IMPULSE • G+/VG+
SERIES 3
EtherNet IP
Drive Communication Instruction Manual
Introduction

This manual explains the specifications and handling of the Electromotive Systems EtherNet/IP Option Card CM092 for the Electromotive Systems models Impulse●G+ Series, and Impulse●VG+ Series drives. The EtherNet/IP Option Card CM092 connects the drive to an EtherNet/IP network and facilitates the exchange of data. In this document, the word “inverter”, “ac drive” and “drive” may be used interchangeably. To ensure proper operation of this product, read and understand this manual. For details on installation and operation of the drive, refer to the appropriate drive technical manual.

Technical References

Refer to the following publications for information about the IMPULSE SERIES 3:
- IMPULSE G+ SERIES 3® Technical Manual
- IMPULSE VG+ SERIES 3® Technical Manual

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Technical Support


Provides telephone support to customers, relating to installation, start-up, programming, and troubleshooting of drives products.
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Chapter 1 Installation

Product Specification

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature:</td>
<td>0 to 55°C</td>
</tr>
<tr>
<td>Storage Temperature:</td>
<td>-20 to 70°C</td>
</tr>
<tr>
<td>Humidity:</td>
<td>90% Relative Humidity (no condensing)</td>
</tr>
<tr>
<td>Vibration:</td>
<td>1G at less than 20Hz, up to 0.2G at 20 to 50Hz.</td>
</tr>
<tr>
<td>Altitude:</td>
<td>3300ft or less</td>
</tr>
</tbody>
</table>

Unpack & Inspect

Unpack the EtherNet/IP Option Card CM092 Option kit and verify that all components are present and undamaged.

<table>
<thead>
<tr>
<th>OPTION Kit Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>EtherNet/IP Option Card CM092 Card (UTC000068)</td>
</tr>
<tr>
<td>Shielded RJ45 M-F Cable (UWR00574-1)</td>
</tr>
<tr>
<td>Ground Wire (UWR00575-1)</td>
</tr>
<tr>
<td>4”x1” Insulated Tubing (M45094075004)</td>
</tr>
<tr>
<td>Cable Ties (UWS-0137)</td>
</tr>
<tr>
<td>Installation Guide</td>
</tr>
<tr>
<td>MAC ID Label (Unique for each EtherNet/IP Option Card CM092)</td>
</tr>
</tbody>
</table>

Example Label:

MAC ID: 00-20-B5-24-11-13
Installation & Wiring

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

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

- Remove the operator keypad and drive cover.
  - Remove the operator keypad.
  - Remove the terminal and control covers.
    - Remove the option card hold-down by carefully compressing the top and bottom until it becomes free of its holder. Lift it out.

- Mount the EtherNet/IP Option Card CM092 on the drive.

  Connect the ground cable supplied to ground terminal J6 on the EtherNet/IP Option Card CM092. Connect the RJ45 M-F cable supplied in the option kit to the EtherNet/IP Option Card CM092. Align the J2 connector on the back of the EtherNet/IP Option Card CM092 with its mating 2CN connector on the drive control card.
  
  Align the two standoffs on the front of the drive control board with the two holes on the right side of the EtherNet/IP Option Card CM092.
  
  Press the EtherNet/IP Option Card CM092 firmly onto the drive 2CN connector and standoffs until the J2 connector is fully seated on 2CN and the drive standoffs have locked into their appropriate holes.
  
  Route the RJ45 M-F cable and the ground cable along the left-inside of the drive case.
  
  Replace the option card hold down.
  
  Connect the ground wire to the ground terminal on the terminal assembly.
  
  Adhere the supplied MAC ID Label on the side of the drive either above or below the drive nameplate.
  
  Apply power to the drive and verify that the drive functions correctly.
  
  Verify that the MS/RUN and PWR LEDs on the EtherNet/IP Option Card CM092 are both GREEN. (Refer to the section on LEDs below)
Option LEDs

LED Definitions

The states of the EtherNet/IP Option Card CM092 card LEDs after the power up sequence has completed are described below. Please wait for at least five seconds for the loading process to complete before verifying the status of the LEDs.

<table>
<thead>
<tr>
<th>Des</th>
<th>Label</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>MS/RUN</td>
<td>GREEN – Card Functioning Normally</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RED – Card Failure</td>
</tr>
<tr>
<td>D2</td>
<td>NS/CON</td>
<td>GREEN – Connection Made</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GREEN BLINK – Control Connection Active (500ms cycle)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RED – Connection Fault</td>
</tr>
<tr>
<td>D3</td>
<td>10/100</td>
<td>GREEN – 100Mbs Connection Speed</td>
</tr>
<tr>
<td>D4</td>
<td>LINK</td>
<td>GREEN – Link Established</td>
</tr>
<tr>
<td>D5</td>
<td>Rx</td>
<td>GREEN - Message Received</td>
</tr>
<tr>
<td>D8</td>
<td>PWR</td>
<td>GREEN - Appropriate Power Supplied to Card</td>
</tr>
</tbody>
</table>
## EtherNet/IP Option Card CM092 Card LED States

<table>
<thead>
<tr>
<th>LED</th>
<th>Indicator</th>
<th>Behavior</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS/RUN</td>
<td>OFF Steady</td>
<td>No Power</td>
<td>No power is applied to the option card the LED remains OFF.</td>
</tr>
<tr>
<td></td>
<td>Green Steady</td>
<td>Normal Operation</td>
<td>The option card is operating correctly with all initialization checks complete.</td>
</tr>
<tr>
<td></td>
<td>Green Flash</td>
<td>Standby / Initializing</td>
<td>The option card is in process of configuring or waiting for configuration information.</td>
</tr>
<tr>
<td></td>
<td>Red Flash</td>
<td>Minor Fault</td>
<td>The option card has detected a recoverable minor fault, such as incomplete configuration. Faults that are typically corrected by cycling power to the drive.</td>
</tr>
<tr>
<td></td>
<td>Red Steady</td>
<td>Major Fault</td>
<td>The option card has detected a non-recoverable major fault. (Ram Error, corrupt storage, non-unique MAC address). All major faults will require more intervention than a power cycle to correct.</td>
</tr>
<tr>
<td></td>
<td>Green/Red Flash</td>
<td>Option Card Test</td>
<td>Power-up sequence and tests.</td>
</tr>
<tr>
<td>NS/CON</td>
<td>OFF Steady</td>
<td>No Power or IP Address</td>
<td>The option card is powered OFF, or is not configured with an IP address and therefore cannot communicate on the network.</td>
</tr>
<tr>
<td></td>
<td>Green Steady</td>
<td>Connected</td>
<td>The option card currently has one or more connections established to it.</td>
</tr>
<tr>
<td></td>
<td>Green Flash</td>
<td>No Connections</td>
<td>The option card currently has no valid connections, but is correctly configured. The state is “waiting” for communication to assume.</td>
</tr>
<tr>
<td></td>
<td>Red Flash</td>
<td>Connection Timeout</td>
<td>One or more of the established connections has timed out. The state will remain until all timeout connections have been re-established or a reset occurs. Recoverable minor fault</td>
</tr>
<tr>
<td></td>
<td>Red Steady</td>
<td>Duplicate IP</td>
<td>A duplicate IP address has been discovered on the network or non-recoverable major network fault has occurred.</td>
</tr>
<tr>
<td></td>
<td>Green/Red Flash</td>
<td>Network Test</td>
<td>Power-up sequence and tests.</td>
</tr>
<tr>
<td>10/100</td>
<td>OFF</td>
<td>10Mbps Connection</td>
<td>The network is operating at 10Mbps.</td>
</tr>
<tr>
<td></td>
<td>Green</td>
<td>100Mbps Connection</td>
<td>The network is operating at 100Mbps.</td>
</tr>
<tr>
<td>Link</td>
<td>OFF</td>
<td>No Network Connection</td>
<td>The option card is not physically connected to the network. Check cable connections.</td>
</tr>
<tr>
<td></td>
<td>Green</td>
<td>Network Connection</td>
<td>The option card is connected to a network.</td>
</tr>
<tr>
<td>Rx</td>
<td>OFF</td>
<td>No Message Received</td>
<td>No message to the option card is being received.</td>
</tr>
<tr>
<td></td>
<td>Green</td>
<td>Message Received</td>
<td>A message to the option card is being received.</td>
</tr>
<tr>
<td>PWR</td>
<td>OFF</td>
<td>No Power</td>
<td>The drive is not powered or the option card is not securely connected to the drive.</td>
</tr>
<tr>
<td></td>
<td>Green</td>
<td>Power Supplied</td>
<td>The option card has the appropriate power supplied.</td>
</tr>
</tbody>
</table>
Chapter 2 Network Configuration

Firmware Description

Drive Status

The following Status Assembly information is available in the EtherNet/IP interface, which is implemented as the normal heartbeat information in CIP. The following states of the device along with the additional flags provide for monitoring the EtherNet/IP enabled Yaskawa drives.

<table>
<thead>
<tr>
<th>Value</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Non-Existent</td>
</tr>
<tr>
<td>1</td>
<td>Device Self-Test</td>
</tr>
<tr>
<td>2</td>
<td>Standby</td>
</tr>
<tr>
<td>3</td>
<td>Operational</td>
</tr>
<tr>
<td>4</td>
<td>Major Fault – Recoverable</td>
</tr>
<tr>
<td>5</td>
<td>Major Fault – Unrecoverable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event Flag</th>
<th>System Fault</th>
<th>User Fault</th>
<th>Device Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>EV_</td>
<td>SF_</td>
<td>UF_</td>
<td>DF_</td>
</tr>
<tr>
<td>An Event has occurred</td>
<td>Connection or BUS Fault.</td>
<td>User Interaction Inhibited Operation</td>
<td>Drive or Hardware Fault</td>
</tr>
</tbody>
</table>

Protocols

Standard TCP/IP and UDP/IP are implemented with the support of SNMP for network diagnostic features support. ARP, ICMP, and IGMP are supported for interoperable operation in IP networks.

Ports

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>EtherNet/IP:</td>
<td>Port 0xAF12 for encapsulation packets, services and CPF-session management</td>
</tr>
<tr>
<td></td>
<td>Port 0x08AE for I/O connections supported with timeout configurations.</td>
</tr>
<tr>
<td>Web:</td>
<td>Port 80 (Http)</td>
</tr>
<tr>
<td>Telnet:</td>
<td>Port 23(Telnet)</td>
</tr>
</tbody>
</table>

Connections

The maximum number of simultaneous connections is: 1 for I/O, 4 for Explicit.

Cable Loss and Timeout

Timeout is calculated based on RPI configuration parameter on startup. It is specified in seconds. A setting of “0” disables the timeout. The default cable loss timeout is RPI * 4.
Configure the PC Network Connection

- Select an existing or create a new network connection that will be used to communicate with the EtherNet/IP Option Card CM092 card.
  - Select Start ⇒ Settings ⇒ Network Connections from the task bar
  - Select the network connection to be used
- Right click on the network connection and select properties from the menu
- Select Internet Protocol (TCP/IP) from the components displayed
  - If a TCP/IP selection is not available, it may be installed by selecting Install. Note that Administrator access is required and that the operating system installation CD may also be required. Consult with your IT department as needed.
- Select Properties
  - If the network connection already has an IP address assigned, ignore the following instructions
  - Select the Use the following IP address radio button
  - Enter the IP address as 192.168.1.19 and the Subnet mask as 255.255.255.0. Check the system network schematic or with the IT department to make sure that the address does not already exist on the network.
  - Once the IP address and Subnet mask are entered select OK
- It may be necessary to reboot the PC in order for the changes to take affect.
Reset the EtherNet/IP Option Card CM092 to the Default Address

- If the web page is not visible, check that the PC has been setup and connected properly. If the PC has been setup and connected properly and the web page is still not visible, the IP address of the EtherNet/IP Option Card CM092 may not be set to its default IP address. To reset it to the default value,
  - Remove power from the drive and wait for the charge lamp to be completely extinguished. Wait at least five additional minutes for the drive to be completely discharged. Measure the DC BUS voltage and verify that it is at a safe level.
  - Place a jumper between test points C and /LD on the EtherNet/IP Option Card CM092 card as shown in the figure to the right.
  - Reapply power to the drive and wait approximately 10 seconds for the power-up cycle to complete. You should now be able to connect to IP address 192.168.1.20 and open the main web page.
  - Remove the jumper between C and /LD on the EtherNet/IP Option Card CM092 once the connection has been made and the web page visible.
Configure the EtherNet/IP Option Card CM092

- Select the **Configure** button from the main web page.
- Enter the desired IP address in the **IP** field and the desired Subnet Mask in the **Subnet** field. Check with the system schematic or network administrator to verify that the IP address and subnet mask entered are valid.
- Select the **Submit** button.
- A confirmation of the entered IP address and Subnet Mask will be displayed.
- Remove power from the drive and wait for the charge lamp to be completely extinguished. Wait at least five additional minutes for the drive to be completely discharged. Measure the DC BUS voltage and verify that it is at a safe level.
- If necessary, reconfigure the network connection of the configuration device to match the entered *EtherNet/IP Option Card CM092* configuration.
- Reapply power to the drive and connect to the desired network.
Main Web Page

The main page is the first web page displayed. It displays the standard page header and footer along with links to the other web pages.

- **Standard Header**
  
  The standard heading displays information specific to the installed *EtherNet/IP Option Card CM092*.
  
  - **PN:** Part Number: Indicates the part number for the *EtherNet/IP Option Kit – CM092*
  
  - **Drive Model and Software:** Indicates the drive family and model along with the drive control card software version. The software control card software version is represented by the last 4 digits preceded by ‘-S’.
  
  - **Protocol Name:** Indicates the current protocol supported – EtherNet/IP
  
  - **Serial Number:** Indicates the serial number of this particular *EtherNet/IP Option Card CM092*. Each card has a unique serial number.
  
  - **MAC ID:** The MAC ID is unique to each *EtherNet/IP Option Card CM092*.
  
  - **Option Software Version/Revision:** The first five (5) digits following “VST” represent the main *EtherNet/IP Option Card CM092* software version. The last digit represents the current revision level.
  
  - **Config:** Server Configuration: Determines how and where the IP address is generated.
  
  - **Speed:** Connection Speed: Current connection speed. Either 10 or 100 will be displayed.
  
  - **IP Address:** The IP address of the current *EtherNet/IP Option Card CM092*.

- **Standard Footer**

  The standard footer contains information on how to contact Yaskawa for technical support.
Configuration Web Page

The configuration page contains the standard header and footer along with a method of configuring the EtherNet/IP server and web server interfaces of the EtherNet/IP Option Card CM092.

- **Web Server Configuration**

The web server configuration allows for the setting of the IP Address, Subnet Mask, Gateway and EtherNet/IP server type. All octets must contain a valid number between 0 and 255. The Submit button must be pressed, the accepted page displayed and the drive power cycled before any changes are effective.

Configure Network Parameters
- **IP**: A series of four (4) octets separated by “.” that determines the interface address for the current EtherNet/IP Option Card CM092.
- **SubNet**: A series of four (4) octets separated by “.” that determines the local area network for the EtherNet/IP Option Card CM092.
- **Gateway**: A series of four (4) octets separated by “.” that determines the IP Address of the gateway server. If a gateway server is not used, select *Do not use default gateway in system*. The gateway field must contain a valid IP address whether it is used or not and must not be blank.
- **Address Configuration Mode**:
  - **USER**: The user enters The IP address via the web interface.
  - **DHCP**: The IP Address is set by a DHCP server and not by the user via the web interface.
  - **BootP**: The IP Address is set by a BootP server and not by the user via the web interface.
    - **Note**: Verify that a DHCP or BootP server determines the network address before selecting either.
- **Browser Access Configuration**: In order to view the web pages, *Enable browser interface* must be selected.
Submit Web Page

After any of the configuration parameters shown above have been changed, the submit button must be pressed to store the changed data. The drive must then be power cycled for the new data to take affect. Verify that the data on the submit page is correct.

Submit Results

The following entries will be updated:

- IPADDR = 192.168.1.37
- SMASK = 255.255.255.0
- Please Reset Power to drive for new settings.

Submit page

After the data on the submit page has been verified and the drive power cycled, make sure to reset your network parameters and browser address accordingly.
The network diagnostics page displays the standard header and footer along with information relative to network and EtherNet/IP Option Card CM092 performance.

- **Message Tx OK:** Transmit Message Count: The number of messages sent from the EtherNet/IP Option Card CM092.
- **Message Rx OK:** Receive Message Count: The number of messages received by the EtherNet/IP Option Card CM092.
- **Rx Discarded:** Received Messages Discarded: The number of received messages discarded by the EtherNet/IP Option.
- **Current Connections:** The number of established connections used on the EtherNet/IP Option Card CM092. This is the total of explicit, implicit and “DriveWizard” connections.
- **O2T RPI:** The time interval for Master to Slave messaging during I/O connection (mS).
- **T2O RPI:** The time interval for Slave to Master messaging during I/O connection (mS).
- **Message Tx Dropped:** Dropped Transmit Messages: The number of dropped transmit messages sensed on the EtherNet/IP Option Card CM092.
- **Message Rx Dropped:** Dropped Receive Messages: The number of dropped receive messages sensed on the EtherNet/IP Option Card CM092.
- **Missed Frame Cnt:** The number of missed frame errors sensed on the EtherNet/IP Option Card CM092.
- **Time Out Multi:** The current timeout multiplier for I/O messages received from the master controller, during the I/O connection.
- **O2T API:** The time interval for Master to slave setup messaging during I/O connection (mS).
- **T2O API:** The time interval for Slave to Master setup messaging during I/O connection (mS).
- **Message Tx Errors:** Transmit Message Errors: The number of error messages sent from the EtherNet/IP Option Card CM092 due to not processing or incorrect processing.
- **Message Rx Errors:** Receive Message Errors: The number of error messages received on the EtherNet/IP Option Card CM092 due to not processing or incorrect processing.
- **Collisions:** The number of collisions sensed on the EtherNet/IP Option Card CM092.
- **Tx Retry:** Transmit Retries: The number of transmit retries on the EtherNet/IP Option Card CM092 due to media collisions or non granted access to the media.
- **Consumed Message Cnt:** The number of consumed messages.
- **Produced Message Cnt:** The number of produced messages.
- **Reset Statistics Button:** Reset counters.
Drive Diagnostics Web Page

The drive diagnostics page contains the standard header and footer along with diagnostic information specific to the current drive.

- Freq Ref: Frequency Reference – Monitor Parameter U1-01.
- Motor Speed: Motor Speed – Monitor Parameter U1-05.
- Output Power: Output Power – Monitor Parameter U1-08.
- PID Feedback: PID Feedback in %
- Drive Run Status: Indicates RUN/STOP state of the drive.
- Output Freq: Output Frequency – Monitor Parameter U1-02.
- Output Volts: Output Voltage – Monitor Parameter U1-06.
- Torque Ref: Torque Reference – Monitor Parameter U1-09.
- Term A2 Level: The analog input A1 Terminal A2 (14) monitor value U1-16.
- Drive Ready Status: Indicates the drive READY status.
- Output Current: Output Current – Monitor Parameter U1-03.
- Term A3 Level: The analog input Terminal A3 (16) monitor value U1-17.
- Drive Fault Status: Indicates drive FAULT status.
Drive Setup

- Remove power from the drive and wait for the charge lamp to be completely extinguished. Wait at least five additional minutes for the drive to be completely discharged. Measure the DC BUS voltage and verify that it is at a safe level.
- Reinstall all drive covers and the operator keypad. Apply power to the drive.
- Set parameters b3-01 and b3-02 to their appropriate values. Refer to the table to the right for available b3-01 and b3-02 values.

### Important Network Information
- It is strongly recommended that shielded CAT-5 cable be used for all network cables.
- A maximum of 10 simultaneous connections are allowed.
- The EtherNet/IP connection must be refreshed within 60 seconds. If it is not refreshed within 60 seconds, the connection will be closed.
- Refer to the appropriate programming or parameter access manual for a complete list of drive parameters available. A list of applicable manuals is available at the end of this document.

### EDS Files

#### Installing the appropriate EDS file

The EDS files can be found on the CD supplied with the drive or can be downloaded from [www.yaskawa.com](http://www.yaskawa.com).

Select “Downloads”, “Browse”, “By Inverter Drives” and “By Product”.

Then select “Network Communications Options” and the appropriate EDS file of the latest version from those listed.

The EDS files are “zip” files. Each “zip” file contains the EDS files for the entire drive family for the listed revision. The “zip” file is named “EDS_Drive Model.UTC000068_File Version.zip”.

Example: The current file containing all of the F7U EDS files is named EDS_F7U.UTC000068_V1.01.zip.

