

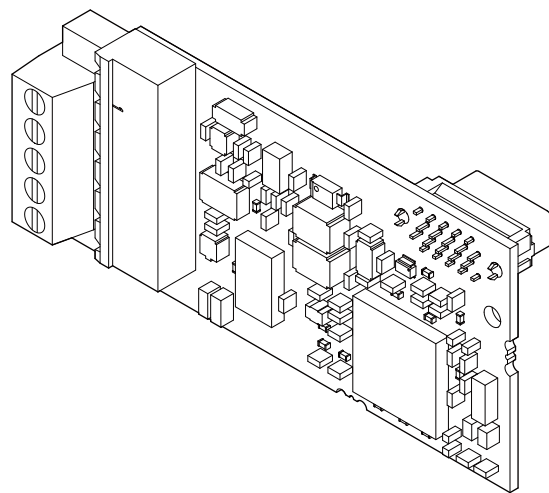


YASKAWA

YASKAWA AC Drive-Option Card DeviceNet Technical Manual

Type SI-N3

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



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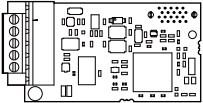
1 Preface and Safety

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

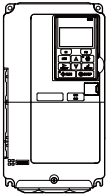
◆ Applicable Documentation

The following manuals are available for the DeviceNet Option:

Option Card

	<p>YASKAWA AC Drive-Option Card DeviceNet Installation Manual Manual No. : TOBPC73060043</p>
	<p>Read this manual first. The installation manual is packaged with the DeviceNet Option and contains a basic overview of wiring, settings, functions, and fault diagnoses.</p>
	<p>YASKAWA AC Drive-Option Card DeviceNet Technical Manual (This book) Manual No. : SIEPC73060043</p>
	<p>The technical manual contains detailed information. To obtain the technical manual access these sites: Europe: http://www.yaskawa.eu.com Japan: http://www.e-mechatronics.com Other areas: contact a Yaskawa representative.</p>

Yaskawa Drive

	<p>Refer to the manual of the drive this option card is being used with. The instruction manual for the drive covers basic installation, wiring, operation procedures, functions, troubleshooting, and maintenance information. It also includes important information on parameter settings and how to tune the drive. A Quick Start Guide is included with the drive. For the more detailed Technical Manual, visit Yaskawa's homepage. Europe: http://www.yaskawa.eu.com Japan: http://www.e-mechatronics.com Other areas: contact a Yaskawa representative</p>
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◆ Terms

Note: Indicates a supplement or precaution that does not cause drive damage.

DeviceNet Option: YASKAWA AC Drive -SI-N3 DeviceNet option card

◆ Registered Trademarks

- DeviceNet is a trademark of the ODVA.
- All trademarks are the property of their respective owners.

◆ Supplemental Safety Information

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

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

DANGER

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

WARNING

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

CAUTION

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

NOTICE

Indicates an equipment damage message.

■ General Safety

General Precautions

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

DANGER

Heed the safety messages in this manual.

Failure to comply will result in death or serious injury.

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

NOTICE

Do not expose the drive to halogen group disinfectants.

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

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

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

Do not modify the drive circuitry.

Failure to comply could result in damage to the drive and will void warranty.

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

2 Product Overview

◆ About This Product

The DeviceNet option provides a communications connection between the drive and an ODVA DeviceNet network. The SI-N3 DeviceNet Option connects the drive to a DeviceNet network and facilitates the exchange of data.

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

DeviceNet is a communications link to connect industrial devices (such as limit switches, photoelectric switches, valve manifolds, motor starters, smart motor controllers, operator interfaces, and variable frequency drives) as well as control devices (such as programmable controllers and computers) to a network. DeviceNet is a simple, networking solution that reduces the cost and time to wire and install factory automation devices, while providing interchangeability of "like" components from multiple vendors.

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

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



Figure 1 DeviceNet Approved

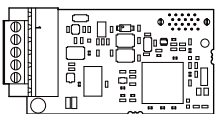



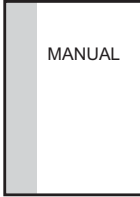
3 Receiving

Please perform the following tasks after receiving the DeviceNet Option:

- Inspect the DeviceNet Option for damage.
If the DeviceNet Option appears damaged upon receipt, contact the shipper immediately.
- Verify receipt of the correct model by checking the information on the PCB (see [Figure 2](#)).
- If you have received the wrong model or the DeviceNet Option does not function properly, contact your supplier.

◆ Contents and Packaging

Table 1 Contents of Package

Description:	Option Card	Ground Cable	Screws	LED Lael	Installation Manual
					
Quantity:	1	1	3	1	1

◆ Tool Requirements

A Phillips screwdriver (M3) metric or (#1, #2) U.S. standard size is required to install the DeviceNet Option.

A straight-edge screwdriver (M2) is required to wire the terminal block.

4 DeviceNet Option Components

◆ DeviceNet Option

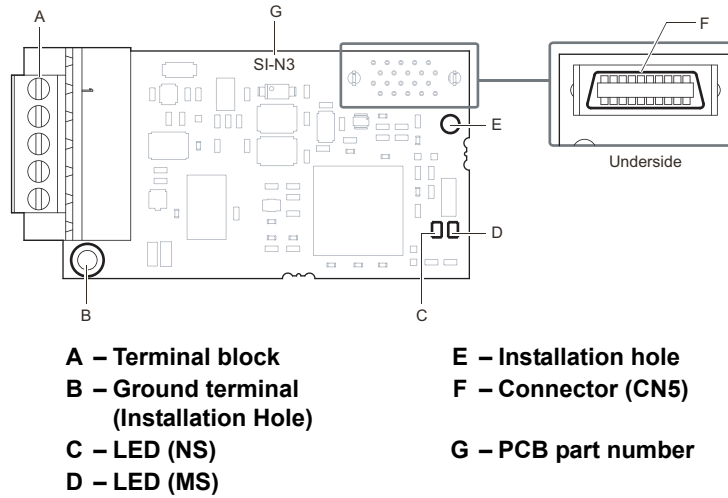


Figure 2 Option Card

Note: For details on the LEDs, Refer to *DeviceNet Option LED Display on page 8*.

◆ Terminal Block

The communication connector is a pluggable terminal block. This pluggable terminal block is the connection point of the DeviceNet network communication cable to the Option.

Table 2 Terminal Descriptions

Terminal	Pin	Color	Signal	Description
	1	Black	V-	Network common
	2	Blue	CAN_L	CAN data Low
	3	–	Shield	Cable shield
	4	White	CAN_H	CAN data High
	5	Red	V+	Communications DC+24V

◆ DeviceNet Option LED Display

The DeviceNet Option has two bicolor , red/green LEDs, one for Module Status (MS) and one for Network Status (NS).

The operational states of the DeviceNet Option LEDs after the DeviceNet power-up diagnostic LED sequence is completed are described in *Table 4*. Wait at least 2 seconds for the power-up diagnostic process to complete before verifying the states of the LEDs.

Table 3 DeviceNet Operation LED States

Name	Indication		Operating Status	Remarks
	Color	Status		
MS	–	OFF	Power supply OFF	Power is not being supplied to the drive.
	Green	ON	SI-N3 Option operating	The SI-N3 Option card is operating normally.
	Green	Flashing	SI-N3 Option initializing	There is an incorrect baud rate setting or there is a MAC ID.
	Red	ON	Fatal error occurred	A fatal (irrecoverable) error occurred in the SI-N3 Option.
	Red	Flashing	Non-fatal error occurred	A non-fatal (recoverable) error occurred.
	Green/Red	Flashing	Device self-test	Device in self-test mode.

Name	Indication		Operating Status	Remarks
	Color	Status		
NS	–	OFF	Offline or Power supply OFF	–
	Green	ON	Online communications established	Device is on-line and has connections in the established state.
	Green	Flashing	Online communications not established	Device is on-line but has no connections in the established state. Dup Mac-ID test has been passed, is on-line but has no open connections to other nodes.
	Red	ON	Communications error	An error occurred that disables DeviceNet communications. MAC ID duplication Bus Off detected
	Red	Flashing	Communications time-out	A communications time-out occurred with the master.
	Green/Red	Flashing	Communication faulted	Specific communication faulted device. The device has detected a network access error and is in the communications faulted state. The device has then received and accepted an Identify communication fault request-long protocol message.

■ Power-Up Diagnostics

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

Table 4 Power-Up Diagnostic LED Sequence

Sequence	Module Status (MS)	Network Status (NS)	Time (ms)
1	GREEN	OFF	250
2	RED	OFF	250
3	GREEN	GREEN	250
4	GREEN	RED	250
5	GREEN	OFF	-

◆ Set the DeviceNet Option MAC ID

■ Parameter F6-50, MAC ID Setting

Range: 0~64

The MAC ID is set by drive parameter F6-50. A MAC ID setting in the range of 0~63 is considered a valid MAC ID. A value other than 0~63 indicates the MAC ID is settable over the network.

The DeviceNet Option SI-N3 reads the MAC ID value from parameter F6-50 upon power-up and upon a network reset.

◆ Set the DeviceNet Option Baud Rate

The DeviceNet Option will support standard baud rates of 125 k bit/s, 250 k bit/s, and 500 k bit/s.

Table 5 Parameter F6-51 Baud Rate Setting

Description	Value
125 k bit/s	0
250 k bit/s	1
500 k bit/s	2
Programmable From Network	3
Auto Detect	4

■ Auto Baud Rate Sensing (F6-51 = 4)

Setting parameter F6-51 = 4, "Auto Detect" causes the DeviceNet Option to determine the data rate of the DeviceNet Network and configure itself appropriately.

Note: The auto baud capability will only be valid when there is more than one node physically on the DeviceNet network segment. The drive digital operator will display "bUS" and the DeviceNet option LEDs will be (NS-OFF and MS=Solid Green) as long as auto baud rate sensing fails to detect the baud rate.

5 Installation Procedure

◆ Section Safety

DANGER

Electrical Shock Hazard

Power to the drive must be shut off when installing the DeviceNet Option.

Even though the power has been shut off, voltage still remains in the drive's DC bus. Wait before removing the front cover once the drive has been turned off.

The CHARGE light on the drive will go out after voltage in the DC bus drops below 50 V, at which point it is safe to remove the front cover.

Due to the risk of electric shock, be sure that all LEDs have gone out and that the DC bus voltage has reached a safe level prior to performing any work on the drive.

WARNING

Electrical Shock Hazard

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

Failure to comply could result in death or serious injury.

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

Do not allow unqualified personnel to use equipment.

Failure to comply could result in death or serious injury.

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

Do not touch circuit boards while the power to the drive is on.

Failure to comply could result in death or serious injury.

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

Failure to comply could result in death or serious injury.

NOTICE

Damage to Equipment

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

Failure to comply may result in ESD damage to circuitry.

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

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

Do not operate damaged equipment.

Failure to comply may cause further damage to the equipment.

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

Tighten all terminal screws to the specified tightening torque.

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

NOTICE

Do not use unshielded cable for control wiring.

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

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

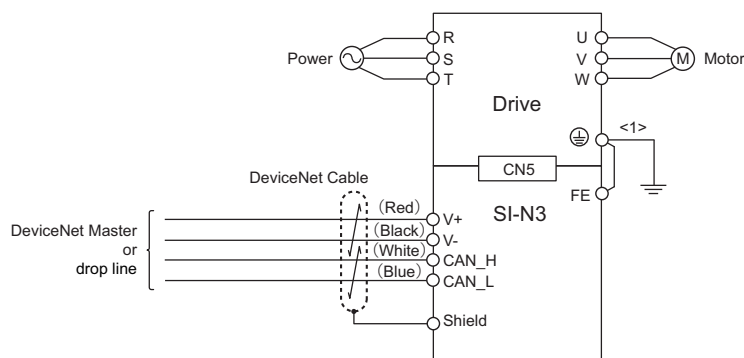
Properly connect all pins and connectors.

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

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

Failure to comply may result in damage to the option card.

◆ Wiring Diagram



<1> The FE terminal on the DeviceNet Option is supplied with a ground cable that should be connected to the ground terminal on the drive.

Figure 3 Wiring Diagram

◆ Prior to Installing the Option Card

Prior to installing the DeviceNet Option, wire the drive and make necessary connections to the drive terminals. Refer to the Quick Start Guide for information on wiring and connecting the drive. Verify that the drive functions normally prior to installing the Option.

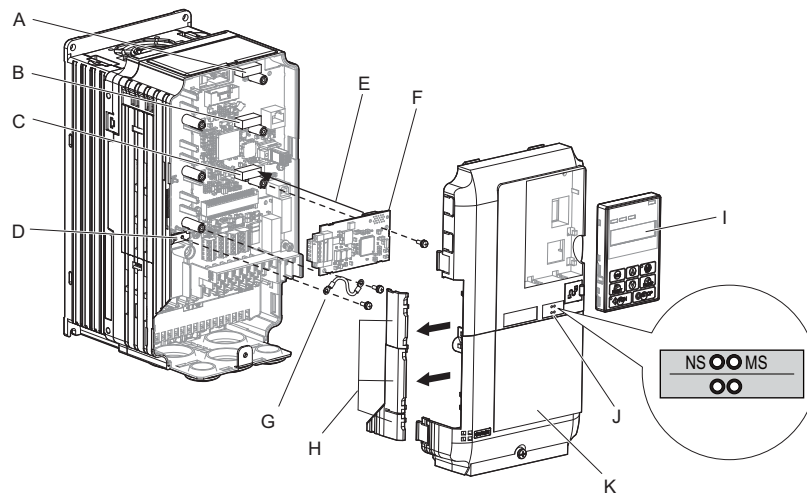
◆ Installing the Card Option

This DeviceNet Option can be inserted into either only CN5-A connectors located on the drive's control board. See the drive manual for directions on removing the front cover.

1. Shut off power to the drive, wait the appropriate amount of time for voltage to dissipate, then remove the operator and front cover.
2. Insert the CN5 connector on the DeviceNet Option into the matching CN5 connector on the drive, then fasten it into place using one of the screws included with the DeviceNet Option. Connect one of the lead lines using one of the screws to the ground terminal. Three separate lead lines have been included with the DeviceNet Option to connect to three separate ports. Use the lead line with the length appropriate for the distance of the port.

Note: There are only two screw holes on the drive for ground terminals. If three option cards are connected, two of the lead lines will need to share the same ground terminal.

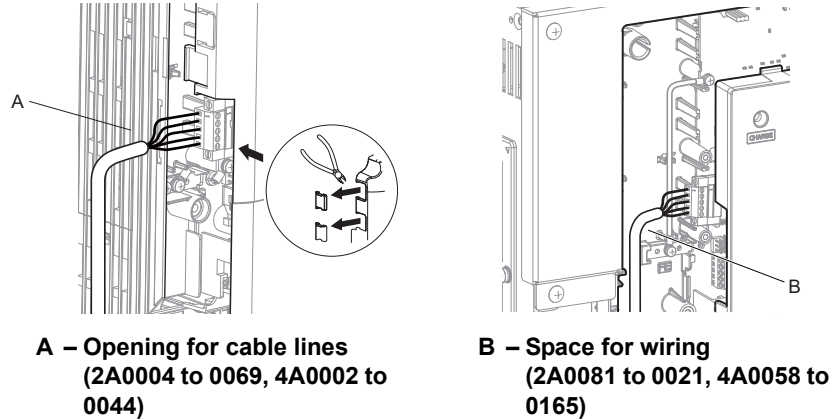
5 Installation Procedure



- | | |
|--|--|
| A – Connector CN5-C | G – Lead line |
| B – Connector CN5-B | H – Use wire cutters to create an opening for cable lines |
| C – Connector CN5-A | I – Operator |
| D – Drive grounding terminal (FE) | J – LED label |
| E – Insert connector CN5 here | K – Front cover |
| F – DeviceNet Option | |

Figure 4 Installing the Option

3. Wire the DeviceNet Option to the terminal block on the DeviceNet Option. For exposed cables in drives 2A004 to 0069, 4A0002 to 0044, use a pair of wire cutters to create an opening on the left side of the front cover that allows wiring to pass through. Sharp edges along the opening that was created should be smoothed down with a file or sand paper so prevent any damage to the wires. Drives 2A0081 to 0021, 4A0058 to 0165 have enough space to keep all wiring inside the unit.



- | | |
|---|--|
| A – Opening for cable lines
(2A0004 to 0069, 4A0002 to 0044) | B – Space for wiring
(2A0081 to 0021, 4A0058 to 0165) |
|---|--|

Figure 5 Wiring space

4. Place the front cover back onto the drive as it was before.

Note: 1. Take care when wiring the DeviceNet Option so that the front cover easily fits back onto the drive.
2. Install Cable Cover option to maintain the drive Enclosure Type.

◆ Communication Cable Wiring

■ Procedure

Follow the instructions below to connect the communications cable to the terminal block.

WARNING! Tighten all terminal screws according to the specified tightening torque. Tightening screws too tight could damage the terminal block, and leaving screws too loose can cause a short-circuit or drive malfunction.

1. Connect the communications cable to the terminal block as shown in the diagram below.

Note: Communication lines should be separated from main circuit wiring and other electrical lines. (Tightening torque: 0.5 to 0.6 (N·m) or 4.4 to 5.3 (inch-lbs)) for Network Cable Wiring.

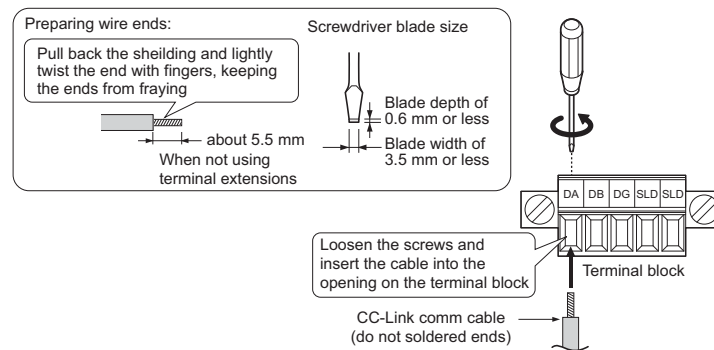


Figure 6 Communication Cable Wiring

2. Ensure all wiring connections are tightened and wire insulation is not pinched in the terminal block. Remove any stray wire strands that touch other terminals.
3. After the terminal block is fully attached to the option card, tighten the screws on the left and right sides of the terminal block. (Tightening torque: 0.5 to 0.6 (N·m) or 4.4 to 5.3 (inch-lbs)).

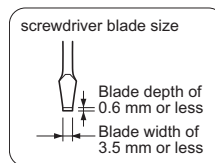


Figure 7 Terminal Block Installation

◆ Termination Resistor Connection

A network termination resistor ($121 \Omega, \pm 1\%$, 1/4 W) must be connected only to nodes of the two ends of trunkline. Refer to ODVA specification for more details on DeviceNet termination.

◆ Communication Cable Specifications

Refer to the ODVA website for more information on network cabling (<http://www.odva.org/>).

