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**POWR-GARD®**
**Motor Protection**
**PGR-6300 SERIES**
**Motor Protection System**

# PGR-6300 DEVICENET INTERFACE

**MAY 20, 2009**

**REVISION 1**

## *QUICK SETUP*

- Use the OPI to access the *Setup* | *Hardware* | *Network Comms* menu. Set the *Network ID* for the device. Set the *Baud Rate* as *DN 125K, DN 250K*, or *DN 500K*. Select the DeviceNet producing assembly (input) from the *DeviceNet Produce* menu and the DeviceNet consuming assembly (output) from the *DeviceNet Consume* menu. Select *DeviceNet* from the *Network Type* menu. The assembly types can also be set using parameter 472 and 473 via configuration software.

- Configure the scanner's polled connections for the selected assembly sizes. The scanner may issue a configuration warning if an I/O size other than the default is used. Disregard the warning.

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## 1. GENERAL

This document describes the DeviceNet features supported by the PGR-6300. The PGR-6300 supports Explicit and Polled I/O. It does not support the Unconnected Message Manager (UCMM).

The PGR-6300 requires supply voltage connected to L1 and L2 to power the control unit and 24-Vdc supply voltage to power the isolated DeviceNet transceiver circuit. The DeviceNet transceiver circuit requires 70 mA @ 24-Vdc from the DeviceNet power supply.

## 2. DEVICENET INTERFACE

### 2.1 Network Settings

DeviceNet settings are located in the *Setup* | *Hardware* | *Network Comms* menu. Prior to making changes to network settings via the OPI, it is recommended to set the *Network Type* to *None*. Set *Network ID* to the slave number. Set the *Baud Rate* to *DN 125K*, *DN 250K* or *DN 500K*. Select the producing assembly instance using the *DeviceNet Produce* menu and the consuming assembly instance using the *DeviceNet Consume* menu. See Section 3.5 for assembly details. Once the changes have been made, select *DeviceNet* from the *Network Type* menu.

### 2.2 Product Manual Notes

Appendix E, Register 383: Baud rate selections (Type T17 in Appendix F) includes DeviceNet selections5:125 kb, 6:250 kb, and 7: 500 kb.

Appendix E, Register 385: Network ID range is 0 to 63. Values greater than 63 will be forced to 63.

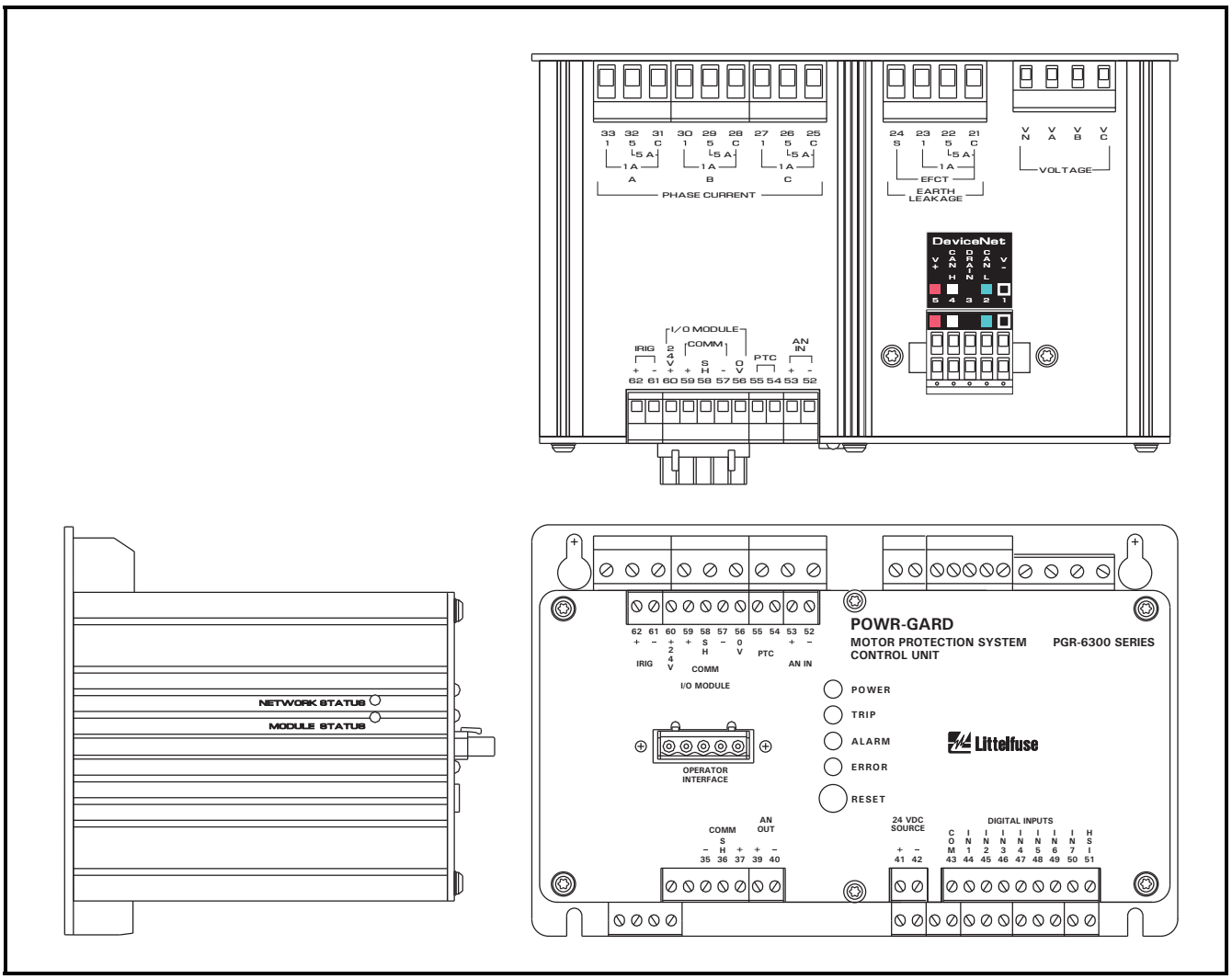



FIGURE 1. Outline Drawing.


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### 2.3 Communication Status Display

The DeviceNet communication status can be viewed using the *Metering* | *Comm State* menu.

This menu indicates the connection state as ONLINE or OFFLINE. The last communication error is also displayed. The PGR-6300 can be programmed to trip if the connection is OFFLINE. The PGR-6300 is OFFLINE when there are no connections established and ONLINE when at least one connection is established.

### 2.4 DeviceNet LED Indication

Two LEDs labeled MODULE STATUS (MS) and NETWORK STATUS (NS) are located on the left side of the control unit as shown in Fig. 1. The MS LED is green when the DeviceNet driver is operational. If this LED is off, verify that *DeviceNet* is selected from the *Setup* | *Hardware* | *Network Comms* | *Network Type* menu.

The NS LED is off when the PGR-6300 is the only device on the network. It flashes green when the PGR-6300 is physically connected to a network containing other devices but has no established communication connections. It is solid green when a Polling or Explicit Messaging connection is established. It flashes red when one or more connections have timed out. It is solid red if a Duplicate MAC ID or Bus-off error has occurred. Red LED indication requires a restart of the DeviceNet driver. This is done by, unplugging and re-connecting the DeviceNet connector, cycling supply voltage or by using the *Setup* | *Hardware* | *Network Comms* | *Network Type* menu. Select *None* to shut down the driver and then select *DeviceNet* to restart.

### 2.5 Network Errors

The PGR-6300 can be configured to trip or alarm on a network error using the *Setup* | *Hardware* | *Network Comms* | *Network Error* menu, or by using attribute 0x64 of the DeviceNet object.

The Network Error set point sets the action to be taken when the module is off line. Selections are Trip, Alarm, Trip and Alarm, or No Trip or Alarm. Network errors can originate from network watchdog timeouts or the network hardware in the PGR-6300.

The last error code is displayed in the *Metering* | *Comm State* menu. The error codes are listed in the following table.

DeviceNet Error Codes

| ERROR | DESCRIPTION |
|---|---|
| 1 | Receive Overrun |
| 2 | Transmit Overrun |
| 3 | CAN Overrun |
| 4 | IO Send |
| 5 | Duplicate MAC |
| 6 | Bus Sense |
| 7 | MAC Was Set |
| 8 | ID Reset 0 |
| 9 | ID Reset 1 |
| 10 | Bus Off |
| 11 | CAN ESET |
| 12 | CAN ERESET |
| 13 | Explicit Timeout |
| 14 | IO Timeout |
| 15 | IO Delete |
| 16 | No CAN Interface |

### 2.6 Configuration Using RSNetWorx

Use the EDS Wizard to register the eds file. The device will register as a Motor Starter named PGR-6300. Select device properties to view Device Parameters. When there is a request to upload from device, select this option. This will load the present configuration from the PGR-6300.

## 3. DEVICENET OBJECTS

*(In Order of Class Number)*

The module supports the following objects:

| CLASS | DESCRIPTION |
|---|---|
| 0x01 | Identity [1] |
| 0x02 | Message Router [1] |
| 0x03 | DeviceNet [1] |
| 0x04 | Assembly [1] |
| 0x05 | Connection [1] |
| 0x29 | Control Supervisor [1] |
| 0x2C | Overload [1] |
| 0x64 | Set Point |
| 0x65 | Acceleration |
| 0x66 | Digital Input |
| 0x67 | Analog I/O |
| 0x68 | RTD Module |
| 0x69 | RTC Clock |
| 0x6A | User Register |

[1] Conformance tested using DeviceNet Protocol Conformance Test Software Version A-17.

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## *3.1 Identity Object*

**Identity Object Class Services**

Get_Attribute_Single: Returns contents of specified attribute.

**Identity Class (1), Instance (0) Attributes**

| ATTRIBUTE NUMBER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|
| 1 | Revision | Get | Revision of this object | 1 | UINT |
| 2 | Max Instance | Get | Maximum number of instances | 1 | UINT |

**Identity Object Instance Services**

Get_Attribute_Single: Returns contents of specified attribute.

Set_Attribute_Single: Modify the specified attribute.

Reset: Performs reset services based on the parameter.

No Parameter or Parameter = 0: The DeviceNet driver is reset with the existing MAC ID and baud rate.

Parameter = 1: The MAC ID is set to 63 and the baud rate is set to 125 kb. The PGR-6300 will then perform a reset that emulates cycling control power.

**Identity Class (1), Instance (1) Attributes**

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 1 | | Vendor ID | Get | Identification of each vendor by number | 691 | UINT | |
| 2 | | Device Type | Get | Motor starter | 22 | UINT | |
| 3 | | Product Code | Get | Platform Type | 1201 | UINT | 0 |
| 4 | | Revision | Get | Major revision must match the EDS value. | 4.100 | A2 02 C6 C6 | |
| 5 | | Status | Get | Summary Status of the device | 0, 0, 255 | WORD | |
| 6 | | Serial Number | Get | Serial number. | N/A, 0, 999999999 | UDINT | 2 |
| 7 | | Product Name | Get | Human readable identification | “PGR-6300” | SHORT_ STRING | |
| 100 (0x64) | 467 | Revision | Get | Revision of Firmware 100 = 1.00 | N/A, 100, N/A | UINT | 1 |
| 101 (0x65) | 468 | System Name | Get/Set | 22 characters. Only 20 significant. | “POWR-GARD PGR-6300” | SHORT_ STRING | 600 |
| 102 (0x66) | 469 | Password | Get/Set | 22 characters. Only 4 significant. | "1111" | SHORT_ STRING | 590 |

## *3.2 Message Router*

No attributes supported for this object.


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### *3.3 DeviceNet Object*

**DeviceNet Object Class Services**

Get_Attribute_Single: Returns contents of specified attribute.

**DeviceNet Class (3), Instance (0) Attributes**

| ATTRIBUTE NUMBER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|
| 1 | Revision | Get | Revision of the DeviceNet object class. Definition upon which the implementation is based. | 1 | UINT |

**DeviceNet Object Instance Services**

Get_Attribute_Single: Returns contents of specified attribute.
Set_Attribute_Single: Modify specified attribute.
Allocate_Master/Slave_Connection_Set:
Release_Master/Slave_Connection_Set:

**DeviceNet Class (3), Instance (1) Attributes**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|---|
| 1 | | MAC ID | Get/Set | Node address | 63, 0, 63 | USINT |
| 2 | | Baud Rate | Get/Set | The baud rate of the device<br>0 = 125 kb<br>1 = 250 kb<br>2 = 500 kb | 0, 0, 2 | USINT |
| 3 | | Buss-Off Interrupt | Get/Set | Define processing of BOI<br>0 = Hold CAN in reset<br>1 = Automatic CAN reset<br>Set to 0 on powerup or when ID Reset is used. In both cases existing connections are lost. | 0, 1, 0 | BOOL |
| 4 | | Buss-Off Counter | Get/Set | Number of times CAN went to the bus-off state.<br>Writing any value clears the counter.<br>Count held at 255. | 0, 0, 255 | USINT |
| 5 | | Allocation Information | Get | Master/Slave allocation indication | Array | BYTE, USINT |
| 100 (0x64) | 470 | Net Trip Action | Get/Set | Trip Action taken on communication error.<br>0 = Disable<br>1 = Trip1<br>2 = Trip2<br>3 = Trip3<br>4 = Trip1 & Trip2<br>5 = Trip1 & Trip3<br>6 = Trip1 & Trip2 & Trip3<br>7 = Trip2 & Trip3 | 0, 0, 7 | UINT |
| 101 (0x65) | 471 | Net Alarm Action | Get/Set | Action taken on communication error.<br>0 = Disable<br>1 = Alarm1<br>2 = Alarm2<br>3 = Alarm3<br>4 = Alarm1 & Alarm2<br>5 = Alarm1 & Alarm3<br>6 = Alarm1 & Alarm2 & Alarm3<br>7 = Alarm2 & Alarm3 | 0, 0, 7 | UINT |

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### *3.4 DeviceNet Connection Object*

**Connection Object Class Services**

Get_Attribute_Single: Returns contents of specified attribute.
Set_Attribute_Single: Modify specified attribute.

**DeviceNet Connection Class (5), Instance (0) Attributes**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|---|
| 1 | | Revision | Get | Revision of this Connection Object Class. | 1 | UINT |
| 100 (0x64) | 472 | Polled Cons ID | Get/Set | Specifies output assembly ID. [1]<br>0 = None (Default)<br>1 = Basic Overload (0x02)<br>2 = Basic Motor Starter (0x03)<br>3 = Extended Contactor (0x04)<br>4 = Extended Motor Starter (0x05) | 0, 0, 4 | UINT |
| 101 (0x65) | 473 | Polled Prod ID | Get/Set | Specifies Input assembly ID. [2]<br>0 = None (empty EPATH)<br>1 = Basic Overload (0x32)<br>2 = Extended Overload (0x33)<br>3 = Basic Motor Starter (0x34)<br>4 = Extended Motor Starter 1 (0x35)<br>5 = Extended Motor Starter 2 (0x36) (Default)<br>6 = Status/Meters/RTD's (0x64)<br>7 = Status/Meters (0x65)<br>8 = Status (0x66)<br>9 = User Registers (0x67) | 5, 0, 9 | UINT |

[1] Can also be set using Class 5, Instance 2, Attribute 16 path. See 3.5 for byte sizes.
[2] Can also be set using Class 5, Instance 2, Attribute 14 path. See 3.5 for byte sizes.

**Connection Object Instance Services**

Get_Attribute_Single: Returns contents of specifiedattribute.
Set_Attribute_Single: Modify specified attribute.
Delete: Delete specified connection instance.
Reset: Reset the connection instance.

