



**DNP3 Device Profile**  
***Based on DNP XML Schema version 2.06.00***

**Document Name: SEL-351RS DNP3 XML File**

**Document Description: DNP3 Complete Device Profile**

Revision History				
Date	Time	Version	Reason for change	Edited by
2010-03-19		1	SEL-351RS Device profile for DNP conformance	Karen Leggett

# REFERENCE DEVICE: SEL-351RS

## 1. Device Properties

This document is intended to be used for several purposes, including:

- Identifying the capabilities of a DNP3 device (Master Station or Outstation)
- Recording the settings of a specific instance of a device (parameter settings for a specific instance of the device in the user's total DNP3 estate)
- Matching user requirements to product capabilities when procuring a DNP3 device

The document is therefore structured to show, for each technical feature, the capabilities of the device (or capabilities required by the device when procuring).

It is also structured to show the current value (or setting) of each of the parameters that describe a specific instance of the device. This "current value" may also show a functional limitation of the device. For example when implementing secure authentication it is not required that all DNP3 devices accept aggressive mode requests during critical exchanges (see Device Profile 1.12.4), in which case a vendor would mark this current value as "No - does not accept aggressive mode requests".

Additionally, the current value may sometimes be used to show a value that a device can achieve because of hardware or software dependencies. An example of this is in section 1.6.8 of the Device Profile (Maximum error in the time that the Master issues freeze requests) where the value may well depend upon tolerances of hardware components and interactions between software tasks. When the Device Profile current value is used in this way the corresponding entry in the capabilities column is grayed-out. Users should note that if an entry in the capabilities column of the Device Profile is grayed-out then there may be information in the current value column that is pertinent to the device's capabilities.

Unless otherwise noted, multiple boxes in the second column below are selected for each parameter to indicate all capabilities supported or required. Parameters without checkboxes in the second column do not have capabilities and are included so that the current value may be shown in the third column.

The items listed in the capabilities column below may be configurable to any of the options selected, or set to a fixed value when the device was designed. Item 1.1.10 contains a list of abbreviations for the possible ways in which the configurable parameters may be set. Since some parameters may not be accessible by each of these methods supported, an abbreviation for the configuration method supported by each parameter is shown in the fourth column of the tables below.

If this document is used to show the current values, the third column should be filled in even if a fixed parameter is selected in the capabilities section ("NA" may be entered for parameters that are Not Applicable).

If the document is used to show the current values of parameters, then column 3 applies to a single connection between a master and an outstation.

<b>1.1. DEVICE IDENTIFICATION</b>	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable list methods</b>
<p>1.1.1. Device Function:  <i>Masters send DNP requests, while Outstations send DNP responses. If a single physical device can perform both functions a separate Device Profile Document must be provided for each function.</i></p>	<p>- Outstation</p>	<p>- Outstation</p>	
<p>1.1.2. Vendor Name:  <i>The name of the organization producing the device. Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 252.</i></p>		<p>Schweitzer Engineering Laboratories, Inc.</p>	
<p>1.1.3. Device Name:  <i>The model and name of the device, sufficient to distinguish it</i></p>		<p>SEL-351RS</p>	

<p>from any other device from the same organization.  <i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 250.</i></p>			
<p>1.1.4. Device manufacturer's hardware version string:  <i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 243.</i></p>		Mainboard Revision #	
<p>1.1.5. Device manufacturer's software version string:  <i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 242.</i></p>		Firmware Version #	
<p>1.1.6. Device Profile Document Version Number:</p>		1	

Version of the Device Profile Document is indicated by a whole number incremented with each new release. This should match the latest version shown in the Revision History at the start of this document.			
1.1.7. DNP Levels Supported for: <i>Indicate each DNP3 Level to which the device conforms fully. For Masters, requests and responses can be indicated independently.</i>	Outstations Only Requests and Responses <input checked="" type="checkbox"/> None <input checked="" type="checkbox"/> Level 1 <input checked="" type="checkbox"/> Level 2 <input type="checkbox"/> Level 3	Level 2	
1.1.8. Supported Function Blocks:	<input type="checkbox"/> Self Address Reservation <input type="checkbox"/> Data Sets <input type="checkbox"/> File Transfer <input type="checkbox"/> Virtual Terminal <input type="checkbox"/> Mapping to IEC 61850 Object Models defined in a DNP3 XML file <input type="checkbox"/> Function code 31, activate configuration <input type="checkbox"/> Secure Authentication (if checked then see 1.12)		
1.1.9. Notable Additions: <i>A brief</i>	Object 34 (Analog Deadbands) Object 30, 32, 34 - Long and Short Floating Point variations	Object 34 (Analog Deadbands) Object 30, 32, 34 -	

<i>description intended to quickly identify (for the reader) the most obvious features the device supports in addition to the Highest DNP Level Supported. The complete list of features is described in the Implementation Table.</i>		Long and Short Floating Point variations																	
1.1.10. Methods to set Configurable Parameters:	<div><input type="checkbox"/> XML - Loaded via DNP3 File Transfer</div> <div><input type="checkbox"/> XML - Loaded via other transport mechanism</div> <div><input checked="" type="checkbox"/> Terminal - ASCII Terminal Command Line</div> <div><input checked="" type="checkbox"/> Software - Vendor software named SEL-5030 AcSELeRator Quickset</div> <div><input type="checkbox"/> Proprietary file loaded via DNP3 File Transfer</div> <div><input checked="" type="checkbox"/> Proprietary file loaded via other transport mechanism</div> <div><input type="checkbox"/> Direct - Keypad on device front panel</div> <div><input checked="" type="checkbox"/> Factory - Specified when device is ordered</div> <div><input checked="" type="checkbox"/> Protocol - Set via DNP3 (e.g. assign class)</div> <div><input type="checkbox"/> Other - explain:</div>	Terminal Software Factory Protocol																	
1.1.11. DNP3 XML files available On-line:	<table><tr><th><u>RdWrFilename</u></th><th><u>Description of Contents</u></th></tr><tr><td><input type="checkbox"/> dnpDP.xml</td><td>Complete Device Profile</td></tr></table>	<u>RdWrFilename</u>	<u>Description of Contents</u>	<input type="checkbox"/> dnpDP.xml	Complete Device Profile	<table><tr><th><u>Rd</u></th><th><u>Wr</u></th><th><u>Filename</u></th></tr><tr><td><input type="checkbox"/></td><td></td><td>dnpDP.xml</td></tr><tr><td><input type="checkbox"/></td><td></td><td>dnpDPCap.xml</td></tr><tr><td><input type="checkbox"/></td><td></td><td>dnpDPCfg.xml</td></tr></table>	<u>Rd</u>	<u>Wr</u>	<u>Filename</u>	<input type="checkbox"/>		dnpDP.xml	<input type="checkbox"/>		dnpDPCap.xml	<input type="checkbox"/>		dnpDPCfg.xml	
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<input type="checkbox"/>		dnpDPCap.xml																	
<input type="checkbox"/>		dnpDPCfg.xml																	

<p>XML configuration file names that can be read or written through DNP3 File Transfer to a device. A device's currently running configuration is returned by DNP3 on-line XML file read from the device. DNP3 on-line XML file write to a device will update the device's configuration when the Activate Configuration (function code 31) is received.</p>	<table><tr><td><input type="checkbox"/></td><td>dnpDPCap.xml</td><td>Device Profile Capabilities</td></tr><tr><td><input type="checkbox"/></td><td>dnpDPCfg.xml</td><td>Device Profile config values</td></tr></table>	<input type="checkbox"/>	dnpDPCap.xml	Device Profile Capabilities	<input type="checkbox"/>	dnpDPCfg.xml	Device Profile config values																								
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<input type="checkbox"/>	dnpDPCfg.xml	Device Profile config values																													
<p>1.1.12. External DNP3 XML files available Off-line: XML configuration file names that can be read or written from an external system, typically from a system that maintains the outstation configuration. External off-line XML file read permits an XML</p>	<table><tr><td><u>Rd</u></td><td><u>Wr</u></td><td><u>Filename</u></td><td><u>Description of Contents</u></td></tr><tr><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td>dnpDP.xml</td><td>Complete Device Profile</td></tr><tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>dnpDPCap.xml</td><td>Device Profile Capabilities</td></tr><tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>dnpDPCfg.xml</td><td>Device Profile config values</td></tr></table>	<u>Rd</u>	<u>Wr</u>	<u>Filename</u>	<u>Description of Contents</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	dnpDP.xml	Complete Device Profile	<input type="checkbox"/>	<input type="checkbox"/>	dnpDPCap.xml	Device Profile Capabilities	<input type="checkbox"/>	<input type="checkbox"/>	dnpDPCfg.xml	Device Profile config values	<table><tr><td><u>Rd</u></td><td><u>Wr</u></td><td><u>Filename</u></td></tr><tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>dnpDP.xml</td></tr><tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>dnpDPCap.xml</td></tr><tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>dnpDPCfg.xml</td></tr></table>	<u>Rd</u>	<u>Wr</u>	<u>Filename</u>	<input type="checkbox"/>	<input type="checkbox"/>	dnpDP.xml	<input type="checkbox"/>	<input type="checkbox"/>	dnpDPCap.xml	<input type="checkbox"/>	<input type="checkbox"/>	dnpDPCfg.xml	
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<input type="checkbox"/>	<input type="checkbox"/>	dnpDPCfg.xml																													

<i>definition of a new configuration to be supplied from off-line configuration tools.</i> <i>External off-line XML file write permits an XML definition of a new configuration to be supplied to off-line configuration tools.</i>			
1.1.13. Connections Supported:	<input checked="" type="checkbox"/> Serial (complete section 1.2) <input checked="" type="checkbox"/> IP Networking (complete section 1.3) <input type="checkbox"/> Other, explain:  <div>Note: IP Networking available if ordered with the optional Ethernet port</div>	Serial IP Networking	

1.2. SERIAL CONNECTIONS	Capabilities	Current Value	If configurable list methods
1.2.1. Port Name: <i>Name used to reference the communications port defined in this section.</i>		PORT 1, PORT 2, PORT 3, PORT F  <div>Note: DNP3 may be enabled on up to three serial ports</div>	
1.2.2. Serial Connection Parameters:	<input checked="" type="checkbox"/> Asynchronous - 8 Data Bits, 1 Start Bit, 1 Stop Bit,	Asynchronous <div>Note: 8 Data</div>	Proprietary File via Other Mechanism



	<p>No Parity  <input checked="" type="checkbox"/> Other,  explain:<b>Asynchronous - 8 Data Bits, 1 Start Bit, 2 Stop Bits, No Parity</b>  <input checked="" type="checkbox"/> Other,  explain:<b>Asynchronous - 8 Data Bits, 1 Start Bit, 1 Stop Bit, Odd Parity</b>  <input checked="" type="checkbox"/> Other,  explain:<b>Asynchronous - 8 Data Bits, 1 Start Bit, 2 Stop Bits, Odd Parity</b>  <input checked="" type="checkbox"/> Other,  explain:<b>Asynchronous - 8 Data Bits, 1 Start Bit, 1 Stop Bit, Even Parity</b>  <input checked="" type="checkbox"/> Other,  explain:<b>Asynchronous - 8 Data Bits, 1 Start Bit, 2 Stop Bits, Even Parity</b></p> <p>Note: Implemented in Target Layer</p>	<p>Bits, 1Start Bit, 1Stop Bit, No Parity</p>	<p>-----  terminal  -----  software <b>SEL-5030</b>  <b>AcSELerator Quickset</b> Vers  -----</p>
1.2.3. Baud Rate:	<p><input type="checkbox"/> Fixed at  <input type="checkbox"/> Configurable, range to  <input checked="" type="checkbox"/> Configurable, selectable from <b>300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600</b>  <input type="checkbox"/> Other, explain:</p> <p>Note: Implemented in Target Layer</p>		<p>Proprietary File via Other Mechanism  -----  terminal  -----  software <b>SEL-5030</b>  <b>AcSELerator Quickset</b> Vers  -----</p>
1.2.4. Hardware Flow Control (Handshaking): Describe hardware signaling requirements of the interface. Where a transmitter or	<p><input checked="" type="checkbox"/> None  <b>RS-232 / V.24 / V.28</b>  <b>Options:</b>  <u>Asserts:</u></p>	<p>None <b>RS-232 / V.24 / V.28</b>  <b>Options:</b>  Other,</p>	<p>Proprietary File via Other Mechanism  -----  terminal</p>