◆ 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.

Table 6 Trunk Line Cable Length

Baud Rate (k bit/s)	Thick Cable (m)	Thin Cable (m)
125	500	100
250	250	100
500	100	100

To calculate the maximum total length for trunk lines of mixed thick and thin cables, use the following formulas:

- 125 k bit/s: $L_{\text{thick}} + (5 \times L_{\text{thin}}) \leq 500 \text{ m}$
- 250 k bit/s: $L_{\text{thick}} + (2.5 \times L_{\text{thin}}) \leq 250 \text{ m}$
- 500 k bit/s: $L_{\text{thick}} + L_{\text{thin}} \leq 100 \text{ m}$

■ 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.

Table 7 Drop Line Cable Length

Baud Rate (k bit/s)	Maximum at Each Drop (m)	Maximum Total (m)
125	6	156
250		78
500		39

◆ EDS Files

For easy network implementation of drives equipped with a SI-N3, an EDS file can be obtained from:

Europe: <http://www.yaskawa.eu.com>

Japan: <http://www.e-mechatronics.com>

Other areas: contact a Yaskawa representative.

6 DeviceNet Option Drive Parameters

Confirm proper setting of the all parameters in [Table 8](#) before starting network communications.

Table 8 Parameter Settings

No. (Addr. Hex)	Name	Description	Values
b1-01 (180) <1>	Frequency Reference Selection	Selects the frequency reference input source 0: Digital Operator - Digital preset speed d1-01 to d1-17 1: Terminals - Analog input terminal A1 or A2 2: MEMOBUS/Modbus communications 3: Option PCB 4: Pulse Input (Terminal RP)	Default: 1 Range: 0~4 (Set to 3 for DeviceNet only)
b1-02 (181) <1>	Run Command Selection	Selects the run command input source 0: Digital Operator - RUN and STOP keys 1: Digital input terminals S□ 2: MEMOBUS/Modbus communications 3: Option PCB	Default: 1 Range: 0~3 (Set to 3 for DeviceNet only)
F6-01 (3A2)	Operation Selection after Communications Error	Determines drive response when a bUS error is detected during communications with the DeviceNet Option 0: Ramp to Stop 1: Coast to Stop 2: Fast-Stop 3: Alarm Only <2>	Default: 1 Range: 0~3
F6-02 (3A3)	External Fault Detection Conditions (EF0)	Sets the condition for external fault detection (EF0) 0: Always detected 1: Detected only during operation	Default: 0 Range: 0~1
F6-03 (3A4)	Stopping Method for External Fault from Communication Option	Determines drive response for external fault input (EF0) detection during DeviceNet communication 0: Ramp to Stop 1: Coast to Stop 2: Fast-Stop 3: Alarm Only <2>	Default: 1 Range: 0~3
F6-06 <3>	Torque Reference/Torque Limit Selection from Communications Option	0: Torque reference / torque limit via network communications are disabled. 1: Torque reference / torque limit via network communications are enabled. <4>	0
F6-07 (3A8)	NetRef/ComRef Selection Function	0: Multi-step speed reference disabled (F7 mode) 1: Multi-step speed reference allowed (V7 mode)	Default: 0
F6-08 (36A)	Reset Communication Related Parameters	Determines which F6-□□ and F7-□□ parameters are reset to default values when the drive is initialized using A1-03. 0: Do not reset parameters 1: Reset parameters	Default: 0
F6-50 (3C1) <5> <7>	MAC ID	Selects the drive MAC address Note: Used in the DeviceNet Object	Default: 0 Range: 0~64
F6-51 (3C2) <7>	Baud Rate	DeviceNet communication speed 0: 125 k bit/s 1: 250 k bit/s 2: 500 k bit/s 3: Programable from Network 4: Detect automatically Note: Used in the DeviceNet Object	Default: 0 Range: 0~4
F6-52 (3C3) <6>	PCA setting	I/O Polled Consuming Assembly data instance Note: Used in the Connection Object	Default: 21 Range: 0~255
F6-53 (3C4) <6>	PPA setting	I/O Polled Producing Assembly data instance Note: Used in the Connection Object	Default: 71 Range: 0~255
F6-54 (3C5) <7>	Idle Mode Fault Detection Selection	When detection is enabled and idle messages are detected, the option will set Run and Frequency to 0. 0: Detection enabled 1: No detection	Default: 0 Range: 0~1

6 DeviceNet Option Drive Parameters

No. (Addr. Hex)	Name	Description	Values
F6-55 (3C6)	Baud rate from Network	(Read only) DeviceNet actual communication speed 0: 125 k bit/s 1: 250 k bit/s 2: 500 k bit/s Note: Used in the DeviceNet Object	Range: 0~2
F6-56 (3D7)	Speed Scaling	Sets the scaling factor for the Speed Monitor in the DeviceNet Object Class 2A hex Note: Used in the AC/DC Drive Object	Default: 0 Range: -15~15
F6-57 (3D8)	Current Scaling	Sets the scaling factor for the Output Current Monitor in the DeviceNet Object Class 2A hex Note: Used in the AC/DC Drive Object	Default: 0 Range: -15~15
F6-58 (3D9)	Torque Scaling	Sets the scaling factor for the Torque Monitor in the DeviceNet Object Class 2A hex Note: Used in the AC/DC Drive Object	Default: 0 Range: -15~15
F6-59 (3DA)	Power Scaling	Sets the scaling factor for the Power Monitor in the DeviceNet Object Class 2A hex Note: Used in the AC/DC Drive Object	Default: 0 Range: -15~15
F6-60 (3DB)	Voltage Scaling	Sets the scaling factor for the Voltage Monitor in the DeviceNet Object Class 2A Note: Used in the AC/DC Drive Object	Default: 0 Range: -15~15
F6-61 (3DC)	Time Scaling	Sets the scaling factor for the Time Monitor in the DeviceNet Object Class 2A hex Note: Used in the AC/DC Drive Object	Default: 0 Range: -15~15
F6-62 (3DD)	Heart Beat	Sets the heartbeat interval Note: Used in the Identity Object	Default: 0 Range: 0~10
F6-63 (3DE)	MAC ID from Network	(Read only) Actual MAC address Note: Used in the DeviceNet Object	Range: 0~63
U6-98 (7F8)	Previous Option Fault	Displays previous faulted status. 0: No fault 1: Option failure 2: PLC in idle state 3: Forcefault 1000: Network power loss 1001: Connection timeout 1002: Duplicate MAC ID 1003: Bus-Off Note: Used in DeviceNet Option Faults	Range: 0~3; 1000~1003
U6-99 (7F9)	Current Option Fault	Displays the most recent fault status. 0: No fault 1: Option failure 2: PLC in idle state 3: Force fault 1000: Network power loss 1001: Connection timeout 1002: Duplicate MAC ID 1003: Bus-Off Note: Used in DeviceNet Option Faults	Range: 0~3; 1000~1003

- <1> To start and stop the drive with the DeviceNet master device using serial communications, set b1-02 to “3” or set the “Net Control” bit in the assemblies or Control Supervisor Object. To control the frequency reference of the drive via the master device, set b1-01 to “3” or set the “Net Reference” bit in the assemblies or AC/DC object.
- <2> If F6-01 or F6-03 is set to 3, then the drive will continue to operate when a fault is detected. Take proper safety measures, such as installing an emergency stop switch.
- <3> Enabled in CLV, PM OLV 2, and PM CLV control modes (A1-02 = 3, 6, or 7). When enabled, d5-01 determines whether the value is read as the torque limit value (d5-01 = 0) or read as the torque reference value (d5-01 = 1). In Closed Loop Vector for PM motors, this value is read as the torque limit.
- <4> Default setting specifies that the torque reference or torque limit is to be provided via network communications (F6-06 = 1). The motor may not rotate if no torque reference or torque limit is supplied from the PLC.
- <5> All MAC addresses must be unique.
- <6> PCA and PPA will be initialized if unavailable values are set.
- <7> Power must be cycled in order for any setting changes to take affect.

7 Configuring DeviceNet Messaging

This section provides information on the various methods used to control the drive on DeviceNet.

◆ Drive Configuration on DeviceNet

■ Polled Configuration

The Drive DeviceNet Polled connection must be configured before receiving commands from a Master device. The two parameters that must be configured are:

- F6-52: Polled Consuming Assembly (PCA)
Note: Output assembly consumed by the drive.
- F6-53: Polled Producing Assembly (PPA)
Note: Input assembly produced by the drive.

The default connection paths for the DeviceNet Option are set for Extended Speed Control.

The PCA and PPA parameters can be accessed by two methods.

- A software configuration tool (not supplied), and Yaskawa Electronic Data Sheet (EDS)
Note: The PCA and PPA parameters can be accessed from the “DN: Polled Config” parameter group.
- A software configuration tool (not supplied), via a DeviceNet message path, such as (Extended Speed Control)
Note: Use DeviceNet Connection Object to change the PCA or PPA if required by the application (Class 5, Instance 1, Attributes 14 and 16)

One each PCA and PPA assembly from the following table must be selected to configure the drive for polled operation.

Table 9 Supported Polled Assemblies (PCA and PPA)

Assembly Number (decimal)	Description	Type	Bytes	Page
20	<i>Basic Speed Control Output - 20 (0x14)</i>	PCA	4	20
21	<i>Extended Speed Control Output - 21 (0x15)</i> (Default Setting)	PCA	4	20
22	<i>Speed and Torque Control Output - 22 (0x16)</i>	PCA	6	21
23	<i>Extended Speed and Torque Control Output - 23 (0x17)</i>	PCA	6	21
70	<i>Basic Speed Control Input - 70 (0x46)</i>	PPA	4	37
71	<i>Extended Speed Control Input - 71 (0x47)</i> (Default Setting)	PPA	4	37
72	<i>Speed and Torque Control Input - 72 (0x48)</i>	PPA	6	38
73	<i>Extended Speed and Torque Control Input - 73 (0x49)</i>	PPA	6	39
100	<i>MEMOBUS/Modbus Message Command (Vendor Specific YE Assy) - 100 (0x64)</i>	PCA	5	22
101	<i>Standard Control (Vendor Specific YE Assy) - 101 (0x65)</i>	PCA	8	23
102	<i>Accel/Decel Time (Vendor Specific YE Assy) - 102 (0x66)</i>	PCA	8	24
105	<i>Enhanced Speed Control, Dynamic (Vendor Specific YE Assy) - 105 (0x69)</i>	PCA	8	25
106	<i>Enhanced Control (Vendor Specific YE Assy) - 106 (0x6A)</i>	PCA	8	27
107	<i>Standard DI/DO Control (Vendor Specific YE Assy) - 107 (0x6B)</i>	PCA	8	28
108	<i>Enhanced Torque Control, Dynamic (Vendor Specific YE Assy) - 108 (0x6C)</i>	PCA	8	29
120	<i>Speed Command 1 (Vendor Specific YE Assy) - 120 (0x78)</i>	PCA	4	30
121	<i>Torque Command 1 (Vendor Specific YE Assy) - 121 (0x79)</i>	PCA	4	31
122	<i>Speed Command 2 (Vendor Specific YE Assy) - 122 (0x7A)</i>	PCA	6	32
123	<i>Torque Command 2 (Vendor Specific YE Assy) - 123 (0x7B)</i>	PCA	6	33
124	<i>Speed Dynamic Assy (Vendor Specific YE Assy) - 124 (0x7C)</i>	PCA	8	34
125	<i>Torque Dynamic Assy (Vendor Specific YE Assy) - 125 (0x7D)</i>	PCA	8	35
126	<i>Speed/Torque Assy (Vendor Specific YE Assy) - 126 (0x7E)</i>	PCA	8	36
130	<i>Speed Status (Vendor Specific YE Assy) - 130 (0x82)</i>	PPA	4	40
131	<i>Current Status (Vendor Specific YE Assy) - 131 (0x83)</i>	PPA	4	41
132	<i>Current & Speed Status (Vendor Specific YE Assy) - 132 (0x84)</i>	PPA	6	42
134	<i>Speed Status Dynamic Assy (Vendor Specific YE Assy) - 134 (0x86)</i>	PPA	8	43
135	<i>Current Status Dynamic Assy (Vendor Specific YE Assy) - 135 (0x87)</i>	PPA	8	44
136	<i>Torque and Speed Status (Vendor Specific YE Assy) - 136 (0x88)</i>	PPA	8	45
150	<i>MEMOBUS/Modbus Message Reply (Vendor Specific YE Assy) - 150 (0x96)</i>	PPA	5	46
151	<i>Standard Status 1 (Vendor Specific YE Assy) - 151 (0x97)</i>	PPA	8	47

7 Configuring DeviceNet Messaging

Assembly Number (decimal)	Description	Type	Bytes	Page
152	<i>Standard Status 2 (Vendor Specific YE Assy) -152 (0x98)</i>	PPA	8	48
155	<i>Enhanced Speed Status, Dynamic (Vendor Specific YE Assy) - 155 (0x9B)</i>	PPA	8	50
156	<i>Enhanced Control Status (Vendor Specific YE Assy) -156 (0x9C)</i>	PPA	8	51
157	<i>Standard DI/DO Status (Vendor Specific YE Assy) - 157 (0x9D)</i>	PPA	8	53
158	<i>Enhanced Torque Status, Dynamic (Vendor Specific YE Assy) - 158 (0x9E)</i>	PPA	8	54
199	<i>Change of State Response (Vendor Specific YE Assy) - 199 (0xC7)</i>	PPA	8	56

8 DeviceNet Option Details

◆ Support Message Type

Explicit Messages: Fragmentation is supported. Up to 32 Bytes can be input and output.

Polled I/O Messages: Fragmentation is not supported. Up to 8 Bytes can be input and output.

COS Messages: Fragmentation is not supported.

Faulted Node Recovery / Offline Connection Set Messages

◆ Support Connection Path Type

Logical encoding is used for the Polled Consumed and Produced connection paths. To support application tools and development tools that do not handle explicit message fragmentation this option supports Symbolic encoding. Symbolic encoding only requires a 3 byte long message where logical encoding requires eleven bytes. This option has a third method of setting Polled Consumed and Produced connection paths. Class 5, Instance 2, Attributes (100, 101) allow setting connection path with a single byte. For instance, to set the Consumed connection path to 100, write 100 (0x64) to Attribute 101. See appendix C of "The CIP Networks Library, Volume 1" for more information on CIP segments.

9 Output Assemblies (Drive Consumes)

Note: The convention in this manual is from the PLC perspective. As such, an assembly is called an “Output Assembly” when outputted from the PLC and received by this node. An “Input Assembly” is outputted from this node and read by the PLC. This section details “Output Assemblies” that are “Consumed” by this drive.

◆ Basic Speed Control Output - 20 (0x14)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
20	0	–	–	–	–	–	Fault Reset	–	Run Fwd
	1	–							
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							

Name	Description
Run Fwd	Forward Run Command 0: Stop 1: Forward Run
Fault Reset	Fault Reset 0: No Fault Reset 1: Fault Reset
Speed Reference	Speed Command Sets drive speed reference Speed reference data: Frequency reference / 2 ^{SS} (SS: Speed scale) Setting range: 0 to 0xFFFF For example, when setting a reference of 1024 with a speed scale of 2 Speed reference data = 1024 / 2 ² = 256 = 0x0100 Unit depends on o1-03.

◆ Extended Speed Control Output - 21 (0x15)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
21	0	–	Net Ref	Net Ctrl	–	–	Fault Reset	Run Rev	Run Fwd
	1	–							
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							

Name	Description
Run Fwd	Forward Run Command 0: Stop 1: Forward Run
Run Rev	Reverse Run Command 0: Stop 1: Reverse Run
Fault Reset	Fault Reset 0: No Fault Reset 1: Fault Reset
NetCtrl	Run command from Network 0: Depends on b1-02 1: Enables the run command from network
NetRef	Speed reference from Network 0: Depends on b1-01 1: Enables the speed reference from network

Name	Description
Speed Reference	Speed Command Sets drive speed reference Speed reference data: Frequency reference / 2^{SS} (SS: Speed scale) Setting range: 0 to 0xFFFF For example, when setting a reference of 1024 with a speed scale of 2 Speed reference data = $1024 / 2^2 = 256 = 0x0100$ Unit depends on o1-03.

◆ Speed and Torque Control Output - 22 (0x16)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
22	0	-	-	-	-	-	Fault Reset	-	Run Fwd
	1	-							
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							
	4	Torque Reference/Torque Limit (Low Byte)							
	5	Torque Reference/Torque Limit (High Byte)							

Name	Description
Run Fwd	Forward Run Command 0: Stop 1: Forward Run
Fault Reset	Fault Reset 0: No Fault Reset 1: Fault Reset
Speed Reference	Speed Command Sets drive speed reference Speed reference data: Frequency reference / 2^{SS} (SS: Speed scale) Setting range: 0 to 0xFFFF For example, when setting a reference of 1024 with a speed scale of 2 Speed reference data = $1024 / 2^2 = 256 = 0x0100$ Unit depends on o1-03.
Torque Reference/Torque Limit	Torque Reference/Torque Limit Sets the torque reference and torque limit in units of 0.1%. Sets the torque reference when using torque control (d5-01 = 1). Sets the torque limit when using speed control (d5-01 = 0). The torque reference and torque limit are disabled when F6-06 = 0.

◆ Extended Speed and Torque Control Output - 23 (0x17)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
23	0	-	Net Ref	Net Ctrl	-	-	Fault Reset	Run Rev	Run Fwd
	1	-							
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							
	4	Torque Reference/Torque Limit (Low Byte)							
	5	Torque Reference/Torque Limit (High Byte)							

Name	Description
Run Fwd	Forward Run Command 0: Stop 1: Forward Run
Run Rev	Reverse Run Command 0: Stop 1: Reverse Run

9 Output Assemblies (Drive Consumes)

Name	Description
Fault Reset	Fault Reset 0: No Fault Reset 1: Fault Reset
NetCtrl	Run command from Network 0: Depends on b1-02 1: Enables the run command from network
NetRef	Speed reference from Network 0: Depends on b1-01 1: Enables the speed reference from network
Speed Reference	Speed Command Sets drive speed reference Speed reference data: Frequency reference $\times 2^{SS}$ (SS: Speed scale) Setting range: 0 to 0xFFFF For example, when setting a reference of 1024 with a speed scale of 2 Speed reference data = $1024 \times 2^2 = 4096 = 0x1000$ Unit depends on o1-03.
Torque Reference/Torque Limit	Torque Reference/Torque Limit Sets the torque reference and torque limit in units of 0.1%. Sets the torque reference when using torque control (d5-01 = 1). Sets the torque limit when using speed control (d5-01 = 0). The torque reference and torque limit are disabled when F6-06 = 0.

◆ MEMOBUS/Modbus Message Command (Vendor Specific YE Assy) - 100 (0x64)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
100	0	Function Code							
	1	Register Number (High Byte)							
	2	Register Number (Low Byte)							
	3	Register Data (High Byte)							
	4	Register Data (Low Byte)							

Note: This is a paired assembly (100/150).