**DeviceNet Connection Class (5), Explicit Connection Instance (1) Attributes**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|---|
| 1 | | State | Get | State of the object<br>0 = nonexistent<br>1 = configuring<br>3 = established<br>4 = timed out<br>5 = deferred delete | 1, 0, 5 | USINT |
| 2 | | Instance Type | Get | Indicates either IO or messaging connection | 0, 0, 0 | USINT |
| 3 | | Transport Class Trigger | Get | Defines behavior of the connection | 0x83 | BYTE |
| 4 | | Produced Cnxn ID | Get | Placed in CAN Identifier field when the Connection Transmits | | UINT |
| 5 | | Consumed Cnxn ID | Get | CAN Identifier Field value that denotes message to be received | | UINT |


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**DeviceNet Connection Class (5), Explicit Connection Instance (1) Attributes** (Continued)

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|---|
| 6 | | Initial Comm Characteristics | Get | Defines the Message Group(s) across which productions and consumptions associated with this Connection occur | | BYTE |
| 7 | | Produced Connection Size | Get | Maximum number of bytes transmitted across this Connection | 254 | UINT |
| 8 | | Consumed Connection Size | Get | Maximum number of bytes received across this Connection | 254 | UINT |
| 9 | | Expected Packet Rate | Get/Set | Defines timing (ms) associated with this Connection. Resolution is 10 ms. | 2500, 0, 65535 | UINT |
| 12 (0x0C) | | Watchdog Timeout Action | Get/Set | Defines how to handle inactivity/Watchdog timeouts<br>1 = Auto Delete<br>3 = Deferred Delete | 1, 1, 3<br>Set to 1 or 3 | USINT |
| 13 (0x0D) | | Produced Connection Path Length | Get | Number of bytes in the produced_connection_path length attribute | 0 | UINT |
| 14 (0x0E) | | Produced Connection Path | Get | Application Object producing data on this connection | {} | EPATH |
| 15 (0x0F) | | Consumed Connection Path Length | Get | Number of bytes in the consumed_connection_path length attribute | 0 | UINT |
| 16 (0x10) | | Consumed Connection Path | Get | Specifies the Application Object(s) that are to receive the data consumed by this Connection Object | {} | EPATH |
| 17 (0x11) | | Production Inhibit Time | Get/Set | Defines minimum time (ms) between new data production | 0 | UINT |

**DeviceNet Connection Class (5), Polled I/O Connection Instance (2) Attributes**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|---|
| 1 | | State | Get | State of the object<br>0 = nonexistent<br>1 = configuring<br>3 = established<br>4 = timed out | 0, 0, 4 | USINT |
| 2 | | Instance Type | Get | Indicates either IO or messaging connection<br>0 = Explicit message<br>1 = I/O message | 1, 0, 1 | USINT |
| 3 | | Transport Class Trigger | Get | Defines behavior of the connection | 0x83 | BYTE |
| 4 | | Produced Cnxn ID | Get | Placed in CAN Identifier field when the Connection Transmits | | UINT |
| 5 | | Consumed Cnxn ID | Get | CAN Identifier Field value that denotes message to be received | | UINT |
| 6 | | Initial Comm Characteristics | Get | Defines the Message Group(s) across which productions and consumptions associated with this Connection occur | | BYTE |
| 7 | | Produced Connection Size | Get | Maximum number of bytes transmitted across this Connection | Defined by Assembly Instance | UINT |


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**DeviceNet Connection Class (5), Polled I/O Connection Instance (2) Attributes** (Continued)

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|---|
| 8 | | Consumed Connection Size | Get | Maximum number of bytes received across this Connection | Defined by Assembly Instance | UINT |
| 9 | | Expected Packet Rate | Get/Set | Defines timing (ms) associated with this Connection. | 0, 0, 65535, N/A, N/A | UINT |
| 12 (0x0C) | | Watchdog Timeout Action | Get | Defines how to handle inactivity/Watchdog timeouts<br>0 = Transition to time out<br>1 = Auto Delete<br>2 = Auto Reset | 0, 0, 0 | USINT |
| 13 (0x0D) | | Produced Connection Path Length | Get | Number of bytes in the produced_connection_path length attribute. Symbolic notation. | 3, 3, 3 | UINT |
| 14 (0x0E) | | Produced Connection Path | Get/Set | Application Object producing data on this connection | 62 33 36 | EPATH |
| 15 (0x0F) | | Consumed Connection Path Length | Get | Number of bytes in the consumed_connection_path length attribute. Symbolic notation. | 3 | UINT |
| 16 (0x10) | | Consumed Connection Path | Get/Set | Specifies the Application Object(s) that are to receive the data consumed by this Connection Object | {} | EPATH |
| 17 (0x11) | | Production Inhibit Time | Get/Set | Defines minimum time (ms) between new data production | 0 | UINT |

## *3.5 Assembly Object*

**Assembly Object Class Services**

Get_Attribute_Single: Returns contents of specified attribute.

**Assembly Class (4), Instance (0) Attributes**

| ATTRIBUTE NUMBER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|
| 1 | Revision | Get | Revision of this object | 1 | UINT |
| 2 | Max Instance | Get | Maximum instance of assembly | 0x67 | UINT |

**Assembly Object Instance Services**

Get_Attribute_Single: Returns assembly-instance data. Applies to both output and input instances.

Set_Attribute_Single: Set assembly instance data. Applies to output instances only. Service not supported for input instances.

The following static input instances are supported and can be selected by setting parameter 473 to the desired ID:

| PRODUCING ASSEMBLY ID | INSTANCE | DESCRIPTION | DATA SIZE IN BYTES | SYMBOLIC IO CONNECTION PATH |
|---|---|---|---|---|
| 6 | 100 (0x64) | Status/Meters/RTDs | 244 | 62 36 34 |
| 7 | 101 (0x65) | Status/Meters | 132 | 62 36 35 |
| 8 | 102 (0x66) | Status | 6 | 62 36 36 |
| 9 | 103 (0x67) | User Registers (1) | 32 | 62 36 37 |
| 1 | 50 (0x32) | Basic Overload | 1 | 62 33 32 |
| 2 | 51 (0x33) | Extended Overload | 1 | 62 33 33 |
| 3 | 52 (0x34) | Basic Motor Starter | 1 | 62 33 34 |
| 4 | 53 (0x35) | Extended Motor Starter 1 | 1 | 62 33 35 |
| 5 | 54 (0x36) | Extended Motor Starter 2 (Default) | 1 | 62 33 36 |

(1) Requires configuration of the User Defined Registers defined by parameters 451 to 466 and set via RSNetWorx or the User Registers menu. SIZE IS FIXED AT 32 BYTES. See Assembly Class 4, Instance 0x67, Attribute 3.

The following static output instance are supported and can be selected by setting parameter 472 to the desired ID:

| CONSUMING ASSEMBLY ID | INSTANCE (1) | DESCRIPTION | DATA SIZE IN BYTES | SYMBOLIC IO CONNECTION PATH |
|---|---|---|---|---|
| 1 | 2 (0x02) | Basic Overload | 1 | 62 30 32 |
| 2 | 3 (0x03) | Basic Motor Starter | 1 | 62 30 33 |
| 3 | 4 (0x04) | Extended Contactor | 1 | 62 30 34 |
| 4 | 5 (0x05) | Extended Motor Starter | 1 | 62 30 35 |

(1) Default is None.

Assemblies are configured using attributes 0x64 and 0x65 of Class 5, or selected by setting the Produced and Consumed connection path attribute in the Polled I/O connection instance. Setting the path to empty (no data), will disable production or consumption and the corresponding connection size will be zero.

Assemblies are accessed using Polled I/O or can be read using Explicit Messaging. For explicit messaging, the Class is 4, the Attribute is 3, and the Instance is the assembly instance number.

| INSTANCE | SERVICES | CLASS_INSTANCE_ ATTRIBUTE |
|---|---|---|
| 0x02 | Get/Set | 04_02_03 |
| 0x03 | Get/Set | 04_03_03 |
| 0x04 | Get/Set | 04_04_03 |
| 0x05 | Get/Set | 04_05_03 |
| 0x32 | Get | 04_32_03 |
| 0x33 | Get | 04_33_03 |
| 0x34 | Get | 04_34_03 |
| 0x35 | Get | 04_35_03 |
| 0x36 | Get | 04_36_03 |
| 0x64 | Get | 04_64_03 |
| 0x65 | Get | 04_65_03 |
| 0x66 | Get | 04_66_03 |
| 0x67 | Get | 04_67_03 |

**Assembly Class (4), Instance (0x64), Attribute (3) – Input**

Produced Connection Path = "62 36 34"

| BYTE (Low to High) | DESCRIPTION | CLASS-INST-ATTR | TYPE |
|---|---|---|---|
| 0, 1 | Trip and Alarm Status | 29-01-90 | WORD |
| 2, 3 | Motor Status | 29-01-91 | WORD |
| 4, 5 | Starter Status | 29-01-92 | WORD |
| 6, 7 | Digital Inputs | 29-01-93 | WORD |
| 8, 9 | Relay Outputs | 29-01-94 | WORD |
| 10, 11 | Message 0 | 29-01-98 | UINT |
| 12, 13 | Message 1 | 29-01-99 | UINT |
| 14, 15 | Message 2 | 29-01-9A | UINT |
| 16, 17 | Message 3 | 29-01-9B | UINT |


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**Assembly Class (4), Instance (0x64), Attribute (3) – Input** (Continued)

| BYTE (Low to High) | DESCRIPTION | CLASS-INST-ATTR | TYPE |
|---|---|---|---|
| 18, 19 | Message 4 | 29-01-9C | UINT |
| 20, 21, 22, 23 | Phase A Current (A) | 2C-01-90 | REAL |
| 24, 25, 26, 27 | Phase B Current (A) | 2C-01-91 | REAL |
| 28, 29, 30, 31 | Phase C Current (A) | 2C-01-92 | REAL |
| 32, 33, 34, 35 | Ground-Fault Current (A) | 2C-01-93 | REAL |
| 36, 37, 38, 39 | Vab (V) | 2C-01-94 | REAL |
| 40, 41, 42, 43 | Vbc (V) | 2C-01-95 | REAL |
| 44, 45, 46, 47 | Vca (V) | 2C-01-96 | REAL |
| 48, 49, 50, 51 | Apparent Power (S) (kVA) | 2C-01-97 | REAL |
| 52, 53, 54, 55 | Reactive Power (Q) (kVAR) | 2C-01-98 | REAL |
| 56, 57, 58, 59 | Real Power (P) (kW) | 2C-01-99 | REAL |
| 60, 61, 62, 63 | Power Factor (±1) | 2C-01-9A | REAL |
| 64, 65, 66, 67 | Used Thermal Capacity (%) | 2C-01-9B | REAL |
| 68, 69, 70, 71 | Analog Input (mA) | 67-01-0D | REAL |
| 72, 73, 74, 75 | Thermal Trend (%) | 2C-01-9C | REAL |
| 76, 77, 78, 79 | Positive Sequence Current (pu) | 2C-01-9D | REAL |
| 80, 81, 82, 83 | Negative Sequence Current (pu) | 2C-01-9E | REAL |
| 84, 85, 86, 87 | Unbalance Current (pu) | 2C-01-9F | REAL |
| 88, 89, 90, 91 | Frequency | 2C-01-A0 | REAL |
| 92, 93, 94, 95 | Negative Sequence Voltage (pu) | 2C-01-A1 | REAL |
| 96, 97, 98, 99 | Unbalance Voltage (pu) | 2C-01-A2 | REAL |
| 100, 101, 102, 103 | Motor Speed From Tach (RPM) | 65-01-0A | REAL |
| 104, 105, 106, 107 | Running Time (Seconds) | 2C-01-A3 | REAL |
| 108 to 115 | kW Seconds | 2C-01-A4 | ULINT |
| 116 to 123 | kVA Seconds | 2C-01-A5 | ULINT |
| 124 to 131 | kVAR Seconds | 2C-01-A6 | ULINT |
| 132, 133, 134, 135 | Module 1 #1 Temperature (°C) | 68-01-29 | REAL |
| 136, 137, 138, 139 | Module 1 #2 Temperature (°C) | 68-01-2A | REAL |
| 140, 141, 142, 143 | Module 1 #3 Temperature (°C) | 68-01-2B | REAL |
| 144, 145, 146, 147 | Module 1 #4 Temperature (°C) | 68-01-2C | REAL |
| 148, 149, 150, 151 | Module 1 #5 Temperature (°C) | 68-01-2D | REAL |
| 152, 153, 154, 155 | Module 1 #6 Temperature (°C) | 68-01-2E | REAL |
| 156, 157, 158, 159 | Module 1 #7 Temperature (°C) | 68-01-2F | REAL |
| 160, 161, 162, 163 | Module 1 #8 Temperature (°C) | 68-01-30 | REAL |
| 164, 165, 166, 167 | Module 2 #1 Temperature (°C) | 68-02-29 | REAL |
| 168, 169, 170, 171 | Module 2 #2 Temperature (°C) | 68-02-2A | REAL |
| 172, 173, 174, 175 | Module 2 #3 Temperature (°C) | 68-02-2B | REAL |
| 176, 177, 178, 179 | Module 2 #4 Temperature (°C) | 68-02-2C | REAL |
| 180, 181, 182, 183 | Module 2 #5 Temperature (°C) | 68-02-2D | REAL |
| 184, 185, 186, 187 | Module 2 #6 Temperature (°C) | 68-02-2E | REAL |
| 188, 189, 190, 191 | Module 2 #7 Temperature (°C) | 68-02-2F | REAL |
| 192, 193, 194, 195 | Module 2 #8 Temperature (°C) | 68-02-30 | REAL |
| 196, 197, 198, 199 | Module 3 #1 Temperature (°C) | 68-03-29 | REAL |
| 200, 201, 202, 203 | Module 3 #2 Temperature (°C) | 68-03-2A | REAL |
| 204, 205, 206, 207 | Module 3 #3 Temperature (°C) | 68-03-2B | REAL |
| 208, 209, 210, 211 | Module 3 #4 Temperature (°C) | 68-03-2C | REAL |
| 212, 213, 214, 215 | Module 3 #5 Temperature (°C) | 68-03-2D | REAL |
| 216, 217, 218, 219 | Module 3 #6 Temperature (°C) | 68-03-2E | REAL |
| 220, 221, 222, 223 | Module 3 #7 Temperature (°C) | 68-03-2F | REAL |
| 224, 225, 226, 227 | Module 3 #8 Temperature (°C) | 68-03-30 | REAL |
| 228, 229, 230, 231 | Maximum Stator Temperature (°C) | 68-00-12 | REAL |
| 232, 233, 234, 235 | Maximum Bearing Temperature (°C) | 68-00-13 | REAL |
| 236, 237, 238, 239 | Maximum Load Temperature (°C) | 68-00-14 | REAL |
| 240, 241, 242, 243 | Maximum Ambient Temperature (°C) | 68-00-15 | REAL |


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**Assembly Class (4), Instance (0x65), Attribute (3) – Input**

Produced Connection Path = "62 36 35"

Assembly definition is the same as Byte 0 to 131 of Assembly Instance 0x64. Use this for applications where RTD temperature protection is not used.

**Assembly Class (4), Instance (0x66), Attribute (3) – Input**

Produced Connection Path = "62 36 36"

Assembly definition is the same as Bytes 0 to 5 of Assembly Instance 0x64. Use this assembly if network traffic must be minimized.

