YASKAWA

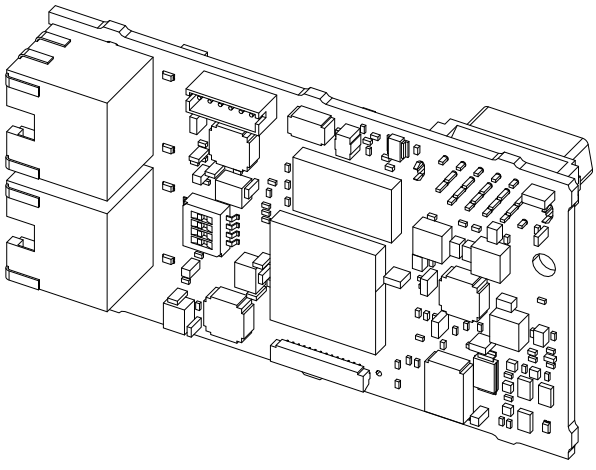
YASKAWA AC Drive Option

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.



MANUAL NO. SIEP C730600 0KC

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1 Receiving

◆ Applicable Documentation

Document	Description
JOHB-SMP3 Multi-Protocol EtherNet Quick Installation 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	• 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).
- QR Code is a registered trademark of DENSO WAVE INCORPORATED.
- Ethernet is a registered trademark of FUJIFILM Business Innovation Corp.
- 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 hazard that can cause minor or moderate injuries if you do not prevent it.*

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 software versions 5002 and earlier are PROFINET Conformance Class A certified.

JOHB-SMP3 software versions 5003 and later are PROFINET Conformance Class B certified.

Refer to *U6-97 [OPT SPARE 4]* to check the option software version.

◆ 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	
Z1000	CIMR-ZxxAxxxx	≥ 1016
Z1000U	CIMR-ZxxUxxxx	≥ 6113
	CIMR-ZxxExxxx	
	CIMR-ZxxPxxxx	

Product Series	Model(s)	Software Version *1
	CIMR-ZxxWxxxx	
CR700	CIPR-CR70xxxxx	≥ 1012
CH700	CIPR-CH70xxxxx	01012 - 01020, ≥ 31000
GA500	CIPR-GA50xxxxx	≥ 1010
GA700	CIPR-GA70xxxxx	≥ 1010
GA800	CIPR-GA80xxxxx	≥ 9010
HV600	CIPR-HV60xxxxx	≥ 1011
FP605	CIPR-FP65xxxxx	≥ 1010
FSDrive-LIPV *2	CIPR-LIPVxxxx	≥ 1014
FSDrive-LIPC *2	CIPR-LIPCxxxx	≥ 3013

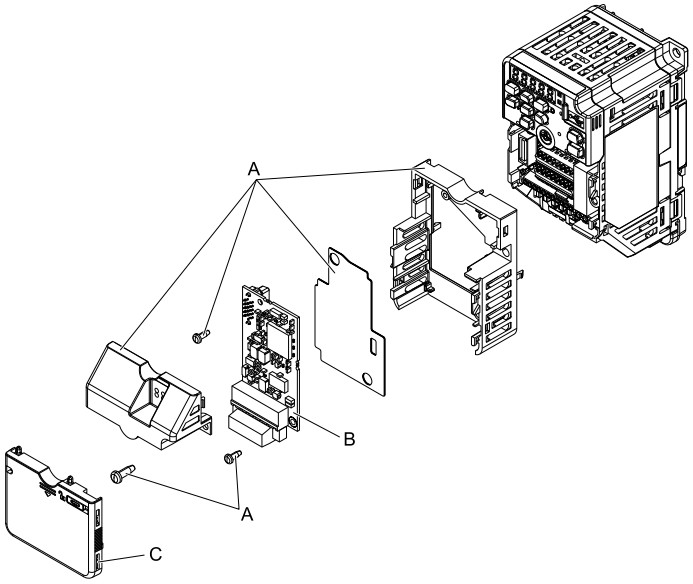
*1 Refer to “PRG” on the drive nameplate for the software version number.
*2 Option software versions PRG: 5006 and later are compatible with these models.

Note:
- Refer to U6-97 [OPT SPARE 4] 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

◆ Option Card Mounting Kit for GA500

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)
B - Option
C - Drive front cover

Figure 2.1 Option Card Mounting Kit (JOHB-GA50)

3 Receiving

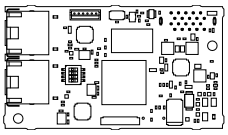
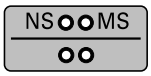
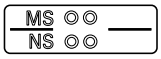
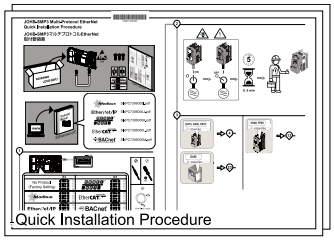
After you receive the option package:

- 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, CH700		1
	Z1000, HV600, FP605 *4		1
Quick Installation Procedure			1

*1 GA500, GA700, GA800, CR700, and CH700 drives do not use the ground wire.
*2 GA700, GA800, CR700, CH700, HV600, and FP605 drives use two screws only.
*3 LED labels are located on this label sheet.

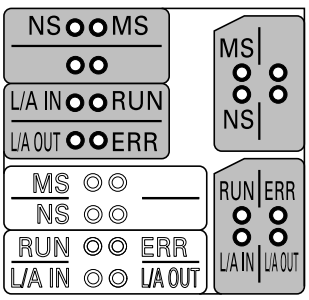


Figure 3.1 LED Label Sheet

*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

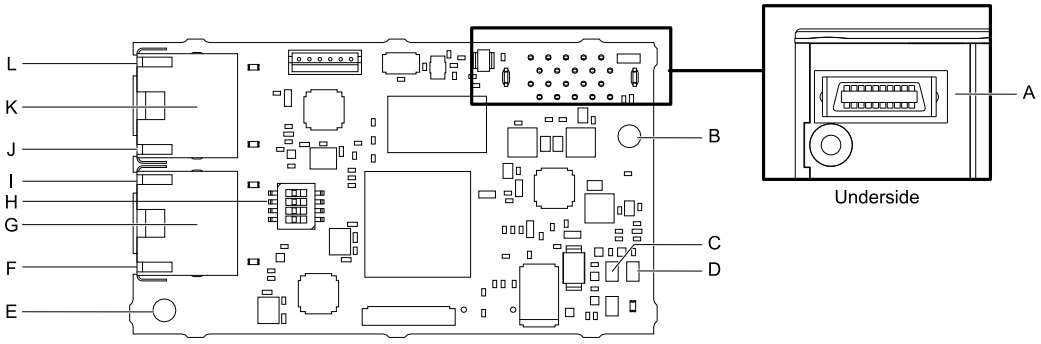
You can use these tools to install the option to the drive:

- A Phillips screwdriver or slotted screwdriver (M3 *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

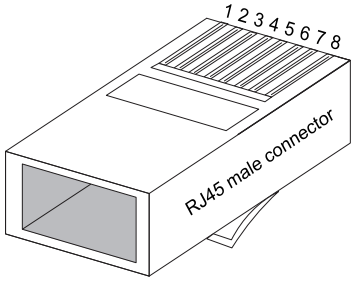
Figure 4.1 Option PCB Components

*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, CR700, and CH700 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.

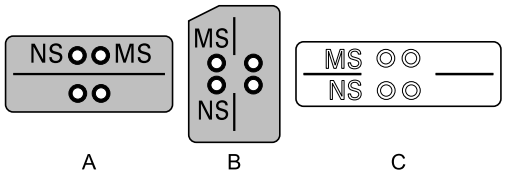
Table 4.1 Male 8-way Ethernet Modular Connector (Customer-Supplied)

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, CH700
C - Z1000, HV600, FP605 *1*

Figure 4.2 Option LED Labels

*1 The 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.

LED Name	Indication		Operating State	Description
	Color	Display		
	Red	Flashing (4)	S2 primary connection timeout	Timeout for no Primary PLC connection when using S2 Redundancy
10/100 *1	Green	OFF	10 Mbps is established	-
	Green	ON	100 Mbps is established	
LINK/ACT *1	-	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.

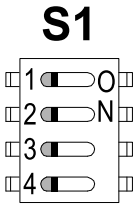


Figure 5.1 Default Settings for DIP Switch S1

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

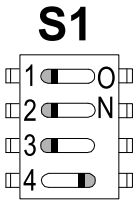


Figure 5.2 PROFINET Settings for DIP Switch S1

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
CH700	Procedure C	17
HV600	Procedure D	18
FP605	Procedure D	18

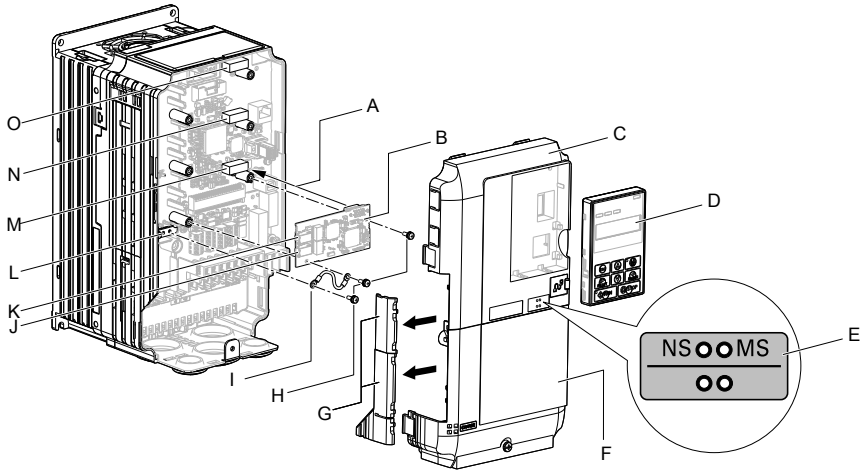
*1 To install the option on GA500 drives, use the option mounting kit (JOHB-GA50) and manual.

■ 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.



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
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.)

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.

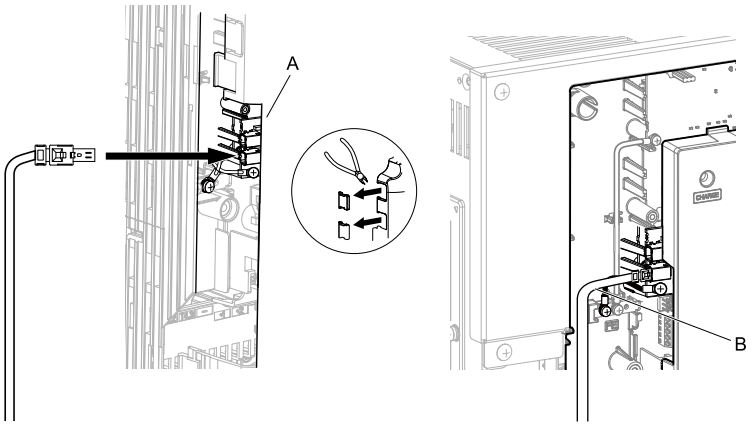
6. Route the option wiring.

   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.*

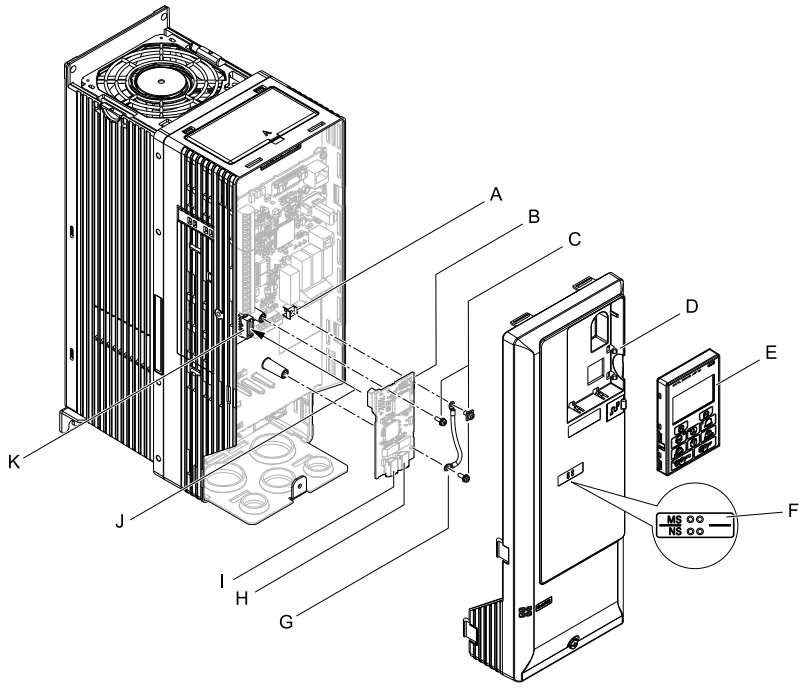
9. Set drive parameters in *Related Drive Parameters on page 23* for correct option performance.

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

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.*

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 (E) and front cover (D).
3. Put the LED label (F) in the correct position on the drive front cover (D).
4. 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.
5. 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)
6. 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.
7. 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.*

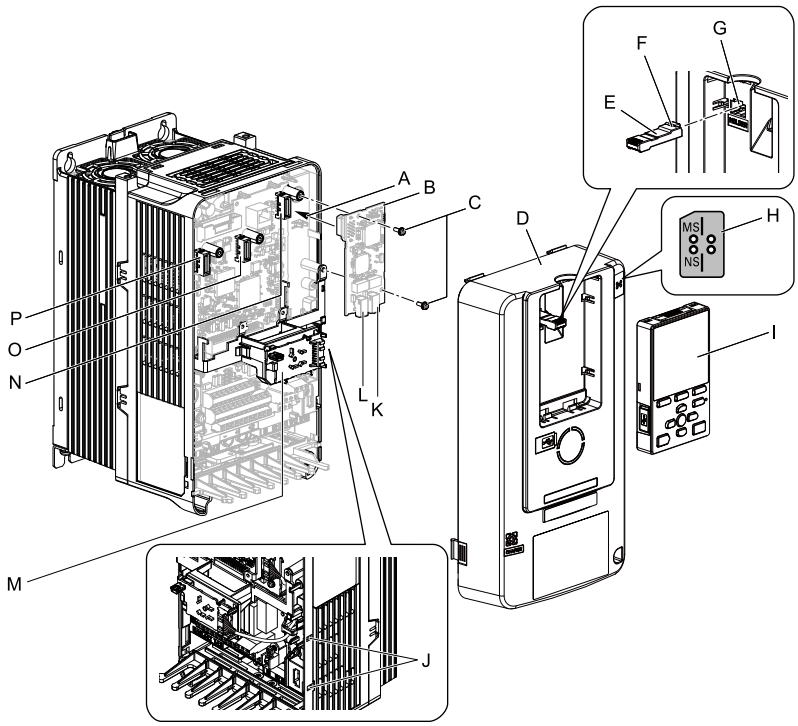
8. Set drive parameters in *Related Drive Parameters on page 23* for correct option performance.

■ Procedure C

This section shows the procedure to install and wire the option on a GA700, GA800, CR700, or CH700 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
B - Option
C - Included screws
D - Drive front cover
E - Keypad connector
F - Keypad connector tab
G - Holder
H - LED label
I - Keypad
J - LED Status Ring board temporary placement holes
K - Option modular connector CN1B (Port 2) (RJ45)
L - Option modular connector CN1A (Port 1) (RJ45)
M - LED Status Ring board
N - Connector CN5-A
O - Connector CN5-B (Not available for communication option installation.)
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, CR700, and CH700 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.

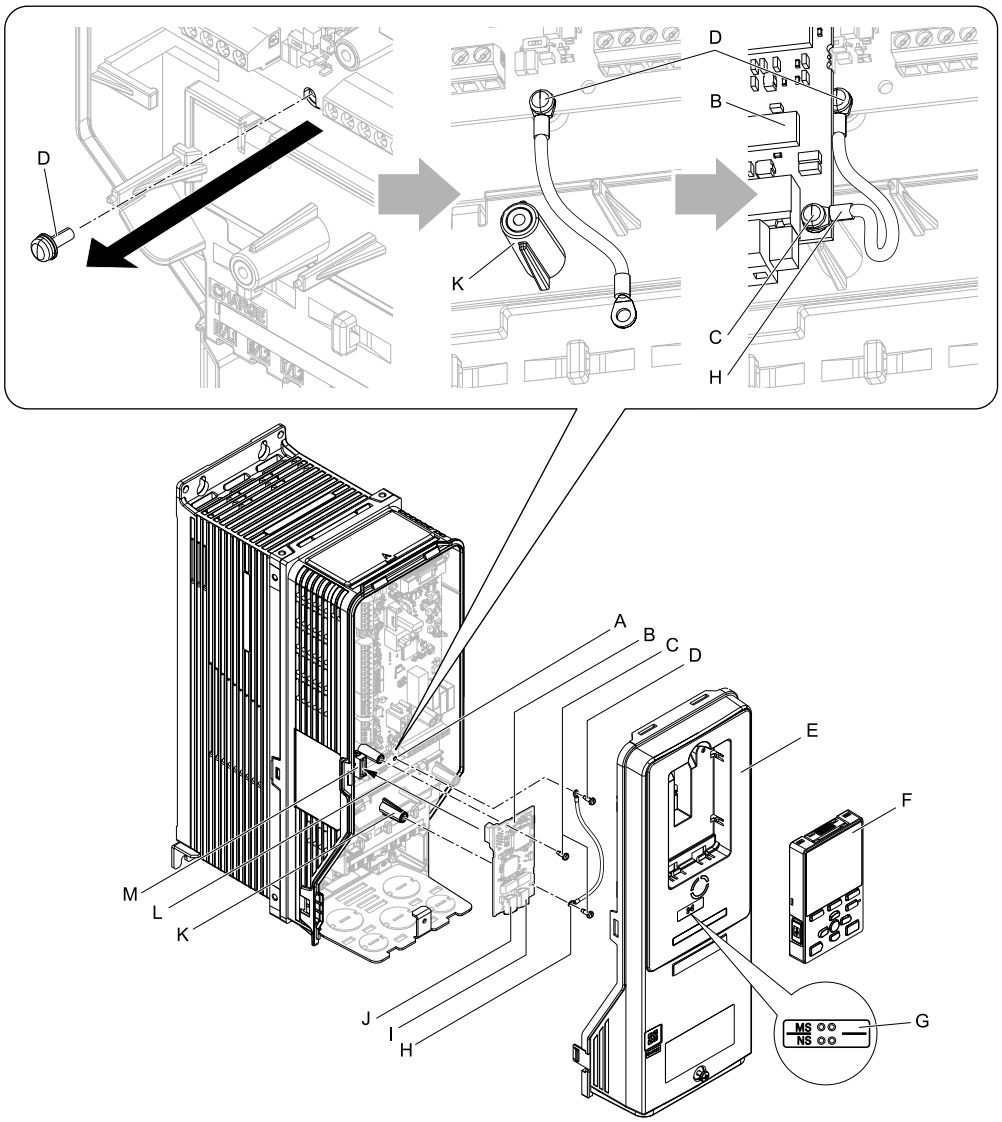
8. Set drive parameters in *Related Drive Parameters on page 23* for correct option performance.

