Watlow’s Series SD6 with DeviceNet offers excellent control and application flexibility in a 1/16th DIN panel mount package.

The Series SD6 with DeviceNet has successfully passed the rigorous testing requirements of ODVA and is also SEMI-SIG compliant.

This single-channel controller includes a universal sensor input with two outputs that can be configured as heat, cool, or alarm. The DeviceNet communications interface is supplied with either of two standard connectors, a closed style M12 (Semi-SIG compliant) or an open style connector.

The Series SD6 with DeviceNet is only available with one or two outputs.

Ordering Information and Model Numbers

| SD6_ | _ _ _ A - D _ _ _ |

Control Type
C = PID Control
L = Limit Control
R = Ramping

Power Supply
H = 100 to 240V~ (ac)
L = 24 V (ac/dc)

Output 1
C = Switched dc
K = SSR, Form A, 0.5 A
F = Universal process
J = Mechanical relay, Form A, 2 A

Output 2
A = None
C = Switched dc
K = SSR, Form A, 0.5 A
J = Mechanical relay, Form A, 2 A

DeviceNet Communications
N = Open style connector
S = Closed style M12 connector (Semi-SIG compliant)

Display Colors and Custom Options
RG = Red Green
RR = Red Red
XX = Custom options, special overlays, etc.

Keys and Display

Diagnostic Indicator Lights
Provide operating and diagnostic information about the module (MOD) and network (NET).

SD6C-XXXA-DXXX shown.

<table>
<thead>
<tr>
<th>Indicator Light</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>No power is applied to the device.</td>
</tr>
<tr>
<td>Flashing Green-Red</td>
<td>The device is performing a self-test.</td>
</tr>
<tr>
<td>Flashing Red</td>
<td>The controller is in Auto mode and an input error condition [Er;in] exists. This indication does not occur if the controller is in the Manual mode when an input error occurs.</td>
</tr>
<tr>
<td>Red</td>
<td>A checksum error [Er;CS] has occurred.</td>
</tr>
<tr>
<td>Green</td>
<td>The device is operating normally.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator Light</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>The device is not online. The device has not completed the duplicate MAC ID test yet. The device may not be powered. Look at Table 1, Module Status Indicator Light.</td>
</tr>
<tr>
<td>Green</td>
<td>The device is online and has connections in the established state. For a Group 2 Only device it means that the device is allocated to a Master.</td>
</tr>
<tr>
<td>Red</td>
<td>Failed communication device. The device has detected an error that has rendered it incapable of communicating on the network (duplicate MAC ID or Bus-off).</td>
</tr>
<tr>
<td>Flashing Green</td>
<td>The device is online, but no connection has been allocated or an explicit connection has timed out.</td>
</tr>
<tr>
<td>Flashing Red</td>
<td>A poll connection has timed out.</td>
</tr>
</tbody>
</table>
**Dimensions**

**Series SD6 open style connector**

![Open Style Connector Diagram]

**Series SD6 closed style M12 connector, (Semi-SIG compliant)**

![Closed Style Connector Diagram]

**Node Address Switches**

Set the controller's MAC ID with the top two rotary switches on the side of the case. Set the most significant digit (MSD) with the top switch and the least significant digit (LSD) with the middle switch. For example, to set the address to 23, set the MSD to 2 and the LSD to 3. If the switch is set to "PGM", the last node address at power down is used.

**Data Rate Switch**

Set the Data Rate switch (below the address switches) to the network data rate. If the switch is set to "PGM", the last baud rate at power down is used.

**Communications Setup**

**Open style connector only (SD6X-XXXA-DNXX)**

Baud Rate (125, 250, 500KB) and Node Address or MAC ID (0 - 63) can be selected from the front panel (Setup Menu) or via the software. The factory default values are as follows:

- **Baud Rate**: 125KB
- **Address**: 63

**Closed style (M12 connector) only (SD6X-XXXA-DSXX)**

The three switches on the side of the unit define the address and baud rate (See picture above for closed style SD6). If the MSD switch is in the "P" (Program) position, the address will be software programmable. Likewise, if the Data Rate switch is set to "PGM" the data rate will be software programmable.

On power down, the unit will always come back into the network with its last known baud rate and address. The factory default values are as follows:

- **Baud Rate**: 500KB
- **Address**: 63

**Pinout**

<table>
<thead>
<tr>
<th>Open style</th>
<th>Pin</th>
<th>M12 Closed style</th>
<th>Signal</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>2</td>
<td>V+</td>
<td>DeviceNet power power</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>4</td>
<td>CAN_H</td>
<td>Positive side of the DeviceNet bus</td>
<td></td>
</tr>
<tr>
<td>Grey (bare)</td>
<td>1</td>
<td>Drain</td>
<td>Shield interconnect</td>
<td></td>
</tr>
<tr>
<td>Blue</td>
<td>5</td>
<td>CAN_L</td>
<td>Negative side of the DeviceNet bus</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>3</td>
<td>V-</td>
<td>DeviceNet power return</td>
<td></td>
</tr>
</tbody>
</table>

**Table 3. DeviceNet Connectors**
DeviceNet Communications

This appendix describes the DeviceNet protocol as it is implemented in the Series SD6 controller. It primarily describes the objects and attributes accessible via the DeviceNet protocol. It may be necessary to refer to the DeviceNet specification as a compliment to the information found here.

DeviceNet Overview

The SD6 controller supports the object-based modeling used in the DeviceNet concepts. This product is configured as a Group 2 Only Slave device using the Predefined Master/Slave Connection Set.

There are two main categories of objects, DeviceNet Objects and Application Objects. DeviceNet objects handle what is necessary for networking and communications. Application Objects have access to the SD6 controller's parameters and data.

Addressing

All data is referenced based upon a four-part definition: Node (MAC ID) + Class + Instance + Attribute.

Table 4. Four Components to an Address, with Ranges

<table>
<thead>
<tr>
<th>Component</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node Address (MAC ID)</td>
<td>[0 to 63]</td>
</tr>
<tr>
<td>Class ID</td>
<td>[1 to 255]</td>
</tr>
<tr>
<td>Instance ID</td>
<td>[0 to 255]</td>
</tr>
<tr>
<td>Attribute ID</td>
<td>[1 to 255]</td>
</tr>
</tbody>
</table>

Data Types

The descriptions of attributes in the following sections includes the data type for each. Table 5 lists and describes these data types.

Table 5. Descriptions of Elementary Data Types

<table>
<thead>
<tr>
<th>Data Type Name</th>
<th>Data Type Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOOL</td>
<td>Logical Boolean with values TRUE and FALSE</td>
</tr>
<tr>
<td>BYTE</td>
<td>Bit string — 8 bits</td>
</tr>
<tr>
<td>EPATH</td>
<td>DeviceNet path segments</td>
</tr>
<tr>
<td>INT</td>
<td>Signed 16-bit integer value</td>
</tr>
<tr>
<td>SHORT_STRING</td>
<td>Character string (1 byte per character, 1 byte length indicator)</td>
</tr>
<tr>
<td>UDINT</td>
<td>Unsigned 32-bit integer value</td>
</tr>
<tr>
<td>UINT</td>
<td>Unsigned 16-bit integer value</td>
</tr>
<tr>
<td>USINT</td>
<td>Unsigned 8-bit integer value</td>
</tr>
<tr>
<td>WORD</td>
<td>Bit string — 16 bits</td>
</tr>
</tbody>
</table>
Group 2 Only Server
A slave (server) device that is UCMM incapable and must use the Predefined Master/Slave Connection Set to establish communications (at a minimum, the Predefined Master/Slave Explicit Messaging Connection must be supported). A Group 2 Only device can transmit and receive only those identifiers defined by the Predefined Master/Slave Connection Set (reference DeviceNet Spec., Vol. 1, Sec. 2).

Master/Slave Connections
The SD6 supports the Predefined Master/Slave Connection Set (refer to DeviceNet Specification, Vol. 1, Sec. 7). The general model calls for the utilization of an Explicit Messaging Connection to manually create and configure Connection Objects within each connection end-point. This chapter uses the general model as a basis for the definition of a set of connections that facilitate communications typically seen in a master-slave relationship. These Connections are referred to collectively as the Predefined Master/Slave Connection Set.

The master is the device that gathers and distributes I/O data for the process controller. Slaves are the devices from which the master gathers I/O data and to which the master distributes I/O data. The master “owns” the slaves whose MAC IDs appear in its scan list. To determine with what slaves it will communicate, the master examines its scan list and sends commands accordingly. Except for the Duplicate MAC ID Check, a slave cannot initiate any communication before being told by the master to do so.

Electronic Data Sheet (EDS)
The EDS allows a configuration tool to automate the device configuration process. The EDS specification provides an open standard for device configuration and compatibility among all DeviceNet products. (Refer to the DeviceNet Specification, Vol. 1, Chapter 4). You can obtain a copy of the EDS at www.watlow.com and search on keywords SD EDS, request a copy by sending an e-mail to wintechsupport@watlow.com or by calling an Application Engineer at +1 (507) 494-5656 between 7 a.m. and 5 p.m. Central Standard Time (CST).

DeviceNet Objects
The following sections describe the standard DeviceNet objects and the SD6-specific application objects.

Identity Object
Class Code: 01hex
The Identity object provides identification information for the device. This includes the device manufacturer, product name, product type, serial number and revision. Refer to the DeviceNet Specification (Vol. II, Sec. 6-2) for complete requirements.

Status Attribute – This is a bit field that represents the current status of the device. Two of the bits in the Status attribute, the Minor Recoverable Fault and Major Recoverable Fault bits, shall never be set. In accordance with the semiconductor industry standard, all module level faults are considered to be unrecoverable faults.

