



# CM012 DeviceNet™ Option Card Technical Manual



Document Number: TM.AFD.16

Models: CIMR-F7U, CIMR-G7U, CIMR-P7U, CIMR-G5M (Spec F), CIMR-G5M (600V), G5HHP



# Warnings and Cautions

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## **WARNING**

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

## **WARNING**

- Read and understand this manual before installing, operating, or servicing this drive. All warnings, cautions, and instructions must be followed. All activity must be performed by qualified personnel. The drive must be installed according to this manual and local codes.
- Do not connect or disconnect wiring while the power is on. Do not remove covers or touch circuit boards while the power is on. Do not remove or insert the digital operator while power is on.
- Before servicing, disconnect all power to the equipment. The internal capacitor remains charged even after the power supply is turned off. Status indicator LEDs and Digital Operator display will be extinguished when the DC bus voltage is below 50VDC. To prevent electric shock, wait at least 5 minutes after all indicators are OFF and measure the DC bus voltage level to confirm that it is at a safe level.
- Do not perform a withstand voltage test on any part of the unit. This equipment uses sensitive devices and may be damaged by high voltage.
- The drive is not suitable for circuits capable of delivering more than the specified RMS symmetrical amperes. Install adequate branch short circuit protection per applicable codes. Refer to the specification. Failure to do so may result in equipment damage and/or personal injury.
- Do not connect unapproved LC or RC interference suppression filters, capacitors, or overvoltage protection devices to the output of the drive. Capacitors may generate peak currents that exceed drive specifications.
- To avoid unnecessary fault displays, caused by contactors or output switches placed between drive and motor, auxiliary contacts must be properly integrated into the control logic circuit.
- YASKAWA is not responsible for any modification of the product made by the user. Doing so will void the warranty. This product must not be modified.
- Verify that the rated voltage of the drive matches the voltage of the incoming power supply before applying power.
- To meet CE directives, proper line filters and proper installation are required.
- Some drawings in this manual may be shown with protective covers or shields removed, to describe details. These must be replaced before operation.
- Observe Electrostatic Discharge Procedures when handling the drive and drive components to prevent ESD damage.
- The attached equipment may start unexpectedly upon application of power to the drive. Clear all personnel from the drive, motor and machine area prior to applying power. Secure covers, couplings, shaft keys, machine beds and all safety equipment before energizing the drive.

# Introduction

This manual explains the specifications and handling of the Yaskawa *CM012 DeviceNet Option Card* for the Yaskawa F7U, G7U, P7U, GPD515/G5M (F Spec), GPD515/G5M (600V) and G5HHP drives. This *DeviceNet Option Card* connects the drive to a DeviceNet network and facilitates the exchange of data. In this document, the word “inverter,” “AC drive” and “drive” may be used interchangeably.

To ensure proper operation of this product, read and understand this manual. For details on installation and operation of the drive, refer to the appropriate drive technical manual. For details on specific parameters, refer to the appropriate drive user and/or programming manual. All technical manuals, EDS files and support files can be found on the CD that came with the drive. They are also available for download at [www.yaskawa.com](http://www.yaskawa.com). Refer to the web site for the most recent information.

For information on DeviceNet contact the Open DeviceNet Vendors Organization at [www.odva.org](http://www.odva.org).

***F7U Drive User Manual*** document reference **TM.F7.01**

***F7U Drive Programming Manual*** document reference **TM.F7.02**

***F7U Drive Parameter Access Manual*** document reference **TM.F7.11**

***G7U Drive Technical Manual*** document reference **TM.G7.01**

***P7U Drive User Manual*** document reference **TM.P7.01**

***P7U Drive Programming Manual*** document reference **TM.P7.02**

***GPD515/G5M (Spec F) Technical Manual*** document reference **TM 4515**

***GPD515/G5M (Spec F) MODBUS<sup>®</sup> Technical Manual*** document reference **TM 4025**

***G5HHP Technical Manual*** document reference **TM.G5HHP.01**

***DeviceNet<sup>™</sup> Installation Guide*** document reference **IG.AFD.16**

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DeviceNet<sup>™</sup> is a trademark of the ODVA.

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# Chapter 1 Installation

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*This section describes how to install and set up the DeviceNet Option Card.*

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# Installation Check Sheet

The following is a quick reference check list to install and configure the *DeviceNet Option Card*. Make a copy of this page and check off  each item as it is completed. For detailed information please refer to the detailed sections that follow.

1.  **Unpack and Inspect.**  
Unpack the *DeviceNet Option Card* and verify that all components are present and undamaged.  
Refer to the “**Unpack and Inspect**” section of this manual.
2.  **Verify Drive Operation:**  
Refer to the “**Verify Drive Operation**” section of this manual for details.
3.  **Install the *DeviceNet Option Card* on the drive:**  
Refer to the “**Mount the DeviceNet Option Card**” section of this manual for details.
4.  **Connect the *DeviceNet Option Card* to the DeviceNet communication network:**  
Refer to the “**Connect to the DeviceNet Option Card**” section of this manual.
5.  **Set the *DeviceNet Option Card* network address and baud rate:**  
Refer to the “**Configure the DeviceNet Option Card**” section of this manual for details.
6.  **Apply power to the drive and check diagnostic and operation LED states:**  
Refer to the “**Power-up Diagnostic LED Test Sequence**” section of this manual for details.  
Refer to the “**Normal Operation LED States**” section of this manual for details.

 **WARNING!**

Dangerous voltages in excess of 400VDC (230V drives) or 800VDC (460V drives) are present at the DC bus terminals of the drive.

Verify that the drive is wired correctly by referring to the appropriate drive user and/or technical manual prior to applying power.

7.  **Verify that the drive is on the network:**  
Refer to the “**Verify that the Drive is on the Network**” section of this manual for details.  
  
Refer to the documentation included with the DeviceNet configuration utility supplied with the DeviceNet Master controller.  
Verify that the drive appears on the DeviceNet network at the correct node address.
8.  **Install the appropriate EDS file if desired.**  
Refer to the “**EDS Files**” section of this manual.
9.  **Configure the drive on the network.**  
Refer to the “**Configure the Drive on the Network**” section of this manual.
10.  **Configure the scanner.**  
Refer to the “**Configure the Scanner**” section of this manual.
11.  **Finish the *DeviceNet Option Card* Installation:**  
Refer to the “**Configure Drive Parameters**” section of this manual for details.  
Set parameters b1-01 and b1-02 to their appropriate values.

# Unpack and Inspect

Prior to unpacking, check the package label and verify that the product received matches the product ordered. Unpack the option and verify that the following items are included in the product package and are undamaged.

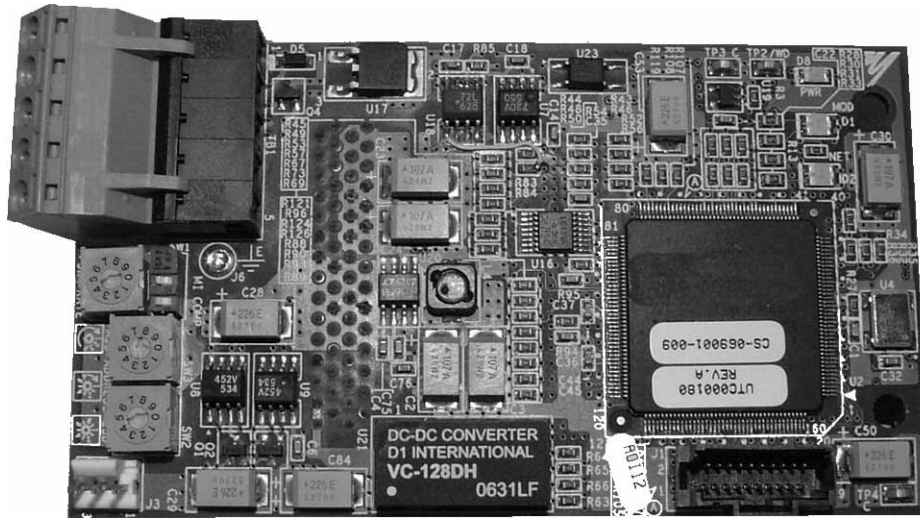


Fig 1.1 – DeviceNet Option Card

Table 1.1 – DeviceNet Option Card	
Item	Qty
DeviceNet Option Card (UTC000180)	1
Installation Guide (IG.AFD.16)	1

# Installation and Wiring

## ◆ Verify Drive Operation

Connect power to the drive and verify that the drive functions properly. This includes running the drive from the operator keypad. Refer to the appropriate drive technical manual for information on connecting and operating the drive.

Remove power from the drive and wait for the charge lamp to be completely extinguished. Wait at least five additional minutes for the drive to be completely discharged. Measure the DC bus voltage and verify that it is at a safe level.

**⚠ WARNING!**

Dangerous voltages in excess of 400VDC (230V drives) or 800VDC (460V drives) are present at the DC bus terminals of the drive.



## ◆ Mount the DeviceNet Option Card

1. Remove the operator keypad.
2. Remove the drive terminal and control covers.
3. On the F7U, G7U and P7U drives, remove the option hold-down by carefully compressing the top and bottom until it becomes free of its holder. Lift it out.
4. Connect the DeviceNet cable to the *DeviceNet Option Card*. Refer to the connection figure below. If the drive is the last device on a network segment make sure to install the terminating resistor (121 $\Omega$  1% metal film 1/4W) between the two CAN connections, 2 and 4.
5. Align the J2 connector on the back of the *DeviceNet Option Card* with its mating 2CN connector on the drive control card.
6. Align the two standoffs on the front of the drive control board with the two holes on the right side of the *DeviceNet Option Card*.
7. Press the *DeviceNet Option Card* firmly onto the drive 2CN connector and standoffs until the J2 connector is fully seated on 2CN and the drive standoffs have locked into their appropriate holes.
8. Route the DeviceNet cable along the left inside of the AC drive enclosure.
9. On the F7U, G7U and P7U drives, replace the option hold-down.

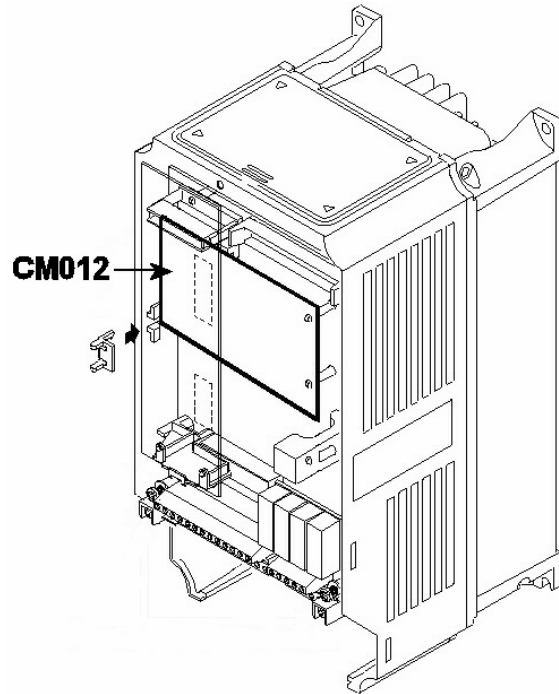


Fig 1.2 – Drive Outline Drawing

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## ◆ Connect to the DeviceNet Option Card

On small frame drives, make sure to connect the DeviceNet cable prior to installing the *DeviceNet Option Card* as it is difficult to install the connector after the *DeviceNet Option Card* has been installed.

Connect the DeviceNet cable to the connector as shown. If the drive is the last device on a network segment make sure to install the terminating resistor (121Ω 1% metal film 1/4W) between the two CAN connections, 2 and 4.

Terminal	Color	Name	Wire Color	Description
1	Black	V-	Black	Network Common
2	Blue	CAN_L	Blue	CAN Data Low
3	Green	Shield	Green	Cable Shield
4	White	CAN_H	White	CAN Data High
5	Red	V+	Red	+24VDC

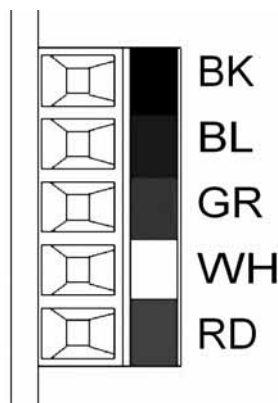


Fig 1.3 – DeviceNet Connector

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## Configure the DeviceNet Option Card

### ◆ Set the DeviceNet Option Card Baud Rate

Set the drive baud rate by selecting the appropriate **Baud Rate Sw** setting. Settings of 3 through 8 will load the previously stored baud rate. A setting of 9 will enable **Auto Baud**. The factory default setting is 3.

Setting	Description
0	125 kbps
1	250 kbps
2	500 kbps
3 ~ 8	NVRAM (Last stored baud rate) (3 = default setting)
9	Auto Sense

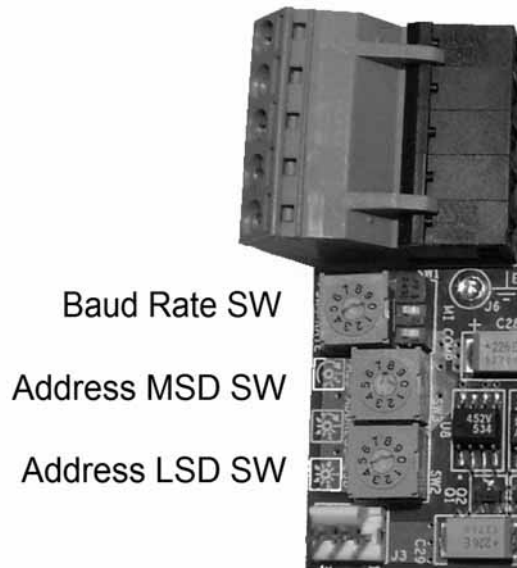


Fig 1.4 – DeviceNet Option Card Network Settings

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## ◆ Set the DeviceNet Option Card MAC ID

Set the drive MAC address by selecting the appropriate settings of the address **MSD** and **LSD** switches. The **MSD** switch sets the MAC address's tens digit while the **LSD** switch sets the ones digit. Valid MAC addresses are 0 through 63 although addresses of 0, 1, 62 and 63 are typically reserved.

- Settings of 0 ~ 63: the MAC address will be selected from the **MSD & LSD** switch settings.
- Settings of 64 ~ 99: the MAC address will be set to the last saved MAC address. The CM012 comes from the factory with the MAC address switches set to 63 and the MAC address last saved to 63 (for use with some vendors' faulted or automatic device recovery features).
- For use with ADR-enabled controllers/scanners, power off the drive and set the MAC ID rotary switches to 63. Power cycle the drive ON and OFF. Change the MAC ID rotary switch setting to 64. Power the drive ON. The MAC ID will be set at 63 and can be reset through the DeviceNet network.

The drive must be power cycled to accept a new switch setting.

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## ◆ Apply Power to the Drive

After the DeviceNet Option Card has been properly configured and the drive wiring has been completed and checked, apply power to the drive. Verify that the drive operates correctly and that there are no faults on the digital operator. Refer to the appropriate drive user and/or programming manual to verify that the drive is properly wired prior to applying power.

# LED States

## ◆ Power-Up LED States

A power-up diagnostic test is performed each time the device is powered up and after the initial boot sequence. The initial boot sequence may take several seconds. After the LEDs have gone through the DeviceNet diagnostic LED sequence, the *DeviceNet Option Card* has been successfully initialized. The LEDs will assume their operational conditions as shown in Table 1.5 “Normal Operation LED States.”

Seq	MOD	NET	Time
1	GREEN	OFF	250 ms
2	RED	OFF	250 ms
3	GREEN	OFF	250 ms
4	GREEN	GREEN	250 ms
5	GREEN	RED	250 ms
6	GREEN	OFF	

## ◆ DeviceNet Operation LED States

The operational states of the *DeviceNet Option Card* LEDs after the DeviceNet diagnostic LED sequence has been completed is described below. Please wait at least 10 seconds for the loading process to complete before verifying the states of the LEDs.

LED	State	Indicates
MOD	Off	No Power
	<b>On Green</b>	<b>Device Operational</b>
	Flash Green	Device in Standby
	Flash Red	Minor Fault
	On Red	Unrecoverable Fault
	Flash Red-Green	Device Self-Test
NET	Off	Not Powered/Not Online
	Flash Green	Online/Not Connected
	<b>On Green</b>	<b>Link OK/Online and Connected</b>
	Flash Red	Connection Timeout
	On Red	Critical Link Failure
	Flash Red & Green	Communication Faulted

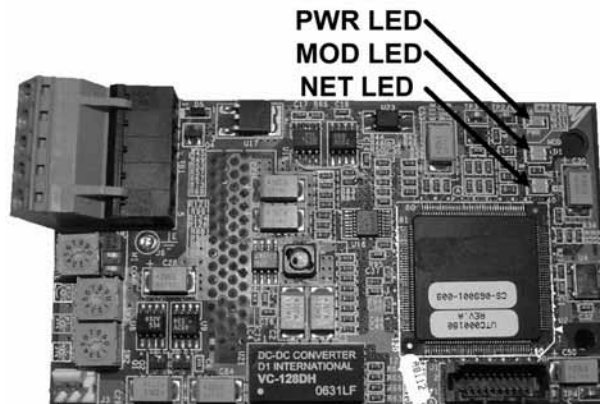


Fig 1.5 – DeviceNet Option Card LEDs

# Verify that the Drive is on the Network

## ◆ Normal Operation LED States

The table below describes the *DeviceNet Option Card* LED states under normal operation. The *DeviceNet Option Card* has been properly connected to the DeviceNet network, configured on that network and is properly part of the scan list. The network is currently operational.

LED	State	Indicates
MOD	On Green	Device Operational
NET	On Green	Link OK/Online and Connected

## ◆ DeviceNet Network

The example below refers to a DeviceNet network configured as shown. A Rockwell 1770-KFD module is used to interface a PC to the DeviceNet network.

Refer to the documentation included with the DeviceNet configuration utility supplied with the DeviceNet Master controller. Verify that the drive appears on the DeviceNet network at the correct node address.

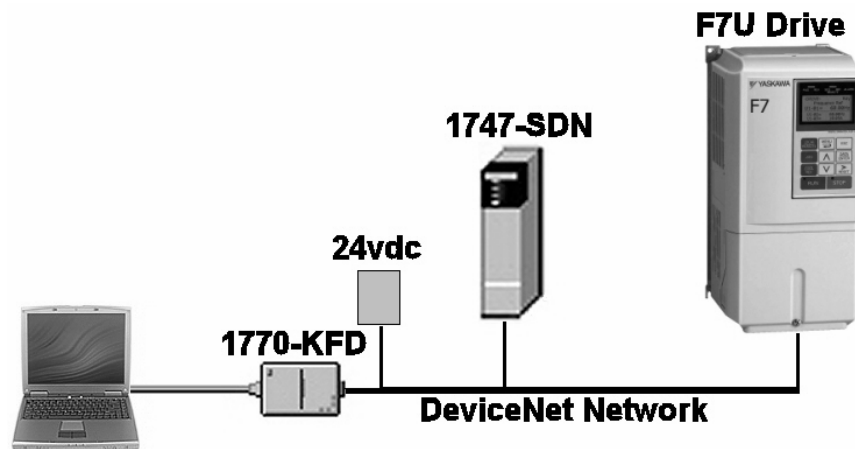


Fig 1.6 – DeviceNet Network Example

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## ◆ RSLinx™

Configure Rockwell's RSLinx software for the 1770-KFD module by selecting the **DeviceNet Drivers (... , 1770-KFD, ...)** module. Select **Add New**, highlight the **Allen-Bradley 1770-KFD** and click on **Select**. Select the PC's communication **Port** and **Baud Rate** and the 1770-KFD module's **Node Address** and the **Data Rate** of the DeviceNet network. Click **OK**.

Refer to the documentation included with RSLinx. Verify that the drive appears on the DeviceNet network at the correct node address.

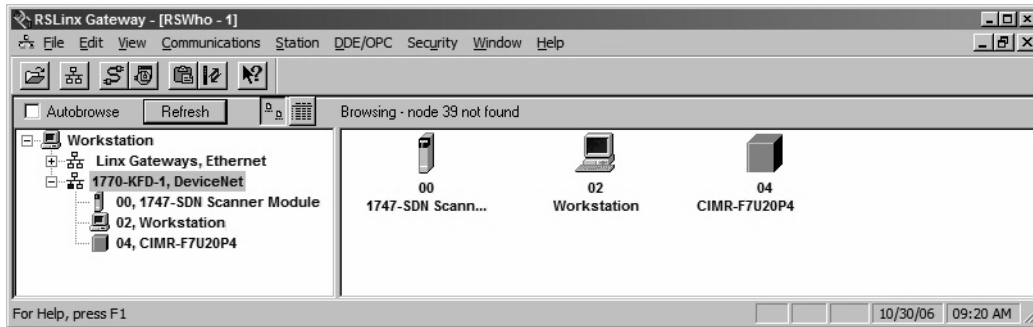


Fig 1.7 – RSLinx Example

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## ◆ RSNetWorx for DeviceNet

With RSLinx running and configured for DeviceNet, run Rockwell's **RSNetWorx for DeviceNet**. Select **Network** → **Online** from the main menu and select **1770-KFD\*** from the network selections.

Refer to the documentation included with the DeviceNet configuration utility supplied with the DeviceNet Master controller. Verify that the drive appears on the DeviceNet network at the correct node address.

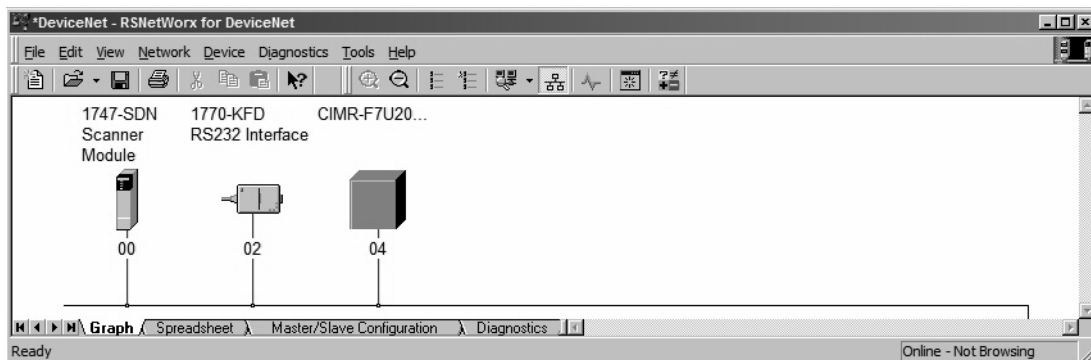


Fig 1.8 – RSNetWorx for DeviceNet Example

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# EDS Files

## ◆ EDS Files

The EDS file can be obtained from the CD that was included with the drive or downloaded from [www.yaskawa.com](http://www.yaskawa.com). It is recommended that the EDS file be downloaded from [www.yaskawa.com](http://www.yaskawa.com) to be sure that the latest version is used. From [www.yaskawa.com](http://www.yaskawa.com) select **Downloads** → **Browse** → **By Inverter Drives** → **By Product**. Select **Network Comms-DeviceNet** from the menu on the left. Select the appropriate EDS file from those listed.

Note: The EDS files located on the CD or downloaded from [www.yaskawa.com](http://www.yaskawa.com) will be in “zip” format and will need to be unzipped to a temporary directory prior to installation.

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## ◆ Installing the EDS File

With RSNetWorx for DeviceNet, select **Tools** → **EDS Wizard** from the main menu. Follow the resulting prompts to install the EDS file(s).

Note: It is recommended, when upgrading to a new version EDS file, that the original EDS file(s) be deleted prior to upgrading.

Install the EDS file into the DeviceNet configuration tool (i.e., RSNetWorx for DeviceNet). There is a separate EDS file for each drive model. Verify that the correct EDS file has been installed for the drive model selected on the network. Refer to the documentation that came with the DeviceNet Master configuration tool for information on installing EDS files and configuring a DeviceNet node.

