



DNP3 Device Profile Document *Based on DNP XML Schema version 2.07.00*

For

Schweitzer Engineering Laboratories SEL-487E DNP3 XML File

Revision History

Date	Version	Reason for change	Edited by
2011-09-23	1	Initial Creation.	Ed Cenon

1. Device Properties

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

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

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

It is also structured to show the current value (or setting) of each of the parameters that describe a specific instance of the device. This "current value" may also show a functional limitation of the device. For example when implementing secure authentication it is not

required that all DNP3 devices accept aggressive mode requests during critical exchanges (see Device Profile 1.12.4), in which case a vendor would mark this current value as "No - does not accept aggressive mode requests".

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

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

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

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

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

1.1. DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable list methods
1.1.1. Device Function: <i>Masters send DNP requests, while Outstations send DNP responses. If a single physical device can perform both functions a separate Device Profile Document</i>	- Outstation	- Outstation	

<i>must be provided for each function.</i>			
<p>1.1.2. Vendor Name:</p> <p><i>The name of the organization producing the device.</i></p> <p><i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 252.</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> <p><i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 250.</i></p>		SEL-487E-3, -4 Relay	
<p>1.1.4. Device manufacturer's hardware version string:</p> <p><i>Note: The current value of this outstation</i></p>		SNUMB value (CAL Level)	

<p><i>parameter is available remotely using protocol object Group 0 Variation 243.</i></p>			
<p>1.1.5. Device manufacturer's software version string:</p> <p><i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 242.</i></p>		FID value (ID command)	
<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 start of this document.</i></p>		1	
<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</i></p>	<p>Outstations Only Requests and Responses</p> <p><input checked="" type="checkbox"/> None <input checked="" type="checkbox"/> Level 1 <input checked="" type="checkbox"/> Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/> Level 4</p>	Level 2	

<i>responses can be indicated independently.</i>			
1.1.8. Supported Function Blocks:	<input type="checkbox"/> Self Address Reservation <input type="checkbox"/> Data Sets <input type="checkbox"/> File Transfer <input checked="" type="checkbox"/> Virtual Terminal <input type="checkbox"/> Mapping to IEC 61850 Object Models defined in a DNP3 XML file <input type="checkbox"/> Function code 31, activate configuration <input type="checkbox"/> Secure Authentication (if checked then see 1.12)	Virtual Terminal	
1.1.9. Notable Additions: <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>	Objects 112, 113 (Virtual terminal) 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)	Objects 112, 113 (Virtual terminal) 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)	
1.1.10. Methods to set Configurable Parameters:	<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:																														
1.1.11. DNP3 XML files available On-line: <i>XML configuration file names that can be read or written through DNP3 File Transfer to a device.</i> <i>A device's currently running configuration is returned by DNP3 on-line XML file read from the device.</i> <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>	<table><tr><th><u>Rd</u></th><th><u>Wr</u></th><th><u>Filename</u></th><th><u>Description of Contents</u></th></tr><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></table>	<u>Rd</u>	<u>Wr</u>	<u>Filename</u>	<u>Description of Contents</u>	<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	<table><tr><th><u>Rd</u></th><th><u>Wr</u></th><th><u>Filename</u></th></tr><tr><td><input type="checkbox"/></td><td></td><td>dnpDP.xml</td></tr><tr><td><input type="checkbox"/></td><td></td><td>dnpDPCap.xml</td></tr><tr><td><input type="checkbox"/></td><td></td><td>dnpDPCfg.xml</td></tr></table>	<u>Rd</u>	<u>Wr</u>	<u>Filename</u>	<input type="checkbox"/>		dnpDP.xml	<input type="checkbox"/>		dnpDPCap.xml	<input type="checkbox"/>		dnpDPCfg.xml	
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1.1.12. External DNP3 XML files available Off-line: <i>XML configuration file</i>	<table><tr><th><u>Rd</u></th><th><u>Wr</u></th><th><u>Filename</u></th><th><u>Description of Contents</u></th></tr><tr><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td>dnpDP.xml</td><td>Complete Device Profile</td></tr><tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>dnpDPCap.xml</td><td>Device Profile</td></tr></table>	<u>Rd</u>	<u>Wr</u>	<u>Filename</u>	<u>Description of Contents</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	dnpDP.xml	Complete Device Profile	<input type="checkbox"/>	<input type="checkbox"/>	dnpDPCap.xml	Device Profile	<table><tr><th><u>Rd</u></th><th><u>Wr</u></th><th><u>Filename</u></th></tr><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></table>	<u>Rd</u>	<u>Wr</u>	<u>Filename</u>	<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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<p><i>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>	<p>Capabilities Device Profile config values</p> <p><input type="checkbox"/> <input type="checkbox"/> dnpDPCfg.xml</p> <p>Note: dnpDP is appended with "-487ERXXX" where XXX is the current release #</p>		
<p>1.1.13. Connections Supported:</p>	<p><input checked="" type="checkbox"/> Serial (complete section 1.2) <input checked="" type="checkbox"/> IP Networking (complete section 1.3) <input type="checkbox"/> Other, explain:</p> <p>Note: IP Networking available if ordered with the optional Ethernet port</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><i>Name used to reference the communications port defined in this section.</i></p>		<p>PORT 1, PORT 2, PORT 3, PORT F</p>	

		Note: DNP3 may only be enabled on one serial port at a time	
1.2.2. Serial Connection Parameters:	<input checked="" type="checkbox"/> Asynchronous - 8 Data Bits, 1 Start Bit, 1 Stop Bit, No Parity <input checked="" type="checkbox"/> Other, explain: Asynchronous - 8 Data Bits, 1 Start Bit, 2 Stop Bits, No Parity <input checked="" type="checkbox"/> Other, explain: Asynchronous - 8 Data Bits, 1 Start Bit, 1 Stop Bit, Odd Parity <input checked="" type="checkbox"/> Other, explain: Asynchronous - 8 Data Bits, 1 Start Bit, 2 Stop Bits, Odd Parity <input checked="" type="checkbox"/> Other, explain: Asynchronous - 8 Data Bits, 1 Start Bit, 1 Stop Bit, Even Parity <input checked="" type="checkbox"/> Other, explain: Asynchronous - 8 Data Bits, 1 Start Bit, 2 Stop Bits, Even Parity Note: Implemented in Target Layer	Asynchronous Note: 8 Data Bits, 1 Start Bit, 1 Stop Bit, No Parity	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELeRator Quickset Vers -----
1.2.3. Baud Rate:	<input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input checked="" type="checkbox"/> Configurable, selectable from 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600 <input type="checkbox"/> Other, explain: Note: Implemented in Target Layer	9600	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELeRator Quickset Vers -----
1.2.4. Hardware Flow Control (Handshaking):	<input checked="" type="checkbox"/> None RS-232 / V.24 / V.28	None RS-232 / V.24 / V.28	Proprietary File via Other Mechanism

Describe hardware signaling requirements of the interface.

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.

Where a signal is asserted prior to transmitting, that signal will be maintained active until after the end of transmission.

Where a signal is asserted to enable reception, any data sent to the device when the signal is not active could be discarded.

Options:

Asserts:

- ☒ RTS Before Tx
- ☐ DTR Before Tx
- ☐ RTS Before Rx
- ☐ DTR Before Rx
- ☒ Always RTS
- ☐ Always DTR

Requires Before Tx:

- CTS ☐ Asserted ☒ Deasserted
- DCD ☐ Asserted ☒ Deasserted
- DSR ☐ Asserted ☐ Deasserted
- RI ☐ Asserted ☐ Deasserted
- ☐ Requires Rx Inactive before Tx

Requires Before Rx:

- CTS ☐ Asserted ☐ Deasserted
- DCD ☐ Asserted ☐ Deasserted
- DSR ☐ Asserted ☐ Deasserted
- RI ☐ Asserted ☐ Deasserted

Always Ignores:

- ☒ CTS
- ☐ DCD
- ☐ DSR
- ☐ RI
- ☐ Other, explain:

RS-422 / V.11 Options:

- ☐ Requires Indication before Rx
- ☐ Asserts Control before Tx
- ☐ Other, explain:

RS-485 Options:

- ☐ Requires Rx inactive before Tx
- ☐ Other, explain:

Options:

Other,

RS-422 / V.11

Options:

Other,

RS-

485Options:

Other,

terminal

software **SEL-5030**

AcSELeRator Quickset Vers

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.

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.

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 & 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.