**Assembly Class (4), Instance (0x67), Attribute (3)**

Produced Connection Path = "62 36 37"

This assembly is used to access any combination of sixteen user-defined registers. Assembly size is fixed at 32 bytes. User defined registers are programmed using the *Setup* | *Hardware* | *Network Comms* | *User Registers* menu, or by explicit messaging to Class 0x6A via the configuration tool. Register values are defined in Appendix E of the PGR-6300 manual. Each comm register in Appendix E defines a 16-bit value. For 32-bit float type (DeviceNet REAL), only the first register of the pair needs too be entered. For example, to configure an assembly to read the first four RTD temperatures in RTD Module 1, enter register numbers 902, 904, 906, 908 in sequence. The first 16 bytes of the assembly will contain the RTD data and the other 16 bytes do not contain any valid data. Register definitions resulting in more than 32 bytes of data will be ignored.

Scanner byte size must be set to 32 bytes in all cases.

**Overload/Starter Instances**

Instances 2 to 5 and 0x32 to 0x36 are assemblies containing attribute values from the Control Supervisor.

| ASSEMBLY BIT | NAME | CLASS NAME | CLASS | INSTANCE | ATTRIBUTE |
|---|---|---|---|---|---|
| Bit 0 | Faulted/Trip | Control Supervisor | 0x29 | 1 | 10 |
| Bit 1 | Warning | Control Supervisor | 0x29 | 1 | 11 |
| Bit 2 | Running 1 | Control Supervisor | 0x29 | 1 | 7 |
| Bit 3 | Running 2 | Control Supervisor | 0x29 | 1 | 8 |
| Bit 4 | Ready | Control Supervisor | 0x29 | 1 | 9 |
| Bit 5 | Control From Net | Control Supervisor | 0x29 | 1 | 15 |

**Assembly Class (4), Instance (0x32), Attribute (3) – Input**

Produced Connection Path = "62 33 32"

| BYTE | BIT 7 | BIT 6 | BIT 5 | BIT 4 | BIT 3 | BIT 2 | BIT 1 | BIT 0 |
|---|---|---|---|---|---|---|---|---|
| 0 | Reserved | Reserved | Reserved | Reserved | Reserved | Reserved | Reserved | Faulted/ Trip |

**Assembly Class (4), Instance (0x33), Attribute (3) – Input**

Produced Connection Path = "62 33 33"

| BYTE | BIT 7 | BIT 6 | BIT 5 | BIT 4 | BIT 3 | BIT 2 | BIT 1 | BIT 0 |
|---|---|---|---|---|---|---|---|---|
| 0 | Reserved | Reserved | Reserved | Reserved | Reserved | Reserved | Warning | Faulted/ Trip |

**Assembly Class (4), Instance (0x34), Attribute (3) – Input**

Produced Connection Path = "62 33 34"

| BYTE | BIT 7 | BIT 6 | BIT 5 | BIT 4 | BIT 3 | BIT 2 | BIT 1 | BIT 0 |
|---|---|---|---|---|---|---|---|---|
| 0 | Reserved | Reserved | Reserved | Reserved | Reserved | Running1 | Reserved | Faulted/ Trip |

**Assembly Class (4), Instance (0x35), Attribute (3) – Input**

Produced Connection Path = "62 33 35"

| BYTE | BIT 7 | BIT 6 | BIT 5 | BIT 4 | BIT 3 | BIT 2 | BIT 1 | BIT 0 |
|---|---|---|---|---|---|---|---|---|
| 0 | Reserved | Reserved | CntrlfrmNet | Ready | Reserved | Running1 | Warning | Faulted/ Trip |


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**Assembly Class (4), Instance (0x36), Attribute (3) – Input**
Produced Connection Path = "62 33 36"

| BYTE | BIT 7 | BIT 6 | BIT 5 | BIT 4 | BIT 3 | BIT 2 | BIT 1 | BIT 0 |
|---|---|---|---|---|---|---|---|---|
| 0 | Reserved | Reserved | CntrlfrmNet | Ready | Running2 | Running1 | Warning | Faulted/ Trip |

**Assembly Class (4), Instance (0x02), Attribute (3) – Output**
Consumed Connection Path = "62 30 32"

| BYTE | BIT 7 | BIT 6 | BIT 5 | BIT 4 | BIT 3 | BIT 2 | BIT 1 | BIT 0 |
|---|---|---|---|---|---|---|---|---|
| 0 | Reserved | Reserved | Reserved | Reserved | Reserved | FaultReset | Reserved | Reserved |

**Assembly Class (4), Instance (0x03), Attribute (3) – Output**
Consumed Connection Path = "62 30 33"

| BYTE | BIT 7 | BIT 6 | BIT 5 | BIT 4 | BIT 3 | BIT 2 | BIT 1 | BIT 0 |
|---|---|---|---|---|---|---|---|---|
| 0 | Reserved | Reserved | Reserved | Reserved | Reserved | FaultReset | Reserved | Run1 |

**Assembly Class (4), Instance (0x04), Attribute (3) – Output**
Consumed Connection Path = "62 30 34"

| BYTE | BIT 7 | BIT 6 | BIT 5 | BIT 4 | BIT 3 | BIT 2 | BIT 1 | BIT 0 |
|---|---|---|---|---|---|---|---|---|
| 0 | Reserved | Reserved | Reserved | Reserved | Reserved | Reserved | Run2 | Run1 |

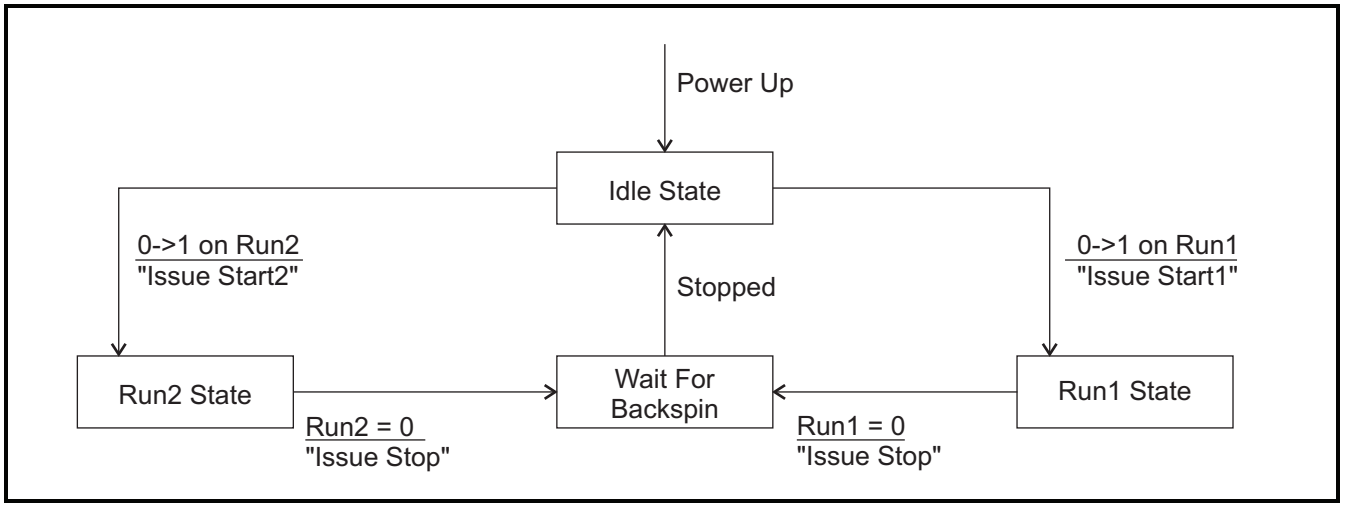
**Assembly Class (4), Instance (0x05), Attribute (3) – Output**
Consumed Connection Path = "62 30 35"

| BYTE | BIT 7 | BIT 6 | BIT 5 | BIT 4 | BIT 3 | BIT 2 | BIT 1 | BIT 0 |
|---|---|---|---|---|---|---|---|---|
| 0 | Reserved | Reserved | Reserved | Reserved | Reserved | FaultReset | Run2 | Run1 |

## *3.6 Control Supervisor Object*

**State Transition Diagram**

Start/Stop control can be performed using the control supervisor class attributes. The control supervisor issues commands to the PGR-6300 as shown in the state diagram.




***Notes:***

- Commands issued are only processed if the CtrlFromNet (Attribute 15) is 1. For this bit to be set, the following conditions must be met:

1) A starter type must be selected (Attribute 0x73).

2) PGR-6300 must be in REMOTE CONTROL - Default setting.
3) Network control must be in the remote group (Attribute 0x72) - Default setting.

- The starter-sequence state is given by Attribute 0x92.
- The user is responsible for setting Run1 and Run2 bits (Attributes 3 & 4) to zero when a stop or trip condition occurs.

**Control Supervisor Object Class Services**

Get_Attribute_Single: Returns contents of specified attribute.

**Control Supervisor Class (0x29), Instance (0) Attributes**

| ATTRIBUTE NUMBER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|
| 1 | Revision | Get | Revision of this object | 1 | UINT |
| 2 | Max Instance | Get | Maximum number of instances | 1 | UINT |

**Supervisor Object Instance Services**

Get_Attribute_Single: Returns contents of specified attribute.
Set_Attribute_Single: Modifies specified attribute.
Reset: Issues a STOP and transition to idle state.

**Supervisor Class (0x29), Instance (1) Attributes**

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 3 | 157 | Run 1 (1) | Get/Set | Run 1 input from master. | 0, 0, 1 | BOOL | |
| 4 | 158 | Run 2 (1) | Get/Set | Run 2 input from master. | 0, 0, 1 | BOOL | |
| 7 | 159 | Running 1 (1) | Get | Starter Sequencer is running | 0, 0, 1 | BOOL | |
| 8 | 160 | Running 2 (1) | Get | Starter Sequencer is running | 0, 0, 1 | BOOL | |
| 9 | 161 | Ready | Get | Starter is ready | 0, 0, 1 | BOOL | |
| 10 (0x0A) | 162 | Faulted | Get | One or more trips present. | 0, 0, 1 | BOOL | |
| 11 (0x0B) | 163 | Warning | Get | One or more alarms present. | 0, 0, 1 | BOOL | |
| 12 (0x0C) | 164 | Fault Rst | Get/Set | Reset issued on 0 → 1 transition | 0, 0, 1 | BOOL | |
| 15 (0x0F) | 165 | Ctrl From Net | Get | 1 = Network control enabled | N/A | BOOL | |

(1) Not applicable in Protection Only mode.


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**Supervisor Class (0x29), Instance (1) Attributes** (Continued)

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 100 (0x64) | 166 | Command | Get/Set | A command "Set" will cause the requested command to be issued. A "Get" will read the last command.<br>0 = Stop<br>1 = Start 1<br>2 = Start 2<br>3 = Reset Trips<br>4 = Set RTC<br>5 = Clear Data Logging Records<br>6 = Clear Trips Counters<br>7 = Clear Energy Totals<br>8 = Clear Running Time<br>9 = Emergency I²t Reset<br>10 = Select Local-Input Ctrl<br>11 = Release Local-Input Ctrl<br>12 = Re-enable Temperature Protection | 0, 0, 12 | USINT | |
| 101 (0x65) | 544 | DIF Enable | Get/Set | Differential module enable. | 0,0,1 | UINT | 1277 |
| 102 (0x66) | 545 | DIF Error Trip Action | Get/Set | DIF Module Error trip action.<br>0 = Disable<br>1 = Trip1<br>2 = Trip2<br>3 = Trip3<br>4 = Trip1 & Trip2<br>5 = Trip1 & Trip3<br>6 = Trip1 & Trip2 & Trip3<br>7 = Trip2 & Trip3 | 0,0,7 | UINT | 1278 |
| 103 (0x67) | 546 | DIF Error Alarm Action | Get/Set | DIF Module Error alarm action.<br>0 = Disable<br>1 = Alarm1<br>2 = Alarm2<br>3 = Alarm3<br>4 = Alarm1 & Alarm2<br>5 = Alarm1 & Alarm3<br>6 = Alarm1 & Alarm2 & Alarm3<br>7 = Alarm2 & Alarm3 | 0,0,7 | UINT | 1279 |
| 104 (0x68) | 547 | DIF Error Trip Count | Get | Module error trip count | | UINT | 1194 |
| 105(0x69) | | Reserved | | | | | |
| 106 (0x6A) | 167 | Trip Action | Get/Set | OPI Loss Trip Action<br>0 = Disable<br>1 = Trip1<br>2 = Trip2<br>3 = Trip3<br>4 = Trip1 & Trip2<br>5 = Trip1 & Trip3<br>6 = Trip1 & Trip2 & Trip3<br>7 = Trip2 & Trip3 | 0, 0, 7 | UINT | 237 |


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**Supervisor Class (0x29), Instance (1) Attributes** (Continued)

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 107 (0x6B) | 168 | # of OPI's | Get/Set | Selects the number of OPI's connected to the control unit. | 1, 0, 3 | UINT | 238 |
| 108 (0x6C) | 169 | OPI Remote | Get/Set | 0 = Enable OPI to select REMOTE<br>1 = OPI cannot select REMOTE | 0, 0, 1 | UINT | 239 |
| 109 (0x6D) | 170 | OPI Control | Get/Set | 0 = Enable OPI motor control<br>1 = Disable OPI motor control | 0, 0, 1 | UINT | 240 |
| 110 (0x6E) | 171 | OPI Local | Get/Set | 0 = Enable OPI to select LOCAL<br>1 = OPI cannot select LOCAL | 0, 0, 1 | UINT | 241 |
| 111 (0x6F) | 172 | OPI Trips | Get | Number of OPI comm trips | | UINT | 1185 |
| 112 (0x70) | 173 | RemGrpDig | Get/ Set | Bind digital start sources to the REMOTE group<br>0 = Include in group<br>1 = Do not include in group | 0, 0, 1 | UINT | 242 |
| 113 (0x71) | 174 | RemGrpNet | Get/Set | Bind OPI start sources to the REMOTE group<br>0 = Include in group<br>1 = Not in group | 0, 0, 1 | UINT | 243 |
| 114 (0x72) | 175 | RemGrpOPI | Get/Set | Bind Net start sources to the REMOTE group<br>0 = Include in group<br>1 = Not in group | 0, 0, 1 | UINT | 244 |
| 115 (0x73) | 176 | Starter Type | Get/Set | Selects the starter type<br>0 = Protection Only<br>1 = Full Voltage Non-Reversing<br>2 = Adjustable-Speed Drive<br>3 = Soft Start<br>4 = Full Voltage Reversing<br>5 = Two Speed *<br>6 = Reactor/Resistor Closed Transition.<br>7 = Reactor/Resistor Open Transition.<br>8 = Slip Ring<br>9 = Soft Start With Bypass<br>10 = Port Winding *<br>11 = Double Delta *<br>12 = Autotransformer<br>13 = Two Winding *<br>14 = Wye-Delta Open Trans. *<br>15 = Wye-Delta Closed Trans. *<br>* Uses Full-Load Current 2 | 0, 0, 15 | UINT | 248 |
| 116 (0x74) | 177 | Start Time | Get/Set | See Main Product Manual | 20, 0.1, 500 | REAL | 249/250 |
| 117 (0x75) | 178 | Start Delay 1 | Get/Set | See Main Product Manual | 20, 0.1, 500 | REAL | 251/252 |
| 118 (0x76) | 179 | Start Delay 2 | Get/Set | See Main Product Manual | 20, 0.1, 500 | REAL | 253/254 |
| 119 (0x77) | 180 | Start Delay 3 | Get/Set | See Main Product Manual | 20, 0.1, 500 | REAL | 255/256 |


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**Supervisor Class (0x29), Instance (1) Attributes** (Continued)