Extract the appropriate EDS file for the drive model. The current CIMR-F7U20P4 drive EDS file is named F7U20P4.UTC000068_V1.01.eds
Drive Fault Messages

- Drive EtherNet/IP Fault Messages

The table of EtherNet/IP Option Card CM092 fault codes returned by the drive is shown below. Refer to the appropriate drive user and/or programming manual(s) for drive specific information on the fault returned.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0h</td>
<td>0000h</td>
<td>None</td>
<td>16h</td>
<td>9000h</td>
<td>External Fault 8 (EF8)</td>
</tr>
<tr>
<td>1h</td>
<td>5120h</td>
<td>DC Bus Fuse Open (PUF)</td>
<td>18h</td>
<td>7310h</td>
<td>Overspeed Detection (OS)</td>
</tr>
<tr>
<td>2h</td>
<td>3220h</td>
<td>DC Bus Undervoltage (UV1)</td>
<td>19h</td>
<td>7310h</td>
<td>Speed Deviation (DEV)</td>
</tr>
<tr>
<td>3h</td>
<td>5110h</td>
<td>CTL PS Undervoltage (UV2)</td>
<td>1Ah</td>
<td>7301h</td>
<td>PG Open (PGO)</td>
</tr>
<tr>
<td>4h</td>
<td>3222h</td>
<td>MC Answerback (UV3)</td>
<td>1Bh</td>
<td>3130h</td>
<td>Input Phase Loss (PF)</td>
</tr>
<tr>
<td>5h</td>
<td>2130h</td>
<td>Short Circuit (SC)</td>
<td>1Ch</td>
<td>3130h</td>
<td>Output Phase Loss (LF)</td>
</tr>
<tr>
<td>6h</td>
<td>2120h</td>
<td>Ground Fault (GF)</td>
<td>1Eh</td>
<td>5300h</td>
<td>Operator Disconnected (OPR)</td>
</tr>
<tr>
<td>7h</td>
<td>2300h</td>
<td>Overcurrent (OC)</td>
<td>1Eh</td>
<td>5300h</td>
<td>OPE Faults</td>
</tr>
<tr>
<td>8h</td>
<td>3210h</td>
<td>DC Bus Overvoltage (OV)</td>
<td>1Fh</td>
<td>6320h</td>
<td>EEPROM R/W Error (ERR)</td>
</tr>
<tr>
<td>9h</td>
<td>4200h</td>
<td>Heatsink Over-temperature (OH)</td>
<td>21h</td>
<td>7500h</td>
<td>EtherNet/IP Communication Error (BUS)</td>
</tr>
<tr>
<td>0Ah</td>
<td>4210h</td>
<td>Heatsink Maximum Temperature (OH1)</td>
<td>22h</td>
<td>7500h</td>
<td>SI-E Communications Error</td>
</tr>
<tr>
<td>0Bh</td>
<td>2220h</td>
<td>Motor Overload (OL1)</td>
<td>23h</td>
<td>7500h</td>
<td>SI-F/G Communications Error</td>
</tr>
<tr>
<td>0Ch</td>
<td>2200h</td>
<td>Inverter Overload (OL2)</td>
<td>24h</td>
<td>7500h</td>
<td>SI-F/G CPU error</td>
</tr>
<tr>
<td>0Dh</td>
<td>2221h</td>
<td>Overtorque Detection 1 (OL3)</td>
<td>25h</td>
<td>8321h</td>
<td>Out of Control (CF)</td>
</tr>
<tr>
<td>0Eh</td>
<td>2222h</td>
<td>Overtorque Detection 2 (OL4)</td>
<td>26h</td>
<td>8313h</td>
<td>Zero Servo Fault (SVE)</td>
</tr>
<tr>
<td>0Fh</td>
<td>7110h</td>
<td>Dynamic Braking Transistor (RR)</td>
<td>27h</td>
<td>9000h</td>
<td>External Fault 0 (EF0)</td>
</tr>
<tr>
<td>10h</td>
<td>7112h</td>
<td>Dynamic Braking Resistor (RH)</td>
<td>28h</td>
<td>2310h</td>
<td>High Slip Braking (OL7)</td>
</tr>
<tr>
<td>11h</td>
<td>9000h</td>
<td>External Fault 3 (EF3)</td>
<td>29h</td>
<td>8321h</td>
<td>Undertorque Detection 1 (UL3)</td>
</tr>
<tr>
<td>12h</td>
<td>9000h</td>
<td>External Fault 4 (EF4)</td>
<td>2Ah</td>
<td>8321h</td>
<td>Undertorque Detection 2 (UL4)</td>
</tr>
<tr>
<td>13h</td>
<td>9000h</td>
<td>External Fault 5 (EF5)</td>
<td>2Bh</td>
<td>8110h</td>
<td>Feedback Loss (FBL)</td>
</tr>
<tr>
<td>14h</td>
<td>9000h</td>
<td>External Fault 6 (EF6)</td>
<td>2Ch</td>
<td>4300h</td>
<td>Motor Overheat 1 (OH3)</td>
</tr>
<tr>
<td>15h</td>
<td>9000h</td>
<td>External Fault 7 (EF7)</td>
<td>2Dh</td>
<td>4310h</td>
<td>Motor Overheat 2 (OH4)</td>
</tr>
</tbody>
</table>
Drive Fault Operator Messages

The following is a table of faults that could be caused by the *EtherNet/IP Option Card CM092* that will display on the operator keypad only. For any fault displayed on the operator that is not listed in the following table, please see the appropriate drive technical manual.

<table>
<thead>
<tr>
<th>Fault</th>
<th>Content</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS</td>
<td>EtherNet/IP Option Card CM092 communications error.</td>
<td>Communication is not established between EtherNet/IP Master and the drive.</td>
<td>• Check EtherNet/IP Option Card CM092 communication LED display.</td>
</tr>
<tr>
<td>EF0</td>
<td>EtherNet/IP Option Card CM092 external fault.</td>
<td>Drive received an external fault command from the EtherNet/IP Option Card CM092</td>
<td>• Check multi-function input settings • Check PLC or controller program • Eliminate cause of fault (machine device in fault state)</td>
</tr>
<tr>
<td>OPE05</td>
<td>Command selection fault.</td>
<td>Parameter b3-01 is set to EtherNet/IP Option Card CM092 and no card is detected.</td>
<td>• Install EtherNet/IP Option Card CM092 • Reprogram b3-01 • Replace the EtherNet/IP Option Card CM092</td>
</tr>
<tr>
<td>OPE06</td>
<td>Reference selection fault.</td>
<td>Parameter b3-02 is set to EtherNet/IP Option Card CM092 and no card is detected.</td>
<td>• Install EtherNet/IP Option Card CM092 • Reprogram b3-02 • Replace the EtherNet/IP Option Card CM092</td>
</tr>
<tr>
<td>CPF20</td>
<td>EtherNet/IP Option Card CM092 fault.</td>
<td>Faulty J1/2CN connection.</td>
<td>• Power cycle the drive • Reseat the EtherNet/IP Option Card CM092 • Replace the EtherNet/IP Option Card CM092 • Replace the inverter</td>
</tr>
<tr>
<td>CPF21</td>
<td>EtherNet/IP Option Card CM092 self-diagnostics fault.</td>
<td>Faulty EtherNet/IP Option Card CM092.</td>
<td>• Replace the EtherNet/IP Option Card CM092</td>
</tr>
<tr>
<td>CPF22</td>
<td>EtherNet/IP Option Card CM092 ID code fault.</td>
<td>Faulty EtherNet/IP Option Card CM092.</td>
<td>• Replace the EtherNet/IP Option Card CM092</td>
</tr>
<tr>
<td>CPF23</td>
<td>Watch dog timer fault.</td>
<td>Faulty EtherNet/IP Option Card CM092.</td>
<td>• Replace the EtherNet/IP Option Card CM092</td>
</tr>
</tbody>
</table>
Chapter 3 EtherNet/IP Supported Objects

This section describes the EtherNet/IP Option Card CM092 supported objects.

Supported Input Instances

Basic Speed Control Input Instance 20 (14h)

<table>
<thead>
<tr>
<th>Input</th>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instance</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Fault Reset</td>
<td>-</td>
<td>Run Forward</td>
</tr>
<tr>
<td>20</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Speed Reference (Low Byte) [scaled by parameter o1-03]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Speed Reference (High Byte) [scaled by parameter o1-03]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Run Forward: Forward RUN Command
Fault Reset: Fault Reset Command
Speed reference: RPM when o1-03 = (2 ~ 39)

Extended Speed Control Input Instance 21 (15h)

<table>
<thead>
<tr>
<th>Input</th>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instance</td>
<td>0</td>
<td>-</td>
<td>Net Reference</td>
<td>Net Control</td>
<td>-</td>
<td>-</td>
<td>Fault Reset</td>
<td>Run Reverse</td>
<td>Run Forward</td>
</tr>
<tr>
<td>21</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Speed Reference (Low Byte) [scaled by parameter o1-03]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Speed Reference (High Byte) [scaled by parameter o1-03]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Run Forward: Forward RUN Command
Run Reverse: Reverse RUN Command
Fault Reset: Fault Reset Command
Net Control: Parameter b3-02
0 – 1 transition sets b3-02 = 3
1 – 0 transition sets b3-02 to previous value
Net Reference: Parameter b3-01
0 – 1 transition sets b3-01 = 3
1 – 0 transition sets b3-01 to previous value
Speed Reference: RPM when o1-03 = (2 ~ 39)
### Basic Speed/Torque Control Input Instance 22 (16h)

<table>
<thead>
<tr>
<th>Input Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fault Reset</td>
</tr>
<tr>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Run Forward</td>
</tr>
<tr>
<td>22</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Speed Reference1 (Low Byte) [scaled by parameter o1-03]</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Speed Reference1 (High Byte) [scaled by parameter o1-03]</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Torque Reference2 (Low Byte) [0.1%]</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Torque Reference2 (High Byte) [0.1%]</td>
</tr>
</tbody>
</table>

Note: 1: Becomes torque limit in torque mode  
2: VG+ Series 3 FVC mode only  
Run Forward: Forward RUN Command  
Run Reverse: Reverse RUN Command  
Fault Reset: Fault Reset Command  
Speed Reference: RPM when o1-03 = (2 ~ 39)  
Torque Reference: Percent of rated torque - (VG+ Series 3 Closed-loop flux vector mode (FVC) only)

### Basic Speed/Torque Control Input Instance 23 (16h)

<table>
<thead>
<tr>
<th>Input Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fault Reset</td>
</tr>
<tr>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Run Reverse</td>
</tr>
<tr>
<td>23</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Speed Reference1 (Low Byte) [scaled by parameter o1-03]</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Speed Reference1 (High Byte) [scaled by parameter o1-03]</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Torque Reference2 (Low Byte) [0.1%]</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Torque Reference2 (High Byte) [0.1%]</td>
</tr>
</tbody>
</table>

Note: 1: Becomes torque limit in torque mode  
2: VG+ Series 3 FVC mode only  
Run Forward: Forward RUN Command  
Run Reverse: Reverse RUN Command  
Fault Reset: Fault Reset Command  
Net Control: Parameter b3-02  
0 – 1 transition sets b3-02 = 3  
1 – 0 transition sets b3-02 to previous value  
Net Reference: Parameter b3-01  
0 – 1 transition sets b3-01 = 3  
1 – 0 transition sets b3-01 to previous value  
Speed Reference: RPM when o1-03 = (2 ~ 39)  
Torque Reference: Percent of rated torque - (VG+ Series 3 Closed-loop flux vector mode (FVC) only)
## Magnetek Input Instances

### Magnetek Standard Speed/Torque Control Input Instance 101 (65h)

<table>
<thead>
<tr>
<th>Instance</th>
<th>Input</th>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Run Reverse</th>
<th>Run Forward</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>0</td>
<td>Terminal S8</td>
<td>Terminal S7</td>
<td>Terminal S6</td>
<td>Terminal S5</td>
<td>Terminal S4</td>
<td>Terminal S3</td>
<td>Run</td>
<td>External Base Block</td>
<td>Fault Log Clear</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>External Base Block</td>
<td>Fault Log Clear</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Fault Reset</td>
<td>External Fault</td>
<td></td>
</tr>
</tbody>
</table>

### Notes:
1. Becomes torque limit in torque mode
2. VG+ Series 3 FVC mode only

- **Run Forward**: Forward RUN Command
- **Run Reverse**: Reverse RUN Command
- **Terminal S3**: Multi-function Digital Input 1 (H1-01)
- **Terminal S4**: Multi-function Digital Input 2 (H1-02)
- **Terminal S5**: Multi-function Digital Input 3 (H1-03)
- **Terminal S6**: Multi-function Digital Input 4 (H1-04)
- **Terminal S7**: Multi-function Digital Input 5 (H1-05)
- **Terminal S8**: Multi-function Digital Input 6 (H1-06)
- **External Fault**: External Fault (Setting of H1-01 ~ H1-06)
- **Fault Reset**: Fault Reset Command
- **Terminal M1-M2**: Multi-function Digital Output 1 (H2-01)
- **Terminal P1**: Multi-function Digital Output 2 (H2-02)
- **Terminal P2**: Multi-function Digital Output 3 (H2-03)
- **Speed Reference**: RPM when o1-03 = (2 ~ 39)
- **Torque Reference**: Percent of rated torque - (VG+ Series 3 Closed-loop flux vector mode (FVC) only)
- **Torque Compensation**: Percent of rated torque - (VG+ Series 3 Closed-loop flux vector mode (FVC) only)
## Magnetek Standard Speed/Torque Control Input Instance 115 (73h)

<table>
<thead>
<tr>
<th>Input</th>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instance 0</td>
<td>Terminal S8</td>
<td>Terminal S7</td>
<td>Terminal S6</td>
<td>Terminal S5</td>
<td>Terminal S4</td>
<td>Terminal S3</td>
<td>Run Reverse</td>
<td>Run Forward</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>External Base Block</td>
<td>Fault Log Clear</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Fault Reset</td>
<td>External Fault</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Speed Reference1 (Low Byte) [scaled by parameter o1-03]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Speed Reference1 (High Byte) [scaled by parameter o1-03]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Torque Reference2 (Low Byte) [0.1%]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Torque Reference2 (High Byte) [0.1%]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Torque Compensation2 (Low Byte) [0.1%]</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>7</td>
<td>Torque Compensation2 (High Byte) [0.1%]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Not Used</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Not Used</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>10 (0Ah)</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>11 (0Bh)</td>
<td>Not Used</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 (0Ch)</td>
<td>Terminal A1 (Low Byte)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 (0Dh)</td>
<td>Terminal A1 (High Byte)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 (0Eh)</td>
<td>Terminal A2 (Low Byte)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 (0Fh)</td>
<td>Terminal A2 (High Byte)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 (10h)</td>
<td>Digital Output (Low Byte)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 (11h)</td>
<td>Digital Output (High Byte)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 (12h) – 39 (27h)</td>
<td>Not Used</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: 1: Becomes torque limit in torque mode  
2: VG+ Series 3 FVC mode only

- **Run Forward**: Forward RUN Command
- **Run Reverse**: Reverse RUN Command
- **Terminal S3**: Multi-function Digital Input 1 (H1-01)
- **Terminal S4**: Multi-function Digital Input 2 (H1-02)
- **Terminal S5**: Multi-function Digital Input 3 (H1-03)
- **Terminal S6**: Multi-function Digital Input 4 (H1-04)
- **Terminal S7**: Multi-function Digital Input 5 (H1-05)
- **Terminal S8**: Multi-function Digital Input 6 (H1-06)
- **External Fault**: External Fault (Setting of H1-01 ~ H1-06)
- **Fault Reset**: Fault Reset Command
- **Terminal M1-M2**: Multi-function Digital Output 1 (H2-01)
- **Terminal P1**: Multi-function Digital Output 2 (H2-02)
- **Terminal P2**: Multi-function Digital Output 3 (H2-03)
- **Speed Reference**: RPM when o1-03 = (2 ~ 39)
- **Torque Reference**: Percent of rated torque - (VG+ Series 3 Closed-loop flux vector mode (FVC) only)
- **Torque Compensation**: Percent of rated torque - (VG+ Series 3 Closed-loop flux vector mode (FVC) only)
- **Terminal A1**: Analog Input 1 (H3-04)
- **Terminal A2**: Analog Input 2 (H3-08)
- **Digital Output**: Digital Output as bit field
### Supported Output Instances

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

<table>
<thead>
<tr>
<th>Output Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
<th>Instance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>Running 1 (FWD)</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Faulted</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>Speed Actual (Low Byte) [scaled by parameter o1-03]</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>Speed Actual (High Byte) [scaled by parameter o1-03]</td>
</tr>
</tbody>
</table>

Faulted: Drive Fault  
Running1 (Forward): Running in forward direction  
Speed Actual: RPM if o1-03 = (2 ~ 39)

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

<table>
<thead>
<tr>
<th>Output Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
<th>Instance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>At Speed</td>
<td>Reference from Net</td>
<td>Control from Net</td>
<td>Ready</td>
<td>Running 2 (REV)</td>
<td>Running 1 (FWD)</td>
<td>Warning</td>
<td>Faulted</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>Speed Actual (Low Byte) [scaled by parameter o1-03]</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>Speed Actual (High Byte) [scaled by parameter o1-03]</td>
</tr>
</tbody>
</table>

Faulted: Drive Fault  
Warning: Drive Alarm  
Running1 (FWD): Running in forward direction  
Running1 (REV): Running in reverse direction  
Ready: Drive Ready  
Control from Net:  
0 = Non-network control  
1 = Control from network  
Reference from Net:  
0 = Reference not from network  
1 = Reference from network  
At Speed: Speed Agree  
Speed Actual: RPM if o1-03 = (2 ~ 39)

#### Basic Speed/Torque Control Output Instance 72 (48h)

<table>
<thead>
<tr>
<th>Output Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
<th>Instance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>At Speed</td>
<td>Reference from Net</td>
<td>Control from Net</td>
<td>Ready</td>
<td>Running 2 (REV)</td>
<td>Running 1 (FWD)</td>
<td>Warning</td>
<td>Faulted</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>Speed Actual (Low Byte) [scaled by parameter o1-03]</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>Speed Actual (High Byte) [scaled by parameter o1-03]</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>Torque Actual1 (Low Byte) [0.1%]</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>Torque Actual1 (High Byte) [0.1%]</td>
</tr>
</tbody>
</table>

Note: 1 VG+ Series 3 FVC mode only  
Running1 (Forward): Running in forward direction  
Speed Actual: RPM if o1-03 = (2 ~ 39)  
Torque Actual: Percent of rated torque
Extended Speed/Torque Control Output Instance 73 (49h)

<table>
<thead>
<tr>
<th>Output</th>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instance</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Fault Reset</td>
<td>-</td>
</tr>
<tr>
<td>73</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Run Forward</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>-</td>
<td>-</td>
<td>Speed Actual (Low Byte) [scaled by parameter o1-03]</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>-</td>
<td>-</td>
<td>Speed Actual (High Byte) [scaled by parameter o1-03]</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>-</td>
<td>Torque Actual1 (Low Byte) [0.1%]</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>-</td>
<td>-</td>
<td>Torque Actual1 (High Byte) [0.1%]</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: 1 VG+ Series 3 FVC mode only
Faulted: Drive Fault
Warning: Drive Alarm
Running1 (Forward): Running in forward direction
Running1 (Reverse): Running in reverse direction
Ready: Drive Ready
Control from Net:
0 = Non-network control
1 = Control from network
Reference from Net:
0 = Reference not from network
1 = Reference from network
At Speed: Speed Agree
Speed Actual: RPM if o1-03 = (2 ~ 39)
Torque Actual: Percent of rated torque
# Magnetek Output Instances

## Magnetek Standard Speed/Torque Output Instance 151 (97h)

<table>
<thead>
<tr>
<th>Output</th>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instance</td>
<td>0</td>
<td>FAULT</td>
<td>ALARM</td>
<td>READY</td>
<td>SPEED</td>
<td>AGREE</td>
<td>RESET</td>
<td>RUNNING</td>
<td>REVERSE</td>
</tr>
<tr>
<td>1</td>
<td>ZSV</td>
<td>MOTOR 2</td>
<td>SELECTED</td>
<td>MULTI-FUNCTION</td>
<td>OUTPUT 3</td>
<td>MULTI-FUNCTION</td>
<td>OUTPUT 2</td>
<td>MULTI-FUNCTION</td>
<td>OUTPUT 1</td>
</tr>
</tbody>
</table>

### Output Byte Bit Descriptions:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>FAULT</td>
</tr>
<tr>
<td>1</td>
<td>ALARM</td>
</tr>
<tr>
<td>2</td>
<td>READY</td>
</tr>
<tr>
<td>3</td>
<td>SPEED AGREE</td>
</tr>
<tr>
<td>4</td>
<td>RESET</td>
</tr>
<tr>
<td>5</td>
<td>RUNNING REVERSE</td>
</tr>
<tr>
<td>6</td>
<td>ZSP</td>
</tr>
<tr>
<td>7</td>
<td>RUNNING FORWARD</td>
</tr>
</tbody>
</table>

### Bit Values:

- **2**: Output Frequency (Low Byte) [scaled by parameter o1-03]
- **3**: Output Frequency (High Byte) [scaled by parameter o1-03]
- **4**: Torque Reference1 (Low Byte) [0.1%]
- **5**: Torque Reference1 (High Byte) [0.1%]
- **6**: Output Current (Low Byte) [0.1A or 0.01A]
- **7**: Output Current (High Byte) [0.1A or 0.01A]

### Notes:

- 1 VG+ Series 3 FVC mode only
- Running (Forward): Running in forward direction
- ZSP: At Zero Speed
- Running (Reverse): Running in reverse direction
- Reset: Fault reset
- Speed Agree: @ commanded speed
- Ready: Drive Ready
- Alarm: Drive Alarm
- Fault: Drive Fault
- OPE: Drive OPE Fault
- UV: Drive Undervoltage Fault
- Local/Remote: 0 = Drive is in Local Control, 1 = Drive is in Remote Control
- Terminal M0-M1: Multi-function Digital Output 1 (H2-01)
- Terminal M2-M3,M2-M4: Multi-function Digital Output 2 (H2-02)
- Terminal M5-M6: Multi-function Digital Output 3 (H2-03)
- ZSV: Zero Servo (FVG+ Series 3 in Closed-loop flux vector mode (FVC) only)
- Output Frequency: Output frequency of the drive
- Torque Reference: Percent of rated torque
- Output Current: Parameter o2-04 for kVA model - Scaling is 0.01A for kVA models 00h ~ 06h and 20h ~ 26h
### Magnetek High Speed/Torque Status Output Instance 155 (9Bh)

