DNP3 Device Profile
Based on DNP XML Schema version 2.06.00

Document Name: SEL-351RS DNP3 XML File

Document Description: DNP3 Complete Device Profile

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

REFERENCE DEVICE: SEL-351RS

1. Device Properties

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

- Identifying the capabilities of a DNP3 device (Master Station or Outstation)

- Recording the settings of a specific instance of a device (parameter settings for a specific instance of the device in the user's total DNP3 estate)

- Matching user requirements to product capabilities when procuring a DNP3 device

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

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

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

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

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

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

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

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

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

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

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.		Long and Short Floating Point variations	
1.1.10. Methods to set Configurable Parameters:	☐ XML - Loaded via DNP3 File Transfer ☐ XML - Loaded via other transport mechanism ☑ Terminal - ASCII Terminal Command Line ☑ Software - Vendor software named SEL-5030 AcSELerator Quickset ☐ Proprietary file loaded via DNP3 File Transfer ☑ Proprietary file loaded via other transport mechanism ☐ Direct - Keypad on device front panel ☑ Factory - Specified when device is ordered ☑ Protocol - Set via DNP3 (e.g. assign class) ☐ Other - explain:	Terminal Software Factory Protocol	
1.1.11. DNP3 XML files available On-line:	RdWrFilename ☐ dnpDP.xml Description of Contents Complete Device Profile	Rd Wr Filename ☐ dnpDP.xml ☐ dnpDPCap.xml ☐ dnpDPCfg.xml	

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

definition of a new configuration to be supplied from off-line configuration tools. *External off-line XML file write permits an XML definition of a new configuration to be supplied to off-line configuration tools.*			
1.1.13. Connections Supported:	☑ Serial (complete section 1.2) ☑ IP Networking (complete section 1.3) ☐ Other, explain: Note: IP Networking available if ordered with the optional Ethernet port	Serial IP Networking	

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

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

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.*	☑ RTS Before Tx ☐ DTR Before Tx ☐ RTS Before Rx ☐ DTR Before Rx ☑ Always RTS ☐ Always DTR <u>Requires Before Tx:</u> CTS ☐ Asserted ☑ Deasserted DCD ☐ Asserted ☑ Deasserted DSR ☐ Asserted ☐ Deasserted RI ☐ Asserted ☐ Deasserted ☐ Requires Rx Inactive before Tx <u>Requires Before Rx:</u> CTS ☐ Asserted ☐ Deasserted DCD ☐ Asserted ☐ Deasserted DSR ☐ Asserted ☐ Deasserted RI ☐ Asserted ☐ Deasserted <u>Always Ignores:</u> ☑ CTS ☐ DCD ☐ DSR ☐ RI ☐ Other, explain: **RS-422 / V.11 Options:** ☐ Requires Indication before Rx ☐ Asserts Control before Tx	**RS-422 / V.11 Options:** Other, **RS-485Options:** Other,	---------- 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 delays transmitting after asserting RTS by at least the time in the PREDLY setting. It delays deasserting RTS after transmission by at least the time in the PSTDLY setting.

	☐ Other, explain: **RS-485 Options:** ☐ Requires Rx inactive before Tx ☐ Other, explain: ☑ Other, explain:		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.
1.2.5. Interval to Request Link Status: *Indicates how often to send Data Link Layer status requests on a serial connection. This parameter is separate from the TCP Keep-alive timer.*	☑ Not Supported ☐ Fixed at seconds ☐ Configurable, range to seconds ☐ Configurable, selectable from seconds ☐ Other, explain:	Not Supported	
1.2.6. Supports DNP3 Collision Avoidance: *Indicates whether an Outstation uses a collision avoidance algorithm. Documentation provided by the vendor will provide information on collision avoidance schemes.*	☐ No ☑ Yes, explain:**For serial connections, the device pauses for a random delay between the settings MAXDLY and MINDLY when it detects a carrier through data on the receive line or the CTS pin. If you use the settings of 0.10 seconds for MAXDLY and 0.05 seconds for MINDLY, the device will insert a random delay of 50 to 100 ms (milliseconds) between the end of carrier detection and the start of data transmission.**	Yes	Proprietary File via Other Mechanism ---------- terminal ---------- software **SEL-5030 AcSELerator Quickset** Vers ----------
1.2.7. Receiver Inter-character Timeout: *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).*	☑ Not Checked ☐ No gap permitted ☐ Fixed at bit times ☐ Fixed at ms ☐ Configurable, range to bit times ☐ Configurable, range to ms ☐ Configurable, selectable	Not Checked	

