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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. Outline Drawing 1

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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.

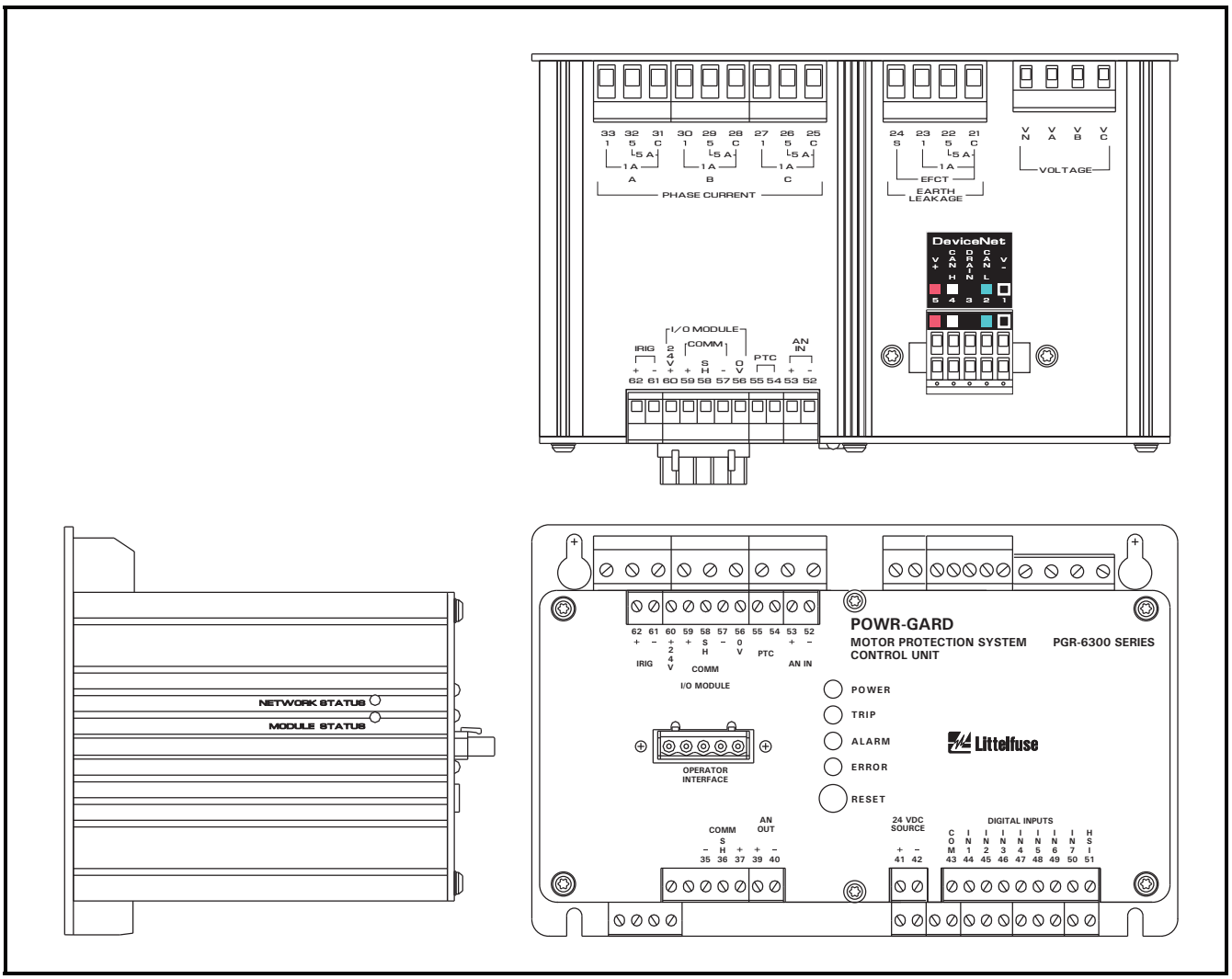


FIGURE 1. Outline Drawing.

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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 0 = 125 kb 1 = 250 kb 2 = 500 kb	0, 0, 2	USINT
3		Buss-Off Interrupt	Get/Set	Define processing of BOI 0 = Hold CAN in reset 1 = Automatic CAN reset 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. Writing any value clears the counter. 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. 0 = Disable 1 = Trip1 2 = Trip2 3 = Trip3 4 = Trip1 & Trip2 5 = Trip1 & Trip3 6 = Trip1 & Trip2 & Trip3 7 = Trip2 & Trip3	0, 0, 7	UINT
101 (0x65)	471	Net Alarm Action	Get/Set	Action taken on communication error. 0 = Disable 1 = Alarm1 2 = Alarm2 3 = Alarm3 4 = Alarm1 & Alarm2 5 = Alarm1 & Alarm3 6 = Alarm1 & Alarm2 & Alarm3 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] 0 = None (Default) 1 = Basic Overload (0x02) 2 = Basic Motor Starter (0x03) 3 = Extended Contactor (0x04) 4 = Extended Motor Starter (0x05)	0, 0, 4	UINT
101 (0x65)	473	Polled Prod ID	Get/Set	Specifies Input assembly ID. [2] 0 = None (empty EPATH) 1 = Basic Overload (0x32) 2 = Extended Overload (0x33) 3 = Basic Motor Starter (0x34) 4 = Extended Motor Starter 1 (0x35) 5 = Extended Motor Starter 2 (0x36) (Default) 6 = Status/Meters/RTD's (0x64) 7 = Status/Meters (0x65) 8 = Status (0x66) 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 0 = nonexistent 1 = configuring 3 = established 4 = timed out 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 1 = Auto Delete 3 = Deferred Delete	1, 1, 3 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 0 = nonexistent 1 = configuring 3 = established 4 = timed out	0, 0, 4	USINT
2		Instance Type	Get	Indicates either IO or messaging connection 0 = Explicit message 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 0 = Transition to time out 1 = Auto Delete 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