Name	Description
Function Code	MEMOBUS/Modbus Function Code <i>Refer to Function Code Decode Table on page 22.</i>
Register Number	MEMOBUS/Modbus Register Number
Register Data	MEMOBUS/Modbus Register Data

Table 10 Function Code Decode Table

Function Code	MEMOBUS/Modbus Function
0x00	No Operation
0x03	Read Register
0x10	Write Register

Note: Refer to the MEMOBUS/Modbus Data Table in Appendix C of the technical Manual for the drive the DeviceNet Option is connected to for a list of monitor data using the MEMOBUS/Modbus message area.

◆ Standard Control (Vendor Specific YE Assy) - 101 (0x65)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
101	0	Multi-Function Input 8	Multi-Function Input 7	Multi-Function Input 6	Multi-Function Input 5	Multi-Function Input 4	Multi-Function Input 3	Run Rev	Run Fwd
	1	Multi-Function Photo Coupler 2	Multi-Function Photo Coupler 1	Multi-Function Digital Output	–	–	–	Fault Reset	External Fault
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							
	4	Torque Reference/Torque Limit (Low Byte)							
	5	Torque Reference/Torque Limit (High Byte)							
	6	Torque Compensation (Low Byte)							
	7	Torque Compensation (High Byte)							

Output Instance	Byte
Run Fwd	Forward Run Command 0: Stop 1: Forward Run
Run Rev	Reverse Run Command 0: Stop 1: Reverse Run
Multi-Function Input 3	Terminal S3 Function Input 0: Terminal S3 Function (H1-03) OFF 1: Terminal S3 Function (H1-03) ON
Multi-Function Input 4	Terminal S4 Function Input 0: Terminal S4 Function (H1-04) OFF 1: Terminal S4 Function (H1-04) ON
Multi-Function Input 5	Terminal S5 Function Input 0: Terminal S5 Function (H1-05) OFF 1: Terminal S5 Function (H1-05) ON
Multi-Function Input 6	Terminal S6 Function Input 0: Terminal S6 Function (H1-06) OFF 1: Terminal S6 Function (H1-06) ON
Multi-Function Input 7	Terminal S7 Function Input 0: Terminal S7 Function (H1-07) OFF 1: Terminal S7 Function (H1-07) ON
Multi-Function Input 8	Terminal S8 Function Input 0: Terminal S8 Function (H1-08) OFF 1: Terminal S8 Function (H1-08) ON
External Fault	External Fault EF0 0: No External Fault (EF0) 1: External Fault (EF0)
Fault Reset	Fault Reset 0: No Fault Reset 1: Fault Reset
Multi-Function Digital Output	Terminal M1/M2 0: M1/M2 OFF 1: M1/M2 ON This function is enabled only when H2-01 is set to F.
Multi-Function Photo Coupler 1	Terminal P1 0: P1 OFF 1: P1 ON This function is enabled only when H2-02 is set to F.
Multi-Function Photo Coupler 2	Terminal P2 0: P2 OFF 1: P2 ON This function is enabled only when H2-03 is set to F.

9 Output Assemblies (Drive Consumes)

Output Instance	Byte
Speed Reference	Speed Command Sets drive speed reference Unit depends on o1-03. Unit is not affected by Speed Scale SS.
Torque Reference/Torque Limit	Torque Reference/Torque Limit Sets the torque reference and torque limit in units of 0.1%. Sets the torque reference when using torque control (d5-01 = 1). Sets the torque limit when using speed control (d5-01 = 0). The torque reference and torque limit are disabled when F6-06 = 0.
Torque Compensation	Sets the amount of torque compensation. Set in units of 0.1%.

◆ Accel/Decel Time (Vendor Specific YE Assy) - 102 (0x66)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
102	0	Multi-Function Input 8	Multi-Function Input 7	Multi-Function Input 6	Multi-Function Input 5	Multi-Function Input 4	Multi-Function Input 3	Run Rev	Run Fwd
	1	Multi-Function Photo Coupler 2	Multi-Function Photo Coupler 1	Multi-Function Digital Output	-	-	-	Fault Reset	External Fault
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							
	4	Acceleration Time 1 (Low Byte)							
	5	Acceleration Time 1 (High Byte)							
	6	Deceleration Time 1 (Low Byte)							
	7	Deceleration Time 1 (High Byte)							

Parameter	Data
Run Fwd	Forward Run Command 0: Stop 1: Forward Run
Run Rev	Reverse Run Command 0: Stop 1: Reverse Run
Multi-Function Input 3	Terminal S3 Function Input 0: Terminal S3 Function (H1-03) OFF 1: Terminal S3 Function (H1-03) ON
Multi-Function Input 4	Terminal S4 Function Input 0: Terminal S4 Function (H1-04) OFF 1: Terminal S4 Function (H1-04) ON
Multi-Function Input 5	Terminal S5 Function Input 0: Terminal S5 Function (H1-05) OFF 1: Terminal S5 Function (H1-05) ON
Multi-Function Input 6	Terminal S6 Function Input 0: Terminal S6 Function (H1-06) OFF 1: Terminal S6 Function (H1-06) ON
Multi-Function Input 7	Terminal S7 Function Input 0: Terminal S7 Function (H1-07) OFF 1: Terminal S7 Function (H1-07) ON
Multi-Function Input 8	Terminal S8 Function Input 0: Terminal S8 Function (H1-08) OFF 1: Terminal S8 Function (H1-08) ON
External Fault	External Fault EF0 0: No External Fault (EF0) 1: External Fault (EF0)

Parameter	Data
Fault Reset	Fault Reset 0: No Fault Reset 1: Fault Reset
Multi-Function Digital Output	Terminal M1/M2 0: M1/M2 OFF 1: M1/M2 ON This function is enabled only when H2-01 is set to F.
Multi-Function Photo Coupler 1	Terminal P1 0: P1 OFF 1: P1 ON This function is enabled only when H2-02 is set to F.
Multi-Function Photo Coupler 2	Terminal P2 0: P2 OFF 1: P2 ON This function is enabled only when H2-03 is set to F.
Speed Reference	Speed Command Sets drive speed reference Unit depends on o1-03. Unit is not affected by Speed Scale SS.
Acceleration Time 1	Acceleration Time 1 (C1-01) Unit depends on C1-10. Unit is not affected by Time Scale TS.
Deceleration Time 1	Deceleration Time 1 (C1-02) Unit depends on C1-10. Unit is not affected by Time Scale TS.

◆ Enhanced Speed Control, Dynamic (Vendor Specific YE Assy) - 105 (0x69)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
105	0	Multi-Function Input 8	Multi-Function Input 7	Multi-Function Input 6	Multi-Function Input 5	Multi-Function Input 4	Multi-Function Input 3	Run Rev	Run Fwd
	1	Multi-Function Photo-coupler 2	Multi-Function Photo-coupler 1	Multi-Function Digital Output	-	Function Code High Bit	Function Code Low Bit	Fault Reset	External Fault
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							
	4	Register Number (Low Byte)							
	5	Register Number (High Byte)							
	6	Register Data (Low Byte)							
	7	Register Data (High Byte)							

Name	Description
Run Fwd	Forward Run Command 0: Stop 1: Forward Run
Run Rev	Reverse Run Command 0: Stop 1: Reverse Run
Multi-Function Input 3	Terminal S3 Function Input 0: Terminal S3 Function (H1-03) OFF 1: Terminal S3 Function (H1-03) ON
Multi-Function Input 4	Terminal S4 Function Input 0: Terminal S4 Function (H1-04) OFF 1: Terminal S4 Function (H1-04) ON
Multi-Function Input 5	Terminal S5 Function Input 0: Terminal S5 Function (H1-05) OFF 1: Terminal S5 Function (H1-05) ON

9 Output Assemblies (Drive Consumes)

Name	Description
Multi-Function Input 6	Terminal S6 Function Input 0: Terminal S6 Function (H1-06) OFF 1: Terminal S6 Function (H1-06) ON
Multi-Function Input 7	Terminal S7 Function Input 0: Terminal S7 Function (H1-07) OFF 1: Terminal S7 Function (H1-07) ON
Multi-Function Input 8	Terminal S8 Function Input 0: Terminal S8 Function (H1-08) OFF 1: Terminal S8 Function (H1-08) ON
External Fault	External Fault EF0 0: No External Fault (EF0) 1: External Fault (EF0)
Fault Reset	Fault Reset 0: No Fault Reset 1: Fault Reset
Function Code	MEMOBUS/Modbus Function Code <i>Refer to Function Code Decode Table on page 26.</i>
Multi-Function Digital Output	Terminal M1/M2 0: M1/M2 OFF 1: M1/M2 ON This function is enabled only when H2-01 is set to F.
Multi-Function Photo Coupler 1	Terminal P1 0: P1 OFF 1: P1 ON This function is enabled only when H2-02 is set to F.
Multi-Function Photo Coupler 2	Terminal P2 0: P2 OFF 1: P2 ON This function is enabled only when H2-03 is set to F.
Speed Reference	Speed Command Sets drive speed reference Unit depends on o1-03. Unit is not affected by Speed Scale SS.
Register Number	MEMOBUS/Modbus Register Number <1>
Register Data	MEMOBUS/Modbus Register Data

<1> Register numbers 0x0001, 0x0002, and 0x0009 are disabled.

Note: This is a paired assembly (105/155).

Table 11 Function Code Decode Table

Function Code High Byte - Low Byte	MEMOBUS/Modbus Function
0 0	No Operation
1 0	Read Register
0 1	Write Register
1 1	No Operation

Note: Refer to the MEMOBUS/Modbus Data Table in Appendix C of the technical Manual for the drive the DeviceNet Option is connected to for a list of monitor data using the MEMOBUS/Modbus message area.

◆ Enhanced Control (Vendor Specific YE Assy) - 106 (0x6A)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
106	0	Multi-Function Input 8	Multi-Function Input 7	Multi-Function Input 6	Multi-Function Input 5	Multi-Function Input 4	Multi-Function Input 3	Run Rev	Run Fwd
	1	Multi-Function Photo Coupler 2	Multi-Function Photo Coupler 1	Multi-Function Digital Output	–	–	–	Fault Reset	External Fault
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							
	4	–							
	5	–							
	6	–							
	7	–							

Parameter	Data
Run Fwd	Forward Run Command 0: Stop 1: Forward Run
Run Rev	Reverse Run Command 0: Stop 1: Reverse Run
Multi-Function Input 3	Terminal S3 Function Input 0: Terminal S3 Function (H1-03) OFF 1: Terminal S3 Function (H1-03) ON
Multi-Function Input 4	Terminal S4 Function Input 0: Terminal S4 Function (H1-04) OFF 1: Terminal S4 Function (H1-04) ON
Multi-Function Input 5	Terminal S5 Function Input 0: Terminal S5 Function (H1-05) OFF 1: Terminal S5 Function (H1-05) ON
Multi-Function Input 6	Terminal S6 Function Input 0: Terminal S6 Function (H1-06) OFF 1: Terminal S6 Function (H1-06) ON
Multi-Function Input 7	Terminal S7 Function Input 0: Terminal S7 Function (H1-07) OFF 1: Terminal S7 Function (H1-07) ON
Multi-Function Input 8	Terminal S8 Function Input 0: Terminal S8 Function (H1-08) OFF 1: Terminal S8 Function (H1-08) ON
External Fault	External Fault EF0 0: No External Fault (EF0) 1: External Fault (EF0)
Fault Reset	Fault Reset 0: No Fault Reset 1: Fault Reset
Multi-Function Digital Output	Terminal M1/M2 0: M1/M2 OFF 1: M1/M2 ON This function is enabled only when H2-01 is set to F.
Multi-Function Photo Coupler 1	Terminal P1 0: P1 OFF 1: P1 ON This function is enabled only when H2-02 is set to F.
Multi-Function Photo Coupler 2	Terminal P2 0: P2 OFF 1: P2 ON This function is enabled only when H2-03 is set to F.

9 Output Assemblies (Drive Consumes)

Parameter	Data
Speed Reference	Speed Command Sets drive speed reference Unit depends on o1-03. Unit is not affected by Speed Scale SS.

◆ Standard DI/DO Control (Vendor Specific YE Assy) - 107 (0x6B)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
107	0	Multi-Function Input 8	Multi-Function Input 7	Multi-Function Input 6	Multi-Function Input 5	Multi-Function Input 4	Multi-Function Input 3	Run Rev	Run Fwd	
	1	–	–	–	–	–	–	Fault Reset	External Fault	
	2	–	–	Multi-Function Photo Coupler 2	Multi-Function Photo Coupler 1	Multi-Function Digital Output	–	–	–	
	3	–	–	–	–	–	–	–	–	
	4	Analog Output 1 (Low Byte)								
	5	Analog Output 1 (High Byte)								
	6	Speed Reference (Low Byte)								
	7	Speed Reference (High Byte)								

Parameter	Data
Run Fwd	Forward Run Command 0: Stop 1: Forward Run
Run Rev	Reverse Run Command 0: Stop 1: Reverse Run
Multi-Function Input 3	Terminal S3 Function Input 0: Terminal S3 Function (H1-03) OFF 1: Terminal S3 Function (H1-03) ON
Multi-Function Input 4	Terminal S4 Function Input 0: Terminal S4 Function (H1-04) OFF 1: Terminal S4 Function (H1-04) ON
Multi-Function Input 5	Terminal S5 Function Input 0: Terminal S5 Function (H1-05) OFF 1: Terminal S5 Function (H1-05) ON
Multi-Function Input 6	Terminal S6 Function Input 0: Terminal S6 Function (H1-06) OFF 1: Terminal S6 Function (H1-06) ON
Multi-Function Input 7	Terminal S7 Function Input 0: Terminal S7 Function (H1-07) OFF 1: Terminal S7 Function (H1-07) ON
Multi-Function Input 8	Terminal S8 Function Input 0: Terminal S8 Function (H1-08) OFF 1: Terminal S8 Function (H1-08) ON
External Fault	External Fault EF0 0: No External Fault (EF0) 1: External Fault (EF0)
Fault Reset	Fault Reset 0: No Fault Reset 1: Fault Reset
Multi-Function Digital Output	Terminal M1/M2 0: M1/M2 OFF 1: M1/M2 ON This function is enabled only when H2-01 is set to F.

Parameter	Data
Multi-Function Photo Coupler 1	Terminal P1 0: P1 OFF 1: P1 ON This function is enabled only when H2-02 is set to F.
Multi-Function Photo Coupler 2	Terminal P2 0: P2 OFF 1: P2 ON This function is enabled only when H2-03 is set to F.
Analog Output 1	Analog Output FM This function is enabled only when H4-01 is set to 000.
Speed Reference	Speed Command Sets drive speed reference Unit depends on o1-03. Unit is not affected by Speed Scale SS.

◆ Enhanced Torque Control, Dynamic (Vendor Specific YE Assy) - 108 (0x6C)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
108	0	Multi-Function Input 8	Multi-Function Input 7	Multi-Function Input 6	Multi-Function Input 5	Multi-Function Input 4	Multi-Function Input 3	Run Rev	Run Fwd
	1	Multi-Function Photo-coupler 2	Multi-Function Photo-coupler 1	Multi-Function Digital Output	-	Function Code High Bit	Function Code Low Bit	Fault Reset	External Fault
	2	Torque Reference/Torque Limit (Low Byte)							
	3	Torque Reference/Torque Limit (High Byte)							
	4	Register Number (Low Byte)							
	5	Register Number (High Byte)							
	6	Register Data (Low Byte)							
	7	Register Data (High Byte)							

Name	Description
Run Fwd	Forward Run Command 0: Stop 1: Forward Run
Run Rev	Reverse Run Command 0: Stop 1: Reverse Run
Multi-Function Input 3	Terminal S3 Function Input 0: Terminal S3 Function (H1-03) OFF 1: Terminal S3 Function (H1-03) ON
Multi-Function Input 4	Terminal S4 Function Input 0: Terminal S4 Function (H1-04) OFF 1: Terminal S4 Function (H1-04) ON
Multi-Function Input 5	Terminal S5 Function Input 0: Terminal S5 Function (H1-05) OFF 1: Terminal S5 Function (H1-05) ON
Multi-Function Input 6	Terminal S6 Function Input 0: Terminal S6 Function (H1-06) OFF 1: Terminal S6 Function (H1-06) ON
Multi-Function Input 7	Terminal S7 Function Input 0: Terminal S7 Function (H1-07) OFF 1: Terminal S7 Function (H1-07) ON
Multi-Function Input 8	Terminal S8 Function Input 0: Terminal S8 Function (H1-08) OFF 1: Terminal S8 Function (H1-08) ON

9 Output Assemblies (Drive Consumes)

Name	Description
External Fault	External Fault EF0 0: No External Fault (EF0) 1: External Fault (EF0)
Fault Reset	Fault Reset 0: No Fault Reset 1: Fault Reset
Function Code	MEMOBUS/Modbus Function Code <i>Refer to Function Code Decode Table on page 26.</i>
Multi-Function Digital Output	Terminal M1/M2 0: M1/M2 OFF 1: M1/M2 ON This function is enabled only when H2-01 is set to F.
Multi-Function Photo Coupler 1	Terminal P1 0: P1 OFF 1: P1 ON This function is enabled only when H2-02 is set to F.
Multi-Function Photo Coupler 2	Terminal P2 0: P2 OFF 1: P2 ON This function is enabled only when H2-03 is set to F.
Torque Reference/Torque Limit	Torque Reference/Torque Limit Sets the torque reference and torque limit in units of 0.1%. Sets the torque reference when using torque control (d5-01 = 1). Sets the torque limit when using speed control (d5-01 = 0). The torque reference and torque limit are disabled when F6-06 = 0.
Register Number	MEMOBUS/Modbus Register Number <I>
Register Data	MEMOBUS/Modbus Register Data

<I> Register number 0x0001, and 0x0009 are disabled.

Note: This is a paired assembly (108/158).

Note: Refer to the MEMOBUS/Modbus Data Table in Appendix C of the technical Manual for the drive the DeviceNet Option is connected to for a list of monitor data using the MEMOBUS/Modbus message area.

◆ Speed Command 1 (Vendor Specific YE Assy) - 120 (0x78)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
120	0	Multi-Function Input 8	Multi-Function Input 7	Multi-Function Input 6	Multi-Function Input 5	Multi-Function Input 4	Multi-Function Input 3	Run Rev	Run Fwd
	1	–	–	–	–	–	–	Fault Reset	External Fault
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							

Parameter	Data
Run Fwd	Forward Run Command 0: Stop 1: Forward Run
Run Rev	Reverse Run Command 0: Stop 1: Reverse Run
Multi-Function Input 3	Terminal S3 Function Input 0: Terminal S3 Function (H1-03) OFF 1: Terminal S3 Function (H1-03) ON
Multi-Function Input 4	Terminal S4 Function Input 0: Terminal S4 Function (H1-04) OFF 1: Terminal S4 Function (H1-04) ON
Multi-Function Input 5	Terminal S5 Function Input 0: Terminal S5 Function (H1-05) OFF 1: Terminal S5 Function (H1-05) ON

Parameter	Data
Multi-Function Input 6	Terminal S6 Function Input 0: Terminal S6 Function (H1-06) OFF 1: Terminal S6 Function (H1-06) ON
Multi-Function Input 7	Terminal S7 Function Input 0: Terminal S7 Function (H1-07) OFF 1: Terminal S7 Function (H1-07) ON
Multi-Function Input 8	Terminal S8 Function Input 0: Terminal S8 Function (H1-08) OFF 1: Terminal S8 Function (H1-08) ON
External Fault	External Fault EF0 0: No External Fault (EF0) 1: External Fault (EF0)
Fault Reset	Fault Reset 0: No Fault Reset 1: Fault Reset
Speed Reference	Speed Command Sets drive speed reference Unit depends on o1-03. Unit is not affected by Speed Scale SS.