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

1.3. IP NETWORKING	**Capabilities**	**Current Value**	**If configurable list methods**
1.3.1. Port Name: *Name used to reference the communications port defined in this section.*		PORT 5	
1.3.2. Type of End Point:	☐ TCP Initiating (Master Only) ☑ TCP Listening (Outstation Only) ☐ TCP Dual (required for Masters)	TCP Listening	Proprietary File via Other Mechanism ---------- terminal ---------- software

	☑ UDP Datagram (required)		**SEL-5030 AcSELerator Quickset** Vers ----------
1.3.3. IP Address of this Device:		192.168.1.2	Proprietary File via Other Mechanism ---------- terminal ---------- software **SEL-5030 AcSELerator Quickset** Vers ----------
1.3.4. Subnet Mask:		255.255.255.0	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:	☐ Allows all (show as *.*.*.* in 1.3.7) ☐ Limits based on IP address ☑ Limits based on list of IP addresses ☐ Limits based on a wildcard IP address ☐ Limits based on list of wildcard IP addresses ☐ Other validation, explain:	List of IP addresses	Proprietary File via Other Mechanism ---------- terminal ---------- software **SEL-5030 AcSELerator Quickset** Vers ----------
1.3.7. IP Address(es) from which TCP Connections or UDP Datagrams are accepted:		*.*.*.*	Proprietary File via Other Mechanism ---------- terminal ----------
1.3.8. TCP Listen Port Number: *If Outstation or dual end point Master, port number on which to listen for incoming TCP connect requests. Required to be configureable for Masters and recommended to be configurable for Outstations.*	☐ Not Applicable (Master w/o dual end point) ☐ Fixed at 20,000 ☑ Configurable, range **1** to **65534** ☐ Configurable, selectable from ☐ 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: *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.*	☑ Not Applicable (Outstation w/o dual end point) ☐ Fixed at 20,000 ☐ Configurable, range to ☐ Configurable, selectable from	Not Applicable	

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

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

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

1.4. LINK LAYER	**Capabilities**	**Current Value**	**If configurable list methods**
1.4.1. Data Link Address: *Indicates if the link address is configurable over the entire valid range of 0 to 65,519. Data link addresses 0xFFF0 through 0xFFFF are reserved for broadcast or other special purposes.*	☐ Fixed at ☑ Configurable, range **0** to **65519** ☐ Configurable, selectable from ☐ Other, explain:	0	Proprietary File via Other Mechanism ---------- terminal ---------- software **SEL-5030 AcSELerator Quickset** Vers ----------
1.4.2. DNP3 Source Address Validation: *Indicates whether the Outstation will filter out*	☑ Never ☐ Always, one address allowed (shown in 1.4.3)	Never	

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

	☐ Variable, explain:		----------
1.4.7. Maximum Data Link Retries: *The number of times the device will retransmit a frame that requests Link Layer confirmation.*	☐ None ☐ Fixed at ☑ Configurable, range **0** to **15** ☐ Configurable, selectable from ☐ Other, explain:	0	Proprietary File via Other Mechanism ---------- terminal ---------- software **SEL-5030 AcSELerator Quickset** Vers ----------
1.4.8. Maximum number of octets Transmitted in a Data Link Frame: *This number includes the CRCs. With a length field of 255, the maximum size would be 292.*	☑ Fixed at **292** ☐ Configurable, range to ☐ Configurable, selectable from ☐ Other, explain:	292	
1.4.9. Maximum number of octets that can be Received in a Data Link Frame: *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.*	☑ Fixed at **292** ☐ Configurable, range to ☐ Configurable, selectable from ☐ Other, explain:	292	

1.5. APPLICATION LAYER	**Capabilities**	**Current Value**	**If configurable list methods**
1.5.1. Maximum number of octets Transmitted in an Application Layer Fragment other than File Transfer: *This size does not include any transport or frame octets.* *- Masters must provide a setting less than or equal to*	☑ Fixed at **2048** ☐ Configurable, range to ☐ Configurable, selectable from ☐ Other, explain:	2048	

