



**DNP3  
Device Profile Document  
For  
Schweitzer Engineering Laboratories  
SEL-700G**

Revision Date: 04/16/2010

# DEVICE PROFILE REVISION HISTORY

Date	Version <sup>1</sup>	Reason for change	Edited by
04/16/10	1	Initial	Sreenivas Dingari

<sup>1</sup> Version of the Device Profile Document is indicated by a whole number incremented with each new release. The most recent version number should match the "Device Profile Document Version Number" (item 1.1.6) in the Current Device Settings Table.

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# 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 used for 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 section 1.6.8 of the Device Profile (Maximum error in the time that the Master issues freeze requests) where this 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 should be 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 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 methods 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 this document is used to show the current value of each parameter, the "Current Value" column applies to a single connection between a master and outstation. If the device has multiple or backup connections to other DNP devices that you wish to show in the Device Profile Document, see section 8.3.2 "ReferenceDevice and AuxillaryInfo" of Volume 8 Interoperability or duplicate the entire Device Profile Document for each communication link to a logical or physical DNP3 Device.

1.1 DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable, list methods
<p>1.1.1 Device Function:</p> <p><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><input type="radio"/> Master</p> <p><input checked="" type="radio"/> Outstation</p>	Outstation	
<p>1.1.2 Vendor Name:</p> <p><i>The name of the organization producing the device.</i></p>		Schweitzer Engineering Laboratories, Inc.	
<p>1.1.3 Device Name:</p> <p><i>The model and name of the device, sufficient to distinguish it from any other device from the same organization.</i></p>		SEL-700G Relay	
<p>1.1.4 Device manufacturer's hardware version string:</p>		Mainboard Revision #	
<p>1.1.5 Device manufacturer's software version string:</p>		Firmware Version #	
<p>1.1.6 Device Profile Document Version Number:</p> <p><i>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 beginning of this document.</i></p>		1	

1.1 DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable, list methods
<p>1.1.7 DNP Levels Supported for:</p> <p><i>Indicate each DNP3 Level to which the device conforms fully. For Masters, requests and responses can be indicated independently.</i></p>	<p>Masters Only</p> <p>Requests    Responses</p> <p><input type="checkbox"/> ..... <input type="checkbox"/> ..... None</p> <p><input type="checkbox"/> ..... <input type="checkbox"/> ..... Level 1</p> <p><input type="checkbox"/> ..... <input type="checkbox"/> ..... Level 2</p> <p><input type="checkbox"/> ..... <input type="checkbox"/> ..... Level 3</p> <p>Outstations Only</p> <p>Requests and Responses</p> <p><input checked="" type="checkbox"/> ..... None</p> <p><input checked="" type="checkbox"/> ..... Level 1</p> <p><input checked="" type="checkbox"/> ..... Level 2</p> <p><input type="checkbox"/> ..... Level 3</p>	Level 2	
<p>1.1.8 Supported Function Blocks:</p>	<p><input type="checkbox"/> Self-Address Reservation</p> <p><input type="checkbox"/> Data Sets</p> <p><input type="checkbox"/> File Transfer</p> <p><input type="checkbox"/> Virtual Terminal</p> <p><input type="checkbox"/> Mapping to IEC 61850 Object Models defined in a DNP3 XML file</p> <p><input type="checkbox"/> Function code 31, activate configuration</p> <p><input type="checkbox"/> Secure Authentication (if checked then see 1.12)</p>		

1.1 DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable, list methods
<p>1.1.9 Notable Additions:</p> <p><i>A brief 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></p>	<p>Function code 14 (warm restart)  Function code 20 (Enable Unsolicited Responses) for class 1, 2, 3 events only  Function code 21 (Disable Unsolicited Messages) for class 1, 2, 3 events only  Object 34 (Analog Deadbands)  Object 30, 32, 34 - Long and Short Floating Point variations  Pattern Control Block and Pattern Mask (Object 12, Var 2 and 3)</p>	<p>Function code 14 (warm restart)  Function code 20 (Enable Unsolicited Responses) for class 1, 2, 3 events only  Function code 21 (Disable Unsolicited Messages) for class 1, 2, 3 events only  Object 34 (Analog Deadbands)  Object 30, 32, 34 - Long and Short Floating Point variations  Pattern Control Block and Pattern Mask (Object 12, Var 2 and 3)</p>	
<p>1.1.10 Methods to set Configurable Parameters:</p>	<p><input type="checkbox"/> XML – Loaded via DNP3 File Transfer  <input type="checkbox"/> XML – Loaded via other transport mechanism  <input checked="" type="checkbox"/> Terminal – ASCII Terminal Command Line  <input checked="" type="checkbox"/> Software – Vendor software named SEL-5030 AcSELeRator Quickset  <input type="checkbox"/> Proprietary file loaded via DNP3 file transfer  <input checked="" type="checkbox"/> Proprietary file loaded via other transport mechanism  <input type="checkbox"/> Direct – Keypad on device front panel  <input checked="" type="checkbox"/> Factory – Specified when device is ordered  <input checked="" type="checkbox"/> Protocol – Set via DNP3 (e.g. assign class)  <input type="checkbox"/> Other – explain _____</p>	<p>Terminal, Software, Proprietary file, Factory, Protocol</p>	

1.1 DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable, list methods																																
<p>1.1.11 DNP3 XML files available On-Line:</p> <p><i>XML configuration file names that can be read or written through DNP3 File Transfer to a device</i></p> <p><i>A device's currently running configuration is returned by DNP3 on-line XML file read from the device.</i></p> <p><i>DNP3 on-line XML file write to a device will update the device's configuration when the Activate Configuration (function code 31) is received.</i></p>	<table border="1"> <thead> <tr> <th>Rd</th> <th>Wr</th> <th>Filename</th> <th>Description of Contents</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td></td> <td>dnpDP.xml</td> <td>Complete Device Profile</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>dnpDPcap.xml</td> <td>Device Profile Capabilities</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>dnpDPcfg.xml</td> <td>Device Profile config. values</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>_____*.xml</td> <td>_____</td> </tr> </tbody> </table> <p>* The Complete Device Profile Document contains the capabilities, Current Value, and configurable methods columns.</p> <p>* The Device Profile Capabilities contains only the capabilities and configurable methods columns.</p> <p>* The Device Profile Config. Values contains only the Current Value column.</p>	Rd	Wr	Filename	Description of Contents	<input type="checkbox"/>		dnpDP.xml	Complete Device Profile	<input type="checkbox"/>		dnpDPcap.xml	Device Profile Capabilities	<input type="checkbox"/>		dnpDPcfg.xml	Device Profile config. values	<input type="checkbox"/>	<input type="checkbox"/>	_____*.xml	_____														
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<input type="checkbox"/>	<input type="checkbox"/>	_____*.xml	_____																																
<p>1.1.12 External DNP3 XML files available Off-line:</p> <p><i>XML configuration file names that can be read or written from an external system, typically from a system that maintains the outstation configuration.</i></p> <p><i>External off-line XML file read permits an XML definition of a new configuration to be supplied from off-line configuration tools.</i></p> <p><i>External off-line XML file write permits an XML definition of a new configuration to be supplied to off-line configuration tools.</i></p>	<table border="1"> <thead> <tr> <th>Rd</th> <th>Wr</th> <th>Filename</th> <th>Description of Contents</th> </tr> </thead> <tbody> <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> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>_____*.xml</td> <td>_____</td> </tr> </tbody> </table> <p>* The Complete Device Profile Document contains the capabilities, Current Value, and configurable methods columns.</p> <p>* The Device Profile Capabilities contains only the capabilities and configurable methods columns.</p> <p>* The Device Profile Config. Values contains only the Current Value column.</p>	Rd	Wr	Filename	Description of Contents	<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	<input type="checkbox"/>	<input type="checkbox"/>	_____*.xml	_____	<table border="1"> <thead> <tr> <th>Rd</th> <th>Wr</th> <th>Filename</th> </tr> </thead> <tbody> <tr> <td><input checked="" 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> </tbody> </table>	Rd	Wr	Filename	<input checked="" 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																																	
<p>1.1.13 Connections Supported:</p>	<p><input checked="" type="checkbox"/> Serial (complete section 1.2)</p> <p><input checked="" type="checkbox"/> IP Networking (complete section 1.3)</p> <p><input type="checkbox"/> Other, explain _____</p> <p><b>Note: IP Networking available if ordered with the optional Ethernet port</b></p>	<p>Serial IP Networking</p>																																	

1.2 SERIAL CONNECTIONS	Capabilities	Current Value	If configurable, list methods
<p>1.2.1 Port Name</p> <p>Name used to reference the communication port defined in this section.</p>		<p>PORT 2, PORT 3, PORT 4</p> <p>Note: DNP3 may be enabled on Ethernet Port 1 or on any of the serial ports 2 through 4, up to a maximum of three concurrent DNP3 sessions.</p>	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software SEL-5030 AcSELERator Quickset</p>
<p>1.2.2 Serial Connection Parameters:</p>	<p><input checked="" type="checkbox"/> Asynchronous - 8 Data Bits, 1 Start Bit, 1 Stop Bit, No Parity</p> <p><input type="checkbox"/> Other, explain <b>Asynchronous - 8 Data Bits, 1 Start Bit, 2 Stop Bits, No Parity</b></p> <p><input type="checkbox"/> Other, explain <b>Asynchronous - 8 Data Bits, 1 Start Bit, 1 Stop Bit, Odd Parity</b></p> <p><input type="checkbox"/> Other, explain <b>Asynchronous - 8 Data Bits, 1 Start Bit, 2 Stop Bits, Odd Parity</b></p> <p><input type="checkbox"/> Other, explain <b>Asynchronous - 8 Data Bits, 1 Start Bit, 1 Stop Bit, Even Parity</b></p> <p><input type="checkbox"/> Other, explain <b>Asynchronous - 8 Data Bits, 1 Start Bit, 2 Stop Bits, Even Parity</b></p>	<p>Asynchronous</p> <p>Note: 8 Data Bits, 1 Start Bit, 1 Stop Bit, No Parity</p>	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software SEL-5030 AcSELERator Quickset</p>
<p>1.2.3 Baud Rate:</p>	<p><input type="checkbox"/> Fixed at _____</p> <p><input type="checkbox"/> Configurable, range _____ to _____</p> <p><input checked="" type="checkbox"/> Configurable, selectable from 300, 1200, 2400, 4800, 9600, 19200, 38400</p> <p><input type="checkbox"/> Configurable, other, describe _____</p>	<p>9600</p>	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software SEL-5030 AcSELERator Quickset</p>