<table>
<thead>
<tr>
<th>Output</th>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instance 0</td>
<td>0</td>
<td>FAULT</td>
<td>ALARM</td>
<td>READY</td>
<td>SPEED</td>
<td>AGREE</td>
<td>RESET</td>
<td>RUNNING</td>
<td>REVERSE</td>
</tr>
<tr>
<td>1</td>
<td>ZSV</td>
<td>MOTOR 2 SELECTED</td>
<td>MULTI-FUNCTION OUTPUT 3</td>
<td>MULTI-FUNCTION OUTPUT 2</td>
<td>MULTI-FUNCTION OUTPUT 1</td>
<td>LOCAL / REMOTE</td>
<td>UV</td>
<td>OPE</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Output Speed (Low Byte) [scaled by parameter o1-03]</td>
<td>Monitor Parameter U1-05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Output Speed (High Byte) [scaled by parameter o1-03]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Torque Reference1 (Low Byte) [0.1%]</td>
<td>Monitor Parameter U1-09</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Torque Reference1 (High Byte) [0.1%]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>PG Count Value (PG-X2) (Low Byte)</td>
<td>Encoder pulse count from PG-X2 option when in flux vector mode. There is no associated drive parameter.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>PG Count Value (PG-X2) (High Byte)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Frequency Command (Low Byte) [scaled by parameter o1-03]</td>
<td>Monitor Parameter U1-01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Frequency Command (High Byte) [scaled by parameter o1-03]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0Ah</td>
<td>Output Frequency (Low Byte) [scaled by parameter o1-03]</td>
<td>Monitor Parameter U1-02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>0Bh</td>
<td>Output Frequency (High Byte) [scaled by parameter o1-03]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>0Ch</td>
<td>Output Current (Low Byte) [0.1A or 0.01A]</td>
<td>Monitor Parameter U1-03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>13</td>
<td>0Dh</td>
<td>Output Current (High Byte) [0.1A or 0.01A]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>0Eh</td>
<td>Inverter Terminal A2 Output (Low Byte)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>0Fh</td>
<td>Inverter Terminal A2 Output (High Byte)</td>
<td>Monitor Parameter U1-16 Terminal A2</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>16</td>
<td>10h</td>
<td>Main Circuit DC Voltage (Low Byte)</td>
<td>Monitor Parameter U1-07</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>11h</td>
<td>Main Circuit DC Voltage (High Byte)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>12h</td>
<td>Error Alarm Signal 1 (Low Byte)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>13h</td>
<td>Error Alarm Signal 1 (High Byte)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>20</td>
<td>14h</td>
<td>Error Alarm Signal 2 (Low Byte)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>15h</td>
<td>Error Alarm Signal 2 (High Byte)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>16h</td>
<td>Error Alarm Signal 3 (Low Byte)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>17h</td>
<td>Error Alarm Signal 3 (High Byte)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>18h</td>
<td>Inverter Terminal A3 Input (Low Byte)</td>
<td>For details refer to the following section:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>19h</td>
<td>Inverter Terminal A3 Input (High Byte)</td>
<td>Monitor Parameter U1-17 Terminal A3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>1Ah</td>
<td>Inverter Terminals S1~S8 Input (Low Byte)</td>
<td>Monitor Parameter U1-10 VG+ Series 3 and G+ Series 3 Terminals S1-S8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>1Bh</td>
<td>Inverter Terminals S1~S8 Input (High Byte)</td>
<td>Monitor Parameter U1-15 Terminal A1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>1Ch</td>
<td>Inverter Terminal A1 Input (Low Byte)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>1Dh</td>
<td>Inverter Terminal A1 Input (High Byte)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>1Eh</td>
<td>PG Counter (Ch2) (PG-W2) (Low Byte)</td>
<td>Encoder pulse count from PG-W2 option when in flux vector mode. Speed detection PG counter value.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>1Fh</td>
<td>PG Counter (Ch2) (PG-W2) (High Byte)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>20h - 39 (29h)</td>
<td>Not Used</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Magnetek High Speed/Torque Status Output Instance 155 (9Bh) - Word Details

| Running Forward: Running in the forward direction | Output Speed: RPM if o1-03 = (2 ~ 39) |
| ZSP: At Zero Speed | Torque Reference: Percent of Rated torque |
| Running Reverse: Running in the reverse direction | PG Count Value: PG-X2 pulse count |
| Reset: Fault Reset | Frequency Command: Frequency command |
| Speed Agree: @ Commanded Speed | Output Frequency: Output frequency of the drive |
| Ready: Drive Ready | Output Current: Parameter o2-04 for kVA model - Scaling is 0.01A for kVA models 00h ~ 06h and 20h ~ 26h |
| Alarm: Drive Alarm | Inverter Terminal A2 Input: Analog Input 2 |
| Fault: Drive Fault | Main Circuit DC Voltage: Monitor Parameter U1-07 |
| OPE: Drive OPE Fault | Error Alarm Signal 1: Refer to: (Details for bytes 10 through 23, Error |
| UV: Drive Undervoltage Fault | Error Alarm Signal 2: Alarm Signals 1, 2, and 3) |
| Local/Remote: 0 = Drive is in Local Control | Error Alarm Signal 3: |
| 1 = Drive is in Remote Control | Inverter Terminal A3 Input: Analog Input 3 |
| Terminal M0-M1: Multi-function Digital Output 1 (H2-01) | Inverter Terminals S1~S8 Input: Digital Inputs as bit field (Terminals S1-S7) |
| Terminal M2-M3,M2-M4: Multi-function Digital Output 2 (H2-02) | Inverter Terminal A1 Input: Analog Input 1 |
| Terminal M5-M6: Multi-function Digital Output 3 (H2-03) | PG Counter (Ch2): Encoder pulse count from PG-W2 option. |

**Magnetek High Speed/Torque Status Output Instance 155 (9Bh)**  
(Details for bytes 10 through 23, Error Alarm Signals 1, 2, and 3)

<table>
<thead>
<tr>
<th>Bytes 18(Low) and 19(High) – Error Alarm Signal 1</th>
<th>Bytes 20(Low) and 21(High) – Error Alarm Signal 2</th>
<th>Bytes 22(Low) and 23(High) – Error Alarm Signal 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bit Fault</td>
<td>Bit Fault</td>
<td>Bit Fault</td>
</tr>
<tr>
<td>0h PUF DC Bus Fuse Open</td>
<td>0h EF3 External Fault - Terminal S3</td>
<td>0h CE Modbus Communication Error</td>
</tr>
<tr>
<td>1h UV1 DC Bus Undervoltage</td>
<td>1h EF4 External Fault - Terminal S4</td>
<td>1h BUS Bus Fault</td>
</tr>
<tr>
<td>2h UV2 Control Circuit Undervoltage</td>
<td>2h EF5 External Fault - Terminal S5</td>
<td>2h Not Used</td>
</tr>
<tr>
<td>3h UV3 Main Circuit Contactor Answerback Fault</td>
<td>3h EF6 External Fault - Terminal S6</td>
<td>3h Not Used</td>
</tr>
<tr>
<td>4h Not Used</td>
<td>4h EF7 External Fault - Terminal S7</td>
<td>4h CF Out of Control Fault No Determination of Motor Speed</td>
</tr>
<tr>
<td>5h GF Ground Fault</td>
<td>5h EF8 External Fault - Terminal S8</td>
<td>5h SVE Zero Servo Fault (VG+ Series in Closed-loop flux vector mode (FVC) only)</td>
</tr>
<tr>
<td>6h DC Overcurrent Fault</td>
<td>6h FAN Drive Cooling Fan Fault (models with internal cooling fans only)</td>
<td>6h EF0 External Communications Fault</td>
</tr>
<tr>
<td>7h OV Overvoltage Fault</td>
<td>7h OS Overspeed Fault</td>
<td>7h Not Used</td>
</tr>
<tr>
<td>8h OH Heatsink Over temperature Fault</td>
<td>8h DEV Speed Deviation Fault</td>
<td>8h Not Used</td>
</tr>
<tr>
<td>9h OH1 Drive Overheat Fault</td>
<td>9h PGO PG Open, Encoder (Pulse Generator open circuit)</td>
<td>9h Not Used</td>
</tr>
<tr>
<td>Ah DL1 Motor Overload Fault</td>
<td>Ah PF Input Phase Loss Fault</td>
<td>Ah Not Used</td>
</tr>
<tr>
<td>8h DL2 Drive Overload Fault</td>
<td>8h LF Output Phase Loss</td>
<td>8h Not Used</td>
</tr>
<tr>
<td>Ch DL3 Overtorque Fault 1 (L6-02)</td>
<td>Ch Not Used</td>
<td>Ch Not Used</td>
</tr>
<tr>
<td>Dh DL4 Overtorque Fault 2 (L6-05)</td>
<td>Dh OPR Operator Disconnected</td>
<td>Dh Not Used</td>
</tr>
<tr>
<td>Eh RR Dynamic Braking Transistor Failure</td>
<td>Eh ERR EPROM R/W Error</td>
<td>Eh Not Used</td>
</tr>
<tr>
<td>Fh RH Dynamic Braking Resistor</td>
<td>Fh Not Used</td>
<td>Fh CPF Control Circuit Fault/Peripheral Fault</td>
</tr>
<tr>
<td>Overheat</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CIP Supported Objects

Class 01h – Identity Object

<table>
<thead>
<tr>
<th>Service Code No. (hex)</th>
<th>Service Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>01h</td>
<td>Get Attribute All</td>
</tr>
<tr>
<td>05h</td>
<td>RESET</td>
</tr>
<tr>
<td>0Eh</td>
<td>Get Attribute Single</td>
</tr>
</tbody>
</table>

Attributes

<table>
<thead>
<tr>
<th>Instance ID (Hex)</th>
<th>Attribute (Hex)</th>
<th>Description</th>
<th>Get</th>
<th>Set</th>
<th>Size</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>00h</td>
<td>01h</td>
<td>Object Software Revision</td>
<td>X</td>
<td></td>
<td>Word</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>02h</td>
<td>Maximum Instances</td>
<td>X</td>
<td></td>
<td>Word</td>
<td>1</td>
</tr>
<tr>
<td>01h</td>
<td>01h</td>
<td>Vendor ID</td>
<td>X</td>
<td></td>
<td>Word</td>
<td>44 (YASKAWA)</td>
</tr>
<tr>
<td></td>
<td>02h</td>
<td>Device Type</td>
<td>X</td>
<td></td>
<td>Word</td>
<td>2 (AC drives)</td>
</tr>
<tr>
<td></td>
<td>03h</td>
<td>Product Code</td>
<td>X</td>
<td></td>
<td>Word</td>
<td>Product/Model Dependant Code- For factory use Refer to Attribute 7-Product Name, for drive family and model.</td>
</tr>
<tr>
<td></td>
<td>04h</td>
<td>Revision</td>
<td>X</td>
<td></td>
<td>Word</td>
<td>Software Dependant</td>
</tr>
<tr>
<td></td>
<td>05h</td>
<td>Status</td>
<td>X</td>
<td></td>
<td>Word</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>06h</td>
<td>Serial Number</td>
<td>X</td>
<td></td>
<td>Word</td>
<td>Each product’s serial number is unique Range is 0x8200000 ~0x82FFFFF</td>
</tr>
<tr>
<td></td>
<td>07h</td>
<td>Product Name</td>
<td>X</td>
<td></td>
<td>(14 Bytes)</td>
<td>Product Dependant*</td>
</tr>
</tbody>
</table>

• The product name is CIMR-[Drive Family][Drive Model].

Class 06h – Connection Manager Object

<table>
<thead>
<tr>
<th>Service Code No. (hex)</th>
<th>Service Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>0E</td>
<td>Get Attribute Single</td>
</tr>
</tbody>
</table>

Attributes

<table>
<thead>
<tr>
<th>Instance ID (Hex)</th>
<th>Attribute (Hex)</th>
<th>Description</th>
<th>Get</th>
<th>Set</th>
<th>Size</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>00h</td>
<td>01h</td>
<td>Object Software Revision</td>
<td>X</td>
<td></td>
<td>Word</td>
<td>1</td>
</tr>
</tbody>
</table>

Class 02h – Messenger Router Object

<table>
<thead>
<tr>
<th>Service Code No. (hex)</th>
<th>Service Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>0Eh</td>
<td>Get Attribute Single</td>
</tr>
</tbody>
</table>

Attributes

<table>
<thead>
<tr>
<th>Instance ID (Hex)</th>
<th>Attribute (Hex)</th>
<th>Description</th>
<th>Get</th>
<th>Set</th>
<th>Size</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0h</td>
<td>01h</td>
<td>Object Software Revision</td>
<td>X</td>
<td></td>
<td>Word</td>
<td>1</td>
</tr>
</tbody>
</table>
### Class 01h – Assembly Object

<table>
<thead>
<tr>
<th>Service Code No. (hex)</th>
<th>Service Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>0Ah</td>
<td>Get Attribute Single</td>
</tr>
<tr>
<td>10h</td>
<td>Set Attribute Single</td>
</tr>
</tbody>
</table>

#### Attributes

<table>
<thead>
<tr>
<th>Instance ID</th>
<th>Attribute (Hex)</th>
<th>Description</th>
<th>Get</th>
<th>Set</th>
<th>Size</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>00h</td>
<td>01h</td>
<td>Object Software Revision</td>
<td>X</td>
<td></td>
<td>Word</td>
<td>1</td>
</tr>
<tr>
<td>14h</td>
<td>03h</td>
<td>Data</td>
<td>X</td>
<td>X</td>
<td>Array 4 Bytes</td>
<td>00 00 00 00</td>
</tr>
<tr>
<td>15h</td>
<td>03h</td>
<td>Data</td>
<td>X</td>
<td>X</td>
<td>Array 4 Bytes</td>
<td>00 00 00 00</td>
</tr>
<tr>
<td>16h</td>
<td>03h</td>
<td>Data</td>
<td>X</td>
<td>X</td>
<td>Array 6 Bytes</td>
<td>00 00 00 00 00 00</td>
</tr>
<tr>
<td>17h</td>
<td>03h</td>
<td>Data</td>
<td>X</td>
<td>-</td>
<td>Array 6 Bytes</td>
<td>00 00 00 00 00 00 00</td>
</tr>
<tr>
<td>46h</td>
<td>03h</td>
<td>Data</td>
<td>X</td>
<td>-</td>
<td>Array 4 Bytes</td>
<td>00 00 00 00</td>
</tr>
<tr>
<td>47h</td>
<td>03h</td>
<td>Data</td>
<td>X</td>
<td>-</td>
<td>Array 4 Bytes</td>
<td>00 00 00 00</td>
</tr>
<tr>
<td>48h</td>
<td>03h</td>
<td>Data</td>
<td>X</td>
<td>-</td>
<td>Array 6 Bytes</td>
<td>00 00 00 00 00 00 00</td>
</tr>
<tr>
<td>49h</td>
<td>03h</td>
<td>Data</td>
<td>X</td>
<td>-</td>
<td>Array 6 Bytes</td>
<td>00 00 00 00 00 00 00 00</td>
</tr>
<tr>
<td>65h</td>
<td>03h</td>
<td>Data</td>
<td>X</td>
<td>-</td>
<td>Array 8 Bytes</td>
<td>00 00 00 00 00 00 00 00 00</td>
</tr>
<tr>
<td>73h</td>
<td>03h</td>
<td>Data</td>
<td>X</td>
<td>X</td>
<td>Array 40 Bytes</td>
<td>00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00</td>
</tr>
<tr>
<td>97h</td>
<td>03h</td>
<td>Data</td>
<td>X</td>
<td>-</td>
<td>Array 8 Bytes</td>
<td>00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00</td>
</tr>
<tr>
<td>9Bh</td>
<td>03h</td>
<td>Data</td>
<td>X</td>
<td>-</td>
<td>Array 40 Bytes</td>
<td>00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00</td>
</tr>
</tbody>
</table>
### Class F5– TCP/IP

<table>
<thead>
<tr>
<th>Service Code No. (hex)</th>
<th>Service Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>01h</td>
<td>Get Attribute All</td>
</tr>
<tr>
<td>0Eh</td>
<td>Get Attribute Single</td>
</tr>
<tr>
<td>10h</td>
<td>Set Attribute Single</td>
</tr>
</tbody>
</table>

#### Attributes

<table>
<thead>
<tr>
<th>Instance ID</th>
<th>Attribute (Hex)</th>
<th>Description</th>
<th>Get</th>
<th>Set</th>
<th>Size</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>00h</td>
<td>01h</td>
<td>Object Software Revision</td>
<td>X</td>
<td>Word</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>02h</td>
<td>01h</td>
<td>Status</td>
<td>X</td>
<td>Long</td>
<td></td>
<td>Bit 0: Not configured</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit 1: Configured</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit 2~31: Reserved</td>
</tr>
<tr>
<td>02h</td>
<td>02h</td>
<td>Configuration Capability</td>
<td>X</td>
<td>Long</td>
<td></td>
<td>Bit 0: BootP Client</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit 1: DHCP Client</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit 2: DNS Client</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit 3: DHCP-DNS update</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit 4: Configuration Settable</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit 5~31: Reserved</td>
</tr>
<tr>
<td>03h</td>
<td>03h</td>
<td>Configuration Control</td>
<td>X</td>
<td>X</td>
<td>Long</td>
<td>Bit 0~3: Start up Configuration</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit 4: DNS Enable</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit 5~31: Reserved</td>
</tr>
<tr>
<td>04h</td>
<td>04h</td>
<td>Physical Link</td>
<td>X</td>
<td>-</td>
<td>Struct</td>
<td>Path (Word): EPATH</td>
</tr>
<tr>
<td>05h</td>
<td>05h</td>
<td>Interface Configuration</td>
<td>X</td>
<td>X</td>
<td>Struct</td>
<td>IP Address (Long)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Subnet Mask (Long)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Gateway (Long)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Name Server 1 (Long)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Name Server 2 (Long)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Domain Name (String)</td>
</tr>
</tbody>
</table>

### Class F6– EtherNet Link Object

<table>
<thead>
<tr>
<th>Service Code No. (hex)</th>
<th>Service Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>01h</td>
<td>Get Attribute All</td>
</tr>
<tr>
<td>0Eh</td>
<td>Get Attribute Single</td>
</tr>
<tr>
<td>10h</td>
<td>Set Attribute Single</td>
</tr>
<tr>
<td>4Ch</td>
<td>Get and Clear</td>
</tr>
</tbody>
</table>

#### Attributes

<table>
<thead>
<tr>
<th>Instance ID (Hex)</th>
<th>Attribute (Hex)</th>
<th>Description</th>
<th>Get</th>
<th>Set</th>
<th>Size</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>00h</td>
<td>01h</td>
<td>Object Software Revision</td>
<td>X</td>
<td>-</td>
<td>Word</td>
<td>1</td>
</tr>
<tr>
<td>02h</td>
<td>02h</td>
<td>Maximum Instances</td>
<td>X</td>
<td>Word</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>01h</td>
<td>01h</td>
<td>Interface Speed</td>
<td>X</td>
<td>Long</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>02h</td>
<td>02h</td>
<td>Interface Flags</td>
<td>X</td>
<td>Long</td>
<td></td>
<td>Bit 0: BootP Client</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit 1: DHCP Client</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit 2: DNS Client</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit 3: DHCP-DNS update</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit 4: Configuration Settable</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit 5~31: Reserved</td>
</tr>
<tr>
<td>03h</td>
<td>03h</td>
<td>Configuration Control</td>
<td>X</td>
<td>X</td>
<td>Long</td>
<td>Bit 0: Link Status</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit 1: 0: Half Duplex</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1: Full Duplex</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit 2~31: Reserved</td>
</tr>
<tr>
<td>04h</td>
<td>04h</td>
<td>Physical Address (MAC ID)</td>
<td>X</td>
<td>Array 6 Words</td>
<td>Unique per assembly</td>
<td></td>
</tr>
<tr>
<td>05h</td>
<td>05h</td>
<td>Interface Control</td>
<td>X</td>
<td>X</td>
<td>Struct</td>
<td>Control Bits: Word Forced Int Speed: Word</td>
</tr>
</tbody>
</table>
Class 29h – Control Supervisor Object

<table>
<thead>
<tr>
<th>Service Code No. (hex)</th>
<th>Service Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>0Eh</td>
<td>Get Attribute Single</td>
</tr>
<tr>
<td>10h</td>
<td>Set Attribute Single</td>
</tr>
<tr>
<td>05h</td>
<td>RESET</td>
</tr>
</tbody>
</table>