249. *- Outstations must provide a setting less than or equal to 2048.* *Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 240.*			
1.5.2. Maximum number of octets Transmitted in an Application Layer Fragment containing File Transfer:	☑ Fixed at **2048** ☐ Configurable, range to ☐ Configurable, selectable from ☐ Other, explain:	2048	
1.5.3. Maximum number of octets that can be received in an Application Layer Fragment: *This size does not include any transport or frame octets.* *- Masters must provide a setting greater than or equal to 2048.* *- Outstations must provide a setting greater than or equal to 249.* *Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 241.*	☑ Fixed at **249** ☐ Configurable, range to ☐ Configurable, selectable from ☐ Other, explain:	249	
1.5.4. Timeout waiting for Complete Application Layer Fragment: *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.*	☑ None ☐ Fixed at ms ☐ Configurable, range to ms ☐ Configurable, selectable from ms ☐ Other, explain: ☐ Variable, explain:	None	

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

1.6. Fill Out The Following Items For Masters Only	**Capabilities**	**Current Value**	**If configurable list methods**

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:	☐ None ☐ Fixed at ms ☑ Configurable, range **1000** to **50000**ms ☐ Configurable, selectable from ms ☐ Other, explain: ☐ Variable, explain:	5000ms	Proprietary File via Other Mechanism ---------- terminal ---------- software **SEL-5030 AcSELerator Quickset** Vers ----------
1.7.2. How often is time synchronization required from the master: *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.*	☑ Never needs time ☐ Within seconds after IIN1.4 is set ☐ Periodically, fixed at seconds ☑ 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.
1.7.3. Device Trouble Bit IIN1.6: *If IIN1.6 device trouble bit is set under certain conditions, explain the possible causes.*	☑ Never used ☐ Reason for setting:	Never used	
1.7.4. File Handle Timeout: *If there is no activity referencing a file handle for a configurable length of time, the outstation must do an*	☑ Not applicable, files not supported ☐ Fixed at ms	Not applicable	

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).	☐ Configurable, range to ms ☐ Configurable, selectable from ms ☐ Other, explain: ☐ Variable, explain:		
1.7.5. Event Buffer Overflow Behavior:	☐ Discard the oldest event ☑ Discard the newest event ☐ Other, explain:	Discard newest	
1.7.6. Event Buffer Organization: *Explain how event buffers are arranged (per Object Group, per Class, single buffer etc) and provide their sizes.*	per Object Group	per Object Group	
1.7.7. Sends Multi-Fragment Responses: *Indicates whether an Outstation sends multi-fragment responses (Masters do not send multi-fragment requests).*	☑ Yes ☐ No		
1.7.8. Last Fragment Confirmation: *Indicates whether the Outstation requests confirmation of the last fragment of a multi-fragment response.*	☐ Always ☑ Sometimes, explain:**Only when it contains events** ☐ Never	Sometimes	
1.7.9. DNP Command Settings preserved through a device reset: *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*	☐ Assign Class ☐ Analog Deadbands ☐ Data Set Prototypes ☐ Data Set Descriptors ☐ Function Code 31 Activate Configuration		

set.			

1.8. OUTSTATION UNSOLICITED RESPONSE SUPPORT	**Capabilities**	**Current Value**	**If configurable list methods**
1.8.1. Supports Unsolicited Reporting: *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.*	☐ Not Supported ☑ 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: *The destination address of the master device where the unsolicited responses will be sent.*	☐ Fixed at ☑ Configurable, range **0** to **65519** ☐ Configurable, selectable from ☐ Other, explain:	1	Proprietary File via Other Mechanism ---------- terminal ---------- software **SEL-5030 AcSELerator Quickset** Vers ----------
1.8.3. Unsolicited Response Confirmation Timeout: *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.*	☐ Fixed at ms ☑ Configurable, range **1000** to **5000000**ms ☐ Configurable, selectable from ms ☐ Other, explain:	60000 ms	Proprietary File via Other Mechanism ---------- terminal ---------- software **SEL-5030 AcSELerator**

