# DNP3 Device Profile
## *Based on DNP XML Schema version 2.08.00*

### Document Name: PLX51-DNPS Device Profile

### Document Description: PLX51-DNPS DNP3 Device Profile Document

### Revision History

| Date | Time | Version | Reason for change | Edited by |
|---|---|---|---|---|
| 2021-04-17 | 06:37:00 | 1004 | v1.001 - Initial Version v1.002 - Updated the firmware revision v1.003 - Updated the firmware revision to the release v1.004 - Update firmware to v1.003.017 which included: - Support for Analog Deadband update from DNP Master - Configurable TCP and UDP ports for DNP - Support for enabling unsolicited responses on a DNP3 point resolution - Support for assigning event classes on a DNP3 point resolution - Time based event logging - Device Trouble Flag when operating interface is offline - Support for Octet Strings | ProSoft Technology |

## Reference Device:

### 1 Device Properties

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

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

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

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

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

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

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

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

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

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

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

| **1.1 Device Identification** | **Capabilities** | **Current Value** | **If configurable list methods** |
|---|---|---|---|
| 1.1.1 Device Function:<br><br>*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<br>◉ Outstation | ○ Master<br>◉ Outstation | |
| 1.1.2 Vendor Name:<br><br>*The name of the organization producing the device.*<br><br>*Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 252.* | | ProSoft Technology | |
| 1.1.3 Device Name:<br><br>*The model and name of the device, sufficient to distinguish it from any other device from the same organization.*<br><br>*Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 250.* | | PLX51-DNPS | |
| 1.1.4 Device manufacturer's hardware version string:<br><br>*Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 243.* | | N/A | |
| 1.1.5 Device manufacturer's software version string:<br><br>*Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 242.* | | 1.003.017 | |
| 1.1.6 Device Profile Document Version Number:<br><br>*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 | |
| 1.1.7 DNP Levels Supported for:<br><br>*Indicate each DNP3 Level to which the device conforms fully. For Masters, requests and responses can be indicated independently.* | Outstations Only<br>Requests and Responses<br>☑ None<br>☑ Level 1<br>☑ Level 2<br>☑ Level 3<br>☑ Level 4 | | Proprietary File via Other Mechanism<br>---------- |

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| 1.1.8 Supported Function Blocks: | ☐ Self Address Support<br>☐ Data Sets<br>☐ File Transfer<br>☐ Virtual Terminal<br>☐ Mapping to IEC 61850 Object Models defined in a DNP3 XML file<br>☐ Function code 31, activate configuration<br>☑ Secure Authentication (if checked then see 1.12) | Secure Authentication | Proprietary File via Other Mechanism<br>---------- |
| 1.1.9 Notable Additions:<br><br>*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.* | | | |
| 1.1.10 Methods to set Configurable Parameters: | ☐ XML - Loaded via DNP3 File Transfer<br>☐ XML - Loaded via other transport mechanism<br>☐ Terminal - ASCII Terminal Command Line<br>☐ Software - Vendor software named<br>☐ Proprietary file loaded via DNP3 File Transfer<br>☑ Proprietary file loaded via other transport mechanism<br>☐ Direct - Keypad on device front panel<br>☐ Factory - Specified when device is ordered<br>☑ Protocol - Set via DNP3 (e.g. assign class)<br>☐ Other - explain: | Protocol | |
| 1.1.11 DNP3 XML files available On-line:<br><br>*XML configuration file names that can be read or written through DNP3 File Transfer to a device.*<br><br>*A device's currently running configuration is returned by DNP3 on-line XML file read from the device.*<br><br>*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<br>☐ dnpDP.xml — Complete Device Profile<br>☐ dnpDPCap.xml — Device Profile Capabilities<br>☐ dnpDPCfg.xml — Device Profile config values | Rd Wr Filename<br>☐ dnpDP.xml<br>☐ dnpDPCap.xml<br>☐ dnpDPCfg.xml | |
| 1.1.12 External DNP3 XML files available Off-line:<br><br>*XML configuration file names that can be read or written from an external system, typically from a system that maintains the outstation configuration.*<br><br>*External off-line XML file read permits an XML definition of a new configuration to be supplied from off-line configuration tools.*<br><br>*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<br>☐ ☐ dnpDP.xml — Complete Device Profile<br>☐ ☐ dnpDPCap.xml — Device Profile Capabilities<br>☐ ☐ dnpDPCfg.xml — Device Profile config values | Rd Wr Filename<br>☐ ☐ dnpDP.xml<br>☐ ☐ dnpDPCap.xml<br>☐ ☐ dnpDPCfg.xml | |

