback Level Loss (AUXFB)	04CF	Vibration Detected (VBRATION)
04A5	PI Aux Fdbk Lost Switched to Net (AuFbl)	04DB	Remote Drive Disable (R-DNE)
04A6	Main Fdbk Lost, Using Diff Fdbk (BuDif)	04DC	De-Scale/De-Rag Active (DS)
04A7	Low City Pressure (LCP)	04DD	Single Phase Converter Not Ready (SPCNR)

◆ Identification and Maintenance Functions (I&M)

The purpose of the I&M functions is to provide support for the customer during commissioning, parametrization and repair of the module. The JOHB-SMP3 supports I&M functions 0 to 3, which can be accessed using the Record data object's read request.

Function	Record Data Index
I&M0	0xAFF0
I&M1	0xAFF1
I&M2	0xAFF2
I&M3	0xAFF3

The structure of the I&M functions is described in [Table 8.21](#) to [Table 8.24](#).

Table 8.21 I&M0 Device Identification (Read-Only)

Content	Description
Header	-
Vendor ID	PROFINET Vendor ID of Yaskawa, which is 0x019F
Order ID	Order number of the JOHB-SMP3 adapter kit (JOHB-SMP3)
Serial number	Serial number of the adapter
Hardware revision	Hardware revision of the JOHB-SMP3 adapter
Software revision	Revision of the software
Revision counter	Revision number
Profile ID	No Profile ID (0x0000)
Profile specific type	No profile specific type (0x0000)
I&M version	Version is 1.1 (0x0101)
Supported I&M functions	I&M0 is supported (0x0001)

Table 8.22 I&M1 Device Identification (Read-Write)

Content	Description
Plant Designation	Installation area
Location Designation	Specific installation place

Table 8.23 I&M2 Device Identification (Read-Write)

Content	Description
Installation Date	Date of installation

Table 8.24 I&M3 Device Identification (Read-Write)

Content	Description
Additional Information	Customer comments

◆ Alarm Mechanism

When a fault or alarm situation occurs in the drive, the JOHB-SMP3 adapter will send an alarm notification, which the IO-Controller station must acknowledge. Refer to [Table 8.25](#) for more information.

Table 8.25 Alarm Notification

Attribute	Description
BlockHeader	-
AlarmType	PROFINET specific alarm type
API	0x3A00 (Yaskawa P-Drive profile)
SlotNumber	Slot number of the Drive Object (DO)
SubslotNumber	Sub-slot number of the sub-slot to which the diagnosis object is related
ModuleIdentNumber	Module Ident number of the DO
SubmoduleIdentNumber	0xFFFF
AlarmSpecifier	Diagnosis type
UserStructureIdentifier	0x8000 (Channel Diagnosis Data)
ChannelNumber	0
ChannelProperties	0x0800 Diagnosis Appears 0x1000 Diagnosis Disappears
ChannelErrorType	Error code of drive fault or drive alarm. Refer to 44 and 46 for more information.

9 Web Interface

The option contains a series of web pages that let you use a standard web browser to view status and diagnostic information.

You can access the web page through a self-contained web server at port 80. Type the IP address of the option into a web browser to access the home page.

Example: "http://192.168.1.20"

The JOHB-SMP3 IP Address is available using drive keypad to access Option Monitors *U6-80* to *U6-83*. Refer to [Table 6.1](#) for more information.

◆ Home Page

The Home page shows the status of the drive and the I/O. It also shows identifying information about the drive and the option.