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).
<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 <input type="checkbox"/> Fixed at seconds <input type="checkbox"/> Configurable, range to seconds <input type="checkbox"/> Configurable, selectable from seconds <input checked="" type="checkbox"/> Other, explain: Controlled by DRETRY (retry attempts) and DTIMEO (timeout in seconds) settings </p>	0 seconds	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software SEL-5030 AcSELeRator Quickset Vers</p> <p>-----</p>
<p>1.2.6. Supports DNP3 Collision Avoidance:</p> <p><i>Indicates whether an Outstation uses a collision avoidance algorithm.</i></p> <p><i>Collision avoidance may be</i></p>	<p> <input type="checkbox"/> No <input type="checkbox"/> Yes, using Back-off time = (Min + Random) method <input checked="" type="checkbox"/> Other, explain: For serial connections, the relay pauses for a random delay between the settings MAXDLY and MINDLY when it detects a </p>	Other	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software SEL-5030</p>

<p><i>implemented by a back-off timer with two parameters that define the back-off time range or by some other vendor-specific mechanism.</i></p> <p><i>The recommended back-off time is specified as being a fixed minimum delay plus a random delay, where the random delay has a maximum value specified. This defines a range of delay times that are randomly distributed between the minimum value and the minimum plus the maximum of the random value.</i></p> <p><i>If a back-off timer is implemented with only a fixed or only a random value, select the Back-off time method and set the parameter that is not supported to “Fixed at 0 ms”.</i></p>	<p>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 relay will insert a random delay of 50 to 100 ms (milliseconds) between the end of carrier detection and the start of data transmission.</p>		<p>AcSELerator Quickset Vers</p> <p>-----</p>
<p>1.2.7. Receiver Inter-character Timeout:</p> <p><i>When serial interfaces with asynchronous character framing are used, this parameter indicates if the receiver makes a check for gaps between characters. (i.e. extensions of the stop bit time of one character prior to the start bit of the following character within a message). If the receiver performs this check and the timeout is exceeded then the receiver discards the current data link frame. A receiver that does not discard data link frames on the basis of inter-character gaps is considered not to</i></p>	<p><input checked="" type="checkbox"/> Not Checked</p> <p><input type="checkbox"/> No gap permitted</p> <p><input type="checkbox"/> Fixed at bit times</p> <p><input type="checkbox"/> Fixed at ms</p> <p><input type="checkbox"/> Configurable, range to bit times</p> <p><input type="checkbox"/> Configurable, range to ms</p> <p><input type="checkbox"/> Configurable, selectable from bit times</p> <p><input type="checkbox"/> Configurable, selectable from ms</p> <p><input type="checkbox"/> Configurable, other, describe:</p> <p><input type="checkbox"/> Variable, explain:</p>	<p>Not Checked</p>	

<p><i>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>			
<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>	<p><input checked="" type="checkbox"/> None (always transmits with no inter-character gap)</p> <p><input type="checkbox"/> Maximumbit times</p> <p><input type="checkbox"/> Maximumms</p>	None	

1.3. IP NETWORKING	Capabilities	Current Value	If configurable list methods
<p>1.3.1. Port Name:</p> <p><i>Name used to reference the communications port defined in this section.</i></p>		PORT 5	
<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>	TCP Listening	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software</p> <p>SEL-5030</p> <p>AcSELerator</p> <p>Quickset</p> <p>Vers</p> <p>-----</p>

1.3.3. IP Address of this Device:		192.168.1.2/24 Note: IP Address is in CIDR notation.	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELerator Quickset Vers -----
1.3.4. Subnet Mask:		255.255.255.0 Note: IP Address is in CIDR notation. Subnet is derived from the IP Address.	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELerator Quickset Vers -----
1.3.5. Gateway IP Address:		192.168.1.1	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELerator Quickset Vers -----
1.3.6. Accepts TCP Connections or UDP Datagrams from:	<input type="checkbox"/> Allows all (show as *.*.*.* in 1.3.7) <input type="checkbox"/> Limits based on IP address <input checked="" type="checkbox"/> Limits based on list of IP addresses <input type="checkbox"/> Limits based on a wildcard IP address	List of IP addresses Note: DNP3 Master IP addresses are defined by the DNPIPn	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELerator Quickset

	<input type="checkbox"/> Limits based on list of wildcard IP addresses <input type="checkbox"/> Other validation, explain:	settings	Quickset Vers -----
1.3.7. IP Address(es) from which TCP Connections or UDP Datagrams are accepted:		As defined by the DNPIPn Settings	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELerator Quickset Vers -----
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 1024 to 65534 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	20000	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELerator Quickset Vers -----
1.3.9. TCP Listen Port Number of remote device: <i>If Master or dual end point Outstation, port number on remote device with which to initiate connection. Required to be configurable for Masters and recommended to be configurable for Outstations.</i>	<input checked="" type="checkbox"/> Not Applicable (Outstation w/o dual end point) <input type="checkbox"/> Fixed at 20,000 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	Not Applicable	
1.3.10. TCP Keep-alive timer: <i>The time period for the keep-alive timer on active TCP connections.</i>	<input type="checkbox"/> Fixed at ms <input checked="" type="checkbox"/> Configurable, range 0 to 20000 ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Other, explain:	10000 ms	Proprietary File via Other Mechanism ----- terminal ----- software

	<p>Note: The ETCPKA setting, along with the KAIDLE, KAINTV, and KACNT settings, can be used to verify that the device at the remote end of a TCP connection is still available. If ETCPKA is enabled and the relay does not transmit any TCP data within the interval specified by the KAIDLE setting, the relay sends a keep-alive packet to the remote device. If the relay does not receive a response from the remote device within the time (in seconds) specified by KAINTV, the keep-alive packet is re-transmitted as many as KACNT times. After this count is reached, the remote device is no longer available, so the relay can terminate the connection without waiting for the idle timer (TIDLE or FTPIDLE) to expire.</p>		SEL-5030 AcSELeRator Quickset Vers -----
1.3.11. Local UDP port: <i>Local UDP port for sending and/or receiving UDP datagrams. Masters may let system choose an available port. Outstations must use one that is known by the Master.</i>	<input type="checkbox"/> Fixed at 20,000 <input checked="" type="checkbox"/> Configurable, range 1024 to 65534 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain: <input type="checkbox"/> Let system choose (Master only)	20000	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELeRator Quickset Vers -----
1.3.12. Destination UDP port for DNP3 Requests (Master Only):	<input type="checkbox"/> Fixed at 20,000 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:		

<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 1025 to 65534 <input type="checkbox"/> Configurable, selectable from <input checked="" type="checkbox"/> Other, explain:DNPUDPn := REQ </p> <p>Note: Depends on DNPUDPn setting. REQ means to use the same port the request came in from.</p>	20000	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software</p> <p>SEL-5030</p> <p>AcSELerator Quickset</p> <p>Vers</p> <p>-----</p>
<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 the initial unsolicited Null response.</i></p>	<p> <input type="checkbox"/> None <input type="checkbox"/> Fixed at 20,000 <input checked="" type="checkbox"/> Configurable, range 1025 to 65534 <input type="checkbox"/> Configurable, selectable from <input checked="" type="checkbox"/> Other, explain:DNPUDPn := REQ <input type="checkbox"/> Use source port number </p> <p>Note: Depends on DNPUDPn setting. REQ means to use the same port the request came in from.</p>	20000	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software</p> <p>SEL-5030</p> <p>AcSELerator Quickset</p> <p>Vers</p> <p>-----</p>
<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>		
<p>1.3.16. Multiple master connections (Outstations only):</p> <p><i>Outstations 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 <input type="checkbox"/> Method 2 (based on IP port number) - recommended <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</p> <p>SEL-5030</p> <p>AcSELerator Quickset</p> <p>Vers</p> <p>-----</p>

1.3.17. Time synchronization support:	<input type="checkbox"/> DNP3 LAN procedure (function code 24) <input checked="" type="checkbox"/> DNP3 Write Time (not recommended over LAN) <input type="checkbox"/> Other, explain: <input type="checkbox"/> Not Supported	Write Time	
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1.4. LINK LAYER	Capabilities	Current Value	If configurable list methods
1.4.1. Data Link Address: <i>Indicates if the link address is configurable over the entire valid range of 0 to 65,519. Data link addresses 0xFFFF0 through 0xFFFFF are reserved for broadcast or other special purposes.</i>	<input type="checkbox"/> Fixed at <input checked="" type="checkbox"/> Configurable, range 0 to 65519 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	0	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELeRator Quickset Vers -----
1.4.2. DNP3 Source Address Validation: <i>Indicates whether the Outstation will filter out requests not from a specific source address.</i>	<input checked="" type="checkbox"/> Never <input type="checkbox"/> Always, one address allowed (shown in 1.4.3) <input type="checkbox"/> Always, any one of multiple addresses allowed (each selectable as shown in 1.4.3) <input type="checkbox"/> Sometimes, explain:	Never	
1.4.3. DNP3 Source Address (es) expected when Validation is Enabled: <i>Selects the allowed source address(es)</i>	<input type="checkbox"/> Configurable to any 16 bit DNP Data Link Address value <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:		
1.4.4. Self Address Support using address 0xFFFC: <i>If an Outstation receives a message with a destination</i>	<input type="checkbox"/> Yes (only allowed if configurable) <input checked="" type="checkbox"/> No	No	

<i>address of 0xFFFFC it shall respond normally with its own source address. It must be possible to diasble this feature if supported.</i>			
<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>	<input type="checkbox"/> Never <input type="checkbox"/> Always <input checked="" type="checkbox"/> Sometimes, explain: Depends on DRETRY setting	Sometimes	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELerator Quickset Vers -----
<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>	<input type="checkbox"/> None <input type="checkbox"/> Fixed at ms <input checked="" type="checkbox"/> Configurable, range 0 to 30000 ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain:	1000ms	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELerator Quickset Vers -----
<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>	<input type="checkbox"/> None <input type="checkbox"/> Fixed at <input checked="" type="checkbox"/> Configurable, range 0 to 15 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	0	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELerator Quickset Vers -----
<p>1.4.8. Maximum number of octets Transmitted in a Data Link Frame:</p> <p><i>This number includes the</i></p>	<input checked="" type="checkbox"/> Fixed at 292 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from	292	

<i>CRCs. With a length field of 255, the maximum size would be 292.</i>	<input type="checkbox"/> Other, explain:		
<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 field length of 255, the maximum size would be 292. The device must be able to receive 292 octets to be compliant.</i></p>	<input checked="" type="checkbox"/> Fixed at 292 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	292	

1.5. APPLICATION LAYER	Capabilities	Current Value	If configurable list methods
<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> <i>- Masters must provide a setting less than or equal to 249.</i> <i>- Outstations must provide a setting less than or equal to 2048.</i></p> <p><i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 240.</i></p>	<input checked="" type="checkbox"/> Fixed at 2048 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	2048	
1.5.2. Maximum number of octets Transmitted in an Application Layer Fragment containing File Transfer:	<input checked="" type="checkbox"/> Fixed at 2048 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	2048	
1.5.3. Maximum number of octets that can be received in an Application Layer Fragment:	<input checked="" type="checkbox"/> Fixed at 249 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	249	