<p>receiver is inhibited until a given control signal is asserted, it is considered to require that signal prior to sending or receiving characters.</p> <p>Where a signal is asserted prior to transmitting, that signal will be maintained active until after the end of transmission.</p> <p>Where a signal is asserted to enable reception, any data sent to the device when the signal is not active could be discarded.</p>	<div> <input checked="" type="checkbox"/> RTS Before Tx         <input type="checkbox"/> DTR Before Tx         <input type="checkbox"/> RTS Before Rx         <input type="checkbox"/> DTR Before Rx         <input checked="" type="checkbox"/> Always RTS         <input type="checkbox"/> Always DTR       </div> <div> <u>Requires Before Tx:</u>          CTS <input type="checkbox"/> <input checked="" type="checkbox"/> Asserted Deasserted          DCD <input type="checkbox"/> <input checked="" type="checkbox"/> Asserted Deasserted          DSR <input type="checkbox"/> <input type="checkbox"/> Asserted Deasserted          RI <input type="checkbox"/> <input type="checkbox"/> Asserted Deasserted  <input type="checkbox"/> Requires Rx Inactive before Tx       </div> <div> <u>Requires Before Rx:</u>          CTS <input type="checkbox"/> <input type="checkbox"/> Asserted Deasserted          DCD <input type="checkbox"/> <input type="checkbox"/> Asserted Deasserted          DSR <input type="checkbox"/> <input type="checkbox"/> Asserted Deasserted          RI <input type="checkbox"/> <input type="checkbox"/> Asserted Deasserted       </div> <div> <u>Always Ignores:</u>  <input checked="" type="checkbox"/> CTS         <input type="checkbox"/> DCD         <input type="checkbox"/> DSR         <input type="checkbox"/> RI         <input type="checkbox"/> Other, explain:       </div> <div> <b>RS-422 / V.11 Options:</b>  <input type="checkbox"/> Requires Indication before Rx         <input type="checkbox"/> Asserts Control before Tx       </div>	<div> <b>RS-422 / V.11 Options:</b>          Other,       </div> <div> <b>RS-485 Options:</b>          Other,       </div>	<div>         -----          software <b>SEL-5030</b>  <b>AcSELeRator Quickset</b> Vers          -----       </div> <div>         Note: If the PREDLY setting = OFF, RTS is always asserted. Otherwise, if PREDLY is a value between 0 and 30, RTS asserts for PREDLY seconds before transmission.       </div> <div>         Note: When the device transmits a DNP message, it delays transmitting after asserting RTS by at least the time in the PREDLY setting. It delays deasserting RTS after transmission by at least the time in the PSTDLY setting.       </div>
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	<div><input type="checkbox"/> Other, explain:</div> <div><b>RS-485 Options:</b></div> <div><input type="checkbox"/> Requires Rx inactive before Tx</div> <div><input type="checkbox"/> Other, explain:</div> <div><input checked="" type="checkbox"/> Other, explain:</div>		<div>Note: The CTS signal is used as a DCD input, indicating when the medium is in use.</div> <div>Transmissions will only be initiated if the DCD signal is deasserted. When DCD drops, the next pending outgoing message, if any, will be sent once an idle time is satisfied. This idle time will be randomly selected between the minimum and maximum allowed idle times (i.e. MAXDLY &amp; MINDLY). In addition, the device will monitor received data, and treat receipt of data as a DCD indication. This allows RTS to be looped-back to DCD in cases where the external</div>
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			transceiver does not support DCD.
<p>1.2.5. Interval to Request Link Status:</p> <p><i>Indicates how often to send Data Link Layer status requests on a serial connection. This parameter is separate from the TCP Keep-alive timer.</i></p>	<input checked="" type="checkbox"/> Not Supported <input type="checkbox"/> Fixed at seconds <input type="checkbox"/> Configurable, range to seconds <input type="checkbox"/> Configurable, selectable from seconds <input type="checkbox"/> Other, explain:	Not Supported	
<p>1.2.6. Supports DNP3 Collision Avoidance:</p> <p><i>Indicates whether an Outstation uses a collision avoidance algorithm. Documentation provided by the vendor will provide information on collision avoidance schemes.</i></p>	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes, explain: <b>For serial connections, the device pauses for a random delay between the settings MAXDLY and MINDLY when it detects a carrier through data on the receive line or the CTS pin. If you use the settings of 0.10 seconds for MAXDLY and 0.05 seconds for MINDLY, the device will insert a random delay of 50 to 100 ms (milliseconds) between the end of carrier detection and the start of data transmission.</b>	Yes	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELeator Quickset</b> Vers -----
<p>1.2.7. Receiver Inter-character Timeout:</p> <p><i>When serial interfaces with asynchronous character framing are used, this parameter indicates if the receiver makes a check for gaps between characters. (i.e. extensions of the stop bit time of one character prior to the start bit of the following character within a message).</i></p>	<input checked="" type="checkbox"/> Not Checked <input type="checkbox"/> No gap permitted <input type="checkbox"/> Fixed at bit times <input type="checkbox"/> Fixed at ms <input type="checkbox"/> Configurable, range to bit times <input type="checkbox"/> Configurable, range to ms <input type="checkbox"/> Configurable, selectable	Not Checked	

<p><i>If the receiver performs this check and the timeout is exceeded then the receiver discards the current data link frame. A receiver that does not discard data link frames on the basis of inter-character gaps is considered not to perform this check. Where no asynchronous serial interface is fitted this parameter is not applicable. In this case none of the options shall be selected.</i></p>	<p>from bit times</p> <p><input type="checkbox"/> Configurable, selectable from ms</p> <p><input type="checkbox"/> Configurable, other, describe:</p> <p><input type="checkbox"/> Variable, explain:</p>		
<p>1.2.8. Inter-character gaps in transmission: <i>When serial interfaces with asynchronous character framing are used, this parameter indicates whether extra delay is ever introduced between characters in the message, and if so, the maximum width of the gap. Where no asynchronous serial interface is fitted this parameter is not applicable. In this case none of the options shall be selected.</i></p>	<p><input checked="" type="checkbox"/> None (always transmits with no inter-character gap)</p> <p><input type="checkbox"/> Maximumbit times</p> <p><input type="checkbox"/> Maximumms</p>	None	

1.3. IP NETWORKING	Capabilities	Current Value	If configurable list methods
1.3.1. Port Name: <i>Name used to reference the communications port defined in this section.</i>		PORT 5	
1.3.2. Type of End Point:	<p><input type="checkbox"/> TCP Initiating (Master Only)</p> <p><input checked="" type="checkbox"/> TCP Listening (Outstation Only)</p> <p><input type="checkbox"/> TCP Dual (required for Masters)</p>	TCP Listening	<p>Proprietary File via Other Mechanism</p> <p>----- terminal ----- software</p>

	<input checked="" type="checkbox"/> UDP Datagram (required)		<b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----
1.3.3. IP Address of this Device:		192.168.1.2	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----
1.3.4. Subnet Mask:		255.255.255.0	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----
1.3.5. Gateway IP Address:		192.168.1.1	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----

1.3.6. Accepts TCP Connections or UDP Datagrams from:	<input type="checkbox"/> Allows all (show as *.*.*.* in 1.3.7) <input type="checkbox"/> Limits based on IP address <input checked="" type="checkbox"/> Limits based on list of IP addresses <input type="checkbox"/> Limits based on a wildcard IP address <input type="checkbox"/> Limits based on list of wildcard IP addresses <input type="checkbox"/> Other validation, explain:	List of IP addresses	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELeRator</b> <b>Quickset</b> Vers -----
1.3.7. IP Address(es) from which TCP Connections or UDP Datagrams are accepted:		*.*.*.*	Proprietary File via Other Mechanism ----- terminal -----
1.3.8. TCP Listen Port Number: <i>If Outstation or dual end point Master, port number on which to listen for incoming TCP connect requests. Required to be configurable for Masters and recommended to be configurable for Outstations.</i>	<input type="checkbox"/> Not Applicable (Master w/o dual end point) <input type="checkbox"/> Fixed at 20,000 <input checked="" type="checkbox"/> Configurable, range <b>1</b> to <b>65534</b> <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	20000	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELeRator</b> <b>Quickset</b> Vers -----
1.3.9. TCP Listen Port Number of remote device: <i>If Master or dual end point Outstation, port number on remote device with which to initiate connection. Required to be configurable for Masters and recommended to be configurable for Outstations.</i>	<input checked="" type="checkbox"/> Not Applicable (Outstation w/o dual end point) <input type="checkbox"/> Fixed at 20,000 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from	Not Applicable	

	<input type="checkbox"/> Other, explain:		
1.3.10. TCP Keep-alive timer: <i>The time period for the keep-alive timer on active TCP connections.</i>	<input type="checkbox"/> Fixed at ms <input checked="" type="checkbox"/> Configurable, range <b>1000</b> to <b>20000</b> ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Other, explain:  <div style="background-color: #e0ffe0; padding: 5px;"> <p>Note: The ETCPKA setting, along with the KAIDLE, KAINTV, and KACNT settings, can be used to verify that the computer at the remote end of a TCP connection is still available. If ETCPKA is enabled and the device does not transmit any TCP data within the interval specified by the KAIDLE setting, the device sends a keep-alive packet to the remote computer. If the device does not receive a response from the remote computer within the time (in seconds) specified by KAINTV, the keep-alive packet is re-transmitted as many as KACNT times. After this count is reached, the device remote device is no longer available, so the device can terminate the connection without waiting for the idle timer (TIDLE or FTPIDLE) to expire.</p> </div>	10000 ms	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----
1.3.11. Local UDP port: <i>Local UDP port for sending and/or receiving UDP datagrams. Masters may let system choose an available</i>	<input type="checkbox"/> Fixed at 20,000 <input checked="" type="checkbox"/> Configurable, range <b>1</b> to <b>65534</b>	20000	Proprietary File via Other Mechanism ----- terminal



port. Outstations must use one that is known by the Master.	<input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:  <input type="checkbox"/> Let system choose (Master only)		----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----
1.3.12. Destination UDP port for DNP3 Requests (Master Only):	<input type="checkbox"/> Fixed at 20,000 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:		
1.3.13. Destination UDP port for initial unsolicited null responses (UDP only Outstations): <i>For a UDP only Outstation, the destination UDP port for sending initial unsolicited Null response.</i>	<input type="checkbox"/> None <input type="checkbox"/> Fixed at 20,000 <input checked="" type="checkbox"/> Configurable, range <b>0</b> to <b>20000</b> <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	0	
1.3.14. Destination UDP port for responses: <i>For a UDP only Outstation, the destination UDP port for sending all responses other than the initial unsolicited Null response.</i>	<input type="checkbox"/> None <input type="checkbox"/> Fixed at 20,000 <input checked="" type="checkbox"/> Configurable, range <b>0</b> to <b>20000</b> <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:  <input type="checkbox"/> Use source port number	0	
1.3.15. Multiple outstation connections (Masters only): <i>Master only. Indicates whether multiple outstation connections are supported.</i>	<input type="checkbox"/> Supports multiple outstations (Masters only)		

1.3.16. Multiple master connections (Outstations only): <i>Outstations only. Indicates whether multiple master connections are supported and the method that can be used to establish connections.</i>	<input checked="" type="checkbox"/> Supports multiple masters (Outstations only) If supported, the following methods may be used: <input checked="" type="checkbox"/> Method 1 (based on IP address) - required <input checked="" type="checkbox"/> Method 2 (based on IP port number) - recommended <input type="checkbox"/> Method 3 (browsing for static data) - optional	IP address IP port number	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELeRator</b> <b>Quickset</b> Vers -----
1.3.17. Time synchronization support:	<input type="checkbox"/> DNP3 LAN procedure (function code 24) <input checked="" type="checkbox"/> DNP3 Write Time (not recommended over LAN) <input type="checkbox"/> Other, explain:  <input type="checkbox"/> Not Supported	Write Time	