Table 6. Identity Object Revision History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Initial Release</td>
</tr>
</tbody>
</table>

Table 7. Identity Object Class Attributes

<table>
<thead>
<tr>
<th>Number</th>
<th>Access Rule</th>
<th>Namers</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
</table>
Table 8. Identity Object Instance Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Get</td>
<td>Vendor ID</td>
<td>UNIT</td>
<td>Identification of each vendor by number. This is Vendor ID 153.</td>
<td>See “Semantics” DeviceNet Spec, Vol. II, Sec. 6-2.2</td>
</tr>
<tr>
<td>2</td>
<td>Get</td>
<td>Product Type</td>
<td>UNIT</td>
<td>Identification of general type of product. This is Type 0.</td>
<td>See “Semantics” DeviceNet Spec, Vol. II, Sec. 6-2.2</td>
</tr>
<tr>
<td>3</td>
<td>Get</td>
<td>Product Code</td>
<td>UNIT</td>
<td>WATLOW SD6-DN, CODE IS 105 WATLOW SD6-DS, CODE IS 104</td>
<td>See “Semantics” DeviceNet Spec, Vol. II, Sec. 6-2.2</td>
</tr>
<tr>
<td>4</td>
<td>Get</td>
<td>Revision</td>
<td>STRUCT of:</td>
<td>Revision of the item the Identity Object represents</td>
<td>See “Semantics” DeviceNet Spec, Vol. II, Sec. 6-2.2</td>
</tr>
<tr>
<td>5</td>
<td>Get</td>
<td>Status</td>
<td>WORD</td>
<td>Summary status of device</td>
<td>See “Semantics” DeviceNet Spec, Vol. II, Sec. 6-2.2</td>
</tr>
<tr>
<td>6</td>
<td>Get</td>
<td>Serial Number</td>
<td>UDINT</td>
<td>Serial number of device Set in accordance with a Watlow manufacturing guidelines.</td>
<td>See “Semantics” DeviceNet Spec, Vol. II, Sec. 6-2.2</td>
</tr>
<tr>
<td>7</td>
<td>Get</td>
<td>Product Name</td>
<td>SHORT_STRING</td>
<td>Human readable ID: “Watlow Series SD6”</td>
<td>See “Semantics” DeviceNet Spec, Vol. II, Sec. 6-2.2</td>
</tr>
</tbody>
</table>

**Class Services:** NONE

**Instance Services:**
- RESET (0,1) GET ATTRIBUTE SINGLE

**DeviceNet Object**

**Class Code:** 03hex

The DeviceNet Object is used to provide the configuration and status of a physical attachment to DeviceNet.

The **MACID** attribute provides the network address for the device. If the rotary switches used to specify the device MACID are set to a valid MACID, i.e. a value from 0 to 63, the MACID attribute shall have Get Only access. If the rotary switches are set to the programmable mode, the MACID attribute shall have Get and Set access.

The **Baud Rate** attribute specifies the data rate for the device. If the rotary switch used to set the data rate specifies a valid data rate, i.e. 125, 250, or 500K Baud, the Baud Rate attribute shall have Get Only access. If the rotary switches are set to the software programmable mode, the MACID shall have Get and Set access.

The **Allocate Master/Slave Connection Set** service of the DeviceNet object shall be a required service for all devices. This implies a requirement that all devices are Group 2 devices on the DeviceNet network. Additionally, all devices shall support, as a minimum, the Explicit connection and the I/O Poll connection in the Master/Slave connection set.

The **Release Master/Slave Connection Set** service of the DeviceNet object shall be a required service.

Refer to the DeviceNet Specification (Vol. I, Sec. 5-5) for complete requirements.

Table 9. DeviceNet Object Revision History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Initial Release</td>
</tr>
<tr>
<td>02</td>
<td>Modification of Baud Rate Attribute Behavior</td>
</tr>
</tbody>
</table>
### Table 10. DeviceNet Object Class Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Get</td>
<td>Revision</td>
<td>UINT</td>
<td>Revision of this object</td>
<td>The revision level of this object. This is now at 2.</td>
</tr>
</tbody>
</table>

### Table 11. DeviceNet Object Instance Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Instance</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Get/Set*</td>
<td>MACID</td>
<td>USINT</td>
<td>Node Address</td>
<td>Range 0.. 63</td>
</tr>
<tr>
<td>2</td>
<td>Get/Set*</td>
<td>Baud Rate</td>
<td>USINT</td>
<td>Baud Rate</td>
<td>Range 0.. 2</td>
</tr>
<tr>
<td>4</td>
<td>Get</td>
<td>Bus-Off Counter</td>
<td>USINT</td>
<td>Number of times CAN went to the bus-off state</td>
<td>Range 0.. 255</td>
</tr>
<tr>
<td>5</td>
<td>Get</td>
<td>Allocation Information</td>
<td>STRUCT of:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Allocation Choice Byte</td>
<td>BYTE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Master’s MAC ID</td>
<td>USINT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Class Services:** GET ATTRIBUTE SINGLE

**Instance Services:** “SET ATTRIBUTE SINGLE (when MACID or BAUD RATE in PRG MODE), GET ATTRIBUTE SINGLE, ALLOCATE M/S CONNECTION SET, RELEASE M/S CONNECTION SET.

**Assembly Object – “Static”**

**Class Code:** 04hex

The Assembly Object binds attributes of multiple objects, which allows data to or from each object to be sent or received over a single connection. Assembly objects can be used to bind input data or output data. The terms “input” and “output” are defined from the network’s point of view.

An input will produce data on the network and an output will consume data from the network.

The term “Static” implies: assemblies with member lists defined by the device profile or by the manufacturer of the product. The Instance number, number of Members, and member list are fixed.

### Table 12. Assembly Object Revision History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Initial Release</td>
</tr>
<tr>
<td>02</td>
<td>Class-specific Service Code 4B and 4C obsolete</td>
</tr>
</tbody>
</table>

### Table 13. Assembly Object Instance Attributes

<table>
<thead>
<tr>
<th>Instance #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Instance</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Get/Set</td>
<td>Poll Output</td>
<td>LONG + USINT</td>
<td>Poll Output</td>
<td>See Poll output in section 6.2.4</td>
</tr>
<tr>
<td>101</td>
<td>Get</td>
<td>Poll Input</td>
<td>USINT + LONG + USINT + USINT</td>
<td>Poll Input</td>
<td>See Poll input in section 6.2.4</td>
</tr>
</tbody>
</table>
Poll Connection

The poll connection allows the master to write set point and process value in one connection. It also allows the reading of all process value, set point and alarm status.

Table 14. Static Input – Instance 101 in the Assembly Object - 7 bytes

<table>
<thead>
<tr>
<th>Byte(s)</th>
<th>Parameter and Description</th>
<th>Size of Data</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Exception Status Byte - Byte reserved for future use.</td>
<td>USINT</td>
<td>Always returns a value of zero.</td>
</tr>
<tr>
<td>1-4</td>
<td>Process Value - Actual value of process input</td>
<td>DINT</td>
<td>-1999.000 to 9999.000</td>
</tr>
<tr>
<td>5</td>
<td>Alarm Status - Indicates when alarm outputs are in alarm condition. Breakdown of byte: Bit 0: alarm low 1 status Bit 1: alarm high 1 status Bit 2: alarm low 2 status Bit 3: alarm high 2 status Bit 4 to bit 7: unused</td>
<td>USINT</td>
<td>For each bit: (0) None (1) Alarm</td>
</tr>
<tr>
<td>6</td>
<td>Control Mode - Breakdown of byte: Bit 0: monitor the auto / manual status. Bit 1 to bit 7: unused</td>
<td>USINT</td>
<td>(0) Auto mode (1) Manual mode</td>
</tr>
</tbody>
</table>

Table 15. Static Output – Instance 100 in the Assembly Object - 5 bytes

<table>
<thead>
<tr>
<th>Byte(s)</th>
<th>Parameter and Description</th>
<th>Size of Data</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>Closed Loop Set Point - Control set point used in the auto mode</td>
<td>DINT</td>
<td>-1999.000 to 9999.000</td>
</tr>
<tr>
<td>4</td>
<td>Control Modes - Breakdown of byte: Bit 0: Selects whether the controller is in the auto or manual mode. Bit 1: Selects whether the set point adjustment is done via the SD front panel or through DeviceNet. Bit 2: Selects whether Auto/Manual mode selection is done via the SD front panel or through DeviceNet. Bit 3 to Bit 7: Not used</td>
<td>USINT</td>
<td>(0) DeviceNet (1) SD front panel</td>
</tr>
<tr>
<td></td>
<td>Bit 1: Selects whether the set point adjustment is done via the SD front panel or through DeviceNet.</td>
<td></td>
<td>(0) DeviceNet (1) SD front panel</td>
</tr>
<tr>
<td></td>
<td>Bit 3 to Bit 7: Not used</td>
<td></td>
<td>N/A</td>
</tr>
</tbody>
</table>
**Class Services:** NONE

**Instance Services:**
- 0x0E GET ATTRIBUTE SINGLE
- 0x10 SET ATTRIBUTE SINGLE

**Additional Poll Connection information:**
- In the event of the input error, a valid process value reading is no longer available. The poll connection will return a value of 9999.999 for the process value while the error condition exists.
- Bit 1 and bit 2 of byte 4 in the output poll connection select whether set point and auto / manual mode values are changed from the SD’s front panel or else over DeviceNet through the poll connection. Setting the bit to “zero” will relinquish control of the parameter to the DeviceNet master device (typically the master is a PLC). Setting the bit to “one” will retain control of the parameter locally at the front panel of the Series SD controller. If there is a loss of communications, control of auto / manual mode and adjustment of set point will automatically return to the Series SD front panel regardless of the settings of byte 4 in the output poll connection.

**Connection Object**

**Class Code:** 05hex

The Connection Class allocates and manages the internal resources associated with both I/O and Explicit Messaging Connections. The specific instance generated by the Connection Class is referred to as a Connection Instance or a Connection Object.

A Connection Object within a particular module actually represents one of the end-points of a Connection. It is possible for one of the Connection end-points to be configured and “active” (e.g., transmitting) without the other end-point(s) being present. Connection Objects are used to model the communication specific characteristics of a particular application-to-application relationship. A specific Connection Object Instance manages the communication-specific aspects related to an end-point.

![Diagram of Connection Object](attachment:connection_diagram.png)
Explicit Connection

The Explicit Connection Object defines the configuration for the Explicit connection to the device. The Explicit Connection object is an instance of the Connection Object defined in the DeviceNet Specification. All devices that are compliant with the DeviceNet Specification must support at least one instance of the Connection object with a connection type of Explicit.

I/O Connection

I/O Connection objects define the configuration for the I/O connections to the device. Each I/O Connection object is an instance of the Connection object defined in the DeviceNet Specification. All devices must be Group 2 devices and must support, as a minimum, the I/O Poll connection in the Master/Slave connection set.