<p><i>This size does not include any transport or frame octets.</i></p> <p><i>- Masters must provide a setting greater than or equal to 2048.</i></p> <p><i>- Outstations must provide a setting greater than or equal to 249.</i></p> <p><i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 241.</i></p>			
<p>1.5.4. Timeout waiting for Complete Application Layer Fragment:</p> <p><i>Timeout if all frames of a message fragment are not received in the specified time. Measured from time first frame of a fragment is received until the last frame is received.</i></p>	<p><input checked="" type="checkbox"/> None</p> <p><input type="checkbox"/> Fixed at ms</p> <p><input type="checkbox"/> Configurable, range to ms</p> <p><input type="checkbox"/> Configurable, selectable from ms</p> <p><input type="checkbox"/> Other, explain:</p> <p><input type="checkbox"/> Variable, explain:</p>	None	
<p>1.5.5. Maximum number of objects allowed in a single control request for CROB (Group 12):</p> <p><i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 216.</i></p>	<p><input checked="" type="checkbox"/> Fixed at 10(enter 0 if controls are not supported)</p> <p><input type="checkbox"/> Configurable, range to</p> <p><input type="checkbox"/> Configurable, selectable from</p> <p><input type="checkbox"/> Other, explain:</p> <p><input type="checkbox"/> Variable, explain:</p>	10	
<p>1.5.6. Maximum number of objects allowed in a single control request for Analog Outputs (Group 41):</p>	<p><input checked="" type="checkbox"/> Fixed at 10(enter 0 if controls are not supported)</p> <p><input type="checkbox"/> Configurable, range to</p> <p><input type="checkbox"/> Configurable, selectable from</p> <p><input type="checkbox"/> Other, explain:</p> <p><input type="checkbox"/> Variable, explain:</p>	10	
<p>1.5.7. Maximum number of objects allowed in a single control request for Data Sets (Groups 85, 86, 87):</p>	<p><input checked="" type="checkbox"/> Fixed at 0(enter 0 if controls are not supported)</p> <p><input type="checkbox"/> Configurable, range to</p> <p><input type="checkbox"/> Configurable, selectable</p>	0	

	from <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain:		
1.5.8. Supports mixed object groups (AOBs, CROBs and Data Sets) in the same control request:	<input type="checkbox"/> Not applicable - controls are not supported <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	No	

1.6. FILL OUT THE FOLLOWING ITEMS FOR MASTERS ONLY	Capabilities	Current Value	If configurable list methods
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1.7. FILL OUT THE FOLLOWING ITEMS FOR OUTSTATIONS ONLY	Capabilities	Current Value	If configurable list methods
1.7.1. Timeout waiting for Application Confirm of solicited response message:	<input type="checkbox"/> None <input type="checkbox"/> Fixed at ms <input checked="" type="checkbox"/> Configurable, range 1000 to 50000 ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain:	2000ms	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELerator Quickset Vers -----
1.7.2. How often is time synchronization required from the master: <i>Details of when the master needs to perform a time synchronization to ensure that the outstation clock does not drift outside of an acceptable tolerance. If the option to relate this to IIN1.4 is used then details of when IIN1.4 is asserted are in section 1.10.2.</i>	<input checked="" type="checkbox"/> Never needs time <input type="checkbox"/> Within seconds after IIN1.4 is set <input type="checkbox"/> Periodically, fixed at seconds <input checked="" type="checkbox"/> Periodically, between 60 and 1966020 seconds	Never	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELerator Quickset Vers ----- Note: Configurable with the TIMERQ setting.

<p>1.7.3. Device Trouble Bit IIN1.6:</p> <p><i>If IIN1.6 device trouble bit is set under certain conditions, explain the possible causes.</i></p>	<input checked="" type="checkbox"/> Never used <input type="checkbox"/> Reason for setting:	Never used	
<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 (obj grp 70 var 6) using a status code value of handle expired (0x02).</i></p>	<input checked="" type="checkbox"/> Not applicable, files not supported <input type="checkbox"/> Fixed at ms <input type="checkbox"/> Configurable, range to ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain:	Not applicable	
<p>1.7.5. Event Buffer Overflow Behavior:</p>	<input type="checkbox"/> Discard the oldest event <input checked="" type="checkbox"/> Discard the newest event <input type="checkbox"/> Other, explain:	Discard newest	
<p>1.7.6. Event Buffer Organization:</p> <p><i>Explain how event buffers are arranged (per Object Group, per Class, single buffer etc) and provide their sizes.</i></p>	per Object Group	per Object Group	
<p>1.7.7. Sends Multi-Fragment Responses:</p> <p><i>Indicates whether an Outstation sends multi-fragment responses (Masters do not send multi-fragment requests).</i></p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	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>	<input type="checkbox"/> Always <input checked="" type="checkbox"/> Sometimes, explain: Only when it contains events <input type="checkbox"/> Never	Sometimes	

1.7.9. DNP Command Settings preserved through a device reset: <i>If any of these settings are written through the DNP protocol and they are not preserved through a restart of the Outstation, the Master will have to write them again anytime the Restart IIN bit is set.</i>	<input type="checkbox"/> Assign Class <input type="checkbox"/> Analog Deadbands <input type="checkbox"/> Data Set Prototypes <input type="checkbox"/> Data Set Descriptors <input type="checkbox"/> Function Code 31 Activate Configuration		
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1.8. OUTSTATION UNSOLICITED RESPONSE SUPPORT	Capabilities	Current Value	If configurable list methods
1.8.1. Supports Unsolicited Reporting: <i>When the unsolicited response mode is configured "off", the device is to behave exactly like an equivalent device that has no support for unsolicited responses. If set to "on", the Outstation will send a null Unsolicited Response after it restarts, then wait for an Enable Unsolicited Response command from the master before sending additional Unsolicited Responses containing event data.</i>	<input type="checkbox"/> Not Supported <input checked="" type="checkbox"/> Configurable, selectable from On and Off	Off	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELeRator Quickset Vers -----
1.8.2. Master Data Link Address: <i>The destination address of the master device where the unsolicited responses will be sent.</i>	<input type="checkbox"/> Fixed at <input checked="" type="checkbox"/> Configurable, range 0 to 65519 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	1	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELeRator Quickset Vers -----
1.8.3. Unsolicited Response	<input type="checkbox"/> Fixed at ms	60000 ms	Proprietary

<p>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 checked="" type="checkbox"/> Configurable, range 1000 to 5000000ms</p> <p><input type="checkbox"/> Configurable, selectable from ms</p> <p><input type="checkbox"/> Other, explain:</p> <p><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 UTIMEO retries, it changes the interval to UTIMEO and continues to retry until it receives an acknowledgement.</p>		<p>File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software SEL-5030 AcSELerator Quickset Vers</p> <p>-----</p>
<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</p> <p><input type="checkbox"/> Fixed at</p> <p><input type="checkbox"/> Configurable, range to</p> <p><input type="checkbox"/> Configurable, selectable from</p> <p><input type="checkbox"/> Other, explain:</p> <p><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	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software SEL-5030 AcSELerator Quickset Vers</p> <p>-----</p>

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

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

<i>A configurable value of 0 indicates that responses are not delayed due to this parameter.</i>	<input type="checkbox"/> Configurable, range to ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Other, explain:		
1.9.7. Hold time after class 3 event: <i>A configurable value of 0 indicates that responses are not delayed due to this parameter.</i>	<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"/> Other, explain:		
1.9.8. Hold time after event assigned to any class: <i>A configurable value of 0 indicates that responses are not delayed due to this parameter.</i>	<input type="checkbox"/> Class events not used to trigger Unsolicited Responses <input type="checkbox"/> Fixed at ms <input checked="" type="checkbox"/> Configurable, range 0 to 99999000ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Other, explain:	2000 ms	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELerator Quickset Vers -----
1.9.9. Retrigger Hold Time: <i>The hold-time timer may be retriggered for each new event detected (increased possibility of capturing all the changes in a single response) or not retriggered (giving the master a guaranteed update time).</i>	<input type="checkbox"/> Hold-time timer will be retriggered for each new event detected (may get more changes in next response) <input checked="" type="checkbox"/> Hold-time timer will not be retriggered for each new event detected (guaranteed update time)	Not retriggered	
1.9.10. Other Unsolicited Response Trigger Conditions:	<input type="checkbox"/>		

1.10. OUTSTATION PERFORMANCE	Capabilities	Current Value	If configurable list methods
1.10.1. Maximum Time Base	<input checked="" type="checkbox"/> Fixed at 1.2ms	1.2 ms	