1.4. LINK LAYER	Capabilities	Current Value	If configurable list methods
1.4.1. Data Link Address: <i>Indicates if the link address is configurable over the entire valid range of 0 to 65,519. Data link addresses 0xFFFF0 through 0xFFFFF are reserved for broadcast or other special purposes.</i>	<input type="checkbox"/> Fixed at <input checked="" type="checkbox"/> Configurable, range <b>0</b> to <b>65519</b> <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	0	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELeRator</b> <b>Quickset</b> Vers -----
1.4.2. DNP3 Source Address Validation: <i>Indicates whether the Outstation will filter out</i>	<input checked="" type="checkbox"/> Never <input type="checkbox"/> Always, one address allowed (shown in 1.4.3)	Never	

requests not from a specific source address.	<input type="checkbox"/> Always, any one of multiple addresses allowed (each selectable as shown in 1.4.3) <input type="checkbox"/> Sometimes, explain:		
1.4.3. DNP3 Source Address(es) expected when Validation is Enabled: <i>Selects the allowed source address(es)</i>	<input type="checkbox"/> Configurable to any 16 bit DNP Data Link Address value <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:		
1.4.4. Self Address Support using address 0xFFFC: <i>If an Outstation receives a message with a destination address of 0xFFFC it shall respond normally with its own source address. It must be possible to diasble this feature if supported.</i>	<input type="checkbox"/> Yes (only allowed if configurable) <input checked="" type="checkbox"/> No	No	
1.4.5. Sends Confirmed User Data Frames: <i>A list of conditions under which the device transmits confirmed link layer services (TEST_LINK_STATES, RESET_LINK_STATES, CONFIRMED_USER_DATA).</i>	<input type="checkbox"/> Never <input type="checkbox"/> Always <input checked="" type="checkbox"/> Sometimes, explain: <b>Determined by DRETRY setting</b>	Sometimes	
1.4.6. Data Link Layer Confirmation Timeout: <i>This timeout applies to any secondary data link message that requires a confirm or response (link reset, link status, user data, etc).</i>	<input type="checkbox"/> None <input type="checkbox"/> Fixed at ms <input checked="" type="checkbox"/> Configurable, range <b>0</b> to <b>5000</b> ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Other, explain:	1000ms	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers

	<input type="checkbox"/> Variable, explain:		-----
1.4.7. Maximum Data Link Retries: <i>The number of times the device will retransmit a frame that requests Link Layer confirmation.</i>	<input type="checkbox"/> None <input type="checkbox"/> Fixed at <input checked="" type="checkbox"/> Configurable, range <b>0</b> to <b>15</b> <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	0	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----
1.4.8. Maximum number of octets Transmitted in a Data Link Frame: <i>This number includes the CRCs. With a length field of 255, the maximum size would be 292.</i>	<input checked="" type="checkbox"/> Fixed at <b>292</b> <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	292	
1.4.9. Maximum number of octets that can be Received in a Data Link Frame: <i>This number includes the CRCs. With a field length of 255, the maximum size would be 292. The device must be able to receive 292 octets to be compliant.</i>	<input checked="" type="checkbox"/> Fixed at <b>292</b> <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	292	

1.5. APPLICATION LAYER	Capabilities	Current Value	If configurable list methods
1.5.1. Maximum number of octets Transmitted in an Application Layer Fragment other than File Transfer: <i>This size does not include any transport or frame octets.</i> - Masters must provide a setting less than or equal to	<input checked="" type="checkbox"/> Fixed at <b>2048</b> <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	2048	

<p>249.</p> <p>- Outstations must provide a setting less than or equal to 2048.</p> <p><i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 240.</i></p>			
<p>1.5.2. Maximum number of octets Transmitted in an Application Layer Fragment containing File Transfer:</p>	<p><input checked="" type="checkbox"/> Fixed at <b>2048</b></p> <p><input type="checkbox"/> Configurable, range to</p> <p><input type="checkbox"/> Configurable, selectable from</p> <p><input type="checkbox"/> Other, explain:</p>	2048	
<p>1.5.3. Maximum number of octets that can be received in an Application Layer Fragment:</p> <p><i>This size does not include any transport or frame octets.</i></p> <p>- Masters must provide a setting greater than or equal to 2048.</p> <p>- Outstations must provide a setting greater than or equal to 249.</p> <p><i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 241.</i></p>	<p><input checked="" type="checkbox"/> Fixed at <b>249</b></p> <p><input type="checkbox"/> Configurable, range to</p> <p><input type="checkbox"/> Configurable, selectable from</p> <p><input type="checkbox"/> Other, explain:</p>	249	
<p>1.5.4. Timeout waiting for Complete Application Layer Fragment:</p> <p><i>Timeout if all frames of a message fragment are not received in the specified time. Measured from time first frame of a fragment is received until the last frame is received.</i></p>	<p><input checked="" type="checkbox"/> None</p> <p><input type="checkbox"/> Fixed at ms</p> <p><input type="checkbox"/> Configurable, range to ms</p> <p><input type="checkbox"/> Configurable, selectable from ms</p> <p><input type="checkbox"/> Other, explain:</p> <p><input type="checkbox"/> Variable, explain:</p>	None	

1.5.5. Maximum number of objects allowed in a single control request for CROB (Group 12): <i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 216.</i>	<input checked="" type="checkbox"/> Fixed at <b>10</b> (enter 0 if controls are not supported) <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain:	10	
1.5.6. Maximum number of objects allowed in a single control request for Analog Outputs (Group 41):	<input checked="" type="checkbox"/> Fixed at <b>10</b> (enter 0 if controls are not supported) <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain:	10	
1.5.7. Maximum number of objects allowed in a single control request for Data Sets (Groups 85, 86, 87):	<input checked="" type="checkbox"/> Fixed at <b>0</b> (enter 0 if controls are not supported) <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain:	0	
1.5.8. Supports mixed object groups (AOBs, CROBs and Data Sets) in the same control request:	<input type="checkbox"/> Not applicable - controls are not supported <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	No	
1.5.9. User Data: <i>A user data entry</i>			

<b>1.6. FILL OUT THE FOLLOWING ITEMS FOR MASTERS ONLY</b>	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable list methods</b>
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1.7. FILL OUT THE FOLLOWING ITEMS FOR OUTSTATIONS ONLY	Capabilities	Current Value	If configurable list methods
1.7.1. Timeout waiting for Application Confirm of solicited response message:	<input type="checkbox"/> None <input type="checkbox"/> Fixed at ms <input checked="" type="checkbox"/> Configurable, range <b>1000</b> to <b>50000</b> ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Other, explain:  <input type="checkbox"/> Variable, explain:	5000ms	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----
1.7.2. How often is time synchronization required from the master: <i>Details of when the master needs to perform a time synchronization to ensure that the outstation clock does not drift outside of an acceptable tolerance. If the option to relate this to IIN1.4 is used then details of when IIN1.4 is asserted are in section 1.10.2.</i>	<input checked="" type="checkbox"/> Never needs time <input type="checkbox"/> Within seconds after IIN1.4 is set <input type="checkbox"/> Periodically, fixed at seconds <input checked="" type="checkbox"/> Periodically, between <b>60</b> and <b>1966020</b> seconds	Never	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers ----- <div>Note: Configurable with the TIMERQ setting.</div>
1.7.3. Device Trouble Bit IIN1.6: <i>If IIN1.6 device trouble bit is set under certain conditions, explain the possible causes.</i>	<input checked="" type="checkbox"/> Never used <input type="checkbox"/> Reason for setting:	Never used	
1.7.4. File Handle Timeout: <i>If there is no activity referencing a file handle for a configurable length of time, the outstation must do an</i>	<input checked="" type="checkbox"/> Not applicable, files not supported <input type="checkbox"/> Fixed at ms	Not applicable	

<p><i>automatic close on the file. The timeout value must be configurable up to 1 hour. When this condition occurs the outstation will send a File Transport Status Object (obj grp 70 var 6) using a status code value of handle expired (0x02).</i></p>	<input type="checkbox"/> Configurable, range to ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain:		
<p>1.7.5. Event Buffer Overflow Behavior:</p>	<input type="checkbox"/> Discard the oldest event <input checked="" type="checkbox"/> Discard the newest event <input type="checkbox"/> Other, explain:	Discard newest	
<p>1.7.6. Event Buffer Organization:  <i>Explain how event buffers are arranged (per Object Group, per Class, single buffer etc) and provide their sizes.</i></p>	per Object Group	per Object Group	
<p>1.7.7. Sends Multi-Fragment Responses:  <i>Indicates whether an Outstation sends multi-fragment responses (Masters do not send multi-fragment requests).</i></p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
<p>1.7.8. Last Fragment Confirmation:  <i>Indicates whether the Outstation requests confirmation of the last fragment of a multi-fragment response.</i></p>	<input type="checkbox"/> Always <input checked="" type="checkbox"/> Sometimes, explain: <b>Only when it contains events</b> <input type="checkbox"/> Never	Sometimes	
<p>1.7.9. DNP Command Settings preserved through a device reset:  <i>If any of these settings are written through the DNP protocol and they are not preserved through a restart of the Outstation, the Master will have to write them again anytime the Restart IIN bit is</i></p>	<input type="checkbox"/> Assign Class <input type="checkbox"/> Analog Deadbands <input type="checkbox"/> Data Set Prototypes <input type="checkbox"/> Data Set Descriptors <input type="checkbox"/> Function Code 31 Activate Configuration		



set.			
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1.8. OUTSTATION UNSOLICITED RESPONSE SUPPORT	Capabilities	Current Value	If configurable list methods
<p>1.8.1. Supports Unsolicited Reporting: <i>When the unsolicited response mode is configured "off", the device is to behave exactly like an equivalent device that has no support for unsolicited responses. If set to "on", the Outstation will send a null Unsolicited Response after it restarts, then wait for an Enable Unsolicited Response command from the master before sending additional Unsolicited Responses containing event data.</i></p>	<input type="checkbox"/> Not Supported <input checked="" type="checkbox"/> Configurable, selectable from On and Off	Off	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----
<p>1.8.2. Master Data Link Address: <i>The destination address of the master device where the unsolicited responses will be sent.</i></p>	<input type="checkbox"/> Fixed at <input checked="" type="checkbox"/> Configurable, range <b>0</b> to <b>65519</b> <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	1	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----
<p>1.8.3. Unsolicited Response Confirmation Timeout: <i>This is the amount of time that the outstation will wait for an Application Layer confirmation back from the master indicating that the master received the unsolicited response message.</i></p>	<input type="checkbox"/> Fixed at ms <input checked="" type="checkbox"/> Configurable, range <b>1000</b> to <b>5000000</b> ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Other, explain:	60000 ms	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b>

As a minimum, the range of configurable values must include times from one second to one minute. This parameter may be the same one that is used for normal, solicited, application confirmation timeouts, or it may be a separate parameter.	<input type="checkbox"/> Variable, explain:  Note: Relay will try URETRY times at an interval of ETIMEO seconds to send an unsolicited message until it receives an acknowledgement. If no acknowledgement is received after UTIMEO retries, it changes the interval to UTIMEO and continues to retry until it receives an acknowledgement.		<b>Quickset</b> Vers -----
1.8.4. Number of Unsolicited Retries: This is the number of retries that an outstation transmits in each unsolicited response series if it does not receive confirmation back from the master. The configured value includes identical and regenerated retry messages. One of the choices must provide for an indefinite (and potentially infinite) number of transmissions.	<input type="checkbox"/> None <input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:  <input checked="" type="checkbox"/> Always infinite, never gives up  Note: URETRY setting is the number of times the relay will try to send an unsolicited message at the ETIMEO timeout. Once it has retried URETRY times, it will continue to retry at the UTIMEO interval.	Infinite	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELeRator</b> <b>Quickset</b> Vers -----
1.8.5. User Data: A user data entry			

1.9. OUTSTATION UNSOLICITED RESPONSE TRIGGER CONDITIONS	Capabilities	Current Value	If configurable list methods
1.9.1. Number of class 1	<input checked="" type="checkbox"/> Class 1 not used to		

events:	trigger Unsolicited Responses <input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:		
1.9.2. Number of class 2 events:	<input checked="" type="checkbox"/> Class 2 not used to trigger Unsolicited Responses <input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:		
1.9.3. Number of class 3 events:	<input checked="" type="checkbox"/> Class 3 not used to trigger Unsolicited Responses <input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:		
1.9.4. Total number of events from any class:	<input type="checkbox"/> Total Number of Events not used to trigger Unsolicited Responses <input type="checkbox"/> Fixed at <input checked="" type="checkbox"/> Configurable, range <b>1 to 200</b> <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	10	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----
1.9.5. Hold time after class 1 event:	<input checked="" type="checkbox"/> Class 1 not used to		