Watchdog Timeout Action Attribute defines the action performed by the I/O Connection object in the event the Inactivity/watchdog Timer for the connection expires. For the I/O Connection object, Auto Reset shall be an invalid value for the Watchdog Timeout Action attribute. (ref. SIG Specification sec. 4.1.5.1.1)

Produced Connection Path Attribute defines the Application object class, instance, and attribute that produces data over the I/O connection. For all I/O connections, the Produced Connection Path shall be a Logical Segment, as defined in the DeviceNet Specification, and shall point to the Data Attribute of an Assembly object. The behavior of the device shall be such that, if the Produced Connection Path attribute is modified, the Produced Connection Size Attribute shall be modified internally to accurately reflect the size of the assembly produce by the I/O connection. For all I/O connection objects in the Master/Slave Connection Set, if the Produced Connection Path attribute is modified, the new attribute value shall be saved in Non-Volatile (NV) memory and shall be the default value when the connection is allocated. (ref. SIG Specification sec. 4.1.5.1.2).

Produced Connection Size Attribute specifies the maximum number of data bytes produced over the I/O connection. The Produced Connection Size attribute shall have Get Only access for all I/O connection objects. The Produced Connection Size attribute shall accurately reflect the size of the assembly produced over the I/O connection. (ref. SIG Specification sec. 4.1.5.1.3).

Consumed Connection Path Attribute defines the Application object class, instance, and, optionally, attribute that consumes data received over the I/O connection. For all I/O connections over which the device is the Server (as specified by the Direction field of the Transport Class Trigger attribute), then special requirements as defined in the Semi SIG specification shall be followed. (ref. SIG Specification sec. 4.1.5.1.4)

Consumed Connection Size Attribute specifies the maximum number of data bytes consumed by the I/O connection objects. The Consumed Connection Size attribute shall accurately reflect the size of the assembly consumed by the I/O connection, as specified by the Consumed Connection Path attribute of the Data With ACK Path List attribute of the Acknowledge Handler object. (ref. SIG Specification sec. 4.1.5.1.5)

Refer to the Semi SIG specification (Sec. 4.1.4/5) for Semi requirements.

Refer to the DeviceNet Specification (Vol. II, Sec. 6-3) for complete requirements.

<table>
<thead>
<tr>
<th>Table 16. Connection Object Revision History</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revision</strong></td>
</tr>
<tr>
<td>01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 17. Connection Object Class Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute #</td>
</tr>
<tr>
<td>--------------</td>
</tr>
</tbody>
</table>
### Table 18. Connection Object Instance Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Get</td>
<td>State</td>
<td>USINT</td>
<td>State of the object</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Get</td>
<td>Instance Type</td>
<td>USINT</td>
<td>Indicates either I/O or Messaging</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Get</td>
<td>Transport Class Trigger</td>
<td>BYTE</td>
<td>Defines behavior of the Connection</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Get</td>
<td>Produced Connection ID</td>
<td>UINT</td>
<td>Placed in CAN Identifier Field when the Connection transmits</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Get</td>
<td>Consumed Connection ID</td>
<td>UINT</td>
<td>CAN Identifier Field value that denotes message to be received</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Get</td>
<td>Initial Comm Characteristics</td>
<td>BYTE</td>
<td>Defines the Message Group(s) across which productions and consumption associated with this Connection when it occurs</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Get</td>
<td>Produced Connection Size</td>
<td>UNIT</td>
<td>Maximum number of bytes transmitted across this Connection</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Get</td>
<td>Consumed Connection Size</td>
<td>UNIT</td>
<td>Maximum number of bytes received across this Connection</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Get/Set</td>
<td>Expected Packet Rate</td>
<td>UNIT</td>
<td>Will round up to the next 100 mSec. Increment.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Get/Set</td>
<td>Watchdog Timeout Action</td>
<td>USINT</td>
<td>Defines how to handle Inactivity/Watchdog timeouts</td>
<td>For Explicit Connection only: 1 = Auto Delete 3 = Deferred Delete</td>
</tr>
<tr>
<td>13</td>
<td>Get</td>
<td>Produced Connection Path Length</td>
<td>UINT</td>
<td>Number of bytes in the Produced Connection Path Attribute</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Get</td>
<td>Produced Connection Path</td>
<td>EPATH</td>
<td>Specifies the Application Object(s) whose data is to be produced by this Connection Object. See Appendix I, DeviceNet Specification</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Get</td>
<td>Consumed Connection Path Length</td>
<td>UINT</td>
<td>Number of bytes in the Consumed Connection Path Length</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Get</td>
<td>Consumed Connection Path</td>
<td>EPATH</td>
<td>Specifies the Application Object(s) that are to receive data consumed by this Connection Object. See Appendix I, DeviceNet Specification</td>
<td></td>
</tr>
</tbody>
</table>
**Home Object**

**Class Code:** 64hex

The Home Object provides access to parameters used for the default display of the Series SD6.

**Table 19. Home Object Revision History**

<table>
<thead>
<tr>
<th>Revision</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Initial Release</td>
</tr>
</tbody>
</table>

**Table 20. Home Object Class Attributes**

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Get</td>
<td>Revision</td>
<td>UINT</td>
<td>Revision of this object</td>
<td>The revision level of this object (currently 1)</td>
</tr>
<tr>
<td>2</td>
<td>Get</td>
<td>Max Instance</td>
<td>UINT</td>
<td>Max allowed Instances of this object</td>
<td>Always 1 for this Class</td>
</tr>
</tbody>
</table>
Table 21. Home Object Instance Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Get</td>
<td>Process Value</td>
<td>DINT</td>
<td>Current process value</td>
<td>-1999 to 9999 (*1000), °C or units</td>
</tr>
<tr>
<td>101</td>
<td>Get/Set</td>
<td>Closed Loop Set Point</td>
<td>DINT</td>
<td>Current closed loop set point</td>
<td>Range is from set point low limit to set point high limit</td>
</tr>
<tr>
<td>102</td>
<td>Get</td>
<td>Filtered Process Value</td>
<td>DINT</td>
<td>Filtered process value</td>
<td>-1999 to 9999 (*1000), °C or units</td>
</tr>
<tr>
<td>103</td>
<td>Get/Set</td>
<td>Open Loop Output Power</td>
<td>INT</td>
<td>Current open loop output power (used in manual mode)</td>
<td>-100.0 to 0.0% (*100) if any output is set to cool; 0.0 to 100.0% (*100) if any output is set to heat</td>
</tr>
<tr>
<td>104</td>
<td>Get</td>
<td>Current Ramp Set Point</td>
<td>DINT</td>
<td>Current working control set point for the ramp that is in process</td>
<td>-1999 to 9999 (*1000), °C or units</td>
</tr>
<tr>
<td>106</td>
<td>Get</td>
<td>Input Error</td>
<td>UINT</td>
<td>There is an analog input error</td>
<td>(0) No error (1) Error</td>
</tr>
<tr>
<td>107</td>
<td>Get</td>
<td>Alarm Low 1 Status</td>
<td>BOOLEAN</td>
<td>There is an alarm 1 low side alarm</td>
<td>(0) None (1) Alarm</td>
</tr>
<tr>
<td>108</td>
<td>Get</td>
<td>Alarm High 1 Status</td>
<td>BOOLEAN</td>
<td>There is an alarm 1 high side alarm</td>
<td>(0) None (1) Alarm</td>
</tr>
<tr>
<td>109</td>
<td>Get</td>
<td>Alarm Low 2 Status</td>
<td>BOOLEAN</td>
<td>There is an alarm 2 low side alarm</td>
<td>(0) None (1) Alarm</td>
</tr>
<tr>
<td>110</td>
<td>Get</td>
<td>Alarm High 2 Status</td>
<td>BOOLEAN</td>
<td>There is an alarm 2 high side alarm</td>
<td>(0) None (1) Alarm</td>
</tr>
</tbody>
</table>

Class Services:
- 0x0E GET ATTRIBUTE SINGLE

Instance Services:
- 0x0E GET ATTRIBUTE SINGLE
- 0x10 SET ATTRIBUTE SINGLE

NOTE: All successful Explicit Message Responses from a SET service will contain no data. The response will be a two-byte message containing the requester's MAC ID and Service Code (with R/R bit set).

Setup Object

Class Code: 65hex

The Setup Object provides access to parameters that define controller functions.

Table 22. Setup Object Revision History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Initial Release</td>
</tr>
</tbody>
</table>
### Table 23. Setup Object Class Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Get</td>
<td>Revision</td>
<td>UINT</td>
<td>Revision of this object</td>
<td>The revision level of this object (currently 1)</td>
</tr>
<tr>
<td>2</td>
<td>Get</td>
<td>Max Instance</td>
<td>UINT</td>
<td>Max allowed Instances of this object</td>
<td>1 for this Class</td>
</tr>
</tbody>
</table>