■ 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
M - Connector CN5

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 23* 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

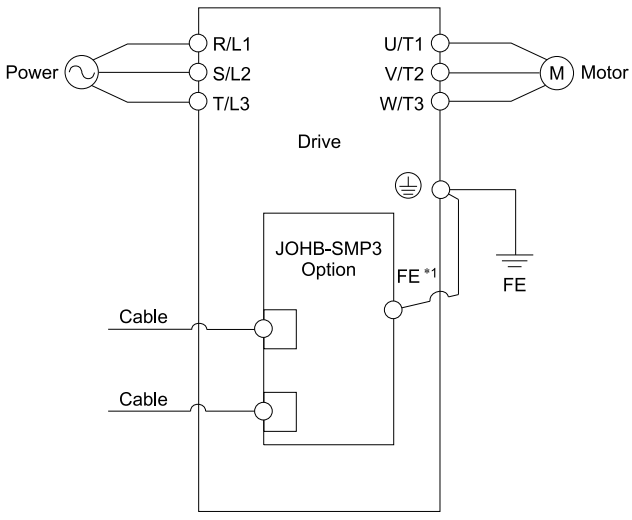


Figure 5.8 Option Connection Diagram

*1 Connect the specified ground wire for installations on 1000-series, HV600, and FP605 drives. For GA500 drives, use the ground wire included in the separately-sold communication option case (model: JOHB-GA50) to connect option terminal FE to the drive ground terminal. The ground wire is not necessary for installation on GA700, GA800, CR700, or CH700 drives.

■ Communication Topology Specifications

You can connect drives with the JOHB-SMP3 option to the network in either star or line topology in software versions 5002 and earlier. In software versions 5003 and later, you can also use ring topology, but MRP (Media Redundancy Protocol) must be enabled in the PLC configuration.

- Star Topology
  Use either one of the communication connectors CN1A (Port 1) or CN1B (Port 2).
- Daisy-Chained Topology
  Use communication connectors CN1A (Port 1) and CN1B (Port 2) at the same time. A switch is not necessary for this connection.
- Ring Topology
  Use communication connectors CN1A (Port 1) and CN1B (Port 2) at the same time. A switch is not necessary for this connection. MRP (Media Redundancy Protocol) allows for ring topology connections.

Note:

Software versions 5002 and earlier do not support MRP (Media Redundancy Protocol). In software versions 5003 and later, MRP (Media Redundancy Protocol) is supported.

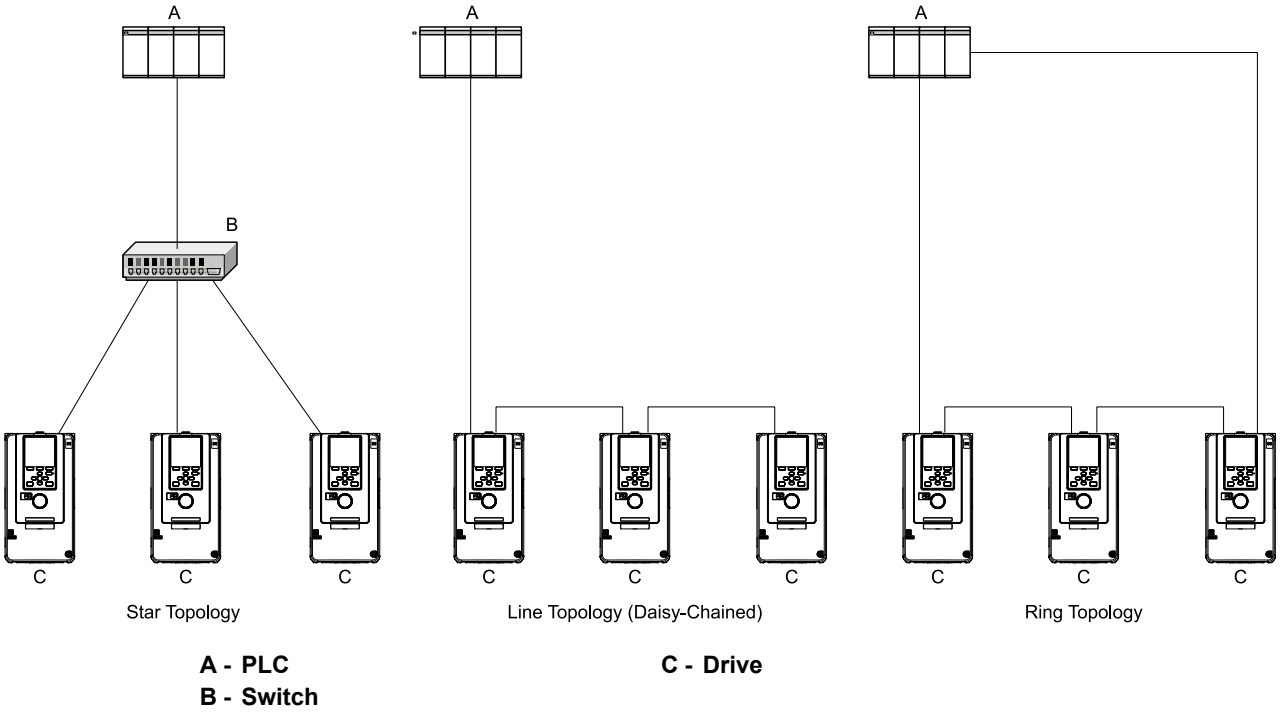


Figure 5.9 Communication Cable Wiring

Note:

- In software versions 5002 and earlier, 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. If Auto-Negotiate is not desired, 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)]*.
- In software versions 5003 and later, if the link speed of Port 1 is different than the link speed of Port 2, it will not trigger a *PA1* because the drive can transfer data between the ports. Refer to *U6-97 [OPT SPARE 4]* to check the option software version.

◆ 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 60* 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
- China: https://www.yaskawa.com.cn
- 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.

■ Device Access Point (DAP) Selection

The GSDML file contains the information needed to commission the Yaskawa PROFINET equipment within the PLC engineering tool software. Inside of the GSDML file are the definitions for the various Device Access Points (DAPs). The selection of which DAP to use in the PLC program will depend upon the firmware version of the JOHB-SMP3. See Table 5.2 to determine the firmware installed on the device and the proper DAP to use.

As Figure 5.10 shows, once the GSDML is installed into the PLC engineering tool software, the various DAPs can be selected from the tool's hardware catalog. The JOHB-SMP3 will be found at the following path in the hardware catalog:

Other field devices → PROFINET IO → Drives → Yaskawa → Yaskawa Drives

Note:
This GSDML file can be used with all versions of PROFINET firmware, see Table 5.2 for details.

Table 5.2 Device Access Point (DAP) Selection

Package Number *1	Option Software Version *2	PROFINET Firmware Version *3	Hardware Catalog: Device Access Point (DAP)
8204	5000	V1.0.1	JOHB-SMP3 Profinet Option Card V1.0.1
8205	5001	V1.0.1	JOHB-SMP3 Profinet Option Card V1.0.1
8206 - 8208	5002	V1.0.1	JOHB-SMP3 Profinet Option Card V1.0.1
8209	5003	V2.0.1	Select from three different DAPs. Refer to *Communications on page 32* for more information.
≥ 8210	≥ 5004	V3.0.1	Select from five different DAPs. Refer to *Communications on page 32* for more information.

*1 Package Number is included on the JOHB-SMP3 labeling and can be found on the web interface.
*2 Option Software Version can be found in drive monitor *U6-97 [OPT SPARE 4]* and also on the web interface.
*3 PROFINET Firmware Version can be found by going online with the PLC engineering tool.

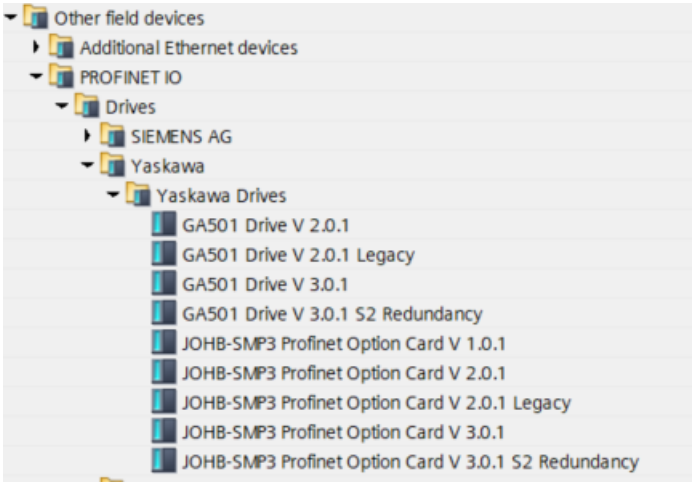


Figure 5.10 Hardware Catalog Example

If a previous version, i.e. GSDML-V2.4-Yaskawa-JOHB-SMP3-20220222.xml, was installed in the engineering tool, it will appear in the hardware catalog differently from Figure 5.10 as shown in Figure 5.11. This version will only support PROFINET Firmware V1.0.1 (see Table 5.2).

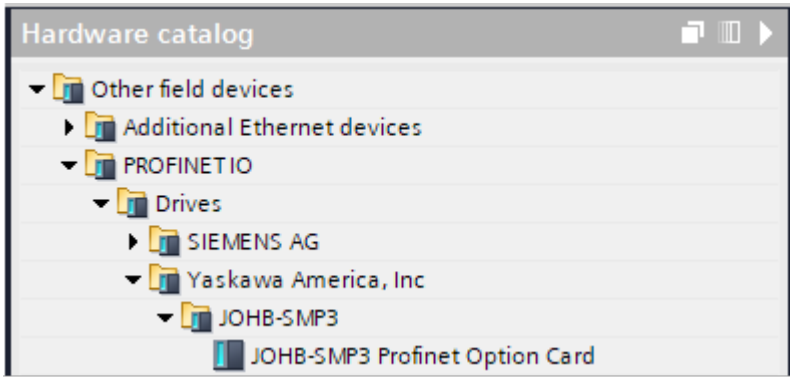


Figure 5.11 Previous GSDML Hardware Catalog

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 *bUS [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 *EF0 [Option Card External Fault]* is detected. 0 : Always Detected 1 : Detected during RUN Only	0 (0, 1)

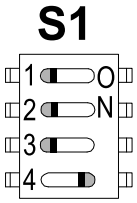
No. (Hex.)	Name	Description	Default (Range)
F6-03 (03A4)	Comm External Fault (EF0) Select	Selects the operation of the drive when *EF0 [Option Card External Fault]* is detected. 0 : Ramp to Stop 1 : Coast to Stop 2 : Fast Stop (Use C1-09) 3 : Alarm Only **Note:** When you set this parameter to *3*, the 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, CH700 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]*. –FSDrive-LIPV Parameter is available when *A1-02 = 2, 3, 4, 6, 7 [Control Method Selection = Open Loop Vector, Closed Loop Vector, Advanced Open 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 = 2 [Control Method Selection = Open Loop Vector]*, this value is read as the Torque Limit. • 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.	0 (0 - 2)

No. (Hex.)	Name	Description	Default (Range)
		• Changes to this parameter take effect immediately. It is not necessary to cycle power on the drive.	
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. • 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]*.	192 (0 - 255)
F7-02 (03E6)	IP Address 2	Sets the static/fixed IP address. Sets the second most significant octet. **Note:** • This parameter is only effective when *F7-13 = 0 [Address Mode at Startup = Static]*. • 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 [Comm. Option Parameters Reload = Reload Now]*.	168 (0 - 255)
F7-03 (03E7)	IP Address 3	Sets the static/fixed IP address. Sets the third most significant octet. **Note:** • This parameter is only effective when *F7-13 = 0 [Address Mode at Startup = Static]*. • 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 [Comm. Option Parameters Reload = Reload Now]*.	1 (0 - 255)
F7-04 (03E8)	IP Address 4	Sets the static/fixed IP address. Sets the fourth most significant octet. **Note:** • This parameter is only effective when *F7-13 = 0 [Address Mode at Startup = Static]*. • 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 [Comm. Option Parameters Reload = Reload Now]*.	20 (0 - 255)
F7-05 (03E9)	Subnet Mask 1	Sets the static/fixed Subnet Mask. 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. • 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]*.	255 (0 - 255)
F7-06 (03EA)	Subnet Mask 2	Sets the static/fixed Subnet Mask. Sets the second most significant octet. **Note:** • This parameter is only effective when *F7-13 = 0 [Address Mode at Startup = Static]*. • 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 [Comm. Option Parameters Reload = Reload Now]*.	255 (0 - 255)
F7-07 (03EB)	Subnet Mask 3	Sets the static/fixed Subnet Mask. Sets the third most significant octet. **Note:** • This parameter is only effective when *F7-13 = 0 [Address Mode at Startup = Static]*. • 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 [Comm. Option Parameters Reload = Reload Now]*.	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:** • This parameter is only effective when *F7-13 = 0 [Address Mode at Startup = Static]*. • 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 [Comm. Option Parameters Reload = Reload Now]*.	0 (0 - 255)
F7-09 (03ED)	Gateway Address 1	Sets the static/fixed Gateway 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. • 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]*.	192 (0 - 255)
F7-10 (03EE)	Gateway Address 2	Sets the static/fixed Gateway address. Sets the second most significant octet. **Note:** • This parameter is only effective when *F7-13 = 0 [Address Mode at Startup = Static]*. • 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 [Comm. Option Parameters Reload = Reload Now]*.	168 (0 - 255)
F7-11 (03EF)	Gateway Address 3	Sets the static/fixed Gateway address. Sets the third most significant octet. **Note:** • This parameter is only effective when *F7-13 = 0 [Address Mode at Startup = Static]*. • 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 [Comm. Option Parameters Reload = Reload Now]*.	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:** • This parameter is only effective when *F7-13 = 0 [Address Mode at Startup = Static]*. • All IP Addresses must be unique.	1 (0 - 255)

No. (Hex.)	Name	Description	Default (Range)
		• 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]*.	
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) **Note:** • 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*.	2 (0 - 2)
F7-14 (03F2)	Duplex Mode Selection	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*. 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) **Note:** 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]*.	1 (0 - 8)
F7-15 (03F3)	Communication Speed Selection	Sets the communications speed (Port 1 (CN1A)/Port 2 (CN1B)). Set this parameter to *100* for PROFINET. 10 : 10/10 Mbps (10 Mbps/10 Mbps) 100 : 100/100 Mbps (100 Mbps/100 Mbps) 101 : 10/100 Mbps (10 Mbps/100 Mbps) 102 : 100/10 Mbps (100 Mbps/10 Mbps) **Note:** • *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]*. • Settings *101* and *102* are not recommended for software versions 5002 and earlier because if the link speed is different between Ports 1 and 2, it will trigger a *PA1 [PLC Alarm 1]* and will not send data between the ports.	10 (10 - 102)
F7-16 (03F4)	Timeout Value	Sets the *bUS [Option Communication Error]* fault delay time to the drive after the option detects a *bUS* fault to let the network condition self-correct. **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 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	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.	0 (-)
F7-33 - F7-42 (0375 to 037E)	Dynamic In Param 1 to 10 for ComCard	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.	0 (-)
F7-44 (1BFF)	PLC Stop Behavior Selection	Sets the drive operation when the PLC enters STOP mode during operation using the PROFINET protocol. 0 : Clear RUN Command 1 : Continue **Note:** • This parameter may not be available on some drives. For more information about this parameter, refer to the Technical Manual for your drive. • This parameter is available in options with software versions PRG:5005 and later. Refer to *U6-97 [OPT SPARE 4]* to check the option software version. • If communication is lost with the PLC and a communication error occurs, the device will operate as specified by *F6-01 [Communication Error Selection]*. To continue operation when connection to the PLC is lost, prepare an alternative safety measure such as fast stop switches and set *F6-01 = 3 [Alarm Only]*.	0 (0, 1)

No. (Hex.)	Name	Description	Default (Range)
H5-11 (043C)	Communications ENTER Function Selection (Function common to communication option)	Sets when an Enter command is necessary to use MEMOBUS/Modbus communications to change parameter values. 0 : Parameter changes are activated when ENTER command is written 1 : Parameter changes are activated immediately. No ENTER command is necessary.	0 (0, 1)
o1-03 (0502)	Frequency Display Unit Selection	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. 0 : 0.01 Hz units 1 : 0.01% units 2 : min^{-1} (r/min) units 3 : User Units (o1-09 -o1-11)	0 (0 - 3)

Table 6.1 Option Monitor

No.	Name	Description	Range
U4-75	Communication OPT Protocol	Shows the setting of DIP switch S1. • 78 (Setting to use PROFINET (1: OFF, 2: OFF, 3: OFF, 4: ON))  • 00 to 77, 79 to FF (Setting to use other than PROFINET) **Note:** PROFINET will not operate with these setting values. **Note:** Contact Yaskawa or your nearest sales representative for more information about corresponding drives and the drive software versions.	00 - FF (Hex.)
U4-76 - U4-78	MAC Address 1	Shows the Main MAC Address. • *U4-76*: First octet, Second octet • *U4-77*: Third octet, Fourth octet • *U4-78*: Fifth octet, Sixth octet **Note:** Not all drive software versions will display this monitor. Contact Yaskawa or your nearest sales representative for more information.	0000 - FFFF (Hex.)
U4-79 - U4-81 Expert	MAC Address 2	Shows the second MAC Address. • *U4-79*: First octet, Second octet • *U4-80*: Third octet, Fourth octet • *U4-81*: Fifth octet, Sixth octet **Note:** Not all drive software versions will display this monitor. Contact Yaskawa or your nearest sales representative for more information.	0000 - FFFF (Hex.)
U4-82 - U4-84 Expert	MAC Address 3	Shows the third MAC Address. • *U4-82*: First octet, Second octet • *U4-83*: Third octet, Fourth octet • *U4-84*: Fifth octet, Sixth octet **Note:** Not all drive software versions will display this monitor. Contact Yaskawa or your nearest sales representative for more information.	0000 - FFFF (Hex.)
U6-80 - U6-83	Option IP Address 1 - 4	Shows the currently available local IP Address. • *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	Shows the currently available subnet mask. • *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	Shows the currently available gateway address. • *U6-88*: First octet • *U6-89*: Second octet • *U6-90*: Third octet • *U6-91*: Fourth octet	0 - 255

No.	Name	Description	Range
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
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 Yasakawa-specific set of control and status words or the PROFIdrive 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 PROFIdrive profile can be selected. Selecting the PROFIdrive profile forces the PROFIdrive run/stop sequence and re-maps the control and status word definitions to be compatible with PROFIdrive.

Note:

PROFIdrive operation is different in option with software versions 5003 and later from that with software versions 5002 and earlier. If you need a previous PROFIdrive/P-Drive behavior, select the JOHB-SMP3 Profinet Option Card V 2.0.1 Legacy DAP. Refer to *P-Drive Operation on page 72* for details on P-Drive Legacy operation.

◆ 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.

Note:

The Control Word corresponds to MEMOBUS register 0001H, and the Status Word corresponds to MEMOBUS register 004BH.

For converters, refer to the converter manual to check the assignment of MEMOBUS registers 0001H and 004BH.

■ 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.

Note:

For converters, this word is used as voltage 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.

Note:

For converters, this word is used as DC bus voltage feedback.

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
6	Multi-Function Input 3	6	Alarm
7	Multi-Function Input 4	7	Fault
8	Multi-Function Input 5	8	*oPE* 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.

◆ PROFIdrive Communication Profile

Software versions 5003 and later have a PROFIdrive communication profile in compliance with PROFIdrive. This behavior is different than P-Drive in software versions 5002 and earlier. If you need a previous P-Drive behavior for backwards compatibility, select the JOHB-SMP3 Profinet Option Card V2.0.1 Legacy DAP. Refer to *P-Drive Operation on page 72* for details on P-Drive and the differences between P-Drive and PROFIdrive.

Note:

You cannot use the PROFIdrive communication profile and P-Drive communication profile for converters. Use the Yaskawa-specific set of control and status words.