Drift (milliseconds per minute): <i>If the device is synchronized by DNP, what is the clock drift rate over the full operating temperature range.</i>	<input type="checkbox"/> Range to ms <input type="checkbox"/> Selectable from ms <input type="checkbox"/> Other, describe:		
1.10.2. When does outstation set IIN1.4? <i>When does the outstation set the internal indication NEED_TIME</i>	<input checked="" type="checkbox"/> Never <input checked="" type="checkbox"/> Asserted at startup until first Time Synchronization request received <input type="checkbox"/> Periodically, range to seconds <input type="checkbox"/> Periodically, selectable from seconds <input checked="" type="checkbox"/> Range 60 to 1966020 seconds after last time sync <input type="checkbox"/> Selectable from seconds after last time sync <input type="checkbox"/> When time error may have drifted by range to ms <input type="checkbox"/> When time error may have drifted by selectable from ms Note: If TIMERQ = I or M, IIN 1.4 is never asserted Note: If TIMERQ = value, IIN 1.4 is asserted periodically every (value) minutes	Never	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELerator Quickset Vers -----
1.10.3. Maximum Internal Time Reference Error when set via DNP (ms): <i>The difference between the time set in DNP Write Time message, and the time actually set in the outstation.</i>	<input checked="" type="checkbox"/> Fixed at 10ms <input type="checkbox"/> Range to ms <input type="checkbox"/> Selectable from ms <input type="checkbox"/> Other, describe:	10 ms	
1.10.4. Maximum Delay Measurement Error (ms): <i>The difference between the time reported in the delay measurement response and the actual time between receipt of the delay</i>	<input checked="" type="checkbox"/> Fixed at 10ms <input type="checkbox"/> Range to ms <input type="checkbox"/> Selectable from ms <input type="checkbox"/> Other, describe:	10 ms	

measurement request and issuing the delay measurement reply.			
<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>	<input checked="" type="checkbox"/> Fixed at 100ms <input type="checkbox"/> Range to ms <input type="checkbox"/> Selectable from ms <input type="checkbox"/> Other, describe:	100 ms	
<p>1.10.6. Maximum time from start-up to IIN 1.4 assertion (ms):</p>	<input type="checkbox"/> Fixed at ms <input type="checkbox"/> Range to ms <input type="checkbox"/> Selectable from ms <input checked="" type="checkbox"/> Other, describe: DNP3 protocol can take from 25-30 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>Other, DNP3 protocol can take from 25-30 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>	
<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><i>Note: The current value of this parameter is available remotely using protocol object Group 0 Variation 217.</i></p>	<input type="checkbox"/> Fixed at ms <input type="checkbox"/> Range to ms <input type="checkbox"/> Selectable from ms <input checked="" type="checkbox"/> Other, describe: If the Binary point is in the SER list, error is +/- 1 ms. Otherwise, error can be up to 500 ms.	<p>Other, If the Binary point is in the SER list, error is +/- 1 ms. Otherwise, error can be up to 500 ms.</p>	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software SEL-5030 AcSELerator Quickset</p> <p>Vers</p> <p>-----</p>
<p>1.10.8. Maximum Event Time-tag error for local I/O other than Binary and Double Bit data types (ms):</p>	<input type="checkbox"/> Fixed at ms <input type="checkbox"/> Range to ms <input type="checkbox"/> Selectable from ms <input checked="" type="checkbox"/> Other, describe: Up to	<p>Other, Up to 500 ms</p>	

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 SID setting	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELeRator Quickset Vers -----
1.11.2. User-assigned ID code/number string (same as g0v246):	value of DNPID setting	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELeRator Quickset Vers -----
1.11.3 User-assigned name string for the outstation (same as g0v247):	value of RID setting	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELeRator Quickset Vers -----
1.11.4 Device Serial Number string (same as g0v248):	device Serial Number	factory -----

1.12. SECURITY PARAMETERS	Capabilities	Current Value	If configurable list methods
<p>1.12.1 DNP3 device support for secure authentication:</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 checked="" type="checkbox"/> Secure Authentication not supported</p> <p>If Secure Authentication is supported, what Version(s) are supported:</p> <p><input type="checkbox"/> Fixed at version</p> <p><input type="checkbox"/> Configurable, selectable from versions</p>	Not Supported	

2. Mapping to IEC 61850 Object Models

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

A tree or table representation may be generated from the XML and shown here in the Device Profile Document. The selection has been made not to show any representation.

3. Capabilities and Current Settings for Device Database (Outstation only)

The following tables identify the capabilities and current settings for each DNP3 data type. Details defining the data points available in the device are shown in part 5 of this Device Profile.

3.1. BINARY INPUT POINTS Static (Steady-State) Object Number: 1 Event Object Number: 2			
	Capabilities	Current Value	If configurable list methods
3.1.1. Static Variation reported when variation 0 requested	<input 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 (see tables in part 5)	Two	
3.1.2. Event Variation reported when variation 0 requested: <i>Note: The support for binary input events can be determined remotely using protocol object Group 0 Variation 237.</i>	<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 (see tables in part 5)	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</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 (see tables in part 5)	Always	

reported.			
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3.3. BINARY OUTPUT STATUS AND CONTROL RELAY OUTPUT BLOCK Binary Output Status Object Number: 10 Binary Output Event Object Number: 11 CROB Object Number: 12 Binary Output Command Event Object Number: 13			
	Capabilities	Current Value	If configurable list methods
3.3.1. Minimum pulse time allowed with Trip, Close and Pulse On commands.	<input checked="" type="checkbox"/> Fixed at 2 ms (hardware may limit this further) <input type="checkbox"/> Based on point index (see tables in part 5) Note: 1/8 cycle @ 60 Hz = 2 ms Pulse	Fixed at 2 ms	
3.3.2. Maximum pulse time allowed with Trip, Close and Pulse On commands.	<input checked="" type="checkbox"/> Fixed at 2 ms (hardware may limit this further) <input type="checkbox"/> Based on point index (see tables in part 5)	Fixed at 2 ms	
3.3.3. Binary Output Status included in Class 0 response: <i>If Binary Output Status points are not included in the Class 0 response, Binary Output Status Events (group 11) may not be reported.</i>	<input checked="" type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to Class 1, 2, or 3 <input type="checkbox"/> Based on point index (see tables in part 5)	Always Note: Displayed only if DNPCL=Y	
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 (see tables in part 5)	Two	
3.3.10. Maximum Time between Select and Operate:	<input type="checkbox"/> Not Applicable <input type="checkbox"/> Fixed at seconds <input checked="" type="checkbox"/> Configurable, range 0 to 60seconds <input type="checkbox"/> Configurable, selectable from seconds	1 seconds	Proprietary File via Other Mechanism ----- terminal ----- software

	<input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain: <input type="checkbox"/> Based on point index (see tables in part 5)		SEL-5030 AcSELerator Quickset Vers -----
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3.4. COUNTERS / FROZEN COUNTERS

Static Counter Object Number: 20

Static Frozen Counter Object Number: 21

Counter Event Object Number: 22

Frozen Counter Event Object Number: 23

	Capabilities	Current Value	If configurable list methods
3.4.1. Static Counter Variation reported when variation 0 requested	<input type="checkbox"/> Variation 1 - 32-bit with flag <input type="checkbox"/> Variation 2 - 16-bit with flag <input type="checkbox"/> Variation 5 - 32-bit without flag <input checked="" type="checkbox"/> Variation 6 - 16-bit without flag <input type="checkbox"/> Based on point index (see tables in part 5)	Six	
3.4.2. Counter Event Variation reported when variation 0 requested <i>Note: The support for counter events can be determined remotely using protocol object Group 0 Variation 227.</i>	<input type="checkbox"/> Variation 1 - 32-bit with flag <input checked="" type="checkbox"/> Variation 2 - 16-bit with flag <input type="checkbox"/> Variation 5 - 32-bit with flag and time <input type="checkbox"/> Variation 6 - 16-bit with flag and time <input type="checkbox"/> Based on point index (see tables in part 5)	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 (see tables in part 5)	Always	
3.4.4. Counter Event reporting mode:	<input checked="" type="checkbox"/> A: Only most recent (value at time of event) <input type="checkbox"/> B: Only most recent (value at time of response)	Most recent - event time	

<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. Only the most recent event is typically reported for Counters. When reporting only the most recent event the counter value returned in the response may be either the value at the time that the event is queued or it may be the value at the time of the response.</i></p>	<input type="checkbox"/> C: All events <input type="checkbox"/> Based on point index (see tables in part 5)		
<p>3.4.5. Static Frozen Counter Variation reported when variation 0 requested:</p>	<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 (see tables in part 5)		
<p>3.4.6. Frozen Counter Event Variation reported when variation 0 requested:</p> <p><i>Note: The support for frozen counter events can be determined remotely using protocol object Group 0 Variation 225.</i></p>	<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 type="checkbox"/> Variation 6 - 16-bit without flag <input type="checkbox"/> Based on point index (see tables in part 5)		
<p>3.4.7. Frozen Counters included in Class 0 response:</p> <p><i>If Frozen Counters are not included in the Class 0 response, Frozen Counter Events (group 23) may not be</i></p>	<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 (see tables in part 5)	Never	

<i>reported.</i>			
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 frozen value <input type="checkbox"/> All frozen values		
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"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain: <input type="checkbox"/> Based on point index (see tables in part 5)	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:		

3.5. ANALOG INPUT POINTS

Static (Steady-State) Object Number: 30

Event Object Number: 32

Deadband Object Number: 34

.	Capabilities	Current Value	If configurable list methods
3.5.1. Static Variation reported when variation 0 requested	<input checked="" type="checkbox"/> Variation 1 - 32-bit with flag <input checked="" type="checkbox"/> Variation 2 - 16-bit with flag <input checked="" type="checkbox"/> Variation 3 - 32-bit without flag <input checked="" type="checkbox"/> Variation 4 - 16-bit without flag <input checked="" type="checkbox"/> Variation 5 - single-	Two	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELerator Quickset

	<p>precision floating point with flag</p> <p><input checked="" type="checkbox"/> Variation 6 - double-precision floating point with flag</p> <p><input type="checkbox"/> Based on point index (see tables in part 5)</p> <p>Note: Setting AIVAR defines default AI variation (1-6)</p>		<p>Vers</p> <p>-----</p>
<p>3.5.2. Event Variation reported when variation 0 requested:</p> <p><i>Note: The support for analog input events can be determined remotely using protocol object Group 0 Variation 231.</i></p>	<p><input checked="" type="checkbox"/> Variation 1 - 32-bit without time</p> <p><input checked="" type="checkbox"/> Variation 2 - 16-bit without time</p> <p><input type="checkbox"/> Variation 3 - 32-bit with time</p> <p><input type="checkbox"/> Variation 4 - 16-bit with time</p> <p><input checked="" type="checkbox"/> Variation 5 - single-precision floating point w/o time</p> <p><input checked="" type="checkbox"/> Variation 6 - double-precision floating point w/o time</p> <p><input type="checkbox"/> Variation 7 - single-precision floating point with time</p> <p><input type="checkbox"/> Variation 8 - double-precision floating point with time</p> <p><input type="checkbox"/> Based on point index (see tables in part 5)</p> <p>Note: Setting AIVAR defines default AI event variation (1 or 3=1, 2 or 4=2, 5=5, 6=6)</p>	Two	<p>Proprietary File via Other Mechanism</p> <p>-----</p> <p>terminal</p> <p>-----</p> <p>software SEL-5030 AcSELerator Quickset Vers</p> <p>-----</p>
<p>3.5.3. Event reporting mode:</p> <p><i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event. Only the most recent event is typically reported for Analog Inputs. When</i></p>	<p><input checked="" type="checkbox"/> A: Only most recent (value at time of event)</p> <p><input type="checkbox"/> B: Only most recent (value at time of response)</p> <p><input type="checkbox"/> C: All events</p> <p><input type="checkbox"/> Based on point index (see tables in part 5)</p>	Most recent - event time	

