DNP3
Device Profile Document
For
Schweitzer Engineering Laboratories
SEL-351-5,-6,-7, SEL351A, A-1

Revision Date: 08/25/2010

DEVICE PROFILE REVISION HISTORY

Date	Version[1]	Reason for change	Edited by
08/25/10	1	ECO 10-0676	Karen Leggett

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

Contents

1 DEVICE PROPERTIES

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

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

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

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

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

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

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

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

If this document is used to show the current value of each parameter, the "Current Value" column applies to a single connection between a master and outstation. If the device has multiple or backup connections to other DNP devices that you wish to show in the Device Profile Document, see section 8.3.2 "ReferenceDevice and AuxillaryInfo" of Volume 8 Interoperability or duplicate the entire Device Profile Document for each communication link to a logical or physical DNP3 Device.

1.1 DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable, list methods
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.*	○ Master ● Outstation	Outstation	
1.1.2 Vendor Name: *The name of the organization producing the device.*		Schweitzer Engineering Laboratories, Inc.	
1.1.3 Device Name: *The model and name of the device, sufficient to distinguish it from any other device from the same organization.*		SEL-351-5, -6, -7, SEL-351A, A-1	
1.1.4 Device manufacturer's hardware version string:		SNUMB value (CAL Level)	
1.1.5 Device manufacturer's software version string:		FID value (ID Command)	
1.1.6 Device Profile Document Version Number: *Version of the Device Profile Document is indicated by a whole number incremented with each new release. This should match the latest version shown in the Revision History at the beginning of this document.*		1	

1.1 DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable, list methods
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.*	Masters Only Requests Responses ☐ ☐ None ☐ ☐ Level 1 ☐ ☐ Level 2 ☐ ☐ Level 3 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 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.*	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)	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 DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable, list methods
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, Proprietary file, Factory, Protocol	
1.1.11 DNP3 XML files available On-Line: *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.* .	Rd Wr Filename Description of Contents ☐ dnpDP.xml Complete Device Profile ☐ dnpDPcap.xml Device Profile Capabilities ☐ dnpDPcfg.xml Device Profile config. values ☐ ☐ _____*.xml _____ * The Complete Device Profile Document contains the capabilities, Current Value, and configurable methods columns. * The Device Profile Capabilities contains only the capabilities and configurable methods columns. * The Device Profile Config. Values contains only the Current Value column.		

1.1 DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable, list methods
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 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.*	Rd Wr Filename Description of Contents ■ ☐ dnpDP.xml Complete Device Profile ☐ ☐ dnpDPcap.xml Device Profile Capabilities ☐ ☐ dnpDPcfg.xml Device Profile config. values ☐ ☐ _____*.xml _____ * The Complete Device Profile Document contains the capabilities, Current Value, and configurable methods columns. * The Device Profile Capabilities contains only the capabilities and configurable methods columns. * The Device Profile Config. Values contains only the Current Value column.	Rd Wr Filename ■ ☐ dnpDP.xml ☐ ☐ dnpDPcap.xml ☐ ☐ dnpDPcfg.xml	
1.1.13 Connections Supported:	■ Serial (complete section 1.2) ■ IP Networking (complete section 1.3) ☐ Other, explain _____	Serial IP Networking	

1.2 SERIAL CONNECTIONS	Capabilities	Current Value	If configurable, list methods
1.2.1 Port Name *Name used to reference the communication port defined in this section.*		PORT 1, PORT 2, PORT 3, PORT F Note: Up to three DNP3 sessions may be enabled.	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
1.2.2 Serial Connection Parameters:	■ Asynchronous - 8 Data Bits, 1 Start Bit, 1 Stop Bit, 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**	Asynchronous Note: 8 Data Bits, 1 Start Bit, 1 Stop Bit, No Parity	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
1.2.3 Baud Rate:	☐ Fixed at _____ ☐ Configurable, range _____ to _____ ■ Configurable, selectable from 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600 ☐ Configurable, other, describe_____	9600	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**

1.2 SERIAL CONNECTIONS	Capabilities	Current Value	If configurable, list methods
1.2.4 Hardware Flow Control (Handshaking): *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.* *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).*	■ None **RS-232 / V.24 / V.28 Options:** Before Tx, Asserts: ■ RTS ☐ DTR Before Rx, Asserts: ☐ RTS ☐ DTR Always Asserts: ■ RTS ☐ DTR Before Tx, Requires: Asserted Deasserted ☐ ■ CTS ☐ ■ DCD ☐ ☐ DSR ☐ ☐ RI ☐ Rx Inactive Before Rx, Requires: Asserted Deasserted ☐ ☐ CTS ☐ ☐ DCD ☐ ☐ DSR ☐ ☐ RI 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 _____	None **RS-232 / V.24 / V.28 Options:** Other, **RS-422 / V.11 Options:** Other, **RS-485Options:** Other,	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**

1.2 SERIAL CONNECTIONS	Capabilities	Current Value	If configurable, list methods
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 ■ Configurable, other, describe **Controlled by DRETRY (retry attempts) and DTIMEO (timeout in seconds) settings**	0 seconds	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
1.2.6 Supports DNP3 Collision Avoidance: *Indicates whether a device uses a collision avoidance algorithm. Documentation by the vendor will provide information on collision avoidance schemes.*	☐ No ■ Yes, explain **For serial connections, the relay pauses for a random delay between the settings MAXDLY and MINDLY when it detects a carrier through data on the receive line or the CTS pin. If you use the settings of 0.10 seconds for MAXDLY and 0.05 seconds for MINDLY, the SEL-351 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**