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 120 (0x78) | 181 | Backspin Enable | Get/Set | 0 = Backspin timer enabled<br>1 = Backspin timer disabled | 1, 0, 1 | UINT | 257 |
| 121 (0x79) | 182 | Backspin Delay | Get/Set | Backspin delay in seconds | 5, 0.1, 100 | REAL | 258/259 |
| 122 (0x7A) | 183 | Sequence Trips | Get | Number of starter sequence trips | | UINT | 1184 |
| 123 (0x7B) | 184 | Stop Count | Get | Number of trips caused by STOP when starter type is set to Protection Only | | UINT | 1186 |
| 124 (0x7C) | 185 | RY Status Trips | Get | Number of contactor status trips | | UINT | 1148 |
| 125 (0x7D) | 186 | Transfer Type | Get/Set | Soft-start transfer type<br>0 = Time Transfer<br>1 = Current Transfer | 0, 0, 1 | UINT | 260 |
| 126 (0x7E) | 187 | Transfer Level | Get/Set | Level in % FLA | 1.25, 1.0, 3.0 | REAL | 261/262 |
| 127(0x7f) | | Reserved | | | | | |
| 128 (0x80) | 188 | RY1 Function | Get/Set | Function Assigned to Relay 1<br>0 = None<br>1 = Starter RLYA<br>2 = Starter RLYB<br>3 = Starter RLYC<br>4 = Starter RLYD<br>5 = Trip1<br>6 = Alarm1<br>7 = Aux<br>8 = Interlock<br>9 = Local<br>10 = Current Detected<br>11 = Run Mode<br>12 = Start Sequence Complete<br>13 = Thermal Lockout<br>14 = None<br>15 = Watchdog<br>16 = Trip3<br>17 =Alarm2<br>18 = Alarm3<br>19 = Trip1 Pulse<br>20 = Reduced OC | 0, 0, 18 | UINT | 334 |
| 129 (0x81) | 189 | RY1 Mode | Get/Set | 0 = Fail Safe, 1 = Non Fail Safe | 0, 0, 1 | UINT | 335 |
| 130 (0x82) | 190 | RY2 Function | Get/ Set | See Attribute 0x80 | 0, 0, 18 | UINT | 336 |
| 131 (0x83) | 191 | RY2 Mode | Get/Set | 0 = Fail Safe, 1 = Non Fail Safe | 0, 0, 1 | UINT | 337 |
| 132 (0x84) | 192 | RY3 Function | Get/ Set | See Attribute 0x80 | 0, 0, 18 | UINT | 338 |
| 133 (0x85) | 193 | RY3 Mode | Get/Set | 0 = Fail Safe, 1 = Non Fail Safe | 0, 0, 1 | UINT | 339 |
| 134 (0x86) | 194 | RY4Function | Get/ Set | See Attribute 0x80 | 0, 0, 18 | UINT | 340 |
| 135 (0x87) | 195 | RY4 Mode | Get/Set | 0 = Fail Safe, 1 = Non Fail Safe | 0, 0, 1 | UINT | 341 |
| 136 (0x88) | 196 | RY5 Function | Get/ Set | See Attribute 0x80 | 0, 0, 18 | UINT | 342 |
| 137 (0x89) | 197 | RY5 Mode | Get/Set | 0 = Fail Safe, 1 = Non Fail Safe | 0, 0, 1 | UINT | 343 |


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**Supervisor Class (0x29), Instance (1) Attributes** (Continued)

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 138 (0x8A) | 523 | RY Pulse Time | Get/Set | Specifies the duration of the trip pulse when the RY function is set to "Trip1 Pulse" | 0.25, 0.05, 10 | REAL | 344 |
| 144 (0x90) | 198 | TA Summary | Get | Trip, Alarm, Status Summary<br>Bit 0: 1 = Trip (Trip1 or Trip3)<br>Bit 1: 1 = Alarm (Alarm 1, 2, 3)<br>Bit 2: 1 = Trip2<br>Bit 3: 1 = Interlocks Not Valid<br>Bit 4: 1 = Start Lock Active<br>Bit 5: 1 = Stop Input Active | | WORD | 1096 |
| 145 (0x91) | 199 | Motor Status | Get | Bit 0: 1 = I > Threshold<br>Bit 1: 1 = 10% < I < 125% for 10 s<br>Bit 2: 1 = Tach at Full Speed<br>Bit 3: 1 = I > 120% FLA<br>Bit 4: 1 = Temperature Bypassed | | WORD | 1097 |
| 146 (0x92) | 200 | Starter Status | Get | 1 = Start 1<br>2 = Run 1 (Sequence Complete)<br>3 = Start 2<br>4 = Run 2 (Sequence Complete)<br>5 = Stop<br>6 = Backspin Timer Active | | UINT | 1098 |
| 147 (0x93) | 201 | Digital Inputs | Get | Bit 0: IN1 Voltage Detected<br>Bit 1: IN2 Voltage Detected<br>Bit 2: IN3 Voltage Detected<br>Bit 3: IN4 Voltage Detected<br>Bit 4: IN5 Voltage Detected<br>Bit 5: IN6 Voltage Detected<br>Bit 6: IN7 Voltage Detected | | WORD | 1099 |
| 148 (0x94) | 202 | Relay Outputs | Get | Bit 0: Relay 1 Energized<br>Bit 1: Relay 2 Energized<br>Bit 2: Relay 3 Energized<br>Bit 3: Relay 4 Energized<br>Bit 4: Relay 5 Energized | | WORD | 1100 |
| 149..151 | | Reserved | | | | | |


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**Supervisor Class (0x29), Instance (1) Attributes** (Continued)

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 152 (0x98) | 203 | Trip/Alarm Msg 0 | Get | Trip and Alarm FIFO. See Main Product Manual Appendix F T27. 255= No trip or alarm. | | UINT | 1104 |
| 153 (0x99) | 204 | Trip/Alarm Msg 1 | Get | Trip and Alarm FIFO. See Main Product Manual Appendix F T27. 255= No trip or alarm. | | UINT | 1105 |
| 154 (0x9A) | 205 | Trip/Alarm Msg 2 | Get | Trip and Alarm FIFO. See Main Product Manual Appendix F T27. 255= No trip or alarm. | | UINT | 1106 |
| 155 (0x9B) | 206 | Trip/Alarm Msg 3 | Get | Trip and Alarm FIFO. See Main Product Manual Appendix F T27. 255= No trip or alarm. | | UINT | 1107 |
| 156 (0x9C) | 207 | Trip/Alarm Msg 4 | Get | Trip and Alarm FIFO. See Main Product Manual Appendix F T27. 255= No trip or alarm. | | UINT | 1108 |

### *3.7 Overload Class 0x2C*

**Overload Object Class Services**

Get_Attribute_Single: Returns contents of specified attribute.

**Overload Class (0x2C), Instance (0) Attributes**

| ATTRIBUTE NUMBER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|
| 1 | Revision | Get | Revision of this object | 1 | UINT |
| 2 | Max Instance | Get | Maximum number of instances | 1 | UINT |

**Overload Object Instance Services**

Get_Attribute_Single: Returns contents of specified attribute.
Set_Attribute_Single: Modify specified attribute.

**Overload Class (0x2C), Instance (1) Attributes**

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 100 (0x64) | 1 | Trip Action | Get/Set | 0 = Disable<br>1 = Trip1<br>2 = Trip2<br>3 = Trip3<br>4 = Trip1 & Trip2<br>5 = Trip1 & Trip3<br>6 = Trip1 & Trip2 & Trip3<br>7 = Trip2 & Trip3 | 1, 0, 7 | UINT | 8 |
| 101 (0x65) | 2 | Thermal Model | Get/Set | 0 = NEMA<br>1 = $I^2t$ | 0, 0, 1 | UINT | 9 |
| 102 (0x66) | 3 | Start Inhibit | Get/Set | Inhibits start if $I^2t$ < Thermal Lockout Level<br>0 = Enable<br>1 = Disable | 1, 0, 1 | UINT | 10 |
| 103 (0x67) | 4 | K-Factor | Get/Set | Used in $I^2t$ Algorithm | 6, 1, 10 | REAL | 11/12 |


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**Overload Class (0x2C), Instance (1) Attributes** (Continued)

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 104 (0x68) | 5 | LR Current | Get/Set | Locked Rotor Current (x FLA) | 6, 1, 10 | REAL | 12/14 |
| 105 (0x69) | 6 | LR Time Cold | Get/Set | Locked Rotor Time Cold (s) | 10, 0.2, 100 | REAL | 15/16 |
| 106 (0x6A) | 7 | LR Time Hot | Get/Set | Locked Rotor Time Hot (s) | 5, 0.2, 100 | REAL | 17/18 |
| 107 (0x6B) | 8 | Cooling Factor | Get/Set | Multiples of running time constant | 2, 0.1, 50 | REAL | 19/20 |
| 108 (0x6C) | 9 | Thermal Lock Level | Get/Set | Thermal Reset/Inhibit Level per unit | 0.3, 0.1, 0.9 | REAL | 21/22 |
| 109 (0x6D) | 10 | Overload Alarm | Get/Set | Level where alarm occurs | 1.0, 0.5, 1.0 | REAL | 23/24 |
| 110 (0x6E) | 11 | Alarm Action | Get/Set | 0 = Disable<br>1 = Alarm1<br>2 = Alarm2<br>3 = Alarm3<br>4 = Alarm1 & Alarm2<br>5 = Alarm1 & Alarm3<br>6 = Alarm1 & Alarm2 & Alarm3<br>7 = Alarm2 & Alarm3 | 1, 0, 7 | UINT | 25 |
| 111 (0x6F) | 12 | V Connection | Get/Set | Voltage Input Connection<br>0 = None<br>1 = 1PT<br>2 = 2PT<br>3 = 3PT | 0, 0, 3 | UINT | 209 |
| 112 (0x70) | 13 | CT Primary | Get/Set | CT Primary Rating (A) | 100, 1, 5000 | REAL | 210/211 |
| 113 (0x71) | 14 | EFCT Primary | Get/Set | EFCT Primary Rating (A) | 5, 1, 5000 | REAL | 212/213 |
| 114 (0x72) | 15 | Vin Rating | Get/Set | Input voltage at rated system voltage (kV) | 0.12, 0.03, 0.6 | REAL | 214/215 |
| 115 (0x73) | 16 | Frequency | Get/Set | System Frequency<br>0 = 50, 1 = 60 Hz | 1, 0, 1 | UINT | 224 |
| 116 (0x74) | 17 | FLA Rating 1 | Get/Set | Full-Load Current #1 | 100, 1, 5000 | REAL | 225/226 |
| 117 (0x75) | 18 | System Voltage | Get/Set | Line-to-Line Voltage (kV) | 0.6, 0.12, 25 | REAL | 227/228 |
| 118 (0x76) | 19 | Sync Speed | Get/Set | Motor Synchronous Speed (RPM) | 1800, 100, 10k | REAL | 229/230 |
| 119 (0x77) | 20 | Service Factor | Get/Set | Motor Service Factor | 1, 1, 1.25 | REAL | 233/234 |
| 120 (0x78) | 21 | FLA Rating 2 | Get/Set | Full-Load Current #2 | 100, 1, 5000 | REAL | 235/236 |
| 121 (0x79) | 22 | Trip Count | Get | Counts overload trips | | UINT | 1132 |
| 122 (0x7A) | 474 | Run-Mode Delay | Get/Set | Time delay defines when motor is in run mode | 10, 5, 60 | REAL | 216/217 |
| 123(0x7B) | 535 | SPH Trip Action | Get/Set | Starts Per Hour trip action. | 0,0,7 | UINT | 1270 |
| 124(0x7C) | 536 | SPH Alarm Action | Get/Set | Starts Per Hour alarm action | 0,0,7 | UINT | 1271 |
| 125(0x7D) | 537 | Starts Per Hour | Get/Set | Starts Per Hour setting.<br>0= 1 Start Per Hour,<br>9= 10 Starts Per Hour. | 4,0,9 | UINT | 1272 |
| 126(0x7E) | 538 | Time Between Starts | Get/Set | Time in minutes between starts. | 0,0,500 | REAL | 1273/1274 |
| 127(0x7F) | 539 | SPH Trip Count | Get | Number of SPH trips. | | UINT | 1193 |
| 128(0x80) | 540 | Overload Reset Type | Get/Set | Thermal Overload Reset Type | 0,0,2 | UINT | 26 |


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**Overload Class (0x2C), Instance (1) Attributes** (Continued)

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 144 (0x90) | 23 | $I_A$ | Get | Phase A Current (A) | | REAL | 860/861 |
| 145 (0x91) | 24 | $I_B$ | Get | Phase B Current (A) | | REAL | 862/863 |
| 146 (0x92) | 25 | $I_C$ | Get | Phase C Current (A) | | REAL | 864/865 |
| 147 (0x93) | 26 | $3I_O$ | Get | Ground-Fault Current (A) | | REAL | 866/867 |
| 148 (0x94) | 27 | $V_{ab}$ | Get | Line-to-Line Voltage (kV) | | REAL | 868/869 |
| 149 (0x95) | 28 | $V_{bc}$ | Get | Line-to-Line Voltage (kV) | | REAL | 870/871 |
| 150 (0x96) | 29 | $V_{ca}$ | Get | Line-to-Line Voltage (kV) | | REAL | 872/873 |
| 151 (0x97) | 30 | S | Get | Apparent Power (kVA) | | REAL | 874/875 |
| 152 (0x98) | 31 | Q | Get | Reactive Power (kVAC) | | REAL | 876/877 |
| 153 (0x99) | 32 | P | Get | Real Power (kW) | | REAL | 878/879 |
| 154 (0x9A) | 33 | PF | Get | Power Factor | −1 to +1 | REAL | 880/881 |
| 155 (0x9B) | 34 | Used $I^2t$ | Get | Used Thermal Capacity (%) | | REAL | 882/883 |
| 156 (0x9C) | 35 | Thermal Trend | Get | Thermal Trend (%) | | REAL | 886/887 |
| 157 (0x9D) | 36 | +Seq I | Get | Positive Sequence Current (Pu) | | REAL | 888/889 |
| 158 (0x9E) | 37 | -Seq I | Get | Negative Sequence Current (Pu) | | REAL | 890/891 |
| 159 (0x9F) | 38 | Unbalance I | Get | Current Unbalance (Pu) | | REAL | 892/893 |
| 160 (0xA0) | 39 | Frequency | Get | Frequency (from Vab) | | REAL | 966/967 |
| 161 (0xA1) | 40 | -Seq V | Get | Negative Sequence Voltage (Pu) | | REAL | 896/897 |
| 162 (0xA2) | 41 | Unbalance V | Get | Voltage Unbalance (Pu) | | REAL | 898/899 |
| 163 (0xA3) | 42 | Run Time | Get | Running time in seconds | | UDINT | 1210 |
| 164 (0xA4) | 43 | KWs | Get | KW seconds | | LREAL | 1212..15 |
| 165 (0xA5) | 44 | KVAs | Get | KVA seconds | | LREAL | 1216..19 |
| 166 (0xA6) | 45 | KVARs | Get | KVAR seconds | | LREAL | 1220..23 |
| 167(0xA7) | 541 | DIF Ia | Get | Differential current, phase A | | REAL | 1224/1225 |
| 168(0xA8) | 542 | DIF Ib | Get | Differential current, phase B | | REAL | 1226/1227 |
| 168(0xA9) | 543 | DIF Ic | Get | Differential current, phase C | | REAL | 1228/1229 |

## *3.8 Set Point Class 0x64*

**Set Point Object Class Services**

Get_Attribute_Single: Returns contents of specified attribute.

**Set Point Class (0x64), Instance (0) Attributes**

| ATTRIBUTE NUMBER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|
| 1 | Revision | Get | Revision of this object | 4 | UINT |
| 2 | Max Instance | Get | Maximum number of instances | 18 | UINT |


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**Set Point Object Instances**

**Set Point Object Instance Services**

Get_Attribute_Single: Returns contents of specified attribute.