<i>reporting only the most recent event the analog value returned in the response may be either the value at the time that the event is queued or it may be the value at the time of the response.</i>			
<p>3.5.4. Analog Inputs included in Class 0 response:</p> <p><i>If Analog Inputs are not included in the Class 0 response, Analog Input Events (group 32) may not be reported.</i></p>	<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 (see tables in part 5)	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 (see tables in part 5)	A	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELeRator Quickset Vers ----- protocol -----
<p>3.5.6. Analog Deadband Algorithm:</p> <p>simple- just compares the difference from the previous reported value</p> <p>integrating- keeps track of the accumulated change</p> <p>other- indicating another algorithm</p>	<input checked="" type="checkbox"/> Simple <input type="checkbox"/> Integrating <input type="checkbox"/> Other, explain: <input type="checkbox"/> Based on point index (see tables in part 5)	Simple	

3.6. ANALOG OUTPUT STATUS AND ANALOG OUTPUT CONTROL BLOCK

Analog Output Status Object Number: 40 Analog Output Control Block Object Number: 41 Analog Output Event Object Number: 42 Analog Output Command Event Object Number: 43			
	Capabilities	Current Value	If configurable list methods
3.6.1. Static Analog Output Status Variation reported when variation 0 requested	<input type="checkbox"/> Variation 1 - 32-bit with flag <input checked="" type="checkbox"/> Variation 2 - 16-bit with flag <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 (see tables in part 5)	Two	
3.6.2. Analog Output Status included in Class 0 response: <i>If Analog Output Status points are not included in the Class 0 response, Analog Output Events (group 42) may not be reported.</i>	<input checked="" type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to Class 1, 2, or 3 <input type="checkbox"/> Based on point index (see tables in part 5)	Always	
3.6.3. Reports Output Command Event Objects:	<input checked="" type="checkbox"/> Never <input type="checkbox"/> Only upon a successful Control <input type="checkbox"/> Upon all control attempts	Never	
3.6.4. Event Variation reported when variation 0 requested <i>Note: The support for analog output events can be determined remotely using protocol object Group 0 Variation 219.</i>	<input type="checkbox"/> Variation 1 - 32-bit without time <input type="checkbox"/> Variation 2 - 16-bit without time <input type="checkbox"/> Variation 3 - 32-bit with time <input type="checkbox"/> Variation 4 - 16-bit with time <input type="checkbox"/> Variation 5 - single-precision floating point w/o time <input type="checkbox"/> Variation 6 - double-precision floating point w/o time <input type="checkbox"/> Variation 7 - single-		

	precision floating point with time <input type="checkbox"/> Variation 8 - double-precision floating point with time <input type="checkbox"/> Based on point index (see tables in part 5)		
3.6.5. Command Event Variation reported when variation 0 requested	<input type="checkbox"/> Variation 1 - 32-bit without time <input type="checkbox"/> Variation 2 - 16-bit without time <input type="checkbox"/> Variation 3 - 32-bit with time <input type="checkbox"/> Variation 4 - 16-bit with time <input type="checkbox"/> Variation 5 - single-precision floating point w/o time <input type="checkbox"/> Variation 6 - double-precision floating point w/o time <input type="checkbox"/> Variation 7 - single-precision floating point with time <input type="checkbox"/> Variation 8 - double-precision floating point with time <input type="checkbox"/> Based on point index (see tables in part 5)		
3.6.6. Change Event reporting mode: <i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.</i>	<input type="checkbox"/> Only most recent <input type="checkbox"/> All events		
3.6.7. Command Event reporting mode: <i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.</i>	<input type="checkbox"/> Only most recent <input type="checkbox"/> All events		

3.6.8. Maximum Time between Select and Operate:	<input type="checkbox"/> Not Applicable <input type="checkbox"/> Fixed at seconds <input checked="" type="checkbox"/> Configurable, range 0 to 60 seconds <input type="checkbox"/> Configurable, selectable from seconds <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain: <input type="checkbox"/> Based on point index (see tables in part 5)	1 seconds	Proprietary File via Other Mechanism ----- terminal ----- software SEL-5030 AcSELerator Quickset Vers -----
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3.7. SEQUENTIAL FILE TRANSFER

Object Number: 70

	Capabilities	Current Value	If configurable list methods
3.7.1. File Transfer Supported:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (do not complete any further entries in section 3.7)	No	

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 are parsed by the Outstation. The *Response* columns identify all responses that can be sent by the Outstation.

DNP OBJECT GROUP & VARIATION			REQUEST Outstation parses		RESPONSE Outstation can issue	
Object Group Number	Variation Number	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
0	211	Device Attributes - User-specific sets of attributes	1 (read)	00 (start-stop)	129 (Response)	00 (start-stop), 17 (index)
0	212	Device Attributes - Master data set prototypes	1 (read)	00 (start-stop)	129 (Response)	00 (start-stop), 17 (index)
0	213	Device Attributes -	1 (read)	00 (start-	129	00 (start-

		Outstation data set prototypes		<i>stop)</i>	<i>(Response)</i>	<i>stop),</i> <i>17 (index)</i>
0	214	Device Attributes - Master data sets	1 (<i>read</i>)	00 (<i>start-stop</i>)	129 (<i>Response</i>)	00 (<i>start-stop</i>), <i>17 (index)</i>
0	215	Device Attributes - Outstation data sets	1 (<i>read</i>)	00 (<i>start-stop</i>)	129 (<i>Response</i>)	00 (<i>start-stop</i>), <i>17 (index)</i>
0	216	Device Attributes - Max binary outputs per request	1 (<i>read</i>)	00 (<i>start-stop</i>)	129 (<i>Response</i>)	00 (<i>start-stop</i>), <i>17 (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>), <i>17 (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>), <i>17 (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>), <i>17 (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>), <i>17 (index)</i>
0	223	Device Attributes - Max binary output index	1 (<i>read</i>)	00 (<i>start-stop</i>)	129 (<i>Response</i>)	00 (<i>start-stop</i>), <i>17 (index)</i>
0	224	Device Attributes - Number of binary outputs	1 (<i>read</i>)	00 (<i>start-stop</i>)	129 (<i>Response</i>)	00 (<i>start-stop</i>), <i>17 (index)</i>
0	225	Device Attributes - Support for frozen counter events	1 (<i>read</i>)	00 (<i>start-stop</i>)	129 (<i>Response</i>)	00 (<i>start-stop</i>), <i>17 (index)</i>
0	226	Device Attributes - Support for frozen counters	1 (<i>read</i>)	00 (<i>start-stop</i>)	129 (<i>Response</i>)	00 (<i>start-stop</i>), <i>17 (index)</i>
0	227	Device Attributes - Support for counter events	1 (<i>read</i>)	00 (<i>start-stop</i>)	129 (<i>Response</i>)	00 (<i>start-stop</i>), <i>17 (index)</i>
0	228	Device Attributes - Max counter index	1 (<i>read</i>)	00 (<i>start-stop</i>)	129 (<i>Response</i>)	00 (<i>start-stop</i>), <i>17 (index)</i>
0	229	Device Attributes - Number of counters	1 (<i>read</i>)	00 (<i>start-stop</i>)	129 (<i>Response</i>)	00 (<i>start-stop</i>), <i>17 (index)</i>

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 of analog input events	1 (read)	00 (start-stop)	129 (Response)	00 (start-stop), 17 (index)
0	232	Device Attributes - Max analog input index	1 (read)	00 (start-stop)	129 (Response)	00 (start-stop), 17 (index)
0	233	Device Attributes - Number of analog inputs	1 (read)	00 (start-stop)	129 (Response)	00 (start-stop), 17 (index)
0	234	Device Attributes - Support for double-bit events	1 (read)	00 (start-stop)	129 (Response)	00 (start-stop), 17 (index)
0	235	Device Attributes - Max double-bit binary index	1 (read)	00 (start-stop)	129 (Response)	00 (start-stop), 17 (index)
0	236	Device Attributes - Number of double-bit binarys	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 inputs	1 (read)	00 (start-stop)	129 (Response)	00 (start-stop), 17 (index)
0	240	Device Attributes - Max transmit fragment size	1 (read)	00 (start-stop)	129 (Response)	00 (start-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 - DNP subset and conformance	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 all), 07, 08 (limited	129 (Response)	00, 01 (start-stop), 17, 28 (index)

				<i>qty</i>), 17, 28 (<i>index</i>)		
1	2	Binary Input - Single-bit with flag	1 (<i>read</i>)	00, 01 (<i>start-stop</i>), 06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>), 17, 28 (<i>index</i>)	129 (<i>Response</i>)	00, 01 (<i>start-stop</i>), 17, 28 (<i>index</i>)
2	0	Binary Input Change Event - any variation	1 (<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)		
2	1	Binary Input Change Event - without time	1 (<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)	129 (<i>Response</i>)	17, 28 (<i>index</i>)
2	2	Binary Input Change Event - with absolute time	1 (<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)	129 (<i>Response</i>)	17, 28 (<i>index</i>)
2	2	Binary Input Change Event - with absolute time	1 (<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)	130 (<i>Unsol. Resp.</i>)	17, 28 (<i>index</i>)
2	3	Binary Input Change Event - with relative time	1 (<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)	129 (<i>Response</i>)	17, 28 (<i>index</i>)
10	0	Continuous Control - binary output - any variation	1 (<i>read</i>)	00, 01 (<i>start-stop</i>), 06 (<i>no range, or all</i>), 07, 08		