■ PROFIdrive Operation

Drive Parameter Settings

For conformant PROFIdrive operation, the following drive parameters must be set:

- Set *b1-01 = 3 [Frequency Reference Selection 1 = Option PCB]*
- Set *b1-02 = 3 [Run Command Selection 1 = Option PCB]*
- Set *b1-03 = 0 [Stopping Method Selection = Ramp to Stop]*
- *L4-01 [Speed Agree Detection Level]* - Determines the Frequency Output level that Setpoint Reached bit of STW (Bit 10) will be set (true).
- *L4-02 [Speed Agree Detection Width]* - Determines tolerance of actual speed as compared to commanded speed. Actual speed is based on *U1-05 [Motor Speed]*, and commanded speed is based on *U1-16 [SFS Output Frequency]*. Speed Deviation bit of STW (bit 8) will be set (true) when within tolerance and will be reset (false) when not within tolerance.

Note:

Alternate sequence and reference *b1-15 [Frequency Reference Selection 2]* & *b1-16 [Run Command Selection 2]* if used, can affect PROFIdrive operation.

The Control Word and the Status Word

For a more detailed description of PROFIdrive Control Bits, Status Bits and behavior see the PROFIdrive specification. This can be obtained from the regional PI associations.

The JOHB-SMP3 supports PROFIDrive Application Class 1. This is the standard drive application with setpoint control.

Table 7.2 Control Word (STW)

Bit	Name	Value	State Change/Description
0	ON	1	Proceed to Switched On unless other interlocks (OFF2, OFF3) are active.
	OFF	0	Proceed to Ready For Switching On unless other interlocks (OFF2, OFF3) are active.
1	OFF2	1	Continue operation (OFF2 inactive)
		0	Coast to Stop Proceed to Switch On Inhibit.
2	OFF3	1	Continue operation (OFF3 inactive)
		0	Quick stop Proceed to Quick Stop. Proceed to Switch On Inhibit once drive stopped.
3	Enable Operation	1	Proceed to Operation.
		0	Inhibit operation. Proceed to Switched On.
4	Enable Ramp Generator	1	Normal operation
		0	When in a running state, it will ramp to zero speed using *C1-09 [Fast Stop Time]*.
5	Unfreeze Ramp Generator	1	Normal operation
		0	Drive will retain its current frequency reference even if ramping up or ramping down.
6	Enable Setpoint	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	Will force the input of the ramp generator (frequency reference) to zero.
7	Fault Acknowledge	0 -> 1	Fault reset if an active fault exists. Proceed to Switch On Inhibit.
		0	(Continue normal operation)
8	Jog 1	-	(Not supported)
9	Jog 2	-	(Not supported)
10	Control by PLC	1	Network control enabled.
		0	Can not proceed to Operating.
11	Multi-Function Digital Input 3 (S3) *1	1	Activates the function set in H1-03.
		0	Deactivates the function set in H1-03.
12	Multi-Function Digital Input 4 (S4) *1	1	Activates the function set in H1-04.
		0	Deactivates the function set in H1-04.
13	Multi-Function Digital Input 5 (S5) *1	1	Activates the function set in H1-05.
		0	Deactivates the function set in H1-05.
14	Multi-Function Digital Input 6 (S6) *1	1	Activates the function set in H1-06.
		0	Deactivates the function set in H1-06.
15	Multi-Function Digital Input 7 (S7) *1	1	Activates the function set in H1-07.
		0	Deactivates the function set in H1-07.

*1 Option software versions PRG: 5006 and later are compatible with this function. Refer to U6-97 [OPT SPARE 4] to check the option software version.

Table 7.3 Status Word (ZSW)

Bit	Name	Value	State Change/Description
0	Ready to Switch on	1	Ready to Switch on
		0	Not Ready to Switch on
1	Ready to Operate	1	Ready to Operate
		0	Not Ready to Operate

Bit	Name	Value	State Change/Description
2	Operation Enabled	1	Enable Operation
		0	Disable Operation
3	Fault Present	1	Faulted
		0	Not Faulted
4	OFF2 Status	1	OFF2 Inactive. (Coast to Stop)
		0	OFF2 Active. (Coast to Stop)
5	OFF3 Status	1	OFF3 Inactive. (Quick Stop)
		0	OFF3 Active. (Quick Stop)
6	Switch on Inhibited	1	Switch on Inhibit Active
		0	Switch on Inhibit Not Active
7	Warning	1	Warning/Alarm.
		0	No Warning/Alarm.
8	Speed Error	1	Actual value equals reference value (i.e. is within tolerance limits).
		0	Actual value differs from reference value (= is outside tolerance limits). This will occur DEV alarm or DEV fault from drive.
9	Control Requested	1	Drive control location: Remote
		0	Drive control location: Local
10	Setpoint Reached		Speed Agree
11	Multi-Function Digital Output 1 (DO1) *1	1	The function set in H2-01 is active.
		0	The function set in H2-01 is inactive.
12	Multi-Function Digital Output 2 (DO2) *1	1	The function set in H2-02 is active.
		0	The function set in H2-02 is inactive.
13	Multi-Function Digital Output 3 (DO3) *1	1	The function set in H2-03 is active.
		0	The function set in H2-03 is inactive.
14	Safe Torque Off (STo or SToF)	1	Safe Torque Off circuit open, Coast To Stop
		0	Safe Torque Off circuit closed.
15	(Reserved)	-	(Reserved)

*1 Option software versions PRG: 5006 and later are compatible with this function. Refer to U6-97 [OPT SPARE 4] to check the option software version.

State Machine

PROFIdrive is based upon a state machine for PLC control. For a more detailed description of the PROFIdrive state machine, see the PROFIdrive specification. This can be obtained from the regional PI associations.

Note:

For options with software versions PRG:5005 and later, when you operate the drive in LOCAL Mode, the drive operation status will be reflected to Status Word (ZSW) as follows:

- Operation Stopped: S2 (Ready For Switching On)
- Drive Running: S4 (Operation)

■ 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 [Frequency Display Unit Selection = User Units (o1-09 - o1-11)] and o1-10 [User Units Maximum Value] > 32,767 at the same time. When o1-03 = 0 [0.01 Hz units], do not set a value greater than 32768 for the frequency reference. 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 (*U1-02*) 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.

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, IOSupervisors, 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 21*.

◆ PROFINET IO in the JOHB-SMP3

The decision to use the PROFIdrive, P-Drive (Legacy) 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 is the DAP and represents the device itself.

IO modules and sub-modules described in the GSD file can be assigned to slot 1 and its sub-slots. The way in which the Slot 1 and its sub-slots are defined differs depending upon which software version of PROFINET that is in use and which DAP is selected.

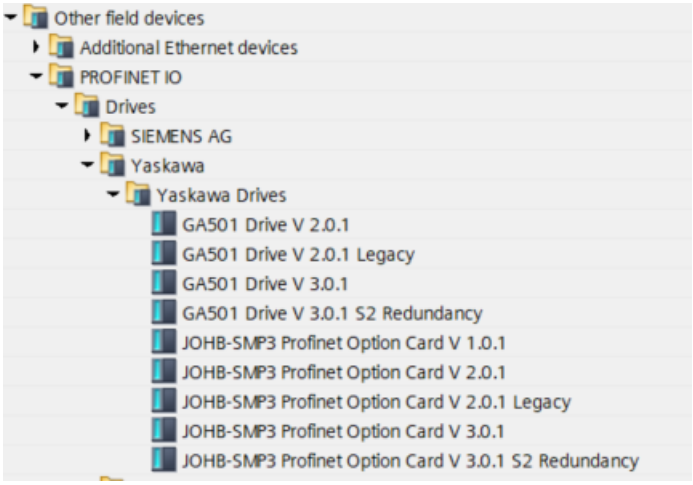
■ Hardware Catalog

There are nine types of DAPs that can be selected:

- GA501 Drive V 2.0.1 *1
- GA501 Drive V 2.0.1 Legacy *1
- GA501 Drive V 3.0.1 *1
- GA501 Drive V 3.0.1 S2 Redundancy *1
- JOHB-SMP3 Profinet Option Card V 1.0.1
- JOHB-SMP3 Profinet Option Card V 2.0.1
- JOHB-SMP3 Profinet Option Card V 2.0.1 Legacy
- JOHB-SMP3 Profinet Option Card V 3.0.1
- JOHB-SMP3 Profinet Option Card V 3.0.1 S2 Redundancy

*1 Not available for the JOHB-SMP3 option.

The hardware catalog in TIA portal should show like below:



■ DAP Descriptions/Selection

For PROFINET version V 2.0.1 and later, the PROFIdrive implementation is not fully backward compatible with P-Drive. If you have an existing PLC program that is using P-Drive, you should select JOHB-SMP3 PROFINET Option Card V 2.0.1 Legacy so as not to have to change your PLC program. When you use PROFINET S2 Redundancy, select the JOHB-SMP3 Profinet Option Card V3.0.1 S2 Redundancy.

More detailed descriptions of each DAP is below.

DAP	PRG *1	Content
JOHB-SMP3 Profinet Option Card V 3.0.1 S2 Redundancy	≥ 5004	Best to use for all new installations when software is PRG: 5004 and later Available functions: • S2 Redundancy function • MRP (Media Redundancy Protocol - Ring) • PROFIdrive • SNMP (Simple Network Management Protocol) • I/O update rate of 4 ms to 512 ms
JOHB-SMP3 Profinet Option Card V 3.0.1	≥ 5004	DAP to use when I/O communication cycle time of 2 ms is required. Available functions: • MRP (Media Redundancy Protocol - Ring) • PROFIdrive • SNMP (Simple Network Management Protocol) • I/O update rate of 2 ms to 512 ms
JOHB-SMP3 Profinet Option Card V 2.0.1	≥ 5003	Available functions: • MRP (Media Redundancy Protocol - Ring) • PROFIdrive • SNMP (Simple Network Management Protocol) • I/O update rate of 2 ms to 512 ms
JOHB-SMP3 Profinet Option Card V 2.0.1 Legacy *2	≥ 5003	Available functions: • MRP (Media Redundancy Protocol - Ring) • P-Drive • SNMP (Simple Network Management Protocol) • I/O update rate of 2 ms to 512 ms
JOHB-SMP3 Profinet Option Card V 1.0.1	≥ 5000	Available functions: • P-Drive • I/O update rate of 8 ms to 512 ms

*1 Refer to *U6-97 [OPT SPARE 4]* to check the option software version.
*2 When you use Option Software Version PRG: 5003 and P-Drive instead of PROFIdrive, use the JOHB-SMP3 Profinet Option Card V 2.0.1 Legacy DAP with GSDML-V2.43-Yaskawa-Drives-20240603. You cannot use the JOHB-SMP3 Profinet Option Card V 2.0.1 Legacy DAP for GSDML-V2.43-Yaskawa-Drives-20241022.

■ Module Configuration

The parameters to configure the PROFINET features within the engineering tool (like TIA Portal) are contained in the “Module” definitions. Table 8.1 lists the parameters and the modules where they are located.

Table 8.1 Module Parameter Locations

Parameter	V2.0.1/V3.0.1	V2.0.1 (Legacy)	V1.0.1
SNMP Enable	Module Access Point (Slot 1.1)	N/A	

Parameter	V2.0.1/V3.0.1	V2.0.1 (Legacy)	V1.0.1
MBTCP Enable		Various Modules (Slot 1)	
Webpage Enable			
Email Enable			
Network Configurator Enable			
Control and Status Word Selection (Slot 1.2)	Standard Telegram 1 (Slot 1.2) • Yaskawa Standard • PROFIDrive	Various Modules (Slot 1) • Yaskawa Standard • P-Drive • P-Drive (no STO)	
PZD Selections	Various Modules (Slot 1.3) Output Parameters Input Parameters	Various Modules (Slot 1) Output Parameters Input Parameters	

Figure 8.1 and Figure 8.2 show the engineering tool examples of the module configurations.

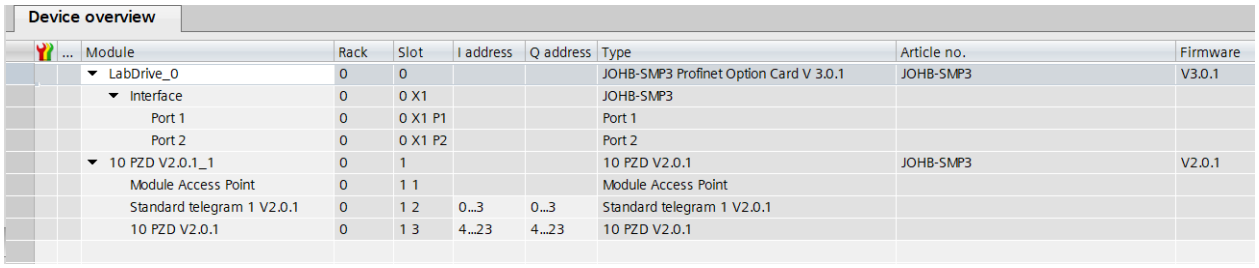


Figure 8.1 For DAP 2.0.1 and Later

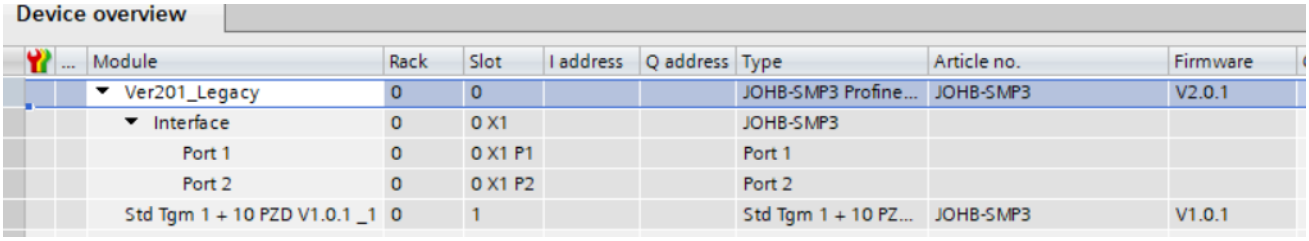


Figure 8.2 For All Other DAPs (1.0.1, 2.0.1 Legacy)

◆ Services Provided by the Option

The option provides the following services:

- Cyclic messaging in PROFIdrive or Yaskawa-specific mode
- Acyclic parameter access mechanism
- Identification & Maintenance functions (I&M0)
- PROFIdrive 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 option 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 8.2 PROFINET Configuration Parameters

PROFINET Configuration Parameter	Drive Parameter	Description
General Configuration and Feature Parameters		
Control/Status Configuration	-	Selects between the Yaskawa Specific profile (control and status words), and the PROFIdrive profile (control and status words): Yaskawa Specific

PROFINET Configuration Parameter	Drive Parameter	Description
		• The control and status words are mapped as shown in Table 7.1. • Simple run/stop control sequence. PROFIdrive • The control and status words are mapped as shown in Table 7.2 and Table 7.3. • The PROFIdrive state machine is active. • The “Safe Torque Off” digital inputs are monitored by the PROFIdrive state machine. Default Value: Yaskawa Specific **Note:** You cannot use the PROFIdrive communication profile and P-Drive communication profile for converters. Use the Yaskawa-specific set of control and status words.
MBTCP Enable (Modbus/ TCP) *1	-	Selects if the Modbus/TCP protocol and port are active. Modbus/TCP is used by the Yaskawa DriveWizard software. 0: Enabled • 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. 1: Disabled • 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. Default Value: Modbus/TCP is Active
Webpage Enable *1	-	Selects if the built-in web-pages and port (HTTP) are available. 0: Enabled • The built-in web pages are available. • The HTTP port (Port 80) is enabled. 1: Disabled • The built-in web pages cannot be accessed. • The HTTP port (Port 80) is disabled. Default Value: Web-pages are available
Email Enable *1	-	Selects if the built-in email notification mechanism and port is enabled. 0: Enabled • The built-in email notification mechanism is enabled. • The SMTP port (configurable port number) is enabled. 1: Disabled • The built-in email notification mechanism is disabled. • The SMTP port (configurable port number) is disabled. Default Value: Email is enabled.
DriveWizard Network Configurator Enable *1	-	Selects if the built-in DriveWizard network configurator is enabled. 0: Enabled • The built-in DriveWizard network configurator is enabled. 1: Disabled • The built-in DriveWizard network configurator is disabled. Default Value: DriveWizard network configurator is enabled.
SNMP Enable *1	-	Selects if the SNMP is enabled in the JOHP-SMP3 option card. This is available in software versions 5003 and later. 0: Enabled 1: Disabled Default Value: SNMP is enabled.
Configurable Outputs (PLC Controller to option)		
Configurable Output 1	F7-23	The settings in these 10 parameters configure commands originating from the controller (PLC) and going to the JOHB-SMP3 (drive). 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. Default Value (all Configurable Outputs): 0 **Note:** The values configured in the module parameters of the PLC will be used for the Configurable Outputs and the drive parameters (*F7-xx*) will be ignored. Only when the module parameters in the PLC are set to 0 will the drive parameters (*F7-xx*) be used.
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	
Configurable Output 9	F7-31	
Configurable Output 10	F7-32	
Configurable Inputs (Option to PLC Controller)		
Configurable Input 1	F7-33	The settings in these 10 parameters configure status and feedback originating the option (drive) and going to the controller (PLC).

PROFINET Configuration Parameter	Drive Parameter	Description
Configurable Input 2	F7-34	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. Example: If the PLC wants to monitor the digital inputs on the drive, the associated Configurable Input should be set to 002BH. Default Value (all Configurable Inputs): 0 **Note:** The values configured in the module parameters of the PLC will be used for the Configurable Inputs and the drive parameters (*F7-xx*) will be ignored. Only when the module parameters in the PLC are set to 0 will the drive parameters (*F7-xx*) be used.
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.

■ PROFINET IO Modules (Drive)

The mapping of the PROFINET IO modules is different for drives and converters. This section describes the mapping of the PROFINET IO modules for drives. Refer to *PROFINET IO Modules (Converter) on page 41* for mapping of the PROFINET IO modules for converters.

You can select five different I/O modules for drives.

Std Tgm 1 (Standard Telegram 1)

Table 8.3 Std Tgm 1 Consume

Word (16 bits)	Description	Notes
0	Control Word	Yaskawa-Specific or PROFIdrive, selectable through the hardware configuration tool.
1	Frequency Reference	The default units are 0.01 Hz (ex: 1234 –> 12.34 Hz). • For PROFIdrive 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*.

Table 8.4 Std Tgm 1 Produce

Word (16 bits)	Description	Notes
0	Status Word	Yaskawa-Specific or PROFIdrive, selectable through the hardware configuration tool.
1	Output Frequency	The default units are 0.01 Hz (ex: 1234 –> 12.34 Hz). • For PROFIdrive 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*.

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

Table 8.5 Std Tgm 1 + 5 Consume

Word (16 bits)	Description	Notes
0	Control Word	Yaskawa-Specific or PROFIdrive, selectable through the hardware configuration tool.
1	Frequency Reference	The default units are 0.01 Hz (ex: 1234 –> 12.34 Hz). • For PROFIdrive 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 Output 1	Configured by the hardware configuration tool or by drive parameter *F7-23 [Dynamic Out Param 1 for CommCard]*.
3	Configurable Output 2	Configured by the hardware configuration tool or by drive parameter *F7-24 [Dynamic Out Param 2 for CommCard]*.
4	Configurable Output 3	Configured by the hardware configuration tool or by drive parameter *F7-25 [Dynamic Out Param 3 for CommCard]*.
5	Configurable Output 4	Configured by the hardware configuration tool or by drive parameter *F7-26 [Dynamic Out Param 4 for CommCard]*.
6	Configurable Output 5	Configured by the hardware configuration tool or by drive parameter *F7-27 [Dynamic Out Param 5 for CommCard]*.