Set_Attribute_Single: Modifies specified attribute.

The set point class consists of seven attributes. Each set-point instance may use some or all of these attributes.

**Attribute 1** - Trip Action

Specifies the action to take on a trip.

0 = Disable
1 = Trip1 (1)
2 = Trip2
3 = Trip3
4 = Trip1 & Trip2
5 = Trip1 & Trip3
6 = Trip1 & Trip2 & Trip3
7 = Trip2 & Trip3

**Attribute 2** - Alarm Action

Specifies the action to take on an alarm.

0 = Disable
1 = Alarm1
2 = Alarm2
3 = Alarm3
4 = Alarm1 & Alarm2
5 = Alarm1 & Alarm3
6 = Alarm1 & Alarm2 & Alarm3
7 = Alarm2 & Alarm3

**Attribute 3** - Trip Level
**Attribute 4** - Trip Delay
**Attribute 5** - Alarm Level
**Attribute 6** - Alarm Delay
**Attribute 7** - Trip Counter for the set point

(1) Initiates a STOP when a starter function is enabled.

**Class 0x64, Instance 1 - Overcurrent**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 46 | Trip Action | Get/Set | 1, 0, 7 | UINT | 32 |
| 3 | 47 | Trip Level | Get/Set | 10, 1, 15 | REAL | 33/34 |
| 4 | 48 | Trip Delay | Get/Set | 0.1, 0, 10 | REAL | 35/36 |
| 7 | 49 | Trip Count | Get | | UINT | 1130 |

**Class 0x64, Instance 2 - Aux. Overcurrent**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 50 | Trip Action | Get/Set | 1, 0, 7 | UINT | 40 |
| 3 | 51 | Trip Level | Get/Set | 10, 1, 15 | REAL | 41/42 |
| 4 | 52 | Trip Delay | Get/Set | 0.1, 0, 10 | REAL | 43/44 |
| 7 | 53 | Trip Count | Get | | UINT | 1131 |

**Class 0x64, Instance 3 - Earth Fault**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 54 | Trip Action | Get/Set | 1, 0, 7 | UINT | 48 |
| 2 | 55 | Alarm Action | Get/Set | 1, 0, 7 | UINT | 58 |
| 3 | 56 | Trip Level | Get/Set | 0.4, 0.05, 1 | REAL | 50/51 |
| 4 | 57 | Trip Delay | Get/Set | 0.25, 0, 100 | REAL | 52/53 |
| 5 | 58 | Alarm Level | Get/Set | 0.20, 0.05, 1 | REAL | 54/55 |
| 6 | 59 | Alarm Delay | Get/Set | 1, 0, 100 | REAL | 56/57 |
| 7 | 60 | Trip Count | Get | | UINT | 1133 |


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**Class 0x64, Instance 4 - Jam**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 61 | Trip Action | Get/Set | 1, 0, 7 | UINT | 64 |
| 2 | 62 | Alarm Action | Get/Set | 1, 0, 7 | UINT | 73 |
| 3 | 63 | Trip Level | Get/Set | 6, 1, 10 | REAL | 65/66 |
| 4 | 64 | Trip Delay | Get/Set | 5, 1, 100 | REAL | 67/68 |
| 5 | 65 | Alarm Level | Get/Set | 3, 1, 10 | REAL | 69/70 |
| 6 | 66 | Alarm Delay | Get/Set | 5, 1, 100 | REAL | 71/72 |
| 7 | 67 | Trip Count | Get | | UINT | 1136 |

**Class 0x64, Instance 5 - Current Unbalance (I)**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 68 | Trip Action | Get/Set | 1, 0, 7 | UINT | 80 |
| 2 | 69 | Alarm Action | Get/Set | 1, 0, 7 | UINT | 89 |
| 3 | 70 | Trip Level | Get/Set | 0.25, 0.05, 1 | REAL | 81/82 |
| 4 | 71 | Trip Delay | Get/Set | 15, 1, 100 | REAL | 83/84 |
| 5 | 72 | Alarm Level | Get/Set | 0.10, 0.05, 1 | REAL | 85/86 |
| 6 | 73 | Alarm Delay | Get/Set | 10, 1, 100 | REAL | 87/88 |
| 7 | 74 | Trip Count | Get | | UINT | 1134 |

**Class 0x64, Instance 6 - Phase Reverse (I)**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 75 | Trip Action | Get/Set | 0, 0, 7 | UINT | 96 |
| 2 | 524 | Alarm Action | Get/Set | 0, 0, 7 | UINT | 95 |
| 4 | 76 | Phase Reverse Delay | Get/Set | 2, 1, 100 | REAL | 97/98 |
| 7 | 77 | Trip Count | Get | | UINT | 1144 |
| | | | | | | |

**Class 0x64, Instance 7 - Phase Loss (I)**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 78 | Trip Action | Get/Set | 1, 0, 7 | UINT | 99 |
| 4 | 79 | Phase Loss Delay | Get/Set | 5, 1, 100 | REAL | 100/101 |
| 7 | 80 | Trip Count | Get | | UINT | 1143 |

**Class 0x64, Instance 8 - Voltage Unbalance**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 81 | Trip Action | Get/Set | 1, 0, 7 | UINT | 104 |
| 2 | 82 | Alarm Action | Get/Set | 1, 0, 7 | UINT | 113 |
| 3 | 83 | Trip Level | Get/Set | 0.1, 0.05, 1 | REAL | 105/106 |
| 4 | 84 | Trip Delay | Get/Set | 15, 1, 100 | REAL | 107/108 |
| 5 | 85 | Alarm Level | Get/Set | 0.05, 0.05, 1 | REAL | 109/110 |
| 6 | 86 | Alarm Delay | Get/Set | 10, 1, 100 | REAL | 111/112 |
| 7 | 87 | Trip Count | Get | | UINT | 1135 |


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**Class 0x64, Instance 9 - Phase Reverse (V)**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 88 | Trip Action | Get/Set | 0, 0, 7 | UINT | 120 |
| 4 | 89 | Phase Reverse Delay | Get/Set | 2, 1, 100 | REAL | 121/122 |
| 7 | 90 | Trip Count | Get | | UINT | 1146 |

**Class 0x64, Instance 0x0A - Phase Loss (V)**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 91 | Trip Action | Get/Set | 0, 0, 7 | UINT | 123 |
| 4 | 92 | Phase Loss Delay | Get/Set | 5, 1, 100 | REAL | 124/125 |
| 7 | 93 | Trip Count | Get | | UINT | 1145 |

**Class 0x64, Instance 0x0B - Undercurrent**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 94 | Trip Action | Get/Set | 0, 0, 7 | UINT | 128 |
| 2 | 95 | Alarm Action | Get/Set | 0, 0, 7 | UINT | 137 |
| 3 | 96 | Trip Level | Get/Set | 0.5, 0.1, 1 | REAL | 129/130 |
| 4 | 97 | Trip Delay | Get/Set | 10, 1, 100 | REAL | 131/132 |
| 5 | 98 | Alarm Level | Get/Set | 0.8, 0.1, 1 | REAL | 133/134 |
| 6 | 99 | Alarm Delay | Get/Set | 20, 1, 100 | REAL | 135/136 |
| 7 | 100 | Trip Count | Get | | UINT | 1137 |

**Class 0x64, Instance 0x0C - PTC Temperature**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 101 | Trip Action | Get/Set | 0, 0, 7 | UINT | 144 |
| 2 | 102 | Alarm Action | Get/Set | 0, 0, 7 | UINT | 145 |
| 7 | 103 | Trip Count | Get | | UINT | 1145 |

**Class 0x64, Instance 0x0D - Overvoltage**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 104 | Trip Action | Get/Set | 1, 0, 7 | UINT | 176 |
| 2 | 105 | Alarm Action | Get/Set | 1, 0, 7 | UINT | 185 |
| 3 | 106 | Trip Level | Get/Set | 1.2, 1, 1.4 | REAL | 177/178 |
| 4 | 107 | Trip Delay | Get/Set | 5, 1, 500 | REAL | 179/180 |
| 5 | 108 | Alarm Level | Get/Set | 1.1, 1, 1.4 | REAL | 181/182 |
| 6 | 109 | Alarm Delay | Get/Set | 5, 1, 500 | REAL | 183/184 |
| 7 | 110 | Trip Count | Get | | UINT | 1138 |


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**Class 0x64, Instance 0x0E - Undervoltage**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 111 | Trip Action | Get/Set | 0, 0, 7 | UINT | 192 |
| 2 | 112 | Alarm Action | Get/Set | 0, 0, 7 | UINT | 201 |
| 3 | 113 | Trip Level | Get/Set | 0.7, 0.5, 1 | REAL | 193/194 |
| 4 | 114 | Trip Delay | Get/Set | 5, 1, 500 | REAL | 195/196 |
| 5 | 115 | Alarm Level | Get/Set | 0.8, 0.5, 1 | REAL | 197/198 |
| 6 | 116 | Alarm Delay | Get/Set | 5, 1, 500 | REAL | 199/200 |
| 7 | 117 | Trip Count | Get | | UINT | 1139 |

**Class 0x64, Instance 0x0F - Underfrequency**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 118 | Trip Action | Get/Set | 0, 0, 7 | UINT | 1230 |
| 2 | 119 | Alarm Action | Get/Set | 0, 0, 7 | UINT | 1248 |
| 3 | 120 | Trip Level | Get/Set | 45, 30, 80 | REAL | 1231/1232 |
| 4 | 121 | Trip Delay | Get/Set | 5, 0.5, 500 | REAL | 1233/1234 |
| 5 | 122 | Alarm Level | Get/Set | 48, 30, 80 | REAL | 1235/1236 |
| 6 | 123 | Alarm Delay | Get/Set | 1, 0.5, 500 | REAL | 1237/1238 |
| 7 | 124 | Trip Count | Get | | UINT | 1188 |

**Class 0x64, Instance 0x10 - Overfrequency**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 125 | Trip Action | Get/Set | 0, 0, 7 | UINT | 1239 |
| 2 | 126 | Alarm Action | Get/Set | 0, 0, 7 | UINT | 1249 |
| 3 | 127 | Trip Level | Get/Set | 65, 30, 80 | REAL | 1240/1241 |
| 4 | 128 | Trip Delay | Get/Set | 5, 0.5, 500 | REAL | 1242/1243 |
| 5 | 129 | Alarm Level | Get/Set | 62, 30, 80 | REAL | 1244/1245 |
| 6 | 130 | Alarm Delay | Get/Set | 1, 0.5, 500 | REAL | 1246/1247 |
| 7 | 131 | Trip Count | Get | | UINT | 1189 |

**Class 0x64, Instance 0x11 - Power Factor Quadrant 4**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 132 | Trip Action | Get/Set | 0, 0, 7 | UINT | 166 |
| 2 | 133 | Alarm Action | Get/Set | 0, 0, 7 | UINT | 175 |
| 3 | 134 | Trip Level | Get/Set | 0.8, 0.5, 1 | REAL | 167/168 |
| 4 | 135 | Trip Delay | Get/Set | 5, 0.2, 500 | REAL | 169/170 |
| 5 | 136 | Alarm Level | Get/Set | 0.9, 0.5, 1 | REAL | 171/172 |
| 6 | 137 | Alarm Delay | Get/Set | 10, 0.2, 500 | REAL | 173/174 |
| 7 | 138 | Trip Count | Get | | UINT | 1187 |

**Class 0x64, Instance 0x12 - Power Factor Quadrant 3**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 139 | Trip Action | Get/Set | 0, 0, 7 | UINT | 1250 |
| 2 | 140 | Alarm Action | Get/Set | 0, 0, 7 | UINT | 1259 |
| 3 | 141 | Trip Level | Get/Set | 0.8, 0.5, 1 | REAL | 1251/1252 |
| 4 | 142 | Trip Delay | Get/Set | 5, 0.2, 500 | REAL | 1253/1254 |
| 5 | 143 | Alarm Level | Get/Set | 0.9, 0.5, 1 | REAL | 1255/1256 |
| 6 | 144 | Alarm Delay | Get/Set | 10, 0.2, 500 | REAL | 1257/1258 |
| 7 | 145 | Trip Count | Get | | UINT | 1192 |


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**Class 0x64, Instance 0x13 - Differential**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 525 | Trip Action | Get/Set | 0, 0, 7 | UINT | 1280 |
| 2 | 526 | Alarm Action | Get/Set | 0, 0, 7 | UINT | 1289 |
| 3 | 527 | Trip Level | Get/Set | 1, 0.1, 15 | REAL | 1281/1282 |
| 4 | 528 | Trip Delay | Get/Set | 0.1, 0, 10 | REAL | 1283/1284 |
| 5 | 529 | Alarm Level | Get/Set | 1, 0.1, 15 | REAL | 1285/1286 |
| 6 | 530 | Alarm Delay | Get/Set | 0.1, 0, 10 | REAL | 1287/1288 |
| 7 | 531 | Trip Count | Get | | UINT | 1195 |

**Class 0x64, Instance 0x14 – Reduced Overcurrent**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 532 | Trip Action | Get/Set | 0, 0, 7 | UINT | 45 |
| 3 | 533 | Trip Level | Get/Set | 1, 1, 15 | REAL | 46/47 |
| 7 | 534 | Trip Count | Get | | UINT | 1196 |

## *3.9 Acceleration Class 0x65*

Motor speed is measured using a digital tach connected to Digital Input 8, or a 4–20 mA speed sensor. This class defines parameters for speed protection.

**Acceleration Object Class Services**

Get_Attribute_Single: Returns contents of specified attribute.

**Acceleration Class (0x65), Instance (0) Attributes**

| ATTRIBUTE NUMBER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|
| 1 | Revision | Get | Revision of this object | 1 | UINT |
| 2 | Max Instance | Get | Maximum number of instances | 1 | UINT |

**Acceleration Object Instance Services**

Get_Attribute_Single: Returns contents of specified attribute.
Set_Attribute_Single: Modifies specified attribute.

**Instance 1 Attributes**

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 1 | 146 | Accel Action | Get/Set | Specifies the action to take on a trip<br>0 = Disable<br>1 = Trip1(1)<br>2 = Trip2<br>3 = Trip3<br>4 = Trip1 & Trip2<br>5 = Trip1 & Trip3<br>6 = Trip1 & Trip2 & Trip3<br>7 = Trip2 & Trip3<br>(1) Initiates a STOP when a starter function is enabled. | 1, 0, 7 | UINT | 152 |
| 2 | 147 | Speed1 | Get/Set | Motor must reach Speed1 in the time defined by Time1. (%FS) | 30, 1, 100 | REAL | 153/154 |


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| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 3 | 148 | Time1 | Get/Set | Defines the time when Speed1 must be reached. (s) | 5, 1, 1000 | REAL | 155/156 |
| 4 | 149 | Speed2 | Get/Set | Motor must reach Speed2 in the time defined by Time2. (%FS) | 60, 1, 100 | REAL | 157/158 |
| 5 | 150 | Time2 | Get/Set | Defines the time when Speed2 must be reached. (s) | 10, 1, 1000 | REAL | 159/160 |
| 6 | 151 | Speed3 | Get/Set | Motor must reach Speed3 in the time defined by Time3. (%FS) | 90, 1, 100 | REAL | 161/164 |
| 7 | 152 | Time3 | Get/Set | Defines the time when Speed3 must be reached. (s) | 15, 1, 1000 | REAL | 163/164 |
| 8 | 153 | Tach Enable | Get/Set | Enables speed measurement even if protection is disabled 0 = Enabled, 1 = Disabled | 1, 0, 1 | UINT | 330 |
| 9 | 154 | Pulses Per Rev | Get/Set | Sets the number of pulses per revolution for digital tach | 60, 1, 100 | REAL | 331/332 |
| 10 (0x0A) | 155 | Tach Speed | Get | Motor speed from tach | | REAL | 900/901 |
| 11 (0x0B) | 156 | Trip Count | Get | Counts number of Accel Trips | | UINT | 1147 |

### *3.10 Digital Input Class 0x66*

**Digital Input Object Class Services**

Get_Attribute_Single: Returns contents of specified attribute.