				(limited qty), 17, 28 (index)		
10	2	Continuous Control - binary output status	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index)	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 block	4(operate)	17, 28 (index)	129 (Response)	echo of 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
12	2	Pulsed Control - pattern control block	3(select)	07 (limited qty = 1)	129 (Response)	echo of request
12	2	Pulsed Control - pattern control block	4(operate)	07 (limited qty = 1)	129 (Response)	echo of request
12	2	Pulsed Control - pattern control block	5(direct op.)	07 (limited qty = 1)	129 (Response)	echo of request
12	2	Pulsed Control - pattern control block	6(direct op, no ack)	07 (limited qty = 1)	129 (Response)	echo of request
12	3	Pulsed Control - pattern mask	3(select)	00, 01 (start-stop)	129 (Response)	echo of request
12	3	Pulsed Control - pattern mask	4(operate)	00, 01 (start-stop)	129 (Response)	echo of request
12	3	Pulsed Control - pattern mask	5(direct op.)	00, 01 (start-stop)	129 (Response)	echo of request
12	3	Pulsed Control - pattern mask	6(direct op, no ack)	00, 01 (start-stop)	129 (Response)	echo of request
20	0	Counter - any variation	1(read)	00, 01 (start-stop),		

				06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>), 17, 18		
20	1	Counter - 32-bit with flag	1(<i>read</i>)	00, 01 (<i>start-stop</i>), 06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>), 17, 18	129 (<i>Response</i>)	00, 01 (<i>start-stop</i>), 17, 28 (<i>index</i>)
20	2	Counter - 16-bit with flag	1(<i>read</i>)	00, 01 (<i>start-stop</i>), 06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>), 17, 28 (<i>index</i>)	129 (<i>Response</i>)	00, 01 (<i>start-stop</i>), 17, 28 (<i>index</i>)
20	5	Counter - 32-bit without flag	1(<i>read</i>)	00, 01 (<i>start-stop</i>), 06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>), 17, 18	129 (<i>Response</i>)	00, 01 (<i>start-stop</i>), 17, 28 (<i>index</i>)
20	6	Counter - 16-bit without flag	1(<i>read</i>)	00, 01 (<i>start-stop</i>), 06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>), 17, 18	129 (<i>Response</i>)	00, 01 (<i>start-stop</i>), 17, 28 (<i>index</i>)
22	0	Counter Change Event - any variation	1(<i>read</i>)	06 (<i>no range, or all</i>),	129 (<i>Response</i>)	17, 28 (<i>index</i>)

				07, 08 (limited qty)		
22	1	Counter Change Event - 32-bit with flag	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
22	2	Counter Change Event - 16-bit with flag	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
22	2	Counter Change Event - 16-bit with flag	1(read)	06 (no range, or all), 07, 08 (limited qty)	130 (Unsol. Resp.)	17, 28 (index)
22	5	Counter Change Event - 32-bit with flag and time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
22	6	Counter Change Event - 16-bit with flag and time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
30	0	Analog Input - any variation	1(read)	00, 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty), 17, 18		
30	1	Analog Input - 32-bit with flag	1(read)	00, 01 (start- stop), 06 (no range, or all), 07, 08 (limited	129 (Response)	00, 01 (start- stop), 17, 28 (index)

				qty), 17, 18		
30	2	Analog Input - 16-bit with flag	1 (read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 18	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, 18	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, 18	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, 18	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),	129 (Response)	00, 01 (start-stop), 17, 28 (index)

				17, 18		
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)
32	1	Analog Input Change Event - 32-bit without time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	130 (Unsol. Resp.)	17, 28 (index)
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	Analog Input Change Event – Single-prec flt-pt without time	1 (read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
32	5	Analog Input Change	1 (read)	06 (no range, or	130 (Unsol.	17, 28 (index)

		Event – Single-prec flt-pt without time		<i>all</i>), 07, 08 (<i>limited qty</i>)	<i>Resp.</i>)	
32	6	Analog Input Change Event – Double-prec flt-pt without time	1(<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)	129 (<i>Response</i>)	17, 28 (<i>index</i>)
32	6	Analog Input Change Event – Double-prec flt-pt without time	1(<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)	130 (<i>Unsol. Resp.</i>)	17, 28 (<i>index</i>)
32	7	Analog Input Change Event – Single-prec flt-pt with time	1(<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)	129 (<i>Response</i>)	17, 28 (<i>index</i>)
32	8	Analog Input Change Event – Double-prec flt-pt with time	1(<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)	129 (<i>Response</i>)	17, 28 (<i>index</i>)
34	1	Analog Input Deadband - 16-bit	1(<i>read</i>)	00, 01 (<i>start-stop</i>), 06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>), 17, 28 (<i>index</i>)	129 (<i>Response</i>)	00, 01 (<i>start-stop</i>), 17, 28 (<i>index</i>)
34	1	Analog Input Deadband - 16-bit	2(<i>write</i>)	00, 01 (<i>start-stop</i>), 06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>), 17, 28 (<i>index</i>)	129 (<i>Response</i>)	00 (<i>start-stop</i>)
34	2	Analog Input Deadband -	1(<i>read</i>)	00, 01	129	00, 01

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

40	1	Analog Output Status - 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)
40	2	Analog Output Status - 16-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)
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)	129 (Response)	00, 01 (start-stop), 17, 28 (index)
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)	129 (Response)	00, 01 (start-stop), 17, 28 (index)
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-	5(direct	17, 28	129	echo of

		bit	op.)	(index)	(Response)	request
41	2	Analog Output Block - 16-bit	6(<i>direct op, no ack</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	3	Analog Output – Single-prec flt-pt	3(<i>select</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	3	Analog Output – Single-prec flt-pt	4(<i>operate</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	3	Analog Output – Single-prec flt-pt	5(<i>direct op.</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	3	Analog Output – Single-prec flt-pt	6(<i>direct op, no ack</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	4	Analog Output – Double-prec flt-pt	3(<i>select</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	4	Analog Output – Double-prec flt-pt	4(<i>operate</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	4	Analog Output – Double-prec flt-pt	5(<i>direct op.</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	4	Analog Output – Double-prec flt-pt	6(<i>direct op, no ack</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
50	1	Time and Date - absolute time	1(<i>read</i>)	07, 08 (<i>limited qty</i>)	129 (<i>Response</i>)	07 (<i>limited qty = 1</i>)
50	1	Time and Date - absolute time	2(<i>write</i>)	07, 08 (<i>limited qty</i>)		
50	3	Time and Date - absolute time at last recorded time	2(<i>write</i>)	07 (<i>limited qty = 1</i>)		
51	1	Time and Date CTO - absolute time, synchronized			129 (<i>Response</i>)	07 (<i>limited qty = 1</i>)
51	2	Time and Date CTO - absolute time, unsynchronized			129 (<i>Response</i>)	07 (<i>limited qty = 1</i>)
52	2	Time Delay - fine			129 (<i>Response</i>)	07 (<i>limited qty = 1</i>)
60	0	Class Objects - All classes	1(<i>read</i>)	06 (<i>no range, or all</i>)		
60	0	Class Objects - class 1 data	20(<i>enable unsol.</i>)	06 (<i>no range, or all</i>)		
60	0	Class Objects - class 1 data	21(<i>disable unsol.</i>)	06 (<i>no range, or</i>		

				<i>all)</i>		
60	1	Class Objects - class 0 data	1(<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)		
60	2	Class Objects - class 1 data	1(<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)		
60	2	Class Objects - class 1 data	20(<i>enable unsol.</i>)	06 (<i>no range, or all</i>)		
60	2	Class Objects - class 1 data	21(<i>disable unsol.</i>)	06 (<i>no range, or all</i>)		
60	3	Class Objects - class 2 data	1(<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)		
60	3	Class Objects - class 2 data	20(<i>enable unsol.</i>)	06 (<i>no range, or all</i>)		
60	3	Class Objects - class 2 data	21(<i>disable unsol.</i>)	06 (<i>no range, or all</i>)		
60	4	Class Objects - class 3 data	1(<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)		
60	4	Class Objects - class 3 data	20(<i>enable unsol.</i>)	06 (<i>no range, or all</i>)		
60	4	Class Objects - class 3 data	21(<i>disable unsol.</i>)	06 (<i>no range, or all</i>)		
80	1	Internal Indications - packed format	2(<i>write</i>)	00 (<i>start-stop</i>)		
80	1	Internal Indications - packed format	2(<i>write</i>)	01 (<i>start-stop</i>)		
112	string length	Virtual Terminal Output Block	2(<i>write</i>)	06 (<i>no range, or</i>		

				<i>all</i>)		
113	string length	Virtual Terminal Event Data	1(<i>read</i>)	06 (<i>no range, or all</i>)	129 (<i>Response</i>)	17, 28 (<i>index</i>)
113	string length	Virtual Terminal Event Data	1(<i>read</i>)	06 (<i>no range, or all</i>)	130 (<i>Unsol. Resp.</i>)	17, 28 (<i>index</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>)			

5. Data Points List (outstation only)

This part of the Device Profile shows, for each data type, 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.