Table 8.6 Std Tgm 1 + 5 Produce

Word (16 bits)	Description	Notes
0	Status Word	Yaskawa-Specific or PROFIdrive, selectable through the hardware configuration tool.
1	Output Frequency	The default units are 0.01 Hz (ex: 1234 –> 12.34 Hz). • For PROFIdrive 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 the hardware configuration tool or by drive parameter *F7-33 [Dynamic In Param 1 for CommCard]*.
3	Configurable Input 2	Configured by the hardware configuration tool or by drive parameter *F7-34 [Dynamic In Param 2 for CommCard]*.
4	Configurable Input 3	Configured by the hardware configuration tool or by drive parameter *F7-35 [Dynamic In Param 3 for CommCard]*.
5	Configurable Input 4	Configured by the hardware configuration tool or by drive parameter *F7-36 [Dynamic In Param 4 for CommCard]*.
6	Configurable Input 5	Configured by the hardware configuration tool or by drive parameter *F7-37 [Dynamic In Param 5 for CommCard]*.

Forty Byte IO

Table 8.7 Forty Byte IO Consume

Word (16 bits)	Description	Notes
0	Control Word	Yaskawa-Specific or PROFIdrive, selectable through the hardware configuration tool.
1	Frequency Reference	The default units are 0.01 Hz (ex: 1234 –> 12.34 Hz). • For PROFIdrive 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	Torque Reference & Torque Limit	Units are 0.1% (ex: 1000 –> 100.0%) Torque reference when in torque mode (*d5-01 = 1*) Torque limit when in speed mode (*d5-01 = 0*) Requires drive parameter *F6-06 = 1 [Torque Reference/Limit by COM = Enabled]*.
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 *H4-01 = 0 [Terminal FM Analog Output Select = Not Used]*.
7	Analog Output 2 (Terminal AM)	Refer to the drive Technical Manual MEMOBUS/Modbus register 0008H for details. You must set *H4-04 = 0 [Terminal AM Analog Output Select = Not Used]*.
8	Digital Outputs	Refer to the drive Technical Manual MEMOBUS/Modbus register 0009H for details. You must set *H2-0x = F [Not Used]* for each output used.
9	Reserved	-
10	Reserved	-
11	Reserved	-
12	Reserved	-
13	Reserved	-
14	Reserved	-
15	Configurable Output 1	Configured by the hardware configuration tool or by drive parameter *F7-23 [Dynamic Out Param 1 for CommCard]*.
16	Configurable Output 2	Configured by the hardware configuration tool or by drive parameter *F7-24 [Dynamic Out Param 2 for CommCard]*.
17	Configurable Output 3	Configured by the hardware configuration tool or by drive parameter *F7-25 [Dynamic Out Param 3 for CommCard]*.
18	Configurable Output 4	Configured by the hardware configuration tool or by drive parameter *F7-26 [Dynamic Out Param 4 for CommCard]*.
19	Configurable Output 5	Configured by the hardware configuration tool or by drive parameter *F7-27 [Dynamic Out Param 5 for CommCard]*.

Table 8.8 Forty Byte IO Produce

Word (16 bits)	Description	Notes
0	Status Word	Yaskawa-Specific or PROFIdrive, selectable through the hardware configuration tool.
1	Output Frequency	The default units are 0.01 Hz (ex: 1234 –> 12.34 Hz). • For PROFIdrive 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	Torque Reference	Units are 0.1% (ex: 1000 –> 100.0%) Drive monitor *U1-09*.
3	PG Count Value	Units are 0 to 65535 encoder counts. Drive monitor *U6-18*.
4	Motor Speed	The default units are 0.01 Hz (ex: 1234 –> 12.34 Hz). Units can be changed using drive parameters *o1-03 and o1-10*. Drive monitor *U1-05*.
5	Frequency Reference Monitor	The default units are 0.01 Hz (ex: 1234 –> 12.34 Hz). Units can be changed using drive parameters *o1-03 and o1-10*. Drive monitor *U1-01*.
6	Output Current	Units are 0.1 A (ex: 432 –> 43.2 A) (For FSDrive-LIPV, the unit is 1 A.) Drive MEMOBUS Address: 0026H
7	Analog Input 1	Units are 0.1% (ex: 500 –> 50.0%) Drive monitor *U1-13*.
8	DC Bus Voltage	Units are 1 V (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 *U2-01*.
10	Alarm Code	For information on alarm code numbers, refer to the drive Technical Manual - MEMOBUS/ Modbus: Minor Fault/Alarm Contents. Drive MEMOBUS Address: 007FH
11	Output Power	Units are 0.01 kW (ex: 345 –> 3.45 kW) or 0.1 kW (ex: 345 –> 34.5 kW) (For FSDrive-LIPV, the unit is 1 kW.) Refer to the drive Technical Manual U1-08 for details about units and scaling. Drive monitor *U1-08*.
12	Analog Input 2	Units are 0.1% (ex: 500 –> 50.0%) Drive monitor *U1-14*.
13	Digital Inputs	For information on digital input status bit-mapping, refer to the drive Technical Manual U1-10. Drive monitor *U1-10*.
14	Analog Input 3	Units are 0.1% (ex: 500 –> 50.0%) Drive monitor *U1-15*.
15	Configurable Input 1	Configured by the hardware configuration tool or by drive parameter *F7-33 [Dynamic In Param 1 for CommCard]*.
16	Configurable Input 2	Configured by the hardware configuration tool or by drive parameter *F7-34 [Dynamic In Param 2 for CommCard]*.
17	Configurable Input 3	Configured by the hardware configuration tool or by drive parameter *F7-35 [Dynamic In Param 3 for CommCard]*.
18	Configurable Input 4	Configured by the hardware configuration tool or by drive parameter *F7-36 [Dynamic In Param 4 for CommCard]*.
19	Configurable Input 5	Configured by the hardware configuration tool or by drive parameter *F7-37 [Dynamic In Param 5 for CommCard]*.

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

Table 8.9 Std Tgm 1 + 10 Consume

Word (16 bits)	Description	Notes
0	Control Word	Yaskawa-Specific or PROFIdrive, selectable through the hardware configuration tool.
1	Frequency Reference	The default units are 0.01 Hz (ex: 1234 –> 12.34 Hz). • For PROFIdrive 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 Output 1	Configured by the hardware configuration tool or by drive parameter *F7-23 [Dynamic Out Param 1 for CommCard]*.
3	Configurable Output 2	Configured by the hardware configuration tool or by drive parameter *F7-24 [Dynamic Out Param 2 for CommCard]*.

Word (16 bits)	Description	Notes
4	Configurable Output 3	Configured by the hardware configuration tool or by drive parameter *F7-25 [Dynamic Out Param 3 for CommCard]*.
5	Configurable Output 4	Configured by the hardware configuration tool or by drive parameter *F7-26 [Dynamic Out Param 4 for CommCard]*.
6	Configurable Output 5	Configured by the hardware configuration tool or by drive parameter *F7-27 [Dynamic Out Param 5 for CommCard]*.
7	Configurable Output 6	Configured by the hardware configuration tool or by drive parameter *F7-28 [Dynamic Out Param 6 for CommCard]*.
8	Configurable Output 7	Configured by the hardware configuration tool or by drive parameter *F7-29 [Dynamic Out Param 7 for CommCard]*.
9	Configurable Output 8	Configured by the hardware configuration tool or by drive parameter *F7-30 [Dynamic Out Param 8 for CommCard]*.
10	Configurable Output 9	Configured by the hardware configuration tool or by drive parameter *F7-31 [Dynamic Out Param 9 for CommCard]*.
11	Configurable Output 10	Configured by the hardware configuration tool or by drive parameter *F7-32 [Dynamic Out Param 10 for CommCard]*.

Table 8.10 Std Tgm 1 + 10 Produce

Word (16 bits)	Description	Notes
0	Status Word	Yaskawa-Specific or PROFIdrive, selectable through the hardware configuration tool.
1	Output Frequency	The default units are 0.01 Hz (ex: 1234 –> 12.34 Hz). • For PROFIdrive 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 the hardware configuration tool or by drive parameter *F7-33 [Dynamic In Param 1 for CommCard]*.
3	Configurable Input 2	Configured by the hardware configuration tool or by drive parameter *F7-34 [Dynamic In Param 2 for CommCard]*.
4	Configurable Input 3	Configured by the hardware configuration tool or by drive parameter *F7-35 [Dynamic In Param 3 for CommCard]*.
5	Configurable Input 4	Configured by the hardware configuration tool or by drive parameter *F7-36 [Dynamic In Param 4 for CommCard]*.
6	Configurable Input 5	Configured by the hardware configuration tool or by drive parameter *F7-37 [Dynamic In Param 5 for CommCard]*.
7	Configurable Input 6	Configured by the hardware configuration tool or by drive parameter *F7-38 [Dynamic In Param 6 for CommCard]*.
8	Configurable Input 7	Configured by the hardware configuration tool or by drive parameter *F7-39 [Dynamic In Param 7 for CommCard]*.
9	Configurable Input 8	Configured by the hardware configuration tool or by drive parameter *F7-40 [Dynamic In Param 8 for CommCard]*.
10	Configurable Input 9	Configured by the hardware configuration tool or by drive parameter *F7-41 [Dynamic In Param 9 for CommCard]*.
11	Configurable Input 10	Configured by the 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.

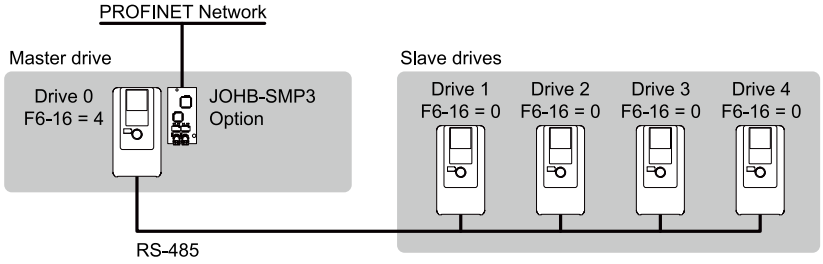


Figure 8.3 Gateway Mode Setup

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 8.11 Std Tgm 1 + Gateway Consume

Word (16 bits)	Description	Notes
0	Control Word	Yaskawa-Specific or PROFIdrive, selectable through the hardware configuration tool.
1	Frequency Reference	The default units are 0.01 Hz (ex: 1234 –> 12.34 Hz). • For PROFIdrive 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	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 the hardware configuration tool or by drive parameter *F7-23 [Dynamic Out Param 1 for CommCard]*.
15	Configurable Output 2	Configured by the hardware configuration tool or by drive parameter *F7-24 [Dynamic Out Param 2 for CommCard]*.
16	Configurable Output 3	Configured by the hardware configuration tool or by drive parameter *F7-25 [Dynamic Out Param 3 for CommCard]*.
17	Configurable Output 4	Configured by the hardware configuration tool or by drive parameter *F7-26 [Dynamic Out Param 4 for CommCard]*.
18	Configurable Output 5	Configured by the hardware configuration tool or by drive parameter *F7-27 [Dynamic Out Param 5 for CommCard]*.
19	Configurable Output 6	Configured by the hardware configuration tool or by drive parameter *F7-28 [Dynamic Out Param 6 for CommCard]*.
20	Configurable Output 7	Configured by the hardware configuration tool or by drive parameter *F7-29 [Dynamic Out Param 7 for CommCard]*.
21	Configurable Output 8	Configured by the hardware configuration tool or by drive parameter *F7-30 [Dynamic Out Param 8 for CommCard]*.
22	Configurable Output 9	Configured by the hardware configuration tool or by drive parameter *F7-31 [Dynamic Out Param 9 for CommCard]*.
23	Configurable Output 10	Configured by the hardware configuration tool or by drive parameter *F7-32 [Dynamic Out Param 10 for CommCard]*.

*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 Control Word format as defined by PROFIdrive.

*2 The Frequency Reference words for all of the slave drives will always remain uni-polar and will NOT change over to the frequency reference format as defined by PROFIdrive format.

Table 8.12 Std Tgm 1 + Gateway Produce

Word (16 bits)	Description	Notes
0	Status Word	Yaskawa-Specific or PROFIdrive, selectable through the hardware configuration tool.
1	Output Frequency	The default units are 0.01 Hz (ex: 1234 –> 12.34 Hz). • For PROFIdrive 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 *o1-03 and o1-10*.
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) (15F1H)	
13	Configurable Input 1	Configured by the hardware configuration tool or by drive parameter *F7-33 [Dynamic In Param 1 for CommCard]*.
14	Configurable Input 2	Configured by the hardware configuration tool or by drive parameter *F7-34 [Dynamic In Param 2 for CommCard]*.
15	Configurable Input 3	Configured by the hardware configuration tool or by drive parameter *F7-35 [Dynamic In Param 3 for CommCard]*.
16	Configurable Input 4	Configured by the hardware configuration tool or by drive parameter *F7-36 [Dynamic In Param 4 for CommCard]*.
17	Configurable Input 5	Configured by the hardware configuration tool or by drive parameter *F7-37 [Dynamic In Param 5 for CommCard]*.
18	Configurable Input 6	Configured by the hardware configuration tool or by drive parameter *F7-38 [Dynamic In Param 6 for CommCard]*.
19	Configurable Input 7	Configured by the hardware configuration tool or by drive parameter *F7-39 [Dynamic In Param 7 for CommCard]*.
20	Configurable Input 8	Configured by the hardware configuration tool or by drive parameter *F7-40 [Dynamic In Param 8 for CommCard]*.
21	Configurable Input 9	Configured by the hardware configuration tool or by drive parameter *F7-41 [Dynamic In Param 9 for CommCard]*.
22	Configurable Input 10	Configured by the hardware configuration tool or by drive parameter *F7-42 [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 Status Word format as defined by PROFIdrive.

*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 output frequency/frequency reference format as defined by PROFIdrive.

■ PROFINET IO Modules (Converter)

The mapping of the PROFINET IO modules is different for drives and converters. This section describes the mapping of the PROFINET IO modules for converters. Refer to *PROFINET IO Modules (Drive) on page 36* for mapping of the PROFINET IO modules for drives.

You can select four different I/O modules.

Note:

- PROFINET IO modules for converters are available in software versions PRG: 5006 and later. Refer to *U6-97 [OPT SPARE 4]* to check the option software version.
- You cannot use the PROFIdrive communication profile and P-Drive communication profile for converters. Use the Yaskawa-specific set of control and status words.

• Your PLC may show the mapping names of the PROFINET IO modules for drives (such as Frequency Reference) for each item and replace the command data and response data with the contents of converters (such as Voltage Reference).

Std Tgm 1 (Standard Telegram 1)

Table 8.13 Std Tgm 1 Consume

Word (16 bits)	Description	Notes
0	Control Word	Writes MEMOBUS/Modbus Register 0001H Refer to the converter manuals for more information.
1	Voltage Reference	Writes MEMOBUS/Modbus Register 000DH Refer to the converter manuals for more information.

Table 8.14 Std Tgm 1 Produce

Word (16 bits)	Description	Notes
0	Status Word	Responses MEMOBUS/Modbus Register 004BH. Refer to the converter manuals for more information.
1	DC Bus Voltage Feedback	Responds MEMOBUS/Modbus Register 1081H. Refer to the converter manuals for more information.

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

Table 8.15 Std Tgm 1 + 5 Consume

Word (16 bits)	Description	Notes
0	Control Word	Writes MEMOBUS/Modbus Register 0001H Refer to the converter manuals for more information.
1	Voltage Reference	Writes MEMOBUS/Modbus Register 000DH Refer to the converter manuals for more information.
2	Configurable Output 1	Configured by the hardware configuration tool or by converter parameter *F7-23 [Dynamic Out Param 1 for CommCard]*.
3	Configurable Output 2	Configured by the hardware configuration tool or by converter parameter *F7-24 [Dynamic Out Param 2 for CommCard]*.
4	Configurable Output 3	Configured by the hardware configuration tool or by converter parameter *F7-25 [Dynamic Out Param 3 for CommCard]*.
5	Configurable Output 4	Configured by the hardware configuration tool or by converter parameter *F7-26 [Dynamic Out Param 4 for CommCard]*.
6	Configurable Output 5	Configured by the hardware configuration tool or by converter parameter *F7-27 [Dynamic Out Param 5 for CommCard]*.

Table 8.16 Std Tgm 1 + 5 Produce

Word (16 bits)	Description	Notes
0	Status Word	Responses MEMOBUS/Modbus Register 004BH. Refer to the converter manuals for more information.
1	DC Bus Voltage Feedback	Responds MEMOBUS/Modbus Register 1081H. Refer to the converter manuals for more information.
2	Configurable Input 1	Configured by the hardware configuration tool or by converter parameter *F7-33 [Dynamic In Param 1 for CommCard]*.
3	Configurable Input 2	Configured by the hardware configuration tool or by converter parameter *F7-34 [Dynamic In Param 2 for CommCard]*.
4	Configurable Input 3	Configured by the hardware configuration tool or by converter parameter *F7-35 [Dynamic In Param 3 for CommCard]*.
5	Configurable Input 4	Configured by the hardware configuration tool or by converter parameter *F7-36 [Dynamic In Param 4 for CommCard]*.
6	Configurable Input 5	Configured by the hardware configuration tool or by converter parameter *F7-37 [Dynamic In Param 5 for CommCard]*.

Forty Byte IO

Table 8.17 Forty Byte IO Consume

Word (16 bits)	Description	Notes
0	Control Word	Writes MEMOBUS/Modbus Register 0001H Refer to the converter manuals for more information.
1	Voltage Reference	Writes MEMOBUS/Modbus Register 000DH Refer to the converter manuals for more information.
2	Reserved	-

Word (16 bits)	Description	Notes
3	Reserved	-
4	Reserved	-
5	Reserved	-
6	Analog Output 1 (Terminal FM)	Refer to the converter manuals for more information about MEMOBUS/Modbus Register 0007H. You must set *H4-01 = 0 [Terminal FM Analog Output Select = Not Used]*.
7	Analog Output 2 (Terminal AM)	Refer to the converter manuals for more information about MEMOBUS/Modbus Register 0008H. You must set *H4-04 = 0 [Terminal AM Analog Output Select = Not Used]*.
8	Digital Outputs	Refer to the converter manuals for more information about MEMOBUS/Modbus Register 0009H. You must set *H2-0x = F [MFDO Function Selection = Not Used]*.
9	Reserved	-
10	Reserved	-
11	Reserved	-
12	Reserved	-
13	Reserved	-
14	Reserved	-
15	Configurable Output 1	Configured by the hardware configuration tool or by converter parameter *F7-23 [Dynamic Out Param 1 for CommCard]*.
16	Configurable Output 2	Configured by the hardware configuration tool or by converter parameter *F7-24 [Dynamic Out Param 2 for CommCard]*.
17	Configurable Output 3	Configured by the hardware configuration tool or by converter parameter *F7-25 [Dynamic Out Param 3 for CommCard]*.
18	Configurable Output 4	Configured by the hardware configuration tool or by converter parameter *F7-26 [Dynamic Out Param 4 for CommCard]*.
19	Configurable Output 5	Configured by the hardware configuration tool or by converter parameter *F7-27 [Dynamic Out Param 5 for CommCard]*.

Table 8.18 Forty Byte IO Produce

Word (16 bits)	Description	Notes
0	Status Word	Responds MEMOBUS/Modbus Register 004BH. Refer to the converter manuals for more information.
1	DC Bus Voltage Feedback	Responds MEMOBUS/Modbus Register 1081H. Refer to the converter manuals for more information.
2	Reserved	-
3	Reserved	-
4	Reserved	-
5	DC Bus Voltage Reference	Responds MEMOBUS/Modbus Register 1080H. Refer to the converter manuals for more information.
6	DC Bus Side Current	Responds by converting the value read from MEMOBUS Register 1082H into current (unit: 0.1 A). Refer to the converter manuals for more information. **Note:** For FSDrive-LIPC, the unit is 1 A.
7	Analog Input 1	Responds the value read from MEMOBUS/Modbus Register 004EH (unit: 0.1%) (ex: 500 –> 50.0%). Refer to the converter manuals for more information.
8	Reserved	-
9	Fault Code	Responds the fault code read from MEMOBUS/Modbus Register 0080H. Refer to the fault codes on converter manuals for more information.
10	Alarm Code	Responds the alarm code read from MEMOBUS/Modbus Register 007FH. Refer to the alarm codes on converter manuals for more information.
11	DC Bus Side Power	Responds MEMOBUS/Modbus Register 1085H. Refer to the converter manuals for more information.
12	Analog Input 2	Responds the value read from MEMOBUS/Modbus Register 004FH (unit: 0.1%) (ex: 500 –> 50.0%). Refer to the converter manuals for more information.
13	Digital Inputs	Responds the value read from MEMOBUS/Modbus Register 0049H. Refer to the converter manuals for more information.
14	Analog Input 3	Responds the value read from MEMOBUS/Modbus Register 0050H (unit: 0.1%) (ex: 500 –> 50.0%). Refer to the converter manuals for more information.
15	Configurable Input 1	Configured by the hardware configuration tool or by converter parameter *F7-33 [Dynamic In Param 1 for CommCard]*.