### Table 24. Setup Object Instance Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Get/Set</td>
<td>Sensor Type</td>
<td>USINT</td>
<td>Analog input sensor type</td>
<td>(0) Thermocouple</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) RTD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2) MA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(3) VOLT</td>
</tr>
<tr>
<td>101</td>
<td>Get/Set</td>
<td>Thermocouple Linearization</td>
<td>USINT</td>
<td>Thermocouple Type</td>
<td>(0) J</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) K (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2) T</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(3) E</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(4) N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(5) C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(6) D</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(7) PTII</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(8) R</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(9) S</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(10) B</td>
</tr>
<tr>
<td>102</td>
<td>Get/Set</td>
<td>Temperature Units</td>
<td>USINT</td>
<td>Temperature Units</td>
<td>(0) °F</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) °C (default)</td>
</tr>
<tr>
<td>103</td>
<td>Get/Set</td>
<td>Temperature Decimal Places</td>
<td>USINT</td>
<td>Thermocouple/RTD precision</td>
<td>(0) 0 (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) 0.0</td>
</tr>
<tr>
<td>104</td>
<td>Get/Set</td>
<td>Process Decimal Places</td>
<td>USINT</td>
<td>Process precision</td>
<td>(0) 0 (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) 0.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2) 0.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(3) 0.000</td>
</tr>
<tr>
<td>105</td>
<td>Get/Set</td>
<td>InfoSense™</td>
<td>USINT</td>
<td>Enables the sensor feature, which synchronizes the controller with a Watlow sensor</td>
<td>(0) NO (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) YES</td>
</tr>
<tr>
<td>106</td>
<td>Get/Set</td>
<td>InfoSense™ 1</td>
<td>UINT</td>
<td>Set sensor point 1 code</td>
<td>0 to 999 (default is 500)</td>
</tr>
<tr>
<td>107</td>
<td>Get/Set</td>
<td>InfoSense™ 2</td>
<td>UINT</td>
<td>Set sensor point 2 code</td>
<td>0 to 999 (default is 500)</td>
</tr>
<tr>
<td>108</td>
<td>Get/Set</td>
<td>InfoSense™ 3</td>
<td>UINT</td>
<td>Set sensor point 3 code</td>
<td>0 to 999 (default is 500)</td>
</tr>
<tr>
<td>Attribute #</td>
<td>Access Rule</td>
<td>Name</td>
<td>DeviceNet Data Type</td>
<td>Description of Attribute</td>
<td>Semantics of Values</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>------</td>
<td>---------------------</td>
<td>--------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>109</td>
<td>Get/Set</td>
<td>InfoSense™ 4</td>
<td>UINT</td>
<td>Set sensor point 4 code</td>
<td>0 to 999 (default is 500)</td>
</tr>
<tr>
<td>110</td>
<td>Get/Set</td>
<td>Process Scale Low mA</td>
<td>UDINT</td>
<td>Set the low scale for process input</td>
<td>0.00 to 20.00 mA (+ * 1000) (when Sensor Type set to mA, default = 4.00 mA)</td>
</tr>
<tr>
<td>111</td>
<td>Get/Set</td>
<td>Process Scale Low Volts</td>
<td>UDINT</td>
<td>Set the low scale for process input</td>
<td>0.0 to 10.00 V (* 1000) (when Sensor Type set to Volt, default = 0.00 V)</td>
</tr>
<tr>
<td>112</td>
<td>Get/Set</td>
<td>Process Scale High mA</td>
<td>UDINT</td>
<td>Set the high scale for process input</td>
<td>0.00 to 20.00 mA (* 1000) (when Sensor Type set to mA, default = 20.00 mA)</td>
</tr>
<tr>
<td>113</td>
<td>Get/Set</td>
<td>Process Scale High Volts</td>
<td>UDINT</td>
<td>Set the high scale for process input</td>
<td>0.0 to 10.00 V (* 1000) (when Sensor Type set to Volt, default = 0.00 V)</td>
</tr>
<tr>
<td>114</td>
<td>Get/Set</td>
<td>Units Scale Low</td>
<td>DINT</td>
<td>Set the low range for process input units</td>
<td>-1999 to 9999 (* 1000) (default = -1999)</td>
</tr>
<tr>
<td>115</td>
<td>Get/Set</td>
<td>Units Scale High</td>
<td>DINT</td>
<td>Set the high range for process input units</td>
<td>-1999 to 9999 (* 1000) (default = 9999)</td>
</tr>
<tr>
<td>116</td>
<td>Get/Set</td>
<td>Set Point Low Limit Thermocouple</td>
<td>DINT</td>
<td>Set the low range for the set point</td>
<td>Minimum operating range (of sensor) to Set Point High Limit – 0.001 (if Sensor Type = Thermocouple, default = min. for K-Thermocouple) (* 1000)</td>
</tr>
<tr>
<td>117</td>
<td>Get/Set</td>
<td>Set Point Low Limit RTD</td>
<td>DINT</td>
<td>Set the low range for the set point</td>
<td>-328 to Set Point High Limit – 0.001 (if Sensor Type = RTD, default = -328) (* 1000)</td>
</tr>
<tr>
<td>118</td>
<td>Get/Set</td>
<td>Set Point Low Limit mA and volts</td>
<td>DINT</td>
<td>Set the low range for the set point</td>
<td>-1999 to Set Point High Limit – 0.001 (if Sensor Type = V or mA, default = -1999) (* 1000)</td>
</tr>
<tr>
<td>119</td>
<td>Get/Set</td>
<td>Set Point High Limit Thermocouple</td>
<td>DINT</td>
<td>Set the high range for the set point</td>
<td>Units Scale Low to max operating range of sensor, if Input Type = Thermocouple (default = max operating range for K-Thermocouple) (* 1000)</td>
</tr>
<tr>
<td>120</td>
<td>Get/Set</td>
<td>Set Point High Limit RTD</td>
<td>DINT</td>
<td>Set the high range for the set point</td>
<td>Set Point Low Limit + 0.001 to 1472, if Input Type = RTD (default = 1472) (* 1000)</td>
</tr>
<tr>
<td>Attribute #</td>
<td>Access Rule</td>
<td>Name</td>
<td>DeviceNet Data Type</td>
<td>Description of Attribute</td>
<td>Semantics of Values</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>-------------------------------------------</td>
<td>---------------------</td>
<td>-----------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>121</td>
<td>Get/Set</td>
<td>Set Point High Limit mA and volts</td>
<td>DINT</td>
<td>Set the high range for the set point</td>
<td>Set Point Low Limit + 0.001 to 9999, if Input Type = mA or Volt (default = 9999) (* 1000)</td>
</tr>
<tr>
<td>122</td>
<td>Get/Set</td>
<td>Input Filter</td>
<td>USINT</td>
<td>Select filtering action</td>
<td>(1) OFF (no filtering, default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) Filter display only</td>
<td>(2) Filter control input only</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(3) Filter both</td>
<td></td>
</tr>
<tr>
<td>123</td>
<td>Get/Set</td>
<td>Filter Value</td>
<td>UDINT</td>
<td>Set the input filter value, units in seconds</td>
<td>0.0 to 60.0 (default = 0.0) seconds (* 1000)</td>
</tr>
<tr>
<td>124</td>
<td>Get/Set</td>
<td>Output 1 Function</td>
<td>USINT</td>
<td>Set the output 1 function</td>
<td>(0) OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) Process Alarm</td>
<td>(2) Deviation Alarm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(3) Heat Control (default)</td>
<td>(4) Cool Control</td>
</tr>
<tr>
<td>125</td>
<td>Get/Set</td>
<td>Control Method 1</td>
<td>USINT</td>
<td>Set the output 1 control type</td>
<td>(1) Fixed Timed Base (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Only used with PID control</td>
<td>(1) Variable Time Base</td>
</tr>
<tr>
<td>126</td>
<td>Get/Set</td>
<td>Fixed Time Base 1</td>
<td>USINT</td>
<td>Set the time base for fixed time based control</td>
<td>1.0 to 60.0 if Output 1 is a mechanical relay</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.1 to 60.0 if Output 1 is not a mechanical relay</td>
<td>Defaults:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20.0 mechanical relay</td>
<td>5.0 solid-state relay</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.0 switched DC</td>
<td></td>
</tr>
<tr>
<td>127</td>
<td>Get/Set</td>
<td>Power Limit 1</td>
<td>UINT</td>
<td>Set the maximum power output for a control output</td>
<td>0.0 to 100% (default = 100%)</td>
</tr>
<tr>
<td>128</td>
<td>Get/Set</td>
<td>Output Power Scale Low 1</td>
<td>USINT</td>
<td>Set the low end of the range within which the output will scale</td>
<td>0 to 100% (default = 0)</td>
</tr>
<tr>
<td>129</td>
<td>Get/Set</td>
<td>Output Power Scale High 1</td>
<td>USINT</td>
<td>Set the high end of the range within which the output will scale</td>
<td>0 to 100% (default = 100)</td>
</tr>
<tr>
<td>130</td>
<td>Get/Set</td>
<td>Output Non-linear Function 1</td>
<td>USINT</td>
<td>Select a non-linear output curve to match the response of your system</td>
<td>(0) OFF (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) Curve 1</td>
<td>(2) Curve 2</td>
</tr>
<tr>
<td>131</td>
<td>Get/Set</td>
<td>Analog Output 1 Units</td>
<td>USINT</td>
<td>Set the analog output units</td>
<td>(0) Milliamperes (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) Volts</td>
<td></td>
</tr>
<tr>
<td>132</td>
<td>Get/Set</td>
<td>Analog Output 1 Low Scale mA</td>
<td>UDINT</td>
<td>Set the low scale for analog outputs</td>
<td>0.00 to 20.00 mA if output is set to mA (default = 0.00) (* 1000)</td>
</tr>
<tr>
<td>Attribute #</td>
<td>Access Rule</td>
<td>Name</td>
<td>DeviceNet Data Type</td>
<td>Description of Attribute</td>
<td>Semantics of Values</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>------</td>
<td>---------------------</td>
<td>--------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>133</td>
<td>Get/Set</td>
<td>Analog Output 1 Low Scale volts</td>
<td>UDINT</td>
<td>Set the low scale for analog outputs</td>
<td>0.00 to 10.00 V if output is set to Volts (default = 0.00) (* 1000)</td>
</tr>
<tr>
<td>134</td>
<td>Get/Set</td>
<td>Analog Output 1 High Scale mA</td>
<td>UDINT</td>
<td>Set the high scale for analog outputs</td>
<td>0.00 to 20.00 mA if output is set to mA (default = 20.00 mA) (* 1000)</td>
</tr>
<tr>
<td>135</td>
<td>Get/Set</td>
<td>Analog Output 1 High Scale volts</td>
<td>UDINT</td>
<td>Set the high scale for analog outputs</td>
<td>0.0 to 10.00 V if output is set to Volts (default = 10.00 V) (* 1000)</td>
</tr>
</tbody>
</table>
| 136        | Get/Set     | Output 2 Function | USINT | Set the output 2 function | (0) OFF  
(1) Process Alarm  
(2) Deviation Alarm  
(3) Heat Control (default)  
(4) Cool Control |