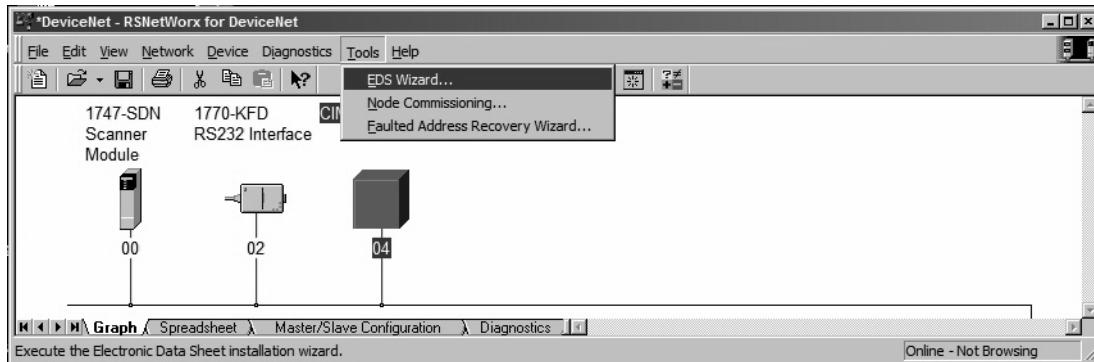


Fig 1.9 – RSNetWorx for DeviceNet EDS Wizard

# Configure the Drive on the Network

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## ◆ Select Drive Properties

After the appropriate EDS file has been loaded and the drive is recognized by the network, highlight the drive, right click on it and select **Properties**.

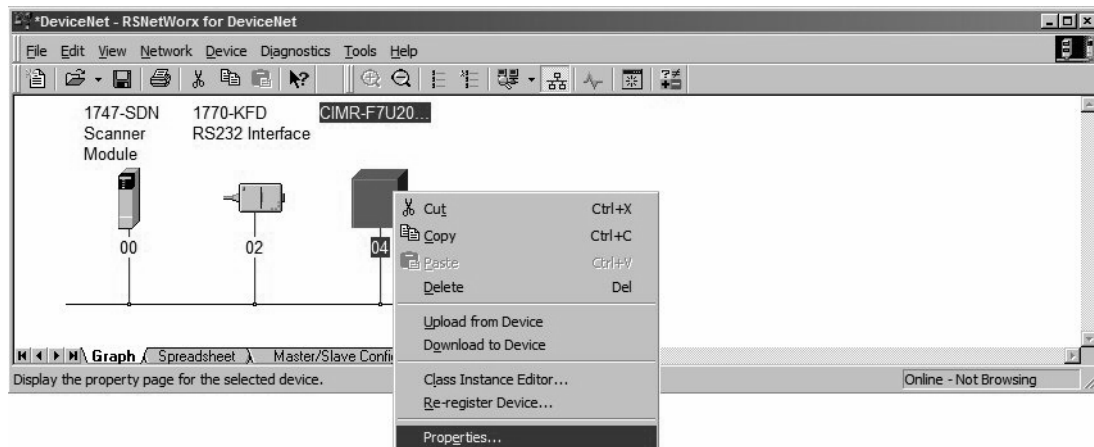


Fig 1.10 – Select Drive Properties

## ◆ Upload Drive Parameters

Select the **Parameters** tab and **Upload** the parameters from the drive.

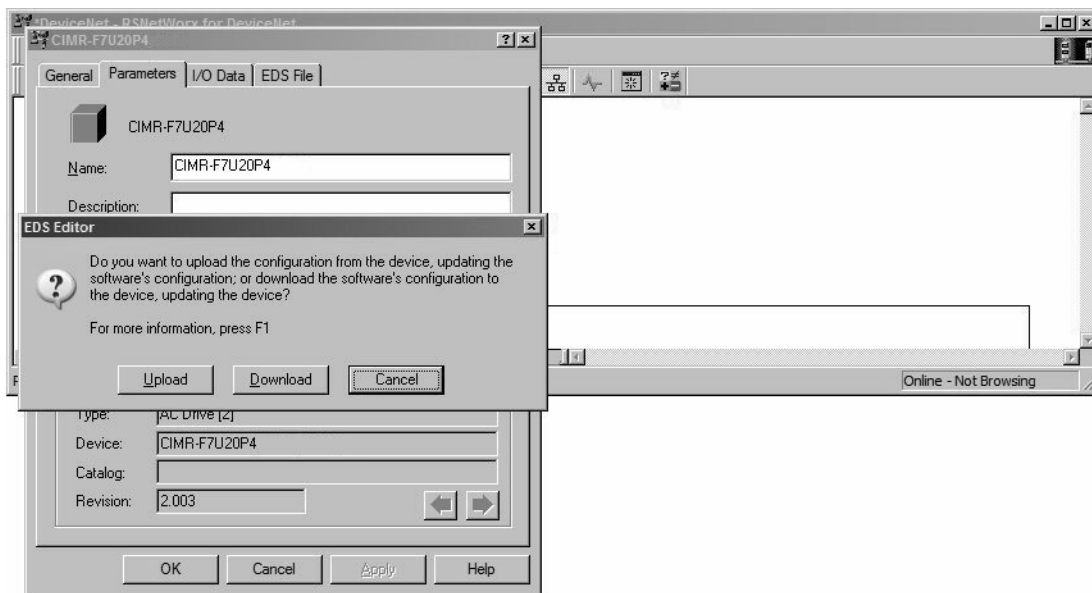


Fig 1.11 – Upload Drive Parameters

## ◆ Select the Poll Produced and Poll Consumed Assemblies

Scroll through the parameter list to the Poll Consumed Assembly (PCA). Enter the desired PCA. Scroll to the Poll Produced Assembly (PPA) and enter the desired PPA. Select **Apply** when done to download the new values to the drive. Select **OK**.

Note that the drive will have to be power cycled for the new PCA and PPA to take effect.

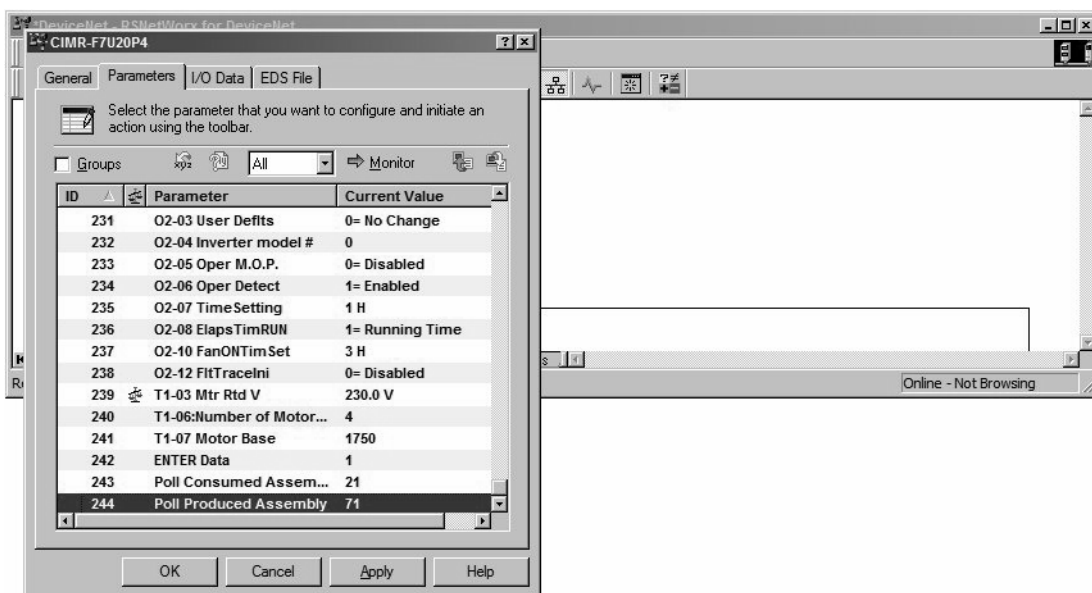


Fig 1.12 – Set Desired PCA and PPA



# Configure the Scanner

## ◆ Select Scanner Properties

Once the drive has been properly configured on the network, highlight the DeviceNet scanner, right click on it and select **Properties**. The example below shows how to add a drive to an A-B 1747-SDN Scanner module. To configure another scanner, please consult the documentation for that particular scanner.

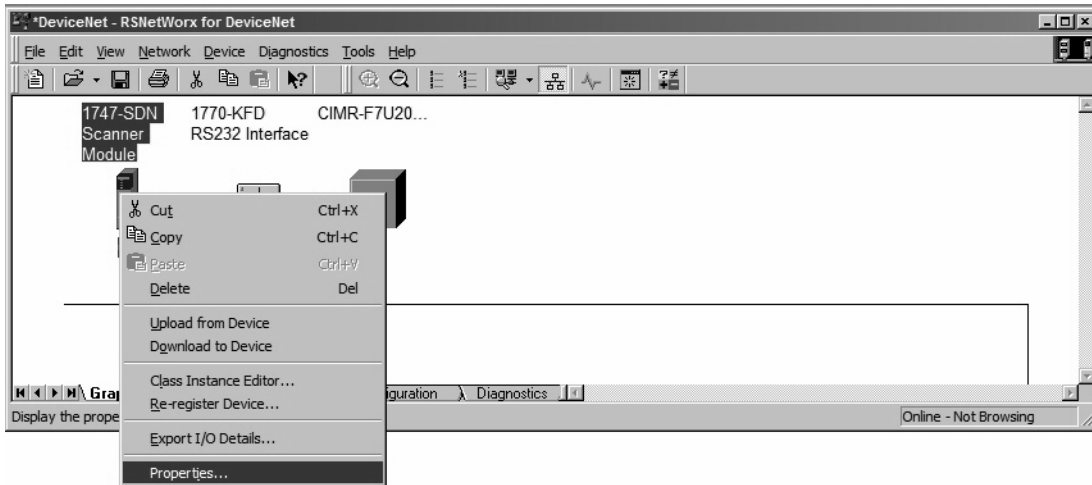


Fig 1.13 – Select Scanner Properties

## ◆ Upload Scanner Configuration

Upload the current scanner configuration.

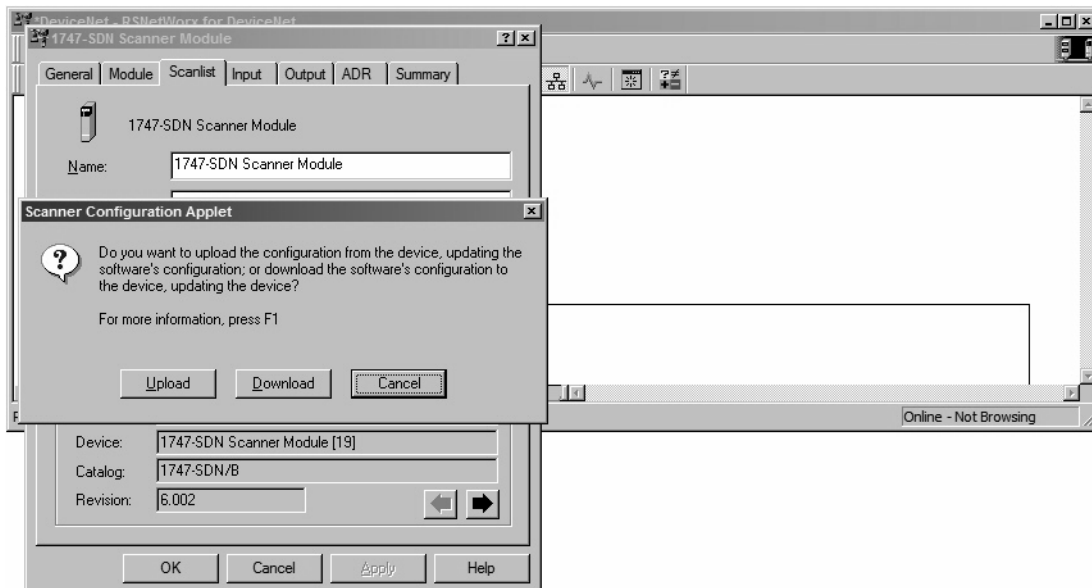


Fig 1.14 – Update Scanner Configuration

## ◆ Update the Scan List

Update the scan list by highlighting any devices in the **Available Devices** column and clicking on either the > or >> buttons until all DeviceNet devices show in the **Scanlist** column. For each device in the scan list, select the **Input** and **Output** tabs and verify that the device memory has been properly allocated. Also select **Edit I/O Parameters** and verify that the number on input and output bytes matches those of the selected PCA and PPA.

When complete, select **Download to Scanner** in order to download the new configuration information to the scanner module.

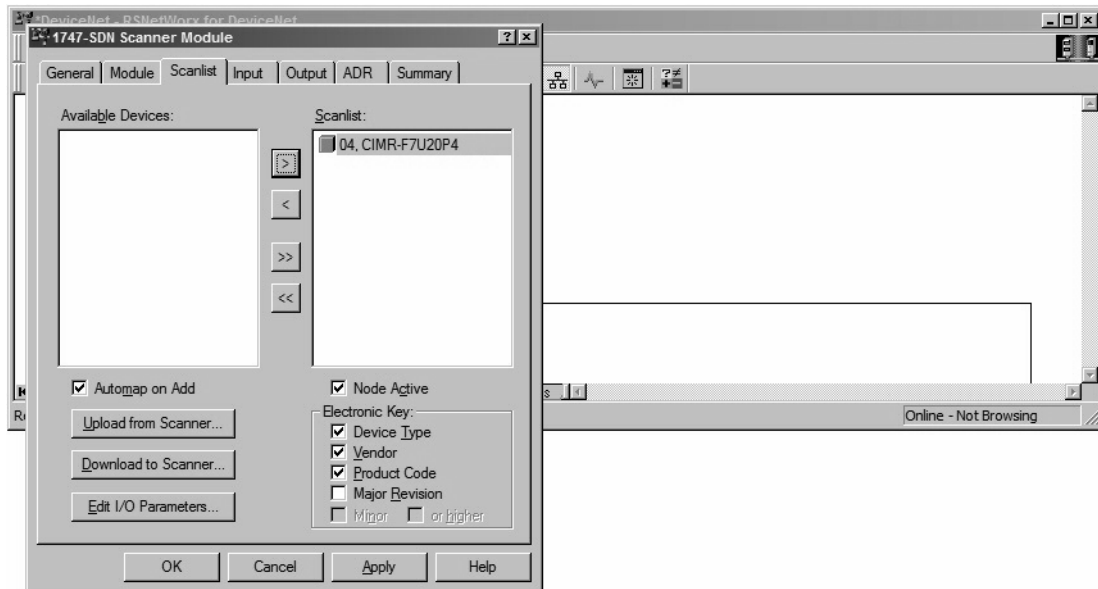


Fig 1.15 – Update the Scan List

# Configure Drive Parameters

## ◆ Command and Reference Source

Refer to the appropriate user, technical, and/or programming or parameter access manual for a complete list of drive parameters and registers available. A list of applicable manuals is available at the beginning of this document.

The run/stop and frequency reference commands can originate from the operator keypad, external terminals or the *DeviceNet Option Card*. Parameter b1-02 (Operation Method Selection) sets the selection of the source of the run/stop commands. Parameter b1-01 (Reference Selection) sets the selection of the source of the frequency reference. The run/stop and frequency reference commands may have different origins. For example, the run/stop command may be set to External Terminals (b1-02 = 1) while the Frequency Reference may be set to Option (*DeviceNet Option Card*) (b1-01 = 3).

<b>b1-01</b>	<b>Frequency Reference Selection</b>
0	Operator Keypad
1	Control Terminal Strip
2	Serial Communication <sup>1</sup> (Modbus RTU. Control terminals R+, R-, S+, and S-)
<b>3</b>	<b>Option (<i>DeviceNet Option Card</i>)</b>
4	Pulse Train Input (Control terminal RP) (Available on F7U and G7 drives only)

<b>b1-02</b>	<b>Operation Method Selection (Run/Stop)</b>
0	Operator Keypad
1	Control Terminal Strip
2	Serial Communication <sup>1</sup> (Modbus RTU. Control terminals R+, R-, S+, and S-)
<b>3</b>	<b>Option (<i>DeviceNet Option Card</i>)</b>

Note: <sup>1</sup> RS485 communications is disabled with the *DeviceNet Option Card* installed.

## ◆ Speed Scaling

Since DeviceNet displays the motor speed and frequency reference in RPM, it is important to set the appropriate number of motor poles in parameter o1-03.

<b>o1-03</b>	<b>Digital Operator Display Mode</b>
0	Hz
1	%
<b>2 ... 39</b>	<b>DeviceNet displays the motor speed in RPM. Enter the number of motor poles to set the input and output speed to RPM.</b>
40 ... 3999	User Scaling

# Drive Fault Messages

## ◆ Drive DeviceNet Fault Messages

The table of *DeviceNet Option Card* fault codes returned by the drive is shown below. Refer to the appropriate drive user and/or programming manual(s) for drive-specific information on the fault returned.

Drive Fault Code [hex]	DeviceNet Fault Code [hex]	Description	Drive Fault Code [hex]	DeviceNet Fault Code [hex]	Description
0h	0000h	None	14h	9000h	External Fault 6 (EF6)
1h	5120h	DC Bus Fuse Open (PUF)	15h	9000h	External Fault 7 (EF7)
2h	3220h	DC Bus Undervoltage (UV1)	16h	9000h	External Fault 8 (EF8)
3h	5110h	CTL PS Undervoltage (UV2)	17h	4140h	Heatsink Fan (FAN)
4h	3222h	MC Answerback (UV3)	18h	7310h	Overspeed Detection (OS)
5h	2130h	Short Circuit (SC)	19h	7310h	Speed Deviation (DEV)
6h	2120h	Ground Fault (GF)	1Ah	7301h	PG Open (PGO)
7h	2300h	Overcurrent (OC)	1Bh	3130h	Input Phase Loss (PF)
8h	3210h	DC Bus Overvoltage (OV)	1Ch	3130h	Output Phase Loss (LF)
9h	4200h	Heatsink Over-temperature (OH)	1Eh	5300h	Operator Disconnected (OPR)
0Ah	4210h	Heatsink Maximum Temperature (OH1)	1Eh	5300h	OPE Faults
0Bh	2220h	Motor Overload (OL1)	1Fh	6320h	EEPROM R/W Error (ERR)
0Ch	2200h	Inverter Overload (OL2)	20h	0000h	No Fault
0Dh	2221h	Overtorque Detection 1 (OL3)	21h	7500h	DeviceNet Communication Error (BUS)
0Eh	2222h	Overtorque Detection 2 (OL4)	22h	7500h	SI-E Communications Error
0Fh	7110h	Dynamic Braking Transistor (RR)	23h	7500h	SI-F/G Communications Error
10h	7112h	Dynamic Braking Resistor (RH)	24h	7500h	SI-F/G CPU Error
11h	9000h	External Fault 3 (EF3)	25h	8321h	Out of Control (CF)
12h	9000h	External Fault 4 (EF4)	26h	8313h	Zero Servo Fault (SVE)
13h	9000h	External Fault 5 (EF5)	27h	9000h	External Fault 0 (EF0)

## ◆ Drive Fault Operator Messages

The following is a table of faults that could be caused by the *DeviceNet Option Card* that will be displayed on the Operator Keypad only. For any fault displayed on the keypad that is not listed in the following table, please see the appropriate drive technical manual.

Table 1.10 – Drive Faults (Displayed on the Drive Keypad)			
Fault	Content	Cause	Solution
BUS	<i>DeviceNet Option Card</i> communications error	Communication is not established between DeviceNet Master and the drive.	<ul style="list-style-type: none"> <li>• Check <i>DeviceNet Option Card</i> communication LED display.</li> </ul>
EF0	<i>DeviceNet Option Card</i> external fault	Drive received an external fault command from the <i>DeviceNet Option Card</i> .	<ul style="list-style-type: none"> <li>• Check multifunction input settings.</li> <li>• Check PLC or controller program.</li> <li>• Eliminate cause of fault (machine device in fault state).</li> </ul>
OPE05	Command selection fault	Parameter b1-01 is set to <i>DeviceNet Option Card</i> and no card is detected.	<ul style="list-style-type: none"> <li>• Install <i>DeviceNet Option Card</i>.</li> <li>• Reprogram b1-01.</li> <li>• Replace the <i>DeviceNet Option Card</i>.</li> </ul>
OPE06	Reference selection fault	Parameter b1-02 is set to <i>DeviceNet Option Card</i> and no card is detected.	<ul style="list-style-type: none"> <li>• Install <i>DeviceNet Option Card</i>.</li> <li>• Reprogram b1-02.</li> <li>• Replace the <i>DeviceNet Option Card</i>.</li> </ul>
CPF20	<i>DeviceNet Option Card</i> fault	Faulty J1/2CN connection	<ul style="list-style-type: none"> <li>• Power cycle the drive.</li> <li>• Reset the <i>DeviceNet Option Card</i>.</li> <li>• Replace the <i>DeviceNet Option Card</i>.</li> <li>• Replace the inverter.</li> </ul>
CPF21	<i>DeviceNet Option Card</i> self-diagnostics fault	Faulty <i>DeviceNet Option Card</i>	<ul style="list-style-type: none"> <li>• Replace the <i>DeviceNet Option Card</i>.</li> </ul>
CPF22	<i>DeviceNet Option Card</i> ID code fault		
CPF23	Watchdog timer fault		

# Chapter 2 Supported Objects

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*This section describes DeviceNet objects supported by the DeviceNet Option Card.*

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# Supported Input Instances

## ◆ Basic Speed Control – Input Instance 20 (14h)

Instance	Word	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
20 (14h) Basic Speed Control 4 Bytes	0	0	-	-	-	-	-	Fault Reset	-	Run FWD	
		1	-								
	1	2	Speed Reference (Scaled by Parameter o1-03)								
		3									

## ◆ Extended Speed Control – Input Instance 21 (15h)

Instance	Word	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
21 (15h) Basic Speed Control 4 Bytes	0	0	-	NetRef <sup>1</sup>	NetCtrl <sup>1</sup>	-	-	Fault Reset	Run REV	Run FWD	
		1	-								
	1	2	Speed Reference (Scaled by Parameter o1-03)								
		3									
Note:	1	Not available for G5									
		NetRef – When set, sets reference source (b1-01 = 3) to Option Card. When reset, returns to its original setting.									
		NetCtrl – When set, sets Run command source (b1-02 = 3) to Option Card. When reset, returns to its original setting.									

## ◆ Speed and Torque Control – Input Instance 22 (16h)

Instance	Word	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
22 (16h) Basic Speed and Torque Control 6 Bytes	0	0	-	-	-	-	-	Fault Reset	-	Run FWD	
		1	-								
	1	2	Speed Reference (Scaled by Parameter o1-03)								
		3									
	2	4	Torque Reference (FVC Mode Only) (A1-02 = 3)								
		5									

## ◆ Extended Speed and Torque Control – Input Instance 23 (17h)

Instance	Word	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
23 (17h) Extended Speed and Torque Control 6 Bytes	0	0		NetRef <sup>1</sup>	NetCtrl <sup>1</sup>	-	-	Fault Reset	Run REV	Run FWD	
		1	-								
	1	2	Speed Reference (Scaled by Parameter o1-03)								
		3									
	2	4	Torque Reference (FVC Mode Only) (A1-02 = 3)								
		5									
Note:	1	Not available for G5									
		NetRef – When set, sets reference source (b1-01 = 3) to Option Card. When reset, returns to its original setting.									
		NetCtrl – When set, sets Run command source (b1-02 = 3) to Option Card. When reset, returns to its original setting.									

# Yaskawa Input Instances

## ◆ Yaskawa Modbus Message – Input Instance 100 (64h)

Instance	Word	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
<b>100 (64h) MODBUS Message 5 Bytes</b>	0	0	Function Code (Only Modbus functions register read (03h) and register write (10h) are supported)							
		1	Register Number							
	1	2								
		3								
	2	4	Data							
Note:		Refer to output instance 150 (96h) for response.								