<p><i>A configurable value of 0 indicates that responses are not delayed due to this parameter.</i></p>	<p>trigger Unsolicited Responses</p> <p><input type="checkbox"/> Fixed at ms</p> <p><input type="checkbox"/> Configurable, range to ms</p> <p><input type="checkbox"/> Configurable, selectable from ms</p> <p><input type="checkbox"/> Other, explain:</p>		
<p>1.9.6. Hold time after class 2 event: <i>A configurable value of 0 indicates that responses are not delayed due to this parameter.</i></p>	<p><input checked="" type="checkbox"/> Class 2 not used to trigger Unsolicited Responses</p> <p><input type="checkbox"/> Fixed at ms</p> <p><input type="checkbox"/> Configurable, range to ms</p> <p><input type="checkbox"/> Configurable, selectable from ms</p> <p><input type="checkbox"/> Other, explain:</p>		
<p>1.9.7. Hold time after class 3 event: <i>A configurable value of 0 indicates that responses are not delayed due to this parameter.</i></p>	<p><input checked="" type="checkbox"/> Class 3 not used to trigger Unsolicited Responses</p> <p><input type="checkbox"/> Fixed at ms</p> <p><input type="checkbox"/> Configurable, range to ms</p> <p><input type="checkbox"/> Configurable, selectable from ms</p> <p><input type="checkbox"/> Other, explain:</p>		
<p>1.9.8. Hold time after event assigned to any class: <i>A configurable value of 0 indicates that responses are not delayed due to this parameter.</i></p>	<p><input type="checkbox"/> Class events not used to trigger Unsolicited Responses</p> <p><input type="checkbox"/> Fixed at ms</p> <p><input checked="" type="checkbox"/> Configurable, range <b>0</b> to <b>99999000</b>ms</p> <p><input type="checkbox"/> Configurable, selectable from ms</p> <p><input type="checkbox"/> Other, explain:</p>	<p>2000 ms</p>	<p>Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----</p>

1.9.9. Retrigger Hold Time: <i>The hold-time timer may be retriggered for each new event detected (increased possibility of capturing all the changes in a single response) or not retriggered (giving the master a guaranteed update time).</i>	<input type="checkbox"/> Hold-time timer will be retriggered for each new event detected (may get more changes in next response) <input checked="" type="checkbox"/> Hold-time timer will not be retriggered for each new event detected (guaranteed update time)	Not retriggered	
1.9.10. Other Unsolicited Response Trigger Conditions:	<input type="checkbox"/>		

1.10. OUTSTATION PERFORMANCE	Capabilities	Current Value	If configurable list methods
1.10.1. Maximum Time Base Drift (milliseconds per minute): <i>If the device is synchronized by DNP, what is the clock drift rate over the full operating temperature range.</i>	<input checked="" type="checkbox"/> Fixed at 0ms <input type="checkbox"/> Range to ms <input type="checkbox"/> Selectable from ms <input checked="" type="checkbox"/> Other, describe: <b>1.2 ms/min @ 25 deg C</b>	Other, <b>1.2 ms/min @ 25 deg C</b>	
1.10.2. When does outstation set IIN1.4? <i>When does the outstation set the internal indication NEED_TIME</i>	<input checked="" type="checkbox"/> Never <input checked="" type="checkbox"/> Asserted at startup until first Time Synchronization request received <input type="checkbox"/> Periodically, range to seconds <input type="checkbox"/> Periodically, selectable from seconds <input type="checkbox"/> Range to seconds after last time sync <input type="checkbox"/> Selectable from seconds after last time sync <input type="checkbox"/> When time error may have drifted by range to ms <input type="checkbox"/> When time error may have drifted by selectable from ms	Never	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELeRator</b> <b>Quickset</b> Vers -----

	<p>Note: If TIMERQ = I or M, IIN 1.4 is never asserted</p> <p>Note: If TIMERQ = value, IIN 1.4 is asserted periodically every (value) minutes</p>		
<p>1.10.3. Maximum Internal Time Reference Error when set via DNP (ms):</p> <p><i>The difference between the time set in DNP Write Time message, and the time actually set in the outstation.</i></p>	<p><input checked="" type="checkbox"/> Fixed at <b>100ms</b></p> <p><input type="checkbox"/> Range to ms</p> <p><input type="checkbox"/> Selectable from ms</p> <p><input type="checkbox"/> Other, describe:</p>	100 ms	
<p>1.10.4. Maximum Delay Measurement Error (ms):</p> <p><i>The difference between the time reported in the delay measurement response and the actual time between receipt of the delay measurement request and issuing the delay measurement reply.</i></p>	<p><input checked="" type="checkbox"/> Fixed at <b>100ms</b></p> <p><input type="checkbox"/> Range to ms</p> <p><input type="checkbox"/> Selectable from ms</p> <p><input type="checkbox"/> Other, describe:</p>	100 ms	
<p>1.10.5. Maximum Response Time (ms):</p> <p><i>The amount of time an outstation will take to respond upon receipt of a valid request. This does not include the message transmission time.</i></p>	<p><input checked="" type="checkbox"/> Fixed at <b>100ms</b></p> <p><input type="checkbox"/> Range to ms</p> <p><input type="checkbox"/> Selectable from ms</p> <p><input type="checkbox"/> Other, describe:</p>	100 ms	
<p>1.10.6. Maximum time from start-up to IIN 1.4 assertion (ms):</p>	<p><input checked="" type="checkbox"/> Fixed at <b>100ms</b></p> <p><input type="checkbox"/> Range to ms</p> <p><input type="checkbox"/> Selectable from ms</p> <p><input type="checkbox"/> Other, describe:</p>	100 ms	
<p>1.10.7. Maximum Event Time-tag error for local Binary and Double Bit I/O (ms):</p> <p><i>The error between the time-</i></p>	<p><input type="checkbox"/> Fixed at ms</p> <p><input type="checkbox"/> Range to ms</p> <p><input type="checkbox"/> Selectable from ms</p>	<p>Other, <b>If the Binary point is in the SER list, error is +/- 1 ms.</b></p>	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p>

<i>tag reported and the absolute time of the physical event. This error includes the Internal Time Reference Error.</i> <i>Note: The current value of this parameter is available remotely using protocol object Group 0 Variation 217.</i>	<input checked="" type="checkbox"/> Other, describe: <b>If the Binary point is in the SER list, error is +/- 1 ms. Otherwise, error can be up to 500 ms.</b>	<b>Otherwise, error can be up to 500 ms.</b>	----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----
1.10.8. Maximum Event Time-tag error for local I/O other than Binary and Double Bit data types (ms):	<input type="checkbox"/> Fixed at ms <input type="checkbox"/> Range to ms <input type="checkbox"/> Selectable from ms <input checked="" type="checkbox"/> Other, describe: <b>Up to 500 ms</b>	<b>Other, Up to 500 ms</b>	

1.11. INDIVIDUAL FIELD OUTSTATION PARAMETERS	Value of Current Setting	If configurable list methods
1.11.1. User-assigned location name or code string (same as g0v245):	Value of TID setting	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----
1.11.2. User-assigned ID code/number string (same as g0v246):	value of RID setting	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b>

		Vers -----
1.11.3 User-assigned name string for the outstation (same as g0v247):	Value of RID setting	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----
1.11.4 Device Serial Number string (same as g0v248):	device Serial Number	factory -----

1.12. SECURITY PARAMETERS	Capabilities	Current Value	If configurable list methods
<p>1.12.1 DNP3 device support for secure authentication:  <i>The support for secure authentication is optional in DNP3 devices. Indicate here if the device supports secure authentication.</i>  <i>If the device does not support secure authentication then ignore the rest of this section.</i>  <i>If the device does support secure authentication then specify the version(s) that are supported in the device. The version number is an integer value defined in the protocol document "DNP3Spec-V2-Sup1-SecureAuthentication". The volume 2 supplement shows version numbers of all associated documents that</i></p>	<p><input checked="" type="checkbox"/> Secure Authentication not supported  If Secure Authentication is supported, what Version(s) are supported:  <input type="checkbox"/> Fixed at version  <input type="checkbox"/> Configurable, selectable from versions</p>	Not Supported	



comprise that version of Secure Authentication.			
<p>1.12.2 Maximum number of users:  <i>The secure authentication algorithm provides support for multiple users. The device must support details for each user (update keys, session keys, etc). A user is identified by a 16-bit user number, allowing a maximum of 65535 users. Devices are not mandated to support this number of potential users. Indicate here the actual limit to the number of simultaneous users that can be supported.</i></p>	Maximum number of users supported:	Maximum number of users supported:	
<p>1.12.3 Security message response timeout:  <i>Authentication of critical messages may involve additional message exchanges (challenges and responses) which can require an extension to the normal DNP3 message response timeout. This timeout specifies an additional time to be used when the extra security transactions are involved. The maximum allowable timeout extension should not exceed 120 seconds.</i></p>	<input type="checkbox"/> Fixed at ms <input type="checkbox"/> Configurable, range to ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Other, explain:		
<p>1.12.4 Aggressive mode of operation (receive):  <i>DNP3 devices may (optionally) accept "aggressive" mode requests, where challenge data used for authentication is appended to a critical message rather than needing to be solicited via a separate message exchange.</i></p>		<input checked="" type="checkbox"/> No, does not accept aggressive mode requests	

<p>1.12.5 Aggressive mode of operation (issuing):  <i>DNP3 devices must support the issuing of "aggressive" mode of operation, where challenge data used for authentication is appended to a critical message rather than needing to be solicited via a separate message exchange. Specific instances of devices may have the use of aggressive mode switched off.</i></p>		<input checked="" type="checkbox"/> No, does not issue aggressive mode requests	
<p>1.12.6 Session key change interval:  <i>To counter an attack that compromises the session key, the session key is changed at regular intervals. The maximum interval is 2 hours. Outstation devices invalidate the current set of session keys if they have not been changed by the master station after a period of twice this configured value. To accommodate systems with infrequent communications, this change interval can be disabled and just the session key change message count used (see 1.12.7)</i></p>	<input type="checkbox"/> Can be disabled When enabled <input type="checkbox"/> Configurable, range to seconds		
<p>1.12.7 Session key change message count:  <i>In addition to changing the session key at regular intervals, the key shall also be changed after a specified number of messages have been exchanged. The maximum allowable value for this message count is 10,000</i></p>	<input type="checkbox"/> Configurable, range to		
<p>1.12.8 Maximum error count:  <i>To assist in countering denial of service attacks, a DNP3</i></p>	<input type="checkbox"/> Configurable, range to		

<p><i>device shall stop replying with error codes after a number of successive authentication failures. This error count has a maximum value of 10. Setting the error count to zero inhibits all error messages.</i></p>			
<p>1.12.9 HMAC algorithm requested in a challenge exchange:  <i>Part of the authentication message is hashed using an HMAC algorithm. DNP3 devices must support SHA-1 and may optionally support SHA-256 for this hashing process. The output of the HMAC algorithm is truncated (the resulting length dependant on the media being used).</i></p>	<p><input type="checkbox"/> SHA-1 (truncated to 4 octets)  <input type="checkbox"/> SHA-1 (truncated to 10 octets)  <input type="checkbox"/> SHA-256 (truncated to 8 octets)  <input type="checkbox"/> SHA-256 (truncated to 16 octets)  <input type="checkbox"/> Other, explain:</p>		
<p>1.12.10 Key-wrap algorithm to encrypt session keys:  <i>During the update of a session key, the key is encrypted using AES-128 or optionally using other algorithms.</i></p>	<p><input type="checkbox"/> AES-128  <input type="checkbox"/> Other, explain:</p>		
<p>1.12.11 Cipher Suites used with DNP implementations using TLS:  <i>Indicate the supported Cipher Suites for implementations using TLS..</i></p>	<p><input type="checkbox"/> Not relevant - TLS is not used  <input type="checkbox"/> TLS_RSA encrypted with RC4_128  <input type="checkbox"/> TLS_RSA encrypted with 3DES_EDE_CBC  <input type="checkbox"/> TLS_DH, signed with DSS, encrypted with 3DES_EDE_CBC  <input type="checkbox"/> TLS_DH, signed with RSA, encrypted with 3DES_EDE_CBC  <input type="checkbox"/> TLS_DHE, signed with</p>		

	<p>DSS, encrypted with 3DES_EDE_CBC</p> <p><input type="checkbox"/> TLS_DHE, signed with RSA, encrypted with 3DES_EDE_CBC</p> <p><input type="checkbox"/> TLS_DH, signed with DSS, encrypted with AES128</p> <p><input type="checkbox"/> TLS_DH, signed with DSS, encrypted with AES256</p> <p><input type="checkbox"/> TLS_DH encrypted with AES128</p> <p><input type="checkbox"/> TLS_DH encrypted with AES256</p> <p><input type="checkbox"/> Other, explain:</p>		
<p>1.12.12 Change cipher request timeout:</p> <p><i>Implementations using TLS shall terminate the connection if a response to a change cipher request is not seen within this timeout period.</i></p>	<p><input type="checkbox"/> Not relevant - TLS is not used</p> <p><input type="checkbox"/> Fixed at</p> <p><input type="checkbox"/> Configurable, range to</p> <p><input type="checkbox"/> Configurable, selectable from</p> <p><input type="checkbox"/> Other, explain:</p>		
<p>1.12.13 Number of Certificate Authorities supported:</p> <p><i>Implementations using TLS shall support at least 4 Certificate Authorities. Indicate the number supported.</i></p>		0	
<p>1.12.14 Certificate Revocation check time:</p> <p><i>Implementations using TLS shall evaluate Certificate Revocation Lists on a periodic basis, terminating a connection if a certificate is revoked.</i></p>	<p><input type="checkbox"/> Not relevant - TLS is not used</p> <p><input type="checkbox"/> Fixed at hours</p> <p><input type="checkbox"/> Configurable, range to hours</p> <p><input type="checkbox"/> Configurable, selectable from hours</p>		