Word (16 bits)	Description	Notes
16	Configurable Input 2	Configured by the hardware configuration tool or by converter parameter *F7-34 [Dynamic In Param 2 for CommCard]*.
17	Configurable Input 3	Configured by the hardware configuration tool or by converter parameter *F7-35 [Dynamic In Param 3 for CommCard]*.
18	Configurable Input 4	Configured by the hardware configuration tool or by converter parameter *F7-36 [Dynamic In Param 4 for CommCard]*.
19	Configurable Input 5	Configured by the hardware configuration tool or by converter parameter *F7-37 [Dynamic In Param 5 for CommCard]*.

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

Table 8.19 Std Tgm 1 + 10 Consume

Word (16 bits)	Description	Notes
0	Control Word	Writes MEMOBUS/Modbus Register 0001H Refer to the converter manuals for more information.
1	Voltage Reference	Writes MEMOBUS/Modbus Register 000DH Refer to the converter manuals for more information.
2	Configurable Output 1	Configured by the hardware configuration tool or by converter parameter *F7-23 [Dynamic Out Param 1 for CommCard]*.
3	Configurable Output 2	Configured by the hardware configuration tool or by converter parameter *F7-24 [Dynamic Out Param 2 for CommCard]*.
4	Configurable Output 3	Configured by the hardware configuration tool or by converter parameter *F7-25 [Dynamic Out Param 3 for CommCard]*.
5	Configurable Output 4	Configured by the hardware configuration tool or by converter parameter *F7-26 [Dynamic Out Param 4 for CommCard]*.
6	Configurable Output 5	Configured by the hardware configuration tool or by converter parameter *F7-27 [Dynamic Out Param 5 for CommCard]*.
7	Configurable Output 6	Configured by the hardware configuration tool or by converter parameter *F7-28 [Dynamic Out Param 6 for CommCard]*.
8	Configurable Output 7	Configured by the hardware configuration tool or by converter parameter *F7-29 [Dynamic Out Param 7 for CommCard]*.
9	Configurable Output 8	Configured by the hardware configuration tool or by converter parameter *F7-30 [Dynamic Out Param 8 for CommCard]*.
10	Configurable Output 9	Configured by the hardware configuration tool or by converter parameter *F7-31 [Dynamic Out Param 9 for CommCard]*.
11	Configurable Output 10	Configured by the hardware configuration tool or by converter parameter *F7-32 [Dynamic Out Param 10 for CommCard]*.

Table 8.20 Std Tgm 1 + 10 Produce

Word (16 bits)	Description	Notes
0	Status Word	Responds MEMOBUS/Modbus Register 004BH. Refer to the converter manuals for more information.
1	DC Bus Voltage Feedback	Responds MEMOBUS/Modbus Register 1081H. Refer to the converter manuals for more information.
2	Configurable Input 1	Configured by the hardware configuration tool or by converter parameter *F7-33 [Dynamic In Param 1 for CommCard]*.
3	Configurable Input 2	Configured by the hardware configuration tool or by converter parameter *F7-34 [Dynamic In Param 2 for CommCard]*.
4	Configurable Input 3	Configured by the hardware configuration tool or by converter parameter *F7-35 [Dynamic In Param 3 for CommCard]*.
5	Configurable Input 4	Configured by the hardware configuration tool or by converter parameter *F7-36 [Dynamic In Param 4 for CommCard]*.
6	Configurable Input 5	Configured by the hardware configuration tool or by converter parameter *F7-37 [Dynamic In Param 5 for CommCard]*.
7	Configurable Input 6	Configured by the hardware configuration tool or by converter parameter *F7-38 [Dynamic In Param 6 for CommCard]*.
8	Configurable Input 7	Configured by the hardware configuration tool or by converter parameter *F7-39 [Dynamic In Param 7 for CommCard]*.
9	Configurable Input 8	Configured by the hardware configuration tool or by converter parameter *F7-40 [Dynamic In Param 8 for CommCard]*.
10	Configurable Input 9	Configured by the hardware configuration tool or by converter parameter *F7-41 [Dynamic In Param 9 for CommCard]*.
11	Configurable Input 10	Configured by the hardware configuration tool or by converter parameter *F7-42 [Dynamic In Param 10 for CommCard]*.

■ Communication Cycle

The option supports cycle times of 2 ms to 512 ms. *1

*1 The option with software versions PRG: 5003 or later supports cycle times of 2 ms to 512 ms. The option with software versions PRG: 5002 or earlier supports cycle times of 8 ms to 512 ms. Refer to *U6-97 [OPT SPARE 4]* to check the option software version.

Note:

- If a network failure occurs when communicating in a ring topology, it may take a long time to restore communication using the MRP (Media Redundancy Protocol) and the connection with the PLC will be disconnected. This may cause a *bUS [Option Communication Error]*. If a *bUS* error occurs, slow down the IO cycle rate in the PLC.
- When you use S2 Redundancy, the cycle time is limited to 4 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.

■ PROFIdrive Acyclic Parameter Access Mechanism

A PROFIdrive acyclic parameter access mechanism can be used to access PROFIdrive parameters and drive parameters using an index of 0xB02E and the structure in Figure 8.4 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.

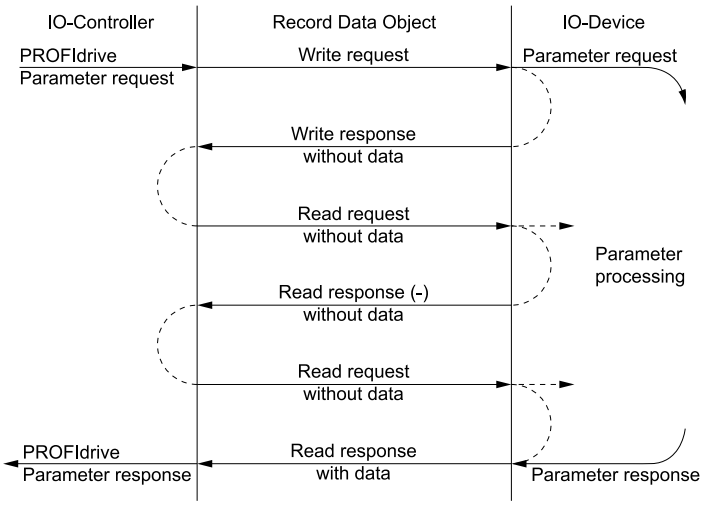


Figure 8.4 PROFIdrive Acyclic Parameter Access Mechanism Structure

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 PROFIdrive 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 8.21 Response Error Codes

Byte	Value and Meaning
ErrorCode	0xDF (Error Write)
	0xDE (Error Read)
ErrorDecode	0x80 (PNIORW) ErrorCode1 decoded according to Table 8.22. ErrorCode2 is 0.
	0x81 (PNIO) ErrorCode1 and ErrorCode2 decoded according to Table 8.22.
ErrorCode1	Error class and error code (Refer to Table 8.22).
ErrorCode2	-

Table 8.22 ErrorCode1 with PNIORW Decoding

Error Class	Meaning	Error Code
0 - 9	Reserved	-
10 (0x0A)	Application	0 = Read error
		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 8.23 Structure of the Read and Write Blocks

Field(s)	Description	Range	Type
Request Reference	Unique identification set by the IO-Controller. Changed for each new request.	1 - 255	Byte
Service	Request or Response service.	Request (0x00) Response (0x80)	UI8
Operation	Read or Write operation.	Write (0x08) Read (0x09)	UI8

Field(s)	Description	Range	Type
Block length	Length of the block.	0 - 0xFFFF	UI16
ARUUID	Identifier • 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 PROFIdrive specific request or response header.

Table 8.24 PROFIdrive 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 PROFIdrive 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 *1	Refer to Table 8.26 for more information.	-	Byte
Number of Values *1	Number of values following.	1	Byte
Values *1	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 8.26 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 8.25 PROFIdrive 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 *1	Refer to Table 8.26 for more information.	-
Number of Values *1	Number of values following.	1
Values *1	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 8.26 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 8.27 PROFIdrive 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.

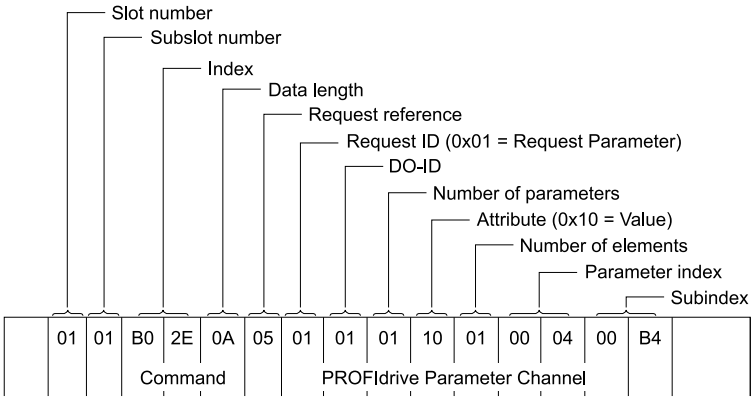
Parameter Data Transfer Examples

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

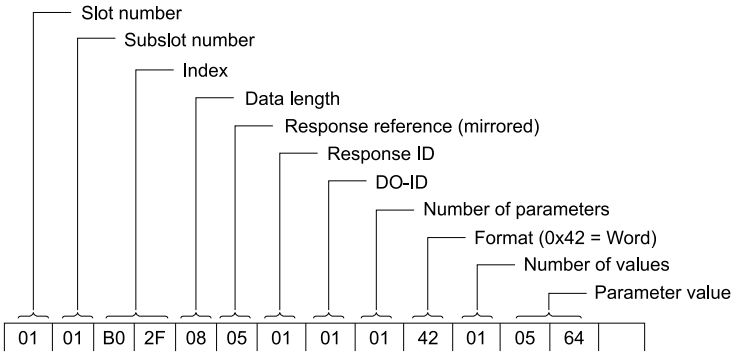
Example: Reading a drive parameter

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

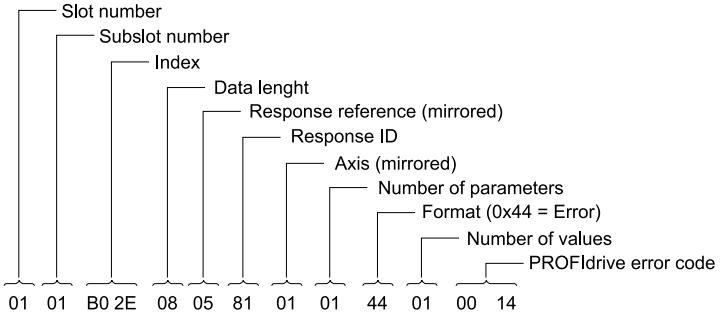
Write Request (Read Parameter Value)



Positive Read Response to Read Request



Negative Response to PROFIdrive Read Request



PROFIdrive Profile-Specific Parameters

PROFIdrive parameters contain data of the drive in standard form. The table below describes the supported PROFIdrive parameters.

Parameter	Read/Write	Data type	Description
922	Read	Unsigned16	Telegram selection
944	Read	Unsigned16	Fault message counter
945	Read	Array [5] Unsigned16	Fault Code
947	Read	Array [5] Unsigned16	Fault number. (coded according to DRIVECOM profile) Refer to parameter 945 for information about Subindex Contents.
950	Read	Array [2] Unsigned16	Scaling of the fault buffer
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

Parameter	Read/Write	Data type	Description
967	Read	Unsigned16	Control word (CW)
968	Read	Unsigned16	Status word (SW)
974	Read	Array [3] Unsigned16	Base Mode Parameter Access service Identification.
975	Read	Array [8] Unsigned16	DO Identification
980 - 989	Read	Array [20] Unsigned16	Numbered list of supported parameters
60000	Read	Float	Velocity reference value. This returns max freq value in *o1-10 [User Units Maximum Value]*.
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

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

- PNU944: Fault message counter
- PNU947: Fault numbers. Cycle power to clear the fault buffer.

◆ 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 8.28.

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 8.28 PROFINET Option High Priority Alarm Codes

Drive Alarm Code (Hex.)	Description	Drive Alarm Code (Hex.)	Description
1002	DC Bus Undervoltage (Uv1)	1016	External Fault (Terminal S8) (EF8)
1003	Control Power Undervoltage (Uv2)	1017	Internal Fan Fault (FAn)
1004	Soft Charge Answerback Fault (Uv3)	1018	Overspeed (oS)
1005	Short Circuit/IGBT Failure (SC)	1019	Speed Deviation (dEv)
1006	Ground Fault (GF)	101A	Encoder (PG) Feedback Loss (PGo)
1007	Overcurrent (oC)	101B	Input Phase Loss (PF)
1008	Overvoltage (ov)	101C	Output Phase Loss (LF)
1009	Heatsink Overheat (oH)	101D	Motor Overheat (PTC Input) (oH3)
100A	Heatsink Overheat (oH1)	101E	Keypad Connection Fault (oPr)
100B	Motor Overload (oL1)	101F	EEPROM Write Error (Err)
100C	Drive Overload (oL2)	1020	Motor Overheat Fault (PTC Input) (oH4)
100D	Overtorque Detection 1 (oL3)	1021	Serial Communications Error (CE)
100E	Overtorque Detection 2 (oL4)	1022	Option Communication Error (bUS)
100F	Dynamic Braking Transistor Fault (rr)	1023	SI-F/G Communication Error (E-15)
1010	Braking Resistor Overheat (rH)	1024	SI-F/G CPU down (E-10)
1011	External Fault (Terminal S3) (EF3)	1025	Control Fault (CF)
1012	External Fault (Terminal S4) (EF4)	1026	Zero Servo Fault (SvE)
1013	External Fault (Terminal S5) (EF5)	1027	Option Card External Fault (EF0)
1014	External Fault (Terminal S6) (EF6)	1028	PID Feedback Loss (FbL)
1015	External Fault (Terminal S7) (EF7)	1029	Undertorque Detection 1 (UL3)

Drive Alarm Code (Hex.)	Description
102A	Undertorque Detection 2 (UL4)
102B	High Slip Braking Overload (oL7)
102C	External Fault (Terminal S9) (EF9)
102D	External Fault (Terminal S10) (EF10)
102E	External Fault (Terminal S11) (EF11)
102F	External Fault (Terminal S12) (EF12)
1032	Z Pulse Fault (dv1)
1033	Z Pulse Noise Fault Detection (dv2)
1034	Inversion Detection (dv3)
1035	Inversion Prevention Detection (dv4)
1036	Output Current Imbalance (LF2)
1037	Motor Step-Out Detected (STPo)
1038	Encoder (PG) Hardware Fault (PGoH)
103B	Speed Search Retries Exceeded (SEr)
1041	Excessive PID Feedback (FbH)
1042	External Fault (Terminal S1) (EF1)
1043	External Fault (Terminal S2) (EF2)
1044	Mechanical Weakening Detection 1 (oL5)
1045	Mechanical Weakening Detection 2 (UL5)
1046	Current Offset Fault (CoF)
1047	PLC Fault 1 (PE1)
1048	PLC Fault 2 (PE2)
1049	DriveWorksEZ Fault (dWFL)
104A	EEPROM Memory DWEZ Data Error (dWF1)
104B	DriveWorksEZ Fault 2 (dWF2)
104C	DriveWorksEZ Fault 3 (dWF3)
104D	Output Voltage Detection Fault (voF)
104E	Braking Resistor Fault (rF)
104F	BrakingTransistor Overload Fault (boL)
1050	Motor Overheat (NTC Input) (oH5)
1051	Low Speed Motor Step-Out (LSo)
1052	Node Setup Error (nSE)
1053	Thermistor Disconnect (THo)
105A	Underload or Belt Break Detected (UL6)
105B	Polarity Judge Timeout (dv7)
1081	Control Circuit Error (CPF00)
1082	Control Circuit Error (CPF01)
1083	A/D Conversion Error (CPF02)
1084	Control Board Connection Error (CPF03)
1086	CPU Adjust Error (CPF05)
1087	EEPROM Memory Data Error (CPF06)
1088	Terminal Board Connection Error (CPF07)
1089	Terminal Board Connection Error (CPF08)
108A	EEPROM Error (CPF09)
108C	RAM Fault (CPF11)

Drive Alarm Code (Hex.)	Description
108D	FLASH Memory Fault (CPF12)
108E	Watchdog Circuit Exception (CPF13)
108F	Control Circuit Fault (CPF14)
1091	Clock Fault (CPF16)
1092	Timing Fault (CPF17)
1093	Control Circuit Fault (CPF18)
1094	Control Circuit Fault (CPF19)
1095	Control Circuit Error (CPF20)
1096	Control Circuit Error (CPF21)
1097	Hybrid IC Error (CPF22)
1098	Control Board Connection Error (CPF23)
1099	Drive Unit Signal Fault (CPF24)
109A	Terminal Board not Connected (CPF25)
109B	BB Circuit Error (CPF26)
109C	PWM Set Reg Error (CPF27)
109D	PWM Pattern Error (CPF28)
109E	On-Delay Error (CPF29)
109F	BB On Error (CPF30)
10A0	ASIC Code Error (CPF31)
10A1	ASIC Startup Error (CPF32)
10A2	Watch-dog Eror (CPF33)
10A3	Power/Clock Eror (CPF34)
10A4	Ext A/D Conv Error (CPF35)
10A5	ASIC COM Error (CPF36)
10A6	ASIC COM Error (CPF37)
10A7	EEPROM Data Error (CPF38)
10A8	CPU-ASIC Communication Error (CPF39)
10B0	FLASH Memory Data Error (CPF47)
1401	Keypad Time Not Set (TiM)
1402	Keypad Battery Low Voltage (bAT)
1405	DC Bus Overvoltage 2 (ov2)
140F	Safety Circuit Fault (SCF)
1411	High Level Communications Error (HLCE)
1413	Drive Cooling Fan Fault (FAn1)
1414	Comparator 1 Limit Fault (CP1)
1415	Comparator 2 Limit Fault (CP2)
1416	Bluetooth Communication Fault (bCE)
1420	PI Aux Feedback Level Loss (AUXFB)
1421	Differential Feedback Exceeded (DIFF)
1422	WIRE Break (FDBKL)
1423	High Feedback Sensed (HFB)
1424	High PI Aux Feedback Level (HIAUX)
1425	Low Feedback Sensed (LFB)
1426	Low PI Aux Feedback Level (LOAUX)
1427	Loss of Prime (LOP)

Drive Alarm Code (Hex.)	Description
1428	Net IO-Controller Lost (MSL)
1429	Setpoint Not Met (NMS)
142A	Output Disconnect (OD)
142B	Thermostat Fault (VLTS)
1432	Low Water Level (LWL)
1433	High Water Level (HWL)
1434	VT Overload (VTOL)
1435	Single Phase Converter Not Ready (SPCNR)
143A	Wait For Interlock Timeout (FB02)
143B	External Fault Bypass (EFB) (FB03)
143D	Motor Overload (FB05)
143E	External Overload Motor 1 (FB06)
143F	External Overload Motor 2 (FB07)