◆ Torque Command 1 (Vendor Specific YE Assy) - 121 (0x79)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
121	0	Multi-Function Input 8	Multi-Function Input 7	Multi-Function Input 6	Multi-Function Input 5	Multi-Function Input 4	Multi-Function Input 3	Run Rev	Run Fwd
	1	-	-	-	-	-	-	Fault Reset	External Fault
	2	Torque Reference/Torque Limit (Low Byte)							
	3	Torque Reference/Torque Limit (High Byte)							

Parameter	Data
Run Fwd	Forward Run Command 0: Stop 1: Forward Run
Run Rev	Reverse Run Command 0: Stop 1: Reverse Run
Multi-Function Input 3	Terminal S3 Function Input 0: Terminal S3 Function (H1-03) OFF 1: Terminal S3 Function (H1-03) ON
Multi-Function Input 4	Terminal S4 Function Input 0: Terminal S4 Function (H1-04) OFF 1: Terminal S4 Function (H1-04) ON
Multi-Function Input 5	Terminal S5 Function Input 0: Terminal S5 Function (H1-05) OFF 1: Terminal S5 Function (H1-05) ON
Multi-Function Input 6	Terminal S6 Function Input 0: Terminal S6 Function (H1-06) OFF 1: Terminal S6 Function (H1-06) ON
Multi-Function Input 7	Terminal S7 Function Input 0: Terminal S7 Function (H1-07) OFF 1: Terminal S7 Function (H1-07) ON
Multi-Function Input 8	Terminal S8 Function Input 0: Terminal S8 Function (H1-08) OFF 1: Terminal S8 Function (H1-08) ON
External Fault	External Fault EF0 0: No External Fault (EF0) 1: External Fault (EF0)

9 Output Assemblies (Drive Consumes)

Parameter	Data
Fault Reset	Fault Reset 0: No Fault Reset 1: Fault Reset
Torque Reference/Torque Limit	Torque Reference/Torque Limit Sets the torque reference and torque limit in units of 0.1%. Sets the torque reference when using torque control (d5-01 = 1). Sets the torque limit when using speed control (d5-01 = 0). The torque reference and torque limit are disabled when F6-06 = 0.

◆ Speed Command 2 (Vendor Specific YE Assy) - 122 (0x7A)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
122	0	Multi-Function Input 8	Multi-Function Input 7	Multi-Function Input 6	Multi-Function Input 5	Multi-Function Input 4	Multi-Function Input 3	Run Rev	Run Fwd
	1	–	–	–	–	–	–	Fault Reset	External Fault
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							
	4	NetRef							
	5	NetCtrl							

Parameter	Data
Run Fwd	Forward Run Command 0: Stop 1: Forward Run
Run Rev	Reverse Run Command 0: Stop 1: Reverse Run
Multi-Function Input 3	Terminal S3 Function Input 0: Terminal S3 Function (H1-03) OFF 1: Terminal S3 Function (H1-03) ON
Multi-Function Input 4	Terminal S4 Function Input 0: Terminal S4 Function (H1-04) OFF 1: Terminal S4 Function (H1-04) ON
Multi-Function Input 5	Terminal S5 Function Input 0: Terminal S5 Function (H1-05) OFF 1: Terminal S5 Function (H1-05) ON
Multi-Function Input 6	Terminal S6 Function Input 0: Terminal S6 Function (H1-06) OFF 1: Terminal S6 Function (H1-06) ON
Multi-Function Input 7	Terminal S7 Function Input 0: Terminal S7 Function (H1-07) OFF 1: Terminal S7 Function (H1-07) ON
Multi-Function Input 8	Terminal S8 Function Input 0: Terminal S8 Function (H1-08) OFF 1: Terminal S8 Function (H1-08) ON
External Fault	External Fault EF0 0: No External Fault (EF0) 1: External Fault (EF0)
Fault Reset	Fault Reset 0: No Fault Reset 1: Fault Reset
Speed Reference	Speed Command Sets drive speed reference Unit depends on o1-03. Unit is not affected by Speed Scale SS.
NetRef	Speed reference form Network 0x00: Depends on b1-01 0x01: Enables the speed reference from network

Parameter	Data
NetCtrl	Run command from Network 0x00: Depends on b1-02 0x01: Enables the run command from network

◆ Torque Command 2 (Vendor Specific YE Assy) - 123 (0x7B)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
123	0	Multi-Function Input 8	Multi-Function Input 7	Multi-Function Input 6	Multi-Function Input 5	Multi-Function Input 4	Multi-Function Input 3	Run Rev	Run Fwd
	1	–	–	–	–	–	–	Fault Reset	External Fault
	2	Torque Reference/Torque Limit (Low Byte)							
	3	Torque Reference/Torque Limit (High Byte)							
	4	NetRef							
	5	NetCtrl							

Parameter	Data
Run Fwd	Forward Run Command 0: Stop 1: Forward Run
Run Rev	Reverse Run Command 0: Stop 1: Reverse Run
Multi-Function Input 3	Terminal S3 Function Input 0: Terminal S3 Function (H1-03) OFF 1: Terminal S3 Function (H1-03) ON
Multi-Function Input 4	Terminal S4 Function Input 0: Terminal S4 Function (H1-04) OFF 1: Terminal S4 Function (H1-04) ON
Multi-Function Input 5	Terminal S5 Function Input 0: Terminal S5 Function (H1-05) OFF 1: Terminal S5 Function (H1-05) ON
Multi-Function Input 6	Terminal S6 Function Input 0: Terminal S6 Function (H1-06) OFF 1: Terminal S6 Function (H1-06) ON
Multi-Function Input 7	Terminal S7 Function Input 0: Terminal S7 Function (H1-07) OFF 1: Terminal S7 Function (H1-07) ON
Multi-Function Input 8	Terminal S8 Function Input 0: Terminal S8 Function (H1-08) OFF 1: Terminal S8 Function (H1-08) ON
External Fault	External Fault EF0 0: No External Fault (EF0) 1: External Fault (EF0)
Fault Reset	Fault Reset 0: No Fault Reset 1: Fault Reset
Torque Reference/Torque Limit	Torque Reference/Torque Limit Sets the torque reference and torque limit in units of 0.1%. Sets the torque reference when using torque control (d5-01 = 1). Sets the torque limit when using speed control (d5-01 = 0). The torque reference and torque limit are disabled when F6-06 = 0.
NetRef	Speed reference from Network 0x00: Depends on b1-01 0x01: Enables the speed reference from network
NetCtrl	Run command from Network 0x00: Depends on b1-02 0x01: Enables the run command from network

◆ Speed Dynamic Assy (Vendor Specific YE Assy) - 124 (0x7C)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
124	0	Multi-Function Input 8	Multi-Function Input 7	Multi-Function Input 6	Multi-Function Input 5	Multi-Function Input 4	Multi-Function Input 3	Run Rev	Run Fwd
	1	Service Code							
	2	Class							
	3	Attribute							
	4	Data (Low Byte)							
	5	Data (High Byte)							
	6	Speed Reference (Low Byte)							
	7	Speed Reference (High Byte)							

Parameter	Data
Run Fwd	Forward Run Command 0: Stop 1: Forward Run
Run Rev	Reverse Run Command 0: Stop 1: Reverse Run
Multi-Function Input 3	Terminal S3 Function Input 0: Terminal S3 Function (H1-03) OFF 1: Terminal S3 Function (H1-03) ON
Multi-Function Input 4	Terminal S4 Function Input 0: Terminal S4 Function (H1-04) OFF 1: Terminal S4 Function (H1-04) ON
Multi-Function Input 5	Terminal S5 Function Input 0: Terminal S5 Function (H1-05) OFF 1: Terminal S5 Function (H1-05) ON
Multi-Function Input 6	Terminal S6 Function Input 0: Terminal S6 Function (H1-06) OFF 1: Terminal S6 Function (H1-06) ON
Multi-Function Input 7	Terminal S7 Function Input 0: Terminal S7 Function (H1-07) OFF 1: Terminal S7 Function (H1-07) ON
Multi-Function Input 8	Terminal S8 Function Input 0: Terminal S8 Function (H1-08) OFF 1: Terminal S8 Function (H1-08) ON
Service Code	Service Code <i>Refer to Service Code Decode Table on page 34</i>
Class	Class Valid Classes are Control Supervisor Object (41) and AC/DC Object (42). Instance will always be 1.
Attribute	Attribute
Data	Data
Speed Reference	Speed Command Sets drive speed reference Unit depends on o1-03. Unit is not affected by Speed Scale SS.

Note: This is a paired assembly (124/134).

Table 12 Service Code Decode Table

Service Code	Function
0x00	No Operation
0x0E	Get Attribute Single
0x10	Set Attribute Single

◆ Torque Dynamic Assy (Vendor Specific YE Assy) - 125 (0x7D)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
125	0	Multi-Function Input 8	Multi-Function Input 7	Multi-Function Input 6	Multi-Function Input 5	Multi-Function Input 4	Multi-Function Input 3	Run Rev	Run Fwd
	1	Function Code							
	2	Class							
	3	Attribute							
	4	Data (Low Byte)							
	5	Data (High Byte)							
	6	Torque Reference/Torque Limit (Low Byte)							
	7	Torque Reference/Torque Limit (High Byte)							

Parameter	Data
Run Fwd	Forward Run Command 0: Stop 1: Forward Run
Run Rev	Reverse Run Command 0: Stop 1: Reverse Run
Multi-Function Input 3	Terminal S3 Function Input 0: Terminal S3 Function (H1-03) OFF 1: Terminal S3 Function (H1-03) ON
Multi-Function Input 4	Terminal S4 Function Input 0: Terminal S4 Function (H1-04) OFF 1: Terminal S4 Function (H1-04) ON
Multi-Function Input 5	Terminal S5 Function Input 0: Terminal S5 Function (H1-05) OFF 1: Terminal S5 Function (H1-05) ON
Multi-Function Input 6	Terminal S6 Function Input 0: Terminal S6 Function (H1-06) OFF 1: Terminal S6 Function (H1-06) ON
Multi-Function Input 7	Terminal S7 Function Input 0: Terminal S7 Function (H1-07) OFF 1: Terminal S7 Function (H1-07) ON
Multi-Function Input 8	Terminal S8 Function Input 0: Terminal S8 Function (H1-08) OFF 1: Terminal S8 Function (H1-08) ON
Service Code	Service Code <i>Refer to Service Code Decode Table on page 34</i>
Class	Class Valid Classes are Control Supervisor Object (41) and AC/DC Object (42). Instance will always be 1.
Attribute	Attribute
Data	Data
Torque Reference/Torque Limit	Torque Reference/Torque Limit Sets the torque reference and torque limit in units of 0.1%. Sets the torque reference when using torque control (d5-01 = 1). Sets the torque limit when using speed control (d5-01 = 0). The torque reference and torque limit are disabled when F6-06 = 0.

Note: This is a paired assembly (125/135).

◆ Speed/Torque Assy (Vendor Specific YE Assy) - 126 (0x7E)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
126	0	Multi-Function Input 8	Multi-Function Input 7	Multi-Function Input 6	Multi-Function Input 5	Multi-Function Input 4	Multi-Function Input 3	Run Rev	Run Fwd
	1	–	–	–	–	–	–	Fault Reset	External Fault
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							
	4	Torque Reference/Torque Limit (Low Byte)							
	5	Torque Reference/Torque Limit (High Byte)							
	6	Torque Compensation (Low Byte)							
	7	Torque Compensation (High Byte)							

Parameter	Data
Run Fwd	Forward Run Command 0: Stop 1: Forward Run
Run Rev	Reverse Run Command 0: Stop 1: Reverse Run
Multi-Function Input 3	Terminal S3 Function Input 0: Terminal S3 Function (H1-03) OFF 1: Terminal S3 Function (H1-03) ON
Multi-Function Input 4	Terminal S4 Function Input 0: Terminal S4 Function (H1-04) OFF 1: Terminal S4 Function (H1-04) ON
Multi-Function Input 5	Terminal S5 Function Input 0: Terminal S5 Function (H1-05) OFF 1: Terminal S5 Function (H1-05) ON
Multi-Function Input 6	Terminal S6 Function Input 0: Terminal S6 Function (H1-06) OFF 1: Terminal S6 Function (H1-06) ON
Multi-Function Input 7	Terminal S7 Function Input 0: Terminal S7 Function (H1-07) OFF 1: Terminal S7 Function (H1-07) ON
Multi-Function Input 8	Terminal S8 Function Input 0: Terminal S8 Function (H1-08) OFF 1: Terminal S8 Function (H1-08) ON
External Fault	External Fault EF0 0: No External Fault (EF0) 1: External Fault (EF0)
Fault Reset	Fault Reset 0: No Fault Reset 1: Fault Reset
Speed Reference	Speed Command Sets drive speed reference Unit depends on o1-03. Unit is not affected by Speed Scale SS.
Torque Reference/Torque Limit	Torque Reference/Torque Limit Sets the torque reference and torque limit in units of 0.1%. Sets the torque reference when using torque control (d5-01 = 1). Sets the torque limit when using speed control (d5-01 = 0). The torque reference and torque limit are disabled when F6-06 = 0.
Torque Compensation	Sets the amount of torque compensation. Set in units of 0.1%.

10 Input Assemblies (Drive Produces)

Note: The convention in this manual is from the PLC perspective. As such, an assembly is called an “Output Assembly” when outputted from the PLC and received by this node. An “Input Assembly” is outputted from this node and read by the PLC. This section details “Input Assemblies” that are “Produced” by this drive.

◆ Basic Speed Control Input - 70 (0x46)

Input Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
70	0	–	–	–	–	–	Running 1 (FWD)	–	Faulted
	1	–							
	2	Speed Actual (Low Byte)							
	3	Speed Actual (High Byte)							

Parameter	Data
Faulted	Faulted 0: No Faults Occurred 1: Fault Occurred
Running1	Forward Running 0: Stop or Reverse Running 1: Forward Running
Speed Actual	Actual Drive Speed Monitors drive output frequency Speed actual data: Output frequency $\times 2^{SS}$ (SS: Speed scale) Range: 0 to 0xFFFF For example, when output frequency of 4096 with a speed scale of 2 Speed actual data = $4096 \times 2^2 = 16384 = 0x4000$ Unit depends on o1-03.

Note: The control mode (A1-02) determines whether the value for the speed monitor is either the output frequency or the actual motor speed.

Control Mode (A1-02)		Speed Actual
0	V/f	Output Frequency
0 (H6-01 = 3)	V/f with Simple PG	Motor Speed
1	V/f with PG	Motor Speed
2	OLV	Motor Speed
3	CLV	Motor Speed
5	OLV for PM Motor	Output Frequency
6	Advanced OLV for PM motor	Motor Speed
7	CLV for PM Motor	Motor Speed

◆ Extended Speed Control Input - 71 (0x47)

Input Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
71	0	At Speed	Ref from Net	Ctrl from Net	Ready	Running 2 (REV)	Running 1 (FWD)	Warning	Faulted
	1	State							
	2	Speed Actual (Low Byte)							
	3	Speed Actual (High Byte)							

Name	Description
Faulted	Faulted 0: No Faults Occurred 1: Fault Occurred

10 Input Assemblies (Drive Produces)

Name	Description
Warning	Warning 0: No Warning Occurred 1: Warning Occurred
Running 1 (FWD)	Forward Running 0: Stop or Reverse Running 1: Forward Running
Running 2 (REV)	Reverse Running 0: Stop or Forward Running 1: Reverse Running
Ready	Drive Ready 0: Not Ready 1: Ready
Ctrl from Net	Status of Run command from Network 0: Run command is not from network 1: Run command is from network
Ref from Net	Status of Speed reference from Network 0: Speed reference is not from network 1: Speed reference is from network
At Speed	Speed Agree 0: No Speed Agree 1: Actual speed at speed reference
State	Drive Status 2: Processing 3: Ready (Stopped) 4: Awaiting Run command 5: Ramping to stop 6: Fault stop 7: Fault
Speed Actual	Actual Drive Speed Monitors drive output frequency Speed actual data: Output frequency $\times 2^{SS}$ (SS: Speed scale) Range: 0 to 0xFFFF For example, when output frequency of 4096 with a speed scale of 2 Speed actual data = $4096 \times 2^2 = 16384 = 0x4000$ Unit depends on o1-03.

◆ Speed and Torque Control Input - 72 (0x48)

Input Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
72	0	–	–	–	–	–	Running 1 (FWD)	–	Faulted
	1	–							
	2	Speed Actual (Low Byte)							
	3	Speed Actual (High Byte)							
	4	Torque Actual (Low Byte)							
	5	Torque Actual (High Byte)							

Name	Description
Faulted	Faulted 0: No Faults Occurred 1: Fault Occurred
Running 1	Forward Running 0: Stop or Reverse Running 1: Forward Running

Name	Description
Speed Actual	Actual Drive Speed Monitors drive output frequency Speed actual data: Output frequency × 2 ^{SS} (SS: Speed scale) Range: 0 to 0xFFFF For example, when output frequency of 4096 with a speed scale of 2 Speed actual data = 4096 × 2 ² = 16384 = 0x4000 Unit depends on o1-03.
Torque Actual	Output Torque Shows the torque reference. Value displays in 0.1% units.

◆ Extended Speed and Torque Control Input - 73 (0x49)

Input Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
73	0	At Speed	Ref from Net	Ctrl from Net	Ready	Running 2 (REV)	Running 1 (FWD)	Warning	Faulted
	1	State							
	2	Speed Actual (Low Byte)							
	3	Speed Actual (High Byte)							
	4	Torque Actual (Low Byte)							
	5	Torque Actual (High Byte)							

Name	Description
Faulted	Faulted 0: No Faults Occurred 1: Fault Occurred
Warning	Warning 0: No Warning Occurred 1: Warning Occurred
Running 1 (FWD)	Forward Running 0: Stop or Reverse Running 1: Forward Running
Running 2 (REV)	Reverse Running 0: Stop or Forward Running 1: Reverse Running
Ready	Drive Ready 0: Not Ready 1: Ready
Ctrl from Net	Status of Run command from Network 0: Run command is not from network 1: Run command is from network
Ref from Net	Status of Speed reference from Network 0: Speed reference is not from network 1: Speed reference is from network
At Speed	Speed Agree 0: No Speed Agree 1: Actual speed at speed reference
State	2: Processing 3: Ready (Stopped) 4: Awaiting Run command 5: Ramping to stop 6: Fault stop 7: Falut
Speed Actual	Actual Drive Speed Monitors drive output frequency Speed actual data: Output frequency / 2 ^{SS} (SS: Speed scale) Range: 0 to 0xFFFF For example, when output frequency of 4096 with a speed scale of 2 Speed actual data = 4096 × 2 ² = 16384 = 0x4000 Unit depends on o1-03.