1.2 SERIAL CONNECTIONS	Capabilities	Current Value	If configurable, list methods
<p>1.2.4 Hardware Flow Control (Handshaking):</p> <p><i>Describe hardware signaling requirements of the interface.</i></p> <p><i>Where a transmitter or receiver is inhibited until a given control signal is asserted, it is considered to require that signal prior to sending or receiving characters.</i></p> <p><i>Where a signal is asserted prior to transmitting, that signal will be maintained active until after the end of transmission.</i></p> <p><i>Where a signal is asserted to enable reception, any data sent to the device when the signal is not active could be discarded.</i></p> <p><i>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.</i></p> <p><i>Note: When the device transmits a DNP message, it will delay transmitting after asserting RTS by at least the time in the PREDLY setting. It will delay deasserting RTS after transmission by at least the time in the PSTDLY setting.</i></p> <p><i>Note: The CTS signal is used as a DCD input, indicating when the medium is in use. 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 transceiver does not support DCD.</i></p> <p><i>Note: If the MODEM setting = Y for the DNP port, special modem handling is employed. The CTS signal will be treated as a data carrier detect (DCD). This means that a message may only be transmitted while DCD is asserted (Normally, a modem will be connected with a SEL-C222 cable which ties the modem's DCD to CTS).</i></p>	<p><input checked="" type="checkbox"/> None</p> <p><b>RS-232 / V.24 / V.28 Options:</b></p> <p>Before Tx, Asserts: <input checked="" type="checkbox"/> RTS <input type="checkbox"/> DTR</p> <p>Before Rx, Asserts: <input type="checkbox"/> RTS <input type="checkbox"/> DTR</p> <p>Always Asserts: <input checked="" type="checkbox"/> RTS <input type="checkbox"/> DTR</p> <p>Before Tx, Requires: Asserted Deasserted <input type="checkbox"/> <input checked="" type="checkbox"/> CTS <input type="checkbox"/> <input checked="" type="checkbox"/> DCD <input type="checkbox"/> <input type="checkbox"/> DSR <input type="checkbox"/> <input type="checkbox"/> RI <input type="checkbox"/> Rx Inactive</p> <p>Before Rx, Requires: Asserted Deasserted <input type="checkbox"/> <input type="checkbox"/> CTS <input type="checkbox"/> <input type="checkbox"/> DCD <input type="checkbox"/> <input type="checkbox"/> DSR <input type="checkbox"/> <input type="checkbox"/> RI</p> <p>Always Ignores: <input checked="" type="checkbox"/> CTS <input type="checkbox"/> DCD <input type="checkbox"/> DSR <input type="checkbox"/> RI</p> <p><input type="checkbox"/> Other, explain _____</p> <p><b>RS-422 / V.11 Options:</b></p> <p><input type="checkbox"/> Requires Indication before Rx <input type="checkbox"/> Asserts Control before Tx <input type="checkbox"/> Other, explain _____</p> <p><b>RS-485 Options:</b></p> <p><input type="checkbox"/> Requires Rx inactive before Tx <input type="checkbox"/> Other, explain _____</p>	<p>None <b>RS-232 / V.24 / V.28 Options:</b> Other,</p> <p><b>RS-422 / V.11 Options:</b> Other,</p> <p><b>RS-485 Options:</b> Other,</p>	<p>Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSELeerator Quickset</b></p>

1.2 SERIAL CONNECTIONS	Capabilities	Current Value	If configurable, list methods
<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>	<p><input type="checkbox"/> Not Supported</p> <p><input type="checkbox"/> Fixed at _____ seconds</p> <p><input type="checkbox"/> Configurable, range ___ to ___ seconds</p> <p><input type="checkbox"/> Configurable, selectable from ___, ___, ___ seconds</p> <p><input checked="" type="checkbox"/> Configurable, other, describe <b>Controlled by DRETRY (retry attempts) and DTIMEO (timeout in seconds) settings</b></p>	0 seconds	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software <b>SEL-5030 AcSELerator Quickset</b></p>
<p>1.2.6 Supports DNP3 Collision Avoidance:</p> <p><i>Indicates whether a device uses a collision avoidance algorithm. Documentation by the vendor will provide information on collision avoidance schemes.</i></p>	<p><input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes, explain</p> <p><b>For serial connections, the relay 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 SEL-700G will insert a random delay of 50 to 100 ms (milliseconds) between the end of carrier detection and the start of data transmission.</b></p>	Yes	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software <b>SEL-5030 AcSELerator Quickset</b></p>

1.2 SERIAL CONNECTIONS	Capabilities	Current Value	If configurable, list methods
<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. extension of the stop bit time of one character prior to the start bit of the following character within a message). 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 to not perform this check.</i></p> <p><i>Where no asynchronous serial interface is fitted, this parameter is not applicable. In this case none of the options shall be selected.</i></p>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Not checked</li> <li><input type="checkbox"/> No gap permitted</li> <li><input type="checkbox"/> Fixed at _____ bit times</li> <li><input type="checkbox"/> Fixed at _____ ms</li> <li><input type="checkbox"/> Configurable, range _____ to _____ bit times</li> <li><input type="checkbox"/> Configurable, range _____ to _____ ms</li> <li><input type="checkbox"/> Configurable, Selectable from _____, _____, _____ bit times</li> <li><input type="checkbox"/> Configurable, Selectable from _____, _____, _____ ms</li> <li><input type="checkbox"/> Configurable, other, describe _____</li> <li><input type="checkbox"/> Variable, explain _____</li> </ul>	Not Checked	
<p>1.2.8 Inter-character gaps in transmission:</p> <p><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.</i></p> <p><i>Where no asynchronous serial interface is fitted, this parameter is not applicable. In this case none of the options shall be selected.</i></p>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> None (always transmits with no inter-character gap)</li> <li><input type="checkbox"/> Maximum _____ bit times</li> <li><input type="checkbox"/> Maximum _____ ms</li> </ul>	None	

1.3 IP NETWORKING	Capabilities	Current Value	If configurable, list methods
<p>1.3.1 Port Name</p> <p><i>Name used to reference the communication port defined in this section.</i></p>		<p>PORT 1</p> <p>Note: DNP3 may be enabled on Ethernet Port 1 or on any of the serial ports 2 through 4, up to a maximum of three concurrent DNP3 sessions.</p>	
<p>1.3.2 Type of End Point:</p>	<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> <p><input checked="" type="checkbox"/> UDP Datagram (required)</p>	<p>TCP Listening</p>	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software <b>SEL-5030 AcSELerator Quickset</b></p>
<p>1.3.3 IP Address of this Device:</p>		<p>192.168.1.2</p>	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software <b>SEL-5030 AcSELerator Quickset</b></p>

1.3 IP NETWORKING	Capabilities	Current Value	If configurable, list methods
1.3.4 Subnet Mask:		255.255.255.0	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSELerator Quickset</b>
1.3.5 Gateway IP Address:		192.168.1.1	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSELerator Quickset</b>
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 an 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 Note: DNP3 Master IP addresses are defined by the DNPIP <sub>n</sub> settings	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSELerator Quickset</b>

1.3 IP NETWORKING	Capabilities	Current Value	If configurable, list methods
1.3.7 IP Address(es) from which TCP Connections or UDP Datagrams are accepted:		As defined by the DNPIP <sub>n</sub> settings	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSELeRator Quickset</b>
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 to 65534</b> <input type="checkbox"/> Configurable, selectable from _____, _____, _____ <input type="checkbox"/> Configurable, other, describe _____	20,000	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSELeRator Quickset</b>
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 _____, _____, _____ <input type="checkbox"/> Configurable, other, describe _____	Not Applicable	

1.3 IP NETWORKING	Capabilities	Current Value	If configurable, list methods
<p>1.3.10 TCP Keep-alive timer:</p> <p><i>The time period for the keep-alive timer on active TCP connections.</i></p>	<p><input checked="" type="checkbox"/> Fixed at <u>10000</u> ms</p> <p><input type="checkbox"/> Configurable, range <b>0</b> to <b>20000</b> ms</p> <p><input type="checkbox"/> Configurable, selectable from _____, _____, _____ ms</p> <p><input type="checkbox"/> Configurable, other, describe _____</p> <p><b>Note:</b> The SEL-700G uses a fixed keep alive time of 10 seconds. If the SEL-700G does not transmit any TCP data within the 10-second interval, the SEL-700G sends a keep-alive packet to the remote computer. If the SEL-700G does not receive a response from the remote computer within 10 seconds, the keep-alive packet is re-transmitted as many as 4 times. After this count is reached, the SEL-700G remote device is no longer available, so the SEL-700G can terminate the connection without waiting for the idle timer (TIDLE) to expire.</p>	10000 ms	
<p>1.3.11 Local UDP port:</p> <p><i>Local UDP port for sending and/or receiving UDP datagrams. Master may let system choose an available port. Outstation must use one that is known by the master.</i></p>	<p><input type="checkbox"/> Fixed at 20,000</p> <p><input checked="" type="checkbox"/> Configurable, range <b>1</b> to <b>65534</b></p> <p><input type="checkbox"/> Configurable, selectable from _____, _____, _____</p> <p><input type="checkbox"/> Configurable, other, describe _____</p> <p><input type="checkbox"/> Let system choose (Master only)</p>	20,000	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELeator</b> <b>Quickset</b>
<p>1.3.12 Destination UDP port for DNP3 Requests (Master Only):</p>	<p><input type="checkbox"/> Fixed at 20,000</p> <p><input type="checkbox"/> Configurable, range _____ to _____</p> <p><input type="checkbox"/> Configurable, selectable from _____, _____, _____</p> <p><input type="checkbox"/> Configurable, other, describe _____</p>		