	<input type="checkbox"/> Other, explain:		
<p>1.12.15 Additional critical function codes:</p> <p><i>The DNP3 security supplement defines those messages with specific function codes that are critical and must be used as part of a secure authentication message exchange. Messages with other function codes are optional and changes to this list should be noted here.</i></p>	<p>Additional function codes that are to be considered as "critical":</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> 0 (Confirm)</li> <li><input type="checkbox"/> 1 (Read)</li> <li><input type="checkbox"/> 7 (Immediate freeze)</li> <li><input type="checkbox"/> 8 (Immediate freeze - no ack)</li> <li><input type="checkbox"/> 9 (Freeze-and-clear)</li> <li><input type="checkbox"/> 10 (Freeze-and-clear - no ack)</li> <li><input type="checkbox"/> 11 (Freeze-at-time)</li> <li><input type="checkbox"/> 12 (Freeze-at-time - no ack)</li> <li><input type="checkbox"/> 22 (Assign Class)</li> <li><input type="checkbox"/> 23 (Delay Measurement)</li> <li><input type="checkbox"/> 25 (Open File)</li> <li><input type="checkbox"/> 26 (Close File)</li> <li><input type="checkbox"/> 27 (Delete File)</li> <li><input type="checkbox"/> 28 (Get File Info)</li> <li><input type="checkbox"/> 30 (Abort File)</li> <li><input type="checkbox"/> 129 (Response)</li> <li><input type="checkbox"/> 130 (Unsolicited Response)</li> </ul>		
<p>1.12.16 Other critical fragments:</p> <p><i>Other critical transactions can be defined and should be detailed here. Examples could be based on time (for example: the first transaction after a communications session is established). Other examples could be based on</i></p>			

<i>specific data objects (for example: the reading of specific data points).</i>			
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## 2. Mapping to IEC 61850 Object Models

This optional section allows each configuration parameter or point in the DNP Data map to be tied to an attribute in the IEC 61850 object models. The IEC 61850 mappings are stored in the XML version of the Device Profile Document as a list of XPath references to the tags representing real-time data from DNP under each point (for example value, timestamp, and quality for Analog inputs) paired with an IEC 61850 Object Reference in the form of a flattened ACSI (Abstract Communications Service Interface) name of the object and attributes as specified in IEC 61850 parts 7-4 and 7-3. The Xpath reference into the DNP XML file may also contain a reference to a constant value, a formula or conditional expression involving one or more XML tags, or a reference to a configuration parameter that is not associated with a particular data point.

A tree or table representation may be generated from the XML and shown here in the Device Profile Document. The following is an example tree format.

### MAPPING TO IEC 61850 OBJECT MODELS

IEC 61850 Object	DNP Xpath Reference
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## 3. Capabilities and Current Settings for Device Database

The following tables identify the capabilities and current settings for each DNP3 data type. Each data type also provides a table defining the data points available in the device or a description of how this information can be obtained if the database is configurable.

### 3.1. BINARY INPUT POINTS

Static (Steady-State) Object Number: 1

Event Object Number: 2

	Capabilities	Current Value	If configurable list methods
3.1.1. Static Variation reported when variation 0 requested	<input checked="" type="checkbox"/> Variation 1 - Single-bit packed format <input checked="" type="checkbox"/> Variation 2 - Single-bit with flag <input type="checkbox"/> Based on point index	Two	
3.1.2. Event Variation reported when variation 0	<input type="checkbox"/> Variation 1 - without	Two	

<p>requested:</p> <p><i>Note: The support for binary input events can be determined remotely using protocol object Group 0 Variation 237.</i></p>	<p>time</p> <p><input checked="" type="checkbox"/> Variation 2 - with absolute time</p> <p><input type="checkbox"/> Variation 3 - with relative time</p> <p><input type="checkbox"/> Based on point index</p>		
<p>3.1.3. Event reporting mode:</p> <p><i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.</i></p> <p><i>All events are typically reported for Binary Inputs</i></p>	<p><input type="checkbox"/> Only most recent</p> <p><input checked="" type="checkbox"/> All events</p>	All events	
<p>3.1.4. Binary Inputs included in Class 0 response:</p> <p><i>If Binary Inputs are not included in the Class 0 response, Binary Input Events (group 2) may not be reported.</i></p>	<p><input checked="" type="checkbox"/> Always</p> <p><input type="checkbox"/> Never</p> <p><input type="checkbox"/> Only if point is assigned to Class 1, 2, or 3</p> <p><input type="checkbox"/> Based on point index</p>	Always	
<p>3.1.5. Definition of Binary Input Point List:</p> <p><i>List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.</i></p> <p><i>Note: the number of binary inputs present in the device, and the maximum binary input index, are available remotely using object Group 0 Variations 239 and 238.</i></p>	<p><input type="checkbox"/> Fixed, list shown in table below</p> <p><input checked="" type="checkbox"/> Configurable (current list may be shown in table below)</p> <p><input type="checkbox"/> Other, explain:</p>	Configurable	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software</p> <p><b>SEL-5030</b></p> <p><b>AcSELeRator</b></p> <p><b>Quickset</b></p> <p>Vers</p> <p>-----</p>

Binary Input points list:					
Point Index	Name	Event Class	Name for State when	Name for State	Description

		Assigned (1, 2, 3 or none)	value is 0	when value is 1	
0	52A	one	Deasserted	Asserted	Circuit Breaker Status
1	79RS	one	Deasserted	Asserted	Reclosing Reset
2	79LO	one	Deasserted	Asserted	Reclosing Lockout
3	LED1	one	Deasserted	Asserted	Operator Control 1 LED state
4	LED2	one	Deasserted	Asserted	Operator Control 2 LED state
5	LED3	one	Deasserted	Asserted	Operator Control 3 LED state
6	LED4	one	Deasserted	Asserted	Operator Control 4 LED state
7	LED5	one	Deasserted	Asserted	Operator Control 5 LED state
8	LED6	one	Deasserted	Asserted	Operator Control 6 LED state
9	LED7	one	Deasserted	Asserted	Operator Control 7 LED state
10	LED8	one	Deasserted	Asserted	Operator Control 8 LED state
11	LED9	one	Deasserted	Asserted	Operator Control 9 LED state
12	TLED17	one	Deasserted	Asserted	Target/Status LED 17 state
13	TLED16	one	Deasserted	Asserted	Target/Status LED 16 state
14	TLED15	one	Deasserted	Asserted	Target/Status LED 15 state
15	TLED14	one	Deasserted	Asserted	Target/Status LED 14 state
16	TLED13	one	Deasserted	Asserted	Target/Status LED 13 state
17	TLED12	one	Deasserted	Asserted	Target/Status LED 12 state
18	TLED11	one	Deasserted	Asserted	Target/Status LED 11 state
19	TLED10	one	Deasserted	Asserted	Target/Status LED 10 state
20	TLED25	one	Deasserted	Asserted	Target/Status LED 25 state
21	TLED24	one	Deasserted	Asserted	Target/Status LED 24 state
22	TLED23	one	Deasserted	Asserted	Target/Status LED 23 state
23	TLED22	one	Deasserted	Asserted	Target/Status LED 22 state
24	TLED21	one	Deasserted	Asserted	Target/Status LED 21 state
25	TLED20	one	Deasserted	Asserted	Target/Status LED 20 state
26	TLED19	one	Deasserted	Asserted	Target/Status LED 19 state
27	TLED18	one	Deasserted	Asserted	Target/Status LED 18 state
28	LDPF	one	Deasserted	Asserted	Leading Power Factor indication
29	RLYDIS	one	Deasserted	Asserted	Relay Disabled



30	STFAIL	one	Deasserted	Asserted	Relay Diagnostic Failure
31	STWARN	one	Deasserted	Asserted	Relay Diagnostic Warning
32	UNRDEV	one	Deasserted	Asserted	Unread Relay Event Available

### 3.2. DOUBLE-BIT INPUT POINTS

**Static (Steady-State) Object Number: 3**

**Event Object Number: 4**

	Capabilities	Current Value	If configurable list methods
<p>3.2.1. Static Variation reported when variation 0 requested</p> <p><i>Note: The support for double-bit inputs can be determined remotely using protocol object Group 0 Variation 234.</i></p>	<input type="checkbox"/> Variation 1 - Double-bit packed format <input type="checkbox"/> Variation 2 - Double-bit with flag <input type="checkbox"/> Based on point index		
<p>3.2.2. Event Variation reported when variation 0 requested</p>	<input type="checkbox"/> Variation 1 - without time <input type="checkbox"/> Variation 2 - with absolute time <input type="checkbox"/> Variation 3 - with relative time <input type="checkbox"/> Based on point index		
<p>3.2.3. Event reporting mode:  <i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.</i>  <i>All events are typically reported for Double Bit Inputs</i></p>	<input type="checkbox"/> Only most recent <input type="checkbox"/> All events		
<p>3.2.4. Double Bit Inputs included in Class 0 response:  <i>If Double-bit Inputs are not included in the Class 0 response, Double-bit Input Events (group 4) may not be</i></p>	<input type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to Class 1, 2, or 3		

reported.	<input type="checkbox"/> Based on point index		
3.2.5. Definition of Double Bit Input Point List: <i>List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.</i> <i>Note: the number of double-bit inputs present in the device, and the maximum double-bit input index, are available remotely using object Group 0 Variations 236 and 235.</i>	<input type="checkbox"/> Fixed, list shown in table below <input type="checkbox"/> Configurable (current list may be shown in table below) <input type="checkbox"/> Other, explain:		

Double-bit Input points list:							
Point Index	Name	Event Class Assigned (1, 2, 3 or none)	Name for State when value is 0 (intermediate)	Name for State when value is 1 (off)	Name for State when value is 2 (on)	Name for State when value is 3 (indeterminate)	Description

### 3.3. BINARY OUTPUT STATUS AND CONTROL RELAY OUTPUT BLOCK

**Binary Output Status Object Number: 10**

**Binary Output Event Object Number: 11**

**CROB Object Number: 12**

**Binary Output Command Event Object Number: 13**

	Capabilities	Current Value	If configurable list methods
3.3.1. Minimum pulse time allowed with Trip, Close and Pulse On commands.	<input checked="" type="checkbox"/> Fixed at <b>2 ms</b> (hardware may limit this further) <input type="checkbox"/> Based on point index Note: 1/8 cycle @ 60 Hz = 2 ms Pulse	Fixed at 2 ms	
3.3.2. Maximum pulse time allowed with Trip, Close and Pulse On commands.	<input checked="" type="checkbox"/> Fixed at <b>2 ms</b> (hardware may limit this further) <input type="checkbox"/> Based on point index	Fixed at 2 ms	

3.3.3. Binary Output Status included in Class 0 response: <i>If Binary Output Status points are not included in the Class 0 response, Binary Output Status Events (group 11) may not be reported.</i>	<input checked="" type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to Class 1, 2, or 3 <input type="checkbox"/> Based on point index	Always	
3.3.4. Reports Output Command Event Objects:	<input checked="" type="checkbox"/> Never <input type="checkbox"/> Only upon a successful Control <input type="checkbox"/> Upon all control attempts	Never	
3.3.5. Static Variation reported when variation 0 requested	<input type="checkbox"/> Variation 1 - Continuous control <input checked="" type="checkbox"/> Variation 2 - Continuous control, binary output status <input type="checkbox"/> Based on point index	Two	
3.3.6. Event Variation reported when variation 0 requested <i>Note: The support for binary output events can be determined remotely using protocol object Group 0 Variation 222.</i>	<input type="checkbox"/> Variation 1 - without time <input type="checkbox"/> Variation 2 - with absolute time <input type="checkbox"/> Based on point index		
3.3.7. Command Event Variation reported when variation 0 requested	<input type="checkbox"/> Variation 1 - without time <input type="checkbox"/> Variation 2 - with absolute time <input type="checkbox"/> Based on point index		
3.3.8. Change Event reporting mode: <i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.</i>	<input type="checkbox"/> Only most recent <input type="checkbox"/> All events		
3.3.9. Command Event reporting mode:	<input type="checkbox"/> Only most recent		