1.2 SERIAL CONNECTIONS	Capabilities	Current Value	If configurable, list methods
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. extension of the stop bit time of one character prior to the start bit of the following character within a message). If the receiver performs this check and the timeout is exceeded then the receiver discards the current data link frame. A receiver that does not discard data link frames on the basis of inter-character gaps is considered to not perform this check.* *Where no asynchronous serial interface is fitted, this parameter is not applicable. In this case none of the options shall be selected.*	■ Not checked ☐ No gap permitted ☐ Fixed at _____ bit times ☐ Fixed at _____ ms ☐ Configurable, range ____ to ____ bit times ☐ Configurable, range ____ to ____ ms ☐ Configurable, Selectable from ___,___,___bit times ☐ Configurable, Selectable from ____, ____, ____ ms ☐ Configurable, other, describe _____ ☐ Variable, explain ____	Not Checked	
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) ☐ Maximum _____ bit times ☐ Maximum _____ ms	None	

1.3 IP NETWORKING	Capabilities	Current Value	If configurable, list methods
1.3.1 Port Name *Name used to reference the communication 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) ■ UDP Datagram (required)	TCP Listening	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
1.3.3 IP Address of this Device:		192.168.1.2	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
1.3.4 Subnet Mask:		255.255.255.0	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**

1.3 IP NETWORKING	Capabilities	Current Value	If configurable, list methods
1.3.5 Gateway IP Address:		192.168.1.1	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
1.3.6 Accepts TCP Connections or UDP Datagrams from:	☐ Allows all (show as *.*.*.* in 1.3.7) ☐ Limits based on an 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 Note: DNP3 Master IP addresses are defined by the DNPIP*n* settings	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
1.3.7 IP Address(es) from which TCP Connections or UDP Datagrams are accepted:		As defined by the DNPIP*n* settings	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**

1.3 IP NETWORKING	Capabilities	Current Value	If configurable, list methods
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 configurable 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 ____,____,____ Configurable, other, describe _____ **Note:Port setting DNPNUM**	20,000	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
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 ____,____,____ ☐ Configurable, other, describe_____	Not Applicable	

1.3 IP NETWORKING	Capabilities	Current Value	If configurable, list methods
1.3.10 TCP Keep-alive timer: *The time period for the keep-alive timer on active TCP connections.*	■ Fixed at _____**0**_____ms ■ Configurable, range **0** to **20000** ms ☐ Configurable, selectable from ____,____,____ms ☐ Configurable, other, describe 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 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 computer. If the relay does not receive a response from the remote computer within the time specified by KAINTV, the keep-alive packet is re-transmitted as many as KACNT times. After this count is reached, the relay remote device is no longer available, so the relay can terminate the connection without waiting for the idle timer (TIDLE or FTPIDLE) to expire. If ETCPKA = N then value of keep alive timer is 0.	10000 ms	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
1.3.11 Local UDP port: *Local UDP port for sending and/or receiving UDP datagrams. Master may let system choose an available port. Outstation must use one that is known by the master.*	☐ Fixed at 20,000 ■ Configurable, range **1** to **65534** ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____ Let system choose (Master only) Note: Port Setting DNPUDPx value.	20,000	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**

1.3 IP NETWORKING	Capabilities	Current Value	If configurable, list methods
1.3.12 Destination UDP port for DNP3 Requests (Master Only):	☐ Fixed at 20,000 ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		
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 **1** to **65534** ☐ Configurable, selectable from ____,____,____ ■ Configurable, other, describe: **DNPUDP*n* := REQ** Note: Depends on DNPUDP*n* setting. REQ means to use the same port the request came in from.	20000	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
1.3.14 Destination UDP port for responses: *For a UDP only Outstation, the destination UDP port for sending all responses other than initial unsolicited Null Response.*	☐ None ☐ Fixed at 20,000 ■ Configurable, range **1** to **65534** ☐ Configurable, selectable from ____,____,____ ■ Configurable, other, describe **DNPUDP*n* := REQ** ☐ Use source port number Note: Depends on DNPUDP*n* setting. REQ means to use the same port the request came in from.	20000	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
1.3.15 Multiple outstation connections (Masters only): *Master only. Indicates whether multiple outstation connections are supported.*	☐ Supports multiple outstations (Masters only)		

1.3 IP NETWORKING	Capabilities	Current Value	If configurable, list methods
1.3.16 Multiple master connections (Outstations Only): *Outstation 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 address	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
1.3.17 Time synchronization support:	☐ DNP3 LAN procedure (function code 24) ■ DNP3 Write Time (not recommended over LAN) ☐ Other, explain _____ ☐ Not Supported	DNP3 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__0___ ■ Configurable, range **0** to **65,519** ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____	0	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
1.4.2 DNP3 Source Address Validation: *Indicates whether the device will filter out messages not from a specific source address.*	■ Never ☐ Always, one address allowed (shown in 1.4.3) ☐ Always, any one of multiple addresses allowed (each selectable as shown in 1.4.3) ☐ Sometimes, explain_____	Never	
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 ____,____,____ ☐ Configurable, other, describe_____		
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 disable the feature if supported.*	☐ Yes (only allowed if configurable) ■ No	No	