**Digital Input Class (0x66), Instance (0) Attributes**

| ATTRIBUTE NUMBER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|
| 1 | Revision | Get | Revision of this object | 1 | UINT |
| 2 | Max Instance | Get | Maximum number of instances | 7 | UINT |

**Digital Input Object Instance Services**

Get_Attribute_Single: Returns contents of specified attribute.
Set_Attribute_Single: Modifies specified attribute.

The digital-input class consists of 5 attributes.

**Attribute 1** - Function

Selects the function of the digital input.
0 = Input not used
1 = Start1 (N.O. Contact)
2 = Start2 (N.O. Contact)
3 = Stop (N.C. Contact)
4 = Starter RLYA contactor status
5 = Starter RLYB contactor status
6 = Starter RLYC contactor status
7 = Starter RLYD contactor status
8 = Interlock (N.C.)
9 = Trip1 (N.C.)
10 = Reset (N.O.)
11 = Local Select
12 = Local Start1
13 = Local Start2
14 = 2-Wire Start1
15 = 2-Wire Start2
16 = FLA2 Select
17 = Limit1 Select
18 = Limit2 Select
19 = Reduced OC

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**Attribute 2** - Bypass Enable/Disable
Attribute applies when the input function is trip. When enabled, the input is bypassed for the time defined by the Bypass Delay when a motor is started using starter control. 0 = Enable, 1 = Disable

**Attribute 3** - Bypass Delay
Defines the Trip bypass time duration on start.

**Attribute 4** - Trip Delay
Applies only to the trip function.

**Attribute 5** - Trip Count
The trip counter only applies to the trip function.

**Class 0x66, Instance 1 - Input 1**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 208 | Function | Get/Set | 0, 0, 19 | UINT | 264 |
| 2 | 209 | Bypass Enable/Disable | Get/Set | 1, 0, 1 | UINT | 265 |
| 3 | 210 | Bypass Delay | Get/Set | 5, 0.5, 100 | REAL | 266/267 |
| 4 | 211 | Trip Delay | Get/Set | 0.1, 0.01, 100 | REAL | 268/269 |
| 5 | 212 | Trip Counter | Get | | UINT | 1149 |

**Class 0x66, Instance 2 - Input 2**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 213 | Function | Get/Set | 0, 0, 19 | UINT | 274 |
| 2 | 214 | Bypass Enable/Disable | Get/Set | 1, 0, 1 | UINT | 275 |
| 3 | 215 | Bypass Delay | Get/Set | 5, 0.5, 100 | REAL | 276/277 |
| 4 | 216 | Trip Delay | Get/Set | 0.1, 0.01, 100 | REAL | 278/279 |
| 5 | 217 | Trip Counter | Get | | UINT | 1150 |

**Class 0x66, Instance 3 - Input 3**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 218 | Function | Get/Set | 0, 0, 19 | UINT | 284 |
| 2 | 219 | Bypass Enable/Disable | Get/Set | 1, 0, 1 | UINT | 285 |
| 3 | 220 | Bypass Delay | Get/Set | 5, 0.5, 100 | REAL | 286/287 |
| 4 | 221 | Trip Delay | Get/Set | 0.1, 0.01, 100 | REAL | 288/289 |
| 5 | 222 | Trip Counter | Get | | UINT | 1151 |

**Class 0x66, Instance 4 - Input 4**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 223 | Function | Get/Set | 0, 0, 19 | UINT | 294 |
| 2 | 224 | Bypass Enable/Disable | Get/Set | 1, 0, 1 | UINT | 295 |
| 3 | 225 | Bypass Delay | Get/Set | 5, 0.5, 100 | REAL | 296/297 |
| 4 | 226 | Trip Delay | Get/Set | 0.1, 0.01, 100 | REAL | 298/299 |
| 5 | 227 | Trip Counter | Get | | UINT | 1152 |


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**Class 0x66, Instance 5 - Input 5**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 228 | Function | Get/Set | 0, 0, 19 | UINT | 304 |
| 2 | 229 | Bypass Enable/Disable | Get/Set | 1, 0, 1 | UINT | 305 |
| 3 | 230 | Bypass Delay | Get/Set | 5, 0.5, 100 | REAL | 306/307 |
| 4 | 231 | Trip Delay | Get/Set | 0.1, 0.01, 100 | REAL | 308/309 |
| 5 | 232 | Trip Counter | Get | | UINT | 1153 |

**Class 0x66, Instance 6 - Input 6**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 233 | Function | Get/Set | 0, 0, 19 | UINT | 314 |
| 2 | 234 | Bypass Enable/Disable | Get/Set | 1, 0, 1 | UINT | 315 |
| 3 | 235 | Bypass Delay | Get/Set | 5, 0.5, 100 | REAL | 316/317 |
| 4 | 236 | Trip Delay | Get/Set | 0.1, 0.01, 100 | REAL | 318/319 |
| 5 | 237 | Trip Counter | Get | | UINT | 1154 |

**Class 0x66, Instance 7 - Input 7**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 238 | Function | Get/Set | 0, 0, 19 | UINT | 324 |
| 2 | 239 | Bypass Enable/Disable | Get/Set | 1, 0, 1 | UINT | 325 |
| 3 | 240 | Bypass Delay | Get/Set | 5, 0.5, 100 | REAL | 326/327 |
| 4 | 241 | Trip Delay | Get/Set | 0.1, 0.01, 100 | REAL | 328/329 |
| 5 | 242 | Trip Counter | Get | | UINT | 1155 |

## *3.11 Analog I/O Class 0x67*

**Analog I/O Object Instance Services**

Get_Attribute_Single: Returns contents of specified attribute.

**Analog I/O Class (0x67), Instance (0) Attributes**

| ATTRIBUTE NUMBER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|
| 1 | Revision | Get | Revision of this object | 1 | UINT |
| 2 | Max Instance | Get | Maximum number of instances | 1 | UINT |

**Analog I/O Object Instance Services**

Get_Attribute_Single: Returns contents of specified attribute.
Set_Attribute_Single: Modifies specified attribute.


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**Analog I/O Class (0x67), Instance (1) Attributes**

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 1 | 243 | Analog In Type | Get/Set | Defines the analog-input type<br>0 = Disabled<br>1 = Generic (Trip1, Alarm1 enabled)<br>2 = ASD sets sampling frequency<br>3 = Motor speed | 0, 0, 3 | UINT | 350 |
| 2 | 244 | High Trip | Get/Set | Sets high trip level for generic input type. (mA) | 16, 0.1, 20 | REAL | 351/352 |
| 3 | 245 | Low Trip | Get Set | Sets low trip level for generic input type. (mA) | 7, 0.1, 20 | REAL | 353/354 |
| 4 | 246 | Trip Delay | Get/Set | Applies to generic type. (s) | 5, 0.01, 100 | REAL | 355/356 |
| 5 | 247 | High Alarm | Get/Set | Sets high alarm level for generic input type. (mA) | 14, 0.1, 20 | REAL | 357/358 |
| 6 | 248 | Low Alarm | Get/Set | Sets low alarm level for generic input type (mA) | 9, 0.1, 20 | REAL | 359/360 |
| 7 | 249 | Alarm Delay | Get/Set | Applies to generic type (s) | 1, 0.01, 100 | REAL | 361/362 |
| 8 | 250 | ASD_4mA | Get/Set | Applies to type 2 input. Frequency corresponding to 4 mA input. (Hz) | 10, 0, 70 | REAL | 363/364 |
| 9 | 251 | ASD_20mA | Get/Set | Applies to type 2 input. Frequency corresponding to 20 mA input. (%FS) | 10, 0, 70 | REAL | 365/366 |
| 10 (0x0A) | 252 | Tach_4mA | Get/Set | Applies to type 3 input. % Speed corresponding to 4 mA input. (%FS) | 10, 0, 100 | REAL | 367/368 |
| 11 (0x0B) | 253 | Tach_20mA | Get/Set | Applies to type 3 input. % Speed corresponding to 20 mA input. (%FS) | 100, 0, 100 | REAL | 369/370 |
| 12 (0x0C) | 254 | Out Param | Get/Set | Specifies the analog output parameter<br>0 = Phase Current<br>1 = Earth Leakage<br>2 = Thermal Capacity<br>3 = Max Stator RTD<br>4 = Max Bearing RTD<br>5 = Max Load RTD<br>6 = Max Ambient RTD<br>7 = Voltage<br>8 = Unbalance (I)<br>9 = Power Factor<br>10 = Real Power<br>11 = Reactive Power<br>12 = Apparent Power<br>13 = Zero (4 mA)<br>14 = Full Scale (20 mA)<br>15= Speed<br>16 = Differential Current | 0, 0, 16 | UINT | 373/374 |
| 13 (0x0D) | 255 | Reading | Get | Analog input reading. (mA) | 0, 0, 20 | REAL | 884/885 |
| 14 (0x0E) | 256 | High Trips | Get | Input-high trip count | | UINT | 1140 |
| 15 (0x0F) | 257 | Low Trips | Get | Input-low trip count | | UINT | 1141 |


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### *3.12 RTD Module Class 0x68*

**RTD Module Object Class Services**

Get_Attribute_Single: Returns contents of specified attribute.
Set_Attribute_Single: Modifies specified attribute.

**Class 0x68, Instance 0, Attributes**

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 1 | | Revision Number | Get | Revision number of this class | 1 | UINT | |
| 2 | | Max Instance | Get | Maximum number of RTD modules | 3 | UINT | |
| 100 (0x64) | 258 | Modules Used | Get/Set | Specifies the number of RTD modules used | 0, 0, 3 | UINT | 390 |
| 101 (0x65) | 259 | Sensor Trip Action | Get/Set | Specifies trip action to take on a sensor error.<br>0 = Disable Trips<br>1 = Trip1(1)<br>2 = Trip2<br>3 = Trip3<br>4 = Trip1 & Trip2<br>5 = Trip1 & Trip3<br>6 = Trip1 & Trip2 & Trip3<br>7 = Trip2 & Trip3<br>(1) Initiates a STOP when a starter function is enabled. | 0, 0, 7 | UINT | 388 |
| 102 (0x66) | 260 | Sensor Alarm Action | Get/Set | Specifies alarm action to take on a sensor error.<br>0 = Disable Alarms<br>1 = Alarm1<br>2 = Alarm2<br>3 = Alarm3<br>4 = Alarm1 & Alarm2<br>5 = Alarm1 & Alarm3<br>6 = Alarm1 & Alarm2 & Alarm3<br>7 = Alarm2 & Alarm3 | 1, 0, 7 | UINT | 379 |
| 103 (0x67) | 261 | Module Error Trip Action | Get/Set | Specifies trip action to take on a module error. Action list is the same as Attribute 9. | 0, 0, 7 | UINT | 389 |
| 104 (0x68) | 262 | Module Error Alarm Action | Get/Set | Specifies alarm action to take on a module error. Action list is the same as Attribute A. | 1, 0, 7 | UINT | 380 |
| 105 (0x69) | 263 | Module1 Comm Trip Count | Get | Number of module1 communication-error trips. | | UINT | 1180 |
| 106 (0x6A) | 264 | Module2 Comm Trip Count | Get | Number of module2 communication-error trips. | | UINT | 1181 |
| 107 (0x6B) | 265 | Module3 Comm Trip Count | Get | Number of module3 communication-error trips. | | UINT | 1182 |
| 108 (0x6C) | 266 | Sensor Trip Count | Get | Number of RTD sensor trips | | UINT | 1183 |


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**Class 0x68, Instance 0, Attributes** (Continued)

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 109 (0x6D) | 267 | HMC Enable | Get/Set | Hot Motor Compensation control.<br>0 = Enable, 1 = Disable | | UINT | 550 |
| 110 (0x6E) | 268 | HMC Max Bias | Get/Set | Stator temperature (°C) where compensation ends at 100% I²t. | 150, 40, 200 | REAL | 551/552 |
| 111 (0x6F) | 269 | HMC Min Bias | Get/Set | Stator temperature (°C) where compensation begins at 0% I²t. | 40, 40, 200 | REAL | 553/554 |
| 112 (0x70) | 270 | Max Stator Temp | Get | Max stator temperature (°C) | | REAL | 950/951 |
| 113 (0x71) | 271 | Max Bearing Temp | Get | Max bearing temperature (°C) | | REAL | 952/953 |
| 114 (0x72) | 272 | Max Load Temp | Get | Max load temperature (°C) | | REAL | 954/955 |
| 115 (0x73) | 273 | Max Amb Temp | Get | Max ambient temperature (°C) | | REAL | 956/957 |
| 116 (0x74) | 274 | Min Stator Temp | Get | Min stator temperature (°C) | | REAL | 958/959 |
| 117 (0x75) | 275 | Min Bearing Temp | Get | Min bearing temperature (°C) | | REAL | 960/961 |
| 118 (0x76) | 276 | Min Load Temp | Get | Min load temperature (°C) | | REAL | 962/963 |
| 119 (0x77) | 277 | Min Ambient Temp | Get | Min ambient temperature (°C) | | REAL | 964/965 |

**RTD Module Object Instance Services**

Get_Attribute_Single: Returns contents of specified attribute.
Set_Attribute_Single: Modifies specified attribute.

**Object Instance Attributes 1 to 8** define the RTD type. Selecting an RTD will enable trip and alarm set points. The trip action is fixed as Trip1 and the alarm action is fixed as Alarm1.

0 = RTD Disabled
1 = Platinum 100 ohm
2 = Nickel 100 ohm
3 = Nickel 120 ohm
4 = Copper 10 ohm

**Object Instance Attributes 0x09 to 0x10** define the RTD function.

0 = Stator
1 = Bearing
2 = Load
3 = Ambient

**Object Instance Attributes 0x11 to 0x20** define the trip and alarm settings in degrees C. The trip action is fixed as Trip1 and the alarm action is fixed as Alarm1.