When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.	<input type="checkbox"/> All events		
3.3.10. Maximum Time between Select and Operate:	<input type="checkbox"/> Not Applicable <input type="checkbox"/> Fixed at seconds <input checked="" type="checkbox"/> Configurable, range 0 to 30seconds <input type="checkbox"/> Configurable, selectable from seconds <input type="checkbox"/> Other, explain:  <input type="checkbox"/> Variable, explain: <input type="checkbox"/> Based on point index	1 seconds	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----
3.3.11. Definition of Binary Output Status / Control Relay Output Block Points List: List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table. Note: the number of binary outputs present in the device, and the maximum binary output index, are available remotely using object Group 0 Variations 224 and 223.	<input type="checkbox"/> Fixed, list shown in table below <input checked="" type="checkbox"/> Configurable (current list may be shown in table below) <input type="checkbox"/> Other, explain:		Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----

Binary Output Status and CROB points list:																	
		Supported Control Operations													Event Class Assigned (1,2,3 or none)		
Po int	Name	Select/ Operate	Dir ect	Dir ect	Pu lse	Pu lse	La tch	La tch	Tr ip	Cl os	Co unt	Canc el	Na me	Na me	Cha nge	Com mand	Descr iption

In de x			Ope rate	Ope rate - No Ack	O n	Of f	On	Of f		e	> 1	Curr ently Runn ing Oper ation	for Sta te wh en val ue is 0	for Sta te wh en val ue is 1				
0	RB1	Y	Y	Y	Y	Y	Y	Y	Y	Y			Cl ear	Set				Remo te Bit 1
1	RB2	Y	Y	Y	Y	Y	Y	Y	Y	Y			Cl ear	Set				Remo te Bit 2
2	RB3	Y	Y	Y	Y	Y	Y	Y	Y	Y			Cl ear	Set				Remo te Bit 3
3	RB4	Y	Y	Y	Y	Y	Y	Y	Y	Y			Cl ear	Set				Remo te Bit 4
4	RB5	Y	Y	Y	Y	Y	Y	Y	Y	Y			Cl ear	Set				Remo te Bit 5
5	RB6	Y	Y	Y	Y	Y	Y	Y	Y	Y			Cl ear	Set				Remo te Bit 6
6	RB7	Y	Y	Y	Y	Y	Y	Y	Y	Y			Cl ear	Set				Remo te Bit 7
7	RB8	Y	Y	Y	Y	Y	Y	Y	Y	Y			Cl ear	Set				Remo te Bit 8
8	RB9	Y	Y	Y	Y	Y	Y	Y	Y	Y			Cl ear	Set				Remo te Bit 9
9	RB10	Y	Y	Y	Y	Y	Y	Y	Y	Y			Cl ear	Set				Remo te Bit 10
10	RB11	Y	Y	Y	Y	Y	Y	Y	Y	Y			Cl ear	Set				Remo te Bit

																	11	
11	RB12	Y	Y	Y	Y	Y	Y	Y	Y	Y			Cl ear	Set			Remo te Bit 12	
12	RB13	Y	Y	Y	Y	Y	Y	Y	Y	Y			Cl ear	Set			Remo te Bit 13	
13	RB14	Y	Y	Y	Y	Y	Y	Y	Y	Y			Cl ear	Set			Remo te Bit 14	
14	RB15	Y	Y	Y	Y	Y	Y	Y	Y	Y			Cl ear	Set			Remo te Bit 15	
15	RB16	Y	Y	Y	Y	Y	Y	Y	Y	Y			Cl ear	Set			Remo te Bit 16	
16	OC	Y	Y	Y	Y		Y			Y			Cl ear	Set			Circui t Break er open comm and	
17	CC	Y	Y	Y	Y		Y			Y			Cl ear	Set			Circui t Break er close comm and	
18	DRST _TAR	Y	Y	Y	Y		Y			Y			Cl ear	Set			Reset front panel target s comm and	
19	NXTE VE	Y	Y	Y	Y	Y	Y	Y	Y	Y			Cl ear	Set			Read next relay event comm	

																		and	
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-----	--

### 3.4. COUNTERS / FROZEN COUNTERS

Static Counter Object Number: 20

Static Frozen Counter Object Number: 21

Counter Event Object Number: 22

Frozen Counter Event Object Number: 23

	Capabilities	Current Value	If configurable list methods
3.4.1. Static Counter Variation reported when variation 0 requested	<input type="checkbox"/> Variation 1 - 32-bit with flag <input type="checkbox"/> Variation 2 - 16-bit with flag <input type="checkbox"/> Variation 5 - 32-bit without flag <input checked="" type="checkbox"/> Variation 6 - 16-bit without flag <input type="checkbox"/> Based on point index	Six	
3.4.2. Counter Event Variation reported when variation 0 requested <i>Note: The support for counter events can be determined remotely using protocol object Group 0 Variation 227.</i>	<input type="checkbox"/> Variation 1 - 32-bit with flag <input checked="" type="checkbox"/> Variation 2 - 16-bit with flag <input type="checkbox"/> Variation 5 - 32-bit with flag and time <input type="checkbox"/> Variation 6 - 16-bit with flag and time <input type="checkbox"/> Based on point index	Two	
3.4.3. Counters included in Class 0 response: <i>If counters are not included in the Class 0 response, Counter Events (group 22) may not be reported.</i>	<input checked="" type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to Class 1, 2, or 3 <input type="checkbox"/> Based on point index	Always	
3.4.4. Counter Event reporting mode: <i>When responding with event</i>	<input checked="" type="checkbox"/> Only most recent <input type="checkbox"/> All events	Most recent	

<p><i>data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.</i></p> <p><i>All events are typically reported for Counters</i></p>			
<p>3.4.5. Static Frozen Counter Variation reported when variation 0 requested:</p>	<p><input type="checkbox"/> Variation 1 - 32-bit with flag</p> <p><input type="checkbox"/> Variation 2 - 16-bit with flag</p> <p><input type="checkbox"/> Variation 5 - 32-bit with flag and time</p> <p><input type="checkbox"/> Variation 6 - 16-bit with flag and time</p> <p><input type="checkbox"/> Variation 9 - 32-bit without flag</p> <p><input type="checkbox"/> Variation 10 - 16-bit without flag</p> <p><input type="checkbox"/> Based on point index</p>		
<p>3.4.6. Frozen Counter Event Variation reported when variation 0 requested:</p> <p><i>Note: The support for frozen counter events can be determined remotely using protocol object Group 0 Variation 225.</i></p>	<p><input type="checkbox"/> Variation 1 - 32-bit with flag</p> <p><input type="checkbox"/> Variation 2 - 16-bit with flag</p> <p><input type="checkbox"/> Variation 5 - 32-bit without flag</p> <p><input type="checkbox"/> Variation 6 - 16-bit without flag</p> <p><input type="checkbox"/> Based on point index</p>		
<p>3.4.7. Frozen Counters included in Class 0 response:</p> <p><i>If Frozen Counters are not included in the Class 0 response, Frozen Counter Events (group 23) may not be reported.</i></p>	<p><input type="checkbox"/> Always</p> <p><input checked="" type="checkbox"/> Never</p> <p><input type="checkbox"/> Only if point is assigned to Class 1, 2, or 3</p> <p><input type="checkbox"/> Based on point index</p>	Never	
<p>3.4.8. Frozen Counter Event reporting mode:</p>	<p><input type="checkbox"/> Only most recent</p>		



<p><i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.</i></p> <p><i>All events are typically reported for Frozen Counters</i></p>	<input type="checkbox"/> All events		
<p>3.4.9. Counters Roll Over at:</p>	<input checked="" type="checkbox"/> 16 Bits (65,535) <input type="checkbox"/> 32 Bits (4,294,967,295) <input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:  <input checked="" type="checkbox"/> Based on point index	Based on point index	
<p>3.4.10. Counters frozen by means of:</p>	<input type="checkbox"/> Master Request <input type="checkbox"/> Freezes itself without concern for time of day <input type="checkbox"/> Freezes itself and requires time of day <input type="checkbox"/> Other, explain:		
<p>3.4.11. Definition of Counter / Frozen Counter Point List:  <i>List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.</i>  <i>Note: the number of counters present in the device, and the maximum counter index, are available remotely using object Group 0 Variations 229 and 228.</i></p>	<input type="checkbox"/> Fixed, list shown in table below <input checked="" type="checkbox"/> Configurable (current list may be shown in table below) <input type="checkbox"/> Other, explain:		Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELerator</b> <b>Quickset</b> Vers -----

Counter / Frozen Counter points list:

Point Index	Name	Event Class Assigned to Counter Events (1, 2, 3 or none)	Frozen Counter Exists (Yes or No)	Event Class Assigned to Frozen Counter Events (1, 2, 3 or none)	Description	Counter rollover at
0	ACTGRP	none	N		Active Settings Group	
1	CTLTR	none	N		Internal Trip Counter	
2	EXTTR	none	N		External Trip Counter	

### 3.5. ANALOG INPUT POINTS

**Static (Steady-State) Object Number: 30**

**Event Object Number: 32**

**Deadband Object Number: 34**

	Capabilities	Current Value	If configurable list methods
3.5.1. Static Variation reported when variation 0 requested	<input checked="" type="checkbox"/> Variation 1 - 32-bit with flag <input checked="" type="checkbox"/> Variation 2 - 16-bit with flag <input checked="" type="checkbox"/> Variation 3 - 32-bit without flag <input checked="" type="checkbox"/> Variation 4 - 16-bit without flag <input checked="" type="checkbox"/> Variation 5 - single-precision floating point with flag <input checked="" type="checkbox"/> Variation 6 - double-precision floating point with flag <input type="checkbox"/> Based on point index <div style="background-color: #90EE90; padding: 5px;">Note: Setting DVARAIx defines default AI variation (1-6)</div>	Four	Proprietary File via Other Mechanism ----- terminal -----

<p>3.5.2. Event Variation reported when variation 0 requested:  <i>Note: The support for analog input events can be determined remotely using protocol object Group 0 Variation 231.</i></p>	<p><input checked="" type="checkbox"/> Variation 1 - 32-bit without time  <input checked="" type="checkbox"/> Variation 2 - 16-bit without time  <input checked="" type="checkbox"/> Variation 3 - 32-bit with time  <input checked="" type="checkbox"/> Variation 4 - 16-bit with time  <input checked="" type="checkbox"/> Variation 5 - single-precision floating point w/o time  <input checked="" type="checkbox"/> Variation 6 - double-precision floating point w/o time  <input type="checkbox"/> Variation 7 - single-precision floating point with time  <input type="checkbox"/> Variation 8 - double-precision floating point with time  <input type="checkbox"/> Based on point index  Note: Setting DVARAIx defines default AI variation (1-6)</p>	<p>Four</p>	<p>Proprietary File via Other Mechanism  -----  terminal  -----</p>
<p>3.5.3. Event reporting mode:  <i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.</i>  <i>When reporting only the most recent event the analog value returned in the response may be either the value at the time that the event is queued or it may be the value at the time of the response.</i>  <i>These options may be set globally for all analog points</i></p>	<p><input checked="" type="checkbox"/> A: Only most recent (value at time of event)  <input type="checkbox"/> B: Only most recent (value at time of response)  <input type="checkbox"/> C: All events  <input type="checkbox"/> Based on point index - column specifies which of the options applies</p>	<p>Most recent - event time</p>	

<i>or set for each individual point.</i>			
3.5.4. Analog Inputs included in Class 0 response: <i>If Analog Inputs are not included in the Class 0 response, Analog Input Events (group 32) may not be reported.</i>	<input checked="" type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to Class 1, 2, or 3 <input type="checkbox"/> Based on point index	Always	
3.5.5. How Deadbands are set:	<input type="checkbox"/> A. Global Fixed <input checked="" type="checkbox"/> B. Configurable through DNP <input checked="" type="checkbox"/> C. Configurable via other means <input type="checkbox"/> D. Other, explain:  <input type="checkbox"/> Based on point index - column specifies which of the options applies B, C or D	C	Proprietary File via Other Mechanism ----- terminal ----- protocol -----
3.5.6. Analog Deadband Algorithm:  <i>simple- just compares the difference from the previous reported value</i>  <i>integrating- keeps track of the accumulated change</i>  <i>other- indicating another algorithm</i>	<input checked="" type="checkbox"/> Simple <input type="checkbox"/> Integrating <input type="checkbox"/> Other, explain: <input type="checkbox"/> Based on point index	Simple	
3.5.7. Definition of Analog Input Point List: <i>List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.</i> <i>Note: the number of analog</i>	<input checked="" type="checkbox"/> Fixed, list shown in table below <input checked="" type="checkbox"/> Configurable (current list may be shown in table below) <input type="checkbox"/> Other, explain:	Fixed	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b>