1.4 LINK LAYER	Capabilities	Current Value	If configurable, list methods
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).*	☐ Always ■ Sometimes, explain **Depends on DRETRY setting** ☐ Never	Sometimes	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
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 **5,000** ms ☐ Configurable, selectable from ___,___,___ms ☐ Configurable, other, describe_____ Variable, explain _____ **Note: port setting DTIMEO value**	1000 ms	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
1.4.7 Maximum Data Link Retries: *The number of times the device will retransmit a frame that requests Link Layer confirmation.*	☐ Never Retries ☐ Fixed at _____ ■ Configurable, range **0** to **15** ☐ Configurable, selectable from ____,____,____ Configurable, other, describe_____ **Note: port setting DRETRY value**	0	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**

1.4 LINK LAYER	Capabilities	Current Value	If configurable, list methods
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 ____,____,____ ☐ Configurable, other, describe_____		
1.4.9 Maximum number of octets that can be Received in a Data Link Frame: *This number includes the CRCs. With a length field of 255, the maximum size would be 292. The device must be able to receive 292 octets to be compliant.*	■ Fixed at **292** ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		

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 249.* • *Outstations must provide a setting less than or equal to 2048.*	■ Fixed at **2048** ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____	2048	
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 ____,____,____ ☐ Configurable, other, describe_____	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.*	■ Fixed at **_249**_____ ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____	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 ☐ Configurable, other, describe_____ ☐ Variable, explain _____	None	

1.5 APPLICATION LAYER	Capabilities	Current Value	If configurable, list methods
1.5.5 Maximum number of objects allowed in a single control request for CROB (group 12):	■ Fixed at **10** (enter 0 if controls are not supported) ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____ ☐ 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 ____,____,____ ☐ Configurable, other, describe_____ ☐ 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 ____,____,____ ☐ Configurable, other, describe_____ ☐ Variable, explain _____	0	
1.5.8 Supports mixing object groups (AOBs, CROBs and Data Sets) in the same control request:	☐ Not applicable – controls are not supported ☐ Yes ■ No	No	

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

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

1.6 FILL OUT THE FOLLOWING ITEMS FOR MASTERS ONLY	Capabilities	Current Value	If configurable, list methods
1.6.10 Scheduled actions that may affect the accuracy of freeze requests: *Indicates if the Master's accuracy of issuing freeze requests may be affected by other scheduled operations such as poll requests or control requests*	☐ Freeze time may be affected by Poll requests ☐ Freeze time may be affected by Control requests		
1.6.11 Master's algorithm for scheduling request operations: *Describe the Master's algorithm for determination of which activity is performed when more than one is due at the same moment. Discuss precedence and priorities for activities such as time synchronization, poll requests, control requests and freeze requests.*	Details of the Master's scheduling algorithm		

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 **1,000** to **50,000** ms ☐ Configurable, selectable from ___,___,___ms ☐ Configurable, other, describe_____ ☐ Variable, explain _____ Note: Configured with the port setting ETIMEOx	2000 ms	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
1.7.2 How often is time synchronization required from the master?	■ Never needs time ☐ Within _____ seconds after IIN1.4 is set ■ Periodically **between 60 and 1966020** seconds Note: Configured with the port setting TIMERQ	Never	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
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 FILL OUT THE FOLLOWING ITEMS FOR OUTSTATIONS ONLY	Capabilities	Current Value	If configurable, list methods
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 automatic close on the file. The timeout value must be configurable up to 1 hour. When this condition occurs the outstation will send a File Transport Status Object (group 70 var 6) using a status code value of file handle expired (0x02).*	■ Not applicable, files not supported ☐ Fixed at_____ ms ☐ Configurable, range _____ to _____ms ☐ Configurable, selectable from ___,___,___ms ☐ Configurable, other, describe_____ ☐ Variable, explain _____	Not applicable	
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 Note: For Analog and Counter points, only the most recent event for each point shall be buffered. For all Binary points, up to 1024 events will be buffered. Subsequent events will be discarded.	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	Yes	
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 FILL OUT THE FOLLOWING ITEMS FOR OUTSTATIONS ONLY	Capabilities	Current Value	If configurable, list methods
1.7.9 DNP Command Settings preserved through a device reset: *If data associated with any of these requests are written through the DNP protocol but not preserved through a restart of the Outstation, the Master will have to write them again anytime the Restart IIN bit is set*	☐ Assign Class ☐ Analog Deadbands ☐ Data Set Prototypes ☐ Data Set Descriptors ☐ Function Code 31 Activate Configuration		

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 Note: Port setting UNSOLx	Off	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
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 **65,519** ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____ Note: Port setting REPADRx	1	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**

1.8 OUTSTATION UNSOLICITED RESPONSE SUPPORT	Capabilities	Current Value	If configurable, list methods
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. 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.*	☐ Fixed at_____ ms ■ Configurable, range **1000** to **5000000 ms** ☐ Configurable, selectable from ___,___,___ms ☐ Configurable, other, describe_____ ☐ 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.	5000 ms	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
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 ____,____,____ ☐ Configurable, other, describe_____ ■ 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**

1.9 OUTSTATION UNSOLICITED RESPONSE TRIGGER CONDITIONS	Capabilities	Current Value	If configurable, list methods
1.9.1 Number of class 1 events:	■ Class 1 not used to trigger Unsolicited Responses ☐ Fixed at _____ ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		
1.9.2 Number of class 2 events:	■ Class 2 not used to trigger Unsolicited Responses ☐ Fixed at _____ ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		
1.9.3 Number of class 3 events:	■ Class 3 not used to trigger Unsolicited Responses ☐ Fixed at _____ ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		
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 ____,____,____ Configurable, other, describe_____ Note: Port setting NUM1EVE	10	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
1.9.5 Hold time after class 1 event: *A configured value of 0 indicates that responses are not delayed due to this parameter.*	■ Class 1 not used to trigger Unsolicited Responses ☐ Fixed at _____ ms ☐ Configurable, range _____ to _____ ms ☐ Configurable, selectable from ____,____,____ ms ☐ Configurable, other, describe_____		