1.3 IP NETWORKING	Capabilities	Current Value	If configurable, list methods
<p>1.3.13 Destination UDP port for initial unsolicited null responses (UDP only Outstations):</p> <p><i>For a UDP only Outstation, the destination UDP port for sending initial unsolicited Null response</i></p>	<p> <input type="checkbox"/> None  <input type="checkbox"/> Fixed at 20,000  <input checked="" type="checkbox"/> Configurable, range 1 to <b>65534</b>  <input type="checkbox"/> Configurable, selectable from _____, _____, _____  <input checked="" type="checkbox"/> Configurable, other, describe: <b>DNPUDP<math>n</math> := REQ</b> </p> <p><b>Note: Depends on DNPUDP<math>n</math> setting. REQ means to use the same port the request came in from.</b></p>	20000	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSElerator Quickset</b>
<p>1.3.14 Destination UDP port for responses:</p> <p><i>For a UDP only Outstation, the destination UDP port for sending all responses other than initial unsolicited Null Response.</i></p>	<p> <input type="checkbox"/> None  <input type="checkbox"/> Fixed at 20,000  <input checked="" type="checkbox"/> Configurable, range 1 to <b>65534</b>  <input type="checkbox"/> Configurable, selectable from _____, _____, _____  <input checked="" type="checkbox"/> Configurable, other, describe <b>DNPUDP<math>n</math> := REQ</b>  <input type="checkbox"/> Use source port number         </p> <p><b>Note: Depends on DNPUDP<math>n</math> setting. REQ means to use the same port the request came in from.</b></p>	20000	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSElerator Quickset</b>
<p>1.3.15 Multiple outstation connections (Masters only):</p> <p><i>Master only. Indicates whether multiple outstation connections are supported.</i></p>	<p><input type="checkbox"/> Supports multiple outstations (Masters only)</p>		

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

1.4 LINK LAYER	Capabilities	Current Value	If configurable, list methods
<p>1.4.1 Data Link Address:</p> <p><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></p>	<p><input type="checkbox"/> Fixed at _____</p> <p><input checked="" type="checkbox"/> Configurable, range <b>0</b> to <b>65,519</b></p> <p><input type="checkbox"/> Configurable, selectable from _____, _____, _____</p> <p><input type="checkbox"/> Configurable, other, describe _____</p>	0	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software <b>SEL-5030 AcSELeator Quickset</b></p>
<p>1.4.2 DNP3 Source Address Validation:</p> <p><i>Indicates whether the device will filter out messages not from a specific source address.</i></p>	<p><input checked="" type="checkbox"/> Never</p> <p><input type="checkbox"/> Always, one address allowed (shown in 1.4.3)</p> <p><input type="checkbox"/> Always, any one of multiple addresses allowed (each selectable as shown in 1.4.3)</p> <p><input type="checkbox"/> Sometimes, explain _____</p>	Never	
<p>1.4.3 DNP3 Source Address(es) expected when Validation is Enabled:</p> <p><i>Selects the allowed source address(es).</i></p>	<p><input type="checkbox"/> Configurable to any 16 bit DNP Data Link Address value</p> <p><input type="checkbox"/> Configurable, range _____ to _____</p> <p><input type="checkbox"/> Configurable, selectable from _____, _____, _____</p> <p><input type="checkbox"/> Configurable, other, describe _____</p>		
<p>1.4.4 Self Address Support using address 0xFFFC:</p> <p><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 disable the feature if supported.</i></p>	<p><input type="checkbox"/> Yes (only allowed if configurable)</p> <p><input checked="" type="checkbox"/> No</p>	No	

1.4 LINK LAYER	Capabilities	Current Value	If configurable, list methods
<p>1.4.5 Sends Confirmed User Data Frames:</p> <p><i>A list of conditions under which the device transmits confirmed link layer services (TEST_LINK_STATES, RESET_LINK_STATES, CONFIRMED_USER_DATA).</i></p>	<p><input type="checkbox"/> Always</p> <p><input checked="" type="checkbox"/> Sometimes, explain <b>Depends on DRETRY setting</b></p> <p><input type="checkbox"/> Never</p>	Sometimes	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software <b>SEL-5030 AcSELerator Quickset</b></p>
<p>1.4.6 Data Link Layer Confirmation Timeout:</p> <p><i>This timeout applies to any secondary data link message that requires a confirm or response (link reset, link status, user data, etc)</i></p>	<p><input type="checkbox"/> None</p> <p><input type="checkbox"/> Fixed at _____ ms</p> <p><input checked="" type="checkbox"/> Configurable, range <b>0</b> to <b>5,000</b> ms</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>	1000 ms	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software <b>SEL-5030 AcSELerator Quickset</b></p>
<p>1.4.7 Maximum Data Link Retries:</p> <p><i>The number of times the device will retransmit a frame that requests Link Layer confirmation.</i></p>	<p><input type="checkbox"/> Never Retries</p> <p><input type="checkbox"/> Fixed at _____</p> <p><input checked="" type="checkbox"/> Configurable, range <b>0</b> to <b>15</b></p> <p><input type="checkbox"/> Configurable, selectable from _____, _____, _____</p> <p><input type="checkbox"/> Configurable, other, describe _____</p>	0	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software <b>SEL-5030 AcSELerator Quickset</b></p>

1.4 LINK LAYER	Capabilities	Current Value	If configurable, list methods
<p>1.4.8 Maximum number of octets Transmitted in a Data Link Frame:</p> <p><i>This number includes the CRCs. With a length field of 255, the maximum size would be 292.</i></p>	<p><input checked="" type="checkbox"/> Fixed at <u>292</u></p> <p><input type="checkbox"/> Configurable, range _____ to _____</p> <p><input type="checkbox"/> Configurable, selectable from _____, _____, _____</p> <p><input type="checkbox"/> Configurable, other, describe _____</p>		
<p>1.4.9 Maximum number of octets that can be Received in a Data Link Frame:</p> <p><i>This number includes the CRCs. With a length field of 255, the maximum size would be 292. The device must be able to receive 292 octets to be compliant.</i></p>	<p><input checked="" type="checkbox"/> Fixed at <u>292</u></p> <p><input type="checkbox"/> Configurable, range _____ to _____</p> <p><input type="checkbox"/> Configurable, selectable from _____, _____, _____</p> <p><input type="checkbox"/> Configurable, other, describe _____</p>		

1.5 APPLICATION LAYER	Capabilities	Current Value	If configurable, list methods
<p>1.5.1 Maximum number of octets Transmitted in an Application Layer Fragment other than File Transfer:</p> <p><i>This size does not include any transport or frame octets.</i></p> <ul style="list-style-type: none"> <li>• Masters must provide a setting less than or equal to 249.</li> <li>• Outstations must provide a setting less than or equal to 2048.</li> </ul>	<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"/> Configurable, other, describe _____</p>	2048	
<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"/> Configurable, other, describe _____</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> <ul style="list-style-type: none"> <li>• Masters must provide a setting greater than or equal to 2048.</li> <li>• Outstations must provide a setting greater than or equal to 249.</li> </ul>	<p><input checked="" type="checkbox"/> Fixed at <u>249</u></p> <p><input type="checkbox"/> Configurable, range _____ to _____</p> <p><input type="checkbox"/> Configurable, selectable from ____, ____, ____</p> <p><input type="checkbox"/> Configurable, other, describe _____</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"/> Configurable, other, describe _____</p> <p><input type="checkbox"/> Variable, explain _____</p>	None	

1.5 APPLICATION LAYER	Capabilities	Current Value	If configurable, list methods
1.5.5 Maximum number of objects allowed in a single control request for CROB (group 12):	<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"/> Configurable, other, describe _____ <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"/> Configurable, other, describe _____ <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"/> Configurable, other, describe _____ <input type="checkbox"/> Variable, explain _____	0	
1.5.8 Supports mixing 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	