5.1. Definition of Binary Input Point List: <i>List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.</i> <i>Note: the number of binary inputs present in the device, and the maximum binary input index, are available remotely using object Group 0 Variations 239 and 238.</i>	<input type="checkbox"/> Fixed, list shown in table below <input checked="" type="checkbox"/> Configurable (current list may be shown in table below) <input type="checkbox"/> Other, explain:
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Binary Input points list:

Point Index	Name	Event Class Assigned (1, 2, 3 or not)	Name for State when value is 0	Name for State when value is 1	Description

0	RLYDIS	one	deasserted	asserted	Relay Disabled
1	TRIPLED	one	deasserted	asserted	Trip LED
2	STFAIL	one	deasserted	asserted	Relay Diagnostic Failure
3	STWARN	one	deasserted	asserted	Relay Diagnostic Warning
4	STSET	one	deasserted	asserted	Settings have changed or relay restarted
5	UNRDEV	one	deasserted	asserted	An event, as yet unread by DNP, exists
6	52CLS	one	deasserted	asserted	Breaker Closed, Terminal S
7	52ALS	one	deasserted	asserted	Breaker Alarm, Terminal S
8	52CLT	one	deasserted	asserted	Breaker Closed, Terminal T
9	52ALT	one	deasserted	asserted	Breaker Alarm, Terminal T
10	52CLU	one	deasserted	asserted	Breaker Closed, Terminal U
11	52ALU	one	deasserted	asserted	Breaker Alarm, Terminal U
12	52CLW	one	deasserted	asserted	Breaker Closed, Terminal W
13	52ALW	one	deasserted	asserted	Breaker Alarm, Terminal W
14	52CLX	one	deasserted	asserted	Breaker Closed, Terminal X
15	52ALX	one	deasserted	asserted	Breaker Alarm, Terminal X
16	89CL01	one	deasserted	asserted	Disconnect 1 Closed
17	89AL01	one	deasserted	asserted	Disconnect 1 Alarm
18	89CL02	one	deasserted	asserted	Disconnect 2 Closed
19	89AL02	one	deasserted	asserted	Disconnect 2 Alarm
20	89CL03	one	deasserted	asserted	Disconnect 3 Closed
21	89AL03	one	deasserted	asserted	Disconnect 3 Alarm
22	89CL04	one	deasserted	asserted	Disconnect 4 Closed
23	89AL04	one	deasserted	asserted	Disconnect 4 Alarm
24	89CL05	one	deasserted	asserted	Disconnect 5 Closed
25	89AL05	one	deasserted	asserted	Disconnect 5 Alarm
26	89CL06	one	deasserted	asserted	Disconnect 6 Closed
27	89AL06	one	deasserted	asserted	Disconnect 6 Alarm
28	89CL07	one	deasserted	asserted	Disconnect 7 Closed
29	89AL07	one	deasserted	asserted	Disconnect 7 Alarm
30	89CL08	one	deasserted	asserted	Disconnect 8 Closed
31	89AL08	one	deasserted	asserted	Disconnect 8 Alarm
32	89CL09	one	deasserted	asserted	Disconnect 9 Closed
33	89AL09	one	deasserted	asserted	Disconnect 9 Alarm
34	89CL10	one	deasserted	asserted	Disconnect 10 Closed

	89AL10	one	deasserted	asserted	Disconnect 10 Alarm
36	TLED_1	one	deasserted	asserted	Target LED 1 on relay front panel
37	TLED_2	one	deasserted	asserted	Target LED 2 on relay front panel
38	TLED_3	one	deasserted	asserted	Target LED 3 on relay front panel
39	TLED_4	one	deasserted	asserted	Target LED 4 on relay front panel
40	TLED_5	one	deasserted	asserted	Target LED 5 on relay front panel
41	TLED_6	one	deasserted	asserted	Target LED 6 on relay front panel
42	TLED_7	one	deasserted	asserted	Target LED 7 on relay front panel
43	TLED_8	one	deasserted	asserted	Target LED 8 on relay front panel
44	TLED_9	one	deasserted	asserted	Target LED 9 on relay front panel
45	TLED_10	one	deasserted	asserted	Target LED 10 on relay front panel
46	TLED_11	one	deasserted	asserted	Target LED 11 on relay front panel
47	TLED_12	one	deasserted	asserted	Target LED 12 on relay front panel
48	TLED_13	one	deasserted	asserted	Target LED 13 on relay front panel
49	TLED_14	one	deasserted	asserted	Target LED 14 on relay front panel
50	TLED_15	one	deasserted	asserted	Target LED 15 on relay front panel
51	TLED_16	one	deasserted	asserted	Target LED 16 on relay front panel
52	TLED_17	one	deasserted	asserted	Target LED 17 on relay front panel
53	TLED_18	one	deasserted	asserted	Target LED 18 on relay front panel
54	TLED_19	one	deasserted	asserted	Target LED 19 on relay front panel
55	TLED_20	one	deasserted	asserted	Target LED 20 on relay front panel
56	TLED_21	one	deasserted	asserted	Target LED 21 on relay front panel
57	TLED_22	one	deasserted	asserted	Target LED 22 on relay front panel
58	TLED_23	one	deasserted	asserted	Target LED 23 on relay front panel
59	TLED_24	one	deasserted	asserted	Target LED 24 on relay front panel
60	VALARMV	one	deasserted	asserted	Voltage alarm Terminal V
61	LOPV	one	deasserted	asserted	Loss of potential terminal V
62	VALARMZ	one	deasserted	asserted	Voltage alarm Terminal Z
63	LOPZ	one	deasserted	asserted	Loss of potential terminal Z
64	IN101	one	deasserted	asserted	Main Board Input 1 asserted
65	IN102	one	deasserted	asserted	Main Board Input 2 asserted
66	IN103	one	deasserted	asserted	Main Board Input 3 asserted
67	IN104	one	deasserted	asserted	Main Board Input 4 asserted
68	IN105	one	deasserted	asserted	Main Board Input 5 asserted
69	IN106	one	deasserted	asserted	Main Board Input 6 asserted

	IN107	one	deasserted	asserted	Main Board Input 7 asserted
71	OUT101	one	deasserted	asserted	Main Board Output 1 asserted
72	OUT102	one	deasserted	asserted	Main Board Output 2 asserted
73	OUT103	one	deasserted	asserted	Main Board Output 3 asserted
74	OUT104	one	deasserted	asserted	Main Board Output 4 asserted
75	OUT105	one	deasserted	asserted	Main Board Output 5 asserted
76	OUT106	one	deasserted	asserted	Main Board Output 6 asserted
77	OUT107	one	deasserted	asserted	Main Board Output 7 asserted
78	OUT108	one	deasserted	asserted	Main Board Output 8 asserted

5.3. Definition of Binary Output Status / Control Relay Output Block Points List:

List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.

Note: the number of binary outputs present in the device, and the maximum binary output index, are available remotely using object Group 0 Variations 224 and 223.

- ☐ Fixed, list shown in table below
☒ Configurable (current list may be shown in table below)
☐ Other, explain:

Binary Output Status and CROB points list:

		Supported Control Operations										Event Class Assigned (1,2,3 or none)			Description
												Command			
												Change			
												Name for State when value is 1			
												Name for State when value is 0			
												Cancel Currently Running Operation			
												Count > 1			
												Close			
												Trip			
												Latch Off			
												Latch On			
												Pulse Off			
												Pulse On			
												Direct Operate - No Ack			
												Direct Operate			
												Select / Operate			
										Name					
										Point Index					

0	RB01	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 01
1	RB02	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 02
2	RB03	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 03
3	RB04	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 04
4	RB05	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 05
5	RB06	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 06
6	RB07	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 07
7	RB08	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 08
8	RB09	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 09
9	RB10	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 10
10	RB11	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 11
11	RB12	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 12
12	RB13	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 13
13	RB14	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 14
14	RB15	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 15
15	RB16	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 16
16	RB17	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 17
17	RB18	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 18
18	RB19	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 19
19	RB20	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit 20
20	RB21	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Remote Bit

																21
21	RB22	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Remote Bit 22
22	RB23	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Remote Bit 23
23	RB24	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Remote Bit 24
24	RB25	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Remote Bit 25
25	RB26	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Remote Bit 26
26	RB27	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Remote Bit 27
27	RB28	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Remote Bit 28
28	RB29	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Remote Bit 29
29	RB30	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Remote Bit 30
30	RB31	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Remote Bit 31
31	RB32	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Remote Bit 32
32	OCS	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Circuit Breaker S open command
33	CCS	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Circuit Breaker S close command
34	OCT	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Circuit Breaker T open command
35	CCT	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Circuit Breaker T close command
36	OCU	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Circuit Breaker U open command

37	CCU	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Circuit Breaker U close command
38	OCW	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Circuit Breaker W open command
39	CCW	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Circuit Breaker W close command
40	OCX	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Circuit Breaker X open command
41	CCX	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Circuit Breaker X close command
42	89OC01	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Open Disconnect 1 command
43	89CC01	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Close Disconnect 1 command
44	89OC02	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Open Disconnect 2 command
45	89CC02	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Close Disconnect 2 command
46	89OC03	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Open Disconnect 3 command
47	89CC03	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Close Disconnect 3 command
																Open

48	89OC04	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Disconnect 4 command
49	89CC04	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Close Disconnect 4 command
50	89OC05	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Open Disconnect 5 command
51	89CC05	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Close Disconnect 5 command
52	89OC06	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Open Disconnect 6 command
53	89CC06	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Close Disconnect 6 command
54	89OC07	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Open Disconnect 7 command
55	89CC07	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Close Disconnect 7 command
56	89OC08	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Open Disconnect 8 command
57	89CC08	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Close Disconnect 8 command
58	89OC09	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Open Disconnect 9 command
59	89CC09	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set		Close Disconnect

																	9 command
60	89OC10	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Open Disconnect 10 command
61	89CC10	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Close Disconnect 10 command
62	RSTTRGT	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Reset Front Panel Targets
63	RSTDNPE	Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			Reset DNP Fault Summary Data

5.4. Definition of Counter / Frozen Counter Point List:

List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.

Note: the number of counters present in the device, and the maximum counter index, are available remotely using object Group 0 Variations 229 and 228.