1.9 OUTSTATION UNSOLICITED RESPONSE TRIGGER CONDITIONS	Capabilities	Current Value	If configurable, list methods
1.9.6 Hold time after class 2 event: *A configured 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 ☐ Configurable, other, describe_____		
1.9.7 Hold time after class 3 event: *A configured 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 ☐ Configurable, other, describe_____		
1.9.8 Hold time after event assigned to any class: *A configured 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 **99999** s ☐ Configurable, selectable from ____,____,____ ms Configurable, other, describe_____ Note: Port setting AGE1EVE	2 s	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
1.9.9 Retrigger Hold Timer: *The hold-time timer may be retriggered for each new event detected (increased possibly of capturing all the changes in a single response) or not retriggered (giving the master a guaranteed update time).*	☐ 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? *Internal Indication 1.4 is NEED_TIME.*	■ Never ■ Asserted at startup until first Time Synchronization request received ☐ Periodically, range _____to_____ minutes ☐ Periodically, selectable from ____,____,___ seconds ■ Range **0** to **1966020** 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 ____,____,___ 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**
1.10.3 Maximum Internal Time Reference Error when set via DNP (ms): *The difference between the time set in a DNP Write Time message, and the time actually set in the Outstation.*	■ Fixed at **20** ms ☐ Range _____ to _____ ms ☐ Selectable from ____,____,____ ms ☐ Other, describe_____	20 ms	

1.10 OUTSTATION PERFORMANCE	Capabilities	Current Value	If configurable, list methods
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 _____ ms ☐ Range _____ to _____ ms ☐ Selectable from ____,____,____ ms ■ 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).**	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).	
1.10.7 Maximum Event Time-tag error for local Binary and Double-bit I/O (ms): *The error between the time-tag reported and the absolute time of the physical event. This error includes the Internal Time Reference Error.*	☐ Fixed at _____ ms ☐ Range _____ to _____ ms ☐ Selectable from ____,____,____ ms ■ Other, describe **If the Binary point is in the SER list, error is +/- 1 ms. Otherwise, error is from 500ms to 1 second.**	If the Binary point is in the SER list, error is +/- 1 ms. Otherwise, error is from 500ms to 1 second.	
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**	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**
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**
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**
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 comprise that version of Secure Authentication.*	☐ Supports secure authentication Version(s) supported: ☐ Fixed at _____ ☐ Configurable, selectable from ____,____,____		
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 number 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 _____ ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		

1.12 SECURITY PARAMETERS	Capabilities	Current Value	If configurable, list methods
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.*		☐ *Yes* - Accepts aggressive mode requests ☐ *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.*		☐ *Yes* - Issues aggressive mode requests ☐ *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 SECURITY PARAMETERS	Capabilities	Current Value	If configurable, list methods
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 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.*	☐ Configurable, range _____ to _____		
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, describe _____		
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, describe _____		

1.12 SECURITY PARAMETERS	Capabilities	Current Value	If configurable, list methods
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, describe		
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 ____,____,____ ☐ Configurable, other, describe_____		
1.12.13 Number of Certificate Authorities supported: *Implementations using TLS shall support at least 4 Certificate Authorities. Indicate the number supported.*			

1.12 SECURITY PARAMETERS	Capabilities	Current Value	If configurable, list methods
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 ☐ Configurable, other, describe_____		
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 SECURITY PARAMETERS	Capabilities	Current Value	If configurable, list methods
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).*	Describe any other critical fragment exchanges:		

2 MAPPING TO IEC 61850 OBJECT MODELS

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

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

IEC 61850 Object	DNP3 XPATH Reference	Comments

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

The following tables identify the capabilities and current settings for each DNP3 data type. Each data type also provides a table defining the data points available in the device or a description of how this information can be obtained if the database is configurable. Tables for data types not supported may be deleted. Additional columns may be added to the point list table if necessary.

3.1 SINGLE-BIT BINARY INPUTS Static (Steady-State) Group Number: **1** Event Group 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 (add column to table below)	Two	
3.1.2 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 (add column to table below)	Two	
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 (add column to table below)	Always	
3.1.5 Definition of Binary Input Point List: *List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.*	■ 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 AcSELerator Quickset**

Point Index	Name	Event Class Assigned (1, 2, 3 or none)	Name for State when value is 0	Name for State when value is 1	Description
0	52A	one	Deasserted	Asserted	52A
1	79RS	one	Deasserted	Asserted	79 Reset
2	79LO	one	Deasserted	Asserted	79 Lock Out
3	81	one	Deasserted	Asserted	81 Target
4	51	one	Deasserted	Asserted	51 Target
5	50	one	Deasserted	Asserted	50 Target
6	SOTF	one	Deasserted	Asserted	Switch on to Fault Target
7	COMM	one	Deasserted	Asserted	Communications Assisted Target
8	INST	one	Deasserted	Asserted	Instantaneous Target
9	TRIP_LED	one	Deasserted	Asserted	Trip Target
10	EN	one	Deasserted	Asserted	Relay Enabled
11	LO	one	Deasserted	Asserted	Lockout Status
12	CY	one	Deasserted	Asserted	Cycle Status
13	RS	one	Deasserted	Asserted	Reset Status
14	N	one	Deasserted	Asserted	N Target
15	G	one	Deasserted	Asserted	G Target
16	C	one	Deasserted	Asserted	C Target
17	B	one	Deasserted	Asserted	B Target
18	A	one	Deasserted	Asserted	A Target
19	LDPF3	one	Deasserted	Asserted	Leading Power Factor
20	RLYDIS	one	Deasserted	Asserted	Relay Disabled Status
21	STFAIL	one	Deasserted	Asserted	Status Failure
22	STWARN	one	Deasserted	Asserted	Status Warning
23	UNRDEV	one	Deasserted	Asserted	Unread Event Available
24		one	Deasserted	Asserted	
Thru					
199		one	Deasserted	Asserted	