1.6 FILL OUT THE FOLLOWING ITEMS FOR MASTERS ONLY	Capabilities	Current Value	If configurable, list methods
<p>1.6.1 Timeout waiting for Complete Application Layer Response(ms):</p> <p><i>Timeout on Master if all fragments of a response message are not received in the specified time.</i></p>	<input type="checkbox"/> None <input type="checkbox"/> Fixed at _____ ms <input type="checkbox"/> Configurable, range _____ to _____ ms <input type="checkbox"/> Configurable, selectable from ____, ____, ___ ms <input type="checkbox"/> Configurable, other, describe _____ <input type="checkbox"/> Variable, explain _____		
<p>1.6.2 Maximum Application Layer Retries for Request Messages:</p> <p><i>The number of times a Master will retransmit an application layer request message if a response is not received. This parameter must never cause a Master to retransmit time sync messages.</i></p>	<input type="checkbox"/> None (required) <input type="checkbox"/> Fixed at _____ <input type="checkbox"/> Configurable, range _____ to _____ <input type="checkbox"/> Configurable, selectable from ____, ____, ___ <input type="checkbox"/> Configurable, other, describe _____ <input type="checkbox"/> Variable, explain _____		
<p>1.6.3 Incremental Timeout waiting for First or Next Fragment of an Application Layer Response:</p>	<input type="checkbox"/> None <input type="checkbox"/> Fixed at _____ ms <input type="checkbox"/> Configurable, range _____ to _____ ms <input type="checkbox"/> Configurable, selectable from ____, ____, ___ ms <input type="checkbox"/> Configurable, other, describe _____ <input type="checkbox"/> Variable, explain _____		
<p>1.6.4 Issuing controls to off-line devices</p> <p><i>Indicates if the Master issues control requests to devices that are thought to be off-line (i.e. the Master has not seen responses to previous Master requests).</i></p>	<input type="checkbox"/> Not applicable – controls are not supported <input type="checkbox"/> Yes <input type="checkbox"/> No		
<p>1.6.5 Issuing controls to off-scan devices</p> <p><i>Indicates if the Master issues control requests to devices that are currently off-scan (i.e. the Master has been configured not to issue poll requests to the device).</i></p>	<input type="checkbox"/> Not applicable – controls are not supported <input type="checkbox"/> Yes <input type="checkbox"/> No		

1.6 FILL OUT THE FOLLOWING ITEMS FOR MASTERS ONLY	Capabilities	Current Value	If configurable, list methods
<p>1.6.6 Maximum Application Layer Retries for Control Select Messages (same sequence number):</p> <p><i>Indicates the number of times a Master will retransmit an application layer control select request message if a response is not received – using the same message sequence number.</i></p>	<input type="checkbox"/> None (required) <input type="checkbox"/> Fixed at _____ <input type="checkbox"/> Configurable, range _____ to _____ <input type="checkbox"/> Configurable, selectable from ____, ____, ____ <input type="checkbox"/> Configurable, other, describe _____ <input type="checkbox"/> Variable, explain _____		
<p>1.6.7 Maximum Application Layer Retries for Control Select Messages (new sequence number):</p> <p><i>Indicates the number of times a Master will retransmit an application layer control select request message if a response is not received – using a new message sequence number.</i></p>	<input type="checkbox"/> None (required) <input type="checkbox"/> Fixed at _____ <input type="checkbox"/> Configurable, range _____ to _____ <input type="checkbox"/> Configurable, selectable from ____, ____, ____ <input type="checkbox"/> Configurable, other, describe _____ <input type="checkbox"/> Variable, explain _____		
<p>1.6.8 Maximum error in the time that the Master issues freeze requests:</p> <p><i>If the Master is scheduled to issue freeze requests at a specific time, what is the maximum error in the time that the Master may actually issue a request?</i></p>			
<p>1.6.9 Maximum error in the time that the Master schedules repetitive freeze requests:</p> <p><i>If the Master is scheduled to issue freeze requests at a regular interval, what is the maximum error in the time interval that the Master may actually issue a request? (i.e. how early / late could the request actually be issued)</i></p>			

<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>
<p>1.6.10 Scheduled actions that may affect the accuracy of freeze requests:</p> <p><i>Indicates if the Master's accuracy of issuing freeze requests may be affected by other scheduled operations such as poll requests or control requests</i></p>	<p><input type="checkbox"/> Freeze time may be affected by Poll requests</p> <p><input type="checkbox"/> Freeze time may be affected by Control requests</p>		
<p>1.6.11 Master's algorithm for scheduling request operations:</p> <p><i>Describe the Master's algorithm for determination of which activity is performed when more than one is due at the same moment. Discuss precedence and priorities for activities such as time synchronization, poll requests, control requests and freeze requests.</i></p>	<p>Details of the Master's scheduling algorithm</p>		

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>1,000</b> to <b>50,000</b> ms <input type="checkbox"/> Configurable, selectable from ____, ____, ____ms <input type="checkbox"/> Configurable, other, describe _____ <input type="checkbox"/> Variable, explain _____	5000 ms	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSELeator Quickset</b>
1.7.2 How often is time synchronization required from the master?	<input checked="" type="checkbox"/> Never needs time <input type="checkbox"/> Within _____ seconds after IIN1.4 is set <input checked="" type="checkbox"/> Periodically <b>between 60 and 1966020</b> seconds	Never	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSELeator Quickset</b>  <b>Note:</b> <b>Configurable with the TIMERQ setting.</b>
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 FILL OUT THE FOLLOWING ITEMS FOR OUTSTATIONS ONLY	Capabilities	Current Value	If configurable, list methods
<p>1.7.4 File Handle Timeout:</p> <p><i>If there is no activity referencing a file handle for a configurable length of time, the outstation must do an 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 (group 70 var 6) using a status code value of file handle expired (0x02).</i></p>	<p><input checked="" type="checkbox"/> Not applicable, files not supported</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"/> Configurable, other, describe _____</p> <p><input type="checkbox"/> Variable, explain _____</p>	Not applicable	
<p>1.7.5 Event Buffer Overflow Behavior:</p>	<p><input type="checkbox"/> Discard the oldest event</p> <p><input checked="" type="checkbox"/> Discard the newest event</p> <p><input type="checkbox"/> Other, explain _____</p>	Discard newest	
<p>1.7.6 Event Buffer Organization:</p> <p><i>Explain how event buffers are arranged (per Object Group, per Class, single buffer, etc.) and provide their sizes</i></p>	<p>Per Object Group</p> <p>Note: For all Analog points, up to 100 events will be buffered. Subsequent events will be discarded.  For all Counter points, up to 32 events will be buffered. Subsequent events will be discarded.  For all Binary points, up to 1024 events will be buffered. Subsequent events will be discarded.</p>	Per Object Group	
<p>1.7.7 Sends Multi-Fragment Responses:</p> <p><i>Indicates whether an Outstation sends multi-fragment responses (Masters do not send multi-fragment requests).</i></p>	<p><input checked="" type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p>	Yes	
<p>1.7.8 Last Fragment Confirmation:</p> <p><i>Indicates whether the Outstation requests confirmation of the last fragment of a multi-fragment response.</i></p>	<p><input type="checkbox"/> Always</p> <p><input checked="" type="checkbox"/> Sometimes, explain <b>Only when it contains events</b></p> <p><input type="checkbox"/> Never</p>	Sometimes	

1.7 FILL OUT THE FOLLOWING ITEMS FOR OUTSTATIONS ONLY	Capabilities	Current Value	If configurable, list methods
<p>1.7.9 DNP Command Settings preserved through a device reset:</p> <p><i>If data associated with any of these requests are written through the DNP protocol but not preserved through a restart of the Outstation, the Master will have to write them again anytime the Restart IIN bit is set</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Assign Class</li> <li><input type="checkbox"/> Analog Deadbands</li> <li><input type="checkbox"/> Data Set Prototypes</li> <li><input type="checkbox"/> Data Set Descriptors</li> <li><input type="checkbox"/> Function Code 31 Activate Configuration</li> </ul>		

1.8 OUTSTATION UNSOLICITED RESPONSE SUPPORT	Capabilities	Current Value	If configurable, list methods
<p>1.8.1 Supports Unsolicited Reporting:</p> <p><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>	<p><input type="checkbox"/> Not Supported</p> <p><input checked="" type="checkbox"/> Configurable, selectable from On and Off</p>	Off	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software <b>SEL-5030 AcSELeator Quickset</b></p>
<p>1.8.2 Master Data Link Address:</p> <p><i>The destination address of the master device where the unsolicited responses will be sent.</i></p>	<p><input type="checkbox"/> Fixed at _____</p> <p><input checked="" type="checkbox"/> Configurable, range <b>0</b> to <b>65,519</b></p> <p><input type="checkbox"/> Configurable, selectable from _____, _____, _____</p> <p><input type="checkbox"/> Configurable, other, describe _____</p>	1	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software <b>SEL-5030 AcSELeator Quickset</b></p>

1.8 OUTSTATION UNSOLICITED RESPONSE SUPPORT	Capabilities	Current Value	If configurable, list methods
<p>1.8.3 Unsolicited Response Confirmation Timeout:</p> <p><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. 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.</i></p>	<p> <input type="checkbox"/> Fixed at _____ ms  <input checked="" type="checkbox"/> Configurable, range <b>1000 to 5000000 ms</b>  <input type="checkbox"/> Configurable, selectable from ____, ____, ____ms  <input type="checkbox"/> Configurable, other, describe _____  <input type="checkbox"/> Variable, explain _____ </p> <p>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 URETRY retries, it changes the interval to UTIMEO and continues to retry until it receives an acknowledgement.</p>	60000 ms	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSElerator Quickset</b>
<p>1.8.4 Number of Unsolicited Retries:</p> <p><i>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.</i></p>	<p> <input type="checkbox"/> None  <input type="checkbox"/> Fixed at _____  <input type="checkbox"/> Configurable, range _____ to _____  <input type="checkbox"/> Configurable, selectable from ____, ____, ____  <input type="checkbox"/> Configurable, other, describe _____  <input checked="" type="checkbox"/> Always infinite, never gives up </p> <p>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.</p>	Infinite	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSElerator Quickset</b>

1.9 OUTSTATION UNSOLICITED RESPONSE TRIGGER CONDITIONS	Capabilities	Current Value	If configurable, list methods
1.9.1 Number of class 1 events:	<input checked="" type="checkbox"/> Class 1 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"/> Configurable, other, describe _____		
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"/> Configurable, other, describe _____		
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"/> Configurable, other, describe _____		
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"/> Configurable, other, describe _____	10	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSELerator Quickset</b>
1.9.5 Hold time after class 1 event: <i>A configured value of 0 indicates that responses are not delayed due to this parameter.</i>	<input checked="" type="checkbox"/> Class 1 not used to trigger Unsolicited Responses <input type="checkbox"/> Fixed at _____ ms <input type="checkbox"/> Configurable, range _____ to _____ ms <input type="checkbox"/> Configurable, selectable from _____, _____, _____ ms <input type="checkbox"/> Configurable, other, describe _____		