| 137        | Get/Set     | Control Method 2 | USINT | Set the output 2 control type Only used with PID control | (0) Fixed Timed Base (default)  
(1) Variable Time Base |
| 138        | Get/Set     | Fixed Time Base 2 | UDINT | Set the time base for fixed time based control | 1.0 to 60.0 if Output 2 is a mechanical relay  
0.1 to 60.0 if Output 2 is not a mechanical relay (* 1000)  
Defaults:  
20.0 mechanical relay  
5.0 solid-state relay  
1.0 switched DC |
| 139        | Get/Set     | Power Limit 2 | UINT | Set the maximum power output for a control output. | 1.0 to 100.0% (default = 100.0%) |
| 140        | Get/Set     | Output Power Scale Low 2 | UINT | Set the low end of the range within which the output will scale. | 0 to 100% (default = 0) |
| 141        | Get/Set     | Output Power Scale High 2 | UINT | Set the high end of the range within which the output will scale. | 0 to 100% (default = 100) |
| 142        | Get/Set     | Output Non-linear Function 2 | USINT | Select a non-linear output curve to match the response of your system. | (0) OFF (default)  
(1) Curve 1  
(2) Curve 2 |
| 143        | Get/Set     | Alarm 1 Hysteresis | UDINT | Set the hysteresis for an alarm. This determines how far into the safe region the input needs to move before the alarm can be cleared. | 1.0 to 999.0 (* 1000) (default = 1.0) |
| 144        | Get/Set     | Alarm 1 Logic | BOOLEAN | Select the alarm output condition in the alarm state. | (0) Closed on alarm (default)  
(1) Open on alarm |
<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>145</td>
<td>Get/Set</td>
<td>Alarm 1 Latching</td>
<td>BOOLEAN</td>
<td>Turn alarm latching on or off.</td>
<td>(0) OFF (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) ON</td>
</tr>
<tr>
<td>146</td>
<td>Get/Set</td>
<td>Alarm 1 Silencing</td>
<td>BOOLEAN</td>
<td>Turn alarm silencing on or off.</td>
<td>(0) No silencing (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) Silencing</td>
</tr>
<tr>
<td>147</td>
<td>Get/Set</td>
<td>Alarm 1 Message</td>
<td>BOOLEAN</td>
<td>Display an alarm message when an alarm is active.</td>
<td>(0) OFF (no message)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) ON (default)</td>
</tr>
<tr>
<td>148</td>
<td>Get/Set</td>
<td>Alarm 2 Hysteresis</td>
<td>UDINT</td>
<td>Set the hysteresis for an alarm. This determines how far into the safe region the input needs to move before the alarm can be cleared.</td>
<td>1.0 to 999.0 (* 1000) (default = 1.0)</td>
</tr>
<tr>
<td>149</td>
<td>Get/Set</td>
<td>Alarm 2 Logic</td>
<td>BOOLEAN</td>
<td>Select the alarm output condition in the alarm state.</td>
<td>(0) Closed on alarm (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) Open on alarm</td>
</tr>
<tr>
<td>150</td>
<td>Get/Set</td>
<td>Alarm 2 Latching</td>
<td>BOOLEAN</td>
<td>Turn alarm latching on or off.</td>
<td>(0) OFF (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) ON</td>
</tr>
<tr>
<td>151</td>
<td>Get/Set</td>
<td>Alarm 2 Silencing</td>
<td>BOOLEAN</td>
<td>Turn alarm silencing on or off.</td>
<td>(0) No silencing (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) Silencing</td>
</tr>
<tr>
<td>152</td>
<td>Get/Set</td>
<td>Alarm 2 Message</td>
<td>BOOLEAN</td>
<td>Display an alarm message when an alarm is active.</td>
<td>(0) OFF (no message)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) ON (default)</td>
</tr>
<tr>
<td>153</td>
<td>Get/Set</td>
<td>Units of Measurement</td>
<td>BOOLEAN</td>
<td>Set the type of units used for the PID control parameters.</td>
<td>(0) US (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) SI</td>
</tr>
<tr>
<td>154</td>
<td>Get/Set</td>
<td>Input Error Latching</td>
<td>BOOLEAN</td>
<td>Turn the input error latching on or off.</td>
<td>(0) OFF (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) ON</td>
</tr>
<tr>
<td>155</td>
<td>Get/Set</td>
<td>Input Error Failure Mode</td>
<td>USINT</td>
<td>Set the input error failure mode when an error is detected and the control changes to manual mode.</td>
<td>(0) OFF (0% power)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) Bumpless (current power level, default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2) Manual (fixed power level)</td>
</tr>
<tr>
<td>156</td>
<td>Get/Set</td>
<td>Input Error Power</td>
<td>INT</td>
<td>Set the manual power level when an input error causes a change to manual mode.</td>
<td>-100.0 to 100.0%</td>
</tr>
<tr>
<td>Attribute #</td>
<td>Access Rule</td>
<td>Name</td>
<td>DeviceNet Data Type</td>
<td>Description of Attribute</td>
<td>Semantics of Values</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>-----------------------------</td>
<td>---------------------</td>
<td>--------------------------</td>
<td>---------------------</td>
</tr>
</tbody>
</table>
| 157        | Get/Set     | Active Displays             | USINT               | Select which display are active. | (0) Both displays (default)  
(1) Lower display only  
(2) Upper display only |
| 158        | Get/Set     | Ramping Mode                | USINT               | Select when the control set point ramps to the defined end set point. | (0) OFF (default)  
(1) Ramps on start-up  
(2) Ramps on any set point change |
| 159        | Get/Set     | Ramp Scale                  | BOOLEAN             | Select the scale of the ramp rate. | (0) Degrees / hour (default)  
(1) Degrees / minute |
| 160        | Get/Set     | Ramp Rate                   | UDINT               | Set the rate for the set point ramp. | 0 to 9999 (* 1000)  
(default = 100) |
| 161        | Get/Set     | Lockout                     | USINT               | Set the security level for the user interface. | (0) No Lockout (default)  
(1) Set Point, Auto/Manual, Alarms, only  
(2) Set Point, Auto/Manual, only  
(3) Set Point only  
(4) Full Lockout |
| 162        | Get/Set     | Alarm Acknowledge 1         | BOOLEAN             | Alarm acknowledge for output 1. | (0) No  
(1) Yes |
| 163        | Get/Set     | Alarm Acknowledge 2         | BOOLEAN             | Alarm acknowledge for output 2. | (0) No  
(1) Yes |
| 164        | Get/Set     | AC Line Frequency           | BOOLEAN             | Sets the frequency of the applied AC line source | (0) - 60 (default)  
(1) - 50 |
| 165        | Get/Set     | Profile Type                | BOOLEAN             | Sets the profile ramp to time based or rate based | (0) - time based (default)  
(1) - ramp based |
| 166        | Get/Set     | Profile Start               | BOOLEAN             | Selects where the profile begins the starting set point, current static set point or process temperature. | (0) - set point (default)  
(1) - process |
| 167        | Get/Set     | Guaranteed Soak Deviation Enable | BOOLEAN             | Enables the guaranteed soak deviation function in profiles | (0) - disabled (default)  
(1) - enabled |
| 168        | Get/Set     | Guaranteed Soak Deviation Value | UDINT               | Sets the value of deviation allowed | 1 to 999 (*1000)  
(default = 1) |
| 169        | Get/Set     | Process Scale Low mV        | UDINT               | Set the low scale for process input | 0.00 to 50.00 mV (*1000)  
(when Sensor Type set to mV, default = 0.00 mV) |
<table>
<thead>
<tr>
<th>Attribute #</th>
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<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>170</td>
<td>Get/Set</td>
<td>Process Scale High mV</td>
<td>UDINT</td>
<td>Set the high scale for process input</td>
<td>0.00 to 50.00 mV (*100) (when Sensor Type set to mV, default = 50.00 mV)</td>
</tr>
<tr>
<td>171</td>
<td>Get/Set</td>
<td>Process Input Low error mA</td>
<td>INT</td>
<td>Sets the low process value that will cause an error to occur for the process input</td>
<td>-1.00 to 10.00 mA (*100) (Default = -1.00 mA)</td>
</tr>
<tr>
<td>172</td>
<td>Get/Set</td>
<td>Process Input Low error Volts</td>
<td>INT</td>
<td>Sets the low process value that will cause an error to occur for the process input</td>
<td>-1.00 to 5.00 V (*100) (Default = -1.00 V)</td>
</tr>
<tr>
<td>173</td>
<td>Get/Set</td>
<td>Process Input Low error mV</td>
<td>INT</td>
<td>Sets the low process value that will cause an error to occur for the process input</td>
<td>-1.00 to 25.00 mV (*100) (Default = -1.00 mV)</td>
</tr>
<tr>
<td>174</td>
<td>Get/Set</td>
<td>Process Input High error mA</td>
<td>UINT</td>
<td>Sets the high process value that will cause an error to occur for the process input</td>
<td>10.00 to 21.00 mA (*100) (Default = 21.00 mA)</td>
</tr>
<tr>
<td>175</td>
<td>Get/Set</td>
<td>Process Input High error Volts</td>
<td>UINT</td>
<td>Sets the high process value that will cause an error to occur for the process input</td>
<td>5.00 to 11.00 V (*100) (Default = 11.00V)</td>
</tr>
<tr>
<td>176</td>
<td>Get/Set</td>
<td>Process Input High error mV</td>
<td>UINT</td>
<td>Sets the high process value that will cause an error to occur for the process input</td>
<td>25.00 to 51.00 mV (*100) (Default = 51.00 mV)</td>
</tr>
<tr>
<td>177</td>
<td>Get/Set</td>
<td>Output 1 Retransmit Source</td>
<td>BOOLEAN</td>
<td>Set the control variable that the retransmit signal represents</td>
<td>(0) - Process (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) - Set Point</td>
</tr>
<tr>
<td>178</td>
<td>Get/Set</td>
<td>Output 1 Retransmit Low Scale</td>
<td>DINT</td>
<td>Set the low scale for the retransmit output</td>
<td>-1999.0 to 9999.0 (*1000) (Default = 0)</td>
</tr>
<tr>
<td>179</td>
<td>Get/Set</td>
<td>Output 1 Retransmit High Scale</td>
<td>DINT</td>
<td>Set the high scale for the retransmit output</td>
<td>-1999.0 to 9999.0 (*1000) (Default = 500)</td>
</tr>
<tr>
<td>180</td>
<td>Get/Set</td>
<td>Output 1 Retransmit Offset</td>
<td>DINT</td>
<td>Set the high scale for the process output</td>
<td>-999.0 to 999.0 (*1000) (Default = 0)</td>
</tr>
<tr>
<td>181</td>
<td>Get/Set</td>
<td>RTD Linearization</td>
<td>USINT</td>
<td>RTD type</td>
<td>(0) DIN (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) Unused 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2) Unused 2</td>
</tr>
</tbody>
</table>
### Operational Object