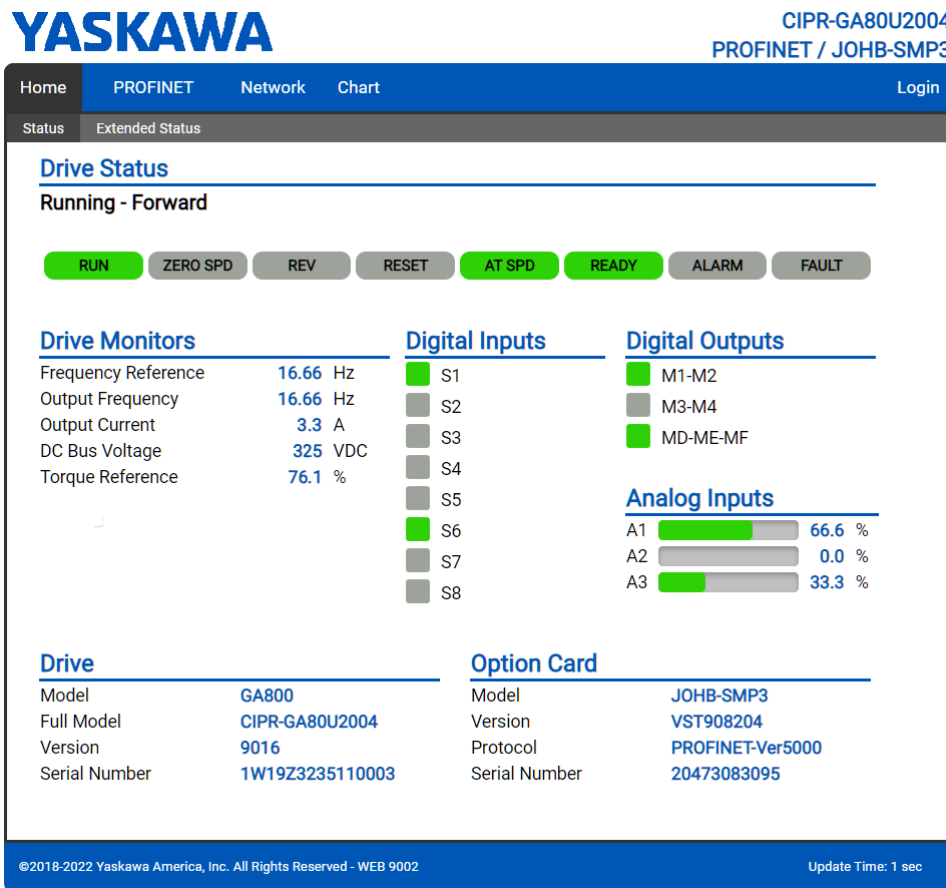


Figure 9.1 Home Page View

◆ PROFINET Page

The PROFINET page shows basic information about the protocol. You can change the station name from this page if the option is not actively connected to a PLC. This requires a security login. Refer to [Security Login on page 54](#) for more information.

You can download the GSDML file from this page.