3.2 DOUBLE-BIT INPUT POINTS Static (Steady-State) Group Number: **3** Event Group Number: **4**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.2.1 Static Variation reported when variation 0 requested:	☐ Variation 1 – Double-bit Packed format ☐ Variation 2 – Double-bit with flag ☐ Based on point Index (add column to table below)		
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 (add column to table below)		
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 reported.*	☐ Always ☐ Never ☐ Only if point is assigned to Class 1, 2, or 3 ☐ Based on point Index (add column to table below)		
3.2.5 Definition of Double-bit Input Point List: *List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.*	☐ Fixed, list shown in table below ☐ Configurable(current list may be shown in table below) ☐ Other, explain_____		

Point Index	Name	Default Class Assigned to Events (1, 2, 3 or none)	Name for State when value is 0 (Intermediate)	Name for State when value is 1 (Off)	Name for State when value is 2 (On)	Name for State when value is 3 (Indeterminate)	Description
0							
1							
2							
: :	Add more rows as necessary						

3.3 BINARY OUTPUT STATUS AND CONTROL RELAY OUTPUT BLOCK Binary Output Status Group Number: **10** Binary Output Event Group Number: **11** CROB Group Number: **12** Binary Output Command Event Object Num: **13**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.3.1 Minimum pulse time allowed with Trip, Close, and Pulse On commands:	■ Fixed at **4** ms (hardware may limit this further) ☐ Based on point Index (add column to table below) Note: 1/4 cycle @ 60 Hz = 4 ms Pulse	Fixed at 4 ms	
3.3.2 Maximum pulse time allowed with Trip, Close, and Pulse On commands:	■ Fixed at **4** ms (hardware may limit this further) ☐ Based on point Index (add column to table below)	Fixed at 4 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 (add column to table below)	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 (add column to table below)	Two	
3.3.6 Command Event Variation reported when variation 0 requested:	☐ Variation 1 – without time ☐ Variation 2 – with absolute time ☐ Based on point Index (add column to table below)		
3.3.7 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		

3.3.8 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		

3.3.9 Maximum Time between Select and Operate:	☐ Not Applicable ☐ Fixed at _____ seconds ■ Configurable, range **0** to **60** seconds ☐ Configurable, selectable from___,___,___ seconds ☐ Configurable, other, describe_____ ☐ Variable, explain _____ ☐ Based on point Index (add column to table below)	1 second	Proprietary File via Other Mechanism ---------- terminal ---------- software **SEL-5030 AcSELerator Quickset**
3.3.10 Definition of Binary Output Status/Control relay output block (CROB) Point List: *List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.*	■ 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 AcSELerator Quickset**

		Supported Control Operations													Event Class Assigned (1,2,3 or none)		
Point Index	Name	Select/Operate	Direct Operate	Direct Operate - No Ack	Pulse On	Pulse Off	Latch On	Latch Off	Trip	Close	Count > 1	Cancel Currently Running Operation	Name for State when value is 0	Name for State when value is 1	Change	Command	Description
0	RB01	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Clear	Set			Remote Bit 01
1	RB02	Y	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		Y	Clear	Set			Remote Bit 03
3	RB04	Y	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		Y	Clear	Set			Remote Bit 05
5	RB06	Y	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		Y	Clear	Set			Remote Bit 07
7	RB08	Y	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		Y	Clear	Set			Remote Bit 09
9	RB10	Y	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		Y	Clear	Set			Remote Bit 11
11	RB12	Y	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		Y	Clear	Set			Remote Bit 13
13	RB14	Y	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		Y	Clear	Set			Remote Bit 15
15	RB16	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Clear	Set			Remote Bit 16
16	OC	Y	Y	Y	Y		Y			Y		Y	Clear	Set			Open Command
17	CC	Y	Y	Y	Y		Y			Y		Y	Clear	Set			Close Command
18	DRST_TAR	Y	Y	Y	Y		Y			Y		Y	Clear	Set			Reset Targets
19	NXTEVE	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Clear	Set			Load Event Registers with Next Event
20		Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			User Settable
thru		Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			
32		Y	Y	Y	Y		Y	Y	Y	Y		Y	Clear	Set			

3.4 COUNTERS/FROZEN COUNTERS Static Counter Group Number: **20** Static Frozen Counter Group Number: **21** Counter Event Group Number: **22** Frozen Counter Event Group 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 (add column to table below)	Six	
3.4.2 Counter Event 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 ☐ Based on point Index (add column to table below)	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 (add column to table below)	Always	
3.4.4 Counter 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 Counters.*	■ Only most recent ☐ All events	Most recent	
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 (add column to table below)		