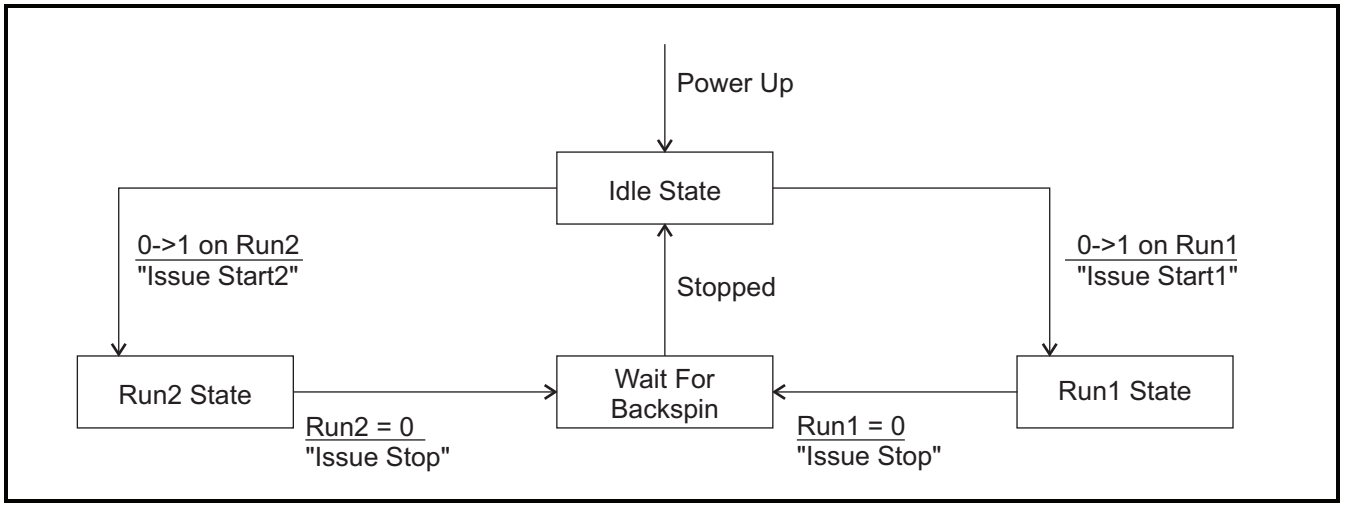
Assembly Class (4), Instance (0x05), Attribute (3) – Output
Consumed Connection Path = "62 30 35"