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.	☐ Variable, explain: Note: Relay will try URETRY times at an interval of ETIMEO seconds to send an unsolicited message until it receives an acknowledgement. If no acknowledgement is received after UTIMEO retries, it changes the interval to UTIMEO and continues to retry until it receives an acknowledgement.		**Quickset** Vers ----------
1.8.4. Number of Unsolicited Retries: *This is the number of retries that an outstation transmits in each unsolicited response series if it does not receive confirmation back from the master. The configured value includes identical and regenerated retry messages. One of the choices must provide for an indefinite (and potentially infinite) number of transmissions.*	☐ None ☐ Fixed at ☐ Configurable, range to ☐ Configurable, selectable from ☐ Other, explain: ☑ Always infinite, never gives up Note: URETRY setting is the number of times the relay will try to send an unsolicited message at the ETIMEO timeout. Once it has retried URETRY times, it will continue to retry at the UTIMEO interval.	Infinite	Proprietary File via Other Mechanism ---------- terminal ---------- software **SEL-5030 AcSELerator Quickset** Vers ----------
1.8.5. User Data: *A user data entry*			

1.9. Outstation Unsolicited Response Trigger Conditions	**Capabilities**	**Current Value**	**If configurable list methods**
1.9.1. Number of class 1	☑ Class 1 not used to		

events:	trigger Unsolicited Responses ☐ Fixed at ☐ Configurable, range to ☐ Configurable, selectable from ☐ Other, explain:		
1.9.2. Number of class 2 events:	☑ Class 2 not used to trigger Unsolicited Responses ☐ Fixed at ☐ Configurable, range to ☐ Configurable, selectable from ☐ Other, explain:		
1.9.3. Number of class 3 events:	☑ Class 3 not used to trigger Unsolicited Responses ☐ Fixed at ☐ Configurable, range to ☐ Configurable, selectable from ☐ Other, explain:		
1.9.4. Total number of events from any class:	☐ Total Number of Events not used to trigger Unsolicited Responses ☐ Fixed at ☑ Configurable, range **1** to **200** ☐ Configurable, selectable from ☐ Other, explain:	10	Proprietary File via Other Mechanism ---------- terminal ---------- software **SEL-5030 AcSELerator Quickset** Vers ----------
1.9.5. Hold time after class 1 event:	☑ Class 1 not used to		

A configurable value of 0 indicates that responses are not delayed due to this parameter.	trigger Unsolicited Responses ☐ Fixed at ms ☐ Configurable, range to ms ☐ Configurable, selectable from ms ☐ Other, explain:		
1.9.6. Hold time after class 2 event: *A configurable value of 0 indicates that responses are not delayed due to this parameter.*	☑ Class 2 not used to trigger Unsolicited Responses ☐ Fixed at ms ☐ Configurable, range to ms ☐ Configurable, selectable from ms ☐ Other, explain:		
1.9.7. Hold time after class 3 event: *A configurable value of 0 indicates that responses are not delayed due to this parameter.*	☑ Class 3 not used to trigger Unsolicited Responses ☐ Fixed at ms ☐ Configurable, range to ms ☐ Configurable, selectable from ms ☐ Other, explain:		
1.9.8. Hold time after event assigned to any class: *A configurable value of 0 indicates that responses are not delayed due to this parameter.*	☐ Class events not used to trigger Unsolicited Responses ☐ Fixed at ms ☑ Configurable, range **0** to **99999000**ms ☐ Configurable, selectable from ms ☐ Other, explain:	2000 ms	Proprietary File via Other Mechanism ---------- terminal ---------- software **SEL-5030 AcSELerator Quickset** Vers ----------

1.9.9. Retrigger Hold Time: *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).*	☐ Hold-time timer will be retriggered for each new event detected (may get more changes in next response) ☑ 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:	☐		

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

	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		
1.10.3. Maximum Internal Time Reference Error when set via DNP (ms): *The difference between the time set in DNP Write Time message, and the time actually set in the outstation.*	☑ Fixed at **100**ms ☐ Range to ms ☐ Selectable from ms ☐ Other, describe:	100 ms	
1.10.4. Maximum Delay Measurement Error (ms): *The difference between the time reported in the delay measurement response and the actual time between receipt of the delay measurement request and issuing the delay measurement reply.*	☑ Fixed at **100**ms ☐ Range to ms ☐ Selectable from ms ☐ Other, describe:	100 ms	
1.10.5. Maximum Response Time (ms): *The amount of time an outstation will take to respond upon receipt of a valid request. This does not include the message transmission time.*	☑ Fixed at **100**ms ☐ Range to ms ☐ Selectable from ms ☐ Other, describe:	100 ms	
1.10.6. Maximum time from start-up to IIN 1.4 assertion (ms):	☑ Fixed at **100**ms ☐ Range to ms ☐ Selectable from ms ☐ Other, describe:	100 ms	
1.10.7. Maximum Event Time-tag error for local Binary and Double Bit I/O (ms): *The error between the time-*	☐ Fixed at ms ☐ Range to ms ☐ Selectable from ms	Other, **If the Binary point is in the SER list, error is +/- 1 ms.**	Proprietary File via Other Mechanism ---------- terminal