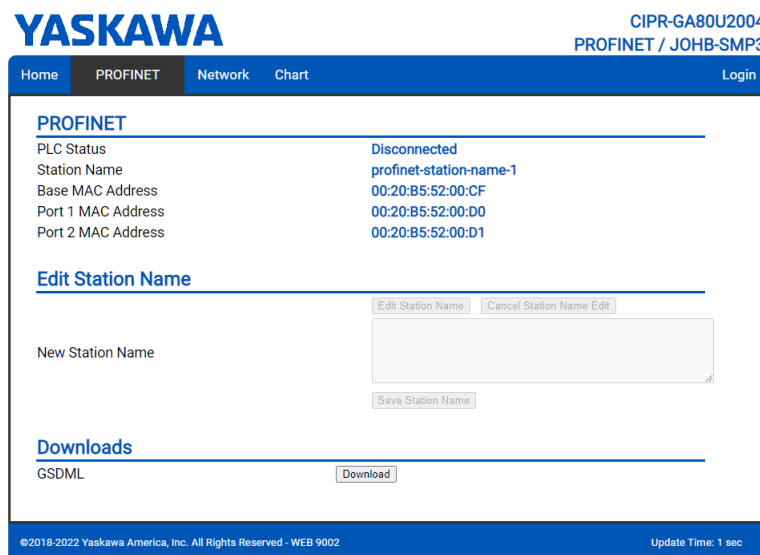


Figure 9.2 PROFINET Page View

◆ Network Page

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

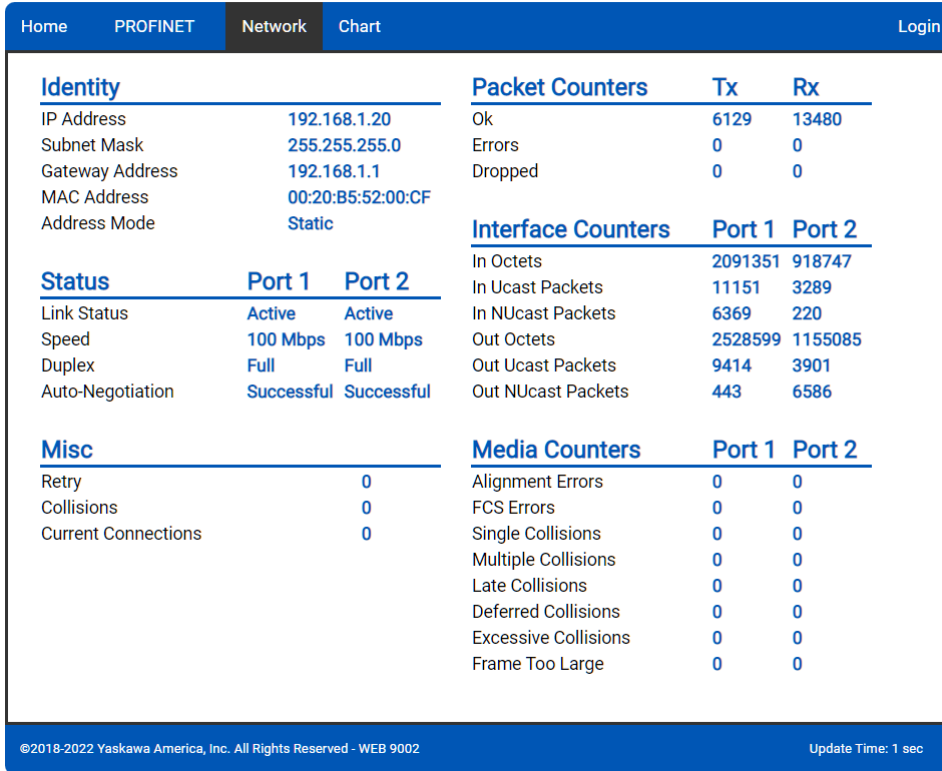


Figure 9.3 Network Page View

Table 9.1 Network Monitor Descriptions

Name	Description
Address Mode	Either static IP address or DHCP.
Alignment Errors	Cumulative number of errors for uneven packets lengths.
Auto-Negotiation	If auto-negotiation is enabled, this will show the status of the negotiation.
Collisions	Cumulative number of collisions (half duplex only) reported by the MAC/PHY (Media Access Control/Physical Layer).
Current Connections	Current number of open connections.
Deferred Collisions	Cumulative number of deferred collisions.
Duplex	Display either Full or Half.
Excessive Collisions	Cumulative number of excessive collisions.
FCS Errors	Cumulative number of frame check sequence errors.
Frame Too Large	Cumulative number of frames that exceed the maximum frame size.
Gateway Address	The Gateway IP Address that the option will use.
In NUCast Packets	Cumulative number of non-unicast packets received.
In Octets	Cumulative number of incoming octets.
In Ucast Packets	Cumulative number of unicast packets received.
IP Address	IP Address of the option.
Late Collisions	Cumulative number of late collisions.
Link Status	Active if the cable is plugged in, or inactive if no cable.
MAC Address	MAC Address of the option.
Msg Rx Dropped	Cumulative number of messages dropped due to input network buffer being full and unable to hold the new message.
Msg Rx Errors	Cumulative number of receive errors reported by the MAC/PHY (Media Access Control/Physical Layer).
Msg Rx OK	Cumulative number of messages received successfully to JOHB-SMP3.
Msg Tx Dropped	Cumulative number of messages dropped due to output network buffer being full and unable to hold the new message.

Name	Description
Msg Tx Errors	Cumulative number of transmit errors reported by the MAC/PHY (Media Access Control/Physical Layer).
Msg Tx OK	Cumulative number of messages transmit successfully from JOHB-SMP3.
Multiple Collisions	Cumulative number of multiple collisions.
Out NUcast Packets	Cumulative number of non-unicast packets sent.
Out Octets	Cumulative number of outgoing octets.
Out Ucast Packets	Cumulative number of unicast packets sent.
Single Collisions	Cumulative number of single collisions.
Speed	Connection speed, either 10 Mbps or 100 Mbps.
Subnet Mask	Subnet Mask of the option.
Tx Retry	Cumulative number of retransmits due to busy medium reported by the MAC/PHY (Media Access Control/Physical Layer).

Note:

Cumulative counters are reset when the power supply is cycled.

◆ Chart Page

The Chart page can be used to monitor one signal from a predefined list.

List:

- Frequency Reference
- Output Frequency
- Output Current
- Motor Speed
- Torque Reference
- DC Bus Voltage
- Terminal Analog Input 1
- Terminal Analog Input 2
- Terminal Analog Input 3

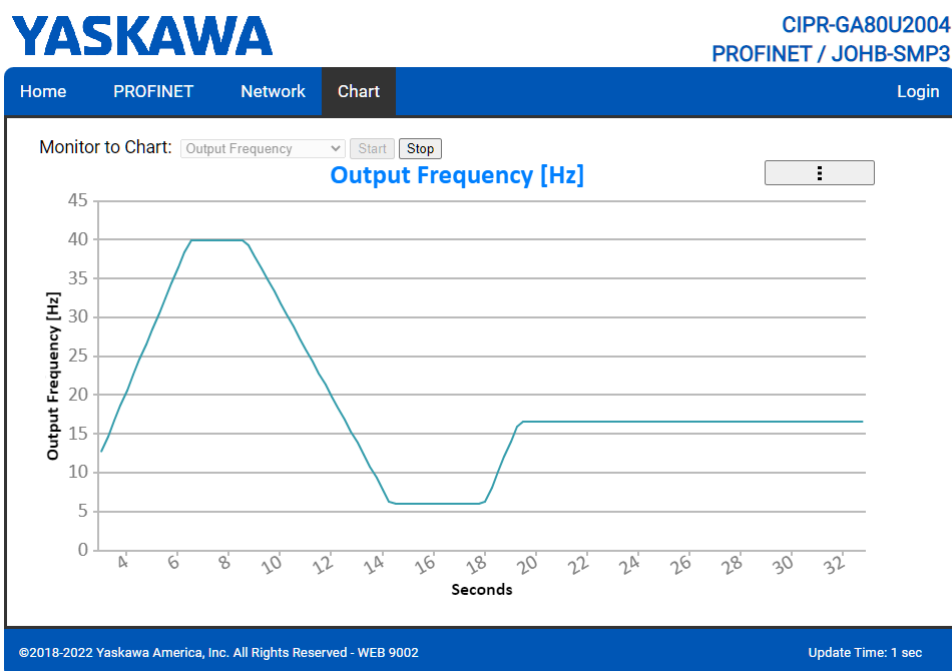


Figure 9.4 Chart Page View

◆ Email Alerts Page (Requires Security Login)

The Email Alerts page 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.