**Class Code:** 66hex

**Operational Object**

The Operational Object access parameters used during normal day-to-day operation.

#### Table 25. Revision History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Initial Release</td>
</tr>
</tbody>
</table>

#### Table 26. Operational Object Class Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Get</td>
<td>Revision</td>
<td>UINT</td>
<td>Revision of this object</td>
<td>The revision level of this object (currently 1)</td>
</tr>
<tr>
<td>2</td>
<td>Get</td>
<td>Max Instance</td>
<td>UINT</td>
<td>Max allowed Instances</td>
<td>Always 1 for this Class</td>
</tr>
</tbody>
</table>

#### Table 27. Operational Object Instance Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Get/Set</td>
<td>Calibration Offset</td>
<td>DINT</td>
<td>Offset the input reading.</td>
<td>-999 to 999 (x 1000) (default = 0)</td>
</tr>
<tr>
<td>101</td>
<td>Get/Set</td>
<td>Autotune</td>
<td>BOOLEAN</td>
<td>Start an Autotune.</td>
<td>(0) OFF (default) (1) ON</td>
</tr>
<tr>
<td>102</td>
<td>Get/Set</td>
<td>Auto-Manual Mode</td>
<td>BOOLEAN</td>
<td>Set the control mode.</td>
<td>(0) Auto (default) (1) Manual</td>
</tr>
<tr>
<td>103</td>
<td>Get</td>
<td>Power Heat</td>
<td>UINT</td>
<td>Displays the current heat control power.</td>
<td>0.0 to 100.0%</td>
</tr>
<tr>
<td>104</td>
<td>Get</td>
<td>Power Cool</td>
<td>UINT</td>
<td>Displays the current cool control power.</td>
<td>0.0 to 100.0%</td>
</tr>
<tr>
<td>105</td>
<td>Get/Set</td>
<td>Heat Control Method</td>
<td>USINT</td>
<td>Set the heat control method.</td>
<td>(0) OFF (1) PID (default) (2) ON/OFF</td>
</tr>
</tbody>
</table>

---

Class Services:
- 0x0E GET ATTRIBUTE SINGLE

Instance Services:
- 0x0E GET ATTRIBUTE SINGLE
- 0x10 SET ATTRIBUTE SINGLE

NOTE: All successful Explicit Message Responses from a SET service will contain no data. The response will be a two-byte message containing the requester's MAC ID and Service Code (with R/R bit set).
<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>106</td>
<td>Get/Set</td>
<td>Proportional Band Heat</td>
<td>UDINT</td>
<td>Set the proportional band for the heat outputs.</td>
<td>1 to 999°C (x1000), if Sensor Type is set to Thermocouple or RTD. (default = 25°C)</td>
</tr>
<tr>
<td>107</td>
<td>Get/Set</td>
<td>Proportional Band Heat</td>
<td>UDINT</td>
<td>Set the proportional band for the heat outputs.</td>
<td>0.001 to 999.999 units, if Sensor Type is set to mA or Volt. (default = 25.000 units)</td>
</tr>
<tr>
<td>108</td>
<td>Get/Set</td>
<td>Integral Heat</td>
<td>UDINT</td>
<td>Set the PID integral in minutes per repeat for the heat outputs.</td>
<td>0.00 to 99.99 (* 1000) minutes per repeat. 0.00 = disabled (default = 0.00)</td>
</tr>
<tr>
<td>108</td>
<td>Get/Set</td>
<td>Reset Heat</td>
<td>UDINT</td>
<td>Set the PID rate time in minutes for the heat outputs.</td>
<td>0.00 to 99.99 (* 1000) minutes per repeat. 0.00 = disabled (default = 0.00)</td>
</tr>
<tr>
<td>109</td>
<td>Get/Set</td>
<td>Derivative Heat</td>
<td>UDINT</td>
<td>Set the PID derivative time in minutes for the heat outputs.</td>
<td>0.00 to 9.99 (* 1000) minutes 0.00 = disabled (default = 0.00)</td>
</tr>
<tr>
<td>109</td>
<td>Get/Set</td>
<td>Rate Heat</td>
<td>UDINT</td>
<td>Set the PID rate time in minutes for the heat outputs.</td>
<td>0.00 to 9.99 (* 1000) minutes 0.00 = disabled (default = 0.00)</td>
</tr>
<tr>
<td>110</td>
<td>Get/Set</td>
<td>Dead Band Heat</td>
<td>UDINT</td>
<td>An offset of the heating proportional band from the set point.</td>
<td>0 to 999 (default = 0)</td>
</tr>
<tr>
<td>111</td>
<td>Get/Set</td>
<td>Heat Hysteresis</td>
<td>UDINT</td>
<td>Set the control switching hysteresis for ON/OFF control. This determines how far into the ON region the input needs to move before the output actually turns on.</td>
<td>1 to 999 degrees, if Sensor Type is set to Thermocouple or RTD (default = 1.0)</td>
</tr>
<tr>
<td>112</td>
<td>Get/Set</td>
<td>Heat Hysteresis Process</td>
<td>UDINT</td>
<td>Set the control switching hysteresis for ON/OFF control. This determines how far into the ON region the input needs to move before the output actually turns on.</td>
<td>0.000 to 999.999 units, if Sensor Type is set to mA or Volt. (default = 1.000)</td>
</tr>
</tbody>
</table>
| 113        | Get/Set     | Cool Control Method     | USINT               | Set the cool control method.                                                            | (0) OFF  
(1) PID (default)  
(2) ON/OFF |
<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
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</tr>
</thead>
<tbody>
<tr>
<td>114</td>
<td>Get/Set</td>
<td>Proportional Band Cool Temperature</td>
<td>UDINT</td>
<td>Set the proportional band for the Cool outputs.</td>
<td>1 to 999°C (* 1000), if Sensor Type is set to Thermocouple or RTD. (default = 25°C)</td>
</tr>
<tr>
<td>115</td>
<td>Get/Set</td>
<td>Proportional Band Cool Process</td>
<td>UDINT</td>
<td>Set the proportional band for the Cool outputs.</td>
<td>0.001 to 999.999 units, if Sensor Type is set to mA or Volt. (default = 25.000 units)</td>
</tr>
<tr>
<td>116</td>
<td>Get/Set</td>
<td>Integral Cool</td>
<td>UDINT</td>
<td>Set the PID integral in minutes per repeat for the Cool outputs.</td>
<td>0.00 to 99.99 (* 1000) minutes per repeat. 0.00 = disabled (default = 0.00)</td>
</tr>
<tr>
<td>117</td>
<td>Get/Set</td>
<td>Reset Cool</td>
<td>UDINT</td>
<td>Set the PID reset in repeats per minute for the Cool outputs.</td>
<td>0.00 to 99.99 (* 1000) repeats per minute. 0.00 = disabled (default = 0.00)</td>
</tr>
<tr>
<td>117</td>
<td>Get/Set</td>
<td>Derivative Cool</td>
<td>UDINT</td>
<td>Set the PID derivative time in minutes for the Cool outputs.</td>
<td>0.00 to 9.99 (* 1000) minutes 0.00 = disabled (default = 0.00)</td>
</tr>
<tr>
<td>117</td>
<td>Get/Set</td>
<td>Rate Cool</td>
<td>UDINT</td>
<td>Set the PID rate time in minutes for the Cool output.</td>
<td>0.00 to 9.99 (* 1000) minutes 0.00 = disabled (default = 0.00)</td>
</tr>
<tr>
<td>118</td>
<td>Get/Set</td>
<td>Dead Band Cool</td>
<td>UDINT</td>
<td>An offset of the Cooling proportional band from the set point.</td>
<td>0 to 999 (* 1000) (default = 0)</td>
</tr>
<tr>
<td>119</td>
<td>Get/Set</td>
<td>Cool Hysteresis Temperature</td>
<td>UDINT</td>
<td>Set the control switching hysteresis for ON/OFF control. This determines how far into the ON region the input needs to move before the output actually turns on.</td>
<td>1 to 999 (* 1000) degrees, if Sensor Type is set to Thermocouple or RTD (default = 1.0)</td>
</tr>
<tr>
<td>120</td>
<td>Get/Set</td>
<td>Cool Hysteresis Process</td>
<td>UDINT</td>
<td>Set the control switching hysteresis for ON/OFF control. This determines how far into the ON region the input needs to move before the output actually turns on.</td>
<td>0.000 to 999.999 units, if Sensor Type is set to mA or Volt. (default = 1.000)</td>
</tr>
<tr>
<td>121</td>
<td>Get</td>
<td>Proportional Term</td>
<td>UINT</td>
<td>View the active proportional term for PID diagnostics.</td>
<td>0.000 to 1.000 (this value multiplied by 100 equals the percent power)</td>
</tr>
<tr>
<td>Attribute #</td>
<td>Access Rule</td>
<td>Name</td>
<td>DeviceNet Data Type</td>
<td>Description of Attribute</td>
<td>Semantics of Values</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>-----------------</td>
<td>--------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>122</td>
<td>Get</td>
<td>Integral Term</td>
<td>UINT</td>
<td>View the active integral term for PID diagnostics.</td>
<td>0.000 to 1.000 (this value multiplied by 100 equals the percent power)</td>
</tr>
<tr>
<td>123</td>
<td>Get</td>
<td>Derivative Term</td>
<td>UINT</td>
<td>View the active derivative term for PID diagnostics.</td>
<td>0.000 to 1.000 (this value multiplied by 100 equals the percent power)</td>
</tr>
<tr>
<td>124</td>
<td>Get/Set</td>
<td>Alarm 1 High Temperature</td>
<td>DINT</td>
<td>Set the high alarm set point.</td>
<td>0 to 9999 (* 1000) if Sensor Type is set to Thermocouple or RTD (default = 999)</td>
</tr>
<tr>
<td>125</td>
<td>Get/Set</td>
<td>Alarm 1 High Process</td>
<td>DINT</td>
<td>Set the high alarm set point.</td>
<td>-1999 to 9999 (* 1000) if Sensor Type is set to mA or Volt. (default = 1500)</td>
</tr>
<tr>
<td>126</td>
<td>Get/Set</td>
<td>Alarm 1 Low Temperature</td>
<td>DINT</td>
<td>Set the low alarm set point.</td>
<td>-1999 to 0 (* 1000) if Sensor Type is set to Thermocouple or RTD (default = -999)</td>
</tr>
<tr>
<td>127</td>
<td>Get/Set</td>
<td>Alarm 1 Low Process</td>
<td>DINT</td>
<td>Set the low alarm set point.</td>
<td>-1999 to 9999 (* 1000) if Sensor Type is set to mA or Volt. (default = 32)</td>
</tr>
<tr>
<td>128</td>
<td>Get/Set</td>
<td>Alarm 2 High Temperature</td>
<td>DINT</td>
<td>Set the high alarm set point.</td>
<td>0 to 9999 (* 1000) if Sensor Type is set to Thermocouple or RTD (default = 999)</td>
</tr>
<tr>
<td>129</td>
<td>Get/Set</td>
<td>Alarm 2 High Process</td>
<td>DINT</td>
<td>Set the high alarm set point.</td>
<td>-1999 to 9999 (* 1000) if Sensor Type is set to mA or Volt. (default = 1500)</td>
</tr>
</tbody>
</table>
### Table 29. Factory/Calibration Class Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Get</td>
<td>Revision</td>
<td>UINT</td>
<td>Revision of this object</td>
<td>The revision level of this object (currently 1)</td>
</tr>
<tr>
<td>2</td>
<td>Get</td>
<td>Max Instance</td>
<td>UINT</td>
<td>Max allowed Instances of this object</td>
<td>Always 1 for this Class</td>
</tr>
</tbody>
</table>

**Factory/Calibration Object**

**Class Code:** 67hex

**Factory/Calibration Object**

The Factory/Calibration Object provides access to parameters that contain diagnostics information, calibration and restore-parameter functions.