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

1.11. INDIVIDUAL FIELD OUTSTATION PARAMETERS	**Value of Current Setting**	**If configurable list methods**
1.11.1. User-assigned location name or code string (same as g0v245):	Value of TID setting	Proprietary File via Other Mechanism ---------- terminal ---------- software **SEL-5030 AcSELerator Quickset** Vers ----------
1.11.2. User-assigned ID code/number string (same as g0v246):	value of RID 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**
1.12.1 DNP3 device support for secure authentication: *The support for secure authentication is optional in DNP3 devices. Indicate here if the device supports secure authentication.* *If the device does not support secure authentication then ignore the rest of this section.* *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*	☑ Secure Authentication not supported If Secure Authentication is supported, what Version(s) are supported: ☐ Fixed at version ☐ Configurable, selectable from versions	Not Supported	

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

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

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

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

	☐ Other, explain:		
1.12.15 Additional critical function codes: *The DNP3 security supplement defines those messages with specific function codes that are critical and must be used as part of a secure authentication message exchange. Messages with other function codes are optional and changes to this list should be noted here.*	Additional function codes that are to be considered as "critical": ☐ 0 (Confirm) ☐ 1 (Read) ☐ 7 (Immediate freeze) ☐ 8 (Immediate freeze - no ack) ☐ 9 (Freeze-and-clear) ☐ 10 (Freeze-and-clear - no ack) ☐ 11 (Freeze-at-time) ☐ 12 (Freeze-at-time - no ack) ☐ 22 (Assign Class) ☐ 23 (Delay Measurement) ☐ 25 (Open File) ☐ 26 (Close File) ☐ 27 (Delete File) ☐ 28 (Get File Info) ☐ 30 (Abort File) ☐ 129 (Response) ☐ 130 (Unsolicited Response)		
1.12.16 Other critical fragments: *Other critical transactions can be defined and should be detailed here. Examples could be based on time (for example: the first transaction after a communications session is established). Other examples could be based on*			

specific data objects (for example: the reading of specific data points).			

2. Mapping to IEC 61850 Object Models

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

MAPPING TO IEC 61850 OBJECT MODELS	
IEC 61850 Object	DNP Xpath Reference

3. Capabilities and Current Settings for Device Database

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

3.1. BINARY INPUT POINTS **Static (Steady-State) Object Number: 1** **Event Object Number: 2**			
	Capabilities	**Current Value**	**If configurable list methods**
3.1.1. Static Variation reported when variation 0 requested	☑ Variation 1 - Single-bit packed format ☑ Variation 2 - Single-bit with flag ☐ Based on point index	Two	
3.1.2. Event Variation reported when variation 0	☐ Variation 1 - without	Two	

requested: *Note: The support for binary input events can be determined remotely using protocol object Group 0 Variation 237.*	time ☑ Variation 2 - with absolute time ☐ Variation 3 - with relative time ☐ Based on point index		
3.1.3. Event reporting mode: *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*	☐ Only most recent ☑ All events	All events	
3.1.4. Binary Inputs included in Class 0 response: *If Binary Inputs are not included in the Class 0 response, Binary Input Events (group 2) may not be reported.*	☑ Always ☐ Never ☐ Only if point is assigned to Class 1, 2, or 3 ☐ Based on point index	Always	
3.1.5. Definition of Binary 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 binary inputs present in the device, and the maximum binary input index, are available remotely using object Group 0 Variations 239 and 238.*	☐ Fixed, list shown in table below ☑ Configurable (current list may be shown in table below) ☐ Other, explain:	Configurable	Proprietary File via Other Mechanism ---------- terminal ---------- software **SEL-5030 AcSELerator Quickset** Vers ----------

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

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

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

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

reported.	☐ Based on point index		
3.2.5. Definition of Double Bit 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 double-bit inputs present in the device, and the maximum double-bit input index, are available remotely using object Group 0 Variations 236 and 235.*	☐ Fixed, list shown in table below ☐ Configurable (current list may be shown in table below) ☐ Other, explain:		