- ☐ Fixed, list shown in table below
☒ Configurable (current list may be shown in table below)
☐ Other, explain:

Counter / Frozen Counter points list:

Point Index	Name	Event Class Assigned to Counter Events (1, 2, 3 or none)	Frozen Counter Exists (Yes or No)	Event Class Assigned to Frozen Counter Events (1, 2, 3 or none)	Description

0	BKRSOP	none	N		Number of breaker S operations
1	BKRTOP	none	N		Number of breaker T operations
2	BKRUOP	none	N		Number of breaker U operations
3	BKRWOP	none	N		Number of breaker W operations
4	BKRXOP	none	N		Number of breaker X operations

5.5. Definition of Analog Input Point List:

List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.

Note: the number of analog inputs present in the device, and the maximum analog input index, are available remotely using object Group 0 Variations 233 and 232.

- ☐ Fixed, list shown in table below
☒ Configurable (current list may be shown in table below)
☐ Other, explain:

Analog Input points list:

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

0	IASFMC	two	/	/					filtered phase current magnitude, Phase A, Terminal S
1	IASFAC	two	/	/					1 cycle average filtered phase current angle, Phase A, Terminal S
2	IBSFMC	two	/	/					1 cycle average filtered phase current magnitude, Phase B, Terminal S
3	IBSFAC	two	/	/					1 cycle average filtered phase current angle, Phase B, Terminal S
4	ICSFMC	two	/	/					1 cycle average filtered phase current magnitude, Phase C, Terminal S
5	ICSFAC	two	/	/					1 cycle average filtered phase current angle, Phase C, Terminal S
6	IATFMC	two	/	/					1 cycle average filtered phase current magnitude, Phase A, Terminal T
7	IATFAC	two	/	/					1 cycle average filtered phase current angle, Phase A, Terminal T
8	IBTFMC	two	/	/					1 cycle average filtered phase current magnitude, Phase B, Terminal T
			/						1 cycle average filtered phase

9	IBTFAC	two		/					current angle, Phase B, Terminal T
10	ICTFMC	two	/	/					1 cycle average filtered phase current magnitude, Phase C, Terminal T
11	ICTFAC	two	/	/					1 cycle average filtered phase current angle, Phase C, Terminal T
12	IAUFMC	two	/	/					1 cycle average filtered phase current magnitude, Phase A, Terminal U
13	IAUFAC	two	/	/					1 cycle average filtered phase current angle, Phase A, Terminal U
14	IBUFMC	two	/	/					1 cycle average filtered phase current magnitude, Phase B, Terminal U
15	IBUFAC	two	/	/					1 cycle average filtered phase current angle, Phase B, Terminal U
16	ICUFMC	two	/	/					1 cycle average filtered phase current magnitude, Phase C, Terminal U
17	ICUFAC	two	/	/					1 cycle average filtered phase current angle, Phase C, Terminal U
18	IAWFMC	two	/	/					1 cycle average filtered phase current

									magnitude, Phase A, Terminal W
19	IAWFAC	two	/	/					1 cycle average filtered phase current angle, Phase A, Terminal W
20	IBWFMC	two	/	/					1 cycle average filtered phase current magnitude, Phase B, Terminal W
21	IBWFAC	two	/	/					1 cycle average filtered phase current angle, Phase B, Terminal W
22	ICWFMC	two	/	/					1 cycle average filtered phase current magnitude, Phase C, Terminal W
23	ICWFAC	two	/	/					1 cycle average filtered phase current angle, Phase C, Terminal W
24	IAXFMC	two	/	/					1 cycle average filtered phase current magnitude, Phase A, Terminal X
25	IAXFAC	two	/	/					1 cycle average filtered phase current angle, Phase A, Terminal X
26	IBXFMC	two	/	/					1 cycle average filtered phase current magnitude, Phase B, Terminal X
27	IBXFAC	two	/	/					1 cycle average filtered phase current angle, Phase B,

									Terminal X
28	ICXFMC	two	/	/					1 cycle average filtered phase current magnitude, Phase C, Terminal X
29	ICXFAC	two	/	/					1 cycle average filtered phase current angle, Phase C, Terminal X
30	VAVFMC	two	/	/					1 cycle average filtered phase-to-neutral Voltage magnitude, Phase A, Terminal V
31	VAVFAC	two	/	/					1 cycle average filtered phase-to-neutral Voltage angle, Phase A, Terminal V
32	VBVFMC	two	/	/					1 cycle average filtered phase-to-neutral Voltage magnitude, Phase B, Terminal V
33	VBVFAC	two	/	/					1 cycle average filtered phase-to-neutral Voltage angle, Phase B, Terminal V
34	VCVFMC	two	/	/					1 cycle average filtered phase-to-neutral Voltage magnitude, Phase C, Terminal V
35	VCVFAC	two	/	/					1 cycle average filtered phase-to-neutral Voltage angle, Phase C, Terminal V
36	VAZFMC	two	/	/					1 cycle average filtered phase-to-neutral Voltage magnitude, Phase A, Terminal Z

37	VAZFAC	two	/	/					1 cycle average filtered phase-to-neutral Voltage angle, Phase A, Terminal Z
38	VBZFMC	two	/	/					1 cycle average filtered phase-to-neutral Voltage magnitude, Phase A, Terminal Z
39	VBZFAC	two	/	/					1 cycle average filtered phase-to-neutral Voltage angle, Phase A, Terminal Z
40	VCZFMC	two	/	/					1 cycle average filtered phase-to-neutral Voltage magnitude, Phase A, Terminal Z
41	VCZFAC	two	/	/					1 cycle average filtered phase-to-neutral Voltage angle, Phase A, Terminal Z
42	PASFC	two	/	/					1 cycle average phase fundamental active power, Phase A, Terminal S
43	PBSFC	two	/	/					1 cycle average phase fundamental active power, Phase B, Terminal S
44	PCSFC	two	/	/					1 cycle average phase fundamental active power, Phase C, Terminal S
45	PATFC	two	/	/					1 cycle average phase fundamental active power,

									Phase A, Terminal T
46	PBTFC	two	/	/					1 cycle average phase fundamental active power, Phase B, Terminal T
47	PCTFC	two	/	/					1 cycle average phase fundamental active power, Phase C, Terminal T
48	PAUFC	two	/	/					1 cycle average phase fundamental active power, Phase A, Terminal U
49	PBUFC	two	/	/					1 cycle average phase fundamental active power, Phase B, Terminal U
50	PCUFC	two	/	/					1 cycle average phase fundamental active power, Phase C, Terminal U
51	PAWFC	two	/	/					1 cycle average phase fundamental active power, Phase A, Terminal W
52	PBWFC	two	/	/					1 cycle average phase fundamental active power, Phase B, Terminal W
			/						1 cycle average phase fundamental

53	PCWFC	two	/					active power, Phase C, Terminal W
54	PAXFC	two	/	/				1 cycle average phase fundamental active power, Phase A, Terminal X
55	PBXFC	two	/	/				1 cycle average phase fundamental active power, Phase B, Terminal X
56	PCXFC	two	/	/				1 cycle average phase fundamental active power, Phase C, Terminal X
57	QASFC	two	/	/				1 cycle average phase fundamental reactive power, Phase A, Terminal S
58	QBSFC	two	/	/				1 cycle average phase fundamental reactive power, Phase B, Terminal S
59	QCSFC	two	/	/				1 cycle average phase fundamental reactive power, Phase C, Terminal S
60	QATFC	two	/	/				1 cycle average phase fundamental reactive power, Phase A, Terminal T
								1 cycle average phase

61	QBTFC	two	/	/					fundamental reactive power, Phase B, Terminal T
62	QCTFC	two	/	/					1 cycle average phase fundamental reactive power, Phase C, Terminal T
63	QAUFC	two	/	/					1 cycle average phase fundamental reactive power, Phase A, Terminal U
64	QBUFC	two	/	/					1 cycle average phase fundamental reactive power, Phase B, Terminal U
65	QCUFC	two	/	/					1 cycle average phase fundamental reactive power, Phase C, Terminal U
66	QAWFC	two	/	/					1 cycle average phase fundamental reactive power, Phase A, Terminal W
67	QBWFC	two	/	/					1 cycle average phase fundamental reactive power, Phase B, Terminal W
68	QCWFC	two	/	/					1 cycle average phase fundamental reactive power, Phase C, Terminal W
									1 cycle average

69	QAXFC	two	/	/					phase fundamental reactive power, Phase A, Terminal X
70	QBXFC	two	/	/					1 cycle average phase fundamental reactive power, Phase B, Terminal X
71	QCXFC	two	/	/					1 cycle average phase fundamental reactive power, Phase C, Terminal X
72	ACTGRP	two	/	/					Active Settings Group
73	RLYTEMP	two	/	/					Relay temperature (°C temperature of the box)
74	FREQ	two	/	/					Tracking frequency
75	VDC	two	/	/					Station Battery DC voltage
76	FTYPE	two	/	/					Fault type
77	FTAR1	two	/	/					Fault targets (Upper byte is 1st target row, lower byte is 2nd target row)
78	FTAR2	two	/	/					Fault targets (Upper byte is 3rd target row, lower byte is 0)
79	FFREQ	two	/	/					Fault frequency
80	FGRP	two	/	/					Fault active settings group (1- 6)
81	FTIMEUH	two	/	/					Fault time (UTC) in DNP format, high 16 bits

82	FTIMEUM	two	/	/					Fault time (UTC) in DNP format, middle 16 bits
83	FTIMEUL	two	/	/					Fault time (UTC) in DNP format, low 16 bits
84	FUNR	two	/	/					Number of unread faults

5.6. Definition of Analog Output Status / Analog Output Block Point List:

List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.

Note: the number of analog outputs present in the device, and the maximum analog output index, are available remotely using object Group 0 Variations 221 and 220.

- ☐ Fixed, list shown in table below
- ☒ Configurable (current list may be shown in table below)
- ☐ Other, explain:

Analog Output points list:

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

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

----- End of Complete Device Profile -----