**NOTE:** All successful Explicit Message Responses from a SET service will contain no data. The response will be a two-byte message containing the requester’s MAC ID and Service Code (with R/R bit set).

### Table 28. Factory/Calibration Revision History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Initial Release</td>
</tr>
</tbody>
</table>

### Class Services:

- 0x0E GET ATTRIBUTE SINGLE

### Instance Services:

- 0x0E GET ATTRIBUTE SINGLE
- 0x10 SET ATTRIBUTE SINGLE
### Table 30. Factory/Calibration Object Instance Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Get</td>
<td>Ambient Temperature</td>
<td>DINT</td>
<td>Displays the current calculated ambient temperature.</td>
<td>-50.0 to 300.0°F (* 1000)</td>
</tr>
<tr>
<td>101</td>
<td>Get</td>
<td>Output 1 Process Value</td>
<td>UINT</td>
<td>Monitors Process Output 1 value via DeviceNet</td>
<td>00.00 to 22.00 units</td>
</tr>
<tr>
<td>102</td>
<td>Get/Set</td>
<td>Restore Factory</td>
<td>BOOLEAN</td>
<td>Replaces the user calibration parameters with the factory</td>
<td>(0) NO (default) (1) YES</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Calibration</td>
<td></td>
<td>calibration parameters.</td>
<td></td>
</tr>
<tr>
<td>103</td>
<td>Get/Set</td>
<td>Restore User Settings</td>
<td>BOOLEAN</td>
<td>Restores the customer-configured settings.</td>
<td>(0) NO (default) (1) YES</td>
</tr>
<tr>
<td>104</td>
<td>Get/Set</td>
<td>Save User Settings</td>
<td>BOOLEAN</td>
<td>Saves the current customer-configured settings.</td>
<td>(0) NO (default) (1) YES</td>
</tr>
<tr>
<td>105</td>
<td>Get/Set</td>
<td>Default Parameters</td>
<td>BOOLEAN</td>
<td>Reset all parameters to their default values.</td>
<td>(0) NO (default) (1) YES</td>
</tr>
<tr>
<td>106</td>
<td>Get</td>
<td>Output 1 Type</td>
<td>USINT</td>
<td>Displays the hardware type for Output 1.</td>
<td>(0) None (1) DC/Open Col.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2) Mech. Relay (3) S.S. Relay (4) Process</td>
<td></td>
</tr>
<tr>
<td>107</td>
<td>Get</td>
<td>Output 2 Type</td>
<td>USINT</td>
<td>Displays the hardware type for Output 2.</td>
<td>(0) None (1) DC/Open Col.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2) Mech. Relay (3) S.S. Relay (4) Process</td>
<td></td>
</tr>
<tr>
<td>108</td>
<td>Get</td>
<td>Software ID</td>
<td>UINT</td>
<td>Software ID number</td>
<td>0 to 9999</td>
</tr>
<tr>
<td>109</td>
<td>Get</td>
<td>Software Build Number</td>
<td>UINT</td>
<td>Software built number</td>
<td>0 to 9999 Build Number</td>
</tr>
<tr>
<td>110</td>
<td>Get</td>
<td>Serial Number</td>
<td>UDINT</td>
<td>Serial number</td>
<td>0 to 99999999</td>
</tr>
</tbody>
</table>
### Table 32. Programmable Class Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Get</td>
<td>Revision</td>
<td>UINT</td>
<td>Revision of this object</td>
<td>The revision level of this object (currently 1)</td>
</tr>
<tr>
<td>2</td>
<td>Get</td>
<td>Max Instance</td>
<td>UINT</td>
<td>Max allowed Instances of this object</td>
<td>Always 1 for this Class</td>
</tr>
</tbody>
</table>

**Class Services:**
- 0x0E     GET ATTRIBUTE SINGLE

**Instance Services:**
- 0x0E     GET ATTRIBUTE SINGLE
- 0x10     SET ATTRIBUTE SINGLE

**NOTE:** All successful Explicit Message Responses from a SET service will contain no data. The response will be a two-byte message containing the requester's MAC ID and Service Code (with R/R bit set).

### Programmable Object

**Class Code:** 68hex

**Programmable Object**

### Table 31. Programmable Object Revision History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Initial Release</td>
</tr>
</tbody>
</table>

---

Watlow Series SD6 PID with DeviceNet
### Table 33. Programmable Object Instance Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Get/set</td>
<td>P1</td>
<td>USINT</td>
<td>Programmable Parameter Location 1</td>
<td>See Programming Page in user's manual.</td>
</tr>
<tr>
<td>102</td>
<td>Get/Set</td>
<td>P3</td>
<td>USINT</td>
<td>Programmable Parameter Location 3</td>
<td>See Programming Page in user's manual.</td>
</tr>
<tr>
<td>103</td>
<td>Get/Set</td>
<td>P4</td>
<td>USINT</td>
<td>Programmable Parameter Location 4</td>
<td>See Programming Page in user's manual.</td>
</tr>
<tr>
<td>104</td>
<td>Get/Set</td>
<td>P5</td>
<td>USINT</td>
<td>Programmable Parameter Location 5</td>
<td>See Programming Page in user's manual.</td>
</tr>
<tr>
<td>105</td>
<td>Get/Set</td>
<td>P6</td>
<td>USINT</td>
<td>Programmable Parameter Location 6</td>
<td>See Programming Page in user's manual.</td>
</tr>
<tr>
<td>106</td>
<td>Get/set</td>
<td>P7</td>
<td>USINT</td>
<td>Programmable Parameter Location 7</td>
<td>See Programming Page in user's manual.</td>
</tr>
<tr>
<td>107</td>
<td>Get/set</td>
<td>P8</td>
<td>USINT</td>
<td>Programmable Parameter Location 8</td>
<td>See Programming Page in user's manual.</td>
</tr>
<tr>
<td>108</td>
<td>Get/set</td>
<td>P9</td>
<td>USINT</td>
<td>Programmable Parameter Location 9</td>
<td>See Programming Page in user's manual.</td>
</tr>
<tr>
<td>111</td>
<td>Get/set</td>
<td>P12</td>
<td>USINT</td>
<td>Programmable Parameter Location 12</td>
<td>See Programming Page in user's manual.</td>
</tr>
<tr>
<td>112</td>
<td>Get/set</td>
<td>P13</td>
<td>USINT</td>
<td>Programmable Parameter Location 13</td>
<td>See Programming Page in user's manual.</td>
</tr>
<tr>
<td>113</td>
<td>Get/set</td>
<td>P14</td>
<td>USINT</td>
<td>Programmable Parameter Location 14</td>
<td>See Programming Page in user's manual.</td>
</tr>
<tr>
<td>114</td>
<td>Get/set</td>
<td>P15</td>
<td>USINT</td>
<td>Programmable Parameter Location 15</td>
<td>See Programming Page in user's manual.</td>
</tr>
</tbody>
</table>
Table 35. Profiling Class Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Get</td>
<td>Revision</td>
<td>UINT</td>
<td>Revision of this object</td>
<td>The revision level of this object (currently 1)</td>
</tr>
<tr>
<td>2</td>
<td>Get</td>
<td>Max Instance</td>
<td>UINT</td>
<td>Max allowed instances of this object</td>
<td>Always 1 for this Class</td>
</tr>
</tbody>
</table>

Class Services:
- 0x0E GET ATTRIBUTE SINGLE

Instance Services:
- 0x0E GET ATTRIBUTE SINGLE
- 0x10 SET ATTRIBUTE SINGLE

NOTE: All successful Explicit Message Responses from a SET service will contain no data. The response will be a two-byte message containing the requester’s MAC ID and Service Code (with R/R bit set).

**Profiling Object**

Class Code: 69hex

**Profiling Object**

The Profiling Object provides access to parameters that contain profiling parameters.

Table 34. Profiling Object Revision History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Initial Release</td>
</tr>
</tbody>
</table>