## ◆ Yaskawa Standard Control – Input Instance 101 (65h)

Instance	Word	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
<b>101 (65h) Standard Control 8 Bytes</b>	0	0	Terminal S8 <sup>1</sup>	Terminal S7	Terminal S6	Terminal S5	Terminal S4	Terminal S3	Run REV	Run FWD
		1	Terminal P2 <sup>2</sup>	Terminal P1 <sup>2</sup>	Terminal MA/MB <sup>2</sup>	-	-	-	Fault Reset	External Fault
	1	2	Speed Reference (Scaled by Parameter o1-03)							
		3								
	2	4	Torque Reference (FVC Mode Only) (A1-02 = 3)							
		5								
	3	6	Torque Compensation (0.1%) (FVC Mode Only) (A1-02 = 3)							
		7								
Note:	<sup>1</sup>	G5, F7 & G7 Only								
	2	G5 Byte 1	Bit 5 = Terminal 9							
			Bit 6 = Terminal 25							
		Bit 7 = Terminal 26								



◆ **Yaskawa Enhanced Control/Modbus Message – Input Instance 105 (69h)**

Instance	Word	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0		
<b>105 (69h) Enhanced Control/ MODBUS Message 8 Bytes</b>	0	0	Terminal S8 <sup>1</sup>	Terminal S7	Terminal S6	Terminal S5	Terminal S4	Terminal S3	Run REV	Run FWD		
		1	Terminal P2 <sup>2</sup>	Terminal P1 <sup>2</sup>	Terminal MA/MB <sup>2</sup>	-	Function Bit 2 <sup>3</sup>	Function Bit 1 <sup>3</sup>	Fault Reset	External Fault		
	1	2	Speed Reference (Scaled by Parameter o1-03)									
		3										
	2	4	Register Number									
		5										
	3	6	Data									
		7										
	Note:	Refer to output instance 155 (9Bh) for response										
		<sup>1</sup>	G5, F7 & G7 Only									
2		G5 Byte 1		Bit 5 = Terminal 9								
				Bit 6 = Terminal 25								
				Bit 7 = Terminal 26								
3		Bit 1	Bit 2	Function								
		0	0	No Function								
		0	1	Read Register								
	1	0	Write Register									
	1	1	No Function									

◆ **Yaskawa Enhanced Control/Modbus Message – Input Instance 107 (6Bh)**

Instance	Word	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0		
<b>107 (6Bh) Standard DI/DO Control 8 Bytes</b>	0	0	Terminal S8 <sup>1</sup>	Terminal S7	Terminal S6	Terminal S5	Terminal S4	Terminal S3	Run REV	Run FWD		
		1	-	-	Terminal S12 <sup>3</sup>	Terminal S11 <sup>3</sup>	Terminal S10 <sup>3</sup>	Terminal S9 <sup>3</sup>	Fault Reset	External Fault		
	1	2	Terminal P4 <sup>3</sup>	Terminal P3 <sup>3</sup>	Terminal P2 <sup>2</sup>	Terminal P1 <sup>2</sup>	Terminal MA/MB <sup>2</sup>	-	-	-		
		3	-									
	2	4	Analog Output 1									
		5										
	3	6	Speed Reference (Scaled by Parameter o1-03)									
		7										
	Note:	<sup>1</sup>	G5, F7 & G7 Only									
		2	G5 Byte 2		Bit 3 = Terminal 9							
Bit 4 = Terminal 25												
Bit 5 = Terminal 26												
<sup>3</sup>	G7 only											

# Supported Output Instances

## ◆ Basic Speed Control – Output Instance 70 (46h)

Instance	Word	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
70 (46h) Basic Speed Control 4 Bytes	0	0	-	-	-	-	-	@FWD Run	-	@Fault	
		1	-								
	1	2	Speed Actual (Scaled by Parameter o1-03)								
		3									

## ◆ Extended Speed Control – Output Instance 71 (47h)

Instance	Word	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
71 (47h) Extended Speed Control 4 Bytes	0	0	@Speed	@Ref from Net <sup>1</sup>	@Ctrl from Net <sup>1</sup>	@Ready	@REV Run	@FWD Run	@Alarm	@Fault	
		1	-								
	1	2	Speed Actual (Scaled by Parameter o1-03)								
		3									
Note:	<sup>1</sup>	Not available for G5									

## ◆ Basic Speed and Torque Control – Output Instance 72 (48h)

Instance	Word	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
72 (48h) Basic Speed and Torque Control 6 Bytes	0	0	-	-	-	-	-	@FWD Run	-	@Fault	
		1	-								
	1	2	Speed Actual (Scaled by Parameter o1-03)								
		3									
	2	4	Torque Actual (0.1%) (FVC Mode Only) (A1-02 = 3)								
		5									

## ◆ Extended Speed and Torque Control – Output Instance 73 (49h)

Instance	Word	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
73 (49h) Extended Speed and Torque Control 6 Bytes	0	0	@Speed	@Ref from Net <sup>1</sup>	@Ctrl from Net <sup>1</sup>	@Ready	@REV Run	@FWD Run	@Alarm	@Fault	
		1	-								
	1	2	Speed Actual (Scaled by Parameter o1-03)								
		3									
	2	4	Torque Actual (0.1%) (FVC Mode Only) (A1-02 = 3)								
		5									
Note:	<sup>1</sup>	Not available for G5									

# Yaskawa Output Instances

## ◆ Yaskawa Modbus Message – Output Instance 150 (96h)

Instance	Word	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
<b>150 (96h) MODBUS Message 5 Bytes</b>	0	0	Function Code <sup>1</sup>							
		1	Register Number							
	1	2	Data							
		3								
2	4									
Note:	Refer to input instance 100 (64h) for command.									
	<sup>1</sup>	A Modbus message error is returned if the function code has the MSB (80h) set.								

## ◆ Yaskawa Standard Control – Output Instance 151 (97h)

Instance	Word	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
<b>151 (97h) Standard Control 8 Bytes</b>	0	0	@Fault	@Alarm	@Ready	@Speed Agree	@Fault Reset	@REV Run	@Zero Speed	@FWD Run	
		1	@Zero Servo Complete <sup>1</sup>	-	@Terminal P2 <sup>2</sup>	@Terminal P1 <sup>2</sup>	@Terminal MA/MB <sup>2</sup>	@Local Mode	@ Pwr Loss Ride Thru	@OPE	
	1	2	Output Frequency (Scaled by Parameter o1-03)								
		3									
	2	4	Torque Reference (0.1%) (FVC Mode Only) (A1-02 = 3)								
		5									
	3	6	Output Current (0.01A or 0.1A Based on Drive Capacity)								
7											
Note:	<sup>1</sup>	FVC mode only (A1-02 = 3)									
	2	G5 Byte 1	Bit 3 = Terminal 9								
			Bit 4 = Terminal 25								
		Bit 5 = Terminal 26									

## ◆ Yaskawa Enhanced Control/Modbus Message – Output Instance 155 (9Bh)

Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
<b>155 (9Bh) Enhanced Control/ MODBUS Message 8 Bytes</b>	0	@Fault	@Alarm	@Ready	@ Speed Agree	@Fault Reset	@REV Run	@ Zero Speed	@FWD Run	
	1	@Terminal P2 <sup>2</sup>	@Terminal P1 <sup>2</sup>	@Terminal MA/MB <sup>2</sup>	@Local Mode	Function Bit 2 <sup>1</sup>	Function Bit 1 <sup>1</sup>	@UV	@OPE	
	2	Output Frequency (Scaled by Parameter o1-03)								
	3									
	4	Register Number								
	5									
	6	Data								
7										
Note:	Refer to input instance 105 (69h) for command.									
	1	Bit 1	Bit 2	Function						
		0	0	No Function						
		0	1	Message Accepted						
		1	0	Message Error						
	1	1	Complete							
2	G5 Byte 1		Bit 5 = Terminal 9							
			Bit 6 = Terminal 25							
			Bit 7 = Terminal 26							

## ◆ Yaskawa Standard DI/DO Control – Output Instance 157 (9Dh)

Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
<b>157 (9Dh) Standard DI/DO Control 8 Bytes</b>	0	@Fault	@Alarm	@Ready	@ Speed Agree	@Fault Reset	@REV Run	@ Zero Speed	@FWD Run	
	1	@ Zero Servo Complete <sup>4</sup>	-	-	-	-	@ Local	@UV	@OPE	
	2	Terminal S10 <sup>2</sup>	Terminal S9 <sup>2</sup>	Terminal S8 <sup>1</sup>	Terminal S7	Terminal S6	Terminal S5	Terminal S4	Terminal S3	
	3	Terminal P4 <sup>2</sup>	Terminal P3 <sup>2</sup>	Terminal P2 <sup>3</sup>	Terminal P1 <sup>3</sup>	Terminal MA/MB <sup>3</sup>	-	Terminal S12 <sup>3</sup>	Terminal S11 <sup>2</sup>	
	4	Analog Input								
	5									
	6	Output Frequency (Scaled by Parameter o1-03)								
7										
Note:	<sup>1</sup>	G5, F7 & G7 only								
	<sup>2</sup>	G7 Only								
	3	G5 Byte 3		Bit 3 = Terminal 9						
				Bit 4 = Terminal 25						
Bit 5 = Terminal 26										
<sup>4</sup>	FVC Mode Only (A1-02 = 3)									

# CIP Supported Objects

## ◆ Class 1 (01h) – Identity Object

Service Code No. (hex)	Service Name
01h	Get Attribute All
05h	Reset
0Eh	Get Attribute Single

Attributes

Instance ID	Attribute	Description	Get	Set	Size	Default			
0	1	Object Software Revision	X		Word	1			
1	1	Vendor ID	X		Word	44 (YASKAWA)			
	2	Device Type	X		Word	2 (AC drives)			
	3	Product Code	X		Word	Product/Model Dependent Code <sup>1</sup>			
	4	Revision	X		Word	Software Dependent			
	5	Status	X		Word	0			
	6	Serial Number	X		Word	Each product's serial number is unique <sup>2</sup>			
	7	Product Name	X		String (14 Bytes)	Product Dependent <sup>3</sup>			
	8	State	X		Byte	3			
	9	Configuration Consistency	X		Word	0000			
	10	Heartbeat Interval	X	X	Byte	00 – 10 (0 = disabled)			
	100 (64h)	Password			X	Long	xxxx xxxx		
Note:	1	A combination of the drive family code and the drive model number. The MSB is the drive family and the LSB is the drive model number. For example: a G7U model 20P4 would have a product code of 2E00h, 2E being the drive family and 00 the drive model number. Drive family numbers: G5M = 2Bh, F7U = 2Dh, G7U = 2Eh, P7U = 2Fh							
		Drive Model Numbers							
		00	20P4	20h	40P4	32h	4110	4Eh	5055
		01	20P7	21h	40P7	33h	4132	4Fh	5075
		02	21P5	22h	41P5	34h	4160	50h	5090
		03	22P2	23h	42P2	35h	4185	51h	5110
		04	23P7	24h	43P7	36h	4220	52h	5160
		05	25P5	25h	44P0	37h	4300		
		06	27P5	26h	45P5	42h	51P5	81h*	BB0400
		07	2011	27h	47P5	43h	52P5	82h*	BB0800
		08	2015	28h	4011	44h	53P7	83h*	BB1200
		09	2018	29h	4015	45h	55P5	84h*	BB1600
		0Ah	2022	2Ah	4018	46h	57P7	91h*	BC0400
		0Bh	2030	2Bh	4022	47h	5011	92h*	BC0800
		0Ch	2037	2Ch	4030	48h	5015	93h*	BC1200
		0Dh	2045	2Dh	4037	49h	5018	94h*	BC1600
		0Eh	2055	2Eh	4045	4Ah	5022		
		0Fh	2075	2Fh	4055	4Bh	5030		
		10h	2090	30h	4075	4Ch	5037		
		11h	2110	31h	4090	4Dh	5045		
		Note:	*	Refers to G5HHP drives					
		2	Range is 0x8200000 ~ 0x82FFFFFF						
		3	The product name is CIMR-[Drive Family][Drive Model]. A Product Name example would be CIMR-G7U20P4, for a G7, U-spec, model 20P4 (200V class, 0.4 kW) drive.						

## ◆ Class 2 (02h) – Message Router Object

Service Code No. (hex)	Service Name
0Eh	Get Attribute Single

Attributes

Instance ID	Attribute	Description	Get	Set	Size	Default
0	1	Object Software Revision	X		Word	

## ◆ Class 3 (03h) – DeviceNet Object

Service Code No. (hex)	Service Name
05h	Reset
0Eh	Get Attribute Single

Attributes

Instance ID	Attribute	Name	Description	Get	Set	Size	Default
0	1		Object Software Revision	X		Word	
1	01	MAC ID	Current MAC ID Setting (0 ~ 63)	X	X	Byte	
	02	Baud Rate	Current Baud rate Setting 0: 125 kbps 1: 250 kbps 2: 500 kbps 3 ~ 9: Auto Baud	X	X	Byte	0
	03	Bus Off Interrupt	Bus Off Condition (0 ~ 1)	X		Byte	00
	04	Bus Off Counter	Number of Bus Off (0 ~ 255)	X		Byte	00
	05	Allocation Info	DeviceNet Communication Connection Info	X		(2) Bytes	00,00
	06	MAC ID Sw Change	MAC ID Switch Changed Since Power-up	X		Bool	0
	07	Baud Rate Sw Change	Baud Rate Switch Changed Since Power-up	X		Bool	0
	08	MAC ID Sw	MAC ID Switch Setting (0 ~ 99)	X		Word	63
	09	Baud Rate Sw	Baud Rate Switch Setting (0 ~ 9)	X		Word	9

## ◆ Class 4 (04h) – Assembly Object

Service Code No. (hex)	Service Name
0Eh	Get Attribute Single
10h	Set Attribute Single

Attributes

Instance ID	Attribute	Description	Get	Set	Size	Default
0	1	Object Software Revision	X		Word	1
20 (14h)	3	Basic Speed Control	X	X	Array 4 Bytes	00 00 00 00
21 (15h)		Extended Speed Control	X	X	Array 4 Bytes	00 00 00 00
22 (16h)		Basic Speed and Torque Control	X	X	Array 6 Bytes	00 00 00 00 00 00
23 (17h)		Extended Speed and Torque Control	X	X	Array 6 Bytes	00 00 00 00 00 00
70 (46h)		Basic Speed Control Status	X		Array 4 Bytes	00 00 00 00
71 (47h)		Extended Speed Control Status	X		Array 4 Bytes	00 00 00 00
72 (48h)		Basic Speed and Torque Control Status	X		Array 6 Bytes	00 00 00 00 00 00
73 (49h)		Extended Speed and Torque Control Status	X		Array 6 Bytes	00 00 00 00 00 00
100 (64h)		Yaskawa Modbus Message	X	X	Array 5 Bytes	00 00 00 00 00
101 (65h)		Yaskawa Standard Control	X	X	Array 8 Bytes	00 00 00 00 00 00 00 00
105 (69h)		Yaskawa Enhanced Control/Modbus Message	X	X	Array 8 Bytes	00 00 00 00 00 00 00 00
107 (6Bh)		Yaskawa Standard DI/DO Control	X	X	Array 8 Bytes	00 00 00 00 00 00 00 00
150 (96h)		Yaskawa Modbus Message Response	X		Array 5 Bytes	00 00 00 00 00
151 (97h)		Yaskawa Standard Control Status	X		Array 8 Bytes	00 00 00 00 00 00 00 00
155 (9Bh)		Yaskawa Enhanced Control/Modbus Message	X		Array 8 Bytes	00 00 00 00 00 00 00 00
157 (9Dh)		Yaskawa Standard DI/DO Control Status	X		Array 8 Bytes	00 00 00 00 00 00 00 00

## ◆ Class 5 (05h) – DeviceNet Connection Object

Service Code No. (hex)	Service Name
0Eh	Get Attribute Single
10h	Set Attribute Single

Attributes

Instance ID	Attribute	Description	Get	Set	Size	Default
0	1	Object Software Revision	X		Word	1
1	1	State	X		Byte	3
	2	Instance Type	X		Byte	0
	3	Transport Class Trigger	X		Byte	83h
	4	Produced Connection ID	X		Word	
	5	Consumed Connection ID	X		Word	
	6	Initial Communications Characteristics	X		Byte	21h
	7	Produced Connection Size	X		Byte	
	8	Consumed Connection Size	X		Byte	
	9	Expected Packet Rate	X	X	Word	09C4h
	12 (0Ch)	Watchdog Timeout Action	X		Byte	1
	13 (0Dh)	Produced Connection Path Length	X		Word	0
	14 (0Eh)	Produced Connection Path	X		Array	
	15 (0Fh)	Consumed Connection Path Length	X		Word	0
	16 (10h)	Consumed Connection Path	X		Array	
2	1	State	X		Byte	1
	2	Instance Type	X		Byte	1
	3	Transport Class Trigger	X		Byte	83h
	4	Produced Connection ID	X		Word	
	5	Consumed Connection ID	X		Word	
	6	Initial Communications Characteristics	X		Byte	1
	7	Produced Connection Size	X	X	Byte	4
	8	Consumed Connection Size	X	X	Byte	4
	9	Expected Packet Rate	X	X	Word	0
	12 (0Ch)	Watchdog Timeout Action	X	X	Byte	1
	13 (0Dh)	Produced Connection Path Length	X		Word	3
	14 (0Eh)	Produced Connection Path	X	X	Array	62 34 36
	15 (0Fh)	Consumed Connection Path Length	X		Word	3
	16 (10h)	Consumed Connection Path	X	X	Array	62 31 34



## ◆ Class 40 (28h) – Motor Data Object

Service Code No. (hex)	Service Name
0Eh	Get Attribute Single
10h	Set Attribute Single

Attributes

Instance ID	Attribute	Description	Get	Set	Size	Data
0	1	Object Software Revision	X		Word	1
1	3	Motor Type	X		Byte	7 (fixed)
	6	Rated Current (0.1A)	X	X	Word	Parameter n036
	7	Rated Voltage (1V)	X	X	Word	Parameter n147

## ◆ Class 41 (29h) – Control Supervisor Object

Service Code No. (hex)	Service Name
0Eh	Get Attribute Single
10h	Set Attribute Single
05h	Reset

Attributes

Instance ID	Attribute	Description	Get	Set	Size	Data
0	1	Object Software Revision	X		Word	1
1	3h	Run 1 (Forward Run)	X	X	Byte	Forward Run Command
	4h	Run 2 (Reverse Run)	X	X	Byte	Reverse Run Command
	5h	Net Control	X	X	Byte	Net Control Command - Parameter b1-02
	6h	State	X		Byte	Inverter Status (3 = Ready, 7 = Faulted)
	7h	Running 1 (Forward)	X		Byte	Forward Running
	8h	Running 2 (Reverse)	X		Byte	Reverse Running
	9h	Ready	X		Byte	Inverter Ready
	10 (0Ah)	Faulted	X		Byte	Inverter Fault
	11 (0Bh)	Warning	X		Byte	Inverter Alarm
	12 (0Ch)	Fault Reset	X	X	Byte	Fault Reset
	13 (0Dh)	Fault Code	X		Word	Current Fault
	15 (0Fh)	Control from Net	X		Byte	Net Control Status - Parameter b1-02
	16 (10h)	DeviceNet Fault Mode	X		Byte	Always "2"
17 (11h)	Force Fault	X	X	Byte	External Fault - EF0	
18 (12h)	Force Status	X		Byte	External Fault Status - EF0	

## ◆ Fault Code Table

Class 41 (29h) – Control Supervisor Object					
Drive Fault Code [hex]	DeviceNet Fault Code [hex]	Description	Drive Fault Code [hex]	DeviceNet Fault Code [hex]	Description
0h	0000h	No Fault	20 (14h)	9000h	External Fault S6 (EF6)
1h	5120h	DC Bus Fuse Open (PUF)	21 (15h)	9000h	External Fault S7 (EF7)
2h	3220h	DC Bus Undervolt (UV1)	22 (16h)	9000h	External Fault S8 <sup>1</sup> (EF8)
3h	5110h	CTL PS Undervolt (UV2)	23 (17h)	4140h	Heatsink Fan (FAN)
4h	3222h	MC Answerback (UV3)	24 (18h)	7310h	Overspeed Detect (OS)
5h	2130h	Short Circuit (SC)	25 (19h)	7310h	Speed Deviation (DEV)
6h	2120h	Ground Fault (GF)	26 (1Ah)	7301h	PG Open (PGO)
7h	2300h	Over Current (OC)	27 (1Bh)	3130h	Input Phase Loss (PF)
8h	3210h	DC Bus Overvolt (OV)	28 (1Ch)	3130h	Output Phase Loss (LF)
9h	4200h	Heatsink Overtemp (OH)	29 (1Dh)	5210h	No Fault
10 (0Ah)	4210h	Heatsink Max Temperature (OH1)	30 (1Eh)	5300h	Operator Disconnected (OPA)
11 (0Bh)	2220h	Motor Overload (OL1)	31 (1Fh)	6320h	EEPROM Error (ERR)
12 (0Ch)	2200h	Drive Overload (OL2)	32 (20h)	0000h	No Fault
13 (0Dh)	2221h	Overtorque Detect 1 (OL3)	33 (21h)	7500h	Serial Communications Error (CE)
14 (0Eh)	2222h	Overtorque Detect 2 (OL4)	34 (22h)	7500h	SI-B Communications Error (BUS)
15 (0Fh)	7110h	Dynamic Brake Transistor (RR)	35 (23h)	7500h	SI-F/G Communications Error (E-15)
16 (10h)	7112h	Dynamic Brake Resistor (RH)	36 (24h)	7500h	SI-F/G CPU Error (E-10)
17 (11h)	9000h	External Fault S3 (EF3)	37 (25h)	8321h	Out of Control (CF)
18 (12h)	9000h	External Fault S4 (EF4)	38 (26h)	8313h	Zero Servo Fault (SVE)
19 (13h)	9000h	External Fault S5 (EF5)	39 (27h)	9000h	External Fault (EF0)
Note:	<sup>1</sup>	G5, F7 & G7 Only			

## ◆ Class 42 (2Ah) – AC Drive Object

Service Code No. (hex)	Service Name
0Eh	Get Attribute Single
10h	Set Attribute Single

### Attributes

Instance ID	Attribute	Description	Get	Set	Size	Data
0	1	Object Software Revision	X		Word	1
1	3h	At Reference	X		Byte	Speed Agree
	4h	Net Reference	X	X	Byte	Parameter b1-01
	6h	Drive Mode	X	X	Byte	Parameter A1-02
	7h	Speed Actual (scaled by o1-03)	X		Word	Parameter U1-02
	8h	Speed Reference (scaled by o1-03)	X	X	Word	Parameter U1-01
	9h	Current Actual (0.1A)	X		Word	Parameter U1-03
	15 (0Fh)	Power Actual (W)	X		Word	Parameter U1-08
	16 (10h)	Input Voltage (VAC)	X		Word	Parameter E1-01
	17 (11h)	Output Voltage (VAC)	X		Word	Parameter U1-06
	18 (12h)	Accel Time (ms)	X	X	Word	Parameter C1-01
	19 (13h)	Decel Time (ms)	X	X	Word	Parameter C1-02
	20 (14h)	Low Speed Limit (scaled by o1-03)	X	X	Word	Parameter D2-02
	21 (15h)	High Speed Limit (scaled by o1-03)	X	X	Word	Parameter D2-01
	22 (16h)	Speed Scale	X	X	Byte	-15 ~ +15 <sup>1</sup>
	23 (17h)	Current Scale	X	X	Byte	-15 ~ +15 <sup>1</sup>
	26 (1Ah)	Power Scale	X	X	Byte	-15 ~ +15 <sup>1</sup>
	27 (1Bh)	Voltage Scale	X	X	Byte	-15 ~ +15 <sup>1</sup>
28 (1Ch)	Time Scale	X	X	Byte	-15 ~ +15 <sup>1</sup>	
29 (1Dh)	Reference from the Net	X		Byte	Parameter b1-01	
<sup>1</sup>	The scaling factor is actually $2^{-15} \sim 2^{15}$					

# Yaskawa Supported Objects

## ◆ Class 100 (64h) – Yaskawa Command Object

Service Code No. (hex)	Service Name
0Eh	Get Attribute Single
10h	Set Attribute Single

### Attributes

Instance ID	Attribute	Description	Get	Set	Size	Default Value
0	1	Object Software Revision	X		Word	1
1	1	Operation Command	X	X	Word	0
	2	Frequency Reference (0.01Hz)	X	X	Word	0
	3	Torque Reference (0.1%)	X	X	Word	1000
	4	Torque Compensation (0.1%)	X	X	Word	0
	5	Reserved				
	6	Analog Output 1 (Terminal 21)	X	X	Word	0
	7	Analog Output 2 (Terminal 23)	X	X	Word	0
	8	Digital Output	X	X	Word	0
	254 (FEh)	Accept Command	X	X	Word	0
255 (FFh) <sup>1</sup>	Enter Command	X	X	Word	0	
Note:	1	The ENTER command stores current drive parameter data in non-volatile RAM. Care should be taken in its use as there are only a limited number of writes to non-volatile RAM supported.				