10 Input Assemblies (Drive Produces)

Name	Description
Torque Actual	Output Torque Shows the torque reference. Value displays in 0.1% units.

◆ Speed Status (Vendor Specific YE Assy) - 130 (0x82)

Input Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
130	0	FAULT	ALARM	READY	Speed Agree	Reset	REV Running	ZSP	Running
	1	ZSV	-	Multi-Function Photo Coupler 2	Multi-Function Photo Coupler 1	Multi-Function Digital Output	Local/Remote	UV	-
	2	Output Frequency (Low Byte)							
	3	Output Frequency (High Byte)							

Parameter	Data
Running	Running 0: Stop 1: Forward or Reverse Running
ZSP	Zero Speed 0: Running 1: Stop or DC Injection Braking
REV Running	Reverse Running 0: Not Reverse Running 1: Reverse Running
Reset	Reset 0: No Reset 1: Reset
Speed Agree	Speed Agree 0: No Speed Agree 1: Actual speed at speed reference
READY	Drive Ready 0: Not Ready 1: Ready
ALARM	Drive Alarm 0: No Drive Alarm 1: Alarm
FAULT	Drive Fault 0: No Drive Fault 1: Fault
UV	Under Voltage 0: No Under Voltage 1: Under Voltage
Local/Remote	Status of Run command from Network 0: Run command is not from network 1: Run command is from network
Multi-Function Digital Output	Terminal M1/M2 0: Terminal M1/M2 OFF 1: Terminal M1/M2 ON
Multi-Function Photo Coupler 1	Terminal P1 0: Terminal P1 OFF 1: Terminal P1 ON
Multi-Function Photo Coupler 2	Terminal P2 0: Terminal P2 OFF 1: Terminal P2 ON
ZSV	Zero Servo Completed 0: - 1: Completed

Parameter	Data
Output Frequency	Actual Drive Speed Monitors drive output frequency Unit depends on o1-03. Unit is not affected by Speed Scale SS.

◆ Current Status (Vendor Specific YE Assy) - 131 (0x83)

Input Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
131	0	FAULT	ALARM	READY	Speed Agree	Reset	REV Running	ZSP	Running
	1	ZSV	–	Multi-Function Photo Coupler 2	Multi-Function Photo Coupler 1	Multi-Function Digital Output	Local/Remote	UV	–
	2	Actual Current (Low Byte)							
	3	Actual Current (High Byte)							

Parameter	Data
Running	Running 0: Stop 1: Forward or Reverse Running
ZSP	Zero Speed 0: Running 1: Stop or DC Injection Braking
REV Running	Reverse Running 0: Not Reverse Running 1: Reverse Running
Reset	Reset 0: No Reset 1: Reset
Speed Agree	Speed Agree 0: No Speed Agree 1: Actual speed at speed reference
READY	Drive Ready 0: Not Ready 1: Ready
ALARM	Drive Alarm 0: No Drive Alarm 1: Alarm
FAULT	Drive Fault 0: No Drive Fault 1: Fault
UV	Under Voltage 0: No Under Voltage 1: Under Voltage
Local/Remote	Status of Run command from Network 0: Run command is not from network 1: Run command is from network
Multi-Function Digital Output	Terminal M1/M2 0: Terminal M1/M2 OFF 1: Terminal M1/M2 ON
Multi-Function Photo Coupler 1	Terminal P1 0: Terminal P1 OFF 1: Terminal P1 ON
Multi-Function Photo Coupler 2	Terminal P2 0: Terminal P2 OFF 1: Terminal P2 ON
ZSV	Zero Servo Completed 0: – 1: Completed

10 Input Assemblies (Drive Produces)

Parameter	Data
Actual Current	Actual Output Current Monitors drive output current Unit is 0.01 A for drives set up to 11 kW in Heavy Duty or Normal Duty and 0.1 A for drives set up for 15 kW and above. Unit is not affected by Current Scale CS.

◆ Current & Speed Status (Vendor Specific YE Assy) - 132 (0x84)

Input Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
132	0	FAULT	ALARM	READY	Speed Agree	Reset	REV Running	ZSP	Running
	1	ZSV	-	Multi-Function Photo Coupler 2	Multi-Function Photo Coupler 1	Multi-Function Digital Output	Local/Remote	UV	-
	2	Actual Current (Low Byte)							
	3	Actual Current (High Byte)							
	4	Output Frequency (Low Byte)							
	5	Output Frequency (High Byte)							

Parameter	Data
Running	Running 0: Stop 1: Forward or Reverse Running
ZSP	Zero Speed 0: Running 1: Stop or DC Injection Braking
REV Running	Reverse Running 0: Not Reverse Running 1: Reverse Running
Reset	Reset 0: No Reset 1: Reset
Speed Agree	Speed Agree 0: No Speed Agree 1: Actual speed at speed reference
READY	Drive Ready 0: Not Ready 1: Ready
ALARM	Drive Alarm 0: No Drive Alarm 1: Alarm
FAULT	Drive Fault 0: No Drive Fault 1: Fault
UV	Under Voltage 0: No Under Voltage 1: Under Voltage
Local/Remote	Status of Run command from Network 0: Run command is not from network 1: Run command is from network
Multi-Function Digital Output	Terminal M1/M2 0: Terminal M1/M2 OFF 1: Terminal M1/M2 ON
Multi-Function Photo Coupler 1	Terminal P1 0: Terminal P1 OFF 1: Terminal P1 ON
Multi-Function Photo Coupler 2	Terminal P2 0: Terminal P2 OFF 1: Terminal P2 ON

Parameter	Data
ZSV	Zero Servo Completed 0: – 1: Completed
Actual Current	Actual Output Current Monitors drive output current Unit is 0.01 A for drives set up to 11 kW in Heavy Duty or Normal Duty and 0.1 A for drives set up for 15 kW and above. Unit is not affected by Current Scale CS.
Output Frequency	Actual Drive Speed Monitors drive output frequency Unit depends on o1-03. Unit is not affected by Speed Scale SS.

◆ Speed Status Dynamic Assy (Vendor Specific YE Assy) - 134 (0x86)

Input Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
134	0	FAULT	ALARM	READY	Speed Agree	Reset	REV Running	ZSP	Running
	1	Service Code							
	2	Class							
	3	Attribute							
	4	Data (Low Byte)							
	5	Data (High Byte)							
	6	Output Frequency (Low Byte)							
	7	Output Frequency (High Byte)							

Parameter	Data
Running	Running 0: Stop 1: Forward or Reverse Running
ZSP	Zero Speed 0: Running 1: Stop or DC Injection Braking
REV Running	Reverse Running 0: Not Reverse Running 1: Reverse Running
Reset	Reset 0: No Reset 1: Reset
Speed Agree	Speed Agree 0: No Speed Agree 1: Actual speed at speed reference
READY	Drive Ready 0: Not Ready 1: Ready
ALARM	Drive Alarm 0: No Drive Alarm 1: Alarm
FAULT	Drive Fault 0: No Drive Fault 1: Fault
Service Code	Service Code <i>Refer to Service Code Decode Table on page 34</i>
Class	Class Valid Classes are Control Supervisor Object (41) and AC/DC Object (42). Instance will always be 1.
Attribute	Attribute
Data	Data If Service Code is 0x94, Data is Error Code.

10 Input Assemblies (Drive Produces)

Parameter	Data
Output Frequency	Actual Drive Speed Monitors drive output frequency Unit depends on o1-03. Unit is not affected by Speed Scale SS.

Note: This is a paired assembly (124/134).

Table 13 Reply Mapping - 134

Byte	Write Success	Read Success	Write Failure	Read Failure	Busy	Illegal Function Code	Function Code Equals Zero
1	0x90	0x8E	0x94	0x94	0x8E/0x90	0x94	0
2	Class Number	Class Number	0	0	Class Number	0	0
3	Attribute Number	Attribute Number	0	0	Attribute Number	0	0
4	0	Data Low Byte	DeviceNet Error Code	DeviceNet Error Code	0	0x08	0
5	0	Data High Byte	0xFF	0xFF	0	0xFF	0

◆ Current Status Dynamic Assy (Vendor Specific YE Assy) - 135 (0x87)

Input Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
135	0	FAULT	ALARM	READY	Speed Agree	Reset	REV Running	ZSP	Running
	1	Service Code							
	2	Class							
	3	Attribute							
	4	Data (Low Byte)							
	5	Data (High Byte)							
	6	Actual Current (Low Byte)							
	7	Actual Current (High Byte)							

Parameter	Data
Running	Running 0: Stop 1: Forward or Reverse Running
ZSP	Zero Speed 0: Running 1: Stop or DC Injection Braking
REV Running	Reverse Running 0: Not Reverse Running 1: Reverse Running
Reset	Reset 0: No Reset 1: Reset
Speed Agree	Speed Agree 0: No Speed Agree 1: Actual speed at speed reference
READY	Drive Ready 0: Not Ready 1: Ready
ALARM	Drive Alarm 0: No Drive Alarm 1: Alarm
FAULT	Drive Fault 0: No Drive Fault 1: Fault
Service Code	Service Code <i>Refer to Service Code Decode Table on page 34</i>

Parameter	Data
Class	Class Valid Classes are Control Supervisor Object (41) and AC/DC Object (42). Instance will always be 1.
Attribute	Attribute
Data	Data If Service Code is 0x94, Data is Error Code.
Actual Current	Actual Output Current Monitors drive output current Unit is 0.01 A for drives set up to 11 kW in Heavy Duty or Normal Duty and 0.1 A for drives set up for 15 kW and above. Unit is not affected by Current Scale CS.

Note: This is a paired assembly (125/135).

Table 14 Reply Mapping - 135

Byte	Write Success	Read Success	Write Failure	Read Failure	Busy	Illegal Function Code	Function Code Equals Zero
1	0x90	0x8E	0x94	0x94	0x8E/0x90	0x94	0
2	Class Number	Class Number	0	0	Class Number	0	0
3	Attribute Number	Attribute Number	0	0	Attribute Number	0	0
4	0	Data Low Byte	DeviceNet Error Code	DeviceNet Error Code	0	0x08	0
5	0	Data High Byte	0xFF	0xFF	0	0xFF	0

◆ Torque and Speed Status (Vendor Specific YE Assy) - 136 (0x88)

Input Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
136	0	FAULT	ALARM	READY	Speed Agree	Reset	REV Running	ZSP	Running
	1	ZSV	-	Multi-Function Photo Coupler 2	Multi-Function Photo Coupler 1	Multi-Function Digital Output	Local/Remote	UV	-
	2	Actual Torque (Low Byte)							
	3	Actual Torque (High Byte)							
	4	Output Frequency (Low Byte)							
	5	Output Frequency (High Byte)							
	6	Speed Reference (Low Byte)							
	7	Speed Reference (High Byte)							

Parameter	Data
Running	Running 0: Stop 1: Forward or Reverse Running
ZSP	Zero Speed 0: Running 1: Stop or DC Injection Braking
REV Running	Reverse Running 0: Not Reverse Running 1: Reverse Running
Reset	Reset 0: No Reset 1: Reset
Speed Agree	Speed Agree 0: No Speed Agree 1: Actual speed at speed reference

10 Input Assemblies (Drive Produces)

Parameter	Data
READY	Drive Ready 0: Not Ready 1: Ready
ALARM	Drive Alarm 0: No Drive Alarm 1: Alarm
FAULT	Drive Fault 0: No Drive Fault 1: Fault
UV	Under Voltage 0: No UV Fault 1: Fault
Local/Remote	Status of Run command from Network 0: Run command is not from network 1: Run command is from network
Multi-Function Digital Output	Terminal M1/M2 0: Terminal M1/M2 OFF 1: Terminal M1/M2 ON
Multi-Function Photo Coupler 1	Terminal P1 0: Terminal P1 OFF 1: Terminal P1 ON
Multi-Function Photo Coupler 2	Terminal P2 0: Terminal P2 OFF 1: Terminal P2 ON
ZSV	Zero Servo Completed 0: – 1: Completed
Actual Torque	Output Torque Shows the torque reference. Value displays in 0.1% units.
Output Frequency	Actual Drive Speed Monitors drive output frequency Unit depends on o1-03. Unit is not affected by Speed Scale SS.
Speed Reference	Frequency Reference Monitors drive frequency reference Unit depends on o1-03. Unit is not affected by Speed Scale SS.

◆ MEMOBUS/Modbus Message Reply (Vendor Specific YE Assy) - 150 (0x96)

Input Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
150	0	Function Code							
	1	Register Number (High Byte)							
	2	Register Number (Low Byte)							
	3	Register Data (High Byte)							
	4	Register Data (Low Byte)							

Note: This is a paired assembly (100/150).

Table 15 Reply Mapping - 150

Byte	Write Success	Read Success	Write Failure	Read Failure	Illegal Function Code	Function Code Equals Zero
0	0x10	0x03	0x90	0x83	Function Code Or-ed with 0x80	0
1	Output Assembly Register Number (High Byte)	Output Assembly Register Number (High Byte)	Output Assembly Register Number (High Byte)	Output Assembly Register Number (High Byte)	Output Assembly Register Number (High Byte)	0

Byte	Write Success	Read Success	Write Failure	Read Failure	Illegal Function Code	Function Code Equals Zero
2	Output Assembly Register Number (Low Byte)	Output Assembly Register Number (Low Byte)	Output Assembly Register Number (Low Byte)	Output Assembly Register Number (Low Byte)	Output Assembly Register Number (Low Byte)	0
3	0	Read Data (High Byte)	0	0	0	0
4	0	Read Data (Low Byte)	Error Code	Error Code	1	0

Table 16 Error Replies - 150

Error Code	Description
0x01	Invalid Function Code
0x02	Invalid Register Number
0x21	Upper/Lower Limit Error
0x22	Option generated busy event. The MEMOBUS/Modbus requested operation is in the process loop but the drive is not done yet. Writing "Enter" when drive is running. Attempt to write data that is read only. Attempt to write a constant when drive is running. During a CPF06 event attempting to write to registers other than A1-00 to A1-05, E1-03, o2-04.
0x23	Attempting to write during a drive undervoltage (Uv) event.
0x24	Attempting to write while the drive is storing data.

Note: Refer to the MEMOBUS/Modbus Data Table in Appendix C of the technical Manual for the drive the DeviceNet Option is connected to for a list of monitor data using the MEMOBUS/Modbus message area.

◆ Standard Status 1 (Vendor Specific YE Assy) - 151 (0x97)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
151	0	FAULT	ALARM	READY	Speed Agree	Reset	REV Running	ZSP	Running
	1	-	-	Multi-Function Photo Coupler 2	Multi-Function Photo Coupler 1	Multi-Function Digital Output	Local/Remote	UV	OPE
	2	Output Frequency (Low Byte)							
	3	Output Frequency (High Byte)							
	4	Actual Torque (Low Byte)							
	5	Actual Torque (High Byte)							
	6	Actual Current (Low Byte)							
	7	Actual Current (High Byte)							

Parameter	Data
Running	Running 0: Stop 1: Forward or Reverse Running
ZSP	Zero Speed 0: Running 1: Stop or DC Injection Braking
REV Running	Reverse Running 0: Not Reverse Running 1: Reverse Running
Reset	Reset 0: No Reset 1: Reset
Speed Agree	Speed Agree 0: No Speed Agree 1: Actual speed at speed reference

10 Input Assemblies (Drive Produces)

Parameter	Data
READY	Drive Ready 0: Not Ready 1: Ready
ALARM	Drive Alarm 0: No Drive Alarm 1: Alarm
FAULT	Drive Fault 0: No Drive Fault 1: Fault
OPE	OPE Fault 0: No OPExx Fault 1: OPExx
UV	Under Voltage 0: No Under Voltage 1: Under Voltage
Local/Remote	Status of Run command from Network 0: Run command is not from network 1: Run command is from network
Multi-Function Digital Output	Terminal M1/M2 0: Terminal M1/M2 OFF 1: Terminal M1/M2 ON
Multi-Function Photo Coupler 1	Terminal P1 0: Terminal P1 OFF 1: Terminal P1 ON
Multi-Function Photo Coupler 2	Terminal P2 0: Terminal P2 OFF 1: Terminal P2 ON
Output Frequency	Actual Drive Speed Monitors drive output frequency Unit depends on o1-03. Unit is not affected by Speed Scale SS.
Actual Torque	Output Torque Shows the torque reference. Value displays in 0.1% units.
Actual Current	Actual Output Current Monitors drive output current Unit is 0.01 A for drives set up to 11 kW in Heavy Duty or Normal Duty and 0.1 A for drives set up for 15 kW and above. Unit is not affected by Current Scale CS.

◆ Standard Status 2 (Vendor Specific YE Assy) -152 (0x98)

Input Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
152	0	FAULT	ALARM	READY	Speed Agree	Reset	REV Running	ZSP	Running
	1	-	-	Multi-Function Photo Coupler 2	Multi-Function Photo Coupler 1	Multi-Function Digital Output	Local/Remote	UV	OPE
	2	Output Frequency (Low Byte)							
	3	Output Frequency (High Byte)							
	4	Speed Reference (Low Byte)							
	5	Speed Reference (High Byte)							
	6	Actual Current (Low Byte)							
	7	Actual Current (High Byte)							

Parameter	Data
Running	Running 0: Stop 1: Forward or Reverse Running
ZSP	Zero Speed 0: Running 1: Stop or DC Injection Braking
REV Running	Reverse Running 0: Not Reverse Running 1: Reverse Running
Reset	Reset 0: No Reset 1: Reset
Speed Agree	Speed Agree 0: No Speed Agree 1: Actual speed at speed reference
READY	Drive Ready 0: Not Ready 1: Ready
ALARM	Drive Alarm 0: No Drive Alarm 1: Alarm
FAULT	Drive Fault 0: No Drive Fault 1: Fault
OPE	OPE Fault 0: No OPExx Fault 1: OPExx
UV	Under Voltage 0: No Under Voltage 1: Under Voltage
Local/Remote	Status of Run command from Network 0: Run command is not from network 1: Run command is from network
Multi-Function Digital Output	Terminal M1/M2 0: Terminal M1/M2 OFF 1: Terminal M1/M2 ON
Multi-Function Photo Coupler 1	Terminal P1 0: Terminal P1 OFF 1: Terminal P1 ON
Multi-Function Photo Coupler 2	Terminal P2 0: Terminal P2 OFF 1: Terminal P2 ON
Output Frequency	Actual Drive Speed Monitors drive output frequency Unit depends on o1-03. Unit is not affected by Speed Scale SS.
Frequency Reference	Frequency Reference Monitors drive frequency reference Unit depends on o1-03. Unit is not affected by Speed Scale SS.
Actual Current	Actual Output Current Monitors drive output current Unit is 0.01 A for drives set up to 11 kW in Heavy Duty or Normal Duty and 0.1 A for drives set up for 15 kW and above. Unit is not affected by Current Scale CS.