Table 35. Profiling Class Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>115</td>
<td>Get/set</td>
<td>P16</td>
<td>USINT</td>
<td>Programmable Parameter Location 16</td>
<td>See Programming Page in user’s manual.</td>
</tr>
<tr>
<td>118</td>
<td>Get/set</td>
<td>P19</td>
<td>USINT</td>
<td>Programmable Parameter Location 19</td>
<td>See Programming Page in user’s manual.</td>
</tr>
<tr>
<td>120</td>
<td>Get/set</td>
<td>P21</td>
<td>USINT</td>
<td>Programmable Parameter Location 21</td>
<td>See Programming Page in user’s manual.</td>
</tr>
<tr>
<td>121</td>
<td>Get/set</td>
<td>P22</td>
<td>USINT</td>
<td>Programmable Parameter Location 22</td>
<td>See Programming Page in user’s manual.</td>
</tr>
</tbody>
</table>
### Table 36. Profiling Object Instance Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Get/Set</td>
<td>Profile Type</td>
<td>BOOLEAN</td>
<td>Set the profile ramp to time based or rate based</td>
<td>(0) - Time (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) - Rate</td>
</tr>
<tr>
<td>101</td>
<td>Get/Set</td>
<td>Profile Start</td>
<td>BOOLEAN</td>
<td>Selects where the profile begins the starting set point of the profile, current static set point or current process temperature.</td>
<td>(0) - Set Point (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) - Process</td>
</tr>
<tr>
<td>102</td>
<td>Get/Set</td>
<td>Guaranteed Soak Deviation Enable</td>
<td>BOOLEAN</td>
<td>Enables the guaranteed soak deviation function in profiles</td>
<td>(0) - Disabled (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) - Enabled</td>
</tr>
<tr>
<td>103</td>
<td>Get/Set</td>
<td>Guaranteed Soak Deviation Value</td>
<td>UDIMT</td>
<td>Set the value of deviation allowed by the guaranteed soak deviation function</td>
<td>1 to 999 (*1000)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(default = 1)</td>
</tr>
<tr>
<td>104</td>
<td>Get</td>
<td>Profile State</td>
<td>USINT</td>
<td>Indicates current profile status</td>
<td>(0) - Off (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) - Holding</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2) - Running</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(3) - Pre-run check failed when starting the profile</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(4) - Pre-run failed when resuming the profile</td>
</tr>
<tr>
<td>105</td>
<td>Get</td>
<td>Jump Count Step Enabled</td>
<td>BOOLEAN</td>
<td>Indicates whether a Jump Step is currently being executed</td>
<td>(0) - Profile is not running or is running and currently not executing a Jump step (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) - Profile is executing a Jump step</td>
</tr>
<tr>
<td>106</td>
<td>Get/Set</td>
<td>Start File Number</td>
<td>UINT</td>
<td>Selects the file to start running</td>
<td>1 to 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(default = 1)</td>
</tr>
<tr>
<td>107</td>
<td>Get/Set</td>
<td>Start Step Number</td>
<td>UINT</td>
<td>Selects the profile step to be run</td>
<td>1 to 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(default = 1)</td>
</tr>
<tr>
<td>108</td>
<td>Get/Set</td>
<td>Profile Select</td>
<td>USINT</td>
<td>Selects what to do when a profile is on hold</td>
<td>(0) - Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) - Resume</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2) - Hold</td>
</tr>
<tr>
<td>109</td>
<td>Get</td>
<td>Guaranteed Soak Deviation Message</td>
<td>BOOLEAN</td>
<td>Monitors guaranteed soak deviation status</td>
<td>(0) - Disabled (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) - Enabled</td>
</tr>
<tr>
<td>110</td>
<td>Get</td>
<td>File Running</td>
<td>UINT</td>
<td>File number that is currently running</td>
<td>1 to 4</td>
</tr>
<tr>
<td>111</td>
<td>Get</td>
<td>Step Running</td>
<td>UINT</td>
<td>Step number that is currently running</td>
<td>1 to 10</td>
</tr>
<tr>
<td>112</td>
<td>Get</td>
<td>End Set Point Value</td>
<td>DINT</td>
<td>Set point value reached at the end of current step</td>
<td>(Splo) to (sphi)</td>
</tr>
<tr>
<td>Attribute #</td>
<td>Access Rule</td>
<td>Name</td>
<td>DeviceNet Data Type</td>
<td>Description of Attribute</td>
<td>Semantics of Values</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>-----------------------</td>
<td>---------------------</td>
<td>----------------------------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>113</td>
<td>Get</td>
<td>Hours Remaining</td>
<td>UINT</td>
<td>Indicates number of hours remaining in the step currently running</td>
<td>0 to 99</td>
</tr>
<tr>
<td>114</td>
<td>Get</td>
<td>Minutes Remaining</td>
<td>UINT</td>
<td>Indicates number of minutes remaining in the step currently running</td>
<td>0 to 59</td>
</tr>
<tr>
<td>115</td>
<td>Get</td>
<td>Seconds Remaining</td>
<td>UINT</td>
<td>Indicates number of seconds remaining in the step currently running</td>
<td>0 to 59</td>
</tr>
<tr>
<td>116</td>
<td>Get</td>
<td>Ramp Rate</td>
<td>UDINT</td>
<td>Rate at which the profile changes in degrees or units per minute</td>
<td>0.0 to 9999.9 (×1000)</td>
</tr>
<tr>
<td>117</td>
<td>Get</td>
<td>Event Output 1 status</td>
<td>BOOLEAN</td>
<td>Indicates Event Output 1 status</td>
<td>(0)- OFF (1)- ON</td>
</tr>
<tr>
<td>118</td>
<td>Get</td>
<td>Event Output 2 status</td>
<td>BOOLEAN</td>
<td>Indicates Event Output 2 status</td>
<td>(0)- OFF (1)- ON</td>
</tr>
<tr>
<td>119</td>
<td>Get</td>
<td>Wait-for Process Value</td>
<td>DINT</td>
<td>Profile clock waits until the process value matches the Wait-for value and continues with the step</td>
<td>(Splo) to (sphi)</td>
</tr>
<tr>
<td>120</td>
<td>Get</td>
<td>Elapsed Jump Count</td>
<td>UDINT</td>
<td>Number of times the profile has been through the Jump Loop Step</td>
<td>0 to 9999 (×1000)</td>
</tr>
<tr>
<td>121</td>
<td>Get</td>
<td>Failed File Number</td>
<td>UINT</td>
<td>Indicates the file number that failed the Pre-Run check</td>
<td>1 to 4</td>
</tr>
<tr>
<td>122</td>
<td>Get</td>
<td>Failed Step Number</td>
<td>UINT</td>
<td>Indicates the step number that failed the Pre-Run check</td>
<td>1 to 10</td>
</tr>
<tr>
<td>123</td>
<td>Get/Set</td>
<td>Comms Temperature Units</td>
<td>BOOLEAN</td>
<td>This register determines the units of measure for temperature values during DeviceNet communication</td>
<td>(0)- Fahrenheit (default) (1)- Celsius</td>
</tr>
</tbody>
</table>

**Class Services:**
- 0x0E      GET ATTRIBUTE SINGLE

**Instance Services:**
- 0x0E      GET ATTRIBUTE SINGLE
- 0x10      SET ATTRIBUTE SINGLE

**NOTE:** All successful Explicit Message Responses from a SET service will contain no data. The response will be a two-byte message containing the requester's MAC ID and Service Code (with R/R bit set).

---

**Profile Program Object**

**Class Code:** 6Ahex

**Profile Program Object**

The Profile Program Object provides access to parameters that contain profile programs.

<table>
<thead>
<tr>
<th>Table 37. Profile Program Object Revision History</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revision</td>
</tr>
<tr>
<td>01</td>
</tr>
</tbody>
</table>
Table 38. Profile Program Class Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Get</td>
<td>Revision</td>
<td>UINT</td>
<td>Revision of this object</td>
<td>The revision level of this object (currently 1)</td>
</tr>
<tr>
<td>2</td>
<td>Get</td>
<td>Max Instance</td>
<td>UINT</td>
<td>Max allowed Instances of this object</td>
<td>Always 1 for this Class</td>
</tr>
</tbody>
</table>

Instances 1 through 10 are for File 1, steps 1 through 10.
Instances 11 through 20 are for File 2, steps 1 through 10.
Instances 21 through 30 are for File 3, steps 1 through 10.
Instances 31 through 40 are for File 4, steps 1 through 10.

Table 39. Profiling Object Instance Attributes

<table>
<thead>
<tr>
<th>Attribute #</th>
<th>Access Rule</th>
<th>Name</th>
<th>DeviceNet Data Type</th>
<th>Description of Attribute</th>
<th>Semantics of Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Get/Set</td>
<td>Step Type</td>
<td>USINT</td>
<td>Selects step type</td>
<td>(0) - End (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) - Set Point</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2) - Soak</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(3) - Jump Loop</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(4) - Link File</td>
</tr>
<tr>
<td>101</td>
<td>Get/Set</td>
<td>Target Set Point</td>
<td>DINT</td>
<td>Indicates ending set point value</td>
<td>-1999 to 9999 (*1000) (default = 75)</td>
</tr>
<tr>
<td>102</td>
<td>Get/Set</td>
<td>Hours</td>
<td>UINT</td>
<td>Hours in the step</td>
<td>0 to 99. (default = 0)</td>
</tr>
<tr>
<td>103</td>
<td>Get/Set</td>
<td>Minutes</td>
<td>UINT</td>
<td>Minutes in the step</td>
<td>0 to 59. (default = 0)</td>
</tr>
<tr>
<td>104</td>
<td>Get/Set</td>
<td>Seconds</td>
<td>UINT</td>
<td>Seconds in the step</td>
<td>0 to 59. (default = 0)</td>
</tr>
<tr>
<td>105</td>
<td>Get/Set</td>
<td>Rate</td>
<td>UDINT</td>
<td>Indicates rate at which set point changes in degrees per minute</td>
<td>0 to 9999 (*1000) (default = 0)</td>
</tr>
<tr>
<td>106</td>
<td>Get/Set</td>
<td>Event Output 1</td>
<td>BOOLEAN</td>
<td>Selects whether output 1 is on or off during step</td>
<td>(0) - OFF (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) - ON</td>
</tr>
<tr>
<td>Attribute #</td>
<td>Access Rule</td>
<td>Name</td>
<td>DeviceNet Data Type</td>
<td>Description of Attribute</td>
<td>Semantics of Values</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>---------------------------</td>
<td>---------------------</td>
<td>------------------------------------------------------------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>107</td>
<td>Get/Set</td>
<td>Event Output 2</td>
<td>BOOLEAN</td>
<td>Selects whether output 2 is on or off during step</td>
<td>(0) - OFF (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) - ON</td>
</tr>
<tr>
<td>108</td>
<td>Get/Set</td>
<td>Wait-for Process Enable</td>
<td>BOOLEAN</td>
<td>Select to enable Wait-for Process value</td>
<td>(0) - NO (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) - YES</td>
</tr>
<tr>
<td>109</td>
<td>Get/Set</td>
<td>Wait-for Process value</td>
<td>DINT</td>
<td>Selects wait-for value before step timer starts</td>
<td>-1999 to 9999(*1000)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default = 75</td>
</tr>
<tr>
<td>110</td>
<td>Get/Set</td>
<td>Jump File</td>
<td>UINT</td>
<td>Selects the file which is to be jumped to</td>
<td>1 to 4. Default = 1</td>
</tr>
<tr>
<td>111</td>
<td>Get/Set</td>
<td>Jump Step</td>
<td>UINT</td>
<td>Selects the step which is to be jumped to</td>
<td>1 to 10. Default = 1</td>
</tr>
<tr>
<td>112</td>
<td>Get/Set</td>
<td>Jump Count</td>
<td>UINT</td>
<td>Indicates the number of time the jump is to be done.</td>
<td>0 to 9999. Default = 1</td>
</tr>
<tr>
<td>113</td>
<td>Get/Set</td>
<td>Link File</td>
<td>UINT</td>
<td>Selects the file to link to.</td>
<td>1 to 4. Default = 1</td>
</tr>
<tr>
<td>114</td>
<td>Get/Set</td>
<td>End</td>
<td>BOOLEAN</td>
<td>Selects the state of the control and auxiliary outputs when a profile is ended</td>
<td>(0) - Off (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) - Hold</td>
</tr>
</tbody>
</table>

**Class Services:**
- 0x0E GET ATTRIBUTE SINGLE

**Instance Services:**
- 0x0E GET ATTRIBUTE SINGLE
- 0x10 SET ATTRIBUTE SINGLE

**NOTE:** All successful Explicit Message Responses from a SET service will contain no data. The response will be a two-byte message containing the requester's MAC ID and Service Code (with R/R bit set).