Yaskawa Command Object – Class 64h, Instance 1, Attribute 1 – Operation Command	
Bit	Definition
0	Forward RUN (1) /Stop (0) Bits 1 and 2 may not be set simultaneously.
1	Reverse RUN (1) /Stop (0) Bits 1 and 2 may not be set simultaneously.
2	Terminal S3 – Multifunction Digital Input 1 – Parameter H1-01 setting
3	Terminal S4 – Multifunction Digital Input 2 – Parameter H1-02 setting
4	Terminal S5 – Multifunction Digital Input 3 – Parameter H1-03 setting
5	Terminal S6 – Multifunction Digital Input 4 – Parameter H1-04 setting
6	Terminal S7 – Multifunction Digital Input 5 – Parameter H1-05 setting
7	Terminal S8 – Multifunction Digital Input 6 – Parameter H1-06 setting (F7U, G7U and G5 only)
8	External Fault
9	Fault Reset
10	Reserved
11	Reserved
12	Reserved
13	Servo On (FVC Mode only) (A1-02 = 3)
14	Speed/Torque Control (FVC Mode only) (A1-02 = 3)
15	Reserved

Yaskawa Command Object – Class 64h, Instance 1, Attribute 8 – Digital Output		
Bit	Definition	
0	PHC 1 – Multifunction Digital Output 1 – Parameter H2-01 setting <sup>1</sup>	
1	PHC 2 – Multifunction Digital Output 2 – Parameter H2-02 setting <sup>1</sup>	
2	Reserved	
3	Reserved	
4	Reserved	
5	Reserved	
6	Fault Contact Enable	
7	Fault Contact – Bit 6 must be set to 1 in order to enable the function of bit 7.	
Note:	1	The type of physical outputs and their terminal designations for outputs controlled by bits 0 and 1 differ according to the drive. Refer to the appropriate drive user, programming and/or technical manual for details on digital outputs.

## ◆ Class 101 (65h) – Yaskawa Status Object

Service Code No. (hex)	Service Name
0Eh	Get Attribute Single
10h	Set Attribute Single

Attributes

Instance ID	Attribute	Description	Get	Set	Size	Data
0	1	Object software Revision	X		Word	1
1	1	Drive Status	X		Word	
	2	Speed Feedback (o1-03 scaled)	X		Word	Parameter U1-05
	3	Torque Reference (0.1%)	X		Word	Parameter U1-09
	4	Speed Detection PG Count	X		Word	
	5	Speed Reference (o1-03 scaled)	X		Word	Parameter U1-01
	6	Output Frequency (o1-03 scaled)	X		Word	Parameter U1-02
	7	Output Current <sup>1</sup>	X		Word	Parameter U1-03
	8	Analog Input Channel 2	X		Word	Parameter U1-16
	9	DC Bus Voltage (1V)	X		Word	Parameter U1-07
	10 (0Ah)	Fault Code 1	X		Word	<sup>2</sup>
	11 (0Bh)	Fault Code 2	X		Word	<sup>2</sup>
	12 (0Ch)	Fault Code 3	X		Word	<sup>2</sup>
	13 (0Dh)	Analog Input Channel 3 (F7U/G7U only)	X		Word	Parameter U1-17
	14 (0Eh)	Digital Input 2	X		Word	Parameter U1-10
	15 (0Fh)	Analog Input Channel 1	X		Word	Parameter U1-15
	16 (10h)	Channel 2 PG Counter	X		Word	
Note:	<sup>1</sup>	0.1A or 0.01A based on drive rating				
	<sup>2</sup>	See “Fault Code Table” on page 2-13.				

## ◆ Class 65h, Instance 1, Attribute 1, Drive Status

Attribute 1 - Drive Status Word	
Bit	Status
0h	Drive Running
1h	Zero Speed
2h	Reverse Running
3h	Reset Command Received
4h	Speed Agree
5h	Inverter Ready
6h	Alarm Condition
7h	Fault Condition
8h	Not Used
9h	Momentary Power Loss Ride Thru
Ah	Local/Remote
Bh	Digital Output 1
Ch	Digital Output 2
Dh	Digital Output 3 (F7U/G7U Only)
Eh	Motor Selection
Fh	Zero Servo Complete (FVC Mode only) (A1-02 = 3)

## ◆ Class 65h, Instance 1, Attribute 10, 11 and 12

Attribute 10 - Fault Code Word 1		Attribute 11 - Fault Code Word 2		Attribute 12 - Fault Code Word 3	
Bit	Fault	Bit	Fault	Bit	Fault
0h	PUF DC Bus Fuse Open	0h	EF3 External Fault - Terminal S3	0h	CE Modbus Communication Error
1h	UV1 DC Bus Undervoltage	1h	EF4 External Fault - Terminal S4	1h	BUS Bus Fault
2h	UV2 Control Circuit Undervoltage	2h	EF5 External Fault - Terminal S5	2h	Not Used
3h	UV3 Main Circuit Contactor Answerback Fault	3h	EF6 External Fault - Terminal S6	3h	Not Used
4h	Not Used	4h	EF7 External Fault - Terminal S7	4h	CF Out of Control Fault No Determination of Motor Speed
5h	GF Ground Fault	5h	EF8 External Fault - Terminal S8 (G5M, F7U, G7U Only)	5h	SVE Zero Servo Fault (F7U, G7U and G5M in Closed-loop flux vector mode (FVC) only)
6h	OC Overcurrent Fault	6h	FAN Drive Cooling Fan Fault (models with internal cooling fans only)	6h	EF0 External Communications Fault
7h	OV Overvoltage Fault	7h	OS Overspeed Fault	7h	Not Used
8h	OH Heatsink Over Temp Fault	8h	DEV Speed Deviation Fault	8h	Not Used
9h	OH1 Drive Overheat Fault	9h	PGO PG Open, Encoder (Pulse Generator Open Circuit)	9h	Not Used
Ah	OL1 Motor Overload Fault	Ah	PF Input Phase Loss Fault	Ah	Not Used
Bh	OL2 Drive Overload Fault	Bh	LF Output Phase Loss	Bh	EF9 External Fault - Terminal S9 (G7U)
Ch	OL3 Overtorque Fault 1 (L6-02)	Ch	Not Used	Ch	EF10 External Fault - Terminal S10 (G7U)
Dh	OL4 Overtorque Fault 2 (L6-05)	Dh	OPR Operator Disconnected	Dh	EF11 External Fault - Terminal S11 (G7U)
Eh	RR DB Transistor Failure	Eh	ERR EEPROM R/W Error	Eh	EF12 External Fault - Terminal S12 (G7U)
Fh	RH DB Resistor Overheat	Fh	Not Used	Fh	CPF Control Circuit Fault/Peripheral Fault

## ◆ Class 102 (66h) – Yaskawa Drive Monitor Object

The following table lists the attributes of the drive monitors that are supported by the DeviceNet Option Card. Each drive has its own attribute for each monitor, so be sure to reference the proper column for the drive. All instances are 1; all monitors are word length and are retrieved through the service function Get Single Attribute (0Eh). For further details on the drive monitors, please see the appropriate drive user, technical and/or programming manual.

Class 102 (66h) – Yaskawa Drive Monitor Object											
Monitor	Text	G5M	F7U	G7U	P7U	Monitor	Text	G5M	F7U	G7U	P7U
		Attribute						Attribute			
U1-01	Frequency Reference (Hz)	33	65	65	65	U1-28	CPU ID	60	92	92	92
U1-02	Output Frequency (Hz)	34	66	66	66	U1-29	KWh Monitor		93	93	93
U1-03	Output Current (A)	35	67	67	67	U1-30	MWh Monitor		94	94	94
U1-04	Control Method	36	68	68		U1-31					
U1-05	Motor Speed (Hz)	37	69	69		U1-32	ACR(q) Output (%)	62	96	96	96
U1-06	Output Voltage (VAC)	38	70	70	70	U1-33	ACR(d) Output (%)	63	97	97	97
U1-07	DC Bus Voltage (VDC)	39	71	71	71	U1-34	OPE Detected	64	98	98	98
U1-08	Output Power (kW)	40	72	72	72	U1-35	Zero Servo Pulse		99	99	99
U1-09	Torque Reference (%)	41	73	73		U1-36	PID Input (%)		100	100	100
U1-10	Input Terminal Status	42	74	74	74	U1-37	PID Output (%)		101	101	101
U1-11	Output Terminal Status	43	75	75	75	U1-38	PID Setpoint (Hz)		102	102	102
U1-12	Drive Status	44	76	76	76	U1-39	Transmit Err		103	103	103
U1-13	Elapsed Time (H)	45	77	77	77	U1-40	Fan OPR Time (H)		104	104	104
U1-14	Software ID	46	78	78	78	U1-41	Cooling Fan Temp (°C)		105	105	105
U1-15	Terminal 13 Level (%)	47	79	79	79	U1-42	Motor Mag Flux Calc (%)			106	
U1-16	Terminal 14 Level (%)	48	80	80	80	U1-43	Motor Mag Flux Comp (%)			107	
U1-17	Terminal 16 Level (%)	49	81	81		U1-44	Output Feedback Ctrl		108	108	108
U1-18	Motor SEC Current (%)	50	82	82	82	U1-45	Feed Forward Output (%)		109	109	109
U1-19	Motor EXE Current (%)	51	83	83		U1-46	Feed Forward Presumption Speed (Hz)			110	
U1-20	SFS Output (Hz)	52	84	84	84	U1-47	Feed Forward Presumption Speed Gain			111	
U1-21	ASR Input (%)	53		85		U1-48	CPU Share			112	
U1-22	ASR Output (%)	54		86		U1-49	Occupation Rate		113	113	113
U1-23	Speed Deviation (%)	55				U1-50					
U1-24	PID Feedback (%)	56	88	88	88	U1-51	AUTO Mode Freq Ref (Hz)				115
U1-25	DI-16 Reference	57	89	89		U1-52	HAND Mode Freq Ref (Hz)				116
U1-26	Voltage Ref (Vq) (VAC)	58	90	90		U1-53	PI Feedback 2 (%)				117
U1-27	Voltage Ref (Vd) (VAC)	59	91	91							

# Yaskawa Drive Parameter Objects

The following table lists the classes and attributes of the drive parameters that are supported by the DeviceNet Option Card. Each drive has its own parameter for each attribute, so be sure to reference the proper column for the drive. All instances are 1; all parameters are word length and are retrieved through the service function Get Single Attribute (0Eh) and set through the service function Set Single Attribute (10h). For further details on the drive parameters, please see the appropriate drive user, technical and/or programming manual.

## ◆ Class 103 (67h) – Yaskawa Initialization Parameter Object

Initialization Object – Class 103 (67h) Instance 1								
Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
1	A1-00	Select Language	A1-00	Select Language	A1-00	Select Language	A1-00	Select Language
2	A1-01	Access Lvl	A1-01	Access Lvl	A1-01	Access Lvl	A1-01	Access Lvl
3	A1-02	Control Method	A1-02	Control Method	A1-02	Control Method		
4	A1-03	Initialize Parameters	A1-03	Initialize Parameters	A1-03	Initialize Parameters	A1-03	Initialize Parameters
5	A1-04	Enter Password	A1-04	Enter Password	A1-04	Enter Password	A1-04	Enter Password
6			A1-05	Select Password	A1-05	Select Password	A1-05	Select Password
7	A2-01	User Parameter 1	A2-01	User Parameter 1	A2-01	User Parameter 1	A2-01	User Parameter 1
8	A2-02	User Parameter 2	A2-02	User Parameter 2	A2-02	User Parameter 2	A2-02	User Parameter 2
9	A2-03	User Parameter 3	A2-03	User Parameter 3	A2-03	User Parameter 3	A2-03	User Parameter 3
10 (Ah)	A2-04	User Parameter 4	A2-04	User Parameter 4	A2-04	User Parameter 4	A2-04	User Parameter 4
11 (Bh)	A2-05	User Parameter 5	A2-05	User Parameter 5	A2-05	User Parameter 5	A2-05	User Parameter 5
12 (Ch)	A2-06	User Parameter 6	A2-06	User Parameter 6	A2-06	User Parameter 6	A2-06	User Parameter 6
13 (Dh)	A2-07	User Parameter 7	A2-07	User Parameter 7	A2-07	User Parameter 7	A2-07	User Parameter 7
14 (Eh)	A2-08	User Parameter 8	A2-08	User Parameter 8	A2-08	User Parameter 8	A2-08	User Parameter 8
15 (Fh)	A2-09	User Parameter 9	A2-09	User Parameter 9	A2-09	User Parameter 9	A2-09	User Parameter 9
16 (10h)	A2-10	User Parameter 10	A2-10	User Parameter 10	A2-10	User Parameter 10	A2-10	User Parameter 10
17 (11h)	A2-11	User Parameter 11	A2-11	User Parameter 11	A2-11	User Parameter 11	A2-11	User Parameter 11
18 (12h)	A2-12	User Parameter 12	A2-12	User Parameter 12	A2-12	User Parameter 12	A2-12	User Parameter 12
19 (13h)	A2-13	User Parameter 13	A2-13	User Parameter 13	A2-13	User Parameter 13	A2-13	User Parameter 13
20 (14h)	A2-14	User Parameter 14	A2-14	User Parameter 14	A2-14	User Parameter 14	A2-14	User Parameter 14
21 (15h)	A2-15	User Parameter 15	A2-15	User Parameter 15	A2-15	User Parameter 15	A2-15	User Parameter 15
22 (16h)	A2-16	User Parameter 16	A2-16	User Parameter 16	A2-16	User Parameter 16	A2-16	User Parameter 16
23 (17h)	A2-17	User Parameter 17	A2-17	User Parameter 17	A2-17	User Parameter 17	A2-17	User Parameter 17
24 (18h)	A2-18	User Parameter 18	A2-18	User Parameter 18	A2-18	User Parameter 18	A2-18	User Parameter 18
25 (19h)	A2-19	User Parameter 19	A2-19	User Parameter 19	A2-19	User Parameter 19	A2-19	User Parameter 19
26 (1Ah)	A2-20	User Parameter 20	A2-20	User Parameter 20	A2-20	User Parameter 20	A2-20	User Parameter 20
27 (1Bh)	A2-21	User Parameter 21	A2-21	User Parameter 21	A2-21	User Parameter 21	A2-21	User Parameter 21
28 (1Ch)	A2-22	User Parameter 22	A2-22	User Parameter 22	A2-22	User Parameter 22	A2-22	User Parameter 22
29 (1Dh)	A2-23	User Parameter 23	A2-23	User Parameter 23	A2-23	User Parameter 23	A2-23	User Parameter 23
30 (1Eh)	A2-24	User Parameter 24	A2-24	User Parameter 24	A2-24	User Parameter 24	A2-24	User Parameter 24
31 (1Fh)	A2-25	User Parameter 25	A2-25	User Parameter 25	A2-25	User Parameter 25	A2-25	User Parameter 25
32 (20h)	A2-26	User Parameter 26	A2-26	User Parameter 26	A2-26	User Parameter 26	A2-26	User Parameter 26
33 (21h)	A2-27	User Parameter 27	A2-27	User Parameter 27	A2-27	User Parameter 27	A2-27	User Parameter 27
34 (22h)	A2-28	User Parameter 28	A2-28	User Parameter 28	A2-28	User Parameter 28	A2-28	User Parameter 28
35 (23h)	A2-29	User Parameter 29	A2-29	User Parameter 29	A2-29	User Parameter 29	A2-29	User Parameter 29
36 (24h)	A2-30	User Parameter 30	A2-30	User Parameter 30	A2-30	User Parameter 30	A2-30	User Parameter 30
37 (25h)	A2-31	User Parameter 31	A2-31	User Parameter 31	A2-31	User Parameter 31	A2-31	User Parameter 31
38 (26h)	A2-32	User Parameter 32	A2-32	User Parameter 32	A2-32	User Parameter 32	A2-32	User Parameter 32



## ◆ Class 104 (68h) - Yaskawa Application Parameter Object

Application Object – Class 104 (68h) Instance 1								
Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
1	b1-01	Ref Source	b1-01	Ref Source	b1-01	Ref Source	b1-01	Ref Source
2	b1-02	Run Source	b1-02	Run Source	b1-02	Run Source	b1-02	Run Source
3	b1-03	Stopping Method	b1-03	Stopping Method	b1-03	Stopping Method	b1-03	Stopping Method
4	b1-04	Rev Operation	b1-04	Rev Operation	b1-04	Rev Operation	b1-04	Rev Operation
5	b1-05	Zero Spd Operation	b1-05	Zero Spd Operation	b1-05	Zero Spd Operation	b1-05	Zero Spd Operation
6	b1-06	Control Input Scans	b1-06	Control Input Scans	b1-06	Control Input Scans	b1-06	Control Input Scans
7	b1-07	Local/Remote Run Select	b1-07	Local/Remote Run Select	b1-07	Local/Remote Run Select	b1-07	Local/Remote Run Select
8	b2-01	DC Inj Start Freq (Hz)	b1-08	Run Command @ Program	b1-08	Run Command @ Program	b1-08	Run Command @ Program
9	b2-02	DC Inj Current (%)	b1-09	Local/Remote Sel @ Drive	b1-09	Local/Remote Sel @ Drive	b1-09	Local/Remote Sel @ Drive
10 (Ah)	b2-03	DC Inj Time @ Start (s)	b2-01	DC Inj Start Freq (Hz)	b2-01	DC Inj Start Freq (Hz)	b2-01	DC Inj Start Freq (Hz)
11 (Bh)	b2-04	DC Inj Time @ Stop (s)	b2-02	DC Inj Current (%)	b2-02	DC Inj Current (%)	b2-02	DC Inj Current (%)
12 (Ch)	b2-05	DC Inj P Gain	b2-03	DC Inj Time @ Start (s)	b2-03	DC Inj Time @ Start (s)	b2-03	DC Inj Time @ Start (s)
13 (Dh)	b2-06	DC Inj I Time (s)	b2-04	DC Inj Time @ Stop (s)	b2-04	DC Inj Time @ Stop (s)	b2-04	DC Inj Time @ Stop (s)
14 (Eh)	b2-07	DC Inj Limit	b2-05	DC Inj P Gain	b2-05	DC Inj P Gain	b2-05	DC Inj P Gain
15 (Fh)	b3-01	Spd Srch Select	b2-06	DC Inj I Time (s)	b2-06	DC Inj I Time (s)	b2-06	DC Inj I Time (s)
16 (10h)	b3-02	Seed Srch Current (%)	b2-07	DC Inj Limit	b2-07	DC Inj Limit	b2-07	DC Inj Limit
17 (11h)	b3-03	Spd Srch Dec Time (s)	b2-08	Field Comp (%)	b2-08	Field Comp (%)	b2-08	Field Comp (%)
18 (12h)	b3-04	Spd Srch V/f	b3-01	Spd Srch @ Start	b3-01	Spd Srch @ Start	b3-01	Spd Srch @ Start
19 (13h)	b4-01	Delay ON Timer (s)	b3-02	Spd Srch Current (%)	b3-02	Spd Srch Current (%)	b3-02	Spd Srch Current (%)
20 (14h)	b4-02	Delay OFF Timer (s)	b3-03	Spd Srch Dec Time (s)	b3-03	Spd Srch Dec Time (s)	b3-03	Spd Srch Dec Time (s)
21 (15h)	b5-01	PID Mode			b3-04	Spd Srch V/f	b3-04	Spd Srch V/f
22 (16h)	b5-02	PID Gain	b3-05	Srch Delay Time (s)	b3-05	Srch Delay Time (s)	b3-05	Srch Delay Time (s)
23 (17h)	b5-03	PID I Time (s)	b3-06	Spd Srch Im Lvl 1	b3-06	Spd Srch Im Lvl 1	b3-06	Spd Srch Im Lvl 1
24 (18h)	b5-04	PID I Limit (%)	b3-07	Spd Srch Im Lvl 2	b3-07	Spd Srch Im Lvl 2	b3-07	Spd Srch Im Lvl 2
25 (19h)	b5-05	PID D Time (s)	b3-08	Spd Srch ACR P Gain	b3-08	Spd Srch ACR P Gain	b3-08	Spd Srch ACR P Gain
26 (1Ah)	b5-06	PID Limit (%)	b3-09	Spd Srch I Time (s)	b3-09	Spd Srch I Time (s)	b3-09	Spd Srch I Time (s)
27 (1Bh)	b5-07	PID Offset (%)	b3-10	Srch Detect Comp	b3-10	Srch Detect Comp	b3-10	Srch Detect Comp
28 (1Ch)	b5-08	PID Delay Time (s)	b3-11	Spd Srch Method Switch Lvl	b3-11	Spd Srch Method Switch Lvl	b3-11	Spd Srch Method Switch Lvl
29 (1Dh)	b6-01	Dwell Freq @ Start (Hz)	b3-12	Spd Srch Deadband	b3-12	Spd Srch Deadband	b3-12	Spd Srch Deadband
30 (1Eh)	b6-02	Dwell Time @ Start (s)			b3-13	Spd Srch Est P Gain (%)		
31 (1Fh)	b6-03	Dwell Freq @ Stop (Hz)	b3-14	Bi-directional Srch Select	b3-14	Bi-directional Srch Select	b3-14	Bi-directional Srch Select
32 (20h)	b6-04	Dwell Time @ Stop (s)						
33 (21h)	b7-01	Droop Quantity (%)						
34 (22h)	b7-02	Droop Delay Time (s)						
35 (23h)	b8-01	Energy Save Gain (%)						
36 (24h)	b8-02	Energy Save Freq (Hz)	b4-01	Delay ON Timer (s)	b4-01	Delay ON Timer (s)	b4-01	Delay ON Timer (s)
37 (25h)	b9-01	Zero Servo Gain	b4-02	Delay OFF Timer (s)	b4-02	Delay OFF Timer (s)	b4-02	Delay OFF Timer (s)
38 (26h)	b9-02	Zero Srvo Complet Width	b5-01	PID Mode	b5-01	PID Mode	b5-01	PID Mode
39 (27h)	b1-08	Run Cmd Sel @ Program	b5-02	PID Gain	b5-02	PID Gain	b5-02	PID Gain
40 (28h)	b5-09	PID Output Select	b5-03	PID I Time (s)	b5-03	PID I Time (s)	b5-03	PID I Time (s)
41 (29h)	b5-10	PID Output Gain	b5-04	PID I Limit (%)	b5-04	PID I Limit (%)	b5-04	PID I Limit (%)
42 (2Ah)	b5-11	PID Output Rev Select	b5-05	PID D Time (s)	b5-05	PID D Time (s)		
43 (2Bh)	b1-09	Run Mode Change Sel	b5-06	PID Limit (%)	b5-06	PID Limit (%)	b5-06	PID Limit (%)
44 (2Ch)	b2-08	Field Comp @ Start	b5-07	PID Offset (%)	b5-07	PID Offset (%)	b5-07	PID Offset (%)
45 (2Dh)	b8-03	Energy Save Select	b5-08	PID Delay Time (s)	b5-08	PID Delay Time (s)	b5-08	PID Delay Time (s)
46 (2Eh)	b8-04	Energy Save Gain	b5-09	Output Lvl Select	b5-09	Output Lvl Select	b5-09	Output Lvl Select
47 (2Fh)	b8-05	Energy Save Time	b5-10	Output Gain	b5-10	Output Gain	b5-10	Output Gain