◆ Enhanced Speed Status, Dynamic (Vendor Specific YE Assy) - 155 (0x9B)

Output Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
155	0	FAULT	ALARM	READY	Speed Agree	Reset	REV Running	ZSP	Running
	1	Multi-Function Photo Coupler 2	Multi-Function Photo Coupler 1	Multi-Function Digital Output	Local / Remote	Function Code High Bit	Function Code Low Bit	UV	OPE
	2	Output Frequency (Low Byte)							
	3	Output Frequency (High Byte)							
	4	Register Number (Low Byte)							
	5	Register Number (High Byte)							
	6	Register Data (Low Byte)							
	7	Register Data (High Byte)							

Parameter	Data
Running	Running 0: Stop 1: Forward or Reverse Running
ZSP	Zero Speed 0: Running 1: Stop or DC Injection Braking
REV Running	Reverse Running 0: Not Reverse Running 1: Reverse Running
Reset	Reset 0: No Reset 1: Reset
Speed Agree	Speed Agree 0: No Speed Agree 1: Actual speed at speed reference
READY	Drive Ready 0: Not Ready 1: Ready
ALARM	Drive Alarm 0: No Drive Alarm 1: Alarm
FAULT	Drive Fault 0: No Drive Fault 1: Fault
OPE	OPE Fault 0: No OPExx Fault 1: OPExx
UV	Under Voltage 0: No Under Voltage 1: Under Voltage
Function Code	MEMOBUS/Modbus Function Code <i>Refer to Function Code Decode Table on page 26</i>
Local/Remote	Status of Run command from Network 0: Run command is not from network 1: Run command is from network
Multi-Function Digital Output	Terminal M1/M2 0: Terminal M1/M2 OFF 1: Terminal M1/M2 ON
Multi-Function Photo Coupler 1	Terminal P1 0: Terminal P1 OFF 1: Terminal P1 ON
Multi-Function Photo Coupler 2	Terminal P2 0: Terminal P2 OFF 1: Terminal P2 ON

Parameter	Data
Output Frequency	Actual Drive Speed Monitors drive output frequency Unit depends on o1-03. Unit is not affected by Speed Scale SS.
Register Number	MEMOBUS/Modbus Register Number
Register Data	MEMOBUS/Modbus Register Data

Note: This is a paired assembly (105/155).

Note: Refer to the MEMOBUS/Modbus Data Table in Appendix C of the technical Manual for the drive the DeviceNet Option is connected to for a list of monitor data using the MEMOBUS/Modbus message area.

Table 17 Reply Mapping - 155

Function Code Bits/Byte	Write Success	Read Success	Write Failure	Read Failure	Function Code Equal to 0 0
Function Bits (High/Low)	1 1	1 1	0 1	0 1	0 0
4	Output Assembly Register Number (Low Byte)	Output Assembly Register Number (Low Byte)	Output Assembly Register Number (Low Byte)	Output Assembly Register Number (Low Byte)	0
5	Output Assembly Register Number (High Byte)	Output Assembly Register Number (High Byte)	Output Assembly Register Number (High Byte)	Output Assembly Register Number (High Byte)	0
6	0	Read Data (Low Byte)	Error Code	Error Code	0
7	0	Read Data (High Byte)	0	0	0

Table 18 Error Replies - 155

Error Code	Description
0x02	Invalid Register Number
0x21	Upper/Lower Limit Error
0x22	Option generated busy event. The MEMOBUS/Modbus requested operation is in the process loop but the drive is not done yet. Writing “Enter” when drive is running. Attempt to write data that is read only. Attempt to write a parameter when drive is running. During a CPF06 event attempting to write to registers other than A1-00 to A1-05, E1-03, o2-04.
0x23	Attempting to write during a drive undervoltage (Uv) event.
0x24	Attempting to write while the drive is storing data.

Note: Refer to the MEMOBUS/Modbus Data Table in Appendix C of the technical Manual for the drive the DeviceNet Option is connected to for a list of monitor data using the MEMOBUS/Modbus message area.

◆ Enhanced Control Status (Vendor Specific YE Assy) -156 (0x9C)

Input Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
156	0	FAULT	ALARM	READY	Speed Agree	Reset	REV Running	ZSP	Running	
	1	Multi-Function Photo Coupler 2	Multi-Function Photo Coupler 1	Multi-Function Digital Output	–	Multi-Function Input 4	Multi-Function Input 3	Multi-Function Input 2	Multi-Function Input 1	
	2	Output Frequency (Low Byte)								
	3	Output Frequency (High Byte)								
	4	–								
	5	–								
	6	Actual Current (Low Byte)								
	7	Actual Current (High Byte)								

Parameter	Data
Running	Running 0: Stop 1: Forward or Reverse Running

10 Input Assemblies (Drive Produces)

Parameter	Data
ZSP	Zero Speed 0: Running 1: Stop or DC Injection Braking
REV Running	Reverse Running 0: Not Reverse Running 1: Reverse Running
Reset	Reset 0: No Reset 1: Reset
Speed Agree	Speed Agree 0: No Speed Agree 1: Actual speed at speed reference
READY	Drive Ready 0: Not Ready 1: Ready
ALARM	Drive Alarm 0: No Drive Alarm 1: Alarm
FAULT	Drive Fault 0: No Drive Fault 1: Fault
Multi-Function Input 1	Terminal S1 0: Terminal S1 OFF 1: Terminal S1 ON
Multi-Function Input 2	Terminal S2 0: Terminal S2 OFF 1: Terminal S2 ON
Multi-Function Input 3	Terminal S3 0: Terminal S3 OFF 1: Terminal S3 ON
Multi-Function Input 4	Terminal S4 0: Terminal S4 OFF 1: Terminal S4 ON
Multi-Function Digital Output	Terminal M1/M2 0: Terminal M1/M2 OFF 1: Terminal M1/M2 ON
Multi-Function Photo Coupler 1	Terminal P1 0: Terminal P1 OFF 1: Terminal P1 ON
Multi-Function Photo Coupler 2	Terminal P2 0: Terminal P2 OFF 1: Terminal P2 ON
Output Frequency	Actual Drive Speed Monitors drive output frequency Unit depends on o1-03. Unit is not affected by Speed Scale SS.
Actual Current	Actual Output Current Monitors drive output current Unit is 0.01 A for drives set up to 11 kW in Heavy Duty or Normal Duty and 0.1 A for drives set up for 15 kW and above. Unit is not affected by Current Scale CS.

Note: Refer to the MEMOBUS/Modbus Data Table in Appendix C of the technical Manual for the drive the DeviceNet Option is connected to for a list of monitor data using the MEMOBUS/Modbus message area.

◆ Standard DI/DO Status (Vendor Specific YE Assy) - 157 (0x9D)

Input Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
157	0	FAULT	ALARM	READY	Speed Agree	Reset	REV Running	ZSP	Running	
	1	–	–	–	–	–	Local/Remote	UV	OPE	
	2	Multi-Function Input 8	Multi-Function Input 7	Multi-Function Input 6	Multi-Function Input 5	Multi-Function Input 4	Multi-Function Input 3	Multi-Function Input 2	Multi-Function Input 1	
	3	–	–	Multi-Function Photo Coupler 2	Multi-Function Photo Coupler 1	Multi-Function Digital Output	–	–	–	
	4	Analog Input 1 (Low Byte)								
	5	Analog Input 1 (High Byte)								
	6	Output Frequency (Low Byte)								
	7	Output Frequency (High Byte)								

Parameter	Data
Running	Running 0: Stop 1: Forward or Reverse Running
ZSP	Zero Speed 0: Running 1: Stop or DC Injection Braking
REV Running	Reverse Running 0: Not Reverse Running 1: Reverse Running
Reset	Reset 0: No Reset 1: Reset
Speed Agree	Speed Agree 0: No Speed Agree 1: Actual speed at speed reference
READY	Drive Ready 0: Not Ready 1: Ready
ALARM	Drive Alarm 0: No Drive Alarm 1: Alarm
FAULT	Drive Fault 0: No Drive Fault 1: Fault
OPE	OPE Fault 0: No OPExx Fault 1: OPExx
UV	Under Voltage 0: No Under Voltage 1: Under Voltage
Local/Remote	Status of Run command from Network 0: Run command is not from network 1: Run command is from network
Multi-Function Input 1	Terminal S1 0: Terminal S1 OFF 1: Terminal S1 ON
Multi-Function Input 2	Terminal S2 0: Terminal S2 OFF 1: Terminal S2 ON

10 Input Assemblies (Drive Produces)

Parameter	Data
Multi-Function Input 3	Terminal S3 0: Terminal S3 OFF 1: Terminal S3 ON
Multi-Function Input 4	Terminal S4 0: Terminal S4 OFF 1: Terminal S4 ON
Multi-Function Input 5	Terminal S5 0: Terminal S5 OFF 1: Terminal S5 ON
Multi-Function Input 6	Terminal S6 0: Terminal S6 OFF 1: Terminal S6 ON
Multi-Function Input 7	Terminal S7 0: Terminal S7 OFF 1: Terminal S7 ON
Multi-Function Input 8	Terminal S8 0: Terminal S8 OFF 1: Terminal S8 ON
Multi-Function Digital Output	Terminal M1/M2 0: Terminal M1/M2 OFF 1: Terminal M1/M2 ON
Multi-Function Photo Coupler 1	Terminal P1 0: Terminal P1 OFF 1: Terminal P1 ON
Multi-Function Photo Coupler 2	Terminal P2 0: Terminal P2 OFF 1: Terminal P2 ON
Analog Input 1	Analog Input A1
Output Frequency	Actual Drive Speed Monitors drive output frequency Unit depends on o1-03. Unit is not affected by Speed Scale SS.

◆ Enhanced Torque Status, Dynamic (Vendor Specific YE Assy) - 158 (0x9E)

Input Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
158	0	FAULT	ALARM	READY	Speed Agree	Reset	REV Running	ZSP	Running
	1	Multi-Function Photo Coupler 2	Multi-Function Photo Coupler 1	Multi-Function Digital Output	Local/Remote	Function Code High Bit	Function Code Low Bit	UV	OPE
	2	Actual Torque (Low Byte)							
	3	Actual Torque (High Byte)							
	4	Register Number (Low Byte)							
	5	Register Number (High Byte)							
	6	Register Data (Low Byte)							
	7	Register Data (High Byte)							

Parameter	Data
Running	Running 0: Stop 1: Forward or Reverse Running
ZSP	Zero Speed 0: Running 1: Stop or DC Injection Braking
REV Running	Reverse Running 0: Not Reverse Running 1: Reverse Running

Parameter	Data
Reset	Reset 0: No Reset 1: Reset
Speed Agree	Speed Agree 0: No Speed Agree 1: Actual speed at speed reference
READY	Drive Ready 0: Not Ready 1: Ready
ALARM	Drive Alarm 0: No Drive Alarm 1: Alarm
FAULT	Drive Fault 0: No Drive Fault 1: Fault
OPE	OPE Fault 0: No OPExx Fault 1: OPExx
UV	Under Voltage 0: No Under Voltage 1: Under Voltage
Local/Remote	Status of Run command from Network 0: Run command is not from network 1: Run command is from network
Multi-Function Digital Output	Terminal M1/M2 0: Terminal M1/M2 OFF 1: Terminal M1/M2 ON
Multi-Function Photo Coupler 1	Terminal P1 0: Terminal P1 OFF 1: Terminal P1 ON
Multi-Function Photo Coupler 2	Terminal P2 0: Terminal P2 OFF 1: Terminal P2 ON
Actual Torque	Output Torque Shows the torque reference. Value displays in 0.1% units.
Register Number	MEMOBUS/Modbus Register Number
Register Data	MEMOBUS/Modbus Register Data

Note: This is a paired assembly (108/158).

Note: Refer to the MEMOBUS/Modbus Data Table in Appendix C of the technical Manual for the drive the DeviceNet Option is connected to for a list of monitor data using the MEMOBUS/Modbus message area.

Table 19 Reply Mapping - 158

Function Code Bits/Byte	Write Success	Read Success	Write Failure	Read Failure	Function Code Equal to 0 0
Function Bits (High/Low)	1 1	1 1	0 1	0 1	0 0
4	Output Assembly Register Number (Low Byte)	Output Assembly Register Number (Low Byte)	Output Assembly Register Number (Low Byte)	Output Assembly Register Number (Low Byte)	0
5	Output Assembly Register Number (High Byte)	Output Assembly Register Number (High Byte)	Output Assembly Register Number (High Byte)	Output Assembly Register Number (High Byte)	0
6	0	Read Data (Low Byte)	Error Code	Error Code	0
7	0	Read Data (High Byte)	0	0	0

Table 20 Error Replies - 158

Error Code	Description
0x02	Invalid Register Number
0x21	Upper/Lower Limit Error

10 Input Assemblies (Drive Produces)

Error Code	Description
0x22	Option generated busy event. The MEMOBUS/Modbus requested operation is in the process loop but the drive is not done yet. Writing "Enter" when drive is running. Attempt to write data that is read only. Attempt to write a constant when drive is running. During a CPF06 event attempting to write to registers other than A1-00 to A1-05, E1-03, o2-04.
0x23	Attempting to write during a drive undervoltage (Uv) event.
0x24	Attempting to write while the drive is storing data.

◆ Change of State Response (Vendor Specific YE Assy) - 199 (0xC7)

Input Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
199	0	Multi-Function Input 4	Multi-Function Input 3	NetCtrl	NetRef	Fault Reset	External Fault	Run Rev	Run Fwd	
	1	–	–	–	–	Multi-Function Input 8	Multi-Function Input 7	Multi-Function Input 6	Multi-Function Input 5	
	2	FAULT	ALARM	READY	Speed Agree	Reset	REV Running	ZSP	Running	
	3	NetCtrl (Status)	NetRef (Status)	–	–	–	2nd Motor	UV	OPE	
	4	Output Frequency (Low Byte)								
	5	Output Frequency (High Byte)								
	6	Actual Torque (Low Byte)								
	7	Actual Torque (High Byte)								

Parameter	Data
Run Fwd	Forward Run command from Network 0: Forward Run command is not from network 1: Forward Run command is from network
Run Rev	Reverse Run command from Network 0: Reverse Run command is not from network 1: Reverse Run command is from network
External Fault	External Fault command from Network 0: External Fault command is not from network 1: External Fault command is from network
Fault Reset	Fault Reset command from Network 0: Fault Reset command is not from network 1: Fault Reset command is from network
NetRef	Reference command from Network 0: Reference command is not from network 1: Reference command is from network
NetCtrl	Run command from Network 0: Run command is not from network 1: Run command is from network
Multi-Function Input 3	Terminal S3 command by Network 0: Terminal S3 command OFF 1: Terminal S3 command ON
Multi-Function Input 4	Terminal S4 command by Network 0: Terminal S4 command OFF 1: Terminal S4 command ON
Multi-Function Input 5	Terminal S5 command by Network 0: Terminal S5 command OFF 1: Terminal S5 command ON
Multi-Function Input 6	Terminal S6 command by Network 0: Terminal S6 command OFF 1: Terminal S6 command ON

Parameter	Data
Multi-Function Input 7	Terminal S7 command by Network 0: Terminal S7 command OFF 1: Terminal S7 command ON
Multi-Function Input 8	Terminal S8 command by Network 0: Terminal S8 command OFF 1: Terminal S8 command ON
Running	Running 0: Stop 1: Forward or Reverse Running
ZSP	Zero Speed 0: Running 1: Stop or DC Injection Braking
REV Running	Reverse Running 0: Not Reverse Running 1: Reverse Running
Reset	Reset 0: No Reset 1: Reset
Speed Agree	Speed Agree 0: No Speed Agree 1: Actual speed at speed reference
READY	Drive Ready 0: Not Ready 1: Ready
ALARM	Drive Alarm 0: No Drive Alarm 1: Alarm
FAULT	Drive Fault 0: No Drive Fault 1: Fault
OPE	OPE Fault 0: No OPExx fault 1: OPExx
UV	Under Voltage 0: No Under Voltage 1: Under Voltage
2nd Motor	Status of Second Motor 0: First Motor Select 1: Second Motor Select
NetRef (Status)	Status of reference command from Network 0: Reference command is not from network 1: Reference command is from network
NetCtrl (Status)	Status of Run command from Network 0: Run command is not from network 1: Run command is from network
Output Frequency	Actual Drive Speed Monitors drive output frequency Unit depends on o1-03. Unit is not affected by Speed Scale SS.
Actual Torque	Output Torque Shows the torque reference. Value displays in 0.1% units.

11 General Class Objects

◆ Identity Object - 1 (Class 0x01)

■ Services Supported

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

■ Attributes Supported

Instance ID	Attribute	Name	Description	Get	Set	Size	Range	Default
0	1	Object Software Revision	The Identity Object software revision	○	–	Word	–	1
1	1	Vendor ID	Manufacturer code. 44 (2C Hex): Yaskawa Electric	○	–	Word	–	44 (YASKAWA)
1	2	Device Type	The device profile. The profile for this product is an AC drive. 2: AC drive	○	–	Word	–	2 (AC Drives)
1	3	Product Code	Product codes determined by the manufacturer.	○	–	Word	–	</>
1	4	Revision	Software revision for the option card.	○	–	Word	–	Depends on software
1	5	Status	The comm. status for the drive.	○	–	Word	–	0
1	6	Serial Number	Option card serial number	○	–	Long	–	Each unit is unique
1	7	Product Name	Product name.	○	–	String (14 Bytes)	–	Product-dependent ex: CIMR-AA2A0004
1	8	State	The operation status of the drive. 3: Drive ready 4: Fault	○	–	Byte	–	3
1	9	Configuration Consistency Value	Shows verification data for any parameters that have been edited from their default values.	○	–	Word	–	0000
1	10	Heartbeat Interval	Heartbeat interval.	○	○	Word	0 to 10	0=disabled

</> Product code is 2 bytes. The first byte is the drive type and the second byte is the model number of the drive.