1.9 OUTSTATION UNSOLICITED RESPONSE TRIGGER CONDITIONS	Capabilities	Current Value	If configurable, list methods
<p>1.9.6 Hold time after class 2 event:</p> <p><i>A configured value of 0 indicates that responses are not delayed due to this parameter.</i></p>	<input checked="" type="checkbox"/> Class 2 not used to trigger Unsolicited Responses <input type="checkbox"/> Fixed at _____ ms <input type="checkbox"/> Configurable, range _____ to _____ ms <input type="checkbox"/> Configurable, selectable from _____, _____, _____ ms <input type="checkbox"/> Configurable, other, describe _____		
<p>1.9.7 Hold time after class 3 event:</p> <p><i>A configured value of 0 indicates that responses are not delayed due to this parameter.</i></p>	<input checked="" type="checkbox"/> Class 3 not used to trigger Unsolicited Responses <input type="checkbox"/> Fixed at _____ ms <input type="checkbox"/> Configurable, range _____ to _____ ms <input type="checkbox"/> Configurable, selectable from _____, _____, _____ ms <input type="checkbox"/> Configurable, other, describe _____		
<p>1.9.8 Hold time after event assigned to any class:</p> <p><i>A configured value of 0 indicates that responses are not delayed due to this parameter.</i></p>	<input type="checkbox"/> Class events not used to trigger Unsolicited Responses <input type="checkbox"/> Fixed at _____ ms <input checked="" type="checkbox"/> Configurable, range <b>0</b> to <b>99999</b> s <input type="checkbox"/> Configurable, selectable from _____, _____, _____ ms <input type="checkbox"/> Configurable, other, describe _____	2 s	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSELerator Quickset</b>
<p>1.9.9 Retrigger Hold Timer:</p> <p><i>The hold-time timer may be retriggered for each new event detected (increased possibly of capturing all the changes in a single response) or not retriggered (giving the master a guaranteed update time).</i></p>	<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	
<p>1.9.10 Other Unsolicited Response Trigger Conditions:</p>			

1.10 OUTSTATION PERFORMANCE	Capabilities	Current Value	If configurable, list methods
<p>1.10.1 Maximum Time Base Drift (milliseconds per minute):</p> <p><i>If the protocol is synchronized by DNP, what is the clock drift rate over the full operating temperature range.</i></p>	<p><input checked="" type="checkbox"/> Fixed at <b>0.6 ms</b></p> <p><input type="checkbox"/> Range _____ to _____ ms</p> <p><input type="checkbox"/> Selectable from _____, _____, _____ ms</p> <p><input checked="" type="checkbox"/> Other, describe <b>0.6 ms/min @ 25 deg C</b></p>	<p><i>Other, 0.6 ms/min @ 25 deg C</i></p>	
<p>1.10.2 When does outstation set IIN1.4?</p> <p><i>Internal Indication 1.4 is NEED_TIME.</i></p>	<p><input checked="" type="checkbox"/> Never</p> <p><input checked="" type="checkbox"/> Asserted at startup until first Time Synchronization request received</p> <p><input type="checkbox"/> Periodically, range _____ to _____ minutes</p> <p><input type="checkbox"/> Periodically, selectable from _____, _____, _____ seconds</p> <p><input checked="" type="checkbox"/> Range <b>0 to 1966020</b> seconds after last time sync</p> <p><input type="checkbox"/> Selectable from _____, _____, _____ seconds after last time sync</p> <p><input type="checkbox"/> When time error may have drifted by range _____ to _____ ms</p> <p><input type="checkbox"/> When time error may have drifted by selectable from _____, _____, _____</p> <p><b>Note: If TIMERQ = I or M, IIN 1.4 is never asserted</b></p> <p><b>Note: If TIMERQ = value, IIN 1.4 is asserted periodically every value minutes</b></p>	<p>Never</p>	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software <b>SEL-5030 AcSELerator Quickset</b></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 a DNP Write Time message, and the time actually set in the Outstation.</i></p>	<p><input checked="" type="checkbox"/> Fixed at <b>100 ms</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>	<p>100 ms</p>	

1.10 OUTSTATION PERFORMANCE	Capabilities	Current Value	If configurable, list methods
<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>100 ms</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>100 ms</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 type="checkbox"/> Fixed at _____ ms</p> <p><input type="checkbox"/> Range _____ to _____ ms</p> <p><input type="checkbox"/> Selectable from _____, _____, _____ ms</p> <p><input checked="" type="checkbox"/> Other, describe <b>DNP3 protocol can take from 60-90 seconds to enable from power-up. Once DNP3 is enabled, IIN 1.4 will be asserted within 100 ms (if TIMERQ is a value other than I or M).</b></p>	DNP3 protocol can take from 60-90 seconds to enable from power-up. Once DNP3 is enabled, IIN 1.4 will be asserted within 100 ms (if TIMERQ is a value other than I or M).	
<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-tag reported and the absolute time of the physical event. This error includes the Internal Time Reference Error.</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><input checked="" type="checkbox"/> Other, describe <b>If the Binary point is in the SER list, error is +/- 4 ms. Otherwise, error is from 500ms to 1 second.</b></p>	If the Binary point is in the SER list, error is +/- 4 ms. Otherwise, error is from 500ms to 1 second.	
<p>1.10.8 Maximum Event Time-tag error for local I/O other than Binary and Double-bit data types (ms):</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><input checked="" type="checkbox"/> Other, describe <b>up to 500 ms</b></p>	Up to 500 ms	

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 AcSELerator Quickset</b>
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 AcSELerator Quickset</b>
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 AcSELerator Quickset</b>
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</p> <p><i>The support for secure authentication is optional in DNP3 devices. Indicate here if the device supports secure authentication.</i></p> <p><i>If the device does not support secure authentication then ignore the rest of this section.</i></p> <p><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 comprise that version of Secure Authentication.</i></p>	<p><input type="checkbox"/> Supports secure authentication</p> <p>Version(s) supported:</p> <p><input type="checkbox"/> Fixed at _____</p> <p><input type="checkbox"/> Configurable, selectable from _____, _____, _____</p>		
<p>1.12.2 Maximum number of users</p> <p><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>	<p>Maximum number of users supported: ____</p>		
<p>1.12.3 Security message response timeout</p> <p><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>	<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"/> Configurable, other, describe _____</p>		

1.12 SECURITY PARAMETERS	Capabilities	Current Value	If configurable, list methods
<p>1.12.4 Aggressive mode of operation (receive)</p> <p><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 type="checkbox"/> Yes - Accepts aggressive mode requests <input type="checkbox"/> No – Does not accept aggressive mode requests	
<p>1.12.5 Aggressive mode of operation (issuing)</p> <p><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 type="checkbox"/> Yes - Issues aggressive mode requests <input type="checkbox"/> No – Does not issue aggressive mode requests	
<p>1.12.6 Session Key change interval</p> <p><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.</i></p> <p><i>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		

1.12 SECURITY PARAMETERS	Capabilities	Current Value	If configurable, list methods
<p>1.12.7 Session Key change message count</p> <p><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</p> <p><i>To assist in countering denial of service attacks, a DNP3 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>	<input type="checkbox"/> Configurable, range _____ to _____		
<p>1.12.9 HMAC algorithm requested in a challenge exchange</p> <p><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>	<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, describe _____		
<p>1.12.10 Key-wrap algorithm to encrypt session keys</p> <p><i>During the update of a session key, the key is encrypted using AES-128 or optionally using other algorithms.</i></p>	<input checked="" type="checkbox"/> AES-128  <input type="checkbox"/> Other, describe _____		

1.12 SECURITY PARAMETERS	Capabilities	Current Value	If configurable, list methods
<p>1.12.11 Cipher Suites used with DNP implementations using TLS</p> <p><i>Indicate the supported Cipher Suites for implementations using TLS.</i></p>	<p><input type="checkbox"/> Not relevant – TLS is not used</p> <p><input type="checkbox"/> TLS_RSA encrypted with RC4_128</p> <p><input type="checkbox"/> TLS_RSA encrypted with 3DES_EDE_CBC</p> <p><input type="checkbox"/> TLS_DH, signed with DSS, encrypted with 3DES_EDE_CBC</p> <p><input type="checkbox"/> TLS_DH, signed with RSA, encrypted with 3DES_EDE_CBC</p> <p><input type="checkbox"/> TLS_DHE, signed with 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, describe</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"/> Configurable, other, describe _____</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>			

1.12 SECURITY PARAMETERS	Capabilities	Current Value	If configurable, list methods
<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> <p><input type="checkbox"/> Configurable, other, describe _____</p>		
<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> <p><input type="checkbox"/> 0 (Confirm)</p> <p><input type="checkbox"/> 1 (Read)</p> <p><input type="checkbox"/> 7 (Immediate freeze)</p> <p><input type="checkbox"/> 8 (Immediate freeze – no ack)</p> <p><input type="checkbox"/> 9 (Freeze-and-clear)</p> <p><input type="checkbox"/> 10 (Freeze-and-clear – no ack)</p> <p><input type="checkbox"/> 11 (Freeze-at-time)</p> <p><input type="checkbox"/> 12 (Freeze-at-time – no ack)</p> <p><input type="checkbox"/> 22 (Assign Class)</p> <p><input type="checkbox"/> 23 (Delay Measurement)</p> <p><input type="checkbox"/> 25 (Open File)</p> <p><input type="checkbox"/> 26 (Close File)</p> <p><input type="checkbox"/> 27 (Delete File)</p> <p><input type="checkbox"/> 28 (Get File Info)</p> <p><input type="checkbox"/> 30 (Abort File)</p> <p><input type="checkbox"/> 129 (Response)</p> <p><input type="checkbox"/> 130 (Unsolicited Response)</p>		

1.12 SECURITY PARAMETERS	Capabilities	Current Value	If configurable, list methods
<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 specific data objects (for example: the reading of specific data points).</i></p>	<p>Describe any other critical fragment exchanges:</p>		

## 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 61850 object models. The 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 data 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 Communication 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 graphical or table representation may be generated from the XML and shown here in the printed version of the Device Profile Document to give an idea of the Logical Devices, Logical Notes, and Attributes available via the DNP interface. The following is an example table format:

IEC 61850 Object	DNP3 XPATH Reference	Comments

### **3 CAPABILITIES AND CURRENT SETTINGS FOR DEVICE DATABASE (OUTSTATION ONLY)**

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. Tables for data types not supported may be deleted. Additional columns may be added to the point list table if necessary.