Click “Save Email Settings” when you save the entered information into the option.

YASKAWA
CIPR-GA80U2004
PROFINET / JOHB-SMP3

Home
PROFINET
Network
Chart
Email Alerts
Parameter Access
Settings
Logout

Conditional Email 1

Enable

Condition Frequency Reference < 0 --- < 0

Address ToAddress1@ToDomain1 Subject Subject1

Message

Conditional Email 2

Enable

Condition Frequency Reference < 0 --- < 0

Address ToAddress2@ToDomain2 Subject Subject2

Message

Conditional Email 3

Enable

Condition Frequency Reference < 0 --- < 0

Address ToAddress3@ToDomain3 Subject Subject3

Message

Conditional Email 4

Enable

Condition Frequency Reference < 0 --- < 0

Address ToAddress4@ToDomain4 Subject Subject4

Message

©2018-2022 Yaskawa America, Inc. All Rights Reserved - WEB 9002
Update Time: 1 sec

Figure 9.5 Email Alerts Page View

■ Procedure: Conditional Email Set-up

1. Click the “Enable” check box to enable the alert.
2. Define the condition that will trigger the email by selecting a monitor parameter, a comparator, and a value.
Set the conditions to send alerts from the “Condition” drop-down selection. If choosing only one condition and no OR or AND are needed, set the “OR/AND” drop-down selection to “—”.
3. Enter the email address where the alert will be sent.
4. Enter the message that will appear in the email contents.
5. Enter the email subject.

◆ Parameter Access Page (Requires Security Login)

The Parameter Access page lets you read parameters, monitors and other Memobus registers from the drive.

Figure 9.6 Parameter Access Page View

The MEMOBUS/Modbus address for the drive parameter being accessed must be entered in 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 “Read Successful” or “Write Successful” is displayed when finished.

◆ Settings Page (Requires Security Login)

The Settings page sets web page behavior parameters. Access is restricted unless a valid password is entered. The default password is yaskawa.

Figure 9.7 Settings Page View

■ Security Login

Click “Login” and enter a valid password. 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 Settings page.

Entering a valid password allows access to the settings in the Settings page, Email Alerts page, and the Parameter Access page.

■ Webpage Password

To change the password, enter the new password in the “New Password:” and “Confirm Password:” text boxes. Click “Save password”.

■ Webpage Settings

The values displayed in the various tabs are refreshed at the rate defined in the “Data Update Time” select box. The Data Update Time can be set to 250 ms, 500 ms, 1 second, 2 seconds, or 5 seconds.

■ Email Settings

The “Email Server IP Address” 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 Server Port” text box.

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

To save the entered information into the option, click “Save Email Settings”.

10 Troubleshooting

◆ Drive-Side Error Codes

Drive-side error codes appear on the drive keypad. [Faults on page 54](#) lists causes of the errors and possible corrective actions. Refer to the drive Technical Manual for additional error codes that may appear on the drive keypad.

■ Faults

Both *bUS* [Option Communication Error] and *EF0* [Option Card External Fault] can appear as a fault. When a fault occurs, the keypad ALM LED stays lit. When an alarm occurs, the ALM LED flashes.

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

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

Code	Name	Causes	Possible Solutions
bUS	Option Communication Error	The drive did not receive a signal from the controller.	<ul style="list-style-type: none"> • Check for wiring errors. • Correct the wiring.
		The communications cable wiring is incorrect.	
		An existing short circuit or communications disconnection	Check disconnected cables and short circuits and repair as needed
		A data error occurred due to electric interference	<ul style="list-style-type: none"> • Prevent noise in the control circuit, main circuit, and ground wiring. • If you identify a magnetic contactor as a source of noise, install a surge absorber to the contactor coil. • Use only recommended cables or other shielded line. Ground the shield on the controller side or the drive input power side. • Separate all communication wiring from drive power lines. Install an EMC noise filter to the drive power supply input. • Decrease the effects of electrical interference from the controller.