3.4 COUNTERS/FROZEN COUNTERS Static Counter Group Number: **20** Static Frozen Counter Group Number: **21** Counter Event Group Number: **22** Frozen Counter Event Group Number: **23**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.4.6 Frozen Counter Event 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 ☐ Based on point Index (add column to table below)		
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 (add column to table below)	Never	
3.4.8 Frozen Counter 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 Frozen Counters.*	☐ Only most recent ☐ All events		
3.4.9 Counters Roll Over at:	■ 16 Bits (65,535) ☐ 32 Bits (4,294,967,295) ☐ Other Fixed Value _____ ☐ Configurable; range _____ to_____ ☐ Configurable, selectable from ___,___,___ ☐ Configurable, other, describe_____ ☐ Based on point Index (add column to table below)	16 Bits (65,535)	
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 COUNTERS/FROZEN COUNTERS Static Counter Group Number: **20** Static Frozen Counter Group Number: **21** Counter Event Group Number: **22** Frozen Counter Event Group Number: **23**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.4.11 Definition of Counter/Frozen Counter Point List: *List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.*	■ 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 AcSELerator Quickset**

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	INTTR	none	N		Internal Trips	
2	EXTTR	none	N		External Trips	
3						
4						
5						
6						

3.5 ANALOG INPUT POINTS Static (Steady-State) Group Number: **30** Event Group Number: **32**	**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 (add column to table below) Note: Setting DVARAIx defines default AI variation (1-6)	Four	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
3.5.2 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 (add column to table below) Note: Setting DVARAIx defines default AI event variation (1 or 3=1, 2 or 4=2, 5=5, 6=6)	Four	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
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. Only the most recent event is typically reported for Analog Inputs.*	■ Only most recent ☐ All events	Most recent – event time	

3.5 ANALOG INPUT POINTS Static (Steady-State) Group Number: **30** Event Group Number: **32**	**Capabilities**	**Current Value**	**If configurable, list methods**
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 (add column to table below)	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	A	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset** --- 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 _____	Simple	

3.5 ANALOG INPUT POINTS Static (Steady-State) Group Number: **30** Event Group Number: **32**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.5.7 Definition of Analog Input Point List: *List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.*	■ 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 AcSELerator Quickset**

			Transmitted Value		Scaling				
Point Index	Name	Event Class Assigned (1, 2, 3 or none)	Min	Max	Multiplier	Offset	Units	Resolution	Description
0	IA	two							Phase A Current (Mag)
1	IAFA	two							Phase A Current (Ang)
2	IB	two							Phase B Current (Mag)
3	IBFA	two							Phase B Current (Ang)
4	IC	two							Phase C Current (Mag)
5	ICFA	two							Phase C Current (Ang)
6	IN	two							Neutral Current (Mag)
7	INFA	two							Neutral current (Ang)
8	VA	two							Phase A Voltage (Mag)
9	VAFA	two							Phase A Voltage (Ang)
10	VB	two							Phase B Voltage (Mag)
11	VBFA	two							Phase B Voltage (Ang)
12	VC	two							Phase C Voltage (Mag)
13	VCFA	two							Phase C Voltage (Ang)
14	VS	two							Synchronizing Voltage (Mag)
15	VSFA	two							Synchronizing Voltage (Ang)
16	IG	two							Ground Current (Mag)
17	IGFA	two							Ground Current (Ang)
18	MW3	two							3 Phase Power
19	MVAR3	two							Reactive 3-Phase Power
20	PF3	two							3-Phase Power Factor
21	FREQ	two							Frequency
22	VDC	two							Station Battery DC voltage
23	MWH3I	two							Energy In
24	MWH3O	two							Energy Out
25	MVRH3I	two							Fault targets (Upper byte is 3rd target row, lower byte is 0)
26	MVRH3O	two							Fault Summary Location

			Transmitted Value		Scaling				
Point Index	Name	Event Class Assigned (1, 2, 3 or none)	Min	Max	Multiplier	Offset	Units	Resolution	Description
27	WEARA	two							Breaker Wear A Phase
28	WEARB	two							Breaker Wear B Phase
29	WEARC	two							Breaker Wear C Phase
30	FTYPE	two							Fault Type
31	FLOC	two							Fault Location
32	FI	two							Fault current
33	FFREQ	two							Fault Frequency
34	FGRP	two							Fault Group
35	FSHO	two							Fault Shot
36	FTIMEH								DNP Fault Time - High 16 bits
37	FTIMEM								DNP Fault Time - Middle 16 bits
38	FTIMEL								DNP Fault Time - Low 16 bits
39	FUNR								Number of Unread Faults
40									User Settable
Thru									
199									

3.6 ANALOG OUTPUT STATUS AND ANALOG OUTPUT CONTROL BLOCK Analog Output Status Group Number: **40** Analog Output Control Block Group Number: **41** Analogue Output Event Group Number: **42** Analogue Output Command Event Group 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 ☐ Variation 3 – single-precision floating point with flag ☐ Variation 4 – double-precision floating point with flag ☐ Based on point Index (add column to table below)	Two	
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 (add column to table below)	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:	☐ 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 (add column to table below)		

3.6 ANALOG OUTPUT STATUS AND ANALOG OUTPUT CONTROL BLOCK Analog Output Status Group Number: **40** Analog Output Control Block Group Number: **41** Analogue Output Event Group Number: **42** Analogue Output Command Event Group Number: **43**	**Capabilities**	**Current Value**	**If configurable, list methods**
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 (add column to table below)		
3.6.6 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 ANALOG OUTPUT STATUS AND ANALOG OUTPUT CONTROL BLOCK Analog Output Status Group Number: **40** Analog Output Control Block Group Number: **41** Analogue Output Event Group Number: **42** Analogue Output Command Event Group Number: **43**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.6.8 Maximum Time between Select and Operate:	☐ Not Applicable ☐ Fixed at _____ seconds ■ Configurable, range **0** to **60** seconds ☐ Configurable, selectable from___,___,___seconds ☐ Configurable, other, describe_____ ☐ Variable, explain _____ ☐ Based on point Index (add column to table below)	1 second	Proprietary File via Other Mechanism --- terminal --- software **SEL-5030 AcSELerator Quickset**
3.6.9 Definition of Analog Output Status/Analog Output Control Block Point List: *List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.*	■ 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 AcSELerator Quickset**