<b>3.1 SINGLE-BIT BINARY INPUTS</b> Static (Steady-State) Group Number: 1 Event Group Number: 2	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable, list methods</b>
3.1.1 Static Variation reported when variation 0 requested:	<input 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 (add column to table below)	Two	
3.1.2 Event Variation reported when variation 0 requested:	<input type="checkbox"/> Variation 1 – without time <input checked="" type="checkbox"/> Variation 2 – with absolute time <input type="checkbox"/> Variation 3 – with relative time <input type="checkbox"/> Based on point Index (add column to table below)	Two	
3.1.3 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. All events are typically reported for Binary Inputs.</i>	<input type="checkbox"/> Only most recent <input checked="" type="checkbox"/> All events	All events	
3.1.4 Binary Inputs included in Class 0 response:  <i>If Binary Inputs are not included in the Class 0 response, Binary Input Events (group 2) 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 (add column to table below)	Always	
3.1.5 Definition of Binary Input Point List:  <i>List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.</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 _____  <b>Note: Additional Binary Input points are added to the list at relay start-up based on the installed card options.</b>	Fixed	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSELeurator Quickset</b>

Point Index	Name	Event Class Assigned (1, 2, 3 or none)	Name for State when value is 0	Name for State when value is 1	Description
0	ENABLED	one	Disabled	Enabled	Relay Status
1	TRIP	one	Deasserted	Asserted	Trip LED
2	STWARN	one	Deasserted	Asserted	Relay Diagnostic Warning
3	STFAIL	one	Deasserted	Asserted	Relay Diagnostic Failure
4	STSET	one	Deasserted	Asserted	Relay Settings Change or Restart
5	IN101	one	Deasserted	Asserted	Contact Input IN101
6	IN102	one	Deasserted	Asserted	Contact Input In102

<b>3.2 DOUBLE-BIT INPUT POINTS</b> Static (Steady-State) Group Number: 3 Event Group Number: 4	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable, list methods</b>
3.2.1 Static Variation reported when variation 0 requested:	<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 (add column to table below)		
3.2.2 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"/> Variation 3 – with relative time <input type="checkbox"/> Based on point Index (add column to table below)		
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. All events are typically reported for Double-bit Inputs.</i>	<input type="checkbox"/> Only most recent <input type="checkbox"/> All events		
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 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 (add column to table below)		
3.2.5 Definition of Double-bit Input Point List:  <i>List all addressable points. Points that do not exist (for example, because an option is not installed) shall be 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 _____		

Point Index	Name	Default Class Assigned to Events (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
0							
1							
2							
:	Add more rows as necessary						
:							

<b>3.3 BINARY OUTPUT STATUS AND CONTROL RELAY OUTPUT BLOCK</b> Binary Output Status Group Number: 10 Binary Output Event Group Number: 11 CROB Group Number: 12 Binary Output Command Event Object Num: 13	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable, list methods</b>
3.3.1 Minimum pulse time allowed with Trip, Close, and Pulse On commands:	<input checked="" type="checkbox"/> Fixed at 4 ms (hardware may limit this further) <input type="checkbox"/> Based on point Index (add column to table below)  <b>Note: 1/4 cycle @ 60 Hz = 4 ms Pulse</b>	Fixed at 4 ms	
3.3.2 Maximum pulse time allowed with Trip, Close, and Pulse On commands:	<input checked="" type="checkbox"/> Fixed at <u>4</u> ms (hardware may limit this further) <input type="checkbox"/> Based on point Index (add column to table below)	Fixed at 4 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 (add column to table below)	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 (add column to table below)	Two	
3.3.6 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 (add column to table below)		
3.3.7 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		

<p>3.3.8 Command 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><input type="checkbox"/> Only most recent</p> <p><input type="checkbox"/> All events</p>		
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<p>3.3.9 Maximum Time between Select and Operate:</p>	<p> <input type="checkbox"/> Not Applicable  <input type="checkbox"/> Fixed at _____ seconds  <input checked="" type="checkbox"/> Configurable, range <b>0</b> to <b>30</b> seconds  <input type="checkbox"/> Configurable, selectable from____,____,____ seconds  <input type="checkbox"/> Configurable, other, describe_____   <input type="checkbox"/> Variable, explain _____  <input type="checkbox"/> Based on point Index (add column to table below) </p>	<p>1 second</p>	<p>Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSELerator Quickset</b></p>
<p>3.3.10 Definition of Binary Output Status/Control relay output block (CROB) Point List:</p> <p><i>List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.</i></p>	<p> <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_____ </p>	<p>Fixed</p>	<p>Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSELerator Quickset</b></p>

		Supported Control Operations													Event Class Assigned (1,2,3 or none)		
Point Index	Name	Select/Operate	Direct Operate	Direct Operate - No Ack	Pulse On	Pulse Off	Latch On	Latch Off	Trip	Close	Count > 1	Cancel Currently Running Operation	Name for State when value is 0	Name for State when value is 1	Change	Command	Description
0	RB01	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 01
1	RB02	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 02
2	RB03	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 03
3	RB04	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 04
4	RB05	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 05
5	RB06	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 06
6	RB07	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 07
7	RB08	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 08
8	RB09	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 09
9	RB10	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 10
10	RB11	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 11
11	RB12	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 12
12	RB13	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 13
13	RB14	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 14
14	RB15	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 15
15	RB16	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 16
16	RB17	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 17
17	RB18	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 18
18	RB19	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 19
19	RB20	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 20

		Supported Control Operations													Event Class Assigned (1,2,3 or none)		
Point Index	Name	Select/Operate	Direct Operate	Direct Operate - No Ack	Pulse On	Pulse Off	Latch On	Latch Off	Trip	Close	Count > 1	Cancel Currently Running Operation	Name for State when value is 0	Name for State when value is 1	Change	Command	Description
20	RB21	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 21
21	RB22	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 22
22	RB23	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 23
23	RB24	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 24
24	RB25	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 25
25	RB26	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 26
26	RB27	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 27
27	RB28	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 28
28	RB29	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 29
29	RB30	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 30
30	RB31	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 31
31	RB32	Y	Y	Y	Y		Y	Y	Y	Y			Clear	Set			Remote Bit 32

<b>3.4 COUNTERS/FROZEN COUNTERS</b> Static Counter Group Number: <b>20</b> Static Frozen Counter Group Number: <b>21</b> Counter Event Group Number: <b>22</b> Frozen Counter Event Group Number: <b>23</b>	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable, list methods</b>
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 (add column to table below)	Six	
3.4.2 Counter Event 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 <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 (add column to table below)	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 (add column to table below)	Always	
3.4.4 Counter 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. All events are typically reported for Counters.</i>	<input checked="" type="checkbox"/> Only most recent <input type="checkbox"/> All events	Most recent	
3.4.5 Static Frozen 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 with flag and time <input type="checkbox"/> Variation 6 – 16-bit with flag and time <input type="checkbox"/> Variation 9 – 32-bit without flag <input type="checkbox"/> Variation 10 – 16-bit without flag <input type="checkbox"/> Based on point Index (add column to table below)		

<b>3.4 COUNTERS/FROZEN COUNTERS</b> Static Counter Group Number: <b>20</b> Static Frozen Counter Group Number: <b>21</b> Counter Event Group Number: <b>22</b> Frozen Counter Event Group Number: <b>23</b>	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable, list methods</b>
3.4.6 Frozen Counter Event 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 with flag and time <input type="checkbox"/> Variation 6 – 16-bit with flag and time <input type="checkbox"/> Based on point Index (add column to table below)		
3.4.7 Frozen Counters included in Class 0 response:  <i>If Frozen Counters are not included in the Class 0 response, Frozen Counter Events (group 23) may not be reported.</i>	<input type="checkbox"/> Always <input checked="" type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to Class 1, 2, or 3 <input type="checkbox"/> Based on point Index (add column to table below)	Never	
3.4.8 Frozen Counter 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. All events are typically reported for Frozen Counters.</i>	<input type="checkbox"/> Only most recent <input type="checkbox"/> All events		
3.4.9 Counters Roll Over at:	<input checked="" type="checkbox"/> 16 Bits (65,535) <input type="checkbox"/> 32 Bits (4,294,967,295) <input type="checkbox"/> Other Fixed Value _____ <input type="checkbox"/> Configurable; range _____ to _____ <input type="checkbox"/> Configurable, selectable from ____, ____, ____ <input type="checkbox"/> Configurable, other, describe _____ <input type="checkbox"/> Based on point Index (add column to table below)	16 Bits (65,535)	
3.4.10 Counters frozen by means of:	<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 _____		