Attributes

<table>
<thead>
<tr>
<th>Instance ID</th>
<th>Attribute</th>
<th>Description</th>
<th>Get</th>
<th>Set</th>
<th>Size</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>00h</td>
<td>01h</td>
<td>Object Software Revision</td>
<td>X</td>
<td>-</td>
<td>Word</td>
<td>1</td>
</tr>
<tr>
<td>03h</td>
<td>Run 1 (Forward Run)</td>
<td>X</td>
<td>X</td>
<td>Byte</td>
<td>Forward Run Command</td>
<td></td>
</tr>
<tr>
<td>04h</td>
<td>Run 2 (Reverse Run)</td>
<td>X</td>
<td>X</td>
<td>Byte</td>
<td>Reverse Run Command</td>
<td></td>
</tr>
<tr>
<td>05h</td>
<td>Net Control</td>
<td>X</td>
<td>X</td>
<td>Byte</td>
<td>Net Control Command - Parameter b3-02</td>
<td></td>
</tr>
<tr>
<td>06h</td>
<td>State</td>
<td>X</td>
<td>-</td>
<td>Byte</td>
<td>Inverter Status</td>
<td></td>
</tr>
<tr>
<td>07h</td>
<td>Running 1 (Forward)</td>
<td>X</td>
<td>-</td>
<td>Byte</td>
<td>Forward Running</td>
<td></td>
</tr>
<tr>
<td>08h</td>
<td>Running 2 (Reverse)</td>
<td>X</td>
<td>-</td>
<td>Byte</td>
<td>Reverse Running</td>
<td></td>
</tr>
<tr>
<td>09h</td>
<td>Ready</td>
<td>X</td>
<td>-</td>
<td>Byte</td>
<td>Inverter Ready</td>
<td></td>
</tr>
<tr>
<td>0Ah</td>
<td>Faulted</td>
<td>X</td>
<td>-</td>
<td>Byte</td>
<td>Inverter Fault</td>
<td></td>
</tr>
<tr>
<td>0Bh</td>
<td>Warning</td>
<td>X</td>
<td>-</td>
<td>Byte</td>
<td>Inverter Alarm</td>
<td></td>
</tr>
<tr>
<td>0Ch</td>
<td>Fault Reset</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>Fault Reset</td>
<td></td>
</tr>
<tr>
<td>0Dh</td>
<td>Fault Code</td>
<td>X</td>
<td>-</td>
<td>Word</td>
<td>Current Fault</td>
<td></td>
</tr>
<tr>
<td>0Eh</td>
<td>Warn Code</td>
<td>X</td>
<td>-</td>
<td>Word</td>
<td>Current Warning</td>
<td></td>
</tr>
<tr>
<td>0Fh</td>
<td>Control from Net</td>
<td>X</td>
<td>-</td>
<td>Byte</td>
<td>Net Control Status - Parameter b3-02</td>
<td></td>
</tr>
<tr>
<td>10h</td>
<td>CIP Fault Mode</td>
<td>X</td>
<td>-</td>
<td>Byte</td>
<td>Always “2”</td>
<td></td>
</tr>
<tr>
<td>11h</td>
<td>Force Fault</td>
<td>X</td>
<td>X</td>
<td>Byte</td>
<td>External Fault - EF0</td>
<td></td>
</tr>
<tr>
<td>12h</td>
<td>Force Status</td>
<td>X</td>
<td>-</td>
<td>Byte</td>
<td>External Fault Status – EF0</td>
<td></td>
</tr>
</tbody>
</table>

Note: See Fault Code Conversions Table for fault description.
## Class 2Ah – AC Dive Object

<table>
<thead>
<tr>
<th>Service Code No. (Hex)</th>
<th>Service Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>0Eh</td>
<td>Get Attribute Single</td>
</tr>
<tr>
<td>10h</td>
<td>Set Attribute Single</td>
</tr>
</tbody>
</table>

### Attributes

<table>
<thead>
<tr>
<th>Instance ID (Hex)</th>
<th>Attribute</th>
<th>Description</th>
<th>Get</th>
<th>Set</th>
<th>Size</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>00h</td>
<td>01h</td>
<td>Object Software Revision</td>
<td>X</td>
<td>-</td>
<td>Word</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>03h</td>
<td>At Reference</td>
<td>X</td>
<td>-</td>
<td>Byte</td>
<td>Speed Agree</td>
</tr>
<tr>
<td></td>
<td>04h</td>
<td>Net Reference</td>
<td>X</td>
<td>X</td>
<td>Byte</td>
<td>Net Reference Command - Parameter b3-01</td>
</tr>
<tr>
<td></td>
<td>06h</td>
<td>Drive Mode</td>
<td>X</td>
<td>X</td>
<td>Byte</td>
<td>Control Method - Parameter A1-02</td>
</tr>
<tr>
<td></td>
<td>07h</td>
<td>Speed Actual</td>
<td>X</td>
<td>-</td>
<td>Word</td>
<td>Output frequency – Monitor Parameter U1-02</td>
</tr>
<tr>
<td></td>
<td>08h</td>
<td>Speed Reference</td>
<td>X</td>
<td>X</td>
<td>Word</td>
<td>Speed Command – Monitor Parameter U1-01</td>
</tr>
<tr>
<td></td>
<td>09h</td>
<td>Current Actual</td>
<td>X</td>
<td>-</td>
<td>Word</td>
<td>Output Current – Monitor Parameter U1-03</td>
</tr>
<tr>
<td></td>
<td>0Ah</td>
<td>Current Limit</td>
<td>X</td>
<td>X</td>
<td>Word</td>
<td>Motor Phase Current Limit</td>
</tr>
<tr>
<td></td>
<td>0Bh</td>
<td>Torque Actual</td>
<td>X</td>
<td>-</td>
<td>Word</td>
<td>Actual Torque – Monitor Parameter U1-09 Converted Units: NM/2 (\text{Torque Scale})</td>
</tr>
<tr>
<td></td>
<td>0Ch</td>
<td>Torque Reference</td>
<td>X</td>
<td>X</td>
<td>Word</td>
<td>Torque Limit Converted Units: NM/2 (\text{Torque Scale})</td>
</tr>
<tr>
<td></td>
<td>0Fh</td>
<td>Power Actual</td>
<td>X</td>
<td>-</td>
<td>Word</td>
<td>Actual Power - Monitor Parameter U1-08 Power Actual = (\text{[U1-08]} \times 100)</td>
</tr>
<tr>
<td></td>
<td>10h</td>
<td>Input Voltage</td>
<td>X</td>
<td>-</td>
<td>Word</td>
<td>Input Voltage - Parameter E1-01</td>
</tr>
<tr>
<td></td>
<td>11h</td>
<td>Output Voltage</td>
<td>X</td>
<td>-</td>
<td>Word</td>
<td>Output Voltage - Monitor Parameter U1-06 Output Voltage = (\text{[U1-06]} / 10)</td>
</tr>
<tr>
<td></td>
<td>17h</td>
<td>Speed Scale (-15 ~ +15)</td>
<td>X</td>
<td>X</td>
<td>Byte</td>
<td>Must be stored to EEPROM on the EtherNet/IP Option Card CM092</td>
</tr>
<tr>
<td></td>
<td>18h</td>
<td>Current Scale (-15 ~ +15)</td>
<td>X</td>
<td>X</td>
<td>Byte</td>
<td>Must be stored to EEPROM on the EtherNet/IP Option Card CM092</td>
</tr>
<tr>
<td></td>
<td>19h</td>
<td>Torque Scale (-15 ~ +15)</td>
<td>X</td>
<td>X</td>
<td>Byte</td>
<td>Must be stored to EEPROM on the EtherNet/IP Option Card CM092</td>
</tr>
<tr>
<td></td>
<td>1Ah</td>
<td>Power Scale (-15 ~ +15)</td>
<td>X</td>
<td>X</td>
<td>Byte</td>
<td>Must be stored to EEPROM on the EtherNet/IP Option Card CM092</td>
</tr>
<tr>
<td></td>
<td>1Bh</td>
<td>Voltage Scale (-15 ~ +15)</td>
<td>X</td>
<td>X</td>
<td>Byte</td>
<td>Must be stored to EEPROM on the EtherNet/IP Option Card CM092</td>
</tr>
<tr>
<td></td>
<td>1Ch</td>
<td>Time Scale (-15 ~ +15)</td>
<td>X</td>
<td>X</td>
<td>Byte</td>
<td>Must be stored to EEPROM on the EtherNet/IP Option Card CM092</td>
</tr>
<tr>
<td></td>
<td>1Dh</td>
<td>Reference from the Net (Status)</td>
<td>X</td>
<td>-</td>
<td>Byte</td>
<td>NetRef Status – Parameter b3-01</td>
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## Class 28h – Assembly Object

<table>
<thead>
<tr>
<th>Service Code No. (Hex)</th>
<th>Service Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>0Eh</td>
<td>Get Attribute Single</td>
</tr>
<tr>
<td>10h</td>
<td>Set Attribute Single</td>
</tr>
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</table>

### Attributes

<table>
<thead>
<tr>
<th>Instance ID (Hex)</th>
<th>Attribute (Hex)</th>
<th>Description</th>
<th>Get</th>
<th>Set</th>
<th>Size</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>00h</td>
<td>01h</td>
<td>Object Software Revision</td>
<td>X</td>
<td>Word</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>01h</td>
<td>03h</td>
<td>Motor 1 Type</td>
<td>X</td>
<td>Byte</td>
<td>7 (0 ~ 10)</td>
<td></td>
</tr>
</tbody>
</table>
## Magnetek Supported Objects

### Class 64h – Assembly Object

<table>
<thead>
<tr>
<th>Service Code No. (hex)</th>
<th>Service Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>0Eh</td>
<td>Get Attribute Single</td>
</tr>
<tr>
<td>10h</td>
<td>Set Attribute Single</td>
</tr>
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</table>

#### Attributes

<table>
<thead>
<tr>
<th>Instance ID (Hex)</th>
<th>Attribute (Hex)</th>
<th>Description</th>
<th>Get</th>
<th>Set</th>
<th>Size</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>00h</td>
<td>01h</td>
<td>Object Software Revision</td>
<td>X</td>
<td>Word</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>01h</td>
<td>01h</td>
<td>Operation Command</td>
<td>X</td>
<td>X</td>
<td>Word</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>02h</td>
<td>Frequency Reference (0.01Hz)</td>
<td>X</td>
<td>X</td>
<td>Word</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>03h</td>
<td>Torque Reference (0.1%)</td>
<td>X</td>
<td>X</td>
<td>Word</td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td>04h</td>
<td>Torque Compensation (0.1%)</td>
<td>X</td>
<td>X</td>
<td>Word</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>05h</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>06h</td>
<td>Analog Output 1 (Terminal 21)</td>
<td>X</td>
<td>X</td>
<td>Word</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>07h</td>
<td>Analog Output 2 (Terminal 23)</td>
<td>X</td>
<td>X</td>
<td>Word</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>08h</td>
<td>Digital Output</td>
<td>X</td>
<td>X</td>
<td>Word</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>FEh</td>
<td>Accept Command (FFDDh)</td>
<td>X</td>
<td>X</td>
<td>Word</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>FFh</td>
<td>Enter Command (FFFDh)</td>
<td>X</td>
<td>X</td>
<td>Word</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Magnetek Command Object – Class 64h, Instance 1, Attribute 1 – Operation Command

<table>
<thead>
<tr>
<th>Bit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Forward RUN (1) /Stop (0) Bits 1 and 2 may not be set simultaneously</td>
</tr>
<tr>
<td>1</td>
<td>Reverse RUN (1) /Stop (0) Bits 1 and 2 may not be set simultaneously</td>
</tr>
<tr>
<td>2</td>
<td>Terminal S3 – Multi-function Digital Input 1 – Parameter H1-01 setting</td>
</tr>
<tr>
<td>3</td>
<td>Terminal S4 – Multi-function Digital Input 2 – Parameter H1-02 setting</td>
</tr>
<tr>
<td>4</td>
<td>Terminal S5 – Multi-function Digital Input 3 – Parameter H1-03 setting</td>
</tr>
<tr>
<td>5</td>
<td>Terminal S6 – Multi-function Digital Input 4 – Parameter H1-04 setting</td>
</tr>
<tr>
<td>6</td>
<td>Terminal S7 – Multi-function Digital Input 5 – Parameter H1-05 setting</td>
</tr>
<tr>
<td>7</td>
<td>Terminal S8 – Multi-function Digital Input 6 – Parameter H1-06 setting</td>
</tr>
<tr>
<td>8</td>
<td>External Fault</td>
</tr>
<tr>
<td>9</td>
<td>Fault Reset</td>
</tr>
<tr>
<td>10</td>
<td>Reserved</td>
</tr>
<tr>
<td>11</td>
<td>Reserved</td>
</tr>
<tr>
<td>12</td>
<td>Reserved</td>
</tr>
<tr>
<td>13</td>
<td>Reserved</td>
</tr>
<tr>
<td>14</td>
<td>Speed/Torque Control (VG+ Series3 Closed-loop flux vector mode (FVC) only)</td>
</tr>
<tr>
<td>15</td>
<td>External Base Block</td>
</tr>
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#### Magnetek Command Object – Class 64h, Instance 1, Attribute 8 – Digital Output

<table>
<thead>
<tr>
<th>Bit</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>Relay Output (Term M0 –M1)</td>
</tr>
<tr>
<td>1</td>
<td>Relay Output (Term M2,M3, M4)</td>
</tr>
<tr>
<td>2</td>
<td>Relay Output (Term M5, M6)</td>
</tr>
<tr>
<td>3</td>
<td>Reserved</td>
</tr>
<tr>
<td>4</td>
<td>Reserved</td>
</tr>
<tr>
<td>5</td>
<td>Reserved</td>
</tr>
<tr>
<td>6</td>
<td>Fault Relay Enable (MA–MB)</td>
</tr>
<tr>
<td>7</td>
<td>Fault Relay Control (MA – MB)</td>
</tr>
</tbody>
</table>

Refer to the appropriate drive user, programming and/or technical manual for details on digital outputs.
# Class 65h – Status Object

<table>
<thead>
<tr>
<th>Service Code No. (hex)</th>
<th>Service Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>0Eh</td>
<td>Get Attribute Single</td>
</tr>
<tr>
<td>10h</td>
<td>Set Attribute Single</td>
</tr>
</tbody>
</table>

## Attributes

<table>
<thead>
<tr>
<th>Instance ID (Hex)</th>
<th>Attribute (Hex)</th>
<th>Description</th>
<th>Get</th>
<th>Set</th>
<th>Size</th>
<th>Default Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>00h</td>
<td>01h</td>
<td>Object Software Revision X Word 1</td>
<td>X</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>01h</td>
<td>01h</td>
<td>Drive Status X Word 0</td>
<td>X</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>02h</td>
<td>Speed Feedback (o1-03 scaled) X Word 0</td>
<td>X</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>03h</td>
<td>Torque Reference (0.1%) X Word 0</td>
<td>X</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>04h</td>
<td>Speed Detection PG Count X Word 0</td>
<td>X</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>05h</td>
<td>Speed Reference (o1-03 scaled) X Word 0</td>
<td>X</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>06h</td>
<td>Output Frequency (o1-03 scaled) X Word 0</td>
<td>X</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>07h</td>
<td>Output Current* X Word 0</td>
<td>X</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>08h</td>
<td>Digital Output X Word 0</td>
<td>X</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>09h</td>
<td>Analog Input Channel 2 X Word 0</td>
<td>X</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0Ah</td>
<td>DC bus Voltage (1V) X Word 0</td>
<td>X</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0Bh</td>
<td>Fault Code 1 X Word 0</td>
<td>X</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0Ch</td>
<td>Fault Code 2 X Word 0</td>
<td>X</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0Dh</td>
<td>Fault Code 3 X Word 0</td>
<td>X</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0Eh</td>
<td>Analog Input Channel 3 X Word 0</td>
<td>X</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0Fh</td>
<td>Analog Input Channel 1 X Word 0</td>
<td>X</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10h</td>
<td>Channel 2 PG Counter X Word 0</td>
<td>X</td>
<td></td>
<td>0</td>
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</table>

* Parameter o2-04 for kVA model - Scaling is 0.01A for kVA models 00h ~ 06h and 20h ~ 26h

## Bit Status

<table>
<thead>
<tr>
<th>Bit</th>
<th>Status</th>
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<tbody>
<tr>
<td>0h</td>
<td>Drive Running</td>
</tr>
<tr>
<td>01h</td>
<td>Zero Speed</td>
</tr>
<tr>
<td>02h</td>
<td>Reverse Running</td>
</tr>
<tr>
<td>03h</td>
<td>Reset Command Received</td>
</tr>
<tr>
<td>04h</td>
<td>Speed Agree</td>
</tr>
<tr>
<td>05h</td>
<td>Inverter Ready</td>
</tr>
<tr>
<td>06h</td>
<td>Alarm Condition</td>
</tr>
<tr>
<td>07h</td>
<td>Fault Condition</td>
</tr>
<tr>
<td>08h</td>
<td>Not Used</td>
</tr>
<tr>
<td>09h</td>
<td>Momentary Power Loss Ride Thru</td>
</tr>
<tr>
<td>0Ah</td>
<td>Local / Remote</td>
</tr>
<tr>
<td>0Bh</td>
<td>Digital Output 1</td>
</tr>
<tr>
<td>0Ch</td>
<td>Digital Output 2</td>
</tr>
<tr>
<td>0Dh</td>
<td>Digital Output 3</td>
</tr>
<tr>
<td>0Eh</td>
<td>Motor Selection</td>
</tr>
<tr>
<td>0Fh</td>
<td>Zero Servo Complete On (VG+ Series3 Closed-loop flux vector mode (FVC) only)</td>
</tr>
</tbody>
</table>
## Class 65h – Drive Status Words

<table>
<thead>
<tr>
<th>Bit</th>
<th>Fault</th>
<th>Bit</th>
<th>Fault</th>
<th>Bit</th>
<th>Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>0h</td>
<td>PUF DC Bus Fuse Open</td>
<td>0h</td>
<td>EF3 External Fault - Terminal S3</td>
<td>0h</td>
<td>CE Modbus Communication Error</td>
</tr>
<tr>
<td>1h</td>
<td>UV1 DC Bus Undervoltage</td>
<td>1h</td>
<td>EF4 External Fault - Terminal S4</td>
<td>1h</td>
<td>BUS Bus Fault</td>
</tr>
<tr>
<td>2h</td>
<td>UV2 Control Circuit Undervoltage</td>
<td>2h</td>
<td>EF5 External Fault - Terminal S5</td>
<td>2h</td>
<td>Not Used</td>
</tr>
<tr>
<td>3h</td>
<td>UV3 Main Circuit Contactor Answerback Fault</td>
<td>3h</td>
<td>EF6 External Fault - Terminal S6</td>
<td>3h</td>
<td>Not Used</td>
</tr>
<tr>
<td>4h</td>
<td>Not Used</td>
<td>4h</td>
<td>EF7 External Fault - Terminal S7</td>
<td>4h</td>
<td>CF Out of Control Fault No Determination of Motor Speed</td>
</tr>
<tr>
<td>5h</td>
<td>GF Ground Fault</td>
<td>5h</td>
<td>EF8 External Fault - Terminal S8</td>
<td>5h</td>
<td>SVE Zero Servo Fault (VG+ Series in Closed-loop flux vector mode (FVC) only)</td>
</tr>
<tr>
<td>6h</td>
<td>OC Overcurrent Fault</td>
<td>6h</td>
<td>FAN Drive Cooling Fan Fault (models with internal cooling fans only)</td>
<td>6h</td>
<td>EF0 External Communications Fault</td>
</tr>
<tr>
<td>7h</td>
<td>OV Overvoltage Fault</td>
<td>7h</td>
<td>OS Overspeed Fault</td>
<td>7h</td>
<td>Not Used</td>
</tr>
<tr>
<td>8h</td>
<td>OH Heatsink Over temperature Fault</td>
<td>8h</td>
<td>DEV Speed Deviation Fault</td>
<td>8h</td>
<td>Not Used</td>
</tr>
<tr>
<td>9h</td>
<td>OH1 Drive Overheat Fault</td>
<td>9h</td>
<td>PGO PG Open, Encoder (Pulse Generator open circuit)</td>
<td>9h</td>
<td>Not Used</td>
</tr>
<tr>
<td>Ah</td>
<td>OL1 Motor Overload Fault</td>
<td>Ah</td>
<td>PF Input Phase Loss Fault</td>
<td>Ah</td>
<td>Not Used</td>
</tr>
<tr>
<td>Bh</td>
<td>OL2 Drive Overload Fault</td>
<td>Bh</td>
<td>LF Output Phase Loss</td>
<td>Bh</td>
<td>Not Used</td>
</tr>
<tr>
<td>Ch</td>
<td>OL3 Overtorque Fault 1 (L6-02)</td>
<td>Ch</td>
<td>Not Used</td>
<td>Ch</td>
<td>Not Used</td>
</tr>
<tr>
<td>Dh</td>
<td>OL4 Overtorque Fault 2 (L6-05)</td>
<td>Dh</td>
<td>OPR Operator Disconnected</td>
<td>Dh</td>
<td>Not Used</td>
</tr>
<tr>
<td>Eh</td>
<td>RR Dynamic Braking Transistor Failure</td>
<td>Eh</td>
<td>ERR Eprom R/W Error</td>
<td>Eh</td>
<td>Not Used</td>
</tr>
<tr>
<td>Fh</td>
<td>RH Dynamic Braking Resistor Overheat</td>
<td>Fh</td>
<td>Not Used</td>
<td>Fh</td>
<td>CPF Control Circuit Fault/Peripheral Fault</td>
</tr>
</tbody>
</table>
Parameter Tables

Class/Instance/Attribute Tables

The following tables list all the drive monitors and parameters that are supported by the CM092 EtherNet/IP Option Card CM092. Each drive has its own set of Classes (CLASS), Instances (INST), and Attributes (ATTR) for each monitor and parameter.