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

3.3. BINARY OUTPUT STATUS AND CONTROL RELAY OUTPUT BLOCK
Binary Output Status Object Number: 10
Binary Output Event Object Number: 11
CROB Object Number: 12
Binary Output Command Event Object Number: 13

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

3.3.3. Binary Output Status included in Class 0 response: *If Binary Output Status points are not included in the Class 0 response, Binary Output Status Events (group 11) may not be reported.*	☑ Always ☐ Never ☐ Only if point is assigned to Class 1, 2, or 3 ☐ Based on point index	Always	
3.3.4. Reports Output Command Event Objects:	☑ Never ☐ Only upon a successful Control ☐ Upon all control attempts	Never	
3.3.5. Static Variation reported when variation 0 requested	☐ Variation 1 - Continuous control ☑ Variation 2 - Continuous control, binary output status ☐ Based on point index	Two	
3.3.6. Event Variation reported when variation 0 requested *Note: The support for binary output events can be determined remotely using protocol object Group 0 Variation 222.*	☐ Variation 1 - without time ☐ Variation 2 - with absolute time ☐ Based on point index		
3.3.7. Command Event Variation reported when variation 0 requested	☐ Variation 1 - without time ☐ Variation 2 - with absolute time ☐ Based on point index		
3.3.8. Change Event reporting mode: *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 most recent ☐ All events		
3.3.9. Command Event reporting mode:	☐ Only most recent		

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

Binary Output Status and CROB points list:																		
		Supported Control Operations												Event Class Assigned (1,2,3 or none)				
Point	Name	Select/ Operate	Direct	Direct	Pulse	Pulse	Latch	Latch	Trip	Clos	Count	Cancel	Name	Name	Change	Command	Description	

Index			Operate	Operate - No Ack	On	Off	On	Off		e	> 1	Currently Running Operation	for State when value is 0	for State when value is 1			
0	RB1	Y	Y	Y	Y	Y	Y	Y	Y	Y			Clear	Set			Remote Bit 1
1	RB2	Y	Y	Y	Y	Y	Y	Y	Y	Y			Clear	Set			Remote Bit 2
2	RB3	Y	Y	Y	Y	Y	Y	Y	Y	Y			Clear	Set			Remote Bit 3
3	RB4	Y	Y	Y	Y	Y	Y	Y	Y	Y			Clear	Set			Remote Bit 4
4	RB5	Y	Y	Y	Y	Y	Y	Y	Y	Y			Clear	Set			Remote Bit 5
5	RB6	Y	Y	Y	Y	Y	Y	Y	Y	Y			Clear	Set			Remote Bit 6
6	RB7	Y	Y	Y	Y	Y	Y	Y	Y	Y			Clear	Set			Remote Bit 7
7	RB8	Y	Y	Y	Y	Y	Y	Y	Y	Y			Clear	Set			Remote Bit 8
8	RB9	Y	Y	Y	Y	Y	Y	Y	Y	Y			Clear	Set			Remote Bit 9
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	OC	Y	Y	Y	Y		Y			Y			Clear	Set			Circuit Breaker open command
17	CC	Y	Y	Y	Y		Y			Y			Clear	Set			Circuit Breaker close command
18	DRST_TAR	Y	Y	Y	Y		Y			Y			Clear	Set			Reset front panel targets command
19	NXTEVE	Y	Y	Y	Y	Y	Y	Y	Y	Y			Clear	Set			Read next relay event comm

																	and	

3.4. COUNTERS / FROZEN COUNTERS **Static Counter Object Number: 20** **Static Frozen Counter Object Number: 21** **Counter Event Object Number: 22** **Frozen Counter Event Object Number: 23**			
	Capabilities	**Current Value**	**If configurable list methods**
3.4.1. Static Counter Variation reported when variation 0 requested	☐ Variation 1 - 32-bit with flag ☐ Variation 2 - 16-bit with flag ☐ Variation 5 - 32-bit without flag ☑ Variation 6 - 16-bit without flag ☐ Based on point index	Six	
3.4.2. Counter Event Variation reported when variation 0 requested *Note: The support for counter events can be determined remotely using protocol object Group 0 Variation 227.*	☐ Variation 1 - 32-bit with flag ☑ Variation 2 - 16-bit with flag ☐ Variation 5 - 32-bit with flag and time ☐ Variation 6 - 16-bit with flag and time ☐ Based on point index	Two	
3.4.3. Counters included in Class 0 response: *If counters are not included in the Class 0 response, Counter Events (group 22) may not be reported.*	☑ Always ☐ Never ☐ Only if point is assigned to Class 1, 2, or 3 ☐ Based on point index	Always	
3.4.4. Counter Event reporting mode: *When responding with event*	☑ Only most recent ☐ All events	Most recent	