<b>3.4 COUNTERS/FROZEN COUNTERS</b> Static Counter Group Number: <b>20</b> Static Frozen Counter Group Number: <b>21</b> Counter Event Group Number: <b>22</b> Frozen Counter Event Group Number: <b>23</b>	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable, list methods</b>
<b>3.4.11 Definition of Counter/Frozen Counter Point List:</b>  <i>List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.</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 AcSELeerator Quickset</b>

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
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<b>3.5 ANALOG INPUT POINTS</b> Static (Steady-State) Group Number: 30 Event Group Number: 32	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable, list methods</b>
3.5.1 Static 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 3 – 32-bit without flag <input type="checkbox"/> Variation 4 – 16-bit without flag <input type="checkbox"/> Variation 5 – single-precision floating point with flag <input type="checkbox"/> Variation 6 – double-precision floating point with flag <input type="checkbox"/> Based on point Index (add column to table below)  <b>Note: Setting DVARAIx defines default AI variation (1-6)</b>	Four	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSELerator Quickset</b>
3.5.2 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 (add column to table below)  <b>Note: Setting DVARAIx defines default AI event variation (1-6)</b>	Four	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSELerator Quickset</b>
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. Only the most recent event is typically reported for Analog Inputs.</i>	<input type="checkbox"/> Only most recent <input type="checkbox"/> All events	Most recent – event time	

<b>3.5 ANALOG INPUT POINTS</b> Static (Steady-State) Group Number: 30 Event Group Number: 32	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable, list methods</b>
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 (add column to table below)	Always	
3.5.5 How Deadbands are set:	<input checked="" 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	A	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030</b> <b>AcSELeRator Quickset</b> ----- 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 _____	Simple	

<b>3.5 ANALOG INPUT POINTS</b> Static (Steady-State) Group Number: 30 Event Group Number: 32	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable, list methods</b>
<b>3.5.7 Definition of Analog Input Point List:</b> <i>List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.</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 _____  <b>Note: Analog Input points are generated at relay start-up based on the installed card options.</b>	Fixed	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSELerator Quickset</b>

			Transmitted Value		Scaling				
Point Index	Name	Event Class Assigned (1, 2, 3 or none)	Min	Max	Multiplier	Offset	Units	Resolution	Description

<b>3.6 ANALOG OUTPUT STATUS AND ANALOG OUTPUT CONTROL BLOCK</b> Analog Output Status Group Number: <b>40</b> Analog Output Control Block Group Number: <b>41</b> Analogue Output Event Group Number: <b>42</b> Analogue Output Command Event Group Number: <b>43</b>	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable, list methods</b>
<b>3.6.1</b> 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 <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 (add column to table below)	Two	
<b>3.6.2</b> 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 (add column to table below)	Always	
<b>3.6.3</b> 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	
<b>3.6.4</b> 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 (add column to table below)		

<b>3.6 ANALOG OUTPUT STATUS AND ANALOG OUTPUT CONTROL BLOCK</b> Analog Output Status Group Number: <b>40</b> Analog Output Control Block Group Number: <b>41</b> Analogue Output Event Group Number: <b>42</b> Analogue Output Command Event Group Number: <b>43</b>	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable, list methods</b>
<b>3.6.5</b> 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 (add column to table below)		
<b>3.6.6</b> 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		
<b>3.6.7</b> 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		

<b>3.6 ANALOG OUTPUT STATUS AND ANALOG OUTPUT CONTROL BLOCK</b> Analog Output Status Group Number: <b>40</b> Analog Output Control Block Group Number: <b>41</b> Analogue Output Event Group Number: <b>42</b> Analogue Output Command Event Group Number: <b>43</b>	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable, list methods</b>
<b>3.6.8</b> Maximum Time between Select and Operate:	<input type="checkbox"/> Not Applicable <input type="checkbox"/> Fixed at _____ seconds <input checked="" type="checkbox"/> Configurable, range <b>0</b> to <b>30</b> seconds <input type="checkbox"/> Configurable, selectable from ____, ____, ____ seconds <input type="checkbox"/> Configurable, other, describe _____ <input type="checkbox"/> Variable, explain _____ <input type="checkbox"/> Based on point Index (add column to table below)	1 second	Proprietary File via Other Mechanism ----- terminal ----- software <b>SEL-5030 AcSELerator Quickset</b>
<b>3.6.9</b> Definition of Analog Output Status/Analog Output Control Block Point List:  <i>List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.</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 AcSELerator Quickset</b>

		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

<b>3.7 SEQUENTIAL FILE TRANSFER</b> Group Number: 70	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable, list methods</b>
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)		
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 type="checkbox"/> 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 type="checkbox"/> 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 series of blocks of a maximum specified size. This indicates whether only a single block or multiple blocks will be sent in fragment.</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No		
3.7.6 Max number of Files Open at one time:	<input type="checkbox"/> Fixed at _____(enter 0 if files are not supported)  <input type="checkbox"/> Configurable, range _____ to _____ <input type="checkbox"/> Configurable, selectable from _____, _____, _____ <input type="checkbox"/> Configurable, other, describe _____		

3.7 SEQUENTIAL FILE TRANSFER Group Number: 70	Capabilities	Current Value	If configurable, list methods
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_____		

File Name	Default Class Assigned to Events (1, 2, 3 or none)	Authentication Required for:			Description
		Read	Write	Delete	
Add more rows as necessary					

<b>3.8 OCTET STRING POINTS</b> Static (Steady-State) Group Number: 110 Event Group 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 event.</i>	<input type="checkbox"/> Only most recent <input type="checkbox"/> All events <b>Note: Not supported</b>		
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 (add column to table below)		
3.8.3 Definition of Octet String Point List: <i>List all addressable points. Points that do not exist (for example, because an option is not installed) shall be 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 _____		

Point Index	Name	Default Class Assigned to Events (1, 2, 3 or none)	Description
0			

<b>3.9 VIRTUAL TERMINAL PORT NUMBERS (POINTS)</b> Static (Steady-State) Group Number: 112 Event Group Number: 113	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable, list methods</b>
3.9.1 Definition of Virtual Terminal Port Numbers:  <i>List all addressable points. Points that do not exist (for example, because an option is not installed) shall be 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 _____  <b>Note: Not supported</b>		

<b>Virtual Port Number (Point Index)</b>	<b>Name</b>	<b>Default Class Assigned to Events (1, 2, 3 or none)</b>	<b>Description</b>

<b>3.10 DATA SET PROTOTYPE</b> Group Number: 85 Variation Number: 1  Duplicate this table for each Data Set Prototype defined	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable, list methods</b>
3.10.1 Definition of Data Set Prototypes:	<input type="checkbox"/> Fixed, a Data Set Prototype is shown in table below <input type="checkbox"/> Configurable, list methods: _____ (a currently defined Data Set Prototype may be shown in table below) <input type="checkbox"/> Other, explain _____  <b>Note: Not supported</b>		
3.10.2 Description:	_____ _____		

Element Number	Descriptor Code (check one)							Element Description	Data Type Code (check one)							Maximum Data Length	Ancillary Value: ID = Identifier number UUID = UUID value NSPC = Prototype namespace NAME = Prototype name DAEL = Data element name CTLS = Control status name CTLV = Control value name
	ID	UUID	NSPC	NAME	DAEL	CTLS	CTLV		NONE	VSTR	UINT	INT	FLT	OSTR	BSTR		
0																	

<b>3.11 DATA SET DESCRIPTOR CONTENTS AND CHARACTERISTICS</b> Group Number: <b>86</b> Variation Number: <b>1</b>  Duplicate this table for each Data Set Descriptor defined	<b>Capabilities</b>	<b>Current Value</b>	<b>If configurable, list methods</b>
3.11.1 Definition of Data Set Descriptors:	<input type="checkbox"/> Fixed, a Data Set Descriptor is shown in table below <input type="checkbox"/> Configurable(current list may be shown in table below) <input type="checkbox"/> Other, explain_____  <b>Note: Not supported</b>		
3.11.2 Description:	_____ _____		
3.11.3 Data Set Properties:	<input type="checkbox"/> Readable <input type="checkbox"/> Writable <input type="checkbox"/> Outstation maintains a static data set <input type="checkbox"/> Outstation generates a data set event <input type="checkbox"/> Data set defined by master		
3.11.4 Default Event Assigned Class:	<input type="checkbox"/> Class 1 <input type="checkbox"/> Class 2 <input type="checkbox"/> Class 3		
3.11.5 Static Data Set included in Class 0 response:	<input type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to Class 1, 2, or 3		

Element Number	Descriptor Code (check one)						Element Description	Data Type Code (check one)								Maximum Data Length	Ancillary Value: ID = Identifier number NAME = Prototype name DAEL = Data element name CTLS = Control status name CTLV = Control value name PTYP = UUID and name of elements
	ID	NAME	DAEL	CTLS	CTLV	PTYP		NONE	VSTR	UINT	INT	FLT	OSTR	BSTR	TIME		
0																	

### 3.12 DATA SET DESCRIPTOR – POINT INDEX ATTRIBUTES

Group Number: **86**

Variation Number: **3**

The following table is optional and correlates data set elements to point indexes of standard DNP3 Data Objects. The element number below refers to the position in the present value (object 87) or event (object 88) data set and will not match the element number in the data set descriptor or data set prototype tables above.