Drive Parameter Attributes (U1-xx / Monitor Only)
Class 66h, Instance 1 – Monitor Parameters 1

Monitor parameters all share the same service (GET), data type (Word) and number of bytes (2).

<table>
<thead>
<tr>
<th>ATTRIBUTES (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>BIT NO.</th>
<th>LIMITS / DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>41h U1-01</td>
<td>Frequency Reference</td>
<td>Frequency Reference of drive (0.1 Hz)</td>
<td>0</td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td>42h U1-02</td>
<td>Output Frequency</td>
<td>Output Frequency of drive (0.1 Hz)</td>
<td>0</td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td>43h U1-03</td>
<td>Output Current</td>
<td>10V/Drive rated current</td>
<td>0</td>
<td>(2)</td>
<td></td>
</tr>
<tr>
<td>44h U1-04</td>
<td>Control Method</td>
<td>V/F Control</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>V/f with PG Feedback</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Open Loop Vector</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flux Vector</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45h U1-05</td>
<td>Motor Speed</td>
<td>Motor Speed (in 0.1 Hz)</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>46h U1-06</td>
<td>Output Voltage</td>
<td>Output Voltage (in 0.1 V)</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>47h U1-07</td>
<td>DC Bus Voltage</td>
<td>DC Bus Voltage (in 1 V)</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48h U1-08</td>
<td>Output Power</td>
<td>Output Power (in 0.1 kW)</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>49h U1-09</td>
<td>Torque Reference</td>
<td>Torque Reference (in 0.1%)</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 4Ah U1-10          | Input Terminal Status | Input Terminal 1 closed | 0 |
|                   |                        | Input Terminal 2 closed | 1 |
|                   |                        | Input Terminal 3 closed | 2 |
|                   |                        | Input Terminal 4 closed | 3 |
|                   |                        | Input Terminal 5 closed | 4 |
|                   |                        | Input Terminal 6 closed | 5 |
|                   |                        | Input Terminal 7 closed | 6 |
|                   |                        | Input Terminal 8 closed | 7 |

| 4Bh U1-11          | Output Terminal Status | Control Circuit terminals M0, M1: “Closed” | 0 |
|                   |                        | Control Circuit terminals M2 ~ M4: “Closed” | 1 |
|                   |                        | Control Circuit terminals M5, M6: “Closed” | 2 |
|                   |                        | Not Used | 3-6 |
|                   |                        | Control Circuit terminals MA ~ MC: “Closed” | 7 |

Notes:
(1) Scaling depends on the setting of o1-03.
(2) Display unit = 0.01 A for models IMPULSE Series 3 2003 thru 2025 and 4001 thru 4011; display unit = 0.1 A for models 2033 - 2300 and 4014 - 4605.
Monitor parameters all share the same service (GET), data type (Word) and number of bytes (2)

<table>
<thead>
<tr>
<th>ATTRIBUTES (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>BIT NO.</th>
<th>LIMITS / DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>4Ch</td>
<td>U1-12</td>
<td>Operation Status</td>
<td></td>
<td>0</td>
<td>Run</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Zero-Speed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>Reverse Run</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>Reset Signal Input</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>Speed Agree</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>Drive Operation Ready</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>Minor Fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7</td>
<td>Major Fault</td>
</tr>
<tr>
<td>4Dh</td>
<td>U1-13</td>
<td>Elapsed Time</td>
<td></td>
<td></td>
<td>Hours</td>
</tr>
<tr>
<td>4Eh</td>
<td>U1-14</td>
<td>Software No. (CPU ID No.)</td>
<td>Software version number</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4Fh</td>
<td>U1-15</td>
<td>Control Circuit Term A1 Input Voltage</td>
<td>Input voltage signal at terminal A1 (+10V / +100.0% ~ -10V / -100.0%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5h</td>
<td>U1-16</td>
<td>Control Circuit Term A2 Input Voltage</td>
<td>Input voltage or mAmp signal at terminal A2 (+10V / +100.0% ~ -10V / -100.0%) or (4mA / 0.0% ~ 20mA / 100.0%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>51h</td>
<td>U1-17</td>
<td>Control Circuit Term A3 Input Voltage</td>
<td>Input voltage signal at terminal A3 (+10V / +100.0% ~ -10V / -100.0%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52h</td>
<td>U1-18</td>
<td>Motor Secondary Current (Iq)</td>
<td>Motor Secondary Current-Iq (0.1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>53h</td>
<td>U1-19</td>
<td>Motor Exciting Current (Id)</td>
<td>Motor Rated Primary Current-Id (0.1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>54h</td>
<td>U1-20</td>
<td>Output Frequency after Soft-start</td>
<td>Max. Output Frequency (0.1 Hz)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>55h</td>
<td>U1-21</td>
<td>Automatic Speed Regulator (ASR) Input</td>
<td>ASR Input (0.01%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>56h</td>
<td>U1-22</td>
<td>Automatic Speed Regulator (ASR) Output</td>
<td>ASR Output (0.01%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>57h</td>
<td>U1-23</td>
<td>PG-Z2 CH2 Detection Speed</td>
<td>PG-Z2 CH2 Detection Speed (0.01%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>58h</td>
<td>U1-24</td>
<td>PID Feedback Amount</td>
<td>PID Feedback Amount (0.01%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>59h</td>
<td>U1-25</td>
<td>G5 IN4 Reference</td>
<td>Input value according to the setting of F3-01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5Ah</td>
<td>U1-26</td>
<td>Output Voltage Reference Vq</td>
<td>Output Voltage-Vq (0.1V)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5Bh</td>
<td>U1-27</td>
<td>Output Voltage Reference Vd</td>
<td>Output Voltage-Vd (0.1V)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5Ch</td>
<td>U1-28</td>
<td>Software No. CPU</td>
<td>processor version number</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5Dh</td>
<td>U1-29</td>
<td>Load Weight</td>
<td>Weight Measurement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5Fh</td>
<td>U1-30</td>
<td>SS Delta Speed</td>
<td>Snap Shaft Speed Difference</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Monitor parameters all share the same service (GET), data type (Word) and number of bytes (2).

<table>
<thead>
<tr>
<th>ATTRIBUTES (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>BIT NO.</th>
<th>LIMITS / DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>060h</td>
<td>U1-32</td>
<td>ACR Output q Axis</td>
<td>ASR Output q Axis (0.1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>061h</td>
<td>U1-33</td>
<td>ACR Output d Axis</td>
<td>ASR Output d Axis (0.1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>062h</td>
<td>U1-34</td>
<td>OPE Detection</td>
<td>Parameter setting error</td>
<td></td>
<td></td>
</tr>
<tr>
<td>063h</td>
<td>U1-35</td>
<td>Zero Servo Motion Pulse</td>
<td>Pulse Count During Zero Servo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>064h</td>
<td>U1-36</td>
<td>PID Input</td>
<td>PID Input (0.00%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>065h</td>
<td>U1-37</td>
<td>PID Output</td>
<td>PID Output (0.00%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>066h</td>
<td>U1-38</td>
<td>PID Setpoint</td>
<td>PID Setpoint (0.00%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>067h</td>
<td>U1-39</td>
<td>Memobus Communication Error</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>068h</td>
<td>U1-40</td>
<td>FAN Accumulated Operation Time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>069h</td>
<td>U1-41</td>
<td>Cooling Fin Temperature</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06Ah</td>
<td>Not Used</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06Bh</td>
<td>Not Used</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06Ch</td>
<td>U1-44</td>
<td>ASR Output</td>
<td>ASR Out No Filter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>06Dh</td>
<td>Not Used</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06Eh</td>
<td>Not Used</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06Fh</td>
<td>Not Used</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>070h</td>
<td>Not Used</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>071h</td>
<td>U1-49</td>
<td>CPU Occupation Rate</td>
<td>Amount of CPU Resources Being Used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>072h</td>
<td>U1-50</td>
<td>Hook Height</td>
<td>Calculated Height of Hook (0.00%) (Height Measurement)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>073h</td>
<td>U1-51</td>
<td>Motor Revolution</td>
<td>Number of Motor Revolutions Since Upper Limit (UL2) (Height Measurement)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>074h</td>
<td>U1-52</td>
<td>Maintenance Timer</td>
<td>Number of Hours Remaining Before Maintenance is Required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>075h</td>
<td>U1-53</td>
<td>Inch 2 Count</td>
<td>Number of Pulses Encoder has Moved Since Inch 2 Command</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Drive Parameters (U2-xx Fault Trace)
### Class 73h, Instance 1 – Fault Monitors

Monitor parameters all share the same service (GET), data type (Word) and number of bytes (2).

<table>
<thead>
<tr>
<th>ATTRIBUTES (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>LIMITS / DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>01h</td>
<td>U2-01</td>
<td>Current Fault</td>
<td></td>
<td>Code of current fault (1)</td>
</tr>
<tr>
<td>02h</td>
<td>U2-02</td>
<td>Last Fault</td>
<td></td>
<td>Code of second to current fault (1)</td>
</tr>
<tr>
<td>03h</td>
<td>U2-03</td>
<td>Frequency Ref. at Fault</td>
<td>Frequency Reference at the time of the current fault (0.0 to 400.0 Hz)</td>
<td></td>
</tr>
<tr>
<td>04h</td>
<td>U2-04</td>
<td>Output Frequency at Fault</td>
<td>Output Frequency at the time of current fault (0.0 to 400.0 Hz)</td>
<td></td>
</tr>
<tr>
<td>05h</td>
<td>U2-05</td>
<td>Output Current at Fault</td>
<td>Output Current at the time of current fault (drive rating /8192)</td>
<td></td>
</tr>
<tr>
<td>06h</td>
<td>U2-06</td>
<td>Motor Speed at Fault</td>
<td>Motor Speed at the time of current fault (in 0.1 Hz)</td>
<td></td>
</tr>
<tr>
<td>07h</td>
<td>U2-07</td>
<td>Output Voltage at Fault</td>
<td>Output Voltage at the time of current fault (in 0.1 V)</td>
<td></td>
</tr>
<tr>
<td>08h</td>
<td>U2-08</td>
<td>DC Bus Voltage at Fault</td>
<td>Output Voltage at the time of current fault (in 1 V)</td>
<td></td>
</tr>
<tr>
<td>09h</td>
<td>U2-09</td>
<td>Output kWatts at Fault</td>
<td>Output Power at the time of current fault (in 0.1 kW)</td>
<td></td>
</tr>
<tr>
<td>0Ah</td>
<td>U2-10</td>
<td>Torque Reference at Fault</td>
<td>Torque Reference at the time of current fault (in 0.1%)</td>
<td></td>
</tr>
<tr>
<td>0Bh</td>
<td>U2-11</td>
<td>Input Terminal Status at Fault</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Drive Parameters (U2-xx Fault Trace)

### Class 73h, Instance 1 – Fault Monitors

Monitor parameters all share the same service (GET), data type (Word) and number of bytes (2)

<table>
<thead>
<tr>
<th>U2-12</th>
<th>Output Terminal Status at Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>0Ch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control Circuit terminals 9 &amp; 10: “Closed”</td>
</tr>
<tr>
<td>1</td>
<td>Control Circuit terminals 25 &amp; 27: “Closed”</td>
</tr>
<tr>
<td>2</td>
<td>Control Circuit terminals 26 &amp; 27: “Closed”</td>
</tr>
<tr>
<td>3-6</td>
<td>not used</td>
</tr>
<tr>
<td>7</td>
<td>Control Circuit terminals 18 &amp; 20: “Closed”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>U2-13</th>
<th>Drive Status at Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>0Dh</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Running at the time of fault</td>
</tr>
<tr>
<td>1</td>
<td>Zero-Speed at the time of fault</td>
</tr>
<tr>
<td>2</td>
<td>Reverse Running at the time of fault</td>
</tr>
<tr>
<td>3</td>
<td>Reset Signal Input at the time of fault</td>
</tr>
<tr>
<td>4</td>
<td>Speed Agree at the time of fault</td>
</tr>
<tr>
<td>5</td>
<td>Drive Operation Ready at the time of fault</td>
</tr>
<tr>
<td>6</td>
<td>Minor Fault</td>
</tr>
<tr>
<td>7</td>
<td>Major Fault</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>U2-14</th>
<th>Elapsed Time at Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>0Eh</td>
<td></td>
</tr>
<tr>
<td>Elapsed Time at the time of fault (in hrs.)</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. List of Drive Error Codes can be found in chapter 8, Error Codes and Troubleshooting.
Drive Parameters (U3-xx Extended Fault History)
Class 74h, Instance 1 – Extended Fault History

Monitor parameters all share the same service (GET), data type (Word) and number of bytes (2).

<table>
<thead>
<tr>
<th>ATTRIBUTE S (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER FUNCTION</th>
<th>LIMITS / DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>01h</td>
<td>U3-01</td>
<td>Last Fault</td>
<td></td>
<td>Code of the most recent fault (1)</td>
</tr>
<tr>
<td>02h</td>
<td>U3-02</td>
<td>Fault Message 2</td>
<td></td>
<td>Code of the second to most recent fault (1)</td>
</tr>
<tr>
<td>03h</td>
<td>U3-03</td>
<td>Fault Message 3</td>
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<td>Code of the third to most recent fault (1)</td>
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<tr>
<td>04h</td>
<td>U3-04</td>
<td>Fault Message 4</td>
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<td>05h</td>
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<td>Elapsed Time at the most recent fault occurrence</td>
</tr>
<tr>
<td>06h</td>
<td>U3-06</td>
<td>Elapsed Time 2</td>
<td></td>
<td>Elapsed Time at the second to most recent fault occurrence</td>
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<tr>
<td>07h</td>
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<td>Elapsed Time 3</td>
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<td>Elapsed Time at the third to most recent fault</td>
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<tr>
<td>08h</td>
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<tr>
<td>09h</td>
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<td>Fault Message 5</td>
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<td>Code of the fifth to most recent fault (1)</td>
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<td>0Ah</td>
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<td>Code of the sixth to most recent fault (1)</td>
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<td>0Bh</td>
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<td>Code of the seventh to most recent fault (1)</td>
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<td>Fault Message 10</td>
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<td></td>
<td>Elapsed Time at the fifth to most recent fault occurrence</td>
</tr>
<tr>
<td>10h</td>
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<td>Elapsed Time 6</td>
<td></td>
<td>Elapsed Time at the sixth to most recent fault occurrence</td>
</tr>
<tr>
<td>11h</td>
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<td></td>
<td>Elapsed Time at the seventh to most recent fault occurrence</td>
</tr>
<tr>
<td>12h</td>
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<tr>
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<tr>
<td>15h</td>
<td>U3-21</td>
<td>Accumulated Operations</td>
<td>Accumulated Operations</td>
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<tr>
<td>16h</td>
<td>U3-22</td>
<td>U3-21 Rollover</td>
<td></td>
<td>Increments each time U3-21 reaches 65535. U3-21 is set to 0</td>
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<tr>
<td>17h</td>
<td>U3-23</td>
<td>OL / LC Count</td>
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<td>OverLoad / Load Check Count</td>
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Notes:
(1) List of Drive Error Codes can be found in chapter 8, Error Codes and Troubleshooting.
**Drive Parameters (Read/Write)**

**Class 67h, Instance 1 – A1- XX Initialize Parameters / A2-XX User Parameters**

AX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

<table>
<thead>
<tr>
<th>ATTRIBUTE S</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
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<td>01h</td>
<td>A1-00</td>
<td>Language Selection</td>
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<td>Spanish</td>
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<td>02h</td>
<td>A1-01</td>
<td>Parameter Access Level</td>
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<td>Operation Only</td>
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<td>User Program</td>
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<td>Advanced</td>
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<td></td>
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<td>3</td>
<td>Factory</td>
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<td>03h</td>
<td>A1-02</td>
<td>Control Method Selection</td>
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<td>V/f Control</td>
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<td>V/f Control w/ PG (Factory Access Only)</td>
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<td>Open Loop Vector</td>
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<td>Flux Vector</td>
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<td>04h</td>
<td>A1-03</td>
<td>Motion Select</td>
<td>0</td>
<td>Traverse</td>
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<td>Standard Hoist</td>
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<td>No-Load Brake Hoist</td>
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<td>Bucket Hoist</td>
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<tr>
<td>05h</td>
<td>A1-04</td>
<td>Speed Reference</td>
<td>0</td>
<td>2-Spd Multi-Step</td>
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<td>1</td>
<td>3-Spd Multi-Step</td>
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<td>2</td>
<td>5-Spd Multi-Step</td>
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<td>3</td>
<td>2-Step Infinitely Variable</td>
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<td>3-Step Infinitely Variable</td>
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<td>Bi-Polar Analog</td>
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<td>7</td>
<td>G5IN4 Option Card</td>
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<td>8</td>
<td>Serial Opt Card</td>
<td></td>
</tr>
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<td>06h</td>
<td>A1-05</td>
<td>Initialize Parameters</td>
<td>0000</td>
<td>No Initialize</td>
<td>0</td>
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<td>1110</td>
<td>User Initialize</td>
<td></td>
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<td></td>
<td>2220</td>
<td>2-wire Initialize</td>
<td></td>
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<tr>
<td>07h</td>
<td>A1-06</td>
<td>User Password 1</td>
<td>0000 ~ 9999</td>
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<td>09h</td>
<td>A1-07</td>
<td>Factory Password 2</td>
<td>0000 ~ 9999</td>
<td>0</td>
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</tr>
<tr>
<td>01h ~ 2Bh</td>
<td>A2-01 ~ A2-32</td>
<td>User Selected Parameter 1 Through User Selected Parameter 32</td>
<td>Setting B1-01 ~ O4-02</td>
<td>0</td>
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</table>
Drive Parameter (Read/Write) – continued
Class 68h, Instance 1 – Application Parameters

BX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

<table>
<thead>
<tr>
<th>ATTRIBUTE S (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
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</thead>
<tbody>
<tr>
<td>01h</td>
<td>B1-01</td>
<td>Frequency Reference 1</td>
<td>0.00 to 400.00 Hz</td>
<td>0.00 to 400.00 Hz (I)</td>
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<td>02h</td>
<td>B1-02</td>
<td>Frequency Reference 2</td>
<td>0.00 to 400.00 Hz</td>
<td>0.00 to 400.00 Hz (I)</td>
<td>30.00</td>
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<tr>
<td>03h</td>
<td>B1-03</td>
<td>Frequency Reference 3</td>
<td>0.00 to 400.00 Hz</td>
<td>0.00 to 400.00 Hz (I)</td>
<td>60.00</td>
</tr>
<tr>
<td>04h</td>
<td>B1-04</td>
<td>Frequency Reference 4</td>
<td>0.00 to 400.00 Hz</td>
<td>0.00 to 400.00 Hz (I)</td>
<td>60.00</td>
</tr>
<tr>
<td>05h</td>
<td>B1-05</td>
<td>Frequency Reference 5</td>
<td>0.00 to 400.00 Hz</td>
<td>0.00 to 400.00 Hz (I)</td>
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<tr>
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<td>B1-06</td>
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<td>0.00 to 400.00 Hz (I)</td>
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<td>B1-07</td>
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<td>0.00 to 400.00 Hz</td>
<td>0.00 to 400.00 Hz (I)</td>
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<tr>
<td>08h</td>
<td>B1-08</td>
<td>Frequency Reference 8</td>
<td>0.00 to 400.00 Hz</td>
<td>0.00 to 400.00 Hz (I)</td>
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<tr>
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<td>B1-09</td>
<td>Frequency Reference 9</td>
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<td>0.00 to 400.00 Hz</td>
<td>0.00 to 400.00 Hz (I)</td>
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<tr>
<td>0Bh</td>
<td>B1-11</td>
<td>Frequency Reference 11</td>
<td>0.00 to 400.00 Hz</td>
<td>0.00 to 400.00 Hz (I)</td>
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<tr>
<td>0Ch</td>
<td>B1-12</td>
<td>Frequency Reference 12</td>
<td>0.00 to 400.00 Hz</td>
<td>0.00 to 400.00 Hz (I)</td>
<td>0.00</td>
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<tr>
<td>0Dh</td>
<td>B1-13</td>
<td>Frequency Reference 13</td>
<td>0.00 to 400.00 Hz</td>
<td>0.00 to 400.00 Hz (I)</td>
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<tr>
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<td>0.00 to 400.00 Hz (I)</td>
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<td>0Fh</td>
<td>B1-15</td>
<td>Frequency Reference 15</td>
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<td>0.00 to 400.00 Hz (I)</td>
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<td>10h</td>
<td>B1-16</td>
<td>Frequency Reference 16</td>
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<td>0.00 to 400.00 Hz (I)</td>
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<tr>
<td>11h</td>
<td>B1-17</td>
<td>Jog Frequency Reference</td>
<td>0.00 to 400.00 Hz</td>
<td>0.00 to 400.00 Hz (I)</td>
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<tr>
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<td>B1-18</td>
<td>Reference Priority ¹</td>
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<td>0.00 to 400.00 Hz (I)</td>
<td>0.00</td>
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<tr>
<td>13h</td>
<td>B2-01</td>
<td>Frequency Reference Upper Limit</td>
<td>0.00 to 110.0%</td>
<td>0.00 to 110.0%</td>
<td>100.0</td>
</tr>
<tr>
<td>14h</td>
<td>B2-02</td>
<td>Frequency Reference Lower Limit</td>
<td>0.00 to 110.0%</td>
<td>0.00 to 110.0%</td>
<td>0.00</td>
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<tr>
<td>15h</td>
<td>B2-03</td>
<td>Master Speed Ref Lower Limit</td>
<td>0.00 to 110.0%</td>
<td>0.00 to 110.0%</td>
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<tr>
<td>16h</td>
<td>B2-04</td>
<td>Alternate Upper Limit</td>
<td>0.00 to 110.0%</td>
<td>0.00 to 110.0%</td>
<td>100.0</td>
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<tr>
<td>17h</td>
<td>B3-01</td>
<td>Reference Selection</td>
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<td>0.00 to 110.0%</td>
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<td>18h</td>
<td>B3-02</td>
<td>Operation Method Selection</td>
<td>0.00 to 110.0%</td>
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## Drive Parameter (Read/Write) – continued