**Object Instance Attributes 0x21 to 0x28** define an 18-character name.

**Object Instance Attributes 0x29 to 0x30** are temperature readings.

**Object Instance Attributes 0x31 to 0x38** are the trip counters for each of the RTD's.

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**Class 0x68, Instance 1**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 278 | RTD #1 Type | Get/Set | 0, 0, 4 | UINT | 391 |
| 2 | 279 | RTD #2 Type | Get/Set | 0, 0, 4 | UINT | 392 |
| 3 | 280 | RTD #3 Type | Get/Set | 0, 0, 4 | UINT | 393 |
| 4 | 281 | RTD #4 Type | Get/Set | 0, 0, 4 | UINT | 394 |
| 5 | 282 | RTD #5 Type | Get/Set | 0, 0, 4 | UINT | 395 |
| 6 | 283 | RTD #6 Type | Get/Set | 0, 0, 4 | UINT | 396 |
| 7 | 284 | RTD #7 Type | Get/Set | 0, 0, 4 | UINT | 397 |
| 8 | 285 | RTD #8 Type | Get/Set | 0, 0, 4 | UINT | 398 |
| 9 | 286 | RTD #1 Function | Get/Set | 0, 0, 3 | UINT | 415 |
| 10 (0x0A) | 287 | RTD #2 Function | Get/Set | 0, 0, 3 | UINT | 416 |
| 11 (0x0B) | 288 | RTD #3 Function | Get/Set | 0, 0, 3 | UINT | 417 |
| 12 (0x0C) | 289 | RTD #4 Function | Get/Set | 0, 0, 3 | UINT | 418 |
| 13 (0x0D) | 290 | RTD #5 Function | Get/Set | 0, 0, 3 | UINT | 419 |
| 14 (0x0E) | 291 | RTD #6 Function | Get/Set | 0, 0, 3 | UINT | 420 |
| 15 (0x0F) | 292 | RTD #7 Function | Get/Set | 0, 0, 3 | UINT | 421 |
| 16 (0x10) | 293 | RTD #8 Function | Get/Set | 0, 0, 3 | UINT | 422 |
| 17 (0x11) | 294 | RTD #1 Trip Level | Get/Set | 130, 40, 200 | REAL | 446/447 |
| 18 (0x12) | 295 | RTD #1 Alarm Level | Get/Set | 110, 40, 200 | REAL | 448/449 |
| 19 (0x13) | 296 | RTD #2 Trip Level | Get/Set | 130, 40, 200 | REAL | 450/451 |
| 20 (0x14) | 297 | RTD #2 Alarm Level | Get/Set | 110, 40, 200 | REAL | 452/453 |
| 21 (0x15) | 298 | RTD #3 Trip Level | Get/Set | 130, 40, 200 | REAL | 454/455 |
| 22 (0x16) | 299 | RTD #3 Alarm Level | Get/Set | 110, 40, 200 | REAL | 456/457 |
| 23 (0x17) | 300 | RTD #4 Trip Level | Get/Set | 130, 40, 200 | REAL | 458/459 |
| 24 (0x18) | 301 | RTD #4 Alarm Level | Get/Set | 110, 40, 200 | REAL | 460/461 |
| 25 (0x19) | 302 | RTD #5 Trip Level | Get/Set | 130, 40, 200 | REAL | 462/463 |
| 26 (0x1A) | 303 | RTD #5 Alarm Level | Get/Set | 110, 40, 200 | REAL | 464/465 |
| 27 (0x1B) | 304 | RTD #6 Trip Level | Get/Set | 130, 40, 200 | REAL | 466/467 |
| 28 (0x1C) | 305 | RTD #6 Alarm Level | Get/Set | 110, 40, 200 | REAL | 468/469 |
| 29 (0x1D) | 306 | RTD #7 Trip Level | Get/Set | 130, 40, 200 | REAL | 470/471 |
| 30 (0x1E) | 307 | RTD #7 Alarm Level | Get/Set | 110, 40, 200 | REAL | 472/473 |
| 31 (0x1F) | 308 | RTD #8 Trip Level | Get/Set | 130, 40, 200 | REAL | 474/475 |
| 32 (0x20) | 309 | RTD #8 Alarm Level | Get/Set | 110, 40, 200 | REAL | 476/477 |
| 33 (0x21) | 310 | RTD #1 Name | Get/Set | RTD M1 #1 | SHORT_ STRING | 610..619 |
| 34 (0x22) | 311 | RTD #2 Name | Get/Set | RTD M1 #2 | SHORT_ STRING | 620..629 |
| 35 (0x23) | 312 | RTD #3 Name | Get/Set | RTD M1 #3 | SHORT_ STRING | 630..639 |
| 36 (0x24) | 313 | RTD #4Name | Get/Set | RTD M1 #4 | SHORT_ STRING | 640..649 |
| 37 (0x25) | 314 | RTD #5 Name | Get/Set | RTD M1 #5 | SHORT_ STRING | 650..659 |
| 38 (0x26) | 315 | RTD #6 Name | Get/Set | RTD M1 #6 | SHORT_ STRING | 660..669 |
| 39 (0x27) | 316 | RTD #7 Name | Get/Set | RTD M1 #7 | SHORT_ STRING | 670..679 |
| 40 (0x28) | 317 | RTD #8 Name | Get/Set | RTD M1 #8 | SHORT_ STRING | 680..689 |
| 41 (0x29) | 318 | RTD #1 Temp RDG | Get | | REAL | 902/903 |
| 42 (0x2A) | 319 | RTD #2 Temp RDG | Get | | REAL | 904/905 |
| 43 (0x2B) | 320 | RTD #3 Temp RDG | Get | | REAL | 906/907 |


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**Class 0x68, Instance 1** (Continued)

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 44 (0x2C) | 321 | RTD #4 Temp RDG | Get | | REAL | 908/909 |
| 45 (0x2D) | 322 | RTD #5 Temp RDG | Get | | REAL | 910/911 |
| 46 (0x2E) | 323 | RTD #6 Temp RDG | Get | | REAL | 912/913 |
| 47 (0x2F) | 324 | RTD #7 Temp RDG | Get | | REAL | 914/915 |
| 48 (0x30) | 325 | RTD #8 Temp RDG | Get | | REAL | 916/917 |
| 49 (0x31) | 326 | RTD #1 Trip Cntr | Get | | UINT | 1156 |
| 50 (0x32) | 327 | RTD #2 Trip Cntr | Get | | UINT | 1157 |
| 51 (0x33) | 328 | RTD #3 Trip Cntr | Get | | UINT | 1158 |
| 52 (0x34) | 329 | RTD #4 Trip Cntr | Get | | UINT | 1159 |
| 53 (0x35) | 330 | RTD #5 Trip Cntr | Get | | UINT | 1160 |
| 54 (0x36) | 331 | RTD #6 Trip Cntr | Get | | UINT | 1161 |
| 55 (0x37) | 332 | RTD #7 Trip Cntr | Get | | UINT | 1162 |
| 56 (0x38) | 333 | RTD #8 Trip Cntr | Get | | UINT | 1163 |

**Class 0x68, Instance 2**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 334 | RTD #1 Type | Get/Set | 0, 0, 4 | UINT | 399 |
| 2 | 335 | RTD #2 Type | Get/Set | 0, 0, 4 | UINT | 400 |
| 3 | 336 | RTD #3 Type | Get/Set | 0, 0, 4 | UINT | 401 |
| 4 | 337 | RTD #4 Type | Get/Set | 0, 0, 4 | UINT | 402 |
| 5 | 338 | RTD #5 Type | Get/Set | 0, 0, 4 | UINT | 403 |
| 6 | 339 | RTD #6 Type | Get/Set | 0, 0, 4 | UINT | 404 |
| 7 | 340 | RTD #7 Type | Get/Set | 0, 0, 4 | UINT | 405 |
| 8 | 341 | RTD #8 Type | Get/Set | 0, 0, 4 | UINT | 406 |
| 9 | 342 | RTD #1 Function | Get/Set | 0, 0, 3 | UINT | 423 |
| 10 (0x0A) | 343 | RTD #2 Function | Get/Set | 0, 0, 3 | UINT | 424 |
| 11 (0x0B) | 344 | RTD #3 Function | Get/Set | 0, 0, 3 | UINT | 425 |
| 12 (0x0C) | 345 | RTD #4 Function | Get/Set | 0, 0, 3 | UINT | 426 |
| 13 (0x0D) | 346 | RTD #5 Function | Get/Set | 0, 0, 3 | UINT | 427 |
| 14 (0x0E) | 347 | RTD #6 Function | Get/Set | 0, 0, 3 | UINT | 428 |
| 15 (0x0F) | 348 | RTD #7 Function | Get/Set | 0, 0, 3 | UINT | 429 |
| 16 (0x10) | 349 | RTD #8 Function | Get/Set | 0, 0, 3 | UINT | 430 |
| 17 (0x11) | 350 | RTD #1 Trip Level | Get/Set | 130, 40, 200 | REAL | 478 |
| 18 (0x12) | 351 | RTD #1 Alarm Level | Get/Set | 110, 40, 200 | REAL | 480 |
| 19 (0x13) | 352 | RTD #2 Trip Level | Get/Set | 130, 40, 200 | REAL | 482/483 |
| 20 (0x14) | 353 | RTD #2 Alarm Level | Get/Set | 110, 40, 200 | REAL | 484/485 |
| 21 (0x15) | 354 | RTD #3 Trip Level | Get/Set | 130, 40, 200 | REAL | 486/487 |
| 22 (0x16) | 355 | RTD #3 Alarm Level | Get/Set | 110, 40, 200 | REAL | 488/489 |
| 23 (0x17) | 356 | RTD #4 Trip Level | Get/Set | 130, 40, 200 | REAL | 490/491 |
| 24 (0x18) | 357 | RTD #4 Alarm Level | Get/Set | 110, 40, 200 | REAL | 492/493 |
| 25 (0x19) | 358 | RTD #5 Trip Level | Get/Set | 130, 40, 200 | REAL | 494/495 |
| 26 (0x1A) | 359 | RTD #5 Alarm Level | Get/Set | 110, 40, 200 | REAL | 496/497 |
| 27 (0x1B) | 360 | RTD #6 Trip Level | Get/Set | 130, 40, 200 | REAL | 498/499 |
| 28 (0x1C) | 361 | RTD #6 Alarm Level | Get/Set | 110, 40, 200 | REAL | 500/501 |
| 29 (0x1D) | 362 | RTD #7 Trip Level | Get/Set | 130, 40, 200 | REAL | 502/503 |
| 30 (0x1E) | 363 | RTD #7 Alarm Level | Get/Set | 110, 40, 200 | REAL | 504/505 |
| 31 (0x1F) | 364 | RTD #8 Trip Level | Get/Set | 130, 40, 200 | REAL | 506/507 |


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**Class 0x68, Instance 2** (Continued)

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 32 (0x20) | 365 | RTD #8 Alarm Level | Get/Set | 110, 40, 200 | REAL | 508/509 |
| 33 (0x21) | 366 | RTD #1 Name | Get/Set | RTD M2 #1 | SHORT_ STRING | 690..699 |
| 34 (0x22) | 367 | RTD #2 Name | Get/Set | RTD M2 #2 | SHORT_ STRING | 700..709 |
| 35 (0x23) | 368 | RTD #3 Name | Get/Set | RTD M2 #3 | SHORT_ STRING | 710..719 |
| 36 (0x24) | 369 | RTD #4Name | Get/Set | RTD M2 #4 | SHORT_ STRING | 720..729 |
| 37 (0x25) | 370 | RTD #5 Name | Get/Set | RTD M2 #5 | SHORT_ STRING | 730..739 |
| 38 (0x26) | 371 | RTD #6 Name | Get/Set | RTD M2 #6 | SHORT_ STRING | 740..749 |
| 39 (0x27) | 372 | RTD #7 Name | Get/Set | RTD M2 #7 | SHORT_ STRING | 750..759 |
| 40 (0x28) | 373 | RTD #8 Name | Get/Set | RTD M2 #8 | SHORT_ STRING | 760..769 |
| 41 (0x29) | 374 | RTD #1 Temp RDG | Get | | REAL | 918/919 |
| 42 (0x2A) | 375 | RTD #2 Temp RDG | Get | | REAL | 920/921 |
| 43 (0x2B) | 376 | RTD #3 Temp RDG | Get | | REAL | 922/923 |
| 44 (0x2C) | 377 | RTD #4 Temp RDG | Get | | REAL | 924/925 |
| 45 (0x2D) | 378 | RTD #5 Temp RDG | Get | | REAL | 926/927 |
| 46 (0x2E) | 379 | RTD #6 Temp RDG | Get | | REAL | 928/929 |
| 47 (0x2F) | 380 | RTD #7 Temp RDG | Get | | REAL | 930/931 |
| 48 (0x30) | 381 | RTD #8 Temp RDG | Get | | REAL | 932/933 |
| 49 (0x31) | 382 | RTD #1 Trip Cntr | Get | | UINT | 1164 |
| 50 (0x32) | 383 | RTD #2 Trip Cntr | Get | | UINT | 1165 |
| 51 (0x33) | 384 | RTD #3 Trip Cntr | Get | | UINT | 1166 |
| 52 (0x34) | 385 | RTD #4 Trip Cntr | Get | | UINT | 1167 |
| 53 (0x35) | 386 | RTD #5 Trip Cntr | Get | | UINT | 1168 |
| 54 (0x36) | 387 | RTD #6 Trip Cntr | Get | | UINT | 1169 |
| 55 (0x37) | 388 | RTD #7 Trip Cntr | Get | | UINT | 1170 |
| 56 (0x38) | 389 | RTD #8 Trip Cntr | Get | | UINT | 1171 |

**Class 0x68, Instance 3**

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 1 | 390 | RTD #1 Type | Get/Set | 0, 0, 4 | UINT | 407 |
| 2 | 391 | RTD #2 Type | Get/Set | 0, 0, 4 | UINT | 408 |
| 3 | 392 | RTD #3 Type | Get/Set | 0, 0, 4 | UINT | 409 |
| 4 | 393 | RTD #4 Type | Get/Set | 0, 0, 4 | UINT | 410 |
| 5 | 394 | RTD #5 Type | Get/Set | 0, 0, 4 | UINT | 411 |
| 6 | 395 | RTD #6 Type | Get/Set | 0, 0, 4 | UINT | 412 |
| 7 | 396 | RTD #7 Type | Get/Set | 0, 0, 4 | UINT | 413 |
| 8 | 397 | RTD #8 Type | Get/Set | 0, 0, 4 | UINT | 414 |
| 9 | 398 | RTD #1 Function | Get/Set | 0, 0, 3 | UINT | 431 |
| 10 (0x0A) | 399 | RTD #2 Function | Get/Set | 0, 0, 3 | UINT | 432 |
| 11 (0x0B) | 400 | RTD #3 Function | Get/Set | 0, 0, 3 | UINT | 433 |
| 12 (0x0C) | 401 | RTD #4 Function | Get/Set | 0, 0, 3 | UINT | 434 |
| 13 (0x0D) | 402 | RTD #5 Function | Get/Set | 0, 0, 3 | UINT | 435 |
| 14 (0x0E) | 403 | RTD #6 Function | Get/Set | 0, 0, 3 | UINT | 436 |
| 15 (0x0F) | 404 | RTD #7 Function | Get/Set | 0, 0, 3 | UINT | 437 |
| 16 (0x10) | 405 | RTD #8 Function | Get/Set | 0, 0, 3 | UINT | 438 |
| 17 (0x11) | 406 | RTD #1 Trip Level | Get/Set | 130, 40, 200 | REAL | 510/511 |