		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
1													
2													
3													
4													
5													
6													
7													

3.7 SEQUENTIAL FILE TRANSFER Group 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)		
3.7.2 File Authentication: *Indicates whether a valid authentication key must be obtained prior to open and delete requests.*	☐ Always ☐ Sometimes, explain _____ ☐ Never		
3.7.3 File Append Mode: *Indicates if a file can be opened and appended to versus just overwritten.*	☐ Always ☐ Sometimes, explain _____ ☐ 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 series of blocks of a maximum specified size. This indicates whether only a single block or multiple blocks will be sent in fragment.*	☐ Yes ☐ No		
3.7.6 Max number of Files Open at one time:	☐ Fixed at _____(enter 0 if files are not supported) ☐ Configurable, range _____ to _____ ☐ Configurable, selectable from ____,____,____ ☐ Configurable, other, describe_____		

3.7 SEQUENTIAL FILE TRANSFER Group Number: 70	Capabilities	Current Value	If configurable, list methods
3.7.7 Definition of File Names that may be read or written:	☐ Fixed, list shown in table below ☐ Configurable(current list may be shown in table below) ☐ Other, explain_____		

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

3.8 OCTET STRING POINTS Static (Steady-State) Group Number: **110** Event Group 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 event.*	☐ Only most recent ☐ All events Note: Not supported		
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 (add column to table below)		
3.8.3 Definition of Octet String Point List: *List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.*	☐ Fixed, list shown in table below ☐ Configurable(current list may be shown in table below ☐ Other, explain_____		

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

3.9 VIRTUAL TERMINAL PORT NUMBERS (POINTS) Static (Steady-State) Group Number: **112** Event Group Number: **113**	**Capabilities**	**Current Value**	**If configurable, list methods**
3.9.1 Definition of Virtual Terminal Port Numbers: *List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.*	■ Fixed, list shown in table below ☐ Configurable(current list may be shown in table below) ☐ Other, explain_____ Note: Not supported		

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

3.10 DATA SET PROTOTYPE Group Number: **85** Variation Number: **1** Duplicate this table for each Data Set Prototype defined	**Capabilities**	**Current Value**	**If configurable, list methods**
3.10.1 Definition of Data Set Prototypes:	☐ Fixed, a Data Set Prototype is shown in table below ☐ Configurable, list methods:_____ (a currently defined Data Set Prototype may be shown in table below) ☐ Other, explain_____ Note: Not supported		
3.10.2 Description:	_____ _____		

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

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

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

3.12 DATA SET DESCRIPTOR – POINT INDEX ATTRIBUTES

Group Number: **86**
Variation Number: **3**

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

Duplicate this table for each Data Set Descriptor defined

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

4 IMPLEMENTATION TABLE

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

NOTE	The implementation table must list all functionality required by the device whether Master or Outstation as defined within the DNP3 IED Conformance Test Procedures. Any functionality beyond the highest subset level supported is indicated by highlighted rows. Any Object Groups not provided by an outstation or not processed by a Master are indicated by ~~strikethrough~~ (note these Object Groups will still be parsed).

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	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)*

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

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)**
				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 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 - control relay output block	3*(select)*	17, 28 *(index)*	129 *(Response)*	echo of request
12	2	Pulsed Control - control relay output block	4*(operate)*	17, 28 *(index)*	129 *(Response)*	echo of request
12	2	Pulsed Control - control relay output block	5*(direct op.)*	17, 28 *(index)*	129 *(Response)*	echo of request
12	2	Pulsed Control - control relay output block	6*(direct op, no ack)*	17, 28 *(index)*	129 *(Response)*	echo of request
12	3	Pulsed Control - control relay output block	3*(select)*	17, 28 *(index)*	129 *(Response)*	echo of request
12	3	Pulsed Control - control relay output block	4*(operate)*	17, 28 *(index)*	129 *(Response)*	echo of request
12	3	Pulsed Control - control relay output block	5*(direct op.)*	17, 28 *(index)*	129 *(Response)*	echo of request
12	3	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)*,		

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
Object Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
				17, 28 *(index)*		
20	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)*,		

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
Object Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
				06 *(no range, or all)*, 07, 08 *(limited qty)*, 17, 28 *(index)*		
20	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		

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
Object Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
				(limited qty), 17, 28 *(index)*		
20	5	Counter - 32-bit without flag	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-*		

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)**
				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)*		
~~21~~	~~0~~	~~Frozen Counter – Any Variation~~	~~1 *(read)*~~	~~06 *(no range, or all)*~~		
~~21~~	~~1~~	~~Frozen Counter – 32 bit with flag~~			~~129 *(Response)*~~	~~00, 01 *(start-stop)*~~
~~21~~	~~2~~	~~Frozen Counter – 32 bit with flag~~			~~129 *(Response)*~~	~~00, 01 *(start-stop)*~~
~~21~~	~~9~~	~~Frozen Counter – 32 bit with flag~~			~~129 *(Response)*~~	~~00, 01 *(start-stop)*~~
~~21~~	~~10~~	~~Frozen Counter – 32 bit with flag~~			~~129 *(Response)*~~	~~00, 01 *(start-stop)*~~
22	0	Counter Change Event - any variation	1*(read)*	06 *(no range, or all)*, 07, 08 *(limited qty)*		
22	1	Counter Change Event - 32-bit with flag	1*(read)*	06 *(no range, or all)*, 07, 08 *(limited qty)*	129 *(Response)*	17, 28 *(index)*