**Application Object – Class 104 (68h) Instance 1**

Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
48 (30h)	b5-12	PID Fdbk Loss Detect	b5-11	Output Rev Select	b5-11	Output Rev Select	b5-11	Output Rev Select
49 (31h)	b5-13	PID Fdbk Loss Detect Lvl	b5-12	Fdbk Loss Detect Select	b5-12	Fdbk Loss Detect Select	b5-12	Fdbk Loss Detect Select
50 (32h)	b5-14	PID Fdbk Loss Det Delay	b5-13	Fdbk Loss Detect Lvl (%)	b5-13	Fdbk Loss Detect Lvl (%)	b5-13	Fdbk Loss Detect Lvl (%)
51 (33h)			b5-14	Fdbk Loss Detect Time (s)	b5-14	Fdbk Loss Detect Time (s)	b5-14	Fdbk Loss Detect Time (s)
52 (34h)			b5-15	PID Sleep Lvl (Hz)	b5-15	PID Sleep Lvl (Hz)	b5-15	PID Sleep Lvl (Hz)
53 (35h)			b5-16	PID Sleep Time (s)	b5-16	PID Sleep Time (s)	b5-16	PID Sleep Time (s)
54 (36h)			b5-17	PID Acc/Dec Time (s)	b5-17	PID Acc/Dec Time (s)		
55 (37h)			b6-01	Dwell Ref @ Start (Hz)	b6-01	Dwell Ref @ Start (Hz)		
56 (38h)			b6-02	Dwell Time @ Start (s)	b6-02	Dwell Time @ Start (s)		
57 (39h)			b6-03	Dwell Ref @ Stop (Hz)	b6-03	Dwell Ref @ Stop (Hz)		
58 (3Ah)			b6-04	Dwell Time @ Stop (s)	b6-04	Dwell Time @ Stop (s)		
59 (3Bh)	Reserved							
...								
74 (4Ah)								
75 (4Bh)			b7-01	Droop Quantity (%)	b7-01	Droop Quantity (%)		
76 (4Ch)			b7-02	Droop Delay Time (s)	b7-02	Droop Delay Time (s)		
77 (4Dh)			b8-01	Energy Save Select	b8-01	Energy Save Select	b8-01	Energy Save Select
78 (4Eh)			b8-02	Energy Save Gain	b8-02	Energy Save Gain		
79 (4Fh)			b8-03	Energy Save Filter Time (s)	b8-03	Energy Save Filter Time (s)		
80 (50h)					b8-04	Energy Save Coef	b8-04	Energy Save Coef
81 (51h)					b8-05	kW Filter Time (ms)	b8-05	kW Filter Time (ms)
82 (52h)					b8-06	Srch V Limit (%)	b8-06	Srch V Limit (%)
83 (53h)			b8-07	Energy Save V Low Limit 1	b8-07	Energy Save V Low Limit 1	b8-07	Energy Save V Low Limit 1
84 (54h)			b8-08	Energy Save V Low Limit 2	b8-08	Energy Save V Low Limit 2	b8-08	Energy Save V Low Limit 2
85 (55h)			b8-09	Energy Save V High Limit 1	b8-09	Energy Save V High Limit 1	b8-09	Energy Save V High Limit 1
86 (56h)			b8-10	Energy Save V High Limit 1	b8-10	Energy Save V High Limit 1	b8-10	Energy Save V High Limit 1
87 (57h)			b8-11	Spd Srch V Step 100%	b8-11	Spd Srch V Step 100%	b8-11	Spd Srch V Step 100%
88 (58h)			b8-12	Spd Srch V Step 5%	b8-12	Spd Srch V Step 5%	b8-12	Spd Srch V Step 5%
89 (59h)			b8-13	Spd Srch V Ave Time	b8-13	Spd Srch V Ave Time	b8-13	Spd Srch V Ave Time
90 (5Ah)			b8-14	Spd Srch kW Hold Width	b8-14	Spd Srch kW Hold Width	b8-14	Spd Srch kW Hold Width
91 (5Bh)			b9-01	Zero Servo Gain	b9-01	Zero Servo Gain		
92 (5Ch)			b9-02	Zero Servo Count	b9-02	Zero Servo Count		
93 (5Dh)			b5-18	PID Setpoint Select	b5-18	PID Setpoint Select		
94 (5Eh)			b5-19	PID Setpoint (%)	b5-19	PID Setpoint (%)		
95 (5Fh)			b1-10	Mode Select @ Zero Spd	b1-10	Mode Select @ Zero Spd		
96 (60h)							b1-11	Wait to Run Time (s)
97 (61h)							b1-12	HAND Ref Source
98 (62h)							b2-09	Preheat Current (%)
99 (63h)							b5-20	PI Setpoint Scaling
100 (64h)							b5-21	PI Sleep Source
101 (65h)							b5-22	PI Snooze Lvl (%)
102 (66h)							b5-23	PI Snooze Delay Time (s)
103 (67h)							b5-34	PI Wake-up Lvl (%)
104 (68h)							b5-25	PI Setpoint Boost (%)
105 (69h)							b5-26	PI Max Boost Time (s)
106 (6Ah)							b5-27	PI Snooze Fdbk (%)
107 (6Bh)							b5-28	PI Fdbk Square Root
108 (6Ch)							b5-29	PI Fdbk Square Root Gain
109 (6Dh)							b5-30	PI Output Monitor Sq Root

## ◆ Class 105 (69h) - Yaskawa Tuning Parameter Object

Tuning Object – Class 105 (69h) Instance 1								
Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
1	C1-01	Acc Time 1 (s)	C1-01	Acc Time 1 (s)	C1-01	Acc Time 1 (s)	C1-01	Acc Time 1 (s)
2	C1-02	Dec Time 1 (s)	C1-02	Dec Time 1 (s)	C1-02	Dec Time 1 (s)	C1-02	Dec Time 1 (s)
3	C1-03	Acc Time 2 (s)	C1-03	Acc Time 2 (s)	C1-03	Acc Time 2 (s)	C1-03	Acc Time 2 (s)
4	C1-04	Dec Time 2 (s)	C1-04	Dec Time 2 (s)	C1-04	Dec Time 2 (s)	C1-04	Dec Time 2 (s)
5	C1-05	Acc Time 3 (s)	C1-05	Acc Time 3 (s)	C1-05	Acc Time 3 (s)		
6	C1-06	Dec Time 3 (s)	C1-06	Dec Time 3 (s)	C1-06	Dec Time 3 (s)		
7	C1-07	Acc Time 4 (s)	C1-07	Acc Time 4 (s)	C1-07	Acc Time 4 (s)		
8	C1-08	Dec Time 4 (s)	C1-08	Dec Time 4 (s)	C1-08	Dec Time 4 (s)		
9	C1-09	Fast Stop Time (s)	C1-09	Fast Stop Time (s)	C1-09	Fast Stop Time (s)	C1-09	Fast Stop Time (s)
10 (Ah)	C1-10	Acc/Dec Time Units	C1-10	Acc/Dec Time Units	C1-10	Acc/Dec Time Units		
11 (Bh)	C1-11	Acc/Dec Switch Freq (Hz)	C1-11	Acc/Dec Switch Freq (Hz)	C1-11	Acc/Dec Switch Freq (Hz)	C1-11	Acc/Dec Switch Freq (Hz)
12 (Ch)	C2-01	S Curve Acc @ Start (s)	C2-01	S Curve Acc @ Start (s)	C2-01	S Curve Acc @ Start (s)	C2-01	S Curve Acc @ Start (s)
13 (Dh)	C2-02	S Curve Acc @ End (s)	C2-02	S Curve Acc @ End (s)	C2-02	S Curve Acc @ End (s)	C2-02	S Curve Acc @ End (s)
14 (Eh)	C2-03	S Curve Dec @ Start (s)	C2-03	S Curve Dec @ Start (s)	C2-03	S Curve Dec @ Start (s)		
15 (Fh)	C2-04	S Curve Dec @ End (s)	C2-04	S Curve Dec @ End (s)	C2-04	S Curve Dec @ End (s)		
16 (10h)	C3-01	Slip Comp Gain	C3-01	Slip Comp Gain	C3-01	Slip Comp Gain		
17 (11h)	C3-02	Slip Comp Time (ms)	C3-02	Slip Comp Time (ms)	C3-02	Slip Comp Time (ms)		
18 (12h)	C3-03	Slip Comp Limit %	C3-03	Slip Comp %	C3-03	Slip Comp %		
19 (13h)	C3-04	Slip Comp Select @ Regen	C3-04	Slip Comp Select @ Regen	C3-04	Slip Comp Select @ Regen		
20 (14h)	C4-01	Torq Comp Gain	C3-05	V/f Slip Comp Select	C3-05	V/f Slip Comp Select		
21 (15h)	C4-02	Torq Comp Time (ms)	C3-06	Output V Limit	C3-06	Output V Limit		
22 (16h)	C5-01	ASR P Gain 1	C4-01	Torq Comp Gain	C4-01	Torq Comp Gain	C4-01	Torq Comp Gain
23 (17h)	C5-02	ASR I Time 1 (s)	C4-02	Torq Comp Time (ms)	C4-02	Torq Comp Time (ms)	C4-02	Torq Comp Time (ms)
24 (18h)	C5-03	ASR P Gain 2	C4-03	Fwd Torq Comp @ Start (%)	C4-03	Fwd Torq Comp @ Start (%)		
25 (19h)	C5-04	ASR I Time 2 (s)	C4-04	Rev Torq Comp @ Start (%)	C4-04	Rev Torq Comp @ Start (%)		
26 (1Ah)	C5-05	ASR Limit (%)	C4-05	Torq Comp Delay Time (ms)	C4-05	Torq Comp Delay Time (ms)		
27 (1Bh)	C5-06	ASR Delay Time (s)	C4-06	Start Torq Time	C4-06	Start Torq Time		
28 (1Ch)	C5-07	ASR Switch Freq (Hz)	C5-01	ASR P Gain 1	C5-01	ASR P Gain 1		
29 (1Dh)	C6-01	Carrier Freq Max (kHz)	C5-02	ASR I Time 1 (s)	C5-02	ASR I Time 1 (s)		
30 (1Eh)	C6-02	Carrier Freq Min (kHz)	C5-03	ASR P Gain 2	C5-03	ASR P Gain 2		
31 (1Fh)	C6-03	Carrier Freq Gain (%)	C5-04	ASR I Time 2 (s)	C5-04	ASR I Time 2 (s)		
32 (20h)	C7-01	Hunting Prevent Select	C5-05	ASR Limit (%)	C5-05	ASR Limit (%)		
33 (21h)	C7-02	Hunting Prevent Gain	C5-06	ASR Delay Time (s)	C5-06	ASR Delay Time (s)		
34 (22h)	C7-03	Hunting Prevent Time (s)	C5-07	ASR Gain Switch Freq (Hz)	C5-07	ASR Gain Switch Freq (Hz)		
35 (23h)	C7-04	Hunting Prevent Limit	C5-08	ASR I Limit (%)	C5-08	ASR I Limit (%)		
36 (24h)	C8-01	ACR Fdbk Gain	C6-01	CT/VT Select			C6-01	CT/VT Select
37 (25h)	C8-02	ACR Iq P Gain	C6-02	Carrier Freq Select	C6-02	Carrier Freq Select	C6-02	Carrier Freq Select
38 (26h)	C8-03	ACR Iq I Time	C6-03	Carrier Freq Max (kHz)	C6-03	Carrier Freq Max (kHz)	C6-03	Carrier Freq Max (kHz)
39 (27h)	C8-04	ACR Vq Limit			C6-04	Carrier Freq Min (kHz)	C6-04	Carrier Freq Min (kHz)
40 (28h)	C8-05	ACR Id P Gain			C6-05	Carrier Freq Gain (%)	C6-05	Carrier Freq Gain (%)
41 (29h)	C8-06	ACR Id I Time	C6-06	PWM Method	C6-06	PWM Method	C6-06	PWM Method
42 (2Ah)	C8-07	ACR Vd Limit	C6-07	Phase Switch Lvl	C6-07	Phase Switch Lvl	C6-07	Phase Switch Lvl
43 (2Bh)	C8-08	AFR Gain	C6-08	PWM On Time	C6-08	PWM On Time	C6-08	PWM On Time
44 (2Ch)	C8-09	AFR Time	C6-09	AFR Time	C6-09	AFR Time		
45 (2Dh)	C8-10	AFR Limit	C6-10		C6-10	Fc Static Tuning		
46 (2Eh)	C8-11	Volt Drop Comp Delay			C6-11	OLV2 Carrier Freq Select		

**Tuning Object – Class 105 (69h) Instance 1**

Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
47 (2Fh)	C8-12	AVR Time			C5-09	ASR Gain Coef		
48 (30h)	C8-13	PWM Method			C6-12	C-vector T Limit		
49 (31h)	C8-14	IGBT Volt Drop			C5-10	ASR Delay Time 2		
50 (32h)	C8-15	ON Delay Time						
51 (33h)	C8-16	OFF Delay Time						
52 (34h)	C8-17	DCCT Filter Time						
53 (35h)	C8-18	Pwr Angle Filter 1						
54 (36h)	C8-19	Pwr Angle Filter 2						
55 (37h)	C8-20	Simulation Mode						
56 (38h)	C8-21	Flux Observer						
57 (39h)	C8-22	Observer Comp						
58 (3Ah)	C8-23	Observer Filter						
59 (3Bh)	C8-24	Observer Volt Comp						
60 (3Ch)	C8-25	Observer I Time						
61 (3Dh)	C8-26	Observer Gain						
62 (3Eh)	C8-27	Inv Rate Current						
63 (3Fh)	C8-28	DCCT Gain						
64 (40h)	C8-29	Phase Switch Lvl						
65 (41h)	C8-30	Carrier in-Tune						
66 (42h)	C5-08	ASR I Limit						
67 (43h)	C3-05	Flux Select						
68 (44h)	C3-06	Output Volt Limit						
69 (45h)	C4-03	Fwd Torq Comp @ Start						
70 (46h)	C4-04	Rev Torq Comp @ Start						
71 (47h)	C4-05	Torq Comp @ Start Time						
72 (48h)	C8-31	Tune Select						

## ◆ Class 106 (6Ah) - Yaskawa Reference Parameter Object

Ref Object – Class 106 (6Ah) Instance 1								
Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
1	d1-01	Freq Ref 1 (Hz)	d1-01	Freq Ref 1 (Hz)	d1-01	Freq Ref 1 (Hz)	d1-01	Freq Ref 1 (Hz)
2	d1-02	Freq Ref 2 (Hz)	d1-02	Freq Ref 2 (Hz)	d1-02	Freq Ref 2 (Hz)	d1-02	Freq Ref 2 (Hz)
3	d1-03	Freq Ref 3 (Hz)	d1-03	Freq Ref 3 (Hz)	d1-03	Freq Ref 3 (Hz)	d1-03	Freq Ref 3 (Hz)
4	d1-04	Freq Ref 4 (Hz)	d1-04	Freq Ref 4 (Hz)	d1-04	Freq Ref 4 (Hz)	d1-04	Freq Ref 4 (Hz)
5	d1-05	Freq Ref 5 (Hz)	d1-05	Freq Ref 5 (Hz)	d1-05	Freq Ref 5 (Hz)	d1-05	Freq Ref 5 (Hz)
6	d1-06	Freq Ref 6 (Hz)	d1-06	Freq Ref 6 (Hz)	d1-06	Freq Ref 6 (Hz)	d1-06	Freq Ref 6 (Hz)
7	d1-07	Freq Ref 7 (Hz)	d1-07	Freq Ref 7 (Hz)	d1-07	Freq Ref 7 (Hz)	d1-07	Freq Ref 7 (Hz)
8	d1-08	Freq Ref 8 (Hz)	d1-08	Freq Ref 8 (Hz)	d1-08	Freq Ref 8 (Hz)	d1-08	Freq Ref 8 (Hz)
9	d1-09	Jog Ref (Hz)	d1-09	Freq Ref 9 (Hz)	d1-09	Freq Ref 9 (Hz)		
10 (Ah)	d2-01	Freq Ref Upper Limit (%)	d2-01	Freq Ref Upper Limit (%)	d2-01	Freq Ref Upper Limit (%)	d2-01	Freq Ref Upper Limit (%)
11 (Bh)	d2-02	Freq Ref Lower Limit (%)	d2-02	Freq Ref Lower Limit (%)	d2-02	Freq Ref Lower Limit (%)	d2-02	Freq Ref Lower Limit (%)
12 (Ch)	d3-01	Prohibit Freq 1 (Hz)	d1-10	Freq Ref 10 (Hz)	d1-10	Freq Ref 10 (Hz)		
13 (Dh)	d3-02	Prohibit Freq 2 (Hz)	d1-11	Freq Ref 11 (Hz)	d1-11	Freq Ref 11 (Hz)		
14 (Eh)	d3-03	Prohibit Freq 3 (Hz)	d1-12	Freq Ref 12 (Hz)	d1-12	Freq Ref 12 (Hz)		
15 (Fh)	d3-04	Prohibit Freq Width (Hz)	d1-13	Freq Ref 13 (Hz)	d1-13	Freq Ref 13 (Hz)		
16 (10h)	d4-01	Freq Ref Hold Select	d1-14	Freq Ref 14 (Hz)	d1-14	Freq Ref 14 (Hz)		
17 (11h)	d4-02	Trim Control Lvl (%)	d1-15	Freq Ref 15 (Hz)	d1-15	Freq Ref 15 (Hz)		
18 (12h)	d5-01	Torq Control Select	d1-16	Freq Ref 16 (Hz)	d1-16	Freq Ref 16 (Hz)		
19 (13h)	d5-02	Torq Ref Delay Time (ms)	d1-17	Jog Ref	d1-17	Jog Ref	d1-17	Jog Ref
20 (14h)	d5-03	Spd Limit Select	d2-03	Master Ref Lower Limit	d2-03	Master Ref Lower Limit	d2-03	Master Ref Lower Limit
21 (15h)	d5-04	Spd Limit (%)	d3-01	Jump Freq 1	d3-01	Jump Freq 1	d3-01	Jump Freq 1
22 (16h)	d5-05	Spd Limit Bias (%)	d3-02	Jump Freq 2	d3-02	Jump Freq 2	d3-02	Jump Freq 2
23 (17h)	d5-06	Spd/Torq Switch Time (ms)	d3-03	Jump Freq 3	d3-03	Jump Freq 3	d3-03	Jump Freq 3
24 (18h)			d3-04	Jump Bandwidth	d3-04	Jump Bandwidth	d3-04	Jump Bandwidth
25 (19h)			d4-01	MOP Ref Memory	d4-01	MOP Ref Memory	d4-01	MOP Ref Memory
26 (1Ah)			d4-02	Trim Control	d4-02	Trim Control	d4-02	Trim Control
27 (1Bh)			d5-01	Torq Control Select	d5-01	Torq Control Select		
28 (1Ch)			d5-02	Torq Ref Delay	d5-02	Torq Ref Delay		
29 (1Dh)			d5-03	Spd Limit Select	d5-03	Spd Limit Select		
30 (1Eh)			d5-04	Spd Limit (%)	d5-04	Spd Limit (%)		
31 (1Fh)			d5-05	Spd Limit Bias (%)	d5-05	Spd Limit Bias (%)		
32 (20h)			d5-06	Ref Hold Time (ms)	d5-06	Ref Hold Time (ms)		
33 (21h)			d6-01	Field Weak Lvl	d6-01	Field Weak Lvl	d6-01	Field Weak Lvl
34 (22h)			d6-02	Field Weak Freq	d6-02	Field Weak Freq	d6-02	Field Weak Freq
35 (23h)			d6-03	Field Force Select	d6-03	Field Force Select	d6-03	
36 (24h)								
37 (25h)					d6-05	A PHI R Filter	d6-05	
38 (26h)			d6-06	Field Force Limit	d6-06	Field Force Limit	d6-06	
39 (27h)					d5-07	Direction Spd Limit Select		

## ◆ Class 107 (6Bh) - Yaskawa Motor Parameter Object

Motor Object – Class 107 (6Bh) Instance 1								
Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
1	E1-01	Input Volt (VAC)	E1-01	Input Volt (VAC)	E1-01	Input Volt (VAC)	E1-01	Input Volt (VAC)
2	E1-02	Motor Select						
3	E1-03	V/f Select	E1-03	V/f Select	E1-03	V/f Select	E1-03	V/f Select
4	E1-04	Max Freq (Hz)	E1-04	Max Freq (Hz)	E1-04	Max Freq (Hz)	E1-04	Max Freq (Hz)
5	E1-05	Max Volt (VAC)	E1-05	Max Volt (VAC)	E1-05	Max Volt (VAC)	E1-05	Max Volt (VAC)
6	E1-06	Base Freq (Hz)	E1-06	Base Freq (Hz)	E1-06	Base Freq (Hz)	E1-06	Base Freq (Hz)
7	E1-07	Mid Freq A (Hz)	E1-07	Mid Freq A (Hz)	E1-07	Mid Freq A (Hz)	E1-07	Mid Freq A (Hz)
8	E1-08	Mid Volt A (VAC)	E1-08	Mid Volt A (VAC)	E1-08	Mid Volt A (VAC)	E1-08	Mid Volt A (VAC)
9	E1-09	Min Freq (Hz)	E1-09	Min Freq (Hz)	E1-09	Min Freq (Hz)	E1-09	Min Freq (Hz)
10 (Ah)	E1-10	Min Volt (VAC)	E1-10	Min Volt (VAC)	E1-10	Min Volt (VAC)	E1-10	Min Volt (VAC)
11 (Bh)	E1-11	Mid Freq B (Hz)	E1-11	Mid Freq B (Hz)	E1-11	Mid Freq B (Hz)	E1-11	Mid Freq B (Hz)
12 (Ch)	E1-12	Mid Volt B (VAC)	E1-12	Mid Volt B (VAC)	E1-12	Mid Volt B (VAC)	E1-12	Mid Volt B (VAC)
13 (Dh)	E1-13	Base Volt (VAC)	E1-13	Base Volt (VAC)	E1-13	Base Volt (VAC)	E1-13	Base Volt (VAC)
14 (Eh)	Reserved							
15 (Fh)	E2-01	Motor Rated FLA (A)	E2-01	Motor Rated FLA (A)	E2-01	Motor Rated FLA (A)	E2-01	Motor Rated FLA (A)
16 (10h)	E2-02	Motor Rated Slip (Hz)	E2-02	Motor Rated Slip (Hz)	E2-02	Motor Rated Slip (Hz)	E2-02	Motor Rated Slip (Hz)
17 (11h)	E2-03	No Load Current (A)	E2-03	No Load Current (A)	E2-03	No Load Current (A)	E2-03	No Load Current (A)
18 (12h)	E2-04	Number of Motor Poles			E2-04	Number of Motor Poles		
19 (13h)	E2-05	Terminal Resistance (Ω)	E2-05	Terminal Resistance (Ω)	E2-05	Terminal Resistance (Ω)	E2-05	Terminal Resistance (Ω)
20 (14h)	E2-06	Leak Inductance (%)	E2-06	Leak Inductance (%)	E2-06	Leak Inductance (%)		
21 (15h)	E2-07	Saturation Comp 1	E2-07	Saturation Comp 1	E2-07	Saturation Comp 1		
22 (16h)	E2-08	Saturation Comp 2	E2-08	Saturation Comp 2	E2-08	Saturation Comp 2		
23 (17h)	E2-09	Mechanical Loss (%)	E2-09	Mechanical Loss (%)	E2-09	Mechanical Loss (%)		
24 (18h)	E3-01	Mtr 2 Control Method	E2-10	Torq Comp Iron Loss (W)	E2-10	Torq Comp Iron Loss (W)	E2-10	Torq Comp Iron Loss (W)
25 (19h)	E4-01	Mtr 2 Max Out Freq (Hz)	E2-11	Motor Rated Pwr (kW)	E2-11	Motor Rated Pwr (kW)	E2-11	Motor Rated Pwr (kW)
26 (1Ah)	E4-02	Mtr 2 Max Volt (VAC)	E3-01	Mtr 2 Control Method	E3-01	Mtr 2 Control Method		
27 (1Bh)	E4-03	Mtr 2 Base Freq (Hz)	E3-02	Mtr 2 Max Output Freq (Hz)	E3-02	Mtr 2 Max Output Freq (Hz)		
28 (1Ch)	E4-04	Mtr 2 Mid Output Freq (Hz)	E3-03	Mtr 2 Max Volt (VAC)	E3-03	Mtr 2 Max Volt (VAC)		
29 (1Dh)	E4-05	Mtr 2 Mid Out Volt (VAC)	E3-04	Mtr 2 Base Freq (Hz)	E3-04	Mtr 2 Base Freq (Hz)		
30 (1Eh)	E4-06	Mtr 2 Min Output Freq (Hz)	E3-05	Mtr 2 Mid Output Freq (Hz)	E3-05	Mtr 2 Mid Output Freq (Hz)		
31 (1Fh)	E4-07	Mtr 2 Min Out Volt (VAC)	E3-06	Mtr 2 Mid Out Volt (VAC)	E3-06	Mtr 2 Mid Out Volt (VAC)		
32 (20h)	E5-01	Mtr 2 Rated Current (A)	E3-07	Mtr 2 Min Output Freq (Hz)	E3-07	Mtr 2 Min Output Freq (Hz)		
33 (21h)	E5-02	Mtr 2 Rated Slip (Hz)	E3-08	Mtr 2 Min Out Volt (VAC)	E3-08	Mtr 2 Min Out Volt (VAC)		
34 (22h)	E5-03	Mtr 2 No Load Current (A)	E4-01	Mtr 2 Rated Current (A)	E4-01	Mtr 2 Rated Current (A)		
35 (23h)	E5-04	Mtr 2 Number of Poles	E4-02	Mtr 2 Rated Slip (Hz)	E4-02	Mtr 2 Rated Slip (Hz)		
36 (24h)	E5-05	Mtr 2 Line-to-Line Res	E4-03	Mtr 2 No Load Current (A)	E4-03	Mtr 2 No Load Current (A)		
37 (25h)	E5-06	Mtr 2 Leakage Inductance	E4-04	Mtr 2 Number of Poles	E4-04	Mtr 2 Number of Poles		
38 (26h)	E2-10	Torq Comp Iron Loss	E4-05	Mtr 2 Line-to-Line Res	E4-05	Mtr 2 Line-to-Line Res		
39 (27h)			E4-06	Mtr 2 Leakage Inductance	E4-06	Mtr 2 Leakage Inductance		
40 (28h)			E4-07	Mtr 2 Rated Pwr (kW)	E4-07	Mtr 2 Rated Pwr (kW)		
41 (29h)			E2-12	Saturation Comp 3	E2-12	Saturation Comp 3		
42 (2Ah)	Reserved							
...	Reserved							
61 (3Dh)								
62 (3Eh)					E2-13			
63 (3Fh)					E4-08	Mtr 2 Slip Comp Gain		
64 (40h)					E4-09	Mtr 2 ASR P Gain		
65 (41h)					E4-10	Mtr 2 ASR I Time (s)		
66 (42h)					E4-11	Mtr 2 Torq Comp Gain		