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**Class 0x68, Instance 3** (Continued)

| ATTRIBUTE NUMBER | DEVICENET PARAMETER | ATTRIBUTE NAME | SERVICES | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|
| 18 (0x12) | 407 | RTD #1 Alarm Level | Get/Set | 110, 40, 200 | REAL | 512/513 |
| 19 (0x13) | 408 | RTD #2 Trip Level | Get/Set | 130, 40, 200 | REAL | 514/515 |
| 20 (0x14) | 409 | RTD #2 Alarm Level | Get/Set | 110, 40, 200 | REAL | 516/517 |
| 21 (0x15) | 410 | RTD #3 Trip Level | Get/Set | 130, 40, 200 | REAL | 518/519 |
| 22 (0x16) | 411 | RTD #3 Alarm Level | Get/Set | 110, 40, 200 | REAL | 520/521 |
| 23 (0x17) | 412 | RTD #4 Trip Level | Get/Set | 130, 40, 200 | REAL | 522/523 |
| 24 (0x18) | 413 | RTD #4 Alarm Level | Get/Set | 110, 40, 200 | REAL | 524/525 |
| 25 (0x19) | 414 | RTD #5 Trip Level | Get/Set | 130, 40, 200 | REAL | 526/527 |
| 26 (0x1A) | 415 | RTD #5 Alarm Level | Get/Set | 110, 40, 200 | REAL | 528/529 |
| 27 (0x1B) | 416 | RTD #6 Trip Level | Get/Set | 130, 40, 200 | REAL | 530/531 |
| 28 (0x1C) | 417 | RTD #6 Alarm Level | Get/Set | 110, 40, 200 | REAL | 532/533 |
| 29 (0x1D) | 418 | RTD #7 Trip Level | Get/Set | 130, 40, 200 | REAL | 534/535 |
| 30 (0x1E) | 419 | RTD #7 Alarm Level | Get/Set | 110, 40, 200 | REAL | 536/537 |
| 31 (0x1F) | 420 | RTD #8 Trip Level | Get/Set | 130, 40, 200 | REAL | 538/539 |
| 32 (0x20) | 421 | RTD #8 Alarm Level | Get/Set | 110, 40, 200 | REAL | 540/541 |
| 33 (0x21) | 422 | RTD #1 Name | Get/Set | RTD M3 #1 | SHORT_ STRING | 770..779 |
| 34 (0x22) | 423 | RTD #2 Name | Get/Set | RTD M3 #2 | SHORT_ STRING | 780..789 |
| 35 (0x23) | 424 | RTD #3 Name | Get/Set | RTD M3 #3 | SHORT_ STRING | 790..799 |
| 36 (0x24) | 425 | RTD #4Name | Get/Set | RTD M3 #4 | SHORT_ STRING | 800..809 |
| 37 (0x25) | 426 | RTD #5 Name | Get/Set | RTD M3 #5 | SHORT_ STRING | 810..819 |
| 38 (0x26) | 427 | RTD #6 Name | Get/Set | RTD M3 #6 | SHORT_ STRING | 820..829 |
| 39 (0x27) | 428 | RTD #7 Name | Get/Set | RTD M3 #7 | SHORT_ STRING | 830..839 |
| 40 (0x28) | 429 | RTD #8 Name | Get/Set | RTD M3 #8 | SHORT_ STRING | 840..849 |
| 41 (0x29) | 430 | RTD #1 Temp RDG | Get | | REAL | 934..935 |
| 42 (0x2A) | 431 | RTD #2 Temp RDG | Get | | REAL | 936..937 |
| 43 (0x2B) | 432 | RTD #3 Temp RDG | Get | | REAL | 938..939 |
| 44 (0x2C) | 433 | RTD #4 Temp RDG | Get | | REAL | 940..941 |
| 45 (0x2D) | 434 | RTD #5 Temp RDG | Get | | REAL | 942..943 |
| 46 (0x2E) | 435 | RTD #6 Temp RDG | Get | | REAL | 944..945 |
| 47 (0x2F) | 436 | RTD #7 Temp RDG | Get | | REAL | 946/947 |
| 48 (0x30) | 437 | RTD #8 Temp RDG | Get | | REAL | 948/949 |
| 49 (0x31) | 438 | RTD #1 Trip Cntr | Get | | UINT | 1172 |
| 50 (0x32) | 439 | RTD #2 Trip Cntr | Get | | UINT | 1173 |
| 51 (0x33) | 440 | RTD #3 Trip Cntr | Get | | UINT | 1174 |
| 52 (0x34) | 441 | RTD #4 Trip Cntr | Get | | UINT | 1175 |
| 53 (0x35) | 442 | RTD #5 Trip Cntr | Get | | UINT | 1176 |
| 54 (0x36) | 443 | RTD #6 Trip Cntr | Get | | UINT | 1177 |
| 55 (0x37) | 444 | RTD #7 Trip Cntr | Get | | UINT | 1178 |
| 56 (0x38) | 445 | RTD #8 Trip Cntr | Get | | UINT | 1179 |


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### *3.13 RTC Class 0x69*

**RTC Object Class Services**

Get_Attribute_Single: Returns contents of specified attribute.

**RTC Class (0x69), Instance (0) Attributes**

| ATTRIBUTE NUMBER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|
| 1 | Revision | Get | Revision of this object | 1 | UINT |
| 2 | Max Instance | Get | Maximum number of instances | 1 | UINT |

**RTC Object Class Services**

Get_Attribute_Single: Returns contents of specified attribute.
Set_Attribute_Single: Modifies specified attribute.

**RTC Class (0x69), Instance (1) Attributes**

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 1 | 446 | IRIG Hr Offset | Get/Set | RTC Hrs = IRIG Hrs + IRIG Hr Offset | 0, 0, 30 | REAL | 568/569 |
| 2 | 447 | IRIG Min Offset | Get/Set | RTC Min = IRIG Min + IRIG Min Offset | 0, 0, 23 | REAL | 570/571 |
| 3 | 448 | RTC Date | Get | Number of days since 1972-01-01 | | DATE | 574/575 |
| 4 | 449 | RTC Time | Get | Number of milliseconds since 00:00:00:00.000 | | TIME OF DAY | 576/577 |
| 5 | 450 | RTC Set | Get/Set (1) | String used to set the date and time YY/MM/DD-HH:MM:SS | | SHORT_ STRING | 580/589 |

(1) Time value is not activated until a SET RTC command is issued using Class 0x29, Instance 1, Attribute 0x64.

### *3.14 Comm Register Class 0x6A*

This object defines the communication registers that generate the data for Assembly Class 4, Instance 0x67, Attribute 3. Register values are defined in Appendix E of the Main Product Manual. Each register in Appendix E defines a 16-bit value. For 32-bit float type (DeviceNet REAL), only the first register of the pair needs too be entered. For example, to configure an assembly to read the first four RTD temperatures in RTD Module 1, enter register numbers 902, 904, 906, 908. The first 16 bytes of the assembly will contain the RTD data and the other 16 bytes do not contain any valid data. Register definitions resulting in more than 32 bytes of data will be ignored.

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**Comm Register Object Class Services**

Get_Attribute_Single: Returns contents of specified attribute.

**Comm Register Class (0x6A), Instance (0) Attributes**

| ATTRIBUTE NUMBER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|
| 1 | Revision | Get | Revision of this object | 1 | UINT |
| 2 | Max Instance | Get | Maximum number of instances | 1 | UINT |

**Comm Register Object Instance Services**

Get_Attribute_Single: Returns contents of specified attribute.
Set_Attribute_Single: Modifies specified attribute.

**Comm Register Class (0x6A), Instance (1) Attributes**

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 1 | 451 | Register 1 | Get/Set | Comm Register value | 0, 0, 1246 | UINT | 1400 |
| 2 | 452 | Register 2 | Get/Set | Comm Register value | 0, 0, 1246 | UINT | 1401 |
| 3 | 453 | Register 3 | Get/Set | Comm Register value | 0, 0, 1246 | UINT | 1402 |
| 4 | 454 | Register 4 | Get/Set | Comm Register value | 0, 0, 1246 | UINT | 1403 |
| 5 | 455 | Register 5 | Get/Set | Comm Register value | 0, 0, 1246 | UINT | 1404 |
| 6 | 456 | Register 6 | Get/Set | Comm Register value | 0, 0, 1246 | UINT | 1405 |
| 7 | 457 | Register 7 | Get/Set | Comm Register value | 0, 0, 1246 | UINT | 1406 |
| 8 | 458 | Register 8 | Get/Set | Comm Register value | 0, 0, 1246 | UINT | 1407 |
| 9 | 459 | Register 9 | Get/Set | Comm Register value | 0, 0, 1246 | UINT | 1408 |
| 10 | 460 | Register 10 | Get/Set | Comm Register value | 0, 0, 1246 | UINT | 1409 |
| 11 | 461 | Register 11 | Get/Set | Comm Register value | 0, 0, 1246 | UINT | 1410 |
| 12 | 462 | Register 12 | Get/Set | Comm Register value | 0, 0, 1246 | UINT | 1411 |
| 13 | 463 | Register 13 | Get/Set | Comm Register value | 0, 0, 1246 | UINT | 1412 |
| 14 | 464 | Register 14 | Get/Set | Comm Register value | 0, 0, 1246 | UINT | 1413 |
| 15 | 465 | Register 15 | Get/Set | Comm Register value | 0, 0, 1246 | UINT | 1414 |
| 16 | 466 | Register 16 | Get/Set | Comm Register value | 0, 0, 1246 | UINT | 1415 |

## *3.15 Data Logging Class 0x6B*

This object is used to access one of 64 data-logging records. The Record Selector value defines the record that is displayed. Record Head indicates the record number for the latest record.

**Data Logging Object Class Services**

Get_Attribute_Single: Returns contents of specified attribute.

**Data Logging Class (0x6B), Instance (0) Attributes**

| ATTRIBUTE NUMBER | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE |
|---|---|---|---|---|---|
| 1 | Revision | Get | Revision of this object | 1 | UINT |
| 2 | Max Instance | Get | Maximum number of instances | 1 | UINT |

**Data Logging Object Instance Services**

Get_Attribute_Single: Returns contents of specified attribute.
Set_Attribute_Single: Modifies specified attribute.


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**Data Logging Class (0x6B), Instance (1) Attributes**

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 1 | 475 | Record Count | Get | Number of captured records since the last time the event records were cleared | 0, 0, 65535 | UINT | 973 |
| 2 | 476 | Record Head | Get | Points to next record. Latest record at Record Head minus 1 | 0, 0, 63 | UINT | 974 |
| 3 | 477 | Record Selector | Get/Set | Selects the record for which the data is displayed in this instance | 0, 0, 63 | UINT | 975 |
| 4 | 478 | Record Date | Get | The date when the record was captured | 0, 0, 65535 | DATE | 976/977 |
| 5 | 479 | Record Time | Get | Time-of-Day the record was captured | 0, 0, 86399999 | TOD | 978/979 |
| 6 | 480 | Record Type | Get | Specifies the trigger source<br>0 = Record Empty<br>1 = Triggered by start<br>2 = Triggered by trip | 0, 0, 2 | UINT | 980 |
| 7 | 481 | Trip Code | Get | See Main Product Manual Appendix F T27 for a list of trip codes. 255 = No Trip or Alarm | 0, 0, 255 | UINT | 981 |
| 8 | 482 | IA | Get | Phase A Current (A) 1 | | Real | 982 |
| 9 | 483 | IB | Get | Phase B Current (A) 1 | | Real | 984 |
| 10 (0x0A) | 484 | IC | Get | Phase C Current (A) 1 | | Real | 986 |
| 11 (0x0B) | 485 | 3IA | Get | Ground-Fault Current (A) 1 | | Real | 988 |
| 12 (0x0C) | 486 | Vab | Get | Line-to-Line Voltage (kV) 1 | | Real | 990 |
| 13 (0x0D) | 487 | Vbc | Get | Line-to-Line Voltage (kV) 1 | | Real | 992 |
| 14 (0x0E) | 488 | Vca | Get | Line-to-Line Voltage (kV) 1 | | Real | 994 |
| 15 (0x0F) | 489 | Frequency | Get | Frequency in Hz | | Real | 1053/1054 |
| 16 (0x10) | 490 | S | Get | Apparent Power (kVA) | | Real | 1055/1056 |
| 17 (0x11) | 491 | P | Get | Real Power (kW) | | Real | 1057/1058 |
| 18 (0x12) | 492 | Q | Get | Reactive Power (kVAR) | | Real | 1059/1060 |
| 19 (0x13) | 493 | PF | Get | Power Factor (-1, +1) | | Real | 1061/1062 |
| 20 (0x14) | 494 | Ain | Get | Analog Input (mA) | | Real | 996/997 |
| 21 (0x15) | 495 | Unbalance I | Get | Current Unbalance (pu) 1 | | Real | 998/999 |
| 22 (0x16) | 496 | Unbalance V | Get | Voltage Unbalance (pu) 1 | | Real | 1000/1001 |
| 23 (0x17) | 497 | Start Time | Get | Start time in seconds. Only valid for start-type records | | UINT | 1002 |
| 24 (0x18) | 498 | $I^2t$ Used | Get | For start records this is the $I^2t$ used during a start | | REAL | 1003/1004 |
| 32 (0x20) | 499 | M1 RTD1 | Get | RTD Temperature reading (ºC) | | REAL | 1005/1006 |
| 33 (0x21) | 500 | M1 RTD2 | Get | RTD Temperature reading (ºC) | | REAL | 1007/1008 |
| 34 (0x22) | 501 | M1 RTD3 | Get | RTD Temperature reading (ºC) | | REAL | 1009/1010 |
| 35 (0x23) | 502 | M1 RTD4 | Get | RTD Temperature reading (ºC) | | REAL | 1011/1012 |
| 36 (0x24) | 503 | M1 RTD5 | Get | RTD Temperature reading (ºC) | | REAL | 1013/1014 |


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**Data Logging Class (0x6B), Instance (1) Attributes** (Continued)

| ATTRIBUTE NUMBER | PARAM | ATTRIBUTE NAME | SERVICES | DESCRIPTION | DEFAULT, MINIMUM, MAXIMUM | DATA TYPE | COMM REGISTER |
|---|---|---|---|---|---|---|---|
| 37 (0x25) | 504 | M1 RTD6 | Get | RTD Temperature reading (ºC) | | REAL | 1015/1016 |
| 38 (0x26) | 505 | M1 RTD7 | Get | RTD Temperature reading (ºC) | | REAL | 1017/1018 |
| 39 (0x27) | 506 | M1 RTD8 | Get | RTD Temperature reading (ºC) | | REAL | 1019/1020 |
| 40 (0x28) | 507 | M2 RTD1 | Get | RTD Temperature reading (ºC) | | REAL | 1021/1022 |
| 41 (0x29) | 508 | M2 RTD2 | Get | RTD Temperature reading (ºC) | | REAL | 1023/1024 |
| 42 (0x2A) | 509 | M2 RTD3 | Get | RTD Temperature reading (ºC) | | REAL | 1025/1026 |
| 43 (0x2B) | 510 | M2 RTD4 | Get | RTD Temperature reading (ºC) | | REAL | 1027/1028 |
| 44 (0x2C) | 511 | M2 RTD5 | Get | RTD Temperature reading (ºC) | | REAL | 1029/1030 |
| 45 (0x2D) | 512 | M2 RTD6 | Get | RTD Temperature reading (ºC) | | REAL | 1031/1032 |
| 46 (0x2E) | 513 | M2 RTD7 | Get | RTD Temperature reading (ºC) | | REAL | 1033/1034 |
| 47 (0x2F) | 514 | M2 RTD8 | Get | RTD Temperature reading (ºC) | | REAL | 1035/1036 |
| 48 (0x30) | 515 | M3 RTD1 (2) | Get | RTD Temperature reading (ºC) | | REAL | 1037/1038 |
| 49 (0x31) | 516 | M3 RTD2 (3) | Get | RTD Temperature reading (ºC) | | REAL | 1039/1040 |
| 50 (0x32) | 517 | M3 RTD3 (4) | Get | RTD Temperature reading (ºC) | | REAL | 1041/1042 |
| 51 (0x33) | 518 | M3 RTD4 (5) | Get | RTD Temperature reading (ºC) | | REAL | 1043/1044 |
| 52 (0x34) | 519 | M3 RTD5 (5) | Get | RTD Temperature reading (ºC) | | REAL | 1045/1046 |
| 53 (0x35) | 520 | M3 RTD6 (5) | Get | RTD Temperature reading (ºC) | | REAL | 1047/1048 |
| 54 (0x36) | 521 | M3 RTD7 (5) | Get | RTD Temperature reading (ºC) | | REAL | 1049/1050 |
| 55 (0x37) | 522 | M3 RTD8 (5) | Get | RTD Temperature reading (ºC) | | REAL | 1051/1052 |

(1) For start records, current and unbalance are maximum values recorded during the start. Voltages are the minimum values recorded during the start.
(2) Phase A differential current for firmware > 2.30
(3) Phase B differential current for firmware > 2.30
(4) Phase C differential current for firmware > 2.30
(5) Ignore this value for firmware > 2.30


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