Duplicate this table for each Data Set Descriptor defined

Element Number	Link to Standard Data Point	
	Group Number	Point Index
0		
1		
2		
⋮	Add more rows as necessary	

## 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.

<b>NOTE</b>	The implementation table must list all functionality required by the device whether Master or Outstation as defined within the DNP3 IED Conformance Test Procedures. Any functionality beyond the highest subset level supported is indicated by <b>highlighted</b> rows. Any Object Groups not provided by an outstation or not processed by a Master are indicated by <del>struck through</del> (note these Object Groups will still be parsed).
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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	211	Device Attributes – Identifier of support for user-specific attributes	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	212	Device Attributes – Number of master-defined data set prototypes	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	213	Device Attributes – Number of outstation-defined data set prototypes	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	214	Device Attributes – Number of master-defined data sets	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	215	Device Attributes – Number of outstation-defined data sets	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	216	Device Attributes – Max number of binary outputs per request	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	219	Device Attributes – Support for analog output events	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	220	Device Attributes – Max analog output index	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	221	Device Attributes – Number of analog outputs	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	222	Device Attributes – Support for binary output events	1( <i>read</i> )	00 ( <i>start-stop</i> )	129 ( <i>Response</i> )	00 ( <i>start-stop</i> ) 17 ( <i>index</i> )
0	223	Device Attributes – Max binary	1( <i>read</i> )	00 ( <i>start-</i>	129	00 ( <i>start-</i>

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)
		output index		stop	(Response)	stop 17 (index)
0	224	Device Attributes – Number of binary outputs	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	225	Device Attributes – Support for frozen counter events	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	226	Device Attributes – Support for frozen counters	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	227	Device Attributes – Support for counter events	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	228	Device Attributes – Max counter index	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	229	Device Attributes – Number of counter points	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	230	Device Attributes – Support for frozen analog inputs	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	231	Device Attributes – Support for analog input events	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	232	Device Attributes – Maximum analog input index	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	233	Device Attributes – Number of analog input points	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	234	Device Attributes – Support for double-bit binary input events	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	235	Device Attributes – Maximum double-bit binary input index	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	236	Device Attributes – Number of double-bit binary input points	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	237	Device Attributes – Support for binary input events	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	238	Device Attributes – Max binary input index	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	239	Device Attributes – Number of binary input points	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	240	Device Attributes – Max transmit	1(read)	00 (start-	129	00 (start-

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)
		fragment size		stop	(Response)	stop 17 (index)
0	241	Device Attributes – Max receive fragment size	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	242	Device Attributes – Device manufacturer's software version	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	243	Device Attributes - Device manufacturer's hardware version	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	245	Device Attributes – User-assigned location name	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	246	Device Attributes – User-assigned ID code/number	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	247	Device Attributes – User-assigned device name	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	248	Device Attributes - Device serial number	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	249	Device Attributes - Device manufacturer's hardware version	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	250	Device Attributes - Device manufacturer's product name and model	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	252	Device Attributes - Device manufacturer's name	1(read)	00 (start-stop)	129 (Response)	00 (start-stop) 17 (index)
0	254	Device Attributes - Non-specific all attributes request	1(read)	00 (start-stop) 06 (no range, or all)	129 (Response)	00 (start-stop) 17 (index)
0	255	Device Attributes - List of attribute variations	1(read)	00 (start-stop) 06 (no range, or all)	129 (Response)	00 (start-stop) 17 (index)
1	0	Binary Input - any variation	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
1	1	Binary Input - Single-bit packed	1(read)	00, 01 (start-stop), 06 (no range, or	129 (Response)	00, 01 (start-stop), 17, 28 (index)

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

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)
		block		(index)	(Response)	request
12	1	Pulsed Control - control relay output block	5(direct op.)	17, 28 (index)	129 (Response)	echo of request
12	1	Pulsed Control - control relay output block	6(direct op, no ack)	17, 28 (index)	129 (Response)	echo of request
20	0	Counter - any variation	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
20	0	Counter - any variation	7(freeze)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
20	0	Counter - any variation	8(freeze, no ack)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
20	0	Counter - any variation	9(freeze & clear)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
20	0	Counter - any variation	10(frz & clr, no ack)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
20	1	Counter - 32-bit with flag	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty),	129 (Response)	00, 01 (start-stop), 17, 28 (index)

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)
				17, 28 (index)		
20	1	Counter - 32-bit with flag	7(freeze)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
20	1	Counter - 32-bit with flag	8(freeze, no ack)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
20	1	Counter - 32-bit with flag	9(freeze & clear )	00, 01 (start-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),		

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)
				06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
20	2	Counter - 16-bit with flag	9(freeze & clear )	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
20	2	Counter - 16-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	5	Counter - 32-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	5	Counter - 32-bit without flag	7(freeze)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited 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		

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)
				(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(freeze)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
20	6	Counter - 16-bit without flag	8(freeze, 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	9(freeze & clear)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
20	6	Counter - 16-bit without flag	10(frz & clr, no ack)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
24	0	Frozen Counter - Any Variation	4(read)	06 (no		

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)
				<del>range, or all</del>		
21	4	Frozen Counter — 32-bit with flag			129 (Response)	00, 01 (start-stop)
21	2	Frozen Counter — 32-bit with flag			129 (Response)	00, 01 (start-stop)
21	9	Frozen Counter — 32-bit with flag			129 (Response)	00, 01 (start-stop)
21	10	Frozen Counter — 32-bit with flag			129 (Response)	00, 01 (start-stop)
22	0	Counter Change Event - any variation	1(read)	06 (no range, or all), 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), 06 (no range, or all), 07, 08	129 (Response)	00, 01 (start-stop), 17, 28 (index)

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)
				(limited qty), 17, 28 (index)		
30	2	Analog Input - 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)
30	3	Analog Input - 32-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)
30	4	Analog Input - 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)
30	5	Analog Input – Single-prec flt-pt 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)
30	6	Analog Input – Double-prec flt-pt 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)
32	0	Analog Input Change Event - any variation	1(read)	06 (no range, or all), 07, 08 (limited qty)		
32	1	Analog Input Change Event - 32-bit without time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)

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)
32	2	Analog Input Change Event - 16-bit without time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
32	2	Analog Input Change Event - 16-bit without time	1(read)	06 (no range, or all), 07, 08 (limited qty)	130 (Unsol. Resp.)	17, 28 (index)
32	3	Analog Input Change Event - 32-bit with time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
32	4	Analog Input Change Event - 16-bit with time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
32	5	Frozen Analog Input – 32-bit without flag	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
32	6	Frozen Analog Input – 16-bit without flag	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
34	0	Analog Input Deadband - any variation	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
34	1	Analog Input Deadband - 16-bit	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)
34	1	Analog Input Deadband - 16-bit	2(write)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		

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)
34	2	Analog Input Deadband - 32-bit	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)
34	2	Analog Input Deadband - 32-bit	2(write)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)		
34	3	Analog Input Deadband - Single-prec fit-pt	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)
34	3	Analog Input Deadband - Single-prec fit-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), 11, 1C	129 (Response)	00, 01 (start-stop), 11, 1C
40	2	Analog Output Status - 16-bit with flag	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 11, 1C	129 (Response)	00, 01 (start-stop), 11, 1C

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)
40	3	Analog Output Status – Single-prec flt-pt with flag	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 11, 1C	129 (Response)	00, 01 (start-stop), 11, 1C
40	4	Analog Output Status – Double-prec flt-pt with flag	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 11, 1C	129 (Response)	00, 01 (start-stop), 11, 1C
41	1	Analog Output Block - 32-bit	3(select)	17, 28 (index)	129 (Response)	echo of request
41	1	Analog Output Block - 32-bit	4(operate)	17, 28 (index)	129 (Response)	echo of request
41	1	Analog Output Block - 32-bit	5(direct op.)	17, 28 (index)	129 (Response)	echo of request
41	1	Analog Output Block - 32-bit	6(direct op, no ack)	17, 28 (index)	129 (Response)	echo of request
41	2	Analog Output Block - 16-bit	3(select)	17, 28 (index)	129 (Response)	echo of request
41	2	Analog Output Block - 16-bit	4(operate)	17, 28 (index)	129 (Response)	echo of request
41	2	Analog Output Block - 16-bit	5(direct op.)	17, 28 (index)	129 (Response)	echo of request
41	2	Analog Output Block - 16-bit	6(direct op, no ack)	17, 28 (index)	129 (Response)	echo of request
41	3	Analog Output – Single-prec flt-pt	3(select)	17, 28 (index)	129 (Response)	echo of request
41	3	Analog Output – Single-prec flt-pt	4(operate)	17, 28 (index)	129 (Response)	echo of request
41	3	Analog Output – Single-prec flt-pt	5(direct op.)	17, 28 (index)	129 (Response)	echo of request
41	3	Analog Output – Single-prec flt-pt	6(direct op, no ack)	17, 28 (index)	129 (Response)	echo of request
41	4	Analog Output – Double-prec flt-pt	3(select)	17, 28 (index)	129 (Response)	echo of 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	129	07 (limited)

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)
				(limited qty)	(Response)	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 unsol.)	06 (no range, or all)		
60	2	Class Objects - class 1 data	21(disable unsol.)	06 (no range, or all)		
60	3	Class Objects - class 2 data	1(read)	06 (no range, or all), 07, 08 (limited qty)		
60	3	Class Objects - class 2 data	20(enable unsol.)	06 (no range, or all)		
60	3	Class Objects - class 2 data	21(disable unsol.)	06 (no range, or all)		
60	4	Class Objects - class 3 data	1(read)	06 (no range, or all), 07, 08 (limited qty)		
60	4	Class Objects - class 3 data	20(enable unsol.)	06 (no range, or all)		
60	4	Class Objects - class 3 data	21(disable unsol.)	06 (no range, or all)		
80	1	Internal Indications - packed format	2(write)	00 (start-stop)		

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)
80	1	Internal Indications - packed format	2( <i>write</i> )	01 ( <i>start-stop</i> )		
		No Object (function code only)	13( <i>cold restart</i> )			
		No Object (function code only)	14( <i>warm restart</i> )			
		No Object (function code only)	23( <i>delay meas.</i> )			