Code	Name	Causes	Possible Solutions
		Option is damaged	If there are no problems with the wiring and the error continues to occur, replace the option.
		Connection Time-out	Check if the CPU of the controller is not stopped.
EF0	Option Card External Fault	The option received an external fault from the controller.	<ol style="list-style-type: none"> Find the device that caused the external fault and remove the cause. Clear the external fault input from the controller.
		A programming error occurred on the controller side.	Examine the operation of the controller program.
oFA00	Option Not Compatible with Port	The option connected to connector CN5-A is not compatible.	Connect the option to the correct connector. <ul style="list-style-type: none"> Use connector CN5-A when you connect the option. To use other options, refer to those option manuals.
		Invalid DIP switch S1 setting	Set the option DIP switch S1 as shown in Figure 5.2 . Monitor, U4-75 [Communication OPT Protocol] will display the DIP switch S1 setting.
		PROFINET has not been installed on the JOHB-SMP3 card.	Upgrade the software in the JOHB-SMP3. For details, consult your local Yaskawa representative.
oFA01	Option Card Fault (CN5-A)	The option connected to option port CN5-A was changed during run.	<ol style="list-style-type: none"> De-energize the drive. Connect the option to the correct option port.
oFA03, oFA04	Option Card Error (CN5-A)	A fault occurred in the option.	<ol style="list-style-type: none"> De-energize the drive. Make sure that the option is correctly connected to the connector. If the problem continues, replace the option.
oFA30 to oFA43	Option Card Connection Error (CN5-A)	A fault occurred in the option.	<ol style="list-style-type: none"> De-energize the drive. Make sure that the option is correctly connected to the connector. If the problem continues, replace the option.
oFb00	Option Not Compatible with Port	The option connected to connector CN5-B is not compatible.	Connect the option to the correct connector. <ul style="list-style-type: none"> Use connector CN5-A when you connect the option. To use other options, refer to those option manuals.
oFb02	Option Fault	An option of the same type is already installed in option port CN5-A, CN5-B, or CN5-C.	Connect the option to the correct option port.
oFC00	Option Fault (CN5-B)	The option connected to connector CN5-C is not compatible.	Connect the option to the correct connector. <ul style="list-style-type: none"> Use connector CN5-A when you connect the option. To use other options, refer to those option manuals.
oFC02	Option Fault	An option of the same type is already installed in option port CN5-A, CN5-B, or CN5-C.	Connect the option to the correct option port.
PSE	JOHB-SMP3 Protocol Set Error	Invalid DIP switch S1 setting	Set the option DIP switch S1 as shown in Figure 5.2 . Monitor, U4-75 [Communication OPT Protocol] will display the DIP switch S1 setting.
		PROFINET has not been installed on the JOHB-SMP3 card.	Upgrade the software in the JOHB-SMP3. For details, consult your local Yaskawa representative.

■ Minor Faults and Alarms

Code	Name	Causes	Possible Solutions
PA1	PLC Alarm 1	Port 1 is at a link speed different from Port 2 (100 Mbps and 10 Mbps). Data will not be passed between the two ports in this condition.	<ul style="list-style-type: none"> AUTO NEGOTIATE: When $F7-14 = 1$ [Duplex Mode Selection = Auto/Auto (Auto Negotiation/Auto Negotiation)], make sure that the devices connected to the two ports of the JOHB-SMP3 have the same speed (both at 10 Mbps or both at 100 Mbps). FORCED DUPLEX SETTING: When $F7-14 \neq 1$ [Duplex Mode Selection \neq Auto/Auto (Auto Negotiation/Auto Negotiation)], set the two connected ports to the same speed using $F7-15$. You cannot set $F7-15$ to 101 or 102.

◆ bUS Fault Tolerance

■ bUS Fault Auto-Restart

Parameter $F6-14$ [bUS Fault Auto Reset Select] will appear when the option is installed.

Setting $F6-14 = 0$ [Disabled] or $F6-01 = 3$ or greater (Alarm only) will not affect standard default drive behavior.

Setting $F6-14 = 1$ [Enabled] AND $F6-01 \neq 3$ [Fault] will cause the following operation:

- The bUS fault occurs after the $F7-16$ [Timeout Value] delay and the Run command is removed from the drive.
- Then the option throws a bUS fault to the drive.
- When the condition is removed, the option commands a fault reset and returns control of the drive to the PROFINET network.

Note:

The option will only read parameter *F6-01* and *F6-14* from the drive during power-up.

■ **bUS Fault Delay**

Parameter *F7-16* [Timeout Value] will appear when the option is installed. The setting value of *F7-16* is the length of time that the option will delay sending the *bUS* fault to the drive. The status LEDs on the option are not affected by the delay time set in *F7-16*; the LEDs will indicate the *bUS* condition immediately.

Note:

The option will only read parameter *F7-16* from the drive during power-up.

◆ **Option Error Codes**

■ **Option Fault Monitors U6-98 and U6-99**

The option can declare error/warning conditions via drive monitor parameters on the drive keypad as shown in [Table 10.1](#).