**Class 68h, Instance 1 – Application Parameters**

BX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

<table>
<thead>
<tr>
<th>ATTRIBUTES (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
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<tbody>
<tr>
<td>19h</td>
<td>B3-03</td>
<td>Stopping Method Selection</td>
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<td>Ramp to Stop</td>
<td>Determined by A1-03 (Motion)</td>
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<td>1</td>
<td>Coast to Stop</td>
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<td>DC Injection to Stop</td>
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<td>3</td>
<td>Coast with Timer</td>
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<td>Ramp with Timer</td>
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<td>Hoist 2 Stop</td>
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<td>No Load Brake</td>
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<td>1Bh</td>
<td>B3-05</td>
<td>Zero Speed Operation (level determined by E1-09)</td>
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<td>Run at Frequency Reference</td>
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<td>Run at Min. Frequency (E1-09)</td>
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<td>2ms - 2 scans</td>
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<td>5ms - 2 scans</td>
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<td>B3-07</td>
<td>Local / Remote RUN Selection</td>
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<td>Accept External Run</td>
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<tr>
<td>1Dh</td>
<td>B3-08</td>
<td>Run Command Selection @ Program Mode</td>
<td>0</td>
<td>Disabled</td>
<td>0</td>
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<td></td>
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<td>Enabled</td>
<td>0</td>
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<td>1Fh</td>
<td>B3-10</td>
<td>Allow Run @ Power Up</td>
<td>0</td>
<td>Disabled</td>
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<td></td>
<td>1</td>
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<td>20h</td>
<td>B4-01</td>
<td>Frequency reference Hold Function</td>
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<td>Disabled: Operates at Zero when restarting</td>
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<td>Enabled: Operates at previously held frequency</td>
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<td>B4-02</td>
<td>Trim Control Level</td>
<td>0 to 100%</td>
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<tr>
<td>22h</td>
<td>B5-01</td>
<td>Acceleration Time 1</td>
<td>0.0 to 25.5 seconds</td>
<td>5.0</td>
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<tr>
<td>23h</td>
<td>B5-02</td>
<td>Deceleration Time 1</td>
<td>0.0 to 25.5 seconds</td>
<td>3.0</td>
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<tr>
<td>24h</td>
<td>B5-03</td>
<td>Acceleration Time 2</td>
<td>0.0 to 6000.0 seconds</td>
<td>2.0</td>
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<td>25h</td>
<td>B5-04</td>
<td>Deceleration Time 2</td>
<td>0.0 to 6000.0 seconds</td>
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<td>B5-05</td>
<td>Acceleration Time N Chg</td>
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<td>Deceleration Time N Chg</td>
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<td>2.0</td>
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<td>29h</td>
<td>B5-08</td>
<td>Fast Stop Time</td>
<td>0.0 to 25.5 seconds</td>
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<td>2Ah</td>
<td>B5-09</td>
<td>Accel / Decel Time Setting Unit</td>
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<td></td>
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<td>0.1 seconds</td>
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<td>2Bh</td>
<td>B5-10</td>
<td>Accel / Decel Time Switching Freq.</td>
<td>0.0 to 400.0 Hz</td>
<td>60.00</td>
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<tr>
<td>2Dh</td>
<td>B5-12</td>
<td>Acceleration Time 3</td>
<td>0.0 to 6000.0 seconds</td>
<td>3.0</td>
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Drive Parameter (Read/Write) – continued
Class 68h, Instance 1 – Application Parameters

BX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

<table>
<thead>
<tr>
<th>ATTRIBUTES  (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
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<tbody>
<tr>
<td>2Eh</td>
<td>B5-13</td>
<td>Deceleration Time 3</td>
<td>0.0 to 6000.0 seconds</td>
<td>3.0</td>
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<tr>
<td>2Fh</td>
<td>B5-14</td>
<td>Acceleration Time 4</td>
<td>0.0 to 6000.0 seconds</td>
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<td>30h</td>
<td>B5-15</td>
<td>Deceleration Time 4</td>
<td>0.0 to 6000.0 seconds</td>
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<tr>
<td>31h</td>
<td>B6-01</td>
<td>Speed Search @ Start</td>
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<td>1</td>
<td>Enabled: Speed Estimation Type</td>
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<td>Enabled: Current Detection Type</td>
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<td>32h</td>
<td>B6-02</td>
<td>Speed Search Operation Current</td>
<td>0.0 to 200.0%</td>
<td>120</td>
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<tr>
<td>33h</td>
<td>B6-03</td>
<td>Speed Search Deceleration Time</td>
<td>0.1 to 10.0 seconds</td>
<td>2.0</td>
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<tr>
<td>35h</td>
<td>B6-05</td>
<td>Search Delay Time</td>
<td>0.0 to 20.0 seconds</td>
<td>0.2</td>
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<td>3Ah</td>
<td>B6-10</td>
<td>Speed Detect Comp Gain</td>
<td>1.00 to 1.50</td>
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<td>3Dh</td>
<td>B8-01</td>
<td>Jump Frequency 1</td>
<td>0.0 to 400.0 Hz</td>
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<tr>
<td>3Eh</td>
<td>B8-02</td>
<td>Jump Frequency 2</td>
<td>0.0 to 400.0 Hz</td>
<td>0.0</td>
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<td>3Fh</td>
<td>B8-03</td>
<td>Jump Frequency 3</td>
<td>0.0 to 400.0 Hz</td>
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<tr>
<td>40h</td>
<td>B8-04</td>
<td>Jump Bandwidth</td>
<td>0.0 to 20.0 Hz</td>
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## Drive Parameter (Read/Write) – continued

### Class 68h, Instance 1 – Special Function Parameters

CX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

<table>
<thead>
<tr>
<th>ATTRIBUTES (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
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<tbody>
<tr>
<td>45h</td>
<td>C1-01</td>
<td>Quick Stop 0/1</td>
<td>0</td>
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<td>1</td>
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<tr>
<td>46h</td>
<td>C1-02</td>
<td>Quick Stop Time</td>
<td>0.0 to 25.5 seconds</td>
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<tr>
<td>47h</td>
<td>C1-03</td>
<td>Plug Reverse 0/1</td>
<td>0</td>
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<td>48h</td>
<td>C1-04</td>
<td>Plug Reverse Decel Time</td>
<td>0.0 to 25.5 seconds</td>
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<tr>
<td>49h</td>
<td>C1-05</td>
<td>Plug Reverse Accel Time</td>
<td>0.0 to 25.5 seconds</td>
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<td>4Ah</td>
<td>C2-01</td>
<td>Micro Speed Gain 1</td>
<td>0.00 to 2.55</td>
<td>1.0</td>
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<tr>
<td>4Bh</td>
<td>C2-02</td>
<td>Micro Speed Gain 2</td>
<td>0.00 to 2.55</td>
<td>1.0</td>
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<td>4Ch</td>
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<td>Upper Limit 1 Speed</td>
<td>0.00 to 400.00 Hz</td>
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<td>4Dh</td>
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<td>Upper Limit 1 Decel Time</td>
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<td>Upper Limit 2 Stop Time</td>
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<td>4Fh</td>
<td>C3-04</td>
<td>Lower Limit 1 Speed</td>
<td>0.00 to 400.00 Hz</td>
<td>6.00</td>
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<tr>
<td>50h</td>
<td>C3-05</td>
<td>Lower Limit 1 Decel Time</td>
<td>0.0 to 25.5 sec</td>
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<tr>
<td>51h</td>
<td>C3-06</td>
<td>Lower Limit 2 Stop Time</td>
<td>0.0 to 25.5 sec</td>
<td>1.0</td>
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<tr>
<td>52h</td>
<td>C3-07</td>
<td>Limit Stop Method</td>
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<td>Decel to Stop</td>
<td>2</td>
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<td>BB to Stop</td>
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<td>2</td>
<td>Use B3-03 Method</td>
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<tr>
<td>53h</td>
<td>C3-08</td>
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<td>Decel/Alarm(No further raise allowed)</td>
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<td>Coast/Alarm (No further raise allowed)</td>
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<td>2</td>
<td>Use B3-03/Alarm (No further raise allowed)</td>
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<td></td>
<td></td>
<td>3</td>
<td>Decel/Fault</td>
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<td>4</td>
<td>Coast/Fault</td>
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<td>5</td>
<td>Use B3-03/Fault</td>
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<tr>
<td>54h</td>
<td>C3-09</td>
<td>Phantom Stop Met</td>
<td>0</td>
<td>Decel To stop</td>
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<td>1</td>
<td>Coast to Stop</td>
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<td>2</td>
<td>Use B3-03 Method</td>
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<tr>
<td>55h</td>
<td>C4-01</td>
<td>Load Float Time 2</td>
<td>0 to 255 Sec</td>
<td>10</td>
<td></td>
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<tr>
<td>56h</td>
<td>C4-02</td>
<td>Load Float Gain</td>
<td>0 to 100</td>
<td>10/20</td>
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<tr>
<td>57h</td>
<td>C4-03</td>
<td>Load Float Count</td>
<td>0 to 16383</td>
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### Drive Parameter (Read/Write) – continued
**Class 68h, Instance 1 – Special Function Parameters**

CX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

<table>
<thead>
<tr>
<th>ATTRIBUTES (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
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<tbody>
<tr>
<td>58h</td>
<td>C5-01</td>
<td>Load Check 0 / 1</td>
<td>0</td>
<td>Disabled</td>
<td>0</td>
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<td></td>
<td></td>
<td>1</td>
<td>Enabled</td>
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<tr>
<td>59h</td>
<td>C5-02</td>
<td>Load Check Alarm Action</td>
<td>0</td>
<td>Alarm Only</td>
<td>1</td>
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<td></td>
<td></td>
<td>1</td>
<td>Decel to Stop</td>
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<td></td>
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<td>Coast to Stop</td>
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<td>3</td>
<td>Fault Stop</td>
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<td>4</td>
<td>Use B3-03 Method – Can lower only (Alarm)</td>
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<td>5Ah</td>
<td>C5-03</td>
<td>Minimum Torque Reference</td>
<td>0 to 100%</td>
<td>60</td>
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<tr>
<td>5Bh</td>
<td>C5-04</td>
<td>Look Speed 1</td>
<td>0 to 400 Hz</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>5Dh</td>
<td>C5-05</td>
<td>I Ref for LS 1 (V/F or OLV)</td>
<td>1 to 300 % IRC</td>
<td>160</td>
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<tr>
<td>5 Eh</td>
<td>C5-07</td>
<td>Look Speed 2</td>
<td>0 to 400 Hz</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>5Fh</td>
<td>C5-08</td>
<td>I Ref for LS 2 (V/F or OLV)</td>
<td>1 to 300 % IRC</td>
<td>160</td>
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</tr>
<tr>
<td>60h</td>
<td>C5-09</td>
<td>Look Speed 3</td>
<td>0 to 400 Hz</td>
<td>40</td>
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</tr>
<tr>
<td>61h</td>
<td>C5-10</td>
<td>I Ref for LS 3 (V/F or OLV)</td>
<td>1 to 300 % IRC</td>
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<td>I Ref for &gt; LS 3</td>
<td>1 to 300 % IRC</td>
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<tr>
<td>63h</td>
<td>C5-12</td>
<td>Load Check Setting Time</td>
<td>0.00 to 2.55 sec</td>
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<td>C5-13</td>
<td>Load Check Test Time</td>
<td>0.00 to 2.55 sec</td>
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<tr>
<td>65h</td>
<td>C5-14</td>
<td>Load Check Alarm Speed</td>
<td>0.0 to 30.0 Hz</td>
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<tr>
<td>66h</td>
<td>C6-01</td>
<td>Ultra / Swift Lift 0 / 1</td>
<td>0</td>
<td>Disabled</td>
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<td></td>
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<td>1</td>
<td>Enabled Automatic</td>
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<td></td>
<td></td>
<td>2</td>
<td>Enabled by MFI</td>
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<td>67h</td>
<td>C6-02</td>
<td>Ultra / Swift Lift Forward Speed</td>
<td>0 to 400 Hz</td>
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<tr>
<td>68h</td>
<td>C6-03</td>
<td>Ultra / Swift Lift Reverse Speed</td>
<td>0 to 400 Hz</td>
<td>60</td>
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<tr>
<td>69h</td>
<td>C6-04</td>
<td>Ultra / Swift Lift Forward Torque</td>
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<tr>
<td>6Ah</td>
<td>C6-05</td>
<td>Ultra / Swift Lift Reverse Torque</td>
<td>0 to 100 %</td>
<td>30</td>
<td></td>
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<tr>
<td>6Bh</td>
<td>C6-06</td>
<td>Ultra / Swift Lift Enabling Speed</td>
<td>0.0 to 400.0 Hz</td>
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<td>6Ch</td>
<td>C6-07</td>
<td>Ultra / Swift Lift Delay Time</td>
<td>0.0 to 25.5 sec</td>
<td>2.0</td>
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</table>
Drive Parameter (Read/Write) – continued
Class 68h, Instance 1 – Special Function Parameters

CX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

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<th>ATTRIBUTES (in hex)</th>
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<th>INITIAL VALUE</th>
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<tbody>
<tr>
<td>6Dh</td>
<td>C6-08</td>
<td>SFS Acc Gain</td>
<td>0.1 to 9.9</td>
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<td>1.0</td>
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<td>6Eh</td>
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<td>Forward Torque Limit</td>
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<tr>
<td>6Fh</td>
<td>C7-02</td>
<td>Reverse Torque Limit</td>
<td>0 to 300%</td>
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<td>Forward Regenerative Torque Limit</td>
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<td>71h</td>
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<td>Reverse Regenerative Torque Limit</td>
<td>0 to 300%</td>
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<td>Torque Limit Gain MFI</td>
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<td>Torque Compensation Time</td>
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<td>1.00 / 2.00</td>
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<td>IFB OK Time</td>
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<td>1.00 / 2.00</td>
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<td>76h</td>
<td>C8-03</td>
<td>Minimum Brake</td>
<td>0 to 300 %</td>
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<td>10/100</td>
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<td>Roll Back Timer / BE4 Timer</td>
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<td>BE3 / Alternate Torque Timer</td>
<td>0.00 to 2.55 Sec</td>
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<td>7Ah</td>
<td>C8-07</td>
<td>BE3 Detection Count</td>
<td>0 to 16536 Pulses</td>
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<td>7Bh</td>
<td>C8-08</td>
<td>Alternate Reverse Torque Limit</td>
<td>0 to 300 %</td>
<td></td>
<td>25</td>
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<tr>
<td>7Ch</td>
<td>C8-09</td>
<td>Zero Speed Level</td>
<td>0.0 to 10.0 Hz</td>
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<tr>
<td>7Dh</td>
<td>C8-10</td>
<td>Load Float Time</td>
<td>0 to 255 Sec</td>
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<td>C8-11</td>
<td>Brake Set Delay Time</td>
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<td>7Fh</td>
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<td>C8-13</td>
<td>BE6 Max Count</td>
<td>0 to 16536 Pulses</td>
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Drive Parameter (Read/Write) – continued
Class 69h, Instance 1 – Special Function Parameters

CX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

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<thead>
<tr>
<th>ATTRIBUTES (in hex)</th>
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<th>PARAMETER FUNCTION</th>
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<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
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<tbody>
<tr>
<td>01h</td>
<td>C8-14</td>
<td>Brake Hold Speed</td>
<td>B2-02 + 0.1 to 25.5 %</td>
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<td>02h</td>
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<td>Load Float Extension timer</td>
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<td>03h</td>
<td>C8-16</td>
<td>Initial Brake Release Torque</td>
<td>0 to 300 %</td>
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<td>06h</td>
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<td>07h</td>
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<td>0 to 10Hz</td>
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<td>C8-21</td>
<td>Height Measure</td>
<td>0 to 65535</td>
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<td>09h</td>
<td>C9-01</td>
<td>G5IN4 Option Enable</td>
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<tr>
<td>0Ah</td>
<td>C9-02</td>
<td>G5IN4 Option Setup</td>
<td>0000 to FFFF</td>
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<tr>
<td>0Bh</td>
<td>C10-01</td>
<td>Load Weight 0 / 1</td>
<td>0</td>
<td>Disabled</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Enabled at C5-04</td>
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<td></td>
<td></td>
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<td>2</td>
<td>Enabled by MFI</td>
<td></td>
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<td></td>
<td></td>
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<td>3</td>
<td>Both Auto &amp; MFI</td>
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<td>4</td>
<td>Analog Input (Load Cell) Data “16”</td>
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<tr>
<td>0Ch</td>
<td>C10-02</td>
<td>Torque Primary Delay</td>
<td>0 to 1000 ms</td>
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<tr>
<td>0Dh</td>
<td>C10-03</td>
<td>Load Weight Display</td>
<td>0</td>
<td>Hold Display</td>
<td>0</td>
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<td>Hold Display for 3 Seconds</td>
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<td>Load Weight Conversion</td>
<td>00000 to 39999</td>
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<td>0Fh</td>
<td>C10-05</td>
<td>Full Load Torque</td>
<td>0.0 to 200.0 %</td>
<td>100.0</td>
<td></td>
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<tr>
<td>10h</td>
<td>C10-06</td>
<td>No Load Torque</td>
<td>0.0 to 200.0 %</td>
<td>20.0</td>
<td></td>
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<tr>
<td>11h</td>
<td>C10-07</td>
<td>Unit Displayed</td>
<td>0</td>
<td>Tons</td>
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<td>Kilograms</td>
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<td>Metric Tons</td>
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<td>4</td>
<td>Percent load</td>
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<tr>
<td>12h</td>
<td>C10-08</td>
<td>Weight Limit Output</td>
<td>0.0 to 200.0%</td>
<td>125.0%</td>
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<tr>
<td>13h</td>
<td>C11-01</td>
<td>Slack Cable 0 / 1</td>
<td>0</td>
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**Drive Parameter (Read/Write) – continued**

**Class 69h, Instance 1 – Special Function Parameters**

CX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

<table>
<thead>
<tr>
<th>ATTRIBUTES (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
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<tr>
<td>14h</td>
<td>C11-02</td>
<td>Action at Slack Cable</td>
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<td>2</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>No Action / C3-04</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>Decel / C3-04</td>
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<td></td>
<td></td>
<td></td>
<td>3</td>
<td>Decel / No Operation</td>
<td></td>
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<td></td>
<td></td>
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<td>4</td>
<td>Decel to Stop / C3-04</td>
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<td>5</td>
<td>Decel to Stop / No Operation</td>
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<tr>
<td>15h</td>
<td>C11-03</td>
<td>Slack Cable Detect Torque</td>
<td>0 to 100 %</td>
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<tr>
<td>16h</td>
<td>C11-04</td>
<td>Slack Cable Detect Speed 1</td>
<td>0 to 150 Hz</td>
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<tr>
<td>17h</td>
<td>C11-05</td>
<td>Slack Cable Delay Time 1</td>
<td>0.00 to 2.55 Sec</td>
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<tr>
<td>18h</td>
<td>C11-06</td>
<td>Slack Cable Detect Speed 2</td>
<td>0 to 150 Hz</td>
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<td>60</td>
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<tr>
<td>19h</td>
<td>C11-07</td>
<td>Slack Cable Delay Time 2</td>
<td>0.00 to 2.55 Sec</td>
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<td>0.10</td>
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<tr>
<td>1Ah</td>
<td>C11-08</td>
<td>Snap Shaft Detection</td>
<td>0</td>
<td>Disabled</td>
<td>0</td>
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<tr>
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<tr>
<td>1Bh</td>
<td>C11-09</td>
<td>Drive Train Discontinue (Action @ Snap Shaft)</td>
<td>0</td>
<td>Brake / Fault Out</td>
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<td>Alarm Only</td>
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<td>1Ch</td>
<td>C11-10</td>
<td>SS Delta Speed</td>
<td>0.0 to 400.0 Hz</td>
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<td>C11-11</td>
<td>SS Delay Time</td>
<td>0 to 2000 mSec</td>
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<tr>
<td>1Eh</td>
<td>C11-12</td>
<td>Gear Ratio Numerator</td>
<td>1 to 65535</td>
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<td>1Fh</td>
<td>C11-13</td>
<td>Gear Ratio Denominator</td>
<td>1 to 65535</td>
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<td>27h</td>
<td>C13-02</td>
<td>Inch Repeat Delay Time</td>
<td>0.00 to 2.55 Sec</td>
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<tr>
<td>28h</td>
<td>C13-03</td>
<td>Index Run Reference</td>
<td>0.01 to 60.00 Hz</td>
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<td>0.10</td>
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<tr>
<td>29h</td>
<td>C13-04</td>
<td>Index Revolutions</td>
<td>0 to 65535 Revs</td>
<td></td>
<td>0</td>
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<tr>
<td>2Ah</td>
<td>C13-05</td>
<td>Index Count</td>
<td>0 to 65535 PLS</td>
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<tr>
<td>2Bh</td>
<td>C13-06</td>
<td>Index Repeat Delay</td>
<td>0.00 to 60.00 Sec</td>
<td></td>
<td>0.00</td>
</tr>
<tr>
<td>2Ch</td>
<td>C13-07</td>
<td>Index Complete</td>
<td>0 to 32767</td>
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Drive Parameter (Read/Write) – continued
Class 69h, Instance 1 – Tuning Parameters

DX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2).