## ◆ Class 108 (6Ch) - Yaskawa Option Parameter Object

Option Object – Class 108 (6Ch) Instance 1								
Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
1	F1-01	PG Pulses/Rev	F1-01	PG Pulses/Rev	F1-01	PG Pulses/Rev		
2	F1-02	PG Fdbk Loss Select	F1-02	PG Fdbk Loss Select	F1-02	PG Fdbk Loss Select		
3	F1-03	PG OverSpd Select	F1-03	PG OverSpd Select	F1-03	PG OverSpd Select		
4	F1-04	PG Deviation Select	F1-04	PG Deviation Select	F1-04	PG Deviation Select		
5	F1-05	PG Rotation Select	F1-05	PG Rotation Select	F1-05	PG Rotation Select		
6	F1-06	PG Output Ratio	F1-06	PG Output Ratio	F1-06	PG Output Ratio		
7	F1-07	PG Ramp PI/I Select	F1-07	PG Ramp PI/I Select	F1-07	PG Ramp PI/I Select		
8	F1-08	PG OverSpd Lvl (%)	F1-08	PG OverSpd Lvl (%)	F1-08	PG OverSpd Lvl (%)		
9	F1-09	PG OverSpd (s)	F1-09	PG OverSpd (s)	F1-09	PG OverSpd (s)		
10 (Ah)	F1-10	PG Deviate Lvl (%)	F1-10	PG Deviate Lvl (%)	F1-10	PG Deviate Lvl (%)		
11 (Bh)	F1-11	PG Deviate Time (s)	F1-11	PG Deviate Time (s)	F1-11	PG Deviate Time (s)		
12 (Ch)	F1-12	PG # Gear Teeth	F1-12	PG # Gear Teeth	F1-12	PG # Gear Teeth		
13 (Dh)	F1-13	PG # Gear Teeth 2	F1-13	PG # Gear Teeth 2	F1-13	PG # Gear Teeth 2		
14 (Eh)	F2-01	AI-14 Input Select	F1-14	PG Open Detect	F1-14	PG Open Detect		
15 (Fh)	F3-01	DI Input Select	F1-15	Spd Detect Filter	F1-15	Spd Detect Filter		
16 (10h)	F4-01	AO Ch1 Select	F2-01	AI-14 Input Select	F2-01	AI-14 Input Select		
17 (11h)	F4-02	AO Ch1 Gain (%)	F3-01	DI Input Select	F3-01	DI Input Select		
18 (12h)	F4-03	AO Ch2 Select	F4-01	AO Ch1 Select	F4-01	AO Ch1 Select		
19 (13h)	F4-04	AO Ch2 Gain (%)	F4-02	AO Ch1 Gain (%)	F4-02	AO Ch1 Gain (%)		
20 (14h)	F5-01	DO Ch1 Select	F4-03	AO Ch2 Select	F4-03	AO Ch2 Select		
21 (15h)	F5-02	DO Ch2 Select	F4-04	AO Ch2 Gain (%)	F4-04	AO Ch2 Gain (%)		
22 (16h)	F6-01	DO-08 Select	F4-05	AO Ch1 Bias (%)	F4-05	AO Ch1 Bias (%)		
23 (17h)	F7-01	PO-36F Select	F4-06	AO Ch2 Bias (%)	F4-06	AO Ch2 Bias (%)		
24 (18h)	F1-14	PG Open Detect Time	F4-07	AO Ch1 Output Lvl	F4-07	AO Ch1 Output Lvl		
25 (19h)	F8-01	E-15 Detect Select	F4-08	AO Ch2 Output Lvl	F4-08	AO Ch2 Output Lvl		
26 (1Ah)	F9-01	EF0 Fault Select	F5-01	DO Ch1 Select	F5-01	DO Ch1 Select		
27 (1Bh)	F9-02	EF0 Fault Detect	F5-02	DO Ch2 Select	F5-02	DO Ch2 Select		
28 (1Ch)	F9-03	EF0 Select	F5-03	DO Ch3 Select	F5-03	DO Ch3 Select		
29 (1Dh)	F9-04	Trace Sample Time	F5-04	DO Ch4 Select	F5-04	DO Ch4 Select		
30 (1Eh)	F1-15	Spd Detect Filter Select	F5-05	DO Ch5 Select	F5-05	DO Ch5 Select		
31 (1Fh)	F9-05	Torq Ref/Limit Select	F5-06	DO Ch6 Select	F5-06	DO Ch6 Select		
32 (20h)	F9-06	Com BUS Fault Select	F5-07	DO Ch7 Select	F5-07	DO Ch7 Select		
33 (21h)	F4-05	AO Ch1 Bias	F5-08	DO Ch8 Select	F5-08	DO Ch8 Select		
34 (22h)	F4-06	AO Ch2 Bias	F5-09	DO Ch8 Mode Select	F5-09	DO Ch8 Mode Select		
35 (23h)			F6-01	Com BUS Fault Select	F6-01	Com BUS Fault Select		
36 (24h)			F6-02	EF0 Detect	F6-02	EF0 Detect		
37 (25h)			F6-03	EF0 Fault Select	F6-03	EF0 Fault Select		
38 (26h)			F6-04	Trace Sample Time	F6-04	Trace Sample Time		
39 (27h)			F6-05	Current Units Select	F6-05	Current Units Select		
40(28h)			F6-06	Torq Ref/Limit Select	F6-06	Torq Ref/Limit Select		
41 (29h)								
...								
48 (30h)								
49 (31h)					F1-21	PG Pulses/Rev 2		
50 (32h)					F1-22	PG Rotation Select 2		
51 (33h)					F1-23	PG Gear Teeth Count 1		

Option Object – Class 108 (6Ch) Instance 1								
Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
52 (34h)					F1-24	PG Gear Teeth Count 2		
53 (35h)					F1-25	Hardware PG Opn Detect Ch1		
54 (36h)					F1-26	Hardware PG Opn Detect Ch2		

## ◆ Class 109 (6Dh) - Yaskawa Terminal Parameter Object

Terminal Object – Class 109 (6Dh) Instance 1								
Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
1	H1-01	Terminal S3 Function Sel	H1-01	Terminal S3 Function Sel	H1-01	Terminal S3 Function Sel	H1-01	Terminal S3 Function Sel
2	H1-02	Terminal S4 Function Sel	H1-02	Terminal S4 Function Sel	H1-02	Terminal S4 Function Sel	H1-02	Terminal S4 Function Sel
3	H1-03	Terminal S5 Function Sel	H1-03	Terminal S5 Function Sel	H1-03	Terminal S5 Function Sel	H1-03	Terminal S5 Function Sel
4	H1-04	Terminal S6 Function Sel	H1-04	Terminal S6 Function Sel	H1-04	Terminal S6 Function Sel	H1-04	Terminal S6 Function Sel
5	H1-05	Terminal S7 Function Sel	H1-05	Terminal S7 Function Sel	H1-05	Terminal S7 Function Sel	H1-05	Terminal S7 Function Sel
6	H1-06	Terminal S8 Function Sel	H1-06	Terminal S8 Function Sel	H1-06	Terminal S8 Function Sel		
7	H2-01	Terminal 9-10 Select			H1-07	Terminal S9 Function Select		
8	H2-03	Terminal 25-26 Select			H1-08	Terminal S10 Function Select		
9	H2-03	Terminal 26-27 Select			H1-09	Terminal S11 Function Select		
10 (Ah)	H3-01	Terminal 13 Signal			H1-10	Terminal S12 Function Select		
11 (Bh)	H3-02	Terminal 13 Gain (%)	H1-11	External BB Select	H1-11	External BB Select		
12 (Ch)	H3-03	Terminal 13 Bias (%)	H2-01	Terminal M1-M2 Select	H2-01	Terminal M1-M2 Select	H2-01	Terminal M1-M2 Select
13 (Dh)	H3-04	Terminal 16 Signal	H2-02	Terminal M3-M4 Select	H2-02	Terminal M3-M4 Select	H2-02	Terminal M3-M4 Select
14 (Eh)	H3-05	Terminal 16 Select	H2-03	Terminal M5-M6 Select	H2-03	Terminal M5-M6 Select	H2-03	Terminal M5-M6 Select
15 (Fh)	H3-06	Terminal 16 Gain (%)			H2-04	Terminal P3 Select		
16 (10h)	H3-07	Terminal 16 Bias (%)			H2-05	Terminal P4 Select		
17 (11h)	H3-08	Terminal 14 Signal	H3-01	Terminal A1 Signal	H3-01	Terminal A1 Signal		
18 (12h)	H3-09	Terminal 14 Select	H3-02	Terminal A1 Gain (%)	H3-02	Terminal A1 Gain (%)	H3-02	Terminal A1 Gain (%)
19 (13h)	H3-10	Terminal 14 Gain (%)	H3-03	Terminal A1 Bias (%)	H3-03	Terminal A1 Bias (%)	H3-03	Terminal A1 Bias (%)
20 (14h)	H3-11	Terminal 14 Bias (%)	H3-04	Terminal A3 Signal	H3-04	Terminal A3 Signal		
21 (15h)	H3-12	Filter Ave Time	H3-05	Terminal A3 Select	H3-05	Terminal A3 Select		
22 (16h)	H4-01	Terminal 21 Select	H3-06	Terminal A3 Gain (%)	H3-06	Terminal A3 Gain (%)		
23 (17h)	H4-02	Terminal 21 Gain (%)	H3-07	Terminal A3 Bias (%)	H3-07	Terminal A3 Bias (%)		
24 (18h)	H4-03	Terminal 21 Bias (%)	H3-08	Terminal A2 Signal	H3-08	Terminal A2 Signal	H3-08	Terminal A2 Signal
25 (19h)	H4-04	Terminal 23 Select	H3-09	Terminal A2 Select	H3-09	Terminal A2 Select	H3-09	Terminal A2 Select
26 (1Ah)	H4-05	Terminal 23 Gain (%)	H3-10	Terminal A2 Gain (%)	H3-10	Terminal A2 Gain (%)	H3-10	Terminal A2 Gain (%)
27 (1Bh)	H4-06	Terminal 23 Bias (%)	H3-11	Terminal A2 Bias (%)	H3-11	Terminal A2 Bias (%)	H3-11	Terminal A2 Bias (%)
28 (1Ch)	H4-07	AO Lvl Select	H3-12	AI Filter Time (s)	H3-12	AI Filter Time (s)	H3-12	AI Filter Time (s)
29 (1Dh)	H5-01	Serial Com Address			H3-13	TA1/A2 Select	H3-13	TA1/A2 Select
30 (1Eh)	H5-02	Serial Baud Rate Select	H4-01	Terminal FM Select	H4-01	Terminal FM Select	H4-01	Terminal FM Select
31 (1Fh)	H5-03	Serial Parity Select	H4-02	Terminal FM Gain (%)	H4-02	Terminal FM Gain (%)	H4-02	Terminal FM Gain (%)
32 (20h)	H5-04	Serial Fault Select	H4-03	Terminal FM Bias (%)	H4-03	Terminal FM Bias (%)	H4-03	Terminal FM Bias (%)
33 (21h)	H5-05	Com Error Detect	H4-04	Terminal AM Select	H4-04	Terminal AM Select	H4-04	Terminal AM Select
34 (22h)	H1-07	External BB Select	H4-05	Terminal AM Gain (%)	H4-05	Terminal AM Gain (%)	H4-05	Terminal AM Gain (%)
35 (23h)			H4-06	Terminal AM Bias (%)	H4-06	Terminal AM Bias (%)	H4-06	Terminal AM Bias (%)
36 (24h)			H4-07	Terminal FM Signal	H4-07	Terminal FM Signal	H4-07	Terminal FM Signal
37 (25h)			H4-08	Terminal AM Signal	H4-08	Terminal AM Signal	H4-08	Terminal AM Signal
38 (26h)			H5-01	Serial Com Address	H5-01	Serial Com Address	H5-01	Serial Com Address
39 (27h)			H5-02	Serial Baud Rate Select	H5-02	Serial Baud Rate Select	H5-02	Serial Baud Rate Select
40 (28h)			H5-03	Serial Parity Select	H5-03	Serial Parity Select	H5-03	Serial Parity Select
41 (29h)			H5-04	Serial Fault Select	H5-04	Serial Fault Select	H5-04	Serial Fault Select



Terminal Object – Class 109 (6Dh) Instance 1								
Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
42 (2Ah)			H5-05	Serial Fault Detect Select	H5-05	Serial Fault Detect Select	H5-05	Serial Fault Detect Select
43 (2Bh)			H5-06	Transmit Wait Time (ms)	H5-06	Transmit Wait Time (ms)	H5-06	Transmit Wait Time (ms)
44 (2Ch)			H5-07	RTS Control	H5-07	RTS Control	H5-07	RTS Control
45 (2Dh)			H6-01	Pulse Input Select	H6-01	Pulse Input Select		
46 (2Eh)			H6-02	Pulse Input Scaling (Hz)	H6-02	Pulse Input Scaling (Hz)		
47 (2Fh)			H6-03	Pulse Input Gain (%)	H6-03	Pulse Input Gain (%)		
48 (30h)			H6-04	Pulse Input Bias (%)	H6-04	Pulse Input Bias (%)		
49 (31h)			H6-05	Pulse Input Filter (s)	H6-05	Pulse Input Filter (s)		
50 (32h)			H6-06	Pulse Input Monitor Select	H6-06	Pulse Input Monitor Select		
51 (33h)			H6-07	Pulse Input Monitor Scaling (Hz)	H6-07	Pulse Input Monitor Scaling (Hz)		
52 (34h)			H3-14	Auto Comp Select	H3-14	Auto Comp Select		
53 (35h)								
54 (36h)							H5-09	Com Error Detect Time (s)

## ◆ Class 110 (6Eh) - Yaskawa Protection Parameter Object

Protection Object – Class 110 (6Eh) Instance 1								
Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
1	L1-01	MOL Fault Select	L1-01	MOL Fault Select	L1-01	MOL Fault Select	L1-01	MOL Fault Select
2	L1-02	MOL Fault Time (min)	L1-02	MOL Time Const (min)	L1-02	MOL Time Const (min)	L1-02	MOL Time Const (min)
3	L2-01	Pwr Loss Ride Thru Select	L1-03	Motor OH Alarm Select	L1-03	Motor OH Alarm Select	L1-03	Motor OH Alarm Select
4	L2-02	Pwr Loss Ride Thru Tm (s)	L1-04	Motor OH Fault Select	L1-04	Motor OH Fault Select	L1-04	Motor OH Fault Select
5	L2-03	Pwr Loss Base Block Tm (s)	L1-05	Motor Temp Filter Time (s)	L1-05	Motor Temp Filter Time (s)	L1-05	Motor Temp Filter Time (s)
6	L2-04	Pwr Loss V/f Ramp Tm (s)	L2-01	Moment Pwr Loss Select	L2-01	Moment Pwr Loss Select	L2-01	Moment Pwr Loss Select
7	L2-05	PUV Detect Lvl (V)	L2-02	Pwr Loss Ride Thru Tm (s)	L2-02	Pwr Loss Ride Thru Tm (s)	L2-02	Pwr Loss Ride Thru Tm (s)
8	L2-06	KEB Freq (%)	L2-03	Pwr Loss Base Block Tm (s)	L2-03	Pwr Loss Base Block Tm (s)	L2-03	Pwr Loss Base Block Tm (s)
9	L3-01	Stall Prevent Acc Select	L2-04	Pwr Loss V/f Ramp Tm (s)	L2-04	Pwr Loss V/f Ramp Tm (s)	L2-04	Pwr Loss V/f Ramp Tm (s)
10 (Ah)	L3-02	Stall Prevent Acc Lvl (%)	L2-05	PUV Detect Lvl (V)	L2-05	PUV Detect Lvl (V)	L2-05	PUV Detect Lvl (V)
11 (Bh)	L3-03	Stall Prevent CHP Lvl (%)	L2-06	KEB Dec Time (s)	L2-06	KEB Dec Time (s)	L2-06	
12 (Ch)	L3-04	Stall Prevent Dec Select	L2-07	UV Return Time (s)	L2-07	UV Return Time (s)	L2-07	
13 (Dh)	L3-05	Stall Prevent @ Run Select	L2-08	KEB Freq (%)	L2-08	KEB Freq (%)	L2-08	
14 (Eh)	L3-06	Stall Prvnt @ Run Lvl (%)	L2-09	KEB Min Freq	L2-09	KEB Min Freq	L2-09	
15 (Fh)	L3-07	Stall Prevent Gain (%)	L2-10	KEB Detect Time	L2-10	KEB Detect Time	L2-10	
16 (10h)	L3-08	Stall Prevent I Time (s)	L3-01	Stall Prevent Acc Select	L3-01	Stall Prevent Acc Select	L3-01	Stall Prevent Acc Select
17 (11h)	L4-01	Spd Agree Lvl (Hz)	L3-02	Stall Prevent Acc Lvl (%)	L3-02	Stall Prevent Acc Lvl (%)	L3-02	Stall Prevent Acc Lvl (%)
18 (12h)	L4-02	Spd Agree Width (Hz)	L3-03	Stall Prevent CHP Lvl (%)	L3-03	Stall Prevent CHP Lvl (%)	L3-03	Stall Prevent CHP Lvl (%)
19 (13h)	L4-03	Spd Agree Lvl ± (Hz)	L3-04	Stall Prevent Dec Select	L3-04	Stall Prevent Dec Select	L3-04	Stall Prevent Dec Select
20 (14h)	L4-04	Spd Agree Width ± (Hz)	L3-05	Stall Prevent @ Run Select	L3-05	Stall Prevent @ Run Select	L3-05	Stall Prevent @ Run Select
21 (15h)	L4-05	Ref Loss Select	L3-06	Stall Prvnt @ Run Lvl (%)	L3-06	Stall Prvnt @ Run Lvl (%)	L3-06	Stall Prvnt @ Run Lvl (%)
22 (16h)	L5-01	Number of Restarts	L3-07	Stall Prevent Gain (%)	L3-07	Stall Prevent Gain (%)	L3-07	Stall Prevent Gain (%)
23 (17h)	L5-02	Restart Select	L3-08	Stall Prevent I Time (s)	L3-08	Stall Prevent I Time (s)	L3-08	Stall Prevent I Time (s)
24 (18h)	L5-03	Fault Restart Time (s)	L3-09	Stall Prevent Dec Time (s)	L3-09	Stall Prevent Dec Time (s)	L3-09	Stall Prevent Dec Time (s)
25 (19h)	L6-01	Torq Detect 1 Select	L3-10	Stall Prevent Dec Lvl (%)	L3-10	Stall Prevent Dec Lvl (%)	L3-10	Stall Prevent Dec Lvl (%)
26 (1Ah)	L6-02	Torq Detect 1 Lvl (%)	L4-01	Spd Agree Lvl (Hz)	L4-01	Spd Agree Lvl (Hz)	L4-01	Spd Agree Lvl (Hz)
27 (1Bh)	L6-03	Torq Detect 1 Time (s)	L4-02	Spd Agree Width (Hz)	L4-02	Spd Agree Width (Hz)	L4-02	Spd Agree Width (Hz)
28 (1Ch)	L6-04	Torq Detect 2 Select	L4-03	Spd Agree Lvl ± (Hz)	L4-03	Spd Agree Lvl ± (Hz)	L4-03	
29 (1Dh)	L6-05	Torq Detect 2 Lvl (%)	L4-04	Spd Agree Width ± (Hz)	L4-04	Spd Agree Width ± (Hz)	L4-04	
30 (1Eh)	L6-06	Torq Detect 2 Time (s)	L4-05	Ref Loss Select	L4-05	Ref Loss Select	L4-05	Ref Loss Select
31 (1Fh)	L7-01	Torq Limit Fwd (%)	L5-01	Number of Restarts	L5-01	Number of Restarts	L5-01	Number of Restarts
32 (20h)	L7-02	Torq Limit Rev (%)	L5-02	Restart Select	L5-02	Restart Select	L5-02	Restart Select
33 (21h)	L7-03	Torq Lmt Fwd Regen (%)	L5-03	Max Restart Time (s)	L5-03	Max Restart Time (s)	L5-03	Max Restart Time (s)
34 (22h)	L7-04	Torq Lmt Rev Regen (%)	L6-01	Torq Detect 1 Select	L6-01	Torq Detect 1 Select	L6-01	Torq Detect 1 Select
35 (23h)	L7-05	Torq Limit P Gain (%)	L6-02	Torq Detect 1 Lvl (%)	L6-02	Torq Detect 1 Lvl (%)	L6-02	Torq Detect 1 Lvl (%)
36 (24h)	L7-06	Torq Limit I Time (s)	L6-03	Torq Detect 1 Time (s)	L6-03	Torq Detect 1 Time (s)	L6-03	Torq Detect 1 Time (s)
37 (25h)	L8-01	DB Resistor Protect	L6-04	Torq Detect 2 Select	L6-04	Torq Detect 2 Select		
38 (26h)	L8-02	Over Heat Pre-Alarm (°C)	L6-05	Torq Detect 2 Lvl (%)	L6-05	Torq Detect 2 Lvl (%)		
39 (27h)	L8-03	Over Heat Pre-Alarm	L6-06	Torq Detect 2 Time (s)	L6-06	Torq Detect 2 Time (s)		
40 (28h)	L8-04	OH1 Fault Select	L7-01	Torq Limit Fwd (%)	L7-01	Torq Limit Fwd (%)		
41 (29h)	L8-05	Input Phase Loss Select	L7-02	Torq Limit Rev (%)	L7-02	Torq Limit Rev (%)		
42 (2Ah)	L8-06	Input Phase Loss Lvl	L7-03	Torq Limit Fwd Regen (%)	L7-03	Torq Limit Fwd Regen (%)		
43 (2Bh)	L8-07	Output Phase Loss Select	L7-04	Torq Limit Rev Regen (%)	L7-04	Torq Limit Rev Regen (%)		
44 (2Ch)	L8-08	Output Phase Loss Lvl	L7-05	Torq Limit Gain (%)	L7-05	Torq Limit Gain (%)		
45 (2Dh)	L8-09	Short Circuit Detect	L7-06	Torq Limit I Time (s)	L7-06	Torq Limit I Time (s)		