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

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
Object Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
				stop), 06 *(no range, or all)*, 07, 08 *(limited qty)*, 17, 28 *(index)*	*(Response)*	*stop)*, 17, 28 *(index)*
30	5	Analog Input – Single-prec flt-pt with flag	1*(read)*	00, 01 *(start-stop)*, 06 *(no range, or all)*, 07, 08 *(limited qty)*, 17, 28 *(index)*	129 *(Response)*	00, 01 *(start-stop)*, 17, 28 *(index)*
30	6	Analog Input – Double-prec flt-pt with flag	1*(read)*	00, 01 *(start-stop)*, 06 *(no range, or all)*, 07, 08 *(limited qty)*, 17, 28 *(index)*	129 *(Response)*	00, 01 *(start-stop)*, 17, 28 *(index)*
32	0	Analog Input Change Event - any variation	1*(read)*	06 *(no range, or all)*, 07, 08 *(limited qty)*		
32	1	Analog Input Change Event - 32-bit without time	1*(read)*	06 *(no range, or all)*, 07, 08 *(limited qty)*	129 *(Response)*	17, 28 *(index)*
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	1*(read)*	06 *(no*	129	17, 28

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)**
		flag		*range, or all)*, 07, 08 *(limited qty)*	*(Response)*	*(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 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 flag	1*(read)*	06 *(no range, or all)*, 07, 08 *(limited qty)*	129 *(Response)*	17, 28 *(index)*
34	0	Analog Input Deadband - any variation	1*(read)*	00, 01 *(start-stop)*, 06 *(no range, or all)*, 07, 08 *(limited qty)*, 17, 28 *(index)*		
34	1	Analog Input Deadband - 16-bit	1*(read)*	00, 01 *(start-stop)*, 06 *(no range, or all)*, 07, 08 *(limited qty)*, 17, 28 *(index)*	129 *(Response)*	00, 01 *(start-stop)*, 17, 28 *(index)*
34	1	Analog Input Deadband - 16-bit	2*(write)*	00, 01 *(start-stop)*, 06 *(no range, or all)*, 07, 08 *(limited qty)*, 17, 28 *(index)*		
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)*,		

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
Object Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
				06 *(no range, or all)*, 07, 08 *(limited qty)*, 17, 28 *(index)*		
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)*		
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)*, 07, 08 *(limited qty)*, 17, 28*(index)*	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)*,	129 *(Response)*	00, 01 *(start-stop)*,

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
Object Group Number	Variation Number	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
				06 *(no range, or all)*, 07, 08 *(limited qty)*, 17, 28*(index)*		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-prec flt-pt	3*(select)*	17, 28 *(index)*	129 *(Response)*	echo of request
41	4	Analog Output – Double-prec flt-pt	4*(operate)*	17, 28 *(index)*	129 *(Response)*	echo of request
41	4	Analog Output – Double-prec flt-pt	5*(direct op.)*	17, 28 *(index)*	129 *(Response)*	echo of request
41	4	Analog Output – Double-prec flt-pt	6*(direct op, no ack)*	17, 28 *(index)*	129 *(Response)*	echo of request
50	1	Time and Date - absolute time	1*(read)*	07, 08 *(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,			129	07 *(limited*

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
Object Group Number	**Variation Number**	**Description**	**Function Codes (dec)**	**Qualifier Codes (hex)**	**Function Codes (dec)**	**Qualifier Codes (hex)**
		un-synchronized			*(Response)*	*qty = 1)*
~~52~~	~~1~~	~~Time Delay - fine~~			~~129 *(Response)*~~	~~07 *(limited qty = 1)*~~
52	2	Time Delay - fine			129 *(Response)*	07 *(limited qty = 1)*
60	0	Class Objects - class 0 data	1*(read)*	06 *(no range, or all)*		
60	0	Class Objects - class 1 data	20*(enable unsol.)*	06 *(no range, or all)*		
60	0	Class Objects - class 1 data	21*(disable unsol.)*	06 *(no range, or all)*		
60	1	Class Objects - class 0 data	1*(read)*	06 *(no range, or all)*		
60	2	Class Objects - class 1 data	1*(read)*	06 *(no range, or all)*, 07, 08 *(limited qty)*		
60	2	Class Objects - class 1 data	20*(enable unsol.)*	06 *(no range, or all)*		
60	2	Class Objects - class 1 data	21*(disable unsol.)*	06 *(no range, or all)*		
60	3	Class Objects - class 2 data	1*(read)*	06 *(no range, or all)*, 07, 08 *(limited qty)*		
60	3	Class Objects - class 2 data	20*(enable unsol.)*	06 *(no range, or all)*		
60	3	Class Objects - class 2 data	21*(disable unsol.)*	06 *(no range, or all)*		
60	4	Class Objects - class 3 data	1*(read)*	06 *(no range, or all)*, 07, 08 *(limited qty)*		
60	4	Class Objects - class 3 data	20*(enable unsol.)*	06 *(no range, or all)*		
60	4	Class Objects - class 3 data	21*(disable unsol.)*	06 *(no range, or all)*		
80	1	Internal Indications - packed format	2*(write)*	00 *(start-stop)*		
80	1	Internal Indications - packed format	2*(write)*	01 *(start-stop)*		