14	WEAR	two							Breaker Contact Wear
15	FTYPE	two							Fault Type
16	FLOC	two							Fault Location
17	FI								Maximum Fault Current
18	FFREQ								Fault Frequency
19	FGRP								Fault Group
20	FSHO								Fault Shot Count
21	FTIMEH								Fault Time High Byte
22	FTIMEM								Fault Time Middle Byte
23	FTIMEL								Fault Time Low Byte
24	FUNR								Number of Unread Faults

### 3.6. ANALOG OUTPUT STATUS AND ANALOG OUTPUT CONTROL BLOCK

Analog Output Status Object Number: 40

Analog Output Control Block Object Number: 41

Analog Output Event Object Number: 42

Analog Output Command Event Object Number: 43

	Capabilities	Current Value	If configurable list methods
3.6.1. Static Analog Output Status Variation reported when variation 0 requested	<input type="checkbox"/> Variation 1 - 32-bit with flag <input checked="" type="checkbox"/> Variation 2 - 16-bit with flag	Two	

	<input type="checkbox"/> Variation 3 - single-precision floating point with flag <input type="checkbox"/> Variation 4 - double-precision floating point with flag <input type="checkbox"/> Based on point index		
3.6.2. Analog Output Status included in Class 0 response: <i>If Analog Output Status points are not included in the Class 0 response, Analog Output Events (group 42) may not be reported.</i>	<input checked="" type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to Class 1, 2, or 3 <input type="checkbox"/> Based on point index	Always	
3.6.3. Reports Output Command Event Objects:	<input checked="" type="checkbox"/> Never <input type="checkbox"/> Only upon a successful Control <input type="checkbox"/> Upon all control attempts	Never	
3.6.4. Event Variation reported when variation 0 requested <i>Note: The support for analog output events can be determined remotely using protocol object Group 0 Variation 219.</i>	<input type="checkbox"/> Variation 1 - 32-bit without time <input type="checkbox"/> Variation 2 - 16-bit without time <input type="checkbox"/> Variation 3 - 32-bit with time <input type="checkbox"/> Variation 4 - 16-bit with time <input type="checkbox"/> Variation 5 - single-precision floating point w/o time <input type="checkbox"/> Variation 6 - double-precision floating point w/o time <input type="checkbox"/> Variation 7 - single-precision floating point with time <input type="checkbox"/> Variation 8 - double-precision floating point with time		

	<input type="checkbox"/> Based on point index		
3.6.5. Command Event Variation reported when variation 0 requested	<input type="checkbox"/> Variation 1 - 32-bit without time <input type="checkbox"/> Variation 2 - 16-bit without time <input type="checkbox"/> Variation 3 - 32-bit with time <input type="checkbox"/> Variation 4 - 16-bit with time <input type="checkbox"/> Variation 5 - single-precision floating point w/o time <input type="checkbox"/> Variation 6 - double-precision floating point w/o time <input type="checkbox"/> Variation 7 - single-precision floating point with time <input type="checkbox"/> Variation 8 - double-precision floating point with time <input type="checkbox"/> Based on point index		
3.6.6. Change Event reporting mode: <i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.</i>	<input type="checkbox"/> Only most recent <input type="checkbox"/> All events		
3.6.7. Command Event reporting mode: <i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.</i>	<input type="checkbox"/> Only most recent <input type="checkbox"/> All events		
3.6.8. Maximum Time	<input type="checkbox"/> Not Applicable	1 seconds	Proprietary



between Select and Operate:	<input type="checkbox"/> Fixed at seconds <input checked="" type="checkbox"/> Configurable, range <b>0</b> to <b>30000</b> seconds <input type="checkbox"/> Configurable, selectable from seconds <input type="checkbox"/> Other, explain:  <input type="checkbox"/> Variable, explain: <input type="checkbox"/> Based on point index		File via Other Mechanism ----- terminal -----
3.6.9. Definition of Analog Output Status / Analog Output Block Point List: <i>List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.</i> <i>Note: the number of analog outputs present in the device, and the maximum analog output index, are available remotely using object Group 0 Variations 221 and 220.</i>	<input type="checkbox"/> Fixed, list shown in table below <input checked="" type="checkbox"/> Configurable (current list may be shown in table below) <input type="checkbox"/> Other, explain:		Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELeRator</b> <b>Quickset</b> Vers -----

Analog Output points list:														
		Supported Control Operations			Transmitted Value		Scaling				Event Class Assigned (1, 2, 3 or none)			
Point Index	Name	Select/Operate	Direct Operate	Direct Operate - No Ack	Min	Max	Min	Max	Units	Resolution	Change	Command	Description	
0	ACTGRP	Y	Y	Y									Active settings group	

### 3.7. SEQUENTIAL FILE TRANSFER

Object Number: 70

	Capabilities	Current Value	If configurable list methods
3.7.1. File Transfer Supported:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (do not complete any further entries in section 3.7)	No	
3.7.2. File Authentication: <i>Indicates whether a valid authentication key must be obtained prior to open and delete requests.</i>	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes, explain <input checked="" type="checkbox"/> Never	Never	
3.7.3. File Append Mode: <i>Indicates if a file can be opened and appended to versus just overwritten.</i>	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes, explain <input checked="" type="checkbox"/> Never	Never	
3.7.4. Permissions Support: <i>Indicates the device is capable of using the indicated permissions.</i>	<input type="checkbox"/> Owner Read Allowed: 0x0100 <input type="checkbox"/> Owner Write Allowed: 0x0080 <input type="checkbox"/> Owner Execute Allowed: 0x0040 <input type="checkbox"/> Group Read Allowed: 0x0020 <input type="checkbox"/> Group Write Allowed: 0x0010 <input type="checkbox"/> Group Execute Allowed: 0x0008 <input type="checkbox"/> World Read Allowed: 0x0004 <input type="checkbox"/> World Write Allowed: 0x0002 <input type="checkbox"/> World Execute Allowed: 0x0001		
3.7.5. Multiple Blocks in a Fragment: <i>File data is transferred in a</i>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	No	

<i>series of blocks of a maximum specified size. This indicates whether only a single block or multiple blocks will be sent in fragment.</i>			
3.7.6. Max number of Files Open at one time:	<input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:		
3.7.7. Definition of File Names that may be read or written:	<input type="checkbox"/> Fixed, list shown in table below <input type="checkbox"/> Configurable (current list may be shown in table below) <input type="checkbox"/> Other, explain:		
Sequential Files list:			
		Authentication Required for:	
File Name	Event Class Assigned (1, 2, 3 or none)	Read	Write
		Delete	Description

### 3.8. OCTET STRING POINTS

**Static (Steady-State) Object Number: 110**

**Event Object Number: 111**

	Capabilities	Current Value	If configurable list methods
3.8.1. Event reporting mode: <i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent</i>	<input type="checkbox"/> Only most recent <input type="checkbox"/> All events <div>Note: Not supported</div>		

<i>event.</i>			
3.8.2. Octet Strings included in Class 0 response: <i>If Octet Strings are not included in the Class 0 response, Octet String Events (group 111) may not be reported.</i>	<input type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to Class 1, 2, or 3 <input type="checkbox"/> Based on point index		
3.8.3. Definition of Octet String Point List: <i>List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.</i>	<input type="checkbox"/> Fixed, list shown in table below <input type="checkbox"/> Configurable (current list may be shown in table below) <input type="checkbox"/> Other, explain:		

Octet String points list:

Point Index	Name	Event Class Assigned (1, 2, 3 or none)	Description
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### 3.9. VIRTUAL TERMINAL PORT NUMBERS (POINTS)

Static (Steady-State) Object Number: 112

Event Object Number: 113

	Capabilities	Current Value	If configurable list methods
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Ports list:

Virtual Port Number (Point Index)	Name	Event Class Assigned (1, 2, 3 or none)	Description
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### 3.10. DATA SET PROTOTYPE

Object Number: 85

Variation Number: 1

	Capabilities	Current Value	If configurable
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			<b>list methods</b>
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3.10.2. Description:

*Note: The numbers of data set prototypes known to the device are available remotely using the prototol object Group 0 Variations 212 and 213.*

Element Number	Descriptor Code	Element Description	Data Type Code	Max Data Length	Ancillary Value
0	ID (identifier)	Mandatory DS identifier	None	0	
1	UUID	UUID assigned to prototype	None	0	

### 3.11. DATA SET DESCRIPTOR CONTENTS AND CHARACTERISTICS

**Object Number: 86**

**Variation Numbers: 1 and 2**

	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable list methods</b>
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*Note: The numbers of data sets known to the device are available remotely using the prototol object Group 0 Variations 214 and 215.*

Element Number	Descriptor Code	Element Description	Data Type Code	Max Data Length	Ancillary Value
0	ID (identifier)	Mandatory DS identifier	None	0	

#### Data set Points

Element Number	DNP Group Number	Point Index
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#### 4. Implementation Table

The following implementation table identifies which object groups and variations, function codes and qualifiers the device supports in both requests and responses. The *Request* columns identify all requests that may be sent by a Master, or all requests that must be parsed by an Outstation. The *Response* columns identify all responses that must be parsed by a Master, or all responses that may be sent by an Outstation.

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
Object Group Number	Variation Number	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
0	242	Device Attributes - Device manufacturer's software version	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	243	Device Attributes - Device manufacturer's hardware version	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	245	Device Attributes – User-assigned location name	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	246	Device Attributes - User assigned ID code/number	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	247	Device Attributes – User-assigned device name	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	248	Device Attributes - Device serial number	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	250	Device Attributes - Device manufacturer's product name and model	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	252	Device Attributes - Device manufacturer's name	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	254	Device Attributes - Non-specific all attributes request	1( <i>read</i> )	00 ( <i>start-stop</i> ) 06 ( <i>no</i>	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )

				<i>range, or all)</i>		
0	255	Device Attributes - List of attribute variations	1( <i>read</i> )	00 ( <i>start-stop</i> ) 06 ( <i>no range, or all</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> )
1	0	Binary Input - any variation	1( <i>read</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		
1	1	Binary Input - Single-bit packed	1( <i>read</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	00, 01 ( <i>start-stop</i> ), 17, 28 ( <i>index</i> )
1	2	Binary Input - Single-bit with flag	1( <i>read</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	00, 01 ( <i>start-stop</i> ), 17, 28 ( <i>index</i> )
2	0	Binary Input Change Event - any variation	1( <i>read</i> )	06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> )		
2	1	Binary Input Change Event -	1( <i>read</i> )	06 ( <i>no</i>	129	17, 28

		without time		<i>range, or all), 07, 08 (limited qty)</i>	<i>(Response)</i>	<i>(index)</i>
2	2	Binary Input Change Event - with absolute time	1( <i>read</i> )	06 ( <i>no range, or all), 07, 08 (limited qty)</i> )	129 <i>(Response)</i>	17, 28 <i>(index)</i>
2	2	Binary Input Change Event - with absolute time	1( <i>read</i> )	06 ( <i>no range, or all), 07, 08 (limited qty)</i> )	130 <i>(Unsol. Resp.)</i>	17, 28 <i>(index)</i>
2	3	Binary Input Change Event - with relative time	1( <i>read</i> )	06 ( <i>no range, or all), 07, 08 (limited qty)</i> )	129 <i>(Response)</i>	17, 28 <i>(index)</i>
10	0	Continuous Control - any variation	1( <i>read</i> )	00, 01 <i>(start-stop), 06 (no range, or all), 07, 08 (limited qty)</i>		
10	2	Continuous Control - binary output status	1( <i>read</i> )	00, 01 <i>(start-stop), 06 (no range, or all), 07, 08 (limited qty)</i>	129 <i>(Response)</i>	00, 01 <i>(start-stop)</i>
12	1	Pulsed Control - control relay output block	3( <i>select</i> )	17, 28 <i>(index)</i>	129 <i>(Response)</i>	echo of request
12	1	Pulsed Control - control relay output block	4( <i>operate</i> )	17, 28 <i>(index)</i>	129 <i>(Response)</i>	echo of request
12	1	Pulsed Control - control	5( <i>direct</i> )	17, 28	129	echo of



		relay output block	<i>op.)</i>	<i>(index)</i>	<i>(Response)</i>	request
12	1	Pulsed Control - control relay output block	6( <i>direct op, no ack</i> )	17, 28 <i>(index)</i>	129 <i>(Response)</i>	echo of request
20	0	Counter - any variation	1( <i>read</i> )	00, 01 <i>(start-stop),</i> 06 ( <i>no range, or all</i> ), 07, 08 <i>(limited qty),</i> 17, 28 <i>(index)</i>		
20	0	Counter - any variation	7( <i>freeze</i> )	00, 01 <i>(start-stop),</i> 06 ( <i>no range, or all</i> ), 07, 08 <i>(limited qty),</i> 17, 28 <i>(index)</i>		
20	0	Counter - any variation	8( <i>freeze, no ack</i> )	00, 01 <i>(start-stop),</i> 06 ( <i>no range, or all</i> ), 07, 08 <i>(limited qty),</i> 17, 28 <i>(index)</i>		
20	0	Counter - any variation	9( <i>freeze &amp; clear</i> )	00, 01 <i>(start-stop),</i> 06 ( <i>no range, or all</i> ), 07, 08 <i>(limited qty),</i> 17, 28		