Drive Alarm Code (Hex.)	Description
1440	Brownout Detected (FB08)
1441	Blackout Detected (FB09)
1442	Loss of Drive Communications (FB10)
1445	Loss of Load Detected (FB13)
1447	Input Phase Loss (FB15)
1448	Input Phase Rotation (FB16)
1449	Load Verify Fault (FB17)
144A	Welded Bypass Contactor Detected (FB18)
1452	Option on Drive Detected (FB26)
1453	Drive Hardware Error (CPFx OFx) (FB27)
1454	Drive Faulted (FB28)
1456	Conflicting SW Check UB-99 (FB30)

◆ 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 8.29 PROFINET Option Low Priority Alarm Codes

Drive Alarm Code (Hex.)	Description
0401	Undervoltage (Uv)
0402	DC Bus Overvoltage (ov)
0403	Heatsink Overheat (oH)
0404	External Overheat (H1-XX=B) (oH2)
0405	Overtorque 1 (oL3)
0406	Overtorque 2 (oL4)
0407	FWD/REV Run Command Input Error (EF)
0408	Baseblock (bb)
0409	External Fault (Terminal S3) (EF3)
040A	External Fault (Terminal S4) (EF4)
040B	External Fault (Terminal S5) (EF5)
040C	External Fault (Terminal S6) (EF6)
040D	External Fault (Terminal S7) (EF7)
040E	External Fault (Terminal S8) (EF8)
040F	Internal Fan Fault (Fan)
0410	Overspeed (oS)
0411	Speed Deviation (dEv)
0412	Encoder (PG) Feedback Loss (PGo)
0413	Keypad Disconnect (oPr)
0414	Modbus Communication Error (CE)
0415	Option Communication Error (bUS)
0416	Serial Comm Transmission Error (CALL)
0417	Motor Overloaded (oL1)
0418	Drive Overloaded (oL2)

Drive Alarm Code (Hex.)	Description
0419	SI-F/G Communication Error (E-15)
041A	Option Card External Fault (EF0)
041B	Motor Switch during Run (rUn)
041C	Option Communication Error (bUS)
041D	Serial Comm Transmission Error (CALL)
041E	Undertorque Detection 1 (UL3)
041F	Undertorque Detection 2 (UL4)
0420	Modbus Test Mode Error (SE)
0421	Loss of External Power 24 Supply (L24v)
0422	Motor Overheat (PTC Input) (oH3)
0423	External Fault (Terminal S9) (EF9)
0424	External Fault (Terminal S10) (EF10)
0425	External Fault (Terminal S11) (EF11)
0426	External Fault (Terminal S12) (EF12)
0427	PID Feedback Loss (FbL)
0428	Excessive PID Feedback (FbH)
0429	Cycle Power to Accept Changes (CyPo)
042A	Drive Disabled (dnE)
042B	Encoder (PG) Hardware Fault (PGoH)
0434	High Current Alarm (HCA)
0435	Cooling Fan Maintenance Time (LT-1)
0436	Capacitor Maintenance Time (LT-2)
0437	Ctrl Failure/STOP (CF)
0438	SI-S EEPROM Error (EEP)
0439	External Fault (Terminal S1) (EF1)

Drive Alarm Code (Hex.)	Description
043A	External Fault (Terminal S2) (EF2)
043B	Safe Torque OFF Hardware (SToF)
043C	Safe Torque OFF (STo)
043D	Mechanical Weakening Detection 1 (oL5)
043E	Mechanical Weakening Detection 2 (UL5)
043F	PLC Error 1 (PA1)
0440	PLC Error 2 (PA2)
0441	Output Voltage Detection Alarm (voF)
0442	IGBT Maintenance Time (90%) (TrPC)
0443	SoftChargeBypassRelay MainteTime (LT-3)
0444	IGBT Maintenance Time (50%) (LT-4)
0445	Braking Transistor Overload (boL)
0447	Input Phase Loss (PF)
0448	Motor Overheat (NTC Input) (oH5)
0449	DriveWorksEZ Alarm (dWAL)
044A	DriveWorksEZ Alarm 2 (dWA2)
044B	DriveWorksEZ Alarm 3 (dWA3)
044D	Thermistor Disconnect (THo)
0455	GF1 Error (GF1)
0462	Customer Safeties (SAFE)
0467	Emergency Override FWD (EOF)
0468	Emergency Override REV (EOR)
0469	BAS Interlock (INTLK)
0481	External Power 24V Supply (EP24v)
0484	Shipping Adjustment Required (SUA)
0485	Keypad Battery Low Voltage (bAT)
0487	Comparator 1 Limit Error (CP1)
0488	Comparator 2 Limit Error (CP2)
0489	Keypad Time Not Set (TiM)
048A	Bluetooth Communication Error (bCE)
0490	Main Fdbk Lost Using Backup Fdbk (Bu-Fb)
0491	Backup Fdbk Lost Chk/Repl Xducer (BuFbl)
0492	Run at H5-34 (CE Go-To-Freq) (CE)
0493	Differential Feedback Exceeded (DIFF)
0494	Feedback Loss Wire Break (FDBKL)
0495	Feedback Loss, Go To Freq b5-83 (FLGT)
0496	High PI Aux Feedback Level (HIAUX)
0497	High Feedback Sensed (HIFB)

Drive Alarm Code (Hex.)	Description
0499	Low PI Aux Feedback Level (LOAUX)
049A	Low Feedback Sensed (LOFB)
049B	Loss of Prime (LOP)
049C	Setpoint Not Met (NMS)
049D	Output Disconnect (OD)
049E	Freq Ref < Minimum Speed (Y1-06) (FR<MS)
049F	Freq. Reference < Thrust (Y4-12) (FR<TH)
04A1	NETSCAN Waiting for IO-Controller (NETSC)
04A2	Analog Fbk Lost, Switched to Net (AFBL)
04A3	Low PI Aux Fdbk Drive Disabled (AuDis)
04A4	PI Aux Feedback Level Loss (AUXFB)
04A5	PI Aux Fdbk Lost Switched to Net (AuFbl)
04A6	Main Fdbk Lost, Using Diff Fdbk (BuDif)
04A7	Low City Pressure (LCP)
04A8	Low Suction Pressure (LSP)
04A9	Low Water In Tank (LWT)
04B1	Multi-Function Input Setting Err (HVoPE03)
04B2	Interlock Open (AL02)
04B3	Emergency Override Bypass (AL03)
04B9	Restart Delay Active (AL09)
04BA	Loss of Drive Communications (AL10)
04BD	Loss of Load Detected (AL13)
04C0	Input Phase Rotation (AL16)
04C1	Remote Xfer disabled in reverse (AL17)
04C2	Auto Xfer disabled in reverse (AL18)
04C9	Safety Open (SAFE)
04CA	Fire Stat Open (FIRE_ST)
04CB	Freeze Stat Open (FREEZ_ST)
04CC	Smoke Alarm Active (SMK_ALRM)
04CD	Over Pressure Detected (OV_PRESS)
04CE	Low Suction Detected (LOW_SUCT)
04CF	Vibration Detected (VBRATION)
04DB	Remote Drive Disable (R-DNE)
04DC	De-Scale/De-Rag Active (DS)
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 8.30 to Table 8.33.

Table 8.30 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 8.31 I&M1 Device Identification (Read-Write)

Content	Description
Plant Designation	Installation area
Location Designation	Specific installation place

Table 8.32 I&M2 Device Identification (Read-Write)

Content	Description
Installation Date	Date of installation

Table 8.33 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 8.34 for more information.

Table 8.34 Alarm Notification

Attribute	Description
BlockHeader	-
AlarmType	PROFINET specific alarm type
API	0x3A00 (PROFIdrive 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

Attribute	Description
ChannelProperties	0x0800 Diagnosis Appears 0x1000 Diagnosis Disappears
ChannelErrorType	Error code of drive fault or drive alarm Refer to page 50 and page 52 for more information.

◆ S2 Redundancy

Options with software versions PRG: 5004 and later support the S2 Redundancy. With S2 redundancy, this option can establish an IO connection to two redundant PLCs (Primary PLC for primary connection and backup PLC for backup connection). This allows a primary and a backup connection so that if the primary connection is lost, the backup PLC can take over and become the primary PLC.

Note:
- Select the JOHB-SMP3 V3.0.1 S2 Redundancy DAP to enable the S2 Redundancy function. Refer to *DAP Descriptions/Selection on page 33* for details.
- When you use the S2 Redundancy, this watchdog time must be set longer than the time required for the PLCs to switch control from primary to backup. The minimum total watchdog time depends on the PLC. Refer to the instruction manual for your PLC.
- The minimum IO cycle update time when S2 Redundancy is enabled is 4 ms. If a bUS [Ethernet Communication Error] occurs when switching from the primary PLC to the backup PLC, set the watchdog time to a longer value. You can also use F7-16 [Timeout Value] to delay declaring bUS [Ethernet Communication Error] for a length of time when a connection is lost.

◆ Media Redundancy Protocol (MRP)

Media Redundancy Protocol (MRP) is supported in versions 5003 and later. Use the PLC configuration software to enable this feature and configure the JOHB-SMP3 as an MRP client. The JOHB-SMP3 does not support manager functionality.

MRP fault detection works best at slower IO rates. An IO rate of 64 ms or greater works reliably to not drop IO connections when the ring is broken.

◆ Simple Network Management Protocol (SNMP)

Simple Network Management Protocol (SNMP) is supported in versions 5003 and later. SNMP allows a method to discover the device identification, topology, and get network diagnostics via several different Management Information Base (MIB) objects.

The module parameters enable and disable this functionality. The setting is non-volatile and will be retained between power cycles. The following MIBs are supported. Refer to *LLDP - MIB Details on page 55* for more information.

- MIB-II
- LLDP
- LLDP-EXT-PNO
- LLDP-EXT-DOT3

■ LLDP - MIB Details

Table 8.35 MIB2 Data

ID	Field (s)	Description	Data type	Access
System Table				
1.3.6.1.2.1.1.1.0	SysDescr	Text description of the device.	OctetString	Read Only
1.3.6.1.2.1.1.2.0	sysObjectID	The standard identification of the managed system this agent represents.	OID	Read Only
1.3.6.1.2.1.1.3.0	sysUpTime	The time (in hundredths of a second) since the network management portion of the system was last reinitialized.	TimeTicks	Read Only
1.3.6.1.2.1.1.4.0	sysContact	The textual identification of the contact person for this managed node, together with information on how to contact this person.	OctetString	Read/Write
1.3.6.1.2.1.1.5.0	sysName	An administratively-assigned name for this managed node.	OctetString	Read/Write
1.3.6.1.2.1.1.6.0	sysLocation	The text description of the physical location of this node.	OctetString	Read/Write

ID	Field (s)	Description	Data type	Access
1.3.6.1.2.1.1.7.0	sysServices	A value which indicates the set of services that this entity primarily offers.	Integer	Read Only
Interfaces Table				
1.3.6.1.2.1.2.1.0	ifPorts	Number of network interfaces (regardless of their current state) present on this system.	Integer	Read Only
1.3.6.1.2.1.2.2.1.(ifEntry)	ifIndex	An entry containing management information applicable to a particular interface.	Integer	Read Only
1.3.6.1.2.1.2.2.1.2.(ifEntry)	ifDescr	A textual string containing information about the interface.	OctetString	Read Only
1.3.6.1.2.1.2.2.1.3.(ifEntry)	ifType	The type of interface in the physical layer.	Integer	Read Only
1.3.6.1.2.1.2.2.1.4.(ifEntry)	ifMtu	The size of the largest datagram which can be sent/ received on the interface, specified in octets.	Integer	Read Only
1.3.6.1.2.1.2.2.1.5.(ifEntry)	ifSpeed	Current Bandwidth - in bits/sec Set based on current speed of port in bits/sec	Gauge	Read Only
1.3.6.1.2.1.2.2.1.6.(ifEntry)	ifPhysAddress	MAC address of interface/port	OctetString	Read Only
1.3.6.1.2.1.2.2.1.7.(ifEntry)	ifAdminStatus	The desired state of the interface. 1: Up 2: Down	Integer	Read Only
1.3.6.1.2.1.2.2.1.8.(ifEntry)	ifOperStatus	The current operational state of the interface. 1: Up 2: Down	Integer	Read Only
1.3.6.1.2.1.2.2.1.10.(ifEntry)	ifInOctets	The total number of octets received on the interface, including framing characters.	Integer	Read Only
1.3.6.1.2.1.2.2.1.13.(ifEntry)	ifInDiscards	The number of inbound packets that were discarded.	Integer	Read Only
1.3.6.1.2.1.2.2.1.14.(ifEntry)	ifInErrors	The number of inbound packets that contained errors preventing them from being deliverable to a higherlayer protocol.	Integer	Read Only
1.3.6.1.2.1.2.2.1.16.(ifEntry)	ifOutOctets	The total number of octets transmitted out of the interface, including framing characters.	Integer	Read Only
1.3.6.1.2.1.2.2.1.19.(ifEntry)	ifOutDiscards	The number of outbound packets that were chosen to be free up buffer space.	Integer	Read Only
1.3.6.1.2.1.2.2.1.20.(ifEntry)	ifOutErrors	The number of outbound packets that could not be transmitted because of errors.	Integer	Read Only
1.3.6.1.2.1.3.1.1.3.(ifEntry)	atNetworkAddress	IP address of device	IpAddress	Read Only
1.3.6.1.2.1.4.1.(ifEntry)	ipForwarding	Indication of whether this device is acting as a gateway.	Integer	Read Only
1.3.6.1.2.1.4.2.(ifEntry)	ipDefaultTTL	Value placed into the Time-To-Live field of the IP header.	Integer	Read Only

Table 8.36 LLDP-MIB

ID	Field (s)	Description	Data type	Access
LLDP Configuration				
1.0.8802.1.1.2.1.1.1	lldpMessageTxInterval	LLDP Transmit interval in seconds	Integer	Read Only
1.0.8802.1.1.2.1.1.2	lldpMessageTxHoldMultiplier	Time to live multiplier on lldpMessageTxInterval.	Integer	Read Only
1.0.8802.1.1.2.1.1.3	lldpReInitDelay	Minimum number of seconds after LLDP is disabled before it can be re-enabled.	Integer	Read Only
1.0.8802.1.1.2.1.1.4	lldpTxDelay	Delay in seconds of transmission after LLDP has been changed	Integer	Read Only
1.0.8802.1.1.2.1.1.5	lldpNotificationInterval	Time in seconds between LLDP notifications.	Integer	Read Only
LLDP Port Config Table				
1.0.8802.1.1.2.1.1.6.1.1. (LocalPort)	lldpPortConfigPortNum	Port index into Port Config table Hardcoded to 1, 2	Integer	Read Only
1.0.8802.1.1.2.1.1.6.1.2. (LocalPort)	llpPortConfigAdminStatus	Status of the LLDP port. 1: TX Only 2: RX Only 3: TX/RX 4: LLDP Disabled	Integer	Read Only
1.0.8802.1.1.2.1.1.6.1.3. (LocalPort)	lldpPortConfigNotificationEnable	Notifications enabled on a per port basis Value of 1 is enabled, 2 is disabled.	Integer	Read Only
1.0.8802.1.1.2.1.1.6.1.4. (LocalPort)	lldpPortConfigTLVsTxEnable	Bitmap of enabled TLV in LLDP	Integer	Read Only

ID	Field (s)	Description	Data type	Access
Configuration Address Table				
1.0.8802.1.1.2.1.1.7.1.1.1.4. (Device IP Address)	lldpConfigManAddrPortsTxEnable	Bitmap of ports	Integer	Read Only
Local System Data				
1.0.8802.1.1.2.1.3.1.0	lldpLocChassisIdSubType	The type of encoding used to identify the chassis associated with the local system.	Integer	Read Only
1.0.8802.1.1.2.1.3.2.0	lldpLocChassisId	The string value used to identify the chassis component associated with the local system.	OctetString	Read Only
1.0.8802.1.1.2.1.3.3.0	lldpLocSysName	Station name or MAC address if no station name	OctetString	Read Only
Local Port Table				
1.0.8802.1.1.2.1.3.7.1.1. (LocalPort)	lldpLocPortNum	The index value used to identify the port component	Integer	Read Only
1.0.8802.1.1.2.1.3.7.1.2. (LocalPort)	lldpLocPortIdSubtype	Type of port identifier	Integer	Read Only
1.0.8802.1.1.2.1.3.7.1.3. (LocalPort)	lldpLocPortId	String of port identifier	OctetString	Read Only
1.0.8802.1.1.2.1.3.7.1.4. (LocalPort)	lldpLocPortDesc	String of Port Description	OctetString	Read Only
Local Man Addr Table				
1.0.8802.1.1.2.1.3.8.1.1. (IpAddress)	lldpLocManAddrSubType	Type of management identifier.	Integer	Read Only
1.0.8802.1.1.2.1.3.8.1.2.1.4. (IpAddress)	lldpLocaManAddr	IP Address of device.	Integer	Read Only
1.0.8802.1.1.2.1.3.8.1.3. (IpAddress)	lldpLocaManAddrLen	Length of management address subtype and address fields	Integer	Read Only
1.0.8802.1.1.2.1.3.8.1.4. (IpAddress)	lldpLocaManAddrIfSubType	Identifies interface	Integer	Read Only
1.0.8802.1.1.2.1.3.8.1.5. (IpAddress)	lldpLocaManAddrIfID	Identifies interface number	Integer	Read Only
1.0.8802.1.1.2.1.3.8.1.6. (IpAddress)	lldpLocaManAddrOID	OID of type of hardware or protocol entity. (1.3.6.1.4.1.14733)	OID	Read Only
Remote System Data - All values retrieved from neighbor device LLDP data				
1.0.8802.1.1.2.1.4.1.1.1. (Timemark).(LocalPort). (EntryIndex)	lldpRemTimeMark	TimeFilter for this entry.	Integer	Read Only
1.0.8802.1.1.2.1.4.1.1.2. (Timemark).(LocalPort). (EntryIndex)	lldpRemLocalPortNum	Port on which information received	Integer	Read Only
1.0.8802.1.1.2.1.4.1.1.3. (Timemark).(LocalPort). (EntryIndex)	lldpRemIndex	Arbitrary local identifier of connection	Integer	Read Only
1.0.8802.1.1.2.1.4.1.1.4. (Timemark).(LocalPort). (EntryIndex)	lldpRemChassisIsSubtype	Type of encoding for chassis identifier	Integer	Read Only
1.0.8802.1.1.2.1.4.1.1.5. (Timemark).(LocalPort). (EntryIndex)	lldpRemChassisId	The string value used to identify the chassis component associated with the remote system.	OctetString	Read Only
1.0.8802.1.1.2.1.4.1.1.6. (Timemark).(LocalPort). (EntryIndex)	lldpRemPortIdSubType	The type of port identifier encoding used in the associated 'lldpRemPortId' object	Integer	Read Only
1.0.8802.1.1.2.1.4.1.1.7. (Timemark).(LocalPort). (EntryIndex)	lldpRemPortId	The string value used to identify the port component associated with the remote system.	OctetString	Read Only
1.0.8802.1.1.2.1.4.1.1.8. (Timemark).(LocalPort). (EntryIndex)	lldpRemPortDesc	The string value used to identify the description of the given port associated with the remote system.	OctetString	Read Only
1.0.8802.1.1.2.1.4.1.1.9. (Timemark).(LocalPort). (EntryIndex)	lldpRemSysName	The string value used to identify the system name of the remote system.	OctetString	Read Only