◆ Message Router Object - 2 (Class 0x02)

■ Services Supported

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

■ Attributes Supported

Instance ID	Attribute	Name	Description	Get	Set	Size	Range	Default
0	1	Object Software Revision	The Message Router object software revision	○	–	Word	–	1

◆ DeviceNet Object - 3 (Class 0x03)

■ Services Supported

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

Service Code No. (hex)	Service Name
10	Set Attribute Single
05	Reset

■ Attributes Supported

Instance ID	Attribute	Name	Description	Get	Set	Size	Range	Default (Hex)
0	1	Object Software Revision	The DeviceNet object software revision.	O	–	Word	–	2
1	1	MAC ID	Current Value of MAC Address	O	O <1>	Byte	0-63	63
1	2	Baud Rate	Current Value of Baud Rate	O	O <2>	Byte	0-3	00
1	3	Bus Off Interruption (BOI)	Operation at a Bus Off Detection is shown.	O	–	Byte	00-01	00
1	4	Bus Off Counter	The number of Bus Off Detection is shown	O	–	Byte	0-255	00
1	5	Allocation Information	The DeviceNet communication connection information.	O	–	Byte x2	–	00, 00
1	6	MAC ID Switch Changed	Indication that MAC Address Switch Changed since last Power-up	O	–	Bool	–	0
1	7	Baud Rate Switch Changed	Indication that Baud Rate Switch Changed since last Power-up	O	–	Bool	–	0
1	8	MAC ID Switch Value	The MAC ID setting value. Setting is done through drive operator, F6-50.	O	–	Byte	0-64	–
1	9	Baud Rate Switch Value	The Baud rate setting value. Setting is done through drive operator.	O	–	Byte	0-4	–

<1> Set only settable when Attribute 08, F6-50 = 64

<2> Set only valid when Attribute 09, F6-63 = 3.

◆ Assembly Object - 4 (Class 0x04)

■ Services Supported

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

■ Attributes Supported

Instance ID	Attribute	Name	Description	Get	Set	Size	Range	Default
0	1	Object Software Revision	The DeviceNet Object software revision	O	–	Word	–	2
20	3	Data	Same function as the Basic Speed Control (Output Assembly)	O	O	Array 4 bytes	–	00 00 00 00
21	3	Data	Same function as the Extended Speed Control (Output Assembly)	O	O	Array 4 bytes	–	00 00 00 00
22	3	Data	Same function as the Speed and Torque Control (Output Assembly)	O	O	Array 6 Bytes	–	00 00 00 00 00 00
23	3	Data	Same function as the Extended Speed and Torque Control (Output Assembly)	O	O	Array 6 Bytes	–	00 00 00 00 00 00
70	3	Data	Same function as the Basic Speed Control (Input Assembly)	O	–	Array 4 bytes	–	00 00 00 00
71	3	Data	Same function as the Extended Speed Control (Input Assembly)	O	–	Array 4 bytes	–	00 00 00 00
72	3	Data	Same function as the Speed Control (Input Assembly)	O	–	Array 6 bytes	–	00 00 00 00 00 00

11 General Class Objects

Instance ID	Attribute	Name	Description	Get	Set	Size	Range	Default
73	3	Data	Same function as the Speed and Torque Control (Input Assembly)	○	–	Array 6 bytes	–	00 00 00 00 00 00
100	3	Data	Same function as the MEMOBUS/ Modbus Message Command (Output Assembly)	○	○	Array 5 bytes	–	00 00 00 00 00
101	3	Data	Same function as the Standard Control (Output Assembly)	○	○	Array 8 bytes	–	00 00 00 00 00 00 00 00
102	3	Data	Same function as the Accel/ Decel Time (Output Assembly)	○	○	Array 8 bytes	–	00 00 00 00 00 00 00 00
105	3	Data	Same function as the Enhanced Torque Control, Dynamic (Output Assembly)	○	○	Array 8 bytes	–	00 00 00 00 00 00 00 00
106	3	Data	Same function as the Enhanced Control (Output Assembly)	○	○	Array 8 bytes	–	00 00 00 00 00 00 00 00
107	3	Data	Same function as the Standard DI/ DO Control (Output Assembly)	○	○	Array 8 bytes	–	00 00 00 00 00 00 00 00
108	3	Data	Same function as the Enhanced Torque Control, Dynamic (Output Assembly)	○	○	Array 8 bytes	–	00 00 00 00 00 00 00 00
120	3	Data	Same function as the Speed Command 1 (Output Assembly)	○	○	Array 4 bytes	–	00 00 00 00
121	3	Data	Same function as the Torque Command 1 (Output Assembly)	○	○	Array 4 bytes	–	00 00 00 00
122	3	Data	Same function as the Speed Command 2 (Output Assembly)	○	○	Array 6 bytes	–	00 00 00 00 00 00
123	3	Data	Same function as the Torque Command 2 (Output Assembly)	○	○	Array 6 bytes	–	00 00 00 00 00 00
124	3	Data	Same function as the Speed Dynamic Assy (Output Assembly)	○	○	Array 8 bytes	–	00 00 00 00 00 00 00 00
125	3	Data	Same function as the Torque Dynamic Assy (Output Assembly)	○	○	Array 8 bytes	–	00 00 00 00 00 00 00 00
126	3	Data	Same function as the Speed / Torque Assy (Output Assembly)	○	○	Array 8 bytes	–	00 00 00 00 00 00 00 00
130	3	Data	Same function as the Speed Status 1 (Input Assembly)	○	–	Array 4 bytes	–	00 00 00 00
131	3	Data	Same function as the Current Status 1 (Input Assembly)	○	–	Array 4 bytes	–	00 00 00 00
132	3	Data	Same function as the Current & Speed Status 1 (Input Assembly)	○	–	Array 6 bytes	–	00 00 00 00 00 00
134	3	Data	Same function as the Speed Status Dynamic Assy (Input Assembly)	○	–	Array 8 bytes	–	00 00 00 00 00 00 00 00
135	3	Data	Same function as the Current Status Dynamic Assy (Input Assembly)	○	–	Array 8 bytes	–	00 00 00 00 00 00 00 00
136	3	Data	Same function as the Torque and Speed Status (Input Assembly)	○	–	Array 8 bytes	–	00 00 00 00 00 00 00 00
150	3	Data	Same function as the MEMOBUS/ Modbus Message Reply (Input Assembly)	○	–	Array 5 bytes	–	00 00 00 00 00
151	3	Data	Same function as the Standard Status (Input Assembly)	○	–	Array 8 bytes	–	00 00 00 00 00 00 00 00
152	3	Data	Same function as the Standard Status 2 (Input Assembly)	○	–	Array 8 bytes	–	00 00 00 00 00 00 00 00
155	3	Data	Same function as the Enhanced Speed Status (Input Assembly)	○	–	Array 8 bytes	–	00 00 00 00 00 00 00 00
156	3	Data	Same function as the Enhanced Control Status (Input Assembly)	○	–	Array 8 bytes	–	00 00 00 00 00 00 00 00
157	3	Data	Same function as the Standard DI/ DO Status (Input Assembly)	○	–	Array 8 bytes	–	00 00 00 00 00 00 00 00

Instance ID	Attribute	Name	Description	Get	Set	Size	Range	Default
158	3	Data	Same function as the Enhanced Torque Status, Dynamic (Input Assembly)	○	–	Array 8 bytes	–	00 00 00 00 00 00 00 00
199	3	Data	Same function as the Change of State Response (Input Assembly)	○	–	Array 8 bytes	–	00 00 00 00 00 00 00 00

◆ DeviceNet Connection Object - 5 (Class 0x05)

■ Services Supported

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

■ Attributes Supported

Instance ID	Attribute	Name	Description	Get	Set	Size	Range	Default
0	1	Object Software Revision	The DeviceNet Connection object software revision	○	–	Word	–	1
1 Explicit	1	State	Status of the instance. 00: Network not found or not yet connected. 01: Online, awaiting connection from the master. 02: Waiting to write the connection ID. 03: Connected successfully. 04: Timeout.	○	–	Byte	–	3
	2	Instance type	Shows the instance type. 00: Explicit message 01: I/O message	○	–	Byte	–	0
	3	Transport class trigger	Defines behavior of the connection.	○	–	Byte	–	83h
	4	Produced connection ID	The label used in the comm. header for the drive.	○	–	Word	–	–
	5	Consumed connection ID	Set once the comm. connection is complete.	○	–	Word	–	–
	6	Initial comm characteristics	Code for the comm. type.	○	–	Byte	–	21h
	7	Produced connection size	Maximum number of bytes that can be transmitted.	○	–	Byte	–	–
	8	Consumed connection size	Maximum number of bytes received.	○	–	Byte	–	–
	9	Expected packet rate	The time to timeout after receiving a comm. request. Rounds up to the nearest 10 ms.	○	○	Word	0 ~ 65535	0
	12	Watchdog time-out action	Action taken after timeout. 00: Save value until reset or power is shut off 01: Auto delete 02: Restart while remaining connected	○	–	Byte	–	1
	13	Produced connection path length	Number of bytes for the transmission connection path.	○	–	Word	–	0
	14	Produced connection path	Specifies the application object that will produce data by this Connection Object.	○	–	Array	–	–
	15	Consumed connection path length	Number of bytes in the consumed connection path.	○	–	Word	–	0
16	Consumed connection path	Specifies the Application Object that will receive data consumed by this Connection Object.	○	–	Array	–	–	

11 General Class Objects

Instance ID	Attribute	Name	Description	Get	Set	Size	Range	Default
2 Polled I/O	1	State	Status of the instance. 00: Network not found or not yet connected. 01: Online, awaiting connection from the master. 02: Waiting to write the connection ID. 03: Connected successfully. 04: Timeout.	○	–	Byte	–	3
	2	Instance type	The instance type. 00: Explicit message 01: I/O message	○	–	Byte	–	1
	3	Transport class trigger	Defines behavior of the connection.	○	–	Byte	–	–
	4	Produced connection ID	The label used in the comm. header for the drive. Set once the comm. connection is complete.	○	–	Word	–	–
	5	Consumed connection ID		○	–	Word	–	–
	6	Initial comm characteristics	Code for the comm. type.	○	–	Byte	–	–
	7	Produced connection size	Maximum number of bytes that can be transmitted.	○	–	Byte	–	4
	8	Consumed connection size	Maximum number of bytes received.	○	–	Byte	–	4
	9	Expected packet rate	The time to timeout after receiving a comm. request. Rounds up to the nearest 10 ms.	○	○	Word </>	0 ~ 65535	0
	12	Watchdog time-out action	Action taken after timeout. 00: Save value until reset or power is shut off 01: Auto delete 02: Restart while remaining connected	○	○	Byte	0 ~ 2	0
	13	Produced connection path length	Number of bytes for the transmission connection path.	○	–	Word </>	–	6
	14	Produced connection path	Specifies the application object whose data will be produced by this Connection Object.	○	○	Array </>	–	20h 04h 24h 47h 30h 03h
	15	Consumed connection path length	Number of bytes in the consumed connection path.	○	–	Word </>	–	6
	16	Consumed connection path	Specifies the Application Object that will receive data consumed by this Connection Object.	○	○	Array </>	–	20h 04h 24h 15h 30h 03h
	100	Produced connection path	Number of bytes in the consumed connection path.	○	○	Byte	–	71
101	Consumed connection path	Specifies the Application Object that will receive data consumed by this Connection Object.	○	○	Byte3	–	21	

Instance ID	Attribute	Name	Description	Get	Set	Size	Range	Default
4 COS	1	State	Status of the instance. 00: Network not found or not yet connected. 01: Online, awaiting connection from the master. 02: Waiting to write the connection ID. 03: Connected successfully. 04: Timeout.	○	–	Byte	–	1
	2	Instance type	The instance type. 00: Explicit message 01: I/O message	○	–	Byte	–	1
	3	Transport class trigger	Defines behavior of the connection.	○	–	Byte	–	0x10
	4	Produced connection ID	Shows the label used in the comm. header for the drive. Set once the comm. connection is complete.	○	–	Word	–	-
	5	Consumed connection ID		○	–	Word	–	0xFFFF
	6	Initial comm characteristics	Code for the comm. type.	○	–	Byte	–	0x0F
	7	Produced connection size	Maximum number of bytes that can be transmitted.	○	–	Byte	–	8
	8	Consumed connection size	Maximum number of bytes received.	○	–	Byte	–	0
	9	Expected packet rate	The time to timeout after receiving a comm. request. Rounds up to the nearest 10 ms.	○	○	Word	–	0
	12	Watchdog time-out action	Action taken after timeout. 00: Save value until reset or power is shut off 01: Auto delete 02: Restart while remaining connected	○	○	Byte	–	0
	13	Produced connection path length	Number of bytes for the transmission connection path.	○	–	Word </>	–	6
	14	Produced connection path	Specifies the application object that will produce data by this Connection Object.	○	–	Array </>	–	20h 04h 24h C7h 30h 03h
	15	Consumed connection path length	Number of bytes in the consumed connection path.	○	–	0	–	0
	16	Consumed connection path	Specifies the Application Object that will receive data consumed by this Connection Object.	○	–	Array </>	–	0
17	Production inhibit time	–	○	○	Word	–	0	

<1> These attributes default on power-up to Logical encoding. If a message is received that is in Symbolic encoding, a three-byte Symbolic encoded message is returned.

<2> A polled EPR time. Timing out will cause the drive to fault with a “bUS” fault.

◆ Motor Data Object - 40 (Class 0x28)

■ Services Supported

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

■ Attributes Supported

Instance ID	Attribute	Name	Description	Get	Set	Size	Range	Default
0	1	Object Software Revision	The Motor Data Object software revision	○	–	Word	–	1

11 General Class Objects

Instance ID	Attribute	Name	Description	Get	Set	Size	Range	Default
1	3	Motor Type	Displays the type of motor used. 3: PM motor 7: IM motor Determined by the control mode set to A1-02. When A1-02 = 5/6/7, this attribute becomes 3 (PM motor). When A1-02 = 0/1/2/3, this attribute becomes 7 (IM motor).	○	–	Byte	–	Depends on A1-02, Control Method Selection
1	6	Rated Current [0.1 A]	Motor rated current. Displayed in 0.1 A units. Changes according to the current scale (CS).	○	○	Byte	–	Depends on Capacity
1	7	Rated Voltage [1 V]	Motor rated voltage. Displayed in 1 V units. Changes according to the voltage scale (VS).	○	○	Byte	–	Depends on Capacity

◆ Control Supervisor Object - 41 (Class 0x29)

■ Services Supported

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

■ Attributes Supported

Instance ID	Attribute	Name	Description	Get	Set	Size	Range	Default
0	1	Object Software Revision	Revision number of the Control Supervisor Object.	○	–	Word	–	1
1	3	Run 1 (Forward Run Command)	Forward Running 0: Stop 1: Forward Running	○	○	Byte	0,1	0
1	4	Run 2 (Reverse Run Command)	Reverse Running 0: Stop 1: Reverse Running	○	○	Byte	0,1	0
1	5	NetCtrl (Command)	Run command from Network 0: Depends on b1-02 1: Enables the run command from network	○	○	Byte	0,1	0
1	6	State	Drive status. 2: Not ready 3: Ready (stopped) 4: Enabled (Run command present) 5: Deceleration to stop 6: Fault stop 7: Fault	○	–	Byte	–	3
1	7	Running 1 (FWD)	Forward Running 0: Stop 1: Forward Running	○	–	Byte	–	0
1	8	Running 1 (REV)	Reverse Running 0: Stop 1: Reverse Running	○	–	Byte	–	0
1	9	Ready	Drive Ready 0: Not ready 1: Ready	○	–	Byte	–	1
1	10	Fault	Drive Fault 0: No Drive Fault 1: Fault	○	–	Byte	–	0

Instance ID	Attribute	Name	Description	Get	Set	Size	Range	Default
1	11	Warning	Warning 0: No Warning 1: Warning	○	–	Byte	–	0
1	12	Fault Reset	Fault Reset 0: No Fault Reset 1: Fault Reset	○	○	Byte	0,1	0
1	13	Fault Code	Current Fault Refer to <i>DeviceNet Fault Code Conversion Table on page 65</i> for details	○	–	Word	–	0000
1	15	Control from Net (Status)	Run Command from DeviceNet 0: Enables the run command from except for DeviceNet 1: Enables the run command from DeviceNet	○	–	Byte	–	0
1	16	DeviceNet Fault Mode	Normal 2 (vendor specific)	○	–	Byte	–	2
1	17	Force Fault	External fault 0: No External Fault 1: External fault (EF0) Triggered by the rising edge of the signal	○	○	Byte	0,1	0
1	18	Force Reset	External fault status 0: No External Fault 1: External fault Triggered by the rising edge of the signal.	○	–	Byte	–	0

■ DeviceNet Fault Code Conversion Table

Drive Fault Code [Dec] (MEMOBUS/Modbus #0080hex)	DeviceNet Fault Code [hex]	Description
0	0000	None
2	3220	DC Bus Undervolt (Uv1)
3	5110	CTL PS Undervolt (Uv2)
4	3222	MC Answerback (Uv3)
6	2120	Ground Fault (GF)
7	2300	Over Current (oC)
8	3210	DC Bus Overvolt (ov)
9	4200	Heatsink Overtemp (oH)
10	4210	Heatsink Max Temp (oH1)
11	2220	Motor Overload (oL1)
12	2200	Inv Overload (oL2)
13	2221	Overtorque Det 1 (oL3)
14	2222	Overtorque Det 2 (oL4)
15	7110	DynBrk Transistor (rr)
16	7112	DynBrk Resistor (rH)
17	9000	External Fault 3 (EF3)
18	9000	External Fault 4 (EF4)
19	9000	External Fault 5 (EF5)
20	9000	External Fault 6 (EF6)
21	9000	External Fault 7 (EF7)
22	9000	External Fault 8 (EF8)
24	7310	Overspeed Det (oS)
25	7310	Speed Deviation (dEv)
26	7301	PG Open (PGo)
27	3130	Input Phase Loss (PF)
28	3130	Output Phase Loss (LF)
29	5210	Motor Overheat 1 (PTC input) (oH3)
30	5300	Operator Disconnected (oPr)

11 General Class Objects

Drive Fault Code [Dec] (MEMOBUS/Modbus #0080hex)	DeviceNet Fault Code [hex]	Description
31	6320	EEPROM R/W Error (Err)
32	0	Motor Overheat 2(PTC input) (oH4)
33	7500	MEMOBUS/Modbus Com Fault (CE)
34	7500	DeviceNet communication Error (bUS)
37	8321	Out of Control (CF)
38	8313	Zero-Servo Fault (SvE)
39	9000	External Fault 0 (EF0)
40	8000	PID Feedback Loss (FbL)
41	8000	Undertorque Detection 1 (UL3)
42	8000	Undertorque Detection 2 (UL4)
43	8000	High Slip Braking oL (oL7)
50	8000	Z Pulse Fall Detection (dv1)
51	8000	Z Pulse Noise Fault Detection (dv2)
52	8000	Inversion Detection(dv3)
53	8000	Inversion Prevention Detection(dv4)
54	8000	Current Imbalance (LF2)
55	8000	Pull-Out Detection (STo)
56	7000	PG Hardware Fault (PGoH)
59	1000	Too Many Speed Search Restarts (SEr)
65	8000	Excessive PID Feedback (FbH)
66	9000	External Fault(input terminal S1) (EF1)
67	9000	External Fault(input terminal S2) (EF2)
68	8000	Mechanical Weakening Detection 1 (oL5)
69	8000	Mechanical Weakening Detection 2 (UL5)
70	5000	Current Offset Fault (CoF)
73	8000	DriveWorksEZ Fault (dWFL)
77	5000	Output Voltage Detection Fault (voF)
78	7000	Braking Resistor Fault (rF)
79	7000	Braking Transistor Overload Fault (boL)
–	1000	Other faults