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

When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event. *All events are typically reported for Frozen Counters*	☐ All events		
3.4.9. Counters Roll Over at:	☑ 16 Bits (65,535) ☐ 32 Bits (4,294,967,295) ☐ Fixed at ☐ Configurable, range to ☐ Configurable, selectable from ☐ Other, explain: ☑ Based on point index	Based on point index	
3.4.10. Counters frozen by means of:	☐ Master Request ☐ Freezes itself without concern for time of day ☐ Freezes itself and requires time of day ☐ Other, explain:		
3.4.11. 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:		Proprietary File via Other Mechanism ---------- terminal ---------- software **SEL-5030 AcSELerator Quickset** Vers ----------

Counter / Frozen Counter points list:

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

3.5. ANALOG INPUT POINTS
Static (Steady-State) Object Number: 30
Event Object Number: 32
Deadband Object Number: 34

	Capabilities	**Current Value**	**If configurable list methods**
3.5.1. Static Variation reported when variation 0 requested	☑ Variation 1 - 32-bit with flag ☑ Variation 2 - 16-bit with flag ☑ Variation 3 - 32-bit without flag ☑ Variation 4 - 16-bit without flag ☑ Variation 5 - single-precision floating point with flag ☑ Variation 6 - double-precision floating point with flag ☐ Based on point index Note: Setting DVARAIx defines default AI variation (1-6)	Four	Proprietary File via Other Mechanism ---------- terminal ----------

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

or set for each individual point.			
3.5.4. Analog Inputs included in Class 0 response: *If Analog Inputs are not included in the Class 0 response, Analog Input Events (group 32) may not be reported.*	☑ Always ☐ Never ☐ Only if point is assigned to Class 1, 2, or 3 ☐ Based on point index	Always	
3.5.5. How Deadbands are set:	☐ A. Global Fixed ☑ B. Configurable through DNP ☑ C. Configurable via other means ☐ D. Other, explain: ☐ Based on point index - column specifies which of the options applies B, C or D	C	Proprietary File via Other Mechanism ---------- terminal ---------- protocol ----------
3.5.6. Analog Deadband Algorithm: *simple- just compares the difference from the previous reported value* *integrating- keeps track of the accumulated change* *other- indicating another algorithm*	☑ Simple ☐ Integrating ☐ Other, explain: ☐ Based on point index	Simple	
3.5.7. 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*	☑ Fixed, list shown in table below ☑ Configurable (current list may be shown in table below) ☐ Other, explain:	Fixed	Proprietary File via Other Mechanism ---------- terminal ---------- software **SEL-5030**

inputs present in the device, and the maximum analog input index, are available remotely using object Group 0 Variations 233 and 232.			**AcSELerator Quickset** Vers ----------

Analog Input points list:										
			Transmitted Value		Scaling					
Point Index	Name	Event Class Assigned (1, 2, 3 or none)	Min	Max	Multiplier	Offset	Units	Resolution	Description	
0	I	two							Current (Mag)	
1	IFA	two							Current (Ang)	
2	V	two							Voltage (Mag)	
3	VFA	two							Voltage (Ang)	
4	MW	two							Power	
5	MVAR	two							Reactive Power	
6	PF	two							Power Factor	
7	FREQ	two							Frequency	
8	VBAT	two							DC Battery Voltage	
9	IBAT	two							Battery Current	
10	MWHI	two							Energy In	
11	MWHO	two							Energy Oout	
12	MVRHI	two							Energy In	
13	MVRHO	two							Energy Out	

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

3.6. ANALOG OUTPUT STATUS AND ANALOG OUTPUT CONTROL BLOCK **Analog Output Status Object Number: 40** **Analog Output Control Block Object Number: 41** **Analog Output Event Object Number: 42** **Analog Output Command Event Object Number: 43**			
	Capabilities	**Current Value**	**If configurable list methods**
3.6.1. Static Analog Output Status Variation reported when variation 0 requested	☐ Variation 1 - 32-bit with flag ☑ Variation 2 - 16-bit with flag	Two	