ID	Field (s)	Description	Data type	Access
1.0.8802.1.1.2.1.4.1.1.10. (Timemark).(LocalPort). (EntryIndex)	lldpRemSysDesc	The string value used to identify the system description of the remote system.	OctetString	Read Only
1.0.8802.1.1.2.1.4.1.1.11. (Timemark).(LocalPort). (EntryIndex)	lldpRemSysCapSupported	The bitmap value used to identify which system capabilities are supported on the remote system.	Integer	Read Only
1.0.8802.1.1.2.1.4.1.1.12. (Timemark).(LocalPort). (EntryIndex)	lldpRemSysCapEnabled	The bitmap value used to identify which system capabilities are enabled on the remote system.	Integer	Read Only
Remote Man Addr Table - All values retrieved from neighbor device LLDP data				
1.0.8802.1.1.2.1.4.2.1.1. (Timemark).(LocalPort). (EntryIndex)	lldpRemManAddrSubType	The type of management address identifier encoding used in the associated 'lldpRemManagmentAddr' object.	Integer	Read Only
1.0.8802.1.1.2.1.4.2.1.2. (Timemark).(LocalPort). (EntryIndex)	lldpRemManAddr	The string value used to identify the management address component associated with the remote system.	Integer	Read Only
1.0.8802.1.1.2.1.4.2.1.3. (Timemark).(LocalPort). (EntryIndex)	lldpRemManAddrIfSubtype	The enumeration value that identifies the interface numbering method used for defining the interface number	Integer	Read Only
1.0.8802.1.1.2.1.4.2.1.4. (Timemark).(LocalPort). (EntryIndex)	lldpRemManAddrIfId	The integer value used to identify the interface number regarding the management address component associated with the remote system	Integer	Read Only

Table 8.37 LLDP-EXT-DOT3-MIB

ID	Field (s)	Description	Data type
Xdot3LocPort Table			
1.0.8802.1.1.2.1.5.4623.1.2.1.1.2. (LocalPort)	lldpXdot3LocPortAutoNegEnabled	Value of 0 or 1 for whether auto-neg is enabled	Boolean
1.0.8802.1.1.2.1.5.4623.1.2.1.1.4. (LocalPort)	lldpXdot3LocPortOperMauType	MAU type, value showing speed and duplex	Integer
Xdot3RemPort Table			
1.0.8802.1.1.2.1.5.4623.1.3.1.1.2. (Timemark).(LocalPort).(EntryIndex)	lldpXdot3RemPortAutoNegEnabled	Value of 0 or 1 for whether auto-neg is enabled	Boolean
1.0.8802.1.1.2.1.5.4623.1.3.1.1.4. (Timemark).(LocalPort).(EntryIndex)	lldpXdot3RemPortOperMauType	MAU type, value showing speed and duplex	Integer

Table 8.38 LLDP-EXT-PNO-MIB

ID	Field (s)	Description	Data type
XPnoLocal Data			
1.0.8802.1.1.2.1.5.3791.1.2.1.1.1. (LocalPort)	lldpXPnoLocLPDValue	Line Propagation delay in nanoseconds	Integer
1.0.8802.1.1.2.1.5.3791.1.2.1.1.2. (LocalPort)	lldpXPnoLocPortTxDValue	Transmit delay in nanoseconds	Integer
1.0.8802.1.1.2.1.5.3791.1.2.1.1.3. (LocalPort)	lldpXPnoLocPortRxDValue	Receive delay in nanoseconds	Integer
1.0.8802.1.1.2.1.5.3791.1.2.1.1.6. (LocalPort)	lldpXPnoLocPortNoS	Name of local station Station name or MAC address if no station name	OctetString
XPnoRemote Data			
1.0.8802.1.1.2.1.5.3791.1.3.1.1.1. (Timemark).(LocalPort).(EntryIndex)	lldpXPnoRemLPDValue	Line Propagation delay in nanoseconds	Integer
1.0.8802.1.1.2.1.5.3791.1.3.1.1.2. (Timemark).(LocalPort).(EntryIndex)	lldpXPnoRemPortTxDValue	Transmit delay in nanoseconds	Integer
1.0.8802.1.1.2.1.5.3791.1.3.1.1.3. (Timemark).(LocalPort).(EntryIndex)	lldpXPnoRemPortRxDValue	Receive delay in nanoseconds	Integer
1.0.8802.1.1.2.1.5.3791.1.3.1.1.6. (Timemark).(LocalPort).(EntryIndex)	lldpXPnoRemPortNoS	Name of remote station Station Name or MAC address if no station name	OctetString

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 a self-contained web server at port 80 in order to display the web page. 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

When an fault or minor fault occurs in the drive, the details of the fault or minor fault are displayed on the Home page.

Figure 9.2 Home Page View (Fault/Minor Fault)

If an fault or minor fault occurs in the drive and only the fault or minor fault code is displayed on the Home page, refer to the Technical Manual for your drive for details on the fault or minor fault.

Figure 9.3 Home Page View (Fault Code/Minor Fault Code)

◆ 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 65* for more information.

Note:

PROFINET station names cannot contain uppercase letters.

You can download the GSDML file from this page.

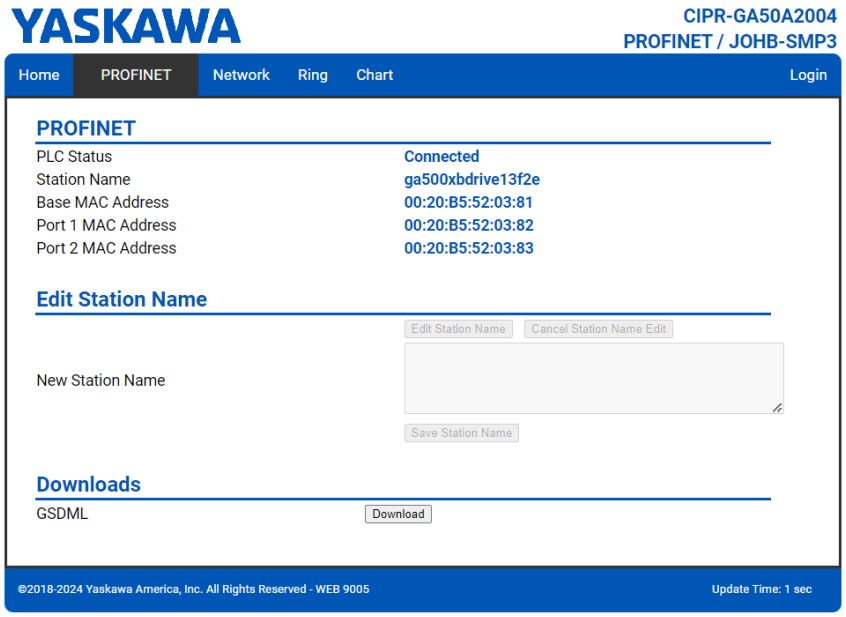


Figure 9.4 PROFINET Page View

◆ Network Page

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

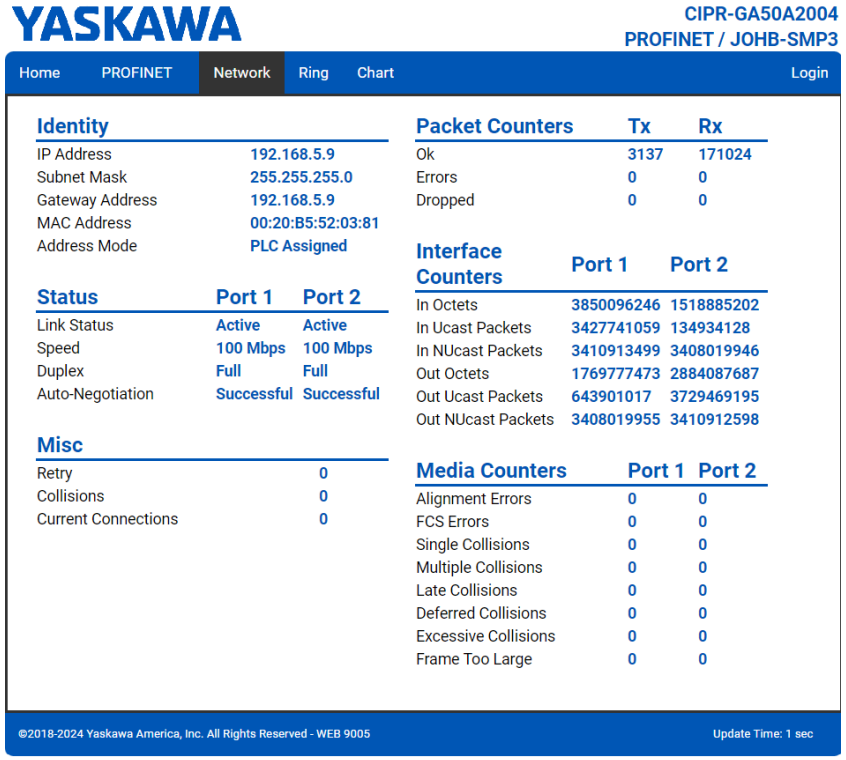


Figure 9.5 Network Page View

Table 9.1 Network Monitor Descriptions

Name	Description
Address Mode	Either static IP address or PLC Assigned.
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.

Name	Description
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.
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

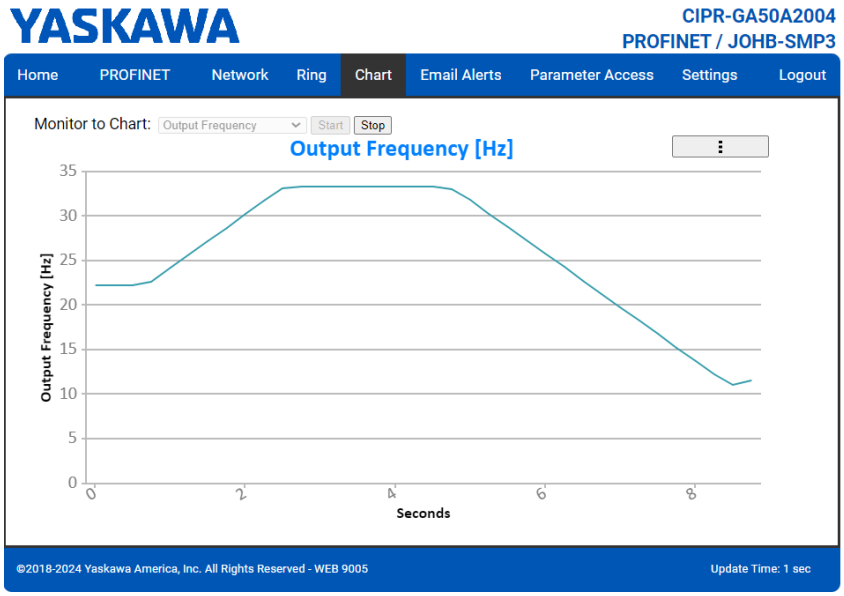


Figure 9.6 Chart Page View

◆ 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.

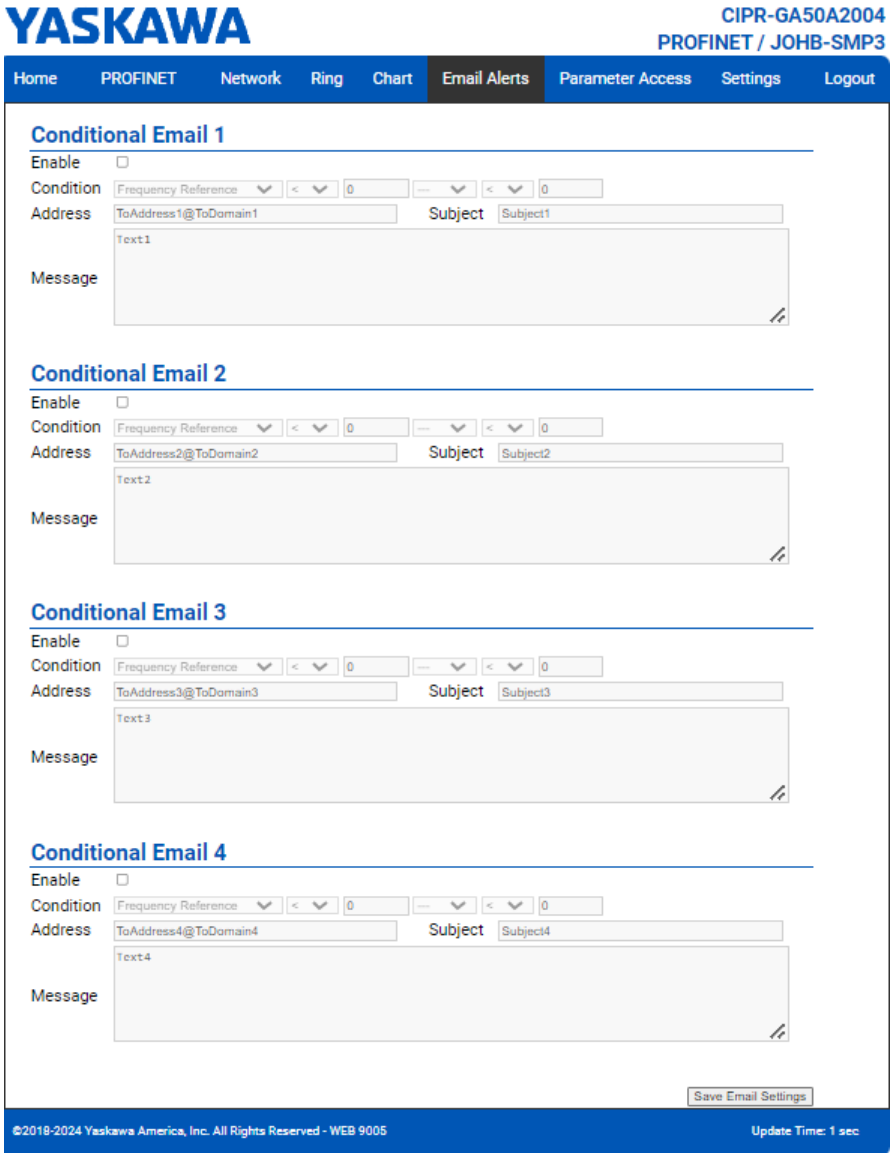


Figure 9.7 Email Alerts Page View

■ 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.

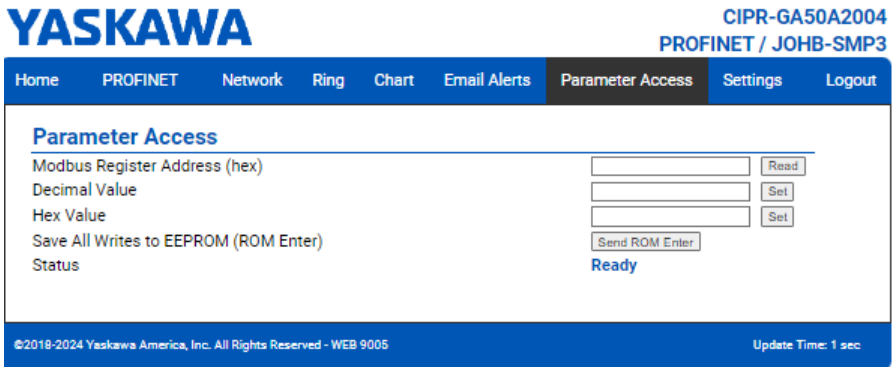


Figure 9.8 Parameter Access Page View

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.

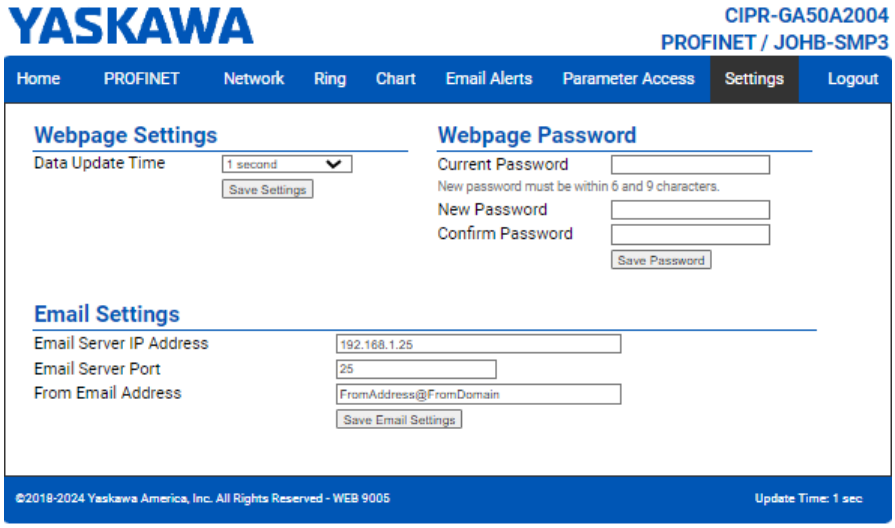


Figure 9.9 Settings Page View

■ 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”.

◆ Ring Page

This page shows the status of Media Redundancy Protocol (MRP) on the JOHB-SMP3 option card.

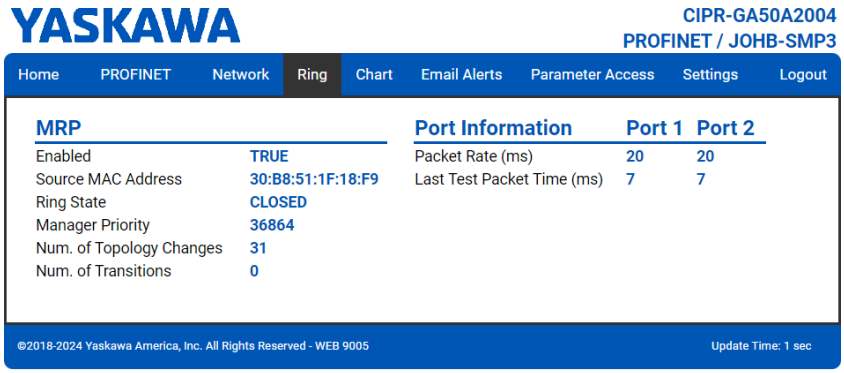


Figure 9.10 Ring Page View

10 Troubleshooting

◆ Drive-Side Error Codes

Drive-side error codes appear on the drive keypad. *Faults on page 66* 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.	• 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	• 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.
		Duplicate IP Address found on network.	Change to a different IP address. If *F7-13 = 0 [Address Mode at Startup = Static]*, change parameters *F7-01 to F7-04 [IP Address 1 to 4]*.
EF0	Option Card External Fault	The option received an external fault from the controller.	1. Find the device that caused the external fault and remove the cause. 2. 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. • 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.	1. De-energize the drive. 2. Connect the option to the correct option port.
oFA03, oFA04	Option Card Error (CN5-A)	A fault occurred in the option.	1. De-energize the drive. 2. Make sure that the option is correctly connected to the connector. 3. If the problem continues, replace the option.
oFA30 to oFA43	Option Card Connection Error (CN5-A)	A fault occurred in the option.	1. De-energize the drive. 2. Make sure that the option is correctly connected to the connector. 3. 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. • 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 connector.
oFC00	Option Fault (CN5-B)	The option connected to connector CN5-C is not compatible.	Connect the option to the correct connector. • 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 connector.
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.	• 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 ≠1 [Duplex Mode Selection ≠ 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 ≠ 3 [Fault]* will cause the following operation:

1. The bUS fault occurs after the *F7-16 [Timeout Value]* delay and the Run command is removed from the drive.
2. Then the option throws a *bUS* fault to the drive.

3. 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	*EF0*	3	The network sent a message to force this node into a fault state.	RED flash 5 times	-
No Link	*bUS*	1300	No physical link to another device. This happens after a link is established and removed.	-	RED flash 2 times
Temporary Network Error	*bUS*	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 (*F7-13 = 1 or 2 [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 (*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*). Adjusting the above parameters or setting the PLC to assign the IP address should clear this fault.	-	RED flash 3 times
Web Interface Setting Error	-	1310	Failure to read the web interface setting.	Solid RED	
S2 primary connection timeout	*bUS*	1311	Timeout for no Primary PLC connection when using S2 Redundancy.	-	RED flash 4 times

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, *U6-98* retains the original fault value and *U6-99* stores the new fault status value.