				(index)		
20	0	Counter - any variation	10( <i>frz &amp; clr, no ack</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		
20	1	Counter - 32-bit with flag	1( <i>read</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	00, 01 ( <i>start-stop</i> ), 17, 28 ( <i>index</i> )
20	1	Counter - 32-bit with flag	7( <i>freeze</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		
20	1	Counter - 32-bit with flag	8( <i>freeze, no ack</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		
20	1	Counter - 32-bit with flag	9( <i>freeze &amp; clear</i> )	00, 01 ( <i>start-</i>		

				stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
20	1	Counter - 32-bit with flag	10(frz & clr, no ack)	00, 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
20	2	Counter - 16-bit with flag	1(read)	00, 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)	129 (Response)	00, 01 (start- stop), 17, 28 (index)
20	2	Counter - 16-bit with flag	7(freeze)	00, 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
20	2	Counter - 16-bit with flag	8(freeze, no ack)	00, 01 (start- stop), 06 (no range, or		

				<i>all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		
20	2	Counter - 16-bit with flag	9( <i>freeze &amp; clear</i> )	00, 01 ( <i>start- stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		
20	2	Counter - 16-bit with flag	10( <i>frz &amp; clr, no ack</i> )	00, 01 ( <i>start- stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		
20	5	Counter - 32-bit without flag	1( <i>read</i> )	00, 01 ( <i>start- stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	00, 01 ( <i>start- stop</i> ), 17, 28 ( <i>index</i> )
20	5	Counter - 32-bit without flag	7( <i>freeze</i> )	00, 01 ( <i>start- stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited</i>		

				qty), 17, 28 (index)		
20	5	Counter - 32-bit without flag	8(freeze, no ack)	00, 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
20	5	Counter - 32-bit without flag	9(freeze & clear )	00, 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
20	5	Counter - 32-bit without flag	10(frz & clr, no ack)	00, 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
20	6	Counter - 16-bit without flag	1(read)	00, 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)	129 (Response)	00, 01 (start- stop), 17, 28 (index)

20	6	Counter - 16-bit without flag	7( <i>freeze</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		
20	6	Counter - 16-bit without flag	8( <i>freeze, no ack</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		
20	6	Counter - 16-bit without flag	9( <i>freeze &amp; clear</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		
20	6	Counter - 16-bit without flag	10( <i>frz &amp; clr, no ack</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		
22	0	Counter Change Event - any variation	1( <i>read</i> )	06 ( <i>no range, or all</i> ),		

				07, 08 (limited qty)		
22	1	Counter Change Event - 32-bit with flag	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
22	2	Counter Change Event - 16-bit with flag	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
22	2	Counter Change Event - 16-bit with flag	1(read)	06 (no range, or all), 07, 08 (limited qty)	130 (Unsol. Resp.)	17, 28 (index)
22	5	Counter Change Event - 32-bit with flag and time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
22	6	Counter Change Event - 16-bit with flag and time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
30	0	Analog Input - any variation	1(read)	00, 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
30	1	Analog Input - 32-bit with flag	1(read)	00, 01 (start- stop),	129 (Response)	00, 01 (start- stop),

				06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		17, 28 ( <i>index</i> )
30	2	Analog Input - 16-bit with flag	1( <i>read</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	00, 01 ( <i>start-stop</i> ), 17, 28 ( <i>index</i> )
30	3	Analog Input - 32-bit without flag	1( <i>read</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	00, 01 ( <i>start-stop</i> ), 17, 28 ( <i>index</i> )
30	4	Analog Input - 16-bit without flag	1( <i>read</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	00, 01 ( <i>start-stop</i> ), 17, 28 ( <i>index</i> )
30	5	Analog Input – Single-prec flt-pt with flag	1( <i>read</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ),	129 ( <i>Response</i> )	00, 01 ( <i>start-stop</i> ), 17, 28 ( <i>index</i> )



				07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		
30	6	Analog Input – Double-prec flt-pt with flag	1( <i>read</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	00, 01 ( <i>start-stop</i> ), 17, 28 ( <i>index</i> )
32	0	Analog Input Change Event - any variation	1( <i>read</i> )	06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> )		
32	1	Analog Input Change Event - 32-bit without time	1( <i>read</i> )	06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> )	129 ( <i>Response</i> )	17, 28 ( <i>index</i> )
32	2	Analog Input Change Event - 16-bit without time	1( <i>read</i> )	06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> )	129 ( <i>Response</i> )	17, 28 ( <i>index</i> )
32	2	Analog Input Change Event - 16-bit without time	1( <i>read</i> )	06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> )	130 ( <i>Unsol. Resp.</i> )	17, 28 ( <i>index</i> )
32	3	Analog Input Change Event - 32-bit with time	1( <i>read</i> )	06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> )	129 ( <i>Response</i> )	17, 28 ( <i>index</i> )

32	4	Analog Input Change Event - 16-bit with time	1( <i>read</i> )	06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> )	129 ( <i>Response</i> )	17, 28 ( <i>index</i> )
32	5	Frozen Analog Input – 32-bit without flag	1( <i>read</i> )	06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> )	129 ( <i>Response</i> )	17, 28 ( <i>index</i> )
32	6	Frozen Analog Input – 16-bit without flag	1( <i>read</i> )	06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> )	129 ( <i>Response</i> )	17, 28 ( <i>index</i> )
32	7	Frozen Analog Input – Single-prec flt-pt with flag	1( <i>read</i> )	06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> )	129 ( <i>Response</i> )	17, 28 ( <i>index</i> )
32	8	Frozen Analog Input – Double-prec flt-pt with flag	1( <i>read</i> )	06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> )	129 ( <i>Response</i> )	17, 28 ( <i>index</i> )
34	0	Analog Input Deadband - any variation	1( <i>read</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		
34	1	Analog Input Deadband - 16-bit	1( <i>read</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ),	129 ( <i>Response</i> )	00, 01 ( <i>start-stop</i> ), 17, 28 ( <i>index</i> )

				07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		
34	1	Analog Input Deadband - 16-bit	2( <i>write</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		
34	2	Analog Input Deadband - 32-bit	1( <i>read</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	00, 01 ( <i>start-stop</i> ), 17, 28 ( <i>index</i> )
34	2	Analog Input Deadband - 32-bit	2( <i>write</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		
34	3	Analog Input Deadband - Single-prec flt-pt	1( <i>read</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ),	129 ( <i>Response</i> )	00, 01 ( <i>start-stop</i> ), 17, 28 ( <i>index</i> )

				17, 28 (index)		
34	3	Analog Input Deadband - Single-prec flt-pt	2(write)	00, 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
40	0	Analog Output Status - any variation	1(read)	00, 01 (start- stop), 06 (no range, or all)		
40	1	Analog Output Status - 32- bit with flag	1(read)	00, 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)	129 (Response)	00, 01 (start- stop), 17, 28 (index)
40	2	Analog Output Status - 16- bit with flag	1(read)	00, 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)	129 (Response)	00, 01 (start- stop), 17, 28 (index)
40	3	Analog Output Status – Single-prec flt-pt with flag	1(read)	00, 01 (start- stop), 06 (no range, or all),	129 (Response)	00, 01 (start- stop), 17, 28 (index)

				07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )		
40	4	Analog Output Status – Double-prec flt-pt with flag	1( <i>read</i> )	00, 01 ( <i>start-stop</i> ), 06 ( <i>no range, or all</i> ), 07, 08 ( <i>limited qty</i> ), 17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	00, 01 ( <i>start-stop</i> ), 17, 28 ( <i>index</i> )
41	1	Analog Output Block - 32-bit	3( <i>select</i> )	17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	echo of request
41	1	Analog Output Block - 32-bit	4( <i>operate</i> )	17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	echo of request
41	1	Analog Output Block - 32-bit	5( <i>direct op.</i> )	17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	echo of request
41	1	Analog Output Block - 32-bit	6( <i>direct op, no ack</i> )	17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	echo of request
41	2	Analog Output Block - 16-bit	3( <i>select</i> )	17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	echo of request
41	2	Analog Output Block - 16-bit	4( <i>operate</i> )	17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	echo of request
41	2	Analog Output Block - 16-bit	5( <i>direct op.</i> )	17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	echo of request
41	2	Analog Output Block - 16-bit	6( <i>direct op, no ack</i> )	17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	echo of request
41	3	Analog Output – Single-prec flt-pt	3( <i>select</i> )	17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	echo of request
41	3	Analog Output – Single-prec flt-pt	4( <i>operate</i> )	17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	echo of request
41	3	Analog Output – Single-prec flt-pt	5( <i>direct op.</i> )	17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	echo of request
41	3	Analog Output – Single-prec flt-pt	6( <i>direct op, no ack</i> )	17, 28 ( <i>index</i> )	129 ( <i>Response</i> )	echo of request
41	4	Analog Output – Double-	3( <i>select</i> )	17, 28	129	echo of

		prec flt-pt		(index)	(Response)	request
41	4	Analog Output – Double-prec flt-pt	4(operate)	17, 28 (index)	129 (Response)	echo of request
41	4	Analog Output – Double-prec flt-pt	5(direct op.)	17, 28 (index)	129 (Response)	echo of request
41	4	Analog Output – Double-prec flt-pt	6(direct op, no ack)	17, 28 (index)	129 (Response)	echo of request
50	1	Time and Date - absolute time	1(read)	07, 08 (limited qty)	129 (Response)	07 (limited qty = 1)
50	1	Time and Date - absolute time	2(write)	07, 08 (limited qty)		
50	3	Time and Date - absolute time at last recorded time	2(write)	07 (limited qty = 1)		
51	1	Time and Date CTO - absolute time, synchronized			129 (Response)	07 (limited qty = 1)
51	2	Time and Date CTO - absolute time, un-synchronized			129 (Response)	07 (limited qty = 1)
52	2	Time Delay - fine			129 (Response)	07 (limited qty = 1)
60	0	Class Objects - class 0 data	1(read)	06 (no range, or all)		
60	0	Class Objects - class 1 data	20(enable unsol.)	06 (no range, or all)		
60	0	Class Objects - class 1 data	21(disable unsol.)	06 (no range, or all)		
60	1	Class Objects - class 0 data	1(read)	06 (no range, or all)		
60	2	Class Objects - class 1 data	1(read)	06 (no range, or all), 07, 08 (limited qty)		
60	2	Class Objects - class 1 data	20(enable	06 (no		

			<i>unsol.)</i>	<i>range, or all)</i>		
60	2	Class Objects - class 1 data	21( <i>disable unsol.)</i>	06 ( <i>no range, or all)</i>		
60	3	Class Objects - class 2 data	1( <i>read</i> )	06 ( <i>no range, or all), 07, 08 (limited qty)</i>		
60	3	Class Objects - class 2 data	20( <i>enable unsol.)</i>	06 ( <i>no range, or all)</i>		
60	3	Class Objects - class 2 data	21( <i>disable unsol.)</i>	06 ( <i>no range, or all)</i>		
60	4	Class Objects - class 3 data	1( <i>read</i> )	06 ( <i>no range, or all), 07, 08 (limited qty)</i>		
60	4	Class Objects - class 3 data	20( <i>enable unsol.)</i>	06 ( <i>no range, or all)</i>		
60	4	Class Objects - class 3 data	21( <i>disable unsol.)</i>	06 ( <i>no range, or all)</i>		
80	1	Internal Indications - packed format	2( <i>write</i> )	00 ( <i>start- stop</i> )		
80	1	Internal Indications - packed format	2( <i>write</i> )	01 ( <i>start- stop</i> )		
-1	0		13( <i>cold restart</i> )			
-1	0		14( <i>warm restart</i> )			
-1	0		23( <i>delay meas.)</i>			

----- End of Device Profile for Reference Device -----