Table 10.1 Option Fault Monitor Descriptions

Status	Fault Declared	Status Value (U6-98/U6-99)	Description	MS LED	NS LED
Forced Fault	<i>EF0</i>	3	The network sent a message to force this node into a fault state.	RED flash 5 times	-
No Link	<i>bUS</i>	1300	No physical link to another device. This happens after a link is established and removed.	-	RED flash 2 times
Temporary Network Error	<i>bUS</i>	1301	PLC connection timeout. This indicates a network problem, for example PLC offline or switch disconnected.	-	RED flash 1 time
Default MAC Address	-	1303	Factory default MAC Address programmed into the option. Note: Return the option to Yaskawa or your nearest sales representative and request the setting change.	Solid RED	-
No IP address	-	1304	Card does not have an IP address. This happens when the JOHB-SMP3 is set to have the PLC configure the IP address but it has not been received yet (<i>F7-13 = 1 or 2</i> [Address Mode at Startup = Set by PLC]).	RED flash 2 times	-
No station name	-	1305	No station name programmed. Program a name through web page or PLC configuration program. Note: If the DIP switches are changed on the JOHB-SMP3, the station name will automatically be erased.	RED flash 3 times	-
IP Configuration Error	-	1309	The configured IP addresses are incompatible. The IP Address (<i>F7-01 to F7-04</i>) does not agree with the Subnet Mask (<i>F7-05 to F7-08</i>) and/or the Gateway Address (<i>F7-09 to F7-12</i>) Adjusting the above parameters or setting the PLC to assign the IP address should clear this fault.	-	NS RED 3 times
Web Interface Setting Error	-	1310	Failure to read the web interface setting.	Solid RED	-

Two drive monitor parameters, *U6-98* [First Fault] and *U6-99* [Current Fault] assist the user 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 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.

◆ **Communication Error**

If there are no errors in your drive, but communication with other devices is not possible, do the corrective steps in the table below.

Status	Possible Solutions
LINK/ACT LED does not light.	Set <i>F7-14 = 1</i> [Duplex Mode Selection = Auto/Auto (Auto Negotiation/Auto Negotiation)].

◆ **Self RAM Check**

Use these procedures to do a self RAM check for all areas including unused areas.

Note:

- The self RAM check completes in approximately 2.5 minutes.
- When you start the self RAM check, the drive will detect *oFA00* [Option Not Compatible with Port].

1. Set DIP switch S1 as shown in [Figure 10.1](#).

Note:

Use non-conductive tweezers or a tool with a tip width of approximately 0.5 mm (0.02 in) to set DIP switch S1.

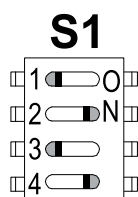


Figure 10.1 DIP Switch S1 Settings for the Self RAM Check

2. Apply power to the option.
This will start the self RAM check.
3. Look at the LEDs on the option to see the status of the self RAM check.
Refer to [Table 10.2](#) for more information.

Table 10.2 LED States during Self RAM Check

Self RAM Check Status	LED States	
	MS	NS
Checking	Lit in green	OFF
Successful termination	Lit in green	Lit in green
Abnormal termination	Lit in red	Lit in red

11 European Standards



Figure 11.1 CE Mark

The CE mark indicates compliance with European safety and environmental regulations.

European standards include the Machinery Directive for machine manufacturers, the Low Voltage Directive for electronics manufacturers, and the EMC Directive for controlling noise.

It is required for engaging in business and commerce in Europe.

This option displays the CE mark based on the EMC Directive.

EMC Directive: 2014/30/EU

Drives used in combination with this option and devices used in combination with the drive must also be CE certified and display the CE mark.

When using drives displaying the CE mark in combination with other devices, it is ultimately the responsibility of the user to ensure compliance with CE standards. Verify that conditions meet European standards after setting up the device.

◆ EMC Directive Compliance

This option is tested according to European standard EN 61800-3:2004/A1:2012 and complies with the EMC Directive. The CE marking is declared based on the harmonized standards.

■ Option Installation

Verify the following installation conditions to make sure that other devices and machinery used with this option and drive also comply with the EMC Directive:

1. Use dedicated shielded cable for the option and external device (encoder, I/O device, Controller), or run the wiring through a metal conduit.

- Keep wiring as short as possible and ground the largest possible surface area of the shield to the metal panel according to Figure 11.2, Figure 11.3, and Figure 11.4.