Protection Object – Class 110 (6Eh) Instance 1								
Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
46 (2Eh)	L8-10	Ground Fault Select	L8-01	DB Resistor Protect	L8-01	DB Resistor Protect	L8-01	DB Resistor Protect
47 (2Fh)	L8-11	Drive OL Select	L8-02	OverHeat PreAlrm Lvl (°C)	L8-02	OverHeat PreAlrm Lvl (°C)	L8-02	OverHeat PreAlrm Lvl (°C)
48 (30h)	L8-12	AVR Select	L8-03	Over Heat Pre-Alarm	L8-03	Over Heat Pre-Alarm Select	L8-03	Over Heat Pre-Alarm
49 (31h)	L8-13	Aging Mode	L8-04	OH1 Fault Lvl (%)	L8-04	OH1 Fault Lvl (%)	L8-04	OH1 Fault Lvl (%)
50 (32h)	L8-14	UV3 Detect	L8-05	Input Phase Loss Select	L8-05	Input Phase Loss Select	L8-05	Input Phase Loss Select
51 (33h)	L8-15	Low Spd OL2 Freq	L8-06	Input Phase Loss Lvl	L8-06	Input Phase Loss Lvl	L8-06	Input Phase Loss Lvl
52 (34h)	L8-16	OL2 Zero Hz Gain	L8-07	Output Phase Loss Select	L8-07	Output Phase Loss Select	L8-07	Output Phase Loss Select
53 (35h)	L8-17	IGBT Select @ Low Spd	L8-08	Output Phase Loss Lvl	L8-08	Output Phase Loss Lvl	L8-08	Output Phase Loss Lvl
54 (36h)	L8-18	L-Spd Carrier Freq	L8-09	Ground Fault Select	L8-09	Ground Fault Select	L8-09	Ground Fault Select
55 (37h)	L8-19	OL2 Select @ Low Spd	L8-10	Fan On/Off Select	L8-10	Fan On/Off Select	L8-10	Fan On/Off Select
56 (38h)	L8-20	L-Spd Fc Time	L8-11	Fan Delay Time (s)	L8-11	Fan Delay Time (s)	L8-11	Fan Delay Time (s)
57 (39h)			L8-12	Ambient Temperature (°C)	L8-12	Ambient Temperature (°C)	L8-12	Ambient Temperature (°C)
58 (3Ah)			L8-13	UV3 Detect	L8-13	UV3 Detect	L8-13	UV3 Detect
59 (3Bh)			L8-14	Inverter OL Se	L8-14	Inverter OL Se	L8-14	Inverter OL Se
60 (3Ch)			L8-15	OL2 Select @ Low Spd	L8-15	OL2 Select @ Low Spd	L8-15	OL2 Select @ Low Spd
61 (3Dh)			L8-16	Low Spd OL2 Freq	L8-16	Low Spd OL2 Freq	L8-16	Low Spd OL2 Freq
62 (3Eh)			L8-17	OL2 0Hz Gain	L8-17	OL2 0Hz Gain	L8-17	OL2 0Hz Gain
63 (3Fh)			L8-18	Soft CLA Select	L8-18	Soft CLA Select	L8-18	Soft CLA Select
64 (40h)			L8-19	Low Spd Carrier Freq			L8-19	Low Spd Carrier Freq
65 (41h)					L8-20	CF Select		
66 (42h)					L8-21	CF Retry Count		
67 (43h)			L4-06	Ref @ Ref Loss (%)	L4-06	Ref @ Ref Loss (%)	L4-06	Ref @ Ref Loss (%)
68 (44h)					L8-22	Vcn Control Select		
69 (45h)					L8-23	Vcn Filter @ Start		
70 (46h)					L8-24	Vcn Filter @ Stop		
71 (47h)					L8-25	Vcn Detect Current		
72 (48h)			L3-11	OV Inhibit Select	L3-11	OV Inhibit Select		
73 (49h)			L3-12	OV Inhibit Volt Lvl (V)	L3-12	OV Inhibit Volt Lvl (V)		
74 (4Ah)			L7-07	Torq Limit Select	L7-07	Torq Limit Select		
75 (4Bh)					L8-26	CF Detect Mask		
76 (4Ch)					L3-13	OV Prevent Gain		
77 (4Dh)	Reserved							
...								
99 (63h)								
100 (64h)					L8-33	CF2 Select		

## ◆ Class 111 (6Fh) - Yaskawa Operator Parameter Object

Operator Object – Class 111 (6Fh) Instance 1								
Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
1	o1-01	User Monitor Select	o1-01	User Monitor Select	o1-01	User Monitor Select	o1-01	User Monitor Select
2	o1-02	Pwr On Monitor	o1-02	Pwr On Monitor	o1-02	Pwr On Monitor	o1-02	Pwr On Monitor
3	o1-03	Display Scaling	o1-03	Display Scaling	o1-03	Display Scaling	o1-03	Display Scaling
4	o1-04	V/f Display Unit	o1-04	V/f Display Unit	o1-04	V/f Display Unit		
5	o1-05	Address Display Select	o1-05	LCD Contrast	o1-05	LCD Contrast	o1-05	LCD Contrast
6	o2-01	Local/Remote Key	o2-01	Local/Remote Key	o2-01	Local/Remote Key	o2-01	Local/Remote Key
7	o2-02	Operator Stop Key	o2-02	Operator Stop Key	o2-02	Operator Stop Key	o2-02	Operator Stop Key
8	o2-03	User Defaults	o2-03	User Defaults	o2-03	User Defaults	o2-03	User Defaults
9	o2-04	Drive Model	o2-04	Drive Model	o2-04	Drive Model	o2-04	Drive Model
10 (Ah)	o2-05	Operator MOP	o2-05	Operator MOP	o2-05	Operator MOP	o2-05	Operator MOP
11 (Bh)	o2-06	Operator Detect	o2-06	Operator Detect	o2-06	Operator Detect	o2-06	Operator Detect
12 (Ch)	o2-07	Elapsed Time Set (H)	o2-07	Elapsed Time Set (H)	o2-07	Elapsed Time Set (H)	o2-07	Elapsed Time Set (H)
13 (Dh)	o2-08	Elapsed Time Select	o2-08	Elapsed Time Select	o2-08	Elapsed Time Select	o2-08	Elapsed Time Select
14 (Eh)	o2-09	Init Mode Select	o2-09	Init Mode Select	o2-09	Init Mode Select	o2-09	Init Mode Select
15 (Fh)			o2-10	Fan On Time (H)	o2-10	Fan On Time (H)	o2-10	Fan On Time (H)
16 (10h)			o2-11	Test Mode Select	o2-11	Test Mode Select		
17 (11h)			o2-12	Fault Trace Init	o2-12	Fault Trace Init	o2-12	Fault Trace Init
18 (12h)			o2-13	PUF Cont Detect Select	o2-13	PUF Cont Detect Select	o2-13	PUF Cont Detect Select
19 (13h)			o2-14	kWH Monitor Clear	o2-14	kWH Monitor Clear	o2-14	kWH Monitor Clear
20 (14h)							o2-15	HAND Function Key Select
21 (15h)								
22 (16h)			o3-01	COPY Function Select	o3-01	COPY Function Select	o3-01	COPY Function Select
23 (17h)			o3-02	Copy Allowable Select	o3-02	Copy Allowable Select	o3-02	Copy Allowable Select
24 (18h)					o1-06	User Monitor Mode Select	o1-06	User Monitor Mode Select
25 (19h)					o1-07	User Monitor Line 2 Select	o1-07	User Monitor Line 2 Select
26 (1Ah)					o1-08	User Monitor Line 3 Select	o1-08	User Monitor Line 3 Select

## ◆ Class 112 (70h) - Yaskawa Factory Adjustments Parameter Object

Yaskawa Factory Adjustments Parameter Object – Class 112 (70h)								
Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
1	P1-01	CASE Parameter 1			N1-01	Hunting Prevention Select		
2	P1-02	CASE Parameter 2			N1-02	Hunting Prevent Gain		
3	P1-03	CASE Parameter 3			N1-03	Hunting Prevent Time		
4	P1-04	CASE Parameter 4			N-104	Hunting Prevent Gain		
5	P1-05	CASE Parameter 5			N2-01	AFR Gain		
6	P1-06	CASE Parameter 6			N2-02	AFR Time Constant (ms)		
7	P1-07	CASE Parameter 7			N2-03	AFR Time Constant 2 (ms)		
8	P1-08	CASE Parameter 8			N2-04	AFR Limit		
9	P1-09	CASE Parameter 9			N3-01	Hi Slip Brake Dec Freq (%)		
10 (Ah)	P1-10	CASE Parameter 10			N3-02	Hi Slip Brake Current (%)		
11 (Bh)					N3-03	Hi Slip Brake Dwell Tm (s)		
12 (Ch)					N3-04	Hi Slip Brake OL Time (s)		
13 (Dh)					N3-05	HSB V/F Gain		
14 (Eh)					N3-06	Spd Agree Current		
15 (Fh)					N3-07	Spd Agree Time		
16 (10h)					N3-08	HSB V Lvl 1		
17 (11h)	P2-01	CASE Parameter 11			N3-09	HSB V Lvl 2		
18 (12h)	P2-02	CASE Parameter 12			N3-10	HSB RI Comp Coef		
19 (13h)	P2-03	CASE Parameter 13			N3-11	HSB RI Comp Time		
20 (14h)	P2-04	CASE Parameter 14			N3-12	Prohibit HSB Dec		
21 (15h)	P2-05	CASE Parameter 15			N4-01	Flux Observer		
22 (16h)	P2-06	CASE Parameter 16			N4-02	Observer Comp		
23 (17h)	P2-07	CASE Parameter 17			N4-03	Observer Filter		
24 (18h)	P2-08	CASE Parameter 18			N4-04	Observer Volt Comp		
25 (19h)	P2-09	CASE Parameter 19			N4-05	Observer I Time		
26 (1Ah)	P2-10	CASE Parameter 20			N4-06	Spd Estimate Gain		
27 (1Bh)					N4-07	Spd Estimate I Time (ms)		
28 (1Ch)					N4-08	Spd Estimate P Gain		
29 (1Dh)					N4-09	Observer I Time High Spd		
30 (1Eh)					N4-10	Observer P Gain High Spd		
31 (1Fh)					N4-11	Spd Change Freq		
32 (20h)					N4-12	Spd Change Time		
33 (21h)	P3-01	CASE Parameter 21			N4-13	Slip Limit Coef		
34 (22h)	P3-02	CASE Parameter 22			N4-14	PH Comp I Limit		
35 (23h)	P3-03	CASE Parameter 23			N4-15	Low Spd Regen Coef 1		
36 (24h)	P3-04	CASE Parameter 24			N4-16	Change T Gain		
37 (25h)	P3-05	CASE Parameter 25			N4-17	Torq Adjust Gain		
38 (26h)	P3-06	CASE Parameter 26			N4-18	Feeder Resistance Gain		
39 (27h)	P3-07	CASE Parameter 27			N4-19	Low Spd Flux Comp		
40 (28h)	P3-08	CASE Parameter 28			N4-20	Low Spd Comp Limit		
41 (29h)	P3-09	CASE Parameter 29			N4-21	Spd Comp P Gain 1		
42 (2Ah)	P3-10	CASE Parameter 30			N4-22	Spd Comp P Gain 2		
43 (2Bh)					N4-23	Spd Comp Filter Time		
44 (2Ch)					N4-24	Phase Comp P Gain		
45 (2Dh)					N4-25	Phase Comp I Time		
46 (2Eh)					N4-26	Phase Comp Filter Time		
47 (2Fh)					N4-27	Phase Comp Hi Spd Gain		
48 (30h)					N4-28	Spd Change 2		

**Yaskawa Factory Adjustments Parameter Object – Class 112 (70h)**

Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
49 (31h)					N5-01	Feed Fwd Select		
50 (32h)					N5-02	Motor Acc Time (s)		
51 (33h)					N5-03	Feed Fwd Gain		
52 (34h)					N5-04	Spd Response Freq		
53 (35h)					N4-29	Torq Adjust Gain 2		
54 (36h)					N4-30	Low Spd Regen Coef 2		
55 (37h)					N4-31	Volt Comp Filter Time		
56 (38h)					N4-32	Spd Est Gain Freq 1 (HZ)		
57 (39h)					N4-33	Spd Est Gain Freq 2 (HZ)		
58 (3Ah)					N4-34	Spd Estimate Gain Rate		
59 (3Bh)					N4-35	U1-48 Reduce Gain		
60 (3Ch)					N4-36	U1-05 Monitor Filter		
61 (3Dh)					N4-37	R1 Online Comp Value		
62 (3Eh)					N4-38	R1 Online Comp Limit		
63 (3Fh)					N4-39	Flux Lvl @ Low Freq (%)		
64 (40h)					N4-40	Current Coef @ Low Spd		
65 (41h)					N4-41	R1 Online Tune Select		
66 (42h)					N4-42	R1 Online Display Lvl		
67 (43h)					N4-43	Spd Estimation Comp Gain		
68 (44h)	Reserved							
...								
80 (50h)								
81 (51h)					N9-01	Inv Rate Current		
82 (52h)					N9-02	DCCT Gain		
83 (53h)					N9-03	ACR q Gain		
84 (54h)					N9-04	ACR q I Time		
85 (55h)					N9-05	ACR q Limit		
86 (56h)					N9-06	ACR d Gain		
87 (57h)					N9-07	ACR d I Time		
88 (58h)					N9-08	ACR d Limit		
89 (59h)					N9-09	AVR Select		
90 (5Ah)					N9-10	AVR Time		
91 (5Bh)					N9-11	ON Delay Time		
92 (5Ch)					N9-12	ON Delay Comp 1		
93 (5Dh)					N9-13	IGBT Volt Drop 1		
94 (5Eh)					N9-14	Pwr Angle Filter 1		
95 (5Fh)					N9-15	Pwr Angle Filter 2		
96 (60h)					N9-16	Idfb Filter		
97 (61h)					N9-17	R Idfb Filter		
98 (62h)					N9-18	L-Tuning Filter		
99 (63h)					N9-19	DCCT Filter Time		
100 (64h)					N9-20	Soft CLA Gain		
101 (65h)					N9-21	Soft CLA Filter		
102 (66h)					N9-22	Soft CLA Lvl 1		
103 (67h)					N9-23	Soft CLA Lvl 2		
104 (68h)					N9-24	Soft CLA Switch Freq		
105 (69h)					N9-25	Soft CLA Lvl 3		
106 (6Ah)					N9-26	On Delay Comp Lvl		
107 (6Bh)					N9-27	IGBT Gain		
108 (6Ch)					N9-28	Aging Test Mode		
109 (6Dh)					N9-29	IGBT Volt Drop 2		

Yaskawa Factory Adjustments Parameter Object – Class 112 (70h)								
Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
110 (6Eh)					N9-30	IGBT Volt Drop 3		
111 (6Fh)					N9-31	ON Delay Comp 2		
112 (70h)					N9-32	ON Delay Comp 3		
113 (71h)					N9-33	IGBT Coef 1		
114 (72h)					N9-34	IGBT Coef 2		
115 (73h)					N9-35	IGBT Coef 3		
116 (74h)					N9-36	IGBT Comp I		

## ◆ Class 113 (71h) - Yaskawa CASE Parameter Object

CASE Object – Class 113 (71h) Instance 1								
Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
1			P1-01	CASE Parameter 1	P1-01	CASE Parameter 1	P1-01	CASE Parameter 1
2			P1-02	CASE Parameter 2	P1-02	CASE Parameter 2	P1-02	CASE Parameter 2
3			P1-03	CASE Parameter 3	P1-03	CASE Parameter 3	P1-03	CASE Parameter 3
4			P1-04	CASE Parameter 4	P1-04	CASE Parameter 4	P1-04	CASE Parameter 4
5			P1-05	CASE Parameter 5	P1-05	CASE Parameter 5	P1-05	CASE Parameter 5
6			P1-06	CASE Parameter 6	P1-06	CASE Parameter 6	P1-06	CASE Parameter 6
7			P1-07	CASE Parameter 7	P1-07	CASE Parameter 7	P1-07	CASE Parameter 7
8			P1-08	CASE Parameter 8	P1-08	CASE Parameter 8	P1-08	CASE Parameter 8
9			P1-09	CASE Parameter 9	P1-09	CASE Parameter 9	P1-09	CASE Parameter 9
10 (Ah)			P1-10	CASE Parameter 10	P1-10	CASE Parameter 10	P1-10	CASE Parameter 10
11 (Bh)			P2-01	CASE Parameter 11	P2-01	CASE Parameter 11	P2-01	CASE Parameter 11
12 (Ch)			P2-02	CASE Parameter 12	P2-02	CASE Parameter 12	P2-02	CASE Parameter 12
13 (Dh)			P2-03	CASE Parameter 13	P2-03	CASE Parameter 13	P2-03	CASE Parameter 13
14 (Eh)			P2-04	CASE Parameter 14	P2-04	CASE Parameter 14	P2-04	CASE Parameter 14
15 (Fh)			P2-05	CASE Parameter 15	P2-05	CASE Parameter 15	P2-05	CASE Parameter 15
16 (10h)			P2-06	CASE Parameter 16	P2-06	CASE Parameter 16	P2-06	CASE Parameter 16
17 (11h)			P2-07	CASE Parameter 17	P2-07	CASE Parameter 17	P2-07	CASE Parameter 17
18 (12h)			P2-08	CASE Parameter 18	P2-08	CASE Parameter 18	P2-08	CASE Parameter 18
19 (13h)			P2-09	CASE Parameter 19	P2-09	CASE Parameter 19	P2-09	CASE Parameter 19
20 (14h)			P2-10	CASE Parameter 20	P2-10	CASE Parameter 20	P2-10	CASE Parameter 20
21 (15h)			P3-01	CASE Parameter 21	P3-01	CASE Parameter 21	P3-01	CASE Parameter 21
22 (16h)			P3-02	CASE Parameter 22	P3-02	CASE Parameter 22	P3-02	CASE Parameter 22
23 (17h)			P3-03	CASE Parameter 23	P3-03	CASE Parameter 23	P3-03	CASE Parameter 23
24 (18h)			P3-04	CASE Parameter 24	P3-04	CASE Parameter 24	P3-04	CASE Parameter 24
25 (19h)			P3-05	CASE Parameter 25	P3-05	CASE Parameter 25	P3-05	CASE Parameter 25
26 (1Ah)			P3-06	CASE Parameter 26	P3-06	CASE Parameter 26	P3-06	CASE Parameter 26
27 (1Bh)			P3-07	CASE Parameter 27	P3-07	CASE Parameter 27	P3-07	CASE Parameter 27
28 (1Ch)			P3-08	CASE Parameter 28	P3-08	CASE Parameter 28	P3-08	CASE Parameter 28
29 (1Dh)			P3-09	CASE Parameter 29	P3-09	CASE Parameter 29	P3-09	CASE Parameter 29
30 (1Eh)			P3-10	CASE Parameter 30	P3-10	CASE Parameter 30	P3-10	CASE Parameter 30
31 (1Fh)	Reserved							
...								
64 (40h)								
65 (41h)					N9-47	+U On Delay		
66 (42h)					N9-48	-U On Delay		
67 (43h)					N9-49	+V On Delay		
68 (44h)					N9-50	-V On Delay		
69 (45h)					N9-51	+W On Delay		
70 (46h)					N9-52	-W On Delay		
71 (47h)					N9-53	On Delay Tune I		
72 (48h)					N9-54	On Delay Tune Run T		
73 (49h)					N9-55	On Delay Tune BB T		
74 (4Ah)					N9-56	On Delay Tune FC		
75 (4Bh)					N9-57	On Delay Gain Width		
76 (4Ch)					N9-58	Vsat ACRq Comp		
77 (4Dh)					N9-59	VDC Filer Time 2		



## ◆ Class 114 (72h) - Yaskawa Auto Tune Parameter Object

Auto Tune Object – Class 114 (72h) Instance 1								
Attr	G5M		F7U		G7U		P7U	
	Prm	Text	Prm	Text	Prm	Text	Prm	Text
1			T1-00	Motor Select				
2			T1-01	Tune Mode Select	T1-01	Tune Mode Select		
3			T1-02	Motor Rated Pwr (kW)	T1-02	Motor Rated Pwr (kW)	T1-02	Motor Rated Pwr (kW)
4			T1-03	Motor Rated Volt (VAC)	T1-03	Motor Rated Volt (VAC)		
5			T1-04	Motor Rated Current (A)	T1-04	Motor Rated Current (A)	T1-04	Motor Rated Current (A)
6			T1-05	Motor Rated Freq (Hz)	T1-05	Motor Rated Freq (Hz)		
7			T1-06	Number of Poles	T1-06	Number of Poles		
8			T1-07	Motor Rated Spd (RPM)	T1-07	Motor Rated Spd (RPM)		
9			T1-08	PG Pulses @ Tuning (PPR)				

## Hexadecimal/Decimal Conversion

Hexadecimal/Decimal Conversions											
Hex	Decimal	Hex	Decimal	Hex	Decimal	Hex	Decimal	Hex	Decimal	Hex	Decimal
0	0	34	52	68	104	9C	156	D0	208		
1	1	35	53	69	105	9D	157	D1	209		
2	2	36	54	6A	106	9E	158	D2	210		
3	3	37	55	6B	107	9F	159	D3	211		
4	4	38	56	6C	108	A0	160	D4	212		
5	5	39	57	6D	109	A1	161	D5	213		
6	6	3A	58	6E	110	A2	162	D6	214		
7	7	3B	59	6F	111	A3	163	D7	215		
8	8	3C	60	70	112	A4	164	D8	216		
9	9	3D	61	71	113	A5	165	D9	217		
A	10	3E	62	72	114	A6	166	DA	218		
B	11	3F	63	73	115	A7	167	DB	219		
C	12	40	64	74	116	A8	168	DC	220		
D	13	41	65	75	117	A9	169	DD	221		
E	14	42	66	76	118	AA	170	DE	222		
F	15	43	67	77	119	AB	171	DF	223		
10	16	44	68	78	120	AC	172	E0	224		
11	17	45	69	79	121	AD	173	E1	225		
12	18	46	70	7A	122	AE	174	E2	226		
13	19	47	71	7B	123	AF	175	E3	227		
14	20	48	72	7C	124	B0	176	E4	228		
15	21	49	73	7D	125	B1	177	E5	229		
16	22	4A	74	7E	126	B2	178	E6	230		
17	23	4B	75	7F	127	B3	179	E7	231		
18	24	4C	76	80	128	B4	180	E8	232		
19	25	4D	77	81	129	B5	181	E9	233		
1A	26	4E	78	82	130	B6	182	EA	234		
1B	27	4F	79	83	131	B7	183	EB	235		
1C	28	50	80	84	132	B8	184	EC	236		
1D	29	51	81	85	133	B9	185	ED	237		

**Hexadecimal/Decimal Conversions**

Hex	Decimal	Hex	Decimal	Hex	Decimal	Hex	Decimal	Hex	Decimal
1E	30	52	82	86	134	BA	186	EE	238
1F	31	53	83	87	135	BB	187	EF	239
20	32	54	84	88	136	BC	188	F0	240
21	33	55	85	89	137	BD	189	F1	241
22	34	56	86	8A	138	BE	190	F2	242
23	35	57	87	8B	139	BF	191	F3	243
24	36	58	88	8C	140	C0	192	F4	244
25	37	59	89	8D	141	C1	193	F5	245
26	38	5A	90	8E	142	C2	194	F6	246
27	39	5B	91	8F	143	C3	195	F7	247
28	40	5C	92	90	144	C4	196	F8	248
29	41	5D	93	91	145	C5	197	F9	249
2A	42	5E	94	92	146	C6	198	FA	250
2B	43	5F	95	93	147	C7	199	FB	251
2C	44	60	96	94	148	C8	200	FC	252
2D	45	61	97	95	149	C9	201	FD	253
2E	46	62	98	96	150	CA	202	FE	254
2F	47	63	99	97	151	CB	203	FF	255
30	48	64	100	98	152	CC	204	100	256
31	49	65	101	99	153	CD	205		
32	50	66	102	9A	154	CE	206		
33	51	67	103	9B	155	CF	207		

# Notes

# Chapter 3 Automatic Device Recovery

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*This section describes the Automatic Device Recovery feature of the DeviceNet Option Card.*

Overview.....	3-2
Setup .....	3-2
Replace a Faulted Drive.....	3-4

# Overview

Automatic Device Recovery allows a faulted device to be replaced by another device with minimal intervention by the user. The replacement device must match the faulted device in all major aspects. For replacing a faulted Yaskawa drive, the replacement drive must at least match the device type, Vendor ID, product code and drive control mode.

## Setup

It is necessary to set up the network and the devices on the network for Automatic Device Recovery.

### ◆ Network Configuration

Verify that all devices on the network are present, at their appropriate node addresses and properly configured.

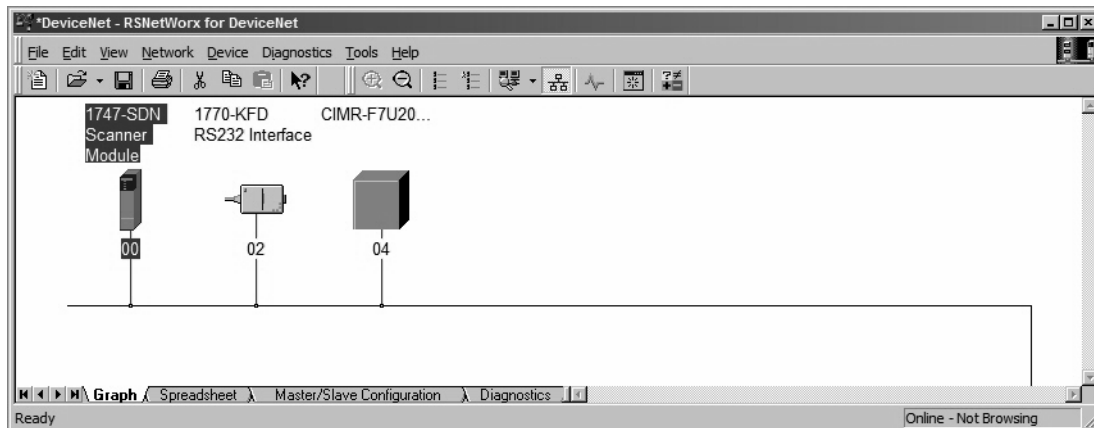


Fig 3.1 – Network Configuration

### ◆ Select Scanner → Properties

Automatic Device Recovery is only available to those devices in the scan list and configured for ADR. Select the Scanner Module and Properties.