<table>
<thead>
<tr>
<th>ATTRIBUTES (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
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<tbody>
<tr>
<td>3Ch</td>
<td>D1-01</td>
<td>DC Injection Start Frequency</td>
<td>0.0 to 10.0 Hz</td>
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<tr>
<td>3Dh</td>
<td>D1-02</td>
<td>DC Injection Current</td>
<td>0 - 100%</td>
<td>50</td>
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<tr>
<td>3Eh</td>
<td>D1-03</td>
<td>DC Injection Time at Start</td>
<td>0.00 - 10.00 seconds</td>
<td>0.00</td>
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<tr>
<td>3Fh</td>
<td>D1-04</td>
<td>DC Injection Time at Stop</td>
<td>0.00 - 10.00 seconds</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>44h</td>
<td>D2-01</td>
<td>Slip Compensation Gain</td>
<td>0.0 to 2.5</td>
<td>0.0 / 1.0</td>
<td></td>
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<tr>
<td>45h</td>
<td>D2-02</td>
<td>Slip Comp Primary Delay Time</td>
<td>0 to 10000 msec.</td>
<td>200 / 2000</td>
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<tr>
<td>46h</td>
<td>D2-03</td>
<td>Slip Compensation Limit</td>
<td>0 to 250%</td>
<td>200</td>
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<tr>
<td>47h</td>
<td>D2-04</td>
<td>Slip Compensation Selection during Regeneration</td>
<td>0</td>
<td>Disabled</td>
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<td>48h</td>
<td>D2-05</td>
<td>V/f Slip Comp Select</td>
<td>0</td>
<td>Disabled</td>
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<td></td>
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<td></td>
<td>1</td>
<td>Enabled</td>
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<tr>
<td>49h</td>
<td>D2-06</td>
<td>Output V Limit Select</td>
<td>0</td>
<td>Magnetek Flux is calculated by output frequency after compensation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td>1</td>
<td>Magnetek Flux is calculated by output frequency before compensation</td>
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</tr>
<tr>
<td>4Ah</td>
<td>D3-01</td>
<td>Torque Compensation Gain</td>
<td>0.00 to 2.50</td>
<td>1.00</td>
<td></td>
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<tr>
<td>4Bh</td>
<td>D3-02</td>
<td>Torque Compensation Time</td>
<td>0.00 to 10000 ms</td>
<td>20 / 200</td>
<td></td>
</tr>
<tr>
<td>4Ch</td>
<td>D3-03</td>
<td>Torque Compensation for Forward</td>
<td>0.0 to 200.0%</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>4Dh</td>
<td>D3-04</td>
<td>Torque Compensation for Reverse</td>
<td>-200.0 to 0.0%</td>
<td>0.0</td>
<td></td>
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<tr>
<td>4Fh</td>
<td>D3-05</td>
<td>Torque Compensation Time Const @ Start</td>
<td>0 to 200 ms</td>
<td>10</td>
<td></td>
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<tr>
<td>50h</td>
<td>D4-01</td>
<td>ASR Proportional Gain</td>
<td>0.00 to 300.00</td>
<td>30.00 / 0.30</td>
<td></td>
</tr>
<tr>
<td>51h</td>
<td>D4-02</td>
<td>ASR Integral Time 1</td>
<td>0.000 to 10.000 seconds</td>
<td>0.500 / 0.20</td>
<td></td>
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</table>
Drive Parameter (Read/Write) – continued
Class 69h, Instance 1 – Tuning Parameters

DX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

<table>
<thead>
<tr>
<th>ATTRIBUTES (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
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<tbody>
<tr>
<td>52h</td>
<td>D4-03</td>
<td>ASR Proportional Gain 2</td>
<td>0.00 to 300.00</td>
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<tr>
<td>53h</td>
<td>D4-04</td>
<td>ASR Integral Time 2</td>
<td>0.000 to 10.000</td>
<td>0.100 / 0.050</td>
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<tr>
<td>54h</td>
<td>D4-05</td>
<td>ASR Limit</td>
<td>0.0 to 20.0%</td>
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<tr>
<td>55h</td>
<td>D4-06</td>
<td>ASR Primary Delay Time</td>
<td>0.000 TO 0.500</td>
<td>0.004</td>
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<tr>
<td>56h</td>
<td>D4-07</td>
<td>ASR Gain Switching Frequency</td>
<td>0.0 to 400.0 Hz</td>
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<tr>
<td>57h</td>
<td>D4-08</td>
<td>ASR Integral Limit</td>
<td>0 to 400 %</td>
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<td>400</td>
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<tr>
<td>58h</td>
<td>D5-01</td>
<td>Torque Control</td>
<td>0 Speed Control (Controlled by D4-01 ~ 07)</td>
<td>0</td>
<td></td>
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<tr>
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<td></td>
<td></td>
<td>1 Torque Control</td>
<td></td>
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<tr>
<td>59h</td>
<td>D5-02</td>
<td>Torque Ref Filter</td>
<td>0 to 1000 ms</td>
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<td>0</td>
</tr>
<tr>
<td>5Ah</td>
<td>D5-03</td>
<td>Speed Limit Select</td>
<td>1 Limited by Frequency Reference (B3-01)</td>
<td>2</td>
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<td></td>
<td></td>
<td></td>
<td>2 Programming Setting (D5-04)</td>
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<tr>
<td>5Bh</td>
<td>D5-04</td>
<td>Speed Limit Value</td>
<td>-120 to +120%</td>
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<td>D5-05</td>
<td>Speed Limit Bias</td>
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<td>D5-06</td>
<td>Ref Hold Time</td>
<td>0 to 1000 ms</td>
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<tr>
<td>5 Eh</td>
<td>D6-01</td>
<td>Dwell Control Gain</td>
<td>0.0 to 100.0 ms</td>
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<tr>
<td>71h</td>
<td>D8-01</td>
<td>Dwell Frequency at Start</td>
<td>0.0 to 400.0 Hz</td>
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<td>0.0</td>
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<tr>
<td>72h</td>
<td>D8-02</td>
<td>Dwell Time at Start</td>
<td>0.0 to 10.0 seconds</td>
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<td>0.0</td>
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<tr>
<td>73h</td>
<td>D8-03</td>
<td>Dwell Frequency at Stop</td>
<td>0.0 to 400.0 Hz</td>
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<tr>
<td>74h</td>
<td>D8-04</td>
<td>Dwell Time at Stop</td>
<td>0.0 to 10.0 seconds</td>
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<td>0.0</td>
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<tr>
<td>75h</td>
<td>D9-01</td>
<td>S-curve Characteristic at Accel Start</td>
<td>0.0 to 2.50 seconds</td>
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<td>0.20</td>
</tr>
<tr>
<td>76h</td>
<td>D9-02</td>
<td>S-curve Characteristic at Accel End</td>
<td>0.0 to 2.50 seconds</td>
<td></td>
<td>0.20</td>
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<tr>
<td>77h</td>
<td>D9-03</td>
<td>S-curve Characteristic at Decel Start</td>
<td>0.0 to 2.50 seconds</td>
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<tr>
<td>78h</td>
<td>D9-04</td>
<td>S-curve Characteristic at Decel End</td>
<td>0.0 to 2.50 seconds</td>
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### Drive Parameter (Read/Write) – continued

**Class 6Ah, Instance 1 – Application Parameters**

BX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

<table>
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<th>ATTRIBUTE S (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
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<tbody>
<tr>
<td>1Bh</td>
<td>B3-04</td>
<td>Motor Rotation</td>
<td>0</td>
<td>Normal Rotation</td>
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<td></td>
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<td>Exchange Phases</td>
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<td>6Ah</td>
<td>B6-14</td>
<td>Bi-directional Search</td>
<td>0</td>
<td>Disabled: Drive uses frequency reference det</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Enabled: Drive uses detected direction</td>
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</table>

### Drive Parameter (Read/Write) – continued

**Class 6Ah, Instance 1 – Special Function Parameters**

CX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

<table>
<thead>
<tr>
<th>ATTRIBUTE S (in hex)</th>
<th>PARAMETER</th>
<th>FUNCTION</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
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<tbody>
<tr>
<td>07h</td>
<td>C6-09</td>
<td>Normal OS Level</td>
<td>40.0 to 400.0 Hz</td>
<td>60.0</td>
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<tr>
<td>09h</td>
<td>C13-08</td>
<td>Index Zero Servo Gain</td>
<td>0 to 100</td>
<td>10</td>
</tr>
<tr>
<td>0Ah</td>
<td>C13-09</td>
<td>Index ASR P Gain</td>
<td>0.00 to 300.00</td>
<td>30</td>
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<tr>
<td>0Bh</td>
<td>C13-11</td>
<td>Index Gain</td>
<td>0.0 to 20.0</td>
<td>5</td>
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### Drive Parameter (Read/Write) – continued

**Class 6Ah, Instance 1 – Tuning Parameters**

DX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

<table>
<thead>
<tr>
<th>ATTRIBUTE S (in hex)</th>
<th>PARAMETER</th>
<th>FUNCTION</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
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<tbody>
<tr>
<td>03h</td>
<td>D11-01</td>
<td>Hunting Prevention Select</td>
<td>0</td>
<td>Disabled</td>
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<td></td>
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<td>1</td>
<td>Enabled</td>
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<tr>
<td>04h</td>
<td>D11-02</td>
<td>Hunting Prevention Gain</td>
<td>0.00 to 2.50</td>
<td>1.00</td>
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</table>
### Drive Parameter (Read/Write) – continued

**Class 6Bh, Instance 1 – Motor Parameters**

EX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2).

<table>
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<tr>
<th>ATTRIBUTE S (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
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<tbody>
<tr>
<td>01h</td>
<td>E1-01</td>
<td>Input Voltage Setting</td>
<td>01h 155 to 255V (230V unit) E1-01 310 to 510V (460V unit)</td>
<td>230 460</td>
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<tr>
<td>03h</td>
<td>E1-03</td>
<td>V/f Pattern Selection</td>
<td>03h F 0 to E E1-03 15 preset V/f patterns</td>
<td>F E1-03 to E1-10</td>
<td>(1)</td>
</tr>
<tr>
<td>04h</td>
<td>E1-04</td>
<td>Maximum Output Frequency</td>
<td>04h 40.0 to 300.0 Hz CT 40.0 to 400.0 Hz VT</td>
<td>60.0</td>
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<tr>
<td>05h</td>
<td>E1-05</td>
<td>Maximum Voltage</td>
<td>05h 0.0 to 255.0V (230V unit) 0.0 to 510.0V (460V unit)</td>
<td>230.0 460.0</td>
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<tr>
<td>06h</td>
<td>E1-06</td>
<td>Base Frequency</td>
<td>06h 0.0 to 400.0 Hz</td>
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<tr>
<td>07h</td>
<td>E1-07</td>
<td>Mid. Output Frequency A</td>
<td>07h 0.0 to 400.0 Hz</td>
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<tr>
<td>08h</td>
<td>E1-08</td>
<td>Mid Output Voltage A</td>
<td>08h 0.0 to 255.0V (230V unit) 0.0 to 510.0V (460V unit)</td>
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<tr>
<td>09h</td>
<td>E1-09</td>
<td>Min. Output Frequency</td>
<td>09h 0.0 to 400.0 Hz</td>
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<tr>
<td>0Ah</td>
<td>E1-10</td>
<td>Min. Output Voltage</td>
<td>0Ah 0.0 to 255.0V (230V unit) 0.0 to 510.0V (460V unit)</td>
<td>(1)</td>
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<tr>
<td>0Bh</td>
<td>E1-11</td>
<td>Mid Frequency B</td>
<td>0Bh 0.0 to 400.0 Hz</td>
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<tr>
<td>0Ch</td>
<td>E1-12</td>
<td>Mid Voltage B</td>
<td>0Ch 0.0 to 255.0 VAC</td>
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<tr>
<td>0Dh</td>
<td>E1-13</td>
<td>Base Voltage</td>
<td>0Dh 0.0 to 255.0 VAC</td>
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<tr>
<td>0Eh</td>
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<td>Reserved</td>
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<tr>
<td>0Fh</td>
<td>E2-01</td>
<td>Motor Rated Current</td>
<td>0Fh 0.32 to 6.40 A</td>
<td>(2)</td>
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<tr>
<td>10h</td>
<td>E2-02</td>
<td>Motor Rated Slip</td>
<td>10h 0.00 to 20.00 Hz</td>
<td>(2)</td>
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<tr>
<td>11h</td>
<td>E2-03</td>
<td>Motor No-Load Current</td>
<td>11h 0.00 to 1.89 Amps</td>
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<tr>
<td>12h</td>
<td>E2-04</td>
<td>Number of Motor Poles</td>
<td>12h 2 to 48 poles</td>
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<tr>
<td>13h</td>
<td>E2-05</td>
<td>Motor Terminal Resistance</td>
<td>13h 0.000 to 65.000 Ohms</td>
<td>(2)</td>
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<tr>
<td>14h</td>
<td>E2-06</td>
<td>Motor Leakage Inductance</td>
<td>14h 0.0 to 40.0%</td>
<td>(2)</td>
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<tr>
<td>15h</td>
<td>E2-07</td>
<td>Motor Iron-core Saturation Coefficient 1</td>
<td>15h 0.00 to 0.50</td>
<td>.50</td>
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<tr>
<td>16h</td>
<td>E2-08</td>
<td>Motor Iron-core Saturation Coefficient 2</td>
<td>16h E2-07 to 0.75</td>
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<tr>
<td>17h</td>
<td>E2-09</td>
<td>Motor Mechanical Loss</td>
<td>17h 0.0 to 10.0%</td>
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<tr>
<td>18h</td>
<td>E2-10</td>
<td>Tcomp Iron Loss</td>
<td>18h 0 – 65535 W</td>
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<tr>
<td>19h</td>
<td>E2-11</td>
<td>Rated Horsepower</td>
<td>19h 0.00 – 650.0</td>
<td>(1)</td>
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</tr>
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</table>

Notes (for this page only):

1. Initial Value differs depending on the control method (A1-02).
2. Values differs depending on the drive capacity.
Drive Parameter (Read/Write) – continued  
Class 6Ch, Instance 1 – Option Parameters

FX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

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<tbody>
<tr>
<td>01h</td>
<td>F1-01</td>
<td>Encoder (PG)</td>
<td>Constant</td>
<td>0 to 60000 ppr</td>
<td>1024</td>
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<tr>
<td></td>
<td></td>
<td>Operation Selection at PG Open Circuit</td>
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<tr>
<td>02h</td>
<td>F1-02</td>
<td>Operation Selection at PG Open Circuit</td>
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<tr>
<td>03h</td>
<td>F1-03</td>
<td>Operation Selection at Overspeed</td>
<td></td>
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</tr>
<tr>
<td>04h</td>
<td>F1-04</td>
<td>Operation Selection at Speed Deviation</td>
<td>0</td>
<td>@Speed Agree-Ramp to stop(B5-02)</td>
<td>1</td>
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<td>1</td>
<td>@Speed Agree-Coast to stop</td>
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<tr>
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<td></td>
<td>2</td>
<td>@Speed Agree Fast-stop(B5-08)</td>
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<td>@Speed Agree Alarm only</td>
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<td>@Run-Decel(B5-02)</td>
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<td>@Run-Coast to Stop</td>
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<td>6</td>
<td>@Run-Fast Stop(B5-08)</td>
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<td>7</td>
<td>@Run-Alarm Only</td>
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<td>05h</td>
<td>F1-05</td>
<td>PG Rotation</td>
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<td>FWD:Counter-clockwise</td>
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<td>FWD:Clockwise</td>
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<td>06h</td>
<td>F1-06</td>
<td>PG Division Rate (PG Pulse Monitor)</td>
<td>1 to 132 (effective only with PG-B2 control board)</td>
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<tr>
<td>07h</td>
<td>F1-07</td>
<td>Integral Value during Accel/Decel Selection</td>
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<td>08h</td>
<td>F1-08</td>
<td>Overspeed Detection Level</td>
<td>0 to 120%</td>
<td>115</td>
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<tr>
<td>09h</td>
<td>F1-09</td>
<td>Overspeed Detection Delay Time</td>
<td>0.0 to 2.0 seconds</td>
<td>0.0</td>
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</table>
Drive Parameter (Read/Write) – continued
Class 6Ch, Instance 1 – Option Parameters

FX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

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<tbody>
<tr>
<td>0Ah</td>
<td>F1-10</td>
<td>Excessive Speed Deviation Detection Level</td>
<td>0 to 50%</td>
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<td>0Bh</td>
<td>F1-11</td>
<td>Excessive Speed Deviation Detection Delay Time</td>
<td>0.0 to 10.0 seconds</td>
<td>0.3</td>
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<tr>
<td>0Ch</td>
<td>F1-12</td>
<td>Number of PG Gear Teeth 1</td>
<td>0 to 1000</td>
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<tr>
<td>0Dh</td>
<td>F1-13</td>
<td>Number of PG Gear Teeth 2</td>
<td>0 to 1000</td>
<td>0</td>
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<tr>
<td>0Eh</td>
<td>F1-14</td>
<td>PG-O Ch1 Software Detection Time</td>
<td>0 ~ 10.0 Sec</td>
<td>0.5</td>
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<td>10h</td>
<td>F1-16</td>
<td>PG CH2 PPR</td>
<td>1 to 60000 PPR</td>
<td>1024</td>
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<td>11h</td>
<td>F1-17</td>
<td>PG CH2 Rotation</td>
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<td>0</td>
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<td>1</td>
<td>1: FWD = C.C.W</td>
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<td>12h</td>
<td>F1-18</td>
<td>PG-O Ch2 Software Detection Time</td>
<td>0 ~ 10 Sec</td>
<td>0.5</td>
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<td>13h</td>
<td>F1-19</td>
<td>PG-Z2 Output Select</td>
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<td>Select by MFI 41 (Motor 2 Select)</td>
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<td>Channel 1</td>
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<td>Select by MFI 64</td>
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<td>14h</td>
<td>F1-20</td>
<td>PGO-1-H</td>
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<td>Disabled</td>
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<td>15h</td>
<td>F1-21</td>
<td>PGO-2-H</td>
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<td>16h</td>
<td>F1-22</td>
<td>PG-Z2 Input Sel</td>
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<td>Motor 1 = CH1 (Motor 2 = CH2)</td>
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<td>Motor 1 = CH2 (Motor 2 = CH1)</td>
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<td>17h</td>
<td>F2-01</td>
<td>AI-14 Bi-polar or Uni-polar Input Selection</td>
<td>0</td>
<td>3-channel Individual</td>
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<td>3-channel Addition</td>
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<td>18h</td>
<td>F3-01</td>
<td>DI-16 Digital Input Option</td>
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<td>BCD 1%</td>
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<td>BCD 0.1%</td>
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<td>2</td>
<td>BCD 0.01%</td>
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<td>BCD 1 Hz</td>
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<td>BCD 0.1 Hz</td>
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<td>BCD 0.01 Hz</td>
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<td>BCD (5DG) 0.01 Hz</td>
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Drive Parameter (Read/Write) – continued
Class 6Ch, Instance 1 – Option Parameters

FX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

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<tr>
<td>19h</td>
<td>F4-01</td>
<td>AO-08/AO-12 Channel 1 Monitor Select.</td>
<td>1 to 50</td>
<td>2</td>
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<tr>
<td>1Ah</td>
<td>F4-02</td>
<td>AO-08/AO-12 Channel 1 Gain</td>
<td>0.00 to 1000.0%</td>
<td>100.0</td>
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<tr>
<td>1Bh</td>
<td>F4-03</td>
<td>AO-08/AO-12 Channel 2 Monitor Select.</td>
<td>1 to 50</td>
<td>3</td>
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<tr>
<td>1Ch</td>
<td>F4-04</td>
<td>AO-08/AO-12 Channel 2 Gain</td>
<td>0.00 to 1000.0%</td>
<td>100.0</td>
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<tr>
<td>1Dh</td>
<td>F4-05</td>
<td>CH1 AO Bias</td>
<td>-110.0 ~ 110.0%</td>
<td>0.0</td>
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<td>1Eh</td>
<td>F4-06</td>
<td>CH2 AO Bias</td>
<td>-110.0 ~ 110.0%</td>
<td>0.0</td>
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<td>1Fh</td>
<td>F4-07</td>
<td>Analog Output Signal Level CH1</td>
<td>0</td>
<td>0 ~ 10VDC</td>
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<td>20h</td>
<td>F4-08</td>
<td>Analog Output Signal Level CH2</td>
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<td>-10 ~ +10VDC</td>
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<td>21h</td>
<td>F5-01</td>
<td>DO-02 Channel 1 Output Selection</td>
<td>00 to FF</td>
<td>F</td>
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<td>22h</td>
<td>F5-02</td>
<td>DO-02 Channel 2 Output Selection</td>
<td>00 to FF</td>
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<td>23h</td>
<td>F5-03</td>
<td>DO-02 Channel 3 Output Selection</td>
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<td>DO-02 Channel 4 Output Selection</td>
<td>00 to FF</td>
<td>F</td>
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<td>25h</td>
<td>F5-05</td>
<td>DO-02 Channel 5 Output Selection</td>
<td>00 to FF</td>
<td>F</td>
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<td>26h</td>
<td>F5-06</td>
<td>DO-02 Channel 6 Output Selection</td>
<td>00 to FF</td>
<td>F</td>
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<td>27h</td>
<td>F5-07</td>
<td>DO-02 Channel 7 Output Selection</td>
<td>00 to FF</td>
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<td>28h</td>
<td>F5-08</td>
<td>DO-02 Channel 8 Output Selection</td>
<td>00 to FF</td>
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### Drive Parameter (Read/Write) – continued