◆ Communication Error

If there are no other problems with your drive, but the LINK/ACT LED will not illuminate and you cannot communicate with other devices, set *F7-14 = 1 [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.

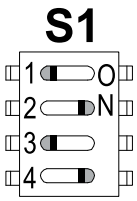


Figure 10.1 DIP Switch S1 Settings for the Self RAM Check

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: 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 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.
2. 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.

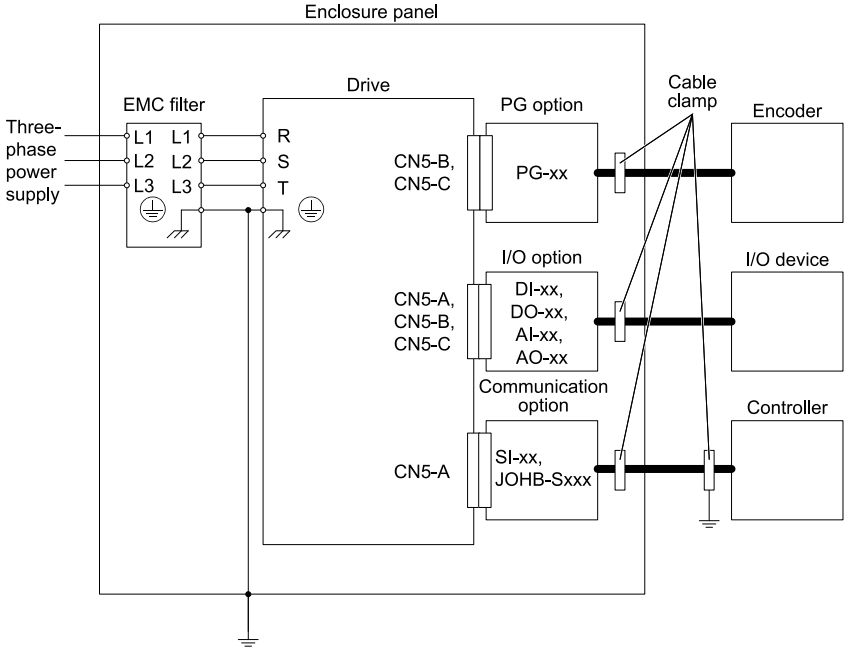


Figure 11.2 Option Installation for CE Compliance: 1000-Series, GA700, GA800, CR700, CH700

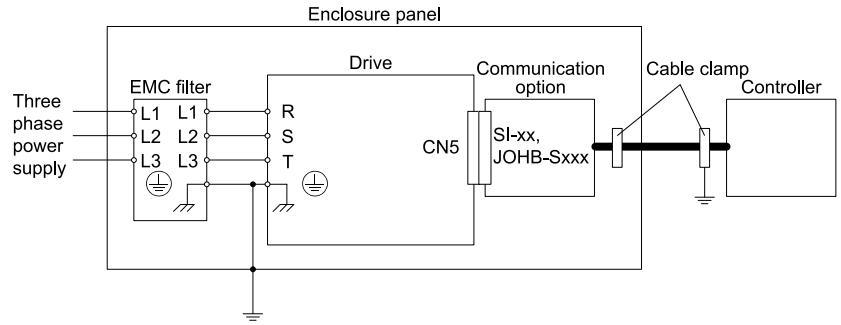


Figure 11.3 Option Installation for CE Compliance: GA500, HV600

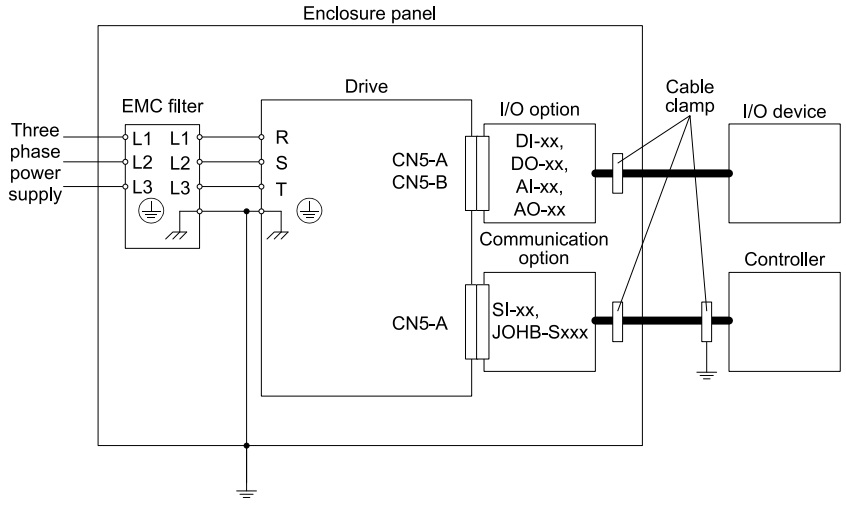
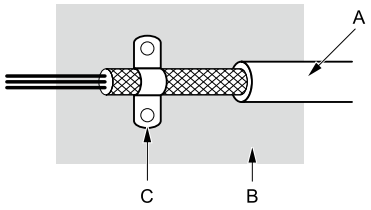


Figure 11.4 Option Installation for CE Compliance: FP605

3. 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 United Kingdom Conformity Assessed Marking

Figure 12.1 UKCA Mark

The UKCA mark indicates compliance with United Kingdom safety and environmental regulations.

It is required for engaging in business and commerce in the United Kingdom.

United Kingdom standards include standards for electrical appliances (Low Voltage Directive), standards for electrical noise (EMC Directive), and standards for machinery (Machinery Directive).

This product displays the UKCA Mark in accordance with the EMC Directive.

Table 12.1 Designated Standards

Statutory Instruments	Designated Standards
Electromagnetic Compatibility Regulations S.I. 2016 No. 1091	EN 61800-3 *1
Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations S.I. 2012 No. 3032	EN IEC 63000 *1

*1 Refer to “UK Declaration of Conformity” for the year of the Designated Standards.

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

13 Precautions for Korean Radio Waves Act

Figure 13.1 KC Mark

This product confirms to broadcast and communications equipment for business use (Class A) and are designed for use in locations other than in ordinary houses.

Drives that bear the Korea Certification (KC) mark conform to the Korean Radio Waves Act. Be careful when you use the drive in Korea under the following conditions.

Table 13.1 Precaution When You Use this Drive

Precautions
This equipment is evaluated for compatibility for use in a business environment and may cause radio interference in a domestic environment.

Note:

The user guide applies only to “Business Broadcasting Communication Equipment”.

Comply with the EMC Directive to conform to the Korean Radio Act.

14 Specifications

◆ Specifications

Table 14.1 Option Specifications

Items	Specifications
Model	JOHB-SMP3
Minimum Communication Cycle	8 ms: Software versions PRG: 5002 and earlier 2 ms: Software version PRG: 5003 2 ms: Software versions PRG: 5004 and later and when S2 Redundancy is disabled 4 ms: Software versions PRG: 5004 and later and when S2 Redundancy is enabled
Option Conformance	Passed PROFINET Conformance Class A *1 Passed PROFINET Conformance Class B *2 Passed S2 Redundancy Conformance *3
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: • 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 PROFIdrive profile Configurable I/O in cyclic messages Drive diagnostic alarms I&M0, I&M1, I&M2, I&M3

*1 Obtained with option software versions PRG: 5000 to 5002.
*2 Obtained with option software versions PRG: 5003 and later.
*3 Obtained with option software versions PRG: 5004 and later.

Note:

Refer to *U6-97 [OPT SPARE 4]* to check the option software version.

15 Appendix

◆ P-Drive Communication Profile

■ P-Drive Operation

This section describes the operation of P-Drive. P-Drive is a profile that was present in software versions 5002 and earlier. In order to use P-Drive in version 5003 and later, the JOHB-SMP3 Profinet Option Card V 2.0.1 Legacy DAP must be selected.

The Control Word and the Status Word

Table 15.1 Control Word (STW)

Bit	Name	Value	State Change/Description
0	ON	1	Proceed to Switched On unless other interlocks (OFF2, OFF3) are active.
	OFF	0	Proceed to Ready For Switching On unless other interlocks (OFF2, OFF3) are active.
1	OFF2	1	Continue operation (OFF2 inactive)
		0	Coast to Stop Proceed to Switch On Inhibit.
2	OFF3	1	Continue operation (OFF3 inactive)
		0	Quick stop Proceed to Quick Stop. Proceed to Switch On Inhibit once drive stopped.
3	Enable Operation	1	Proceed to Operation.
		0	Inhibit operation. Proceed to Switched On.
4	Enable Ramp Generator	1	Normal operation
		0	Reset Ramp Generator.
5	Unfreeze Ramp Generator	1	Normal operation
		0	Freeze Ramp Generator.
6	Enable Setpoint	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	Fault Acknowledge	0 -> 1	Fault reset if an active fault exists. Proceed to Switch On Inhibit.
		0	(Continue normal operation)
8	Jog 1	-	(Not supported)
9	Jog 2	-	(Not supported)
10	Control by PLC	1	Option card will be controlled from the Profinet network, disregarding the settings of *b1-01 [Frequency Reference Selection 1]* and *b1-02 [Run Command Selection 1]*.
		0	Option card will be controlled by the settings of *b1-01* and *b1-02*.
11 - 15	(Reserved)	-	(Reserved)

Table 15.2 Status Word (ZSW)

Bit	Name	Value	State Change/Description
0	Ready to Switch on	1	Ready to Switch on
		0	Not Ready to Switch on
1	Ready to Operate	1	Ready to Operate
		0	Not Ready to Operate
2	Operation Enabled	1	Enable Operation
		0	Disable Operation
3	Fault Present	1	Faulted
		0	Not Faulted
4	OFF2 Status	1	OFF2 Inactive. (Coast to Stop)
		0	OFF2 Active. (Coast to Stop)
5	OFF3 Status	1	OFF3 Inactive. (Quick Stop)
		0	OFF3 Active. (Quick Stop)
6	Switch on Inhibited	1	Switch on Inhibit Active
		0	Switch on Inhibit Not Active
7	Warning	1	Warning/Alarm.

Bit	Name	Value	State Change/Description
		0	No Warning/Alarm.
8	Speed Error	1	Actual value equals reference value (i.e. is within tolerance limits).
		0	Actual value differs from reference value (= is outside tolerance limits). This will occur DEV alarm or DEV fault from drive.
9	Control Requested	1	Drive control location: Remote
		0	Drive control location: Local
10	Setpoint Reached		Speed Agree bit
11 - 13	(Reserved)	-	(Reserved)
14 *1	Safe Torque Off (STo or SToF)	1	Either or both of the Safe Disable input terminals H1 and H2 are OFF. Coast To Stop.
		0	Both of the Safe Disable input terminals H1 and H2 are ON.
14 *2	(Reserved)	-	(Reserved)
15	(Reserved)	-	(Reserved)

*1 Active when the “P-Drive” Control/Status word is selected.
*2 Bit 14 is not used when “P-Drive (NO STO)” Control/Status word is selected.

P-Drive and STO Status

There is a selection in the Control/Status Word Selection for “P-Drive” or “P-Drive (NO STO)”.

When “P-Drive” is selected, the option card will monitor the Safe Torque Off digital inputs (STO) of the drive. If the STO is active in the drive, the P-Drive state machine will Coast to Stop and will assert status bit 14 to 1. It will transition into the Switch On Inhibited State.

In “P-Drive (NO STO)”, the STO status of the drive will not be monitored by P-Drive, and it will not affect the state machine operation.

Note:

In software versions 5002 and earlier, the control/status word selection for “P-Drive (NO STO)” was named “P-Drive (Legacy)”.

P-Drive to PROFIdrive Transition

P-Drive is an earlier version of PROFIdrive. The differences between P-Drive operation and PROFIdrive operation are noted below.

Drive Parameter Settings

Table 15.3 shows the differences in the drive parameter settings.

Table 15.3 Differences in the Drive Parameter Settings

Parameters	Function	P-Drive	PROFIdrive
b1-01 [Frequency Reference Selection 1], *b1-02 [Run Command Selection 1]*	Control from network	Bit 10 of the control word would force control to originate from the Option PCB, if control wasn't already set by the *b1-01* and *b1-02* parameters.	Bit 10 of the control word will no longer force control to originate from the Option PCB. Parameters *b1-01* and *b1-02* must be set to get control from the network. • *b1-01 = 3 [Option PCB]* • *b1-02 = 3 [Option PCB]*
b1-03 [Stopping Method Selection]	Stopping Method	The stopping method was based on the Control Word Bit 0 (OFF 1), Bit 1 (OFF2), and Bit 2 (OFF3). Parameter *b1-03* was not required to be set to any particular value.	Stopping method now must be set to *[Ramp to Stop]*. By this setting, similar to 5002, PROFIDrive inherently allows for selection of Ramp, Coast, or Quick stop via the Control Word Bit 0 (OFF 1), Bit 1 (OFF2), and Bit 2 (OFF3). *b1-03 = 0 [Ramp to Stop]*
L4-01 [Speed Agree Detection Level]	At speed bit	Bit 10 of status word would be set to 1 if the speed agree bit in the drive was 1.	Bit 10 of status word will now only be 1 if the output frequency is above the value of *L4-01*. *L4-01* must be set to the desired level to trigger this Bit 10 of status word.

Difference in the Control and Status Words

Some functions of the Control and Status Words differ between P-Drive and PROFIdrive. Table 15.4 and Table 15.5 show these differences.

Table 15.4 Control Word (STW)

Name	Bit	P-Drive	PROFIdrive
Enable Ramp Generator	Bit 4	• 0: When in a running state, it will stop via stopping method set in *b1-03 [Stopping Method Selection]*. • 1: Required to enter running state	• 0: When in a running state, it will ramp to zero speed using *C1-09 [Fast Stop Time]*. • 1: Normal operation
Unfreeze Ramp Generator	Bit 5		• 0: Drive will retain its current frequency reference even if ramping up or ramping down. • 1: Normal operation

Name	Bit	P-Drive	PROFIdrive
Enable Setpoint	Bit 6		• 0: Will force the input of the ramp generator (frequency reference) to zero. • 1: Normal operation
Control by PLC	Bit 10	• 0: *b1-01 [Frequency Reference Selection 1]* and *b1-02 [Run Command Selection 1]* are not overridden. • 1: Overrides values of *b1-01* and *b1-02* to get Option PCB control of Freq Ref and Run Command Source.	• Keeps drive from entering the running state. Run command outside the network is still available. • 1: Normal operation

Table 15.5 Status Word (ZSW)

Name	Bit	P-Drive	PROFIdrive
OFF2 Status	Bit 4	This was not updated under all conditions. • 0: OFF2 Active • 1: OFF2 Not Active	This will now always show the status of OFF2 even in non-running states. • 0: OFF2 Active • 1: OFF2 Not Active
OFF3 Status	Bit 5	This was not updated under all conditions. • 0: OFF3 Active • 1: OFF3 Not Active	This will now always show the status of OFF3 even in non-running states. • 0: OFF3 Active • 1: OFF3 Not Active
Speed Error	Bit 8	Set based on speed deviation status sent from drive. This is limited to control methods that use an encoder. • 0: Speed Deviation detected • 1: Speed within tolerance levels	Set when actual speed differs from commanded speed. Actual speed is based on *U1-05 [Motor Speed]*, and commanded speed is based on *U1-16 [SFS Output Frequency]*. Parameter *L4-02 [Speed Agree Detection Width]* determines the tolerance for Speed Error. If in a control method that does not support *U1-05*, this bit is always set. • 0: Speed Deviation detected • 1: Speed within tolerance levels
Control Requested	Bit 9	This is set if the drive freq ref source and run command source are set to option PCB.	This is a handshaking bit to the PLC. It will be set once the connection to the PLC has been completely established via the Application Relationship PROFINET handshake.
Setpoint Reached	Bit 10	This is set if the speed agree status bit in the drive was set.	This is set if the output frequency is above the value set in parameter *L4-01 [Speed Agree Detection Level]*.

Behavior Changes

In PROFIdrive (5003), the drive can now be restarted before it has finished ramping down. This was not possible in P-Drive (5002 and earlier) and it required the drive to be stopped before re-asserting the run.

PROFIdrive Parameters

In PROFIdrive, fault history parameters are no longer linked to the values of *U2-01, U3-01 to U3-04* in the drive. The fault history buffer will be generated in the option card itself and will clear on a powercycle. This is expected behavior per the PROFIdrive specification.

Some parameters have been added to PROFIdrive that were not in P-Drive. Refer to Table 15.6.

Table 15.6 PROFIdrive Parameters

Parameter Number	Description	P-Drive	PROFIdrive
922	Telegram selection 16 bit value	YES	YES
944	Fault message counter 16 bit value	YES	YES
945	Fault code Array of size 5	YES	YES
947	Fault number Array of size 5	YES	YES
950	Scaling of the fault buffer Array of size 2	NO	YES
964	Drive unit identification Array of size 5	YES	YES
965	Profile identification number Array of size 2	YES	YES
967	Control word 1 16 bit value	YES	YES
968	Status word 1 16 bit value	YES	YES
974	Base mode parameter access service identification Array of size 3	NO	YES

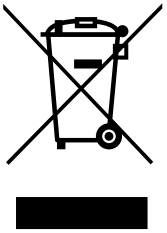
Parameter Number	Description	P-Drive	PROFIdrive
975	DO identification Array of size 8	YES	YES
977	Write trigger to non-volatile memory 16 bit value	YES	NO
980 - 989	Number list of defined parameter Each Parameter number is an array of size 20.	NO	YES
60000	Velocity reference value 32bit float value	NO	YES
61000	NameOfStation Array of size 240	YES	YES
61001	IpOfStation Array of size 4	YES	YES
61002	MacOfStation Array of size 6	YES	YES
61003	DefaultGatewayOfStation Array of size 4	YES	YES
61004	Subnet mask of station Array of size 4	YES	YES

16 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
November 2025	2	All	Addition: Information on additional compatible products • CIPR-LIPVxxxxxxx • CIPR-LIPCxxxxxxx Revision: • Reviewed and corrected entire documentation • Updated information on option software version VST908210 (PROFINET Ver5004) to VST908212 (PROFINET Ver5006)
		5	Revision: Device Access Point (DAP) Selection
		6	Addition: F7-44 [PLC Stop Behavior Selection]
		7	Addition: Information on PROFIBUS Control Word and Status Word Vendor Bit
		8	Addition: • PROFINET IO Modules (Converter) • S2 Redundancy Revision: • Hardware Catalog • DAP Descriptions/Selection • Module Configuration
		9	Revision: Illustrations of web page display examples
		10	Addition: Information on S2 primary connection timeout
		14	Addition: • Minimum Communication Cycle • Option Conformance: Passed S2 Redundancy Conformance
October 2024	1	All	Addition: Information on CH700 Revision: • Reviewed and corrected entire documentation • Updated information on option software version VT908209 (PROFINET Ver5003)
		5	Addition: Device Access Point (DAP) Selection
		7	Revision: PROFIdrive Communication Profile
		8	Addition: • Hardware Catalog • DAP Descriptions/Selection • Module Configuration • Media Redundancy Protocol (MRP) • Simple Network Management Protocol (SNMP) • LLDP - MIB Details
		9	Addition: Ring Page
		12	Addition: United Kingdom Conformity Assessed Marking
		13	Addition: Precautions for Korean Radio Waves Act
		15	Addition: Appendix (P-Drive Communication Profile)
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YASKAWA AC Drive Option

PROFINET

Technical Manual

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