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. 0 = Stop 1 = Start 1 2 = Start 2 3 = Reset Trips 4 = Set RTC 5 = Clear Data Logging Records 6 = Clear Trips Counters 7 = Clear Energy Totals 8 = Clear Running Time 9 = Emergency I²t Reset 10 = Select Local-Input Ctrl 11 = Release Local-Input Ctrl 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. 0 = Disable 1 = Trip1 2 = Trip2 3 = Trip3 4 = Trip1 & Trip2 5 = Trip1 & Trip3 6 = Trip1 & Trip2 & Trip3 7 = Trip2 & Trip3	0,0,7	UINT	1278
103 (0x67)	546	DIF Error Alarm Action	Get/Set	DIF Module Error alarm action. 0 = Disable 1 = Alarm1 2 = Alarm2 3 = Alarm3 4 = Alarm1 & Alarm2 5 = Alarm1 & Alarm3 6 = Alarm1 & Alarm2 & Alarm3 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 0 = Disable 1 = Trip1 2 = Trip2 3 = Trip3 4 = Trip1 & Trip2 5 = Trip1 & Trip3 6 = Trip1 & Trip2 & Trip3 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 1 = OPI cannot select REMOTE	0, 0, 1	UINT	239
109 (0x6D)	170	OPI Control	Get/Set	0 = Enable OPI motor control 1 = Disable OPI motor control	0, 0, 1	UINT	240
110 (0x6E)	171	OPI Local	Get/Set	0 = Enable OPI to select LOCAL 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 0 = Include in group 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 0 = Include in group 1 = Not in group	0, 0, 1	UINT	243
114 (0x72)	175	RemGrpOPI	Get/Set	Bind Net start sources to the REMOTE group 0 = Include in group 1 = Not in group	0, 0, 1	UINT	244
115 (0x73)	176	Starter Type	Get/Set	Selects the starter type 0 = Protection Only 1 = Full Voltage Non-Reversing 2 = Adjustable-Speed Drive 3 = Soft Start 4 = Full Voltage Reversing 5 = Two Speed * 6 = Reactor/Resistor Closed Transition. 7 = Reactor/Resistor Open Transition. 8 = Slip Ring 9 = Soft Start With Bypass 10 = Port Winding * 11 = Double Delta * 12 = Autotransformer 13 = Two Winding * 14 = Wye-Delta Open Trans. * 15 = Wye-Delta Closed Trans. * * 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 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 0 = Time Transfer 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 0 = None 1 = Starter RLYA 2 = Starter RLYB 3 = Starter RLYC 4 = Starter RLYD 5 = Trip1 6 = Alarm1 7 = Aux 8 = Interlock 9 = Local 10 = Current Detected 11 = Run Mode 12 = Start Sequence Complete 13 = Thermal Lockout 14 = None 15 = Watchdog 16 = Trip3 17 =Alarm2 18 = Alarm3 19 = Trip1 Pulse 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 Bit 0: 1 = Trip (Trip1 or Trip3) Bit 1: 1 = Alarm (Alarm 1, 2, 3) Bit 2: 1 = Trip2 Bit 3: 1 = Interlocks Not Valid Bit 4: 1 = Start Lock Active Bit 5: 1 = Stop Input Active		WORD	1096
145 (0x91)	199	Motor Status	Get	Bit 0: 1 = I > Threshold Bit 1: 1 = 10% < I < 125% for 10 s Bit 2: 1 = Tach at Full Speed Bit 3: 1 = I > 120% FLA Bit 4: 1 = Temperature Bypassed		WORD	1097
146 (0x92)	200	Starter Status	Get	1 = Start 1 2 = Run 1 (Sequence Complete) 3 = Start 2 4 = Run 2 (Sequence Complete) 5 = Stop 6 = Backspin Timer Active		UINT	1098
147 (0x93)	201	Digital Inputs	Get	Bit 0: IN1 Voltage Detected Bit 1: IN2 Voltage Detected Bit 2: IN3 Voltage Detected Bit 3: IN4 Voltage Detected Bit 4: IN5 Voltage Detected Bit 5: IN6 Voltage Detected Bit 6: IN7 Voltage Detected		WORD	1099
148 (0x94)	202	Relay Outputs	Get	Bit 0: Relay 1 Energized Bit 1: Relay 2 Energized Bit 2: Relay 3 Energized Bit 3: Relay 4 Energized 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 1 = Trip1 2 = Trip2 3 = Trip3 4 = Trip1 & Trip2 5 = Trip1 & Trip3 6 = Trip1 & Trip2 & Trip3 7 = Trip2 & Trip3	1, 0, 7	UINT	8
101 (0x65)	2	Thermal Model	Get/Set	0 = NEMA 1 = I^2t	0, 0, 1	UINT	9
102 (0x66)	3	Start Inhibit	Get/Set	Inhibits start if I^2t < Thermal Lockout Level 0 = Enable 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 1 = Alarm1 2 = Alarm2 3 = Alarm3 4 = Alarm1 & Alarm2 5 = Alarm1 & Alarm3 6 = Alarm1 & Alarm2 & Alarm3 7 = Alarm2 & Alarm3	1, 0, 7	UINT	25
111 (0x6F)	12	V Connection	Get/Set	Voltage Input Connection 0 = None 1 = 1PT 2 = 2PT 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 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. 0= 1 Start Per Hour, 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 0 = Disable 1 = Trip1(1) 2 = Trip2 3 = Trip3 4 = Trip1 & Trip2 5 = Trip1 & Trip3 6 = Trip1 & Trip2 & Trip3 7 = Trip2 & Trip3 (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 0 = Disabled 1 = Generic (Trip1, Alarm1 enabled) 2 = ASD sets sampling frequency 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 0 = Phase Current 1 = Earth Leakage 2 = Thermal Capacity 3 = Max Stator RTD 4 = Max Bearing RTD 5 = Max Load RTD 6 = Max Ambient RTD 7 = Voltage 8 = Unbalance (I) 9 = Power Factor 10 = Real Power 11 = Reactive Power 12 = Apparent Power 13 = Zero (4 mA) 14 = Full Scale (20 mA) 15= Speed 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. 0 = Disable Trips 1 = Trip1(1) 2 = Trip2 3 = Trip3 4 = Trip1 & Trip2 5 = Trip1 & Trip3 6 = Trip1 & Trip2 & Trip3 7 = Trip2 & Trip3 (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. 0 = Disable Alarms 1 = Alarm1 2 = Alarm2 3 = Alarm3 4 = Alarm1 & Alarm2 5 = Alarm1 & Alarm3 6 = Alarm1 & Alarm2 & Alarm3 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. 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 0 = Record Empty 1 = Triggered by start 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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