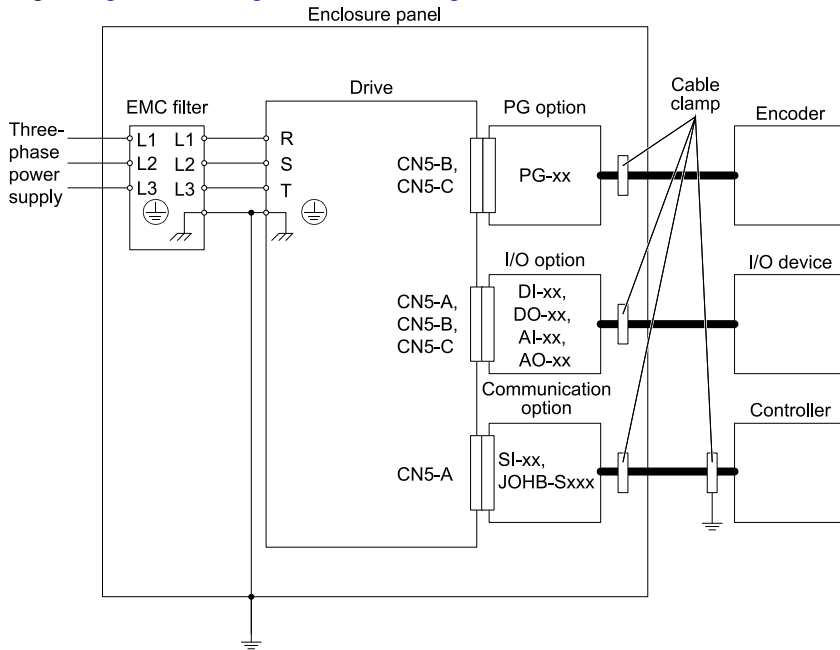


Figure 11.2 Option Installation for CE Compliance: 1000-Series, GA700, GA800, CR700, CH700

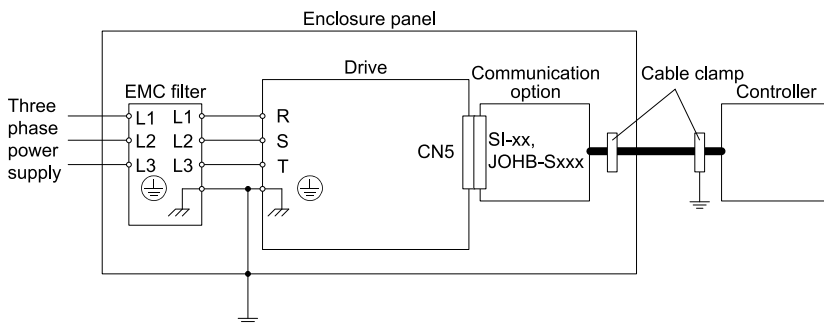


Figure 11.3 Option Installation for CE Compliance: GA500, HV600

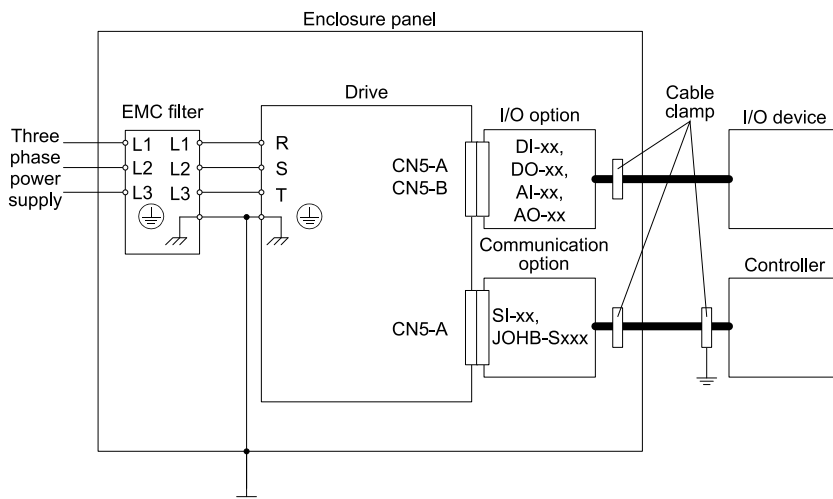
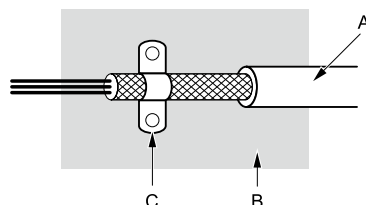


Figure 11.4 Option Installation for CE Compliance: FP605

- Ground the largest possible surface area of the shield to the metal panel. Yaskawa recommends using cable clamps.



A - Braided shielded cable
B - Metal panel

C - Cable clamp (conductive)

Figure 11.5 Ground Area

12 Specifications

◆ Specifications

Table 12.1 Option Specifications

Items	Specifications
Model	JOHB-SMP3
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 TCP Protocol Transformer Isolated
IP Address Setting	Programmable from drive keypad or network
Communication Speed	Programmable from drive keypad or network: 10/100 Mbps, auto-negotiate.
Duplex Mode	Half-forced, Auto-negotiate, Full-forced
Address Startup Mode	Static or PLC Assigned
Ambient Temperature	-10 °C - +50 °C (14 °F - 122 °F)
Humidity	Up to 95% RH (no condensation)
Storage Temperature	-20 °C - +60 °C (-4 °F - +140 °F) allowed for short-term transport of the product
Area of Use	Indoors and free from: <ul style="list-style-type: none"> • Oil mist, corrosive gas, flammable gas, and dust • Radioactive materials or flammable materials, including wood • Harmful gas or fluids • Salt • Direct sunlight • Falling foreign objects
Altitude	Up to 1000 m (3281 ft) Note: You can use the option at a maximum of 4000 m (13123 ft), depending on the model of the drive and the operating conditions. Refer to the drive manuals for more information.
PROFINET Functions	PROFINET IO with Yaskawa P-Drive profile Configurable I/O in cyclic messages Drive diagnostic alarms I&M0, I&M1, I&M2, I&M3