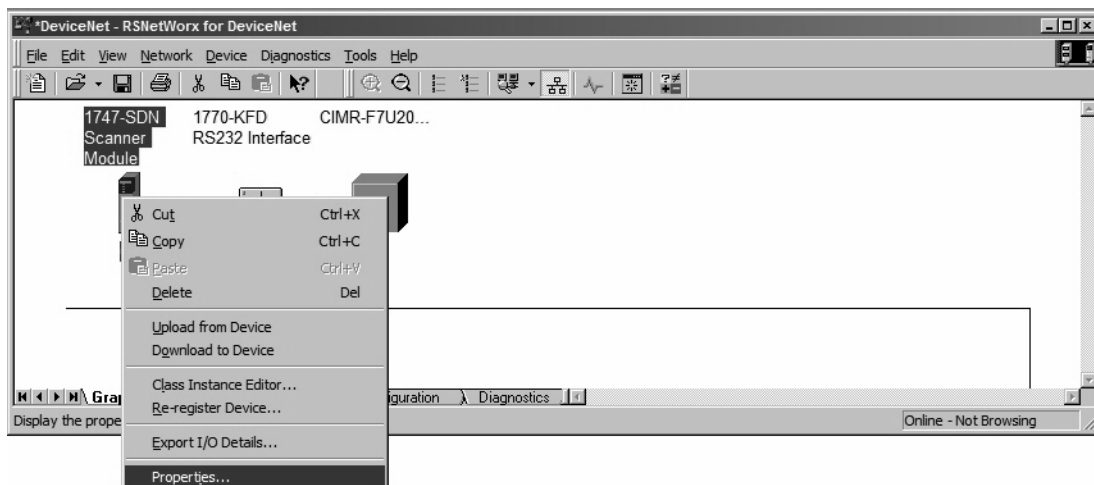


Fig 3.2 – Scanner Properties

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## ◆ Upload Scan List Configuration

Upload the current network configuration from the scanner.

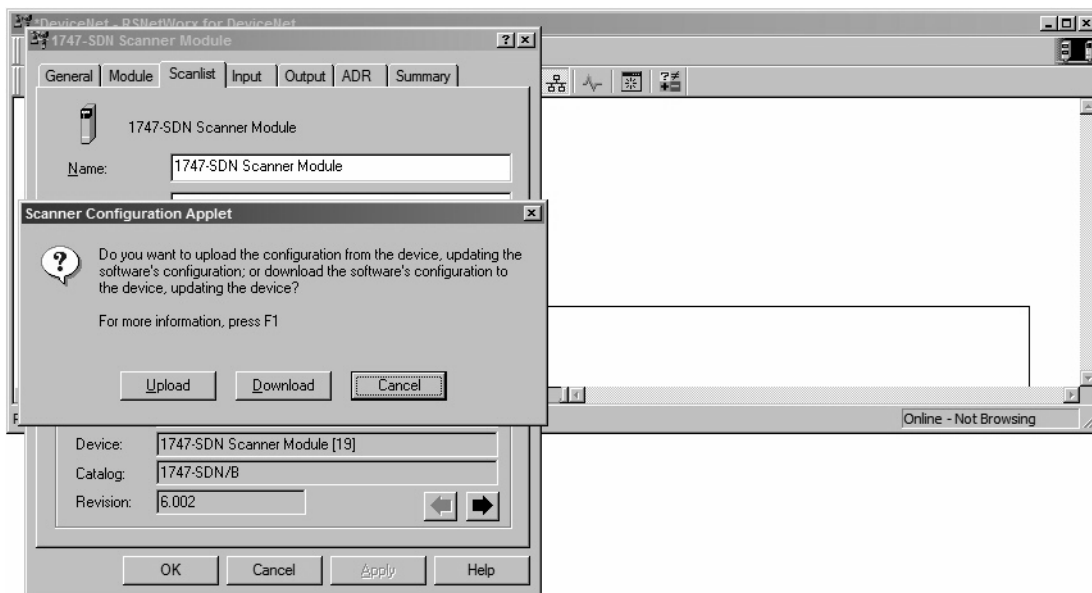


Fig 3.3 – Upload Scan List Configuration

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## ◆ Verify Scan List – Electronic Keying

Verify that all network devices appear on the scan list and are properly configured. Select each device and then select the items for that device's electronic key. The electronic key specifies which data must match exactly between the faulted device and its replacement.

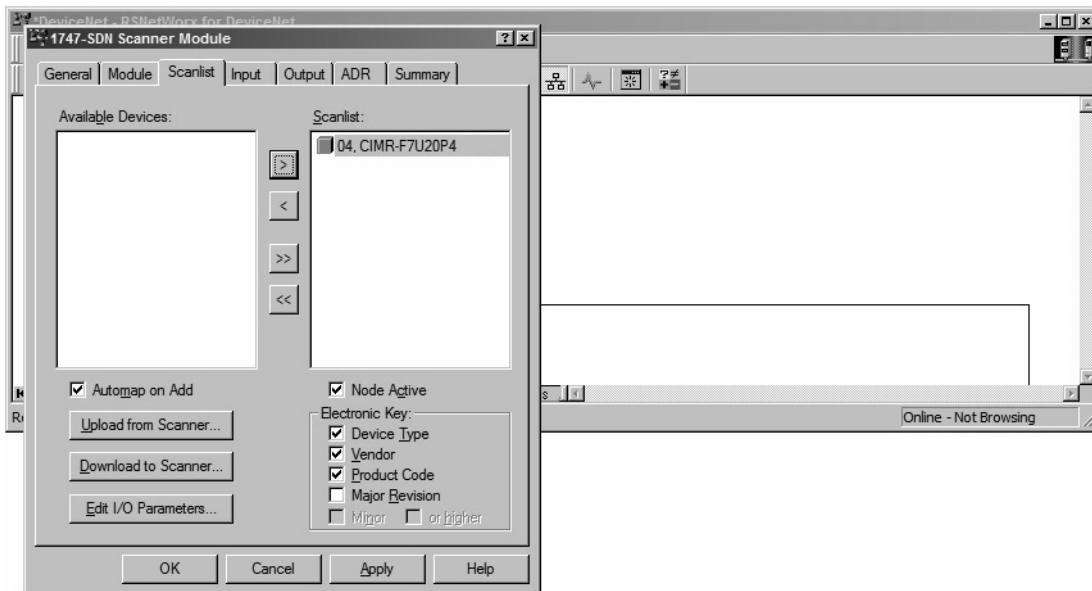


Fig 3.4 – Set Devices' Electronic Key

## ◆ Set Drive ADR Configuration

After the scan list has been verified and the electronic keys have been entered for the devices on the network, select the ADR tab and highlight the device. Check **Enable Auto-Address Recovery**, then select **Load Device Config**. Check **Configuration Recovery**, then check **Auto-Address Recovery**. Once the ADR settings for all devices have been entered, select **Download to Scanner** to save the ADR configuration data to the scanner.

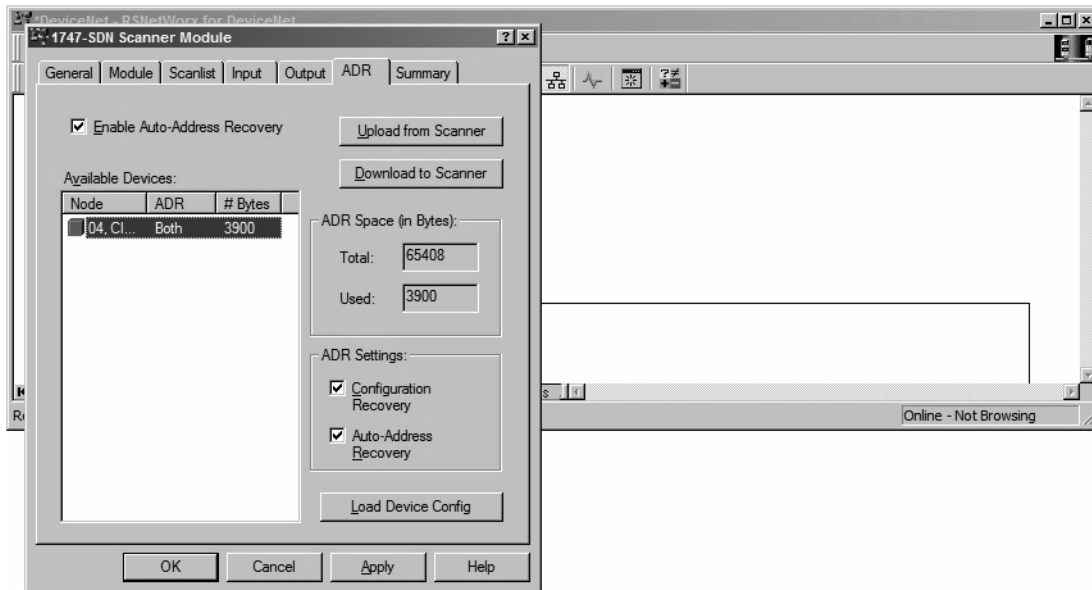


Fig 3.5 – Device ADR Configuration

## Replace a Faulted Drive

Verify that the replacement drive is identical to the faulted drive. The replacement drive must be of the same drive family (F7U, G7U, etc.) and same drive model (20P4, 4130, etc.) as the faulted drive.

Verify that the main power has been shut off and locked out and that there is no voltage present at the drive. Connect the replacement drive's power and motor leads. Refer to the appropriate drive user and/or technical manual for the proper way to connect the drive. Install the *DeviceNet Option Card* but do not connect it to the DeviceNet network. Set the *DeviceNet Option Card* baud rate switch to 9 for **Auto Sense** and set the MAC ID address switches to 99. With the motor's load disconnected, apply power to the drive and verify that it functions properly from the operator keypad.

Set the drive control mode to the control mode of the faulted drive and remove power from the drive. Set the *DeviceNet Option Card* MAC ID address switches to 63. Reapply power to the drive.

Auto-tune the drive.

Connect the *DeviceNet Option Card* to the DeviceNet network.

# Chapter 4 Product Description

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*This section describes the DeviceNet Option Card.*

Product Description ..... 4-2



# Product Description

Table 4.1 – Product Description	
Item	Description
Current (Network)	100 mA
Operating Voltage (Network)	11 ~ 25VDC
Operating Temperature	-10°C to 45°C
Storage Temperature	-20°C to 60°C
Humidity	95% RG (non-condensing)
Vibration	1G @ 20Hz, 0.2G @ 20 to 50Hz
Altitude	3300 ft or less

# Chapter 5 Cable Specification

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*This section describes the DeviceNet Option Card Cable Requirements.*

Cable Specifications.....	5-2
Cable Length.....	5-3

# Cable Specifications

## ◆ Thick Cable

This cable consists of two shielded pairs of wire twisted on a common axis with a drain wire in the center. It is covered with an overall braid shield.

- One 18AWG twisted pair signal wire (Blue & White)
- One 15AWG twisted pair power wire (Red & Black)
- Separate aluminized mylar shields around the signal and power wires
- Overall foil/braid shield with 18AWG drain wire

Table 5.1 – DeviceNet Thick Cable					
Belden Wire & Cable Co.					
Part #	Pair	AWG	Insulation	Outer Jacket	Color
3082A	Data	18	Datalene	PVC	Lt. Gray
	Power	15	PVC/Nylon		
3083A	Data	18	Datalene	PVC	Yellow CPE
	Power	15	PVC/Nylon		
Berk-Tek.					
Part #	Pair	AWG	Insulation	Outer Jacket	Color
210051	Data	18	FPE/HDPE	PVC	Lt. Gray
	Power	15	PVC/Nylon		

## ◆ Thin Cable

This cable consists of two shielded pairs of wire twisted on a common axis with a drain wire in the center. It is covered with an overall braid shield.

- One 24AWG twisted pair signal wire (Blue & White)
- One 22AWG twisted pair power wire (Red & Black)
- Separate aluminized mylar shields around the signal and power wires
- Overall foil/braid shield with 22AWG drain wire

Table 5.2 – DeviceNet Thin Cable					
Belden Wire & Cable Co.					
Part #	Pair	AWG	Insulation	Outer Jacket	Color
3084A	Data	24	Datalene	PVC	Lt. Gray
	Power	22	PVC/Nylon		
3085A	Data	24	Datalene	PVC	Yellow CPE
	Power	22	PVC/Nylon		
Berk-Tek.					
Part #	Pair	AWG	Insulation	Outer Jacket	Color
210144	Data	24	FPE/HDPE	PVC	Lt. Gray
	Power	22	PVC/Nylon		

# Cable Length

## ◆ Trunk Line

The maximum allowed trunk line length depends on the type of cable used and the network baud rate. The total cable length includes the length of the trunk and the sum of all the drop lines.

Baud Rate	Thick Cable	Thin Cable
125 kbaud	500 m	100 m
250 kbaud	250 m	
500 kbaud	100 m	

For trunk lines of mixed thick and thin cables, the total length at the various baud rates:

- o 125 kbaud:  $L_{\text{thick}} + (5 \times L_{\text{thin}}) = 500 \text{ m}$
- o 250 kbaud:  $L_{\text{thick}} + (2.5 \times L_{\text{thin}}) = 250 \text{ m}$
- o 500 kbaud:  $L_{\text{thick}} + L_{\text{thin}} = 100 \text{ m}$

## ◆ Drop Line

The drop line is measured from the tap on the trunk line to the transceiver of the DeviceNet node. Note that the total cable length includes the length of the trunk and the sum of all the drop lines.

Baud Rate	Maximum @ Each	Maximum Total
125 kbaud	6 m	156 m
250 kbaud		78 m
500 kbaud		39 m

# Notes

# Chapter 6 Troubleshooting

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*This section describes troubleshooting the DeviceNet Option Card.*

Verify the Drive .....	6-2
LED States .....	6-2
DeviceNet Faults.....	6-3
Network Wiring .....	6-5

# Verify the Drive

Remove power from the drive and wait for the charge lamp to be completely extinguished. Wait at least five additional minutes for the drive to be completely discharged. Measure the DC bus voltage and verify that it is at a safe level.

**⚠ WARNING!**

Dangerous voltages in excess of 400VDC (230V drives) or 800VDC (460V drives) are present at the DC bus terminals of the drive.

Remove the DeviceNet Option Card. Reapply power to the drive and verify that the drive runs as expected without the DeviceNet Option Card installed.

If the drive runs as expected, remove power from the drive, following the guidelines described above, and reinstall the DeviceNet Option Card. With the DeviceNet Option Card installed, reapply power to the drive.

## LED States

The operational state of the *DeviceNet Option Card* LEDs after the DeviceNet diagnostic LED sequence has been completed is described below. Please wait at least 10 seconds for the loading process to complete before verifying the states of the LEDs. Compare the state of the DeviceNet Option Card LEDs with the states listed in the table below to determine the nature of the fault.

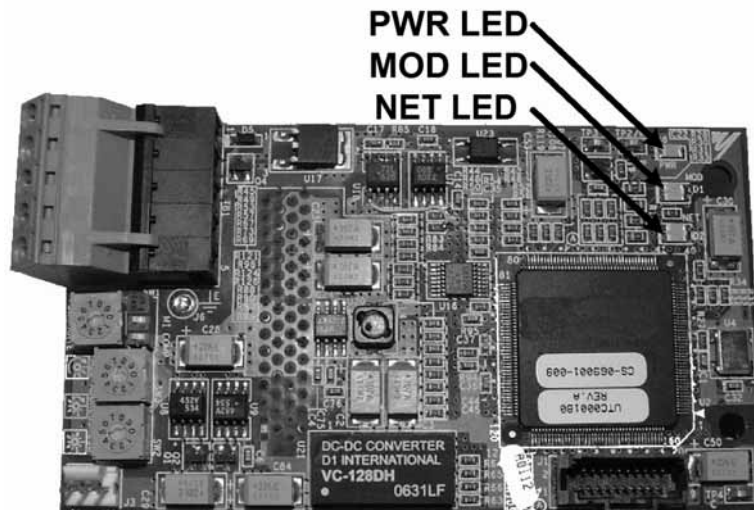


Fig 6.1 – DeviceNet Option LEDs

LED	State	Indicates	
MOD	Off	No Power	Verify that the DeviceNet Option Card is properly installed. Verify that the drive connected properly and is powered.
	<b>On Green</b>	<b>Device Operational</b>	Normal operation
	Flash Green	Device in Standby	Drive not configured on the network.
	Flash Red	Minor Fault	Recoverable fault
	On Red	Unrecoverable Fault	Cycle power to the DeviceNet Option Card. If fault continues replace the card.
	Flash Red-Green	Device Self-Test	Self-Test mode
NET	Off	Not Powered/Not Online	Verify that the DeviceNet Option Card is properly installed. Verify that the DeviceNet Option Card is properly connected to the network. Verify that the drive connected properly and is powered.
	Flash Green	Online/Not Connected	Check network configuration. Check PLC and DeviceNet scanner.
	<b>On Green</b>	<b>Link OK/Online and Connected</b>	Normal operation
	Flash Red	Connection Timeout	Check network connections. Check PLC and DeviceNet scanner.
	On Red	Critical Link Failure	Check for duplicate MAC ID. Check for faulty network connection. Check 24VDC power supply voltage. Check for proper installation of the termination resistors.
	Flash Red & Green	Communication Faulted	Check duplicate MAC IDs.

## DeviceNet Faults

The table of *DeviceNet Option Card* fault codes returned by the drive is shown below. Refer to the appropriate drive user and/or programming manual(s) for drive specific information on the fault returned.

Drive Code	DeviceNet Code	Description	
0h	0000h	None	
1h	5120h	DC Bus Fuse Open (PUF)	Output Transistor Failure – Replace the drive.
2h	3220h	DC Bus Undervoltage (UV1)	Input power fluctuation too large
3h	5110h	CTL PS Undervoltage (UV2)	Cycle drive power – Replace drive if fault continues.
4h	3222h	MC Answerback (UV3)	Cycle drive power – Replace drive if fault continues.
5h	2130h	Short Circuit (SC)	Check drive wiring. Cycle drive power – Replace drive if fault continues.
6h	2120h	Ground Fault (GF)	Check for motor and/or cable damage.
7h	2300h	Overcurrent (OC)	Check motor, motor load and acc/dec rates.
8h	3210h	DC Bus Overvoltage (OV)	Check incoming voltage. Check deceleration time.
9h	4200h	Heatsink Over-Temperature (OH)	Check ambient temperature. Check drive cooling fan.
0Ah	4210h	Heatsink Maximum Temperature (OH1)	Check drive cooling fan.
0Bh	2220h	Motor Overload (OL1)	Check the load, acc/dec and cycle times. Check motor rated current (E2-01).
0Ch	2200h	Inverter Overload (OL2)	Check the load, acc/dec and cycle times. Check drive rating.
0Dh	2221h	Overtorque Detection 1 (OL3)	Check L6-02 and L6-03 settings. Check system mechanics.
0Eh	2222h	Overtorque Detection 2 (OL4)	Check L6-05 and L6-06 settings. Check system mechanics.
0Fh	7110h	Dynamic Braking Transistor (RR)	Cycle drive power – Replace drive if fault continues.
10h	7112h	Dynamic Braking Resistor (RH)	Check load, operating speed and deceleration time.



Drive Code	DeviceNet Code	Description	
11h	9000h	External Fault 3 (EF3)	Multifunction digital input set to external fault (See H1-01 to H1-06) Circuit at terminal is closed.
12h	9000h	External Fault 4 (EF4)	
13h	9000h	External Fault 5 (EF5)	
14h	9000h	External Fault 6 (EF6)	
15h	9000h	External Fault 7 (EF7)	
16h	9000h	External Fault 8 (EF8)	
17h	4140h	Heatsink Fan (FAN)	Check drive cooling fan.
18h	7310h	Overspeed Detection (OS)	Check reference and reference gain. Check F1-08 and F1-09 settings.
19h	7310h	Speed Deviation (DEV)	Check load, acc/dec times and system mechanics. Check F1-10 and F1-11 settings.
1Ah	7301h	PG Open (PGO)	Check PG card connections.
1Bh	3130h	Input Phase Loss (PF)	Excessive input voltage fluctuation.
1Ch	3130h	Output Phase Loss (LF)	Check for broken wire/loose terminals. Check motor rating.
1Eh	5300h	Operator Disconnected (OPR)	Reconnect the digital operator.
1Eh	5300h	OPE Faults	Verify parameter settings.
1Fh	6320h	EEPROM R/W Error (ERR)	Cycle drive power – Replace drive if fault continues.
20h	0000h	No Fault	
21h	7500h	DeviceNet Communication Error (BUS)	Check DeviceNet network cable connections. Check 24VDC power supply voltage.
22h	7500h	SI-E Communications Error	Check DeviceNet Option Card installation and connections.
23h	7500h	SI-F/G Communications Error	Check DeviceNet Option Card installation and connections.
24h	7500h	SI-F/G CPU error	Cycle drive power – Replace drive if fault continues.
25h	8321h	Out of Control (CF)	Check motor parameters. Auto-tune.
26h	8313h	Zero Servo Fault (SVE)	Check load. Torque limit is too small.
27h	9000h	External Fault 0 (EF0)	Check PLC program. Check MI switch setting. Check DeviceNet Option Card LEDs for fault indication.

# Network Wiring

1.  Connector Wiring
  - The network cable wires are connected in the correct order.
  - All network wires are securely connected.
  - There are no short circuits between network wires or shield.
  - The network connector is securely inserted into the mating connector.
  
2.  Network Cable
  - The number of DeviceNet nodes does not exceed 64 on any one network.
  - No drop line is longer than 6 m.
  - The total drop length is less than the allowable length for the network baud rate and cable type.
  - The network trunk length does not exceed the allowable length for the network baud rate and cable type.
  - Network cables are not close to high power or frequency cables.
  
3.  Terminating Resistors
  - The terminating resistors are appropriately installed and are of the correct size and type.
  - Measure the DC resistance between CAN\_L and CAN\_H at the ends and middle of the network. The measurement should be between 50 ohms and 70 ohms.
  
4.  Grounding
  - Single point ground technology is used.
  - The network shield and drain wire are grounded at only one point, preferably in the center of the network.
  - The 24VDC power supply common is grounded at the same point as the network shield and drain wire.
  - Check for noise with an oscilloscope.
  
5.  24VDC Power Supply
  - Turn on the 24VDC power supply and configure all nodes for their maximum current draw.
  - Measure the voltage between V+ and V- at the power supply and at each end of the network. The voltage should not fall below 11VDC at any point on the network. If the network contains powered devices (proximity sensors, photoelectric sensors, etc.) the voltage should not fall below 20VDC.
  - The 24VDC power supply common is grounded at the single point ground.

# Notes

# CM012 DeviceNet™ Option Card YASKAWA

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## **YASKAWA ELECTRIC AMERICA, INC.**

Drives Division  
16555 W. Ryerson Rd., New Berlin, WI 53151, U.S.A.  
Phone: (800) YASKAWA (800-927-5292) Fax: (262) 782-3418  
Internet: <http://www.drives.com>

## **YASKAWA ELECTRIC AMERICA, INC.**

Chicago-Corporate Headquarters  
2121 Norman Drive South, Waukegan, IL 60085, U.S.A.  
Phone: (800) YASKAWA (800-927-5292) Fax: (847) 887-7310  
Internet: <http://www.yaskawa.com>

## **YASKAWA ELECTRIC CORPORATION**

New Pier Takeshiba South Tower, 1-16-1, Kaigan, Minatoku, Tokyo, 105-0022, Japan  
Phone: 81-3-5402-4511 Fax: 81-3-5402-4580  
Internet: <http://www.yaskawa.co.jp>

## **YASKAWA ELECTRIC EUROPE GmbH**

Am Kronberger Hang 2, 65824 Schwalbach, Germany  
Phone: 49-6196-569-300 Fax: 49-6196-888-301