◆ AC/DC Drive Object - 42 (Class 0x2A)

■ Services Supported

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

■ Attributes Supported

Instance ID	Attribute	Name	Description	Get	Set	Size	Range	Default
0	1	Object Software Revision	Revision number of AC/DC Drive object	○	–	Word	–	1
1	3	Speed Agree	Speed Agree 0: – 1: Speed Agree	○	–	Byte	–	0
1	4	NetRef (Command)	Status of reference command from DeviceNet 0: Reference command from DeviceNet 1: Reference command from except for DeviceNet	○	–	Byte	–	0

Instance ID	Attribute	Name	Description	Get	Set	Size	Range	Default
1	6	Drive Mode	Drive control mode. 0: OLV 0: OLV for PM motors (Read only) 0: Advanced OLV for PM motors (Read only) 1: V/f control 2: V/f control with PG 3: CLV 3: CLV for PM motors (Read only)	○	○	Byte	0 to 3	0
1	7	Speed Actual	Actual Drive Speed Unit is not affected by Speed Scale SS.	○	–	Word	–	3
1	8	Speed Reference	Frequency Reference Monitors drive frequency reference. Unit is not affected by Speed Scale SS.	○	○	Word	–	0
1	9	Current Actual	Actual Output Current Unit is 0.01 A for drives set up to 11 kW in Heavy Duty or Normal Duty and 0.1 A for drives set up for 15 kW and above. Unit is not affected by Current Scale CS.	○	–	Word	–	0
1	11	Torque Actual	Drive Output Torque Unit is affected by Torque Scale TS	○	–	Word	–	0
1	12	Torque Reference/Torque Limit	Torque Reference/Torque Limit Sets the torque reference and torque limit. The units are determined by the torque scale. Sets the torque reference when using torque control (d5-01 = 1). Sets the torque limit when using speed control (d5-01 = 0). The torque reference and torque limit are disabled when F6-06 = 0.	○	○	Word	–	0
1	15	Power Actual [W]	Drive Output Power Unit is affected by Power Scale PS	○	–	Word	–	0
1	16	Input Voltage [V]	Drive Input Voltage Unit is affected by Voltage Scale VS	○	–	Word	–	Depends on Capacity
1	17	Output Voltage [V]	Drive Output Voltage Unit is affected by Voltage Scale VS	○	–	Word	–	0
1	18	Accel Time [ms]	Acceleration Time 1 (C1-01) Units set in parameter C1-10. Unit is affected by Time scale (TS).	○	○	Word	–	2710h
1	19	Decel Time [ms]	Deceleration Time 1 (C1-02) Units set in parameter C1-10. Unit is affected by Time scale (TS).	○	○	Word	–	2710h
1	20	Low Speed Limit Percent of Max Speed	Frequency Reference Lower Limit (d2-02)	○	○	Word	0 ~ 1100	0
1	21	High Speed Limit Percent of Max Speed	Frequency Reference Upper Limit (d2-01)	○	○	Word	0 ~ 1100	3E8h
1	22	Speed Scale (–15 to 15)	Setting for F6-56, scale of units for speed-related data	○	○	Byte	–15 ~ 15	0
1	23	Current Scale (–15 to 15)	Setting for F6-57, scale of units for current-related data	○	○	Byte	–15 ~ 15	0
1	24	Torque Scale (–15 to 15)	Setting for F6-58, scale of units for torque-related data	○	○	Byte	–15 ~ 15	0
1	26	Power Scale (–15 to 15)	Setting for F6-59, scale of units for power-related data	○	○	Byte	–15 ~ 15	0
1	27	Voltage Scale (–15 to 15)	Setting for F6-60, scale of units for voltage-related data	○	○	Byte	–15 ~ 15	0
1	28	Time Scale (–15 to 15)	Setting for F6-61, scale of units for speed-related data	○	○	Byte	–15 ~ 15	0

11 General Class Objects

Instance ID	Attribute	Name	Description	Get	Set	Size	Range	Default
1	29	Reference from Net (Status)	Status of reference command from DeviceNet 0: Reference command from DeviceNet 1: Reference command from except for DeviceNet	○	–	Byte	–	0

12 Vendor-Specific (Yaskawa) Class Objects

◆ Yaskawa Drive Parameters Object - 100 (Class 0x64)

■ Services Supported

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

This is a dynamic explicit Class Object. With this Class object any drive parameter with a MEMOBUS/Modbus address greater than 0x00FF can be accessed. The mapping of Class Object instance / attribute to MEMOBUS/Modbus address is as follows.

Given a typical MEMOBUS/Modbus Address of 0xXXYY

The DeviceNet Instance value is equal to XX

The DeviceNet Attribute value is equal to YY

As an example, to access parameter b5-12 (MEMOBUS/Modbus Address =0x01B0)

Class Object is 100 (0x64) (Always for this Class Object)

Instance = 0x01

Attribute = 0xB0

Note: Writing a zero to 0x0900 (Enter) stores changed parameters to the drive non-volatile memory. Writing a zero to 0x0910 (Accept) allows the drive to use the changed parameters. This normally is automatically sent when the parameter is changed. Read Enter Command 0x0900 or Accept Command 910 will always return a value of 0x0001.

■ Attributes Supported

Instance ID	Attribute	Name	Description	Get	Set	Size	Range	Default
0	1	Object Software Revision	The Yaskawa Drive Parameters object software revision	○	–	Word	–	1
1	00	MEMOBUS/Modbus Register 0x0100	Language selection	○	○	Word	0 ~ 7	1
1	01	MEMOBUS/Modbus Register 0x0101	Parameter access level	○	○	Word	0 ~ 2	2
1	YY	MEMOBUS/Modbus Registers 0x0100 ~ 0x01FF	MEMOBUS/Modbus registers 0x0100 to 0x01FF	○	○	Word	–	–
2	YY	MEMOBUS/Modbus Registers 0x0200 ~ 0x02FF	MEMOBUS/Modbus registers 0x0200 to 0x02FF	○	○	Word	–	–
..	○	○	Word	–	–
255	YY	MEMOBUS/Modbus Register 0xFF00 ~ 0xFFFF	MEMOBUS/Modbus registers 0xFF00 to 0xFFFF	○	○	Word	–	–

Note: Attempting to set a read-only parameter results in a DeviceNet error code of 0x0E, Attribute Not Settable.

Note: Attempting to access an invalid parameter results in a DeviceNet error code of 0x09, Invalid Attribute Value

Note: Refer to the MEMOBUS/Modbus Data Table in Appendix C of the technical Manual for the drive the DeviceNet Option is connected to for a list of monitor data using the MEMOBUS/Modbus message area.

◆ Yaskawa Monitor/Control Object - 125 (Class 0x7D)

■ Services Supported

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

This is a dynamic explicit Class Object. With this Class object any parameter with a MEMOBUS/Modbus address less than 0x0100 can be accessed. This class is similar to the Drive Parameters Object Class 100, except that since the most significant byte of MEMOBUS/Modbus address is always zero, the instance in this class remains at "1".

Given a typical MEMOBUS/Modbus Address of 0x00YY

The DeviceNet Instance value is equal to 0x01

The DeviceNet Attribute value is equal to YY

As an example, to access Drive Status (MEMOBUS/Modbus Address = 0x002C)

Class Object is 125 (0x7D) (Always for this Class Object)

Instance = 0x01

Attribute = 0x2C

■ Attributes Supported

Instance ID	Attribute	MEMOBUS/Modbus Address	Description	Get	Set	Size
0	1	-	Object Software Revision	○	-	Word
1	1	0x0001	Drive Command Bits	○	○	Word
1	2	0x0002	Frequency Instruction	○	○	Word
..	○	○	Word
1	255	0x00FF	Unused	○	○	Word

Note: Attempting to set a read-only parameter results in a DeviceNet error code of 0x0E, Attribute Not Settable.

Note: Attempting to access an invalid parameter results in a DeviceNet error code of 0x09, Invalid Attribute Value

Note: Refer to the MEMOBUS/Modbus Data Table in Appendix C of the technical Manual for the drive the DeviceNet Option is connected to for a list of monitor data using the MEMOBUS/Modbus message area.

13 Troubleshooting

◆ Drive-Side Error Codes

Drive-side error codes appear on the drive digital operator. Causes of the errors and corrective actions are listed in [Table 21](#).

For additional error codes that may appear on the digital operator screen, refer to the technical manual for the drive.

■ Faults

Both bUS (DeviceNet Option Communication Error) and EF0 (External Fault Input from the DeviceNet Option) can appear as an alarm or as a fault. When a fault occurs, the digital operator ALM LED remains. When an alarm occurs, the digital operator ALM LED flashes.

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

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

Table 21 Fault Display and Possible Solutions

Digital Operator Display		Fault Name
bUS	bUS	DeviceNet Option Communication Error
		After establishing initial communication, the connection was lost. Only detected when the run command frequency reference is assigned to the option (bl-01 = 3 or bl-02 = 3).
Cause		Possible Solution
Master controller (PLC) has stopped communicating.		Check for faulty wiring. Correct any wiring problems.
Communication cable is not connected properly.		
A data error occurred due to noise.		Check the various options available to minimize the effects of noise. Take steps to counteract noise in the control circuit wiring, main circuit lines, and ground wiring. If a magnetic contactor is identified as a source of noise, install a surge absorber to the contactor coil. Make sure the cable used fulfills the DeviceNet requirements. Ground the shield on the controller side and on the DeviceNet Option side.
DeviceNet Option is damaged.		If there are no problems with the wiring and the error continues to occur, replace the DeviceNet Option.
Network power loss		The power on the DeviceNet network cable is 0. Verify power is available between option terminals V+ (red) and V- (black).
Connection timeout		The DeviceNet option Expected Packet Rate (EPR) timer timed out. Make sure that EPR time is set properly.
Duplicate MAC ID		The DeviceNet option MAC ID and at least one other mode have the same MAC ID. Verify F6-50 is set properly.

Digital Operator Display		Fault Name
EF0	EF0	External Fault Input from DeviceNet Option
		The alarm function for an external device has been triggered.
Cause		Corrective Action
An external fault is being sent from the upper controller (PLC).		Remove the cause of the external fault. Reset the external fault input from the PLC device.
Problem with the PLC program.		Check the program used by the PLC and make the appropriate corrections.

Digital Operator Display		Fault Name
oFA00	oFA00	DeviceNet Option Fault (CN5-A)
		DeviceNet Option is not properly connected.
Cause		Possible Solution
Non-compatible option connected to the drive.		Connect an option that is compatible with the drive.

13 Troubleshooting

Digital Operator Display		Fault Name	
oFA01	oFA01	DeviceNet Option Fault (CN5-A)	
		DeviceNet Option is not properly connected.	
Cause		Possible Solution	
Problem with the connectors between the drive and DeviceNet Option.		Turn the power off and check the connectors between the drive and DeviceNet Option.	

Digital Operator Display		Fault Name	
oFA30 to oFA43	oFA30 to oFA43	DeviceNet Option Fault (CN5-A)	
		Communication ID error	
Cause		Possible Solution	
DeviceNet Option hardware fault		Replace the DeviceNet Option. Contact Yaskawa for assistance.	

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

Operator Display		Fault Name	
oFb02	oFb02	DeviceNet Option Fault (CN5-B)	
		Two of the same option cards are connected at the same time.	
Cause		Possible Solution	
Option cards AI-A3 or DI-A3 were connected to the CN5-B port while an option card was already connected to CN5-A.		⇒ Only one type of option input card AI-A3 or DI-A3 can be connected to the drive. Only this option card for DeviceNet can be connected to CN5-A.	

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

Operator Display		Fault Name	
oFc02	oFc02	DeviceNet Option Fault (CN5-C)	
		Two of the same option cards are connected at the same time.	
Cause		Possible Solution	
Option cards AI-A3 or DI-A3 were connected to the CN5-C port while an option card was already connected to CN5-A.		⇒ Only one type of option input card AI-A3 or DI-A3 can be connected to the drive. Only this option card for DeviceNet can be connected to CN5-A.	

■ Minor Faults and Alarms

Digital Operator Display		Fault Name	
CALL	CALL	Serial Communication Transmission Error	
		Communication has not yet been established.	
Cause		Possible Solution	Minor Fault (H2-□□ = 10)
Communication wiring or terminal resistor connection is faulty, there is a short circuit, or something is not connected properly.		Check for wiring errors. Correct the wiring. Remove and ground shorts and reconnect loose wires.	Yes
Programming error on the master side		Check communications at start-up and correct programming errors.	
Communication circuitry is damaged.		Perform a self-diagnostics check. Replace the drive if the fault continues to occur.	

◆ Explicit Message Communications Errors

When there is a problem with a request message sent from the master in explicit communications, the drive will return a response message with 94 as the service code well as one of the following error codes as the data.

Error Code	Description	Cause	Possible Solution
08FF	Service not supported	The service code is incorrect.	Correct the service code.
09FF	Invalid attribute value	The attribute is incorrect.	Correct the attribute.
0CFF	Object state conflict	Attempted to change a drive constant that cannot be changed while the drive is running.	Stop the drive.
0EFF	Attribute not settable	Attempted to change a read-only attribute.	Correct the service code or attribute setting.
13FF	Not enough data	The data size is incorrect.	Correct the data size.
14FF	Attribute not supported	Attempted to execute a service that is not defined for the attribute.	Correct the service code or attribute setting.
15FF	Too much data	The data size is incorrect.	Correct the data size.
16FF	Object does not exist	An unsupported object was specified.	Correct the class or instance setting.
1FFF	Vendor specific error	Attempted to change a drive constant that cannot be changed while the drive is running. Attempted to change a drive constant to a value outside of the setting range.	Stop the drive. Specify a value that is within the setting range.
20FF	Invalid parameter	Attempted to change to a data value outside of the setting range.	Specify a data value that is within the setting range.

Note: Refer to the MEMOBUS/Modbus Data Table in Appendix C of the technical Manual for the drive the DeviceNet Option is connected to for a list of monitor data using the MEMOBUS/Modbus message area.

◆ DeviceNet Option Error Codes

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

The DeviceNet Option SI-N3 can declare the error/warning conditions via drive monitor parameters as shown in [Table 22](#).

Table 22 DeviceNet Option Fault Monitor Descriptions

Fault Condition	Fault Declared	Status Value (U6-99/ U6-98)	Description
No Fault	n/a	0	No faults.
CPU Error	EF0	1	Option board failure.
PLC in Idle State	EF0	2	PLC is sending polled I/O with all data set to zero.
Force Fault	EF0	3	Network sent a message to force this node to the fault state.
Network Power Loss	BUS ERROR	1000	Power on DeviceNet network is off.
Connection Time-out	BUS ERROR	1001	This nodes timer (Expect Packet Rate) timed out.
Dup MAC ID	BUS ERROR	1002	This node and at least one other node have the same MAC ID. Another node sent its MAC ID to the network first.
Bus-Off	BUS ERROR	1003	CAN transceiver senses network error.

Two drive monitor parameters, U6-98 (OPTN LATCH STAT) and U6-99 (OPTN ACTIVE STAT), assist the user in network troubleshooting.

- U6-98 displays the first declared fault since the last fault reset or power cycle.
- U6-99 displays the present DeviceNet Option SI-N3 status.

These parameters are accessible from the DeviceNet network the or the drive digital operator. A drive fault reset or power off clears and refreshes both U6-98 and U6-99.

Note: In the event of a PLC idle state, the action taken by the DeviceNet Option SI-N3 depends upon the value of parameter F6-54 (Idle Mode Fault Detection).

◆ Automatic Device Replacement (ADR)

This DeviceNet Interface is compatible with the ADR feature associated with Rockwell controllers and DeviceNet Scanners. ADR features Configuration Recovery and Auto Address Recovery.

■ Configuration Recovery (CR)

CR is the ability of the scanner to download previously uploaded and saved configuration data to the DeviceNet node.

When a DeviceNet node is removed and returned to the network or replaced with another device, an ADR-enabled scanner reads the Electronic Key of the device that is configured in the scanner. A typical setup of the Electronic Key is: Vendor ID, Product Code, Model Number and Product Revision. When the CR feature is enabled, the stored configuration is downloaded to the DeviceNet node.

If the scanner reads the Configuration Consistency Value (CCV), it will use this value to determine if a download will occur. If the CCV in the scanner does not equal the CCV in the DeviceNet node, the configuration information saved in the scanner will be downloaded to the DeviceNet node. In this implementation of DeviceNet, the CCV will always be 0.

■ Auto Address Recovery (AAR)

AAR is the ability of the scanner to change the MAC ID of a node to a predetermined MAC ID. To use this feature the DeviceNet node must have its MAC ID switch (F6-50) set to 64 and its actual MAC ID (F6-63) equal to 63.

If the recovering node is a replacement for another device, putting the new device on the network enables the AAR feature. A scanner with AAR enabled will search the network for a node with a MAC ID of 63 and then read its Electronic Key. If the Electronic Key matches the node being replaced, the scanner will change the MAC ID of the found device to the MAC ID of the device it is replacing.

After the MAC ID is changed, the device sends its duplicate MAC IDs and executes the CR feature. Example: With current Rockwell PLCs, the AAR feature can only be enabled if the CR feature is also enabled.

14 Specifications

◆ Specifications

Table 23 Option Specifications

Items	Specifications
Model	SI-N3
SI-N3 Supported Messages	Group 2 Server (UCMM capable) Explicit Messages: Fragmentation is supported. Up to 32 bytes can be input and output. Polled I/O Messages: Fragmentation is not supported. Up to 8 bytes can be input and output. Faulted Node Recovery / Offline Connection Set Messages / Automatic Device Replacement (ADR) Change of State Message (COS). COS can be used as an I/O Input Assembly.
I/O Assembly Instance	Input: 17 types (4~8 bytes) Output: 18 types (4~8 bytes)
DeviceNet Specification	Conformance Level 19: Passed
DeviceNet Profile	AC Drive
Input Power	Voltage: 11~25 Vdc Current: 40 mA
Connector Type	5-pin open-style screw connector
Physical Layer Type	Isolated Physical Layer CAN transceiver + photocoupler
MAC ID Setting	Programmable from drive keypad or network: MAC ID 0 to 63
Communications Speed/Baud Rate	Programmable from drive keypad or network: 125/250/500 k bit/s Auto Baud Rate Idle Mode Detect Heartbeat
Ambient Temperature	-10 °C to +50 °C
Humidity	up to 95% RH (no condensation)
Storage Temperature	-20 °C to +60 °C (allowed for short-term transport of the product)
Area of Use	Indoor (free of corrosive gas, airborne particles, etc.)
Altitude	up to 1000 m

◆ Revision History

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

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YASKAWA AC Drive-Option Card

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