13 Disposal

◆ Disposal Instructions

Correctly dispose of the product and packing material as specified by applicable regional, local, and municipal laws and regulations.

◆ **WEEE Directive**



The wheelie bin symbol on this product, its manual, or its packaging identifies that you must recycle it at the end of its product life.

You must discard the product at an applicable collection point for electrical and electronic equipment (EEE). Do not discard the product with usual waste.

Revision History

Date of Publication	Revision Number	Section	Revised Content
May 2022	-	-	First Edition

YASKAWA AC Drive Option

PROFINET

Technical Manual

DRIVE CENTER (INVERTER PLANT)

2-13-1, Nishimiyaichi, Yukuhashi, Fukuoka, 824-8511, Japan
Phone: +81-930-25-2548 Fax: +81-930-25-3431
www.yaskawa.co.jp

YASKAWA ELECTRIC CORPORATION

New Pier Takeshiba South Tower, 1-16-1, Kaigan, Minatoku, Tokyo, 105-6891, Japan
Phone: +81-3-5402-4502 Fax: +81-3-5402-4580
www.yaskawa.co.jp

YASKAWA AMERICA, INC.

2121, Norman Drive South, Waukegan, IL 60085, U.S.A.
Phone: +1-800-YASKAWA (927-5292) or +1-847-887-7000 Fax: +1-847-887-7310
www.yaskawa.com

YASKAWA ELÉTRICO DO BRASIL LTDA.

777, Avenida Piraporinha, Diadema, São Paulo, 09950-000, Brasil
Phone: +55-11-3585-1100 Fax: +55-11-3585-1187
www.yaskawa.com.br

YASKAWA EUROPE GmbH

Hauptstraße 185, 65760 Eschborn, Germany
Phone: +49-6196-569-300 Fax: +49-6196-569-398
E-mail: info@yaskawa.eu.com
www.yaskawa.eu.com

YASKAWA ELECTRIC KOREA CORPORATION

18F, Hi Investment & Securities Building, 66 Yeoui-daero, Yeongdeungpo-gu, Seoul, 07325, Korea
Phone: +82-2-784-7844 Fax: +82-2-784-8495
www.yaskawa.co.kr

YASKAWA ASIA PACIFIC PTE. LTD

30A, Kallang Place, #06-01, 339213, Singapore
Phone: +65-6282-3003 Fax: +65-6289-3003
www.yaskawa.com.sg

YASKAWA ELECTRIC (THAILAND) CO., LTD.

59, 1F-5F, Flourish Building, Soi Ratchadapisek 18, Ratchadapisek Road, Huaykwang, Bangkok, 10310, Thailand
Phone: +66-2-017-0099 Fax: +66-2-017-0799
www.yaskawa.co.th

YASKAWA ELECTRIC (CHINA) CO., LTD.

22F, Link Square 1, No.222, Hubin Road, Shanghai, 200021, China
Phone: +86-21-5385-2200 Fax: +86-21-5385-3299
www.yaskawa.com.cn

YASKAWA ELECTRIC (CHINA) CO., LTD. BEIJING OFFICE

Room 1011, Tower W3 Oriental Plaza, No. 1, East Chang An Avenue,
Dong Cheng District, Beijing, 100738, China
Phone: +86-10-8518-4086 Fax: +86-10-8518-4082

YASKAWA ELECTRIC TAIWAN CORPORATION

12F, No. 207, Section 3, Beishin Road, Shindian District, New Taipei City 23143, Taiwan
Phone: +886-2-8913-1333 Fax: +886-2-8913-1513 or +886-2-8913-1519
www.yaskawa.com.tw

YASKAWA INDIA PRIVATE LIMITED

#17/A, Electronics City, Hosur Road, Bengaluru, 560 100 (Karnataka), India
Phone: +91-80-4244-1900 Fax: +91-80-4244-1901
www.yaskawaindia.in

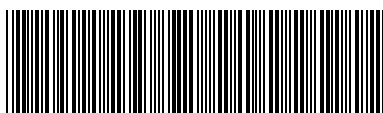
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In the event that the end user of this product is to be the military and said product is to be employed in any weapons systems or the manufacture thereof, the export will fall under the relevant regulations as stipulated in the Foreign Exchange and 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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