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

	☐ Based on point index		
3.6.5. Command Event Variation reported when variation 0 requested	☐ Variation 1 - 32-bit without time ☐ Variation 2 - 16-bit without time ☐ Variation 3 - 32-bit with time ☐ Variation 4 - 16-bit with time ☐ Variation 5 - single-precision floating point w/o time ☐ Variation 6 - double-precision floating point w/o time ☐ Variation 7 - single-precision floating point with time ☐ Variation 8 - double-precision floating point with time ☐ Based on point index		
3.6.6. Change Event reporting mode: *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 most recent ☐ All events		
3.6.7. Command Event reporting mode: *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 most recent ☐ All events		
3.6.8. Maximum Time	☐ Not Applicable	1 seconds	Proprietary

between Select and Operate:	☐ Fixed at seconds ☑ Configurable, range **0** to **30000**seconds ☐ Configurable, selectable from seconds ☐ Other, explain: ☐ Variable, explain: ☐ Based on point index		File via Other Mechanism ---------- terminal ----------
3.6.9. 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:		Proprietary File via Other Mechanism ---------- terminal ---------- software **SEL-5030 AcSELerator Quickset** Vers ----------

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

3.7. SEQUENTIAL FILE TRANSFER
Object Number: 70

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

series of blocks of a maximum specified size. This indicates whether only a single block or multiple blocks will be sent in fragment.			
3.7.6. Max number of Files Open at one time:	☐ Fixed at ☐ Configurable, range to ☐ Configurable, selectable from ☐ Other, explain:		
3.7.7. Definition of File Names that may be read or written:	☐ Fixed, list shown in table below ☐ Configurable (current list may be shown in table below) ☐ Other, explain:		

Sequential Files list:					
		Authentication Required for:			
File Name	Event Class Assigned (1, 2, 3 or none)	Read	Write	Delete	Description

3.8. OCTET STRING POINTS **Static (Steady-State) Object Number: 110** **Event Object Number: 111**			
	Capabilities	**Current Value**	**If configurable list methods**
3.8.1. Event reporting mode: *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*	☐ Only most recent ☐ All events Note: Not supported		

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

Octet String points list:			
Point Index	Name	Event Class Assigned (1, 2, 3 or none)	Description

3.9. VIRTUAL TERMINAL PORT NUMBERS (POINTS) **Static (Steady-State) Object Number: 112** **Event Object Number: 113**			
	Capabilities	**Current Value**	**If configurable list methods**

Ports list:			
Virtual Port Number (Point Index)	Name	Event Class Assigned (1, 2, 3 or none)	Description

3.10. DATA SET PROTOTYPE **Object Number: 85** **Variation Number: 1**			
	Capabilities	**Current Value**	**If configurable**

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

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

3.11. DATA SET DESCRIPTOR CONTENTS AND CHARACTERISTICS
Object Number: 86
Variation Numbers: 1 and 2

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

Element Number	Descriptor Code	Element Description	Data Type Code	Max Data Length	Ancillary Value
0	ID (identifier)	Mandatory DS identifier	None	0	
Data set Points					
Element Number	DNP Group Number	Point Index			

4. Implementation Table

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

DNP OBJECT GROUP & VARIATION			**REQUEST Master may issue Outstation must parse**		**RESPONSE Master must parse Outstation may issue**	
Object Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
0	242	Device Attributes - Device manufacturer's software version	1*(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	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*	129 *(Response)*	00 *(start-stop)* 17 *(index)*

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

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

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

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

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

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

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

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

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

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

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

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

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

				07, 08 *(limited qty)*, 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)*, 17, 28 *(index)*	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-bit	5*(direct op.)*	17, 28 *(index)*	129 *(Response)*	echo of request
41	2	Analog Output Block - 16-bit	6*(direct op, no ack)*	17, 28 *(index)*	129 *(Response)*	echo of request
41	3	Analog Output – Single-prec flt-pt	3*(select)*	17, 28 *(index)*	129 *(Response)*	echo of request
41	3	Analog Output – Single-prec flt-pt	4*(operate)*	17, 28 *(index)*	129 *(Response)*	echo of request
41	3	Analog Output – Single-prec flt-pt	5*(direct op.)*	17, 28 *(index)*	129 *(Response)*	echo of request
41	3	Analog Output – Single-prec flt-pt	6*(direct op, no ack)*	17, 28 *(index)*	129 *(Response)*	echo of request
41	4	Analog Output – Double-	3*(select)*	17, 28	129	echo of

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

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

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