**Class 6Ch, Instance 1 – Option Parameters**

FX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

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<td>F5-09</td>
<td>DO-08 Output Mode Selection</td>
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<td>8-channel Individual</td>
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<td>8CH Sel-Outputs according to F5-01 ~ 08</td>
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<td>Serial Com Output – Serial Communication</td>
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<td>2Ah</td>
<td>F6-01</td>
<td>Communication Error Detection Operation Selection</td>
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<td>Deceleration To Stop (B5-02)</td>
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<td>1</td>
<td>Coast To Stop</td>
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<td>2</td>
<td>Fast Stop (B5-08)</td>
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<td>Use B3-03 Method</td>
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<td>4</td>
<td>Alarm Only (Operation Continues)</td>
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<td>2Bh</td>
<td>F6-02</td>
<td>EFO Detection</td>
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<td>2Ch</td>
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<td>EFO Fault Action</td>
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<td>Coast To Stop</td>
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<td>Fast Stop (B5-08)</td>
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<td>Use B3-03 Method</td>
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<td>Alarm Only (Operation Continues)</td>
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<td>2Eh</td>
<td>F6-05</td>
<td>Current Monitor Display Unit Selection</td>
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<td>Enabled – Torque Reference/Limit From Communication is Enabled</td>
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Drive Parameter (Read/Write) – continued
Class 6Dh, Instance 1 – Terminal Parameters

HX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

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<tr>
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<td>01h</td>
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<td>03h</td>
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<td>Multi-function Output (term. M5 – M6)</td>
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<td>14h</td>
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<td>Multi-function Analog Input Term A3 Select</td>
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<td>18h</td>
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<td>Terminal A2 Signal Voltage</td>
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**Class 6Dh, Instance 1 – Terminal Parameters**

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<td>1 Eh</td>
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<td>Multi-function Analog Output 1 Selection (Terminal FM)</td>
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<td>26h</td>
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<td>Stopping Method after Serial Communication Error</td>
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<td>Ramp to Stop</td>
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## Drive Parameter (Read/Write) – continued

### Class 6Dh, Instance 1 – Terminal Parameters

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<th>ATTRIBUTES (in hex)</th>
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<td>29h</td>
<td>H5-04</td>
<td>Stopping Method after Serial Communication Error</td>
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<td>Ramp to Stop</td>
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<td>Fast-Stop</td>
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<td>Communication Error (CE) Detection Selection</td>
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<td>2Bh</td>
<td>H5-06</td>
<td>Send Waiting Time</td>
<td>5 ~ 65 mSec</td>
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<td>2Ch</td>
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<td>RTS Control Select</td>
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<td>Enabled (RTS is on only when sending)</td>
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<td>H6-01</td>
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<td>H6-02</td>
<td>Pulse Input Scaling</td>
<td>1000 ~ 32000 Hz</td>
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<td>H6-03</td>
<td>Pulse Input Gain</td>
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<td>Pulse Input Bias</td>
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<td>31h</td>
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<td>Pulse Input Filter Time</td>
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<td>32h</td>
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<td>Pulse Output Selection</td>
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<td>33h</td>
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<td>Pulse Output Scaling</td>
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Drive Parameter (Read/Write) – continued
Class 6Eh, Instance 1 – Protection Parameters

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<td>01h</td>
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<td>Motor Overload Protection Selection</td>
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<td>Motor Overload Protection Time Constant</td>
<td>0.1 to 20.0 Minutes</td>
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<td>Alarm: Decel to Stop</td>
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<td>Alarm: Coast To Stop</td>
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<td>Alarm: Alarm Only OH3 Flashes on D.O. Method</td>
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<td>Alarm: Stop by B3-03 Method</td>
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<td>Fast Stop by B5-08 Deceleration Time</td>
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<td>Motor Temp Input Filter Time Constant</td>
<td>0.00 ~ 10.00 Sec</td>
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<td>Momentary Power Loss Detection</td>
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<td>While CPU Power Active</td>
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<td>Momentary Powerloss Ride Through Time</td>
<td>0.0 ~ 25.5 Sec</td>
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<td>08h</td>
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<td>Minimum Base Block Time</td>
<td>0.1 ~ 5.0 Seconds</td>
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<td>09h</td>
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<td>Pwrl V/F Ramp Time</td>
<td>0.0 ~ 5.0 Seconds</td>
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<td>L2-05</td>
<td>Undervoltage Detection Level</td>
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<td>150 (1)</td>
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<td>Stall Prevention Level during Accel (CHP)</td>
<td>0 to 100%</td>
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Drive Parameter (Read/Write) – continued
Class 6Eh, Instance 1 – Protection Parameters

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<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>13h</td>
<td>L3-04</td>
<td>Stall Prevention Selection during Deceleration</td>
<td>0</td>
<td>Disabled</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>General-purpose</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>Intelligent (2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>Stall Prevent with Braking Resistor</td>
<td></td>
</tr>
<tr>
<td>14h</td>
<td>L3-05</td>
<td>Stall Prevention Selection during Running</td>
<td>0</td>
<td>Disabled</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Decel time 1</td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td>2</td>
<td>Decel time 2</td>
<td></td>
</tr>
<tr>
<td>15h</td>
<td>L3-06</td>
<td>Stall Prevention Level during Running</td>
<td>30 to 200%</td>
<td></td>
<td>150(1)</td>
</tr>
<tr>
<td>1Ah</td>
<td>L4-01</td>
<td>Speed Agree 1 Level</td>
<td>0.0 ~ 300.0 CT</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.0 ~ 400.0 VT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1Bh</td>
<td>L4-02</td>
<td>Speed Agree 1 Width</td>
<td>0.0 to 20.0 Hz</td>
<td></td>
<td>2.0</td>
</tr>
<tr>
<td>1Ch</td>
<td>L4-03</td>
<td>Speed Agree 2 Level (+/-)</td>
<td>-400.0 to +400.0 Hz</td>
<td></td>
<td>0.0</td>
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<tr>
<td>1Dh</td>
<td>L4-04</td>
<td>Speed Agree 2 Width</td>
<td>0.0 to 20.0 Hz</td>
<td></td>
<td>2.0</td>
</tr>
<tr>
<td>0Fh</td>
<td>L4-05</td>
<td>Frequency Reference Loss Detection</td>
<td>0</td>
<td>Stop</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Run at 80% of Frequency Reference</td>
<td></td>
</tr>
<tr>
<td>22h</td>
<td>L6-01</td>
<td>Torque Detection Selection 1</td>
<td>0</td>
<td>Disabled</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Alarm: OT @ Spd Agree</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>Alarm: OT @ Run</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>Fault: OT @ Spd Agree</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>Fault: OT @ Run</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>Alarm: UT @ Spd Agree</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>Alarm: UT @ Run</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7</td>
<td>Fault: UT @ Spd Agree</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8</td>
<td>Fault: UT @ Run</td>
<td></td>
</tr>
<tr>
<td>23h</td>
<td>L6-02</td>
<td>Torque Detection Level 1</td>
<td>0 to 300%</td>
<td></td>
<td>150</td>
</tr>
<tr>
<td>24h</td>
<td>L6-03</td>
<td>Torque Detection Time 1</td>
<td>0.0 to 10.0 seconds</td>
<td></td>
<td>0.1</td>
</tr>
</tbody>
</table>
### Drive Parameter (Read/Write) – continued  
Class 6Eh, Instance 1 – Protection Parameters

LX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

<table>
<thead>
<tr>
<th>ATTRIBUTES (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>25h</td>
<td>L6-04</td>
<td>Torque Detection Selection 2</td>
<td>0</td>
<td>Disabled</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Alarm: OT @ Spd Agree</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>Alarm: OT @ Run</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>Fault: OT @ Spd Agree</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>Fault: OT @ Run</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>Alarm: UT @ Spd Agree</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td>Alarm: UT @ Run</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7</td>
<td>Fault: UT @ Spd Agree</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8</td>
<td>Fault: UT @ Run</td>
<td></td>
</tr>
<tr>
<td>26h</td>
<td>L6-05</td>
<td>Torque Detection Level 2</td>
<td>0 to 300%</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>27h</td>
<td>L6-06</td>
<td>Torque Detection Time 2</td>
<td>0.0 to 10.0 seconds</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>2Fh</td>
<td>L8-02</td>
<td>oH (Overheat) Protection Alarm Level</td>
<td>50 to 110 ℃</td>
<td>95 (1)</td>
<td></td>
</tr>
<tr>
<td>30h</td>
<td>L8-03</td>
<td>Operation Selection after oH (Overheat) Pre-alarm</td>
<td>0</td>
<td>Ramp to Stop</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Coast to Stop</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>Fast-stop</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>Alarm Only</td>
<td></td>
</tr>
<tr>
<td>32h</td>
<td>L8-05</td>
<td>Input Phase Loss Protection</td>
<td>0</td>
<td>Disabled</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Enabled</td>
<td></td>
</tr>
<tr>
<td>34h</td>
<td>L8-07</td>
<td>Output Phase Loss Protection</td>
<td>0</td>
<td>Disabled</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Enabled: 1 PH Loss Det</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>Enabled: 2/3 Loss Det</td>
<td></td>
</tr>
<tr>
<td>36h</td>
<td>L8-09</td>
<td>Ground Fault Detection</td>
<td>0</td>
<td>Disabled</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Enabled</td>
<td></td>
</tr>
<tr>
<td>37h</td>
<td>L8-10</td>
<td>Cooling Fan Operation Select</td>
<td>0</td>
<td>Fan On-Run Mode</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Fan Always On</td>
<td></td>
</tr>
<tr>
<td>38h</td>
<td>L8-11</td>
<td>Cooling Fan On/Off Delay Time</td>
<td>0 ~ 300 Seconds</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>39h</td>
<td>L8-12</td>
<td>Ambient Temperature</td>
<td>45 ~ 60 Deg C</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>3Ch</td>
<td>L8-15</td>
<td>OL2 Select @ Low Speed</td>
<td>0</td>
<td>Disabled: OL Disabled @ Low Speed</td>
<td>1 (1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Enabled</td>
<td></td>
</tr>
<tr>
<td>3Fh</td>
<td>L8-18</td>
<td>Soft CLA Selection</td>
<td>0</td>
<td>Disabled</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Enabled</td>
<td></td>
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</tbody>
</table>
### Drive Parameter (Read/Write) – continued

**Class 6Eh, Instance 1 – Protection Parameters**

LX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

<table>
<thead>
<tr>
<th>ATTRIBUTES (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>40h</td>
<td>L9-01</td>
<td>Auto Restart Operation Selection</td>
<td>0</td>
<td>Disabled</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Enabled</td>
<td></td>
</tr>
<tr>
<td>41h</td>
<td>L9-02</td>
<td>Number of Auto Restart Attempts</td>
<td>0 to 10</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>42h</td>
<td>L9-03</td>
<td>Reset Time</td>
<td>0.0 to 180.0 Seconds</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>43h</td>
<td>L9-04</td>
<td>Reset Fault Select 1</td>
<td>0000 to FFFF</td>
<td>0001</td>
<td></td>
</tr>
<tr>
<td>44h</td>
<td>L9-05</td>
<td>Reset Fault Select 2</td>
<td>0000 to FFFF</td>
<td>E000</td>
<td></td>
</tr>
<tr>
<td>45h</td>
<td>L9-06</td>
<td>Fault Contact Select</td>
<td>0</td>
<td>Disabled: Fault Contact Not Operated</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Enabled: Fault Contact is Operated</td>
<td></td>
</tr>
</tbody>
</table>

Notes (for this page only):

(1) Setting depends on D10-01. When D10-01 = 0, L8-15 will change to 0. When D10-01 = 1 or 2, it will change to 1
Drive Parameter (Read/Write) – continued
Class 6Fh, Instance 1 – Operator Parameters

OX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

<table>
<thead>
<tr>
<th>ATTRIBUTES (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>01h</td>
<td>O1-01</td>
<td>Monitor Selection</td>
<td>4 to 52</td>
<td>Frequency Reference</td>
<td>6</td>
</tr>
<tr>
<td>02h</td>
<td>O1-02</td>
<td>Monitor Selection after Power-up</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>03h</td>
<td>O1-03</td>
<td>Digital Operator Display Scaling</td>
<td>0 ~ 39999</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>04h</td>
<td>O1-04</td>
<td>Digital Operator Display Units</td>
<td>0 Hz</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>05h</td>
<td>O1-05</td>
<td>LCD Brightness Adjust</td>
<td>0 ~ 5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>06h</td>
<td>O2-01</td>
<td>Mode Service Key Select</td>
<td></td>
<td>Mode/Service</td>
<td>0</td>
</tr>
<tr>
<td>07h</td>
<td>O2-02</td>
<td>Stop Key Function Selection</td>
<td></td>
<td>0 Coast To Stop</td>
<td></td>
</tr>
<tr>
<td>08h</td>
<td>O2-03</td>
<td>User Parameter Initialization Selection</td>
<td></td>
<td>No Change</td>
<td>0</td>
</tr>
<tr>
<td>09h</td>
<td>O2-04</td>
<td>KVA Selection</td>
<td>0 ~ FF</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>0Ah</td>
<td>O2-05</td>
<td>Operator M.O.P.</td>
<td>0</td>
<td>Disabled: Enter Key Required</td>
<td>0</td>
</tr>
<tr>
<td>0Bh</td>
<td>O2-06</td>
<td>Digital Operator Detection</td>
<td></td>
<td>0 Disabled</td>
<td>1</td>
</tr>
<tr>
<td>0Ch</td>
<td>O2-07</td>
<td>Elapsed Timer Setting</td>
<td>0 ~ 65535 Hour</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>0Dh</td>
<td>O2-08</td>
<td>Elapsed Timer Selection</td>
<td></td>
<td>Power On Time</td>
<td>1</td>
</tr>
<tr>
<td>0Fh</td>
<td>O2-10</td>
<td>Fan Operating Time Setting</td>
<td>0 ~ 65535 Hour</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>16h</td>
<td>O3-01</td>
<td>Clear Fault history</td>
<td></td>
<td>Not Clear U2/U3</td>
<td>0</td>
</tr>
<tr>
<td>17h</td>
<td>O3-02</td>
<td>Clear Count History</td>
<td></td>
<td>Not Clear</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Accumulated Operation Clear (U3-21 ~ 22)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Overload Load Check Clear (U3-23)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Both 1 and 2 Cleared</td>
<td>0</td>
</tr>
</tbody>
</table>
### Drive Parameter (Read/Write) – continued

**Class 6Fh, Instance 1 – Operator Parameters**

OX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2).

<table>
<thead>
<tr>
<th>18h</th>
<th>O4-01</th>
<th>Copy Function Select</th>
<th>0</th>
<th>Copy Select</th>
<th>1</th>
<th>Read: Inverter → Operator</th>
<th>2</th>
<th>Operator → Inverter</th>
<th>3</th>
<th>OP → Inverter Verify</th>
</tr>
</thead>
<tbody>
<tr>
<td>19h</td>
<td>O4-02</td>
<td>Read Selection</td>
<td>0</td>
<td>Disabled</td>
<td>1</td>
<td>Enabled</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Drive Parameter (Read/Write) – continued

**Class 70h, Instance 1 – Factory Adjustment Parameters**

CX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2).

<table>
<thead>
<tr>
<th>05h</th>
<th>N2-01</th>
<th>AFR Gain</th>
<th>0.00 ~ 10.00</th>
<th>1.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>06h</td>
<td>N2-02</td>
<td>AFR Time</td>
<td>0 ~ 2000 mSeconds</td>
<td>50</td>
</tr>
<tr>
<td>07h</td>
<td>N2-03</td>
<td>AFR Time 2</td>
<td>0 ~ 2000 mSeconds</td>
<td>750</td>
</tr>
<tr>
<td>08h</td>
<td>N2-04</td>
<td>AFR Limit</td>
<td>0.0 ~ 60.0 Hz</td>
<td>5.0</td>
</tr>
</tbody>
</table>

### Drive Parameter (Read/Write) – continued

**Class 71h, Instance 1 – Tuning Parameters**

CX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2).

<table>
<thead>
<tr>
<th>01h</th>
<th>C3-10</th>
<th>Load Share Limit</th>
<th>0</th>
<th>Disabled</th>
<th>1</th>
<th>Enabled</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>02h</td>
<td>C8-22</td>
<td>Brake Slip Detect</td>
<td>0</td>
<td>Disabled</td>
<td>1</td>
<td>Enabled</td>
<td>0</td>
</tr>
<tr>
<td>03h</td>
<td>C8-23</td>
<td>Brake Slip Detect Speed</td>
<td>0.0 to 10.0 Hz</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Drive Parameter (Read/Write) – continued
Class 72h, Instance 1 – Auto-tune Parameters

CX-XX parameters all share the same service (GET/SET), data type (Word) and number of bytes (2)

<table>
<thead>
<tr>
<th>ATTRIBUTES (in hex)</th>
<th>PARAMETER</th>
<th>PARAMETER FUNCTION</th>
<th>PARAMETER SETTING</th>
<th>LIMITS / DESCRIPTION</th>
<th>INITIAL VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>11h</td>
<td>T1-00</td>
<td>Motor Selection 1/2</td>
<td>0</td>
<td>1st Motor</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2nd Motor</td>
<td></td>
</tr>
<tr>
<td>12h</td>
<td>T1-01</td>
<td>Tuning Mode Selection</td>
<td>0</td>
<td>Rotational Tune</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>Stationary Auto Tune</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>Terminal Resistance</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>On-Dly Comp Tune</td>
<td></td>
</tr>
<tr>
<td>13h</td>
<td>T1-02</td>
<td>Motor Output Power</td>
<td>0.4 ~ 650.0 HP</td>
<td>0.4</td>
<td>0.40</td>
</tr>
<tr>
<td>14h</td>
<td>T1-03</td>
<td>Motor Rated Voltage</td>
<td>0 ~ 255.5</td>
<td>230.0</td>
<td></td>
</tr>
<tr>
<td>15h</td>
<td>T1-04</td>
<td>Motor Rated Current</td>
<td>0 ~ 200%</td>
<td>Setting Range</td>
<td></td>
</tr>
<tr>
<td>16h</td>
<td>T1-05</td>
<td>Base frequency</td>
<td>0 ~ 400.0Hz</td>
<td>60.00</td>
<td></td>
</tr>
<tr>
<td>17h</td>
<td>T1-06</td>
<td>Number of Motor Poles</td>
<td>2 ~ 48 Pole</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>18h</td>
<td>T1-07</td>
<td>Rated Motor Speed</td>
<td>0 ~ 24000 RPM</td>
<td>1750</td>
<td></td>
</tr>
<tr>
<td>19h</td>
<td>T1-08</td>
<td>PG Pulses/Rev</td>
<td>0 ~ 60000 RPM</td>
<td>1024</td>
<td></td>
</tr>
</tbody>
</table>

Notes (for this page only):
(1) For 400V class, the value is twice that for the 200V class
(2) Setting Range is 10 ~ 200% of inverter rated output current
(3) Initial value differs depending upon inverter capacity
Memory Registers

The drive has two types of memory, Volatile and Non-Volatile. Data held in Volatile memory will be lost when power is removed from the drive. Data held in Non-Volatile memory will be retained when power is removed from the drive. The drive also has active and inactive areas of memory. The different registers are saved and activated differently, as described below.

Command Registers:

The command registers are stored in Volatile Memory. When writing to a command register the new data becomes inactive immediately. In the case of power loss, all data stored in these registers will not be retained.

Monitor Registers:

The monitor registers are stored in Volatile Memory. These registers cannot be written to (read only registers). Any data read from the monitor registers will not be retained during a power loss situation.

Parameter Registers:

The parameter registers are stored in Non-Volatile memory. When writing new data to parameter registers, the new data is not active.

Sending the ACCEPT command will cause the new data to become active. The ACCEPT command is accomplished by Setting a value of 0 into Accept Command Register at Class 64h, Instance 1, Attribute FEh. The accept command allows the drive to run with these changed parameters. It also allows parameters to again be changed from the drive keypad. The data is not saved to Non-Volatile Memory.

Sending the ENTER command will cause the new data to become active and to be saved in Non-Volatile Memory. The ENTER command is accomplished by Setting a value of 0 into Enter Command CIP Register at Class 64h, Instance 1, Attribute FFh. If power loss occurs after the new data has been saved (by using the ENTER command) into Non-Volatile Memory, the data will be retained.

Special Registers:

The special registers are in Volatile Memory. These registers will not be retained during a power loss situation. When writing to a special register, the new data becomes active immediately.

CAUTION

USE THE ENTER AND ACCEPT COMMAND ONLY WHEN NECESSARY!

The Life of the Non-Volatile EEPROM on the drive will support a finite number of operations. This means that the ENTER command can only be used a maximum of 100,000 times to store data in the EEPROM. After the specified number of operations, the EEPROM may fault (ERR), requiring the drive control board to be replaced.