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| 1.1.13 Connections Supported: | ☑ Serial (complete section 1.2)<br>☑ IP Networking (complete section 1.3)<br>☐ Other, explain | Serial<br>IP Networking | Proprietary File via Other Mechanism<br>---------- |

| **1.2 Serial Connections** | **Capabilities** | **Current Value** | **If configurable list methods** |
|---|---|---|---|
| 1.2.1 Port Name:<br><br>*Name used to reference the communications port defined in this section.* | | | |
| 1.2.2 Serial Connection Parameters: | ☑ Asynchronous - 8 Data Bits, 1 Start Bit, 1 Stop Bit, No Parity<br>☐ Other, explain<br><br>Note: Implemented in Target Layer | Asynchronous | |
| 1.2.3 Baud Rate: | ☐ Fixed at<br>☐ Configurable, range to<br>☑ Configurable, selectable from **1200**, **2400**, **4800**, **9600**, **19200**, **38400**, **57600**, **115200**<br>☐ Configurable, other, describe<br><br>Note: Implemented in Target Layer | | |

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| 1.2.4 Hardware Flow Control (Handshaking):<br><br>*Describe hardware signaling requirements of the interface.*<br><br>*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.*<br><br>*Where a signal is asserted prior to transmitting, that signal will be maintained active until after the end of transmission.*<br><br>*Where a signal is asserted to enable reception, any data sent to the device when the signal is not active could be discarded.* | ☑ None<br>**RS-232 / V.24 / V.28 Options:**<br>Asserts:<br>☐ RTS Before Tx<br>☐ DTR Before Tx<br>☐ RTS Before Rx<br>☐ DTR Before Rx<br>☐ Always RTS<br>☐ Always DTR<br>Requires Before Tx:<br>CTS ☐ Asserted ☐ Deasserted<br>DCD ☐ Asserted ☐ Deasserted<br>DSR ☐ Asserted ☐ Deasserted<br>RI ☐ Asserted ☐ Deasserted<br>☐ Requires Rx Inactive before Tx<br>Requires Before Rx:<br>CTS ☐ Asserted ☐ Deasserted<br>DCD ☐ Asserted ☐ Deasserted<br>DSR ☐ Asserted ☐ Deasserted<br>RI ☐ Asserted ☐ Deasserted<br>Always Ignores:<br>☐ CTS<br>☐ DCD<br>☐ DSR<br>☐ RI<br>☐ Other, explain<br><br>**RS-422 / V.11 Options:**<br>☐ Requires Indication before Rx<br>☐ Asserts Control before Tx<br>☐ Other, explain<br><br>**RS-485 Options:**<br>☐ Requires Rx inactive before Tx<br>☐ Other, explain<br><br>☑ Other, explain **Sofware** | None **RS-232 / V.24 / V.28 Options:**<br>Other,<br><br>**RS-422 / V.11 Options:**<br><br>**RS-485Options:** Other, | |
| 1.2.5 Interval to Request Link Status:<br><br>*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<br>☐ Fixed at seconds<br>☐ Configurable, range to seconds<br>☐ Configurable, selectable from seconds<br>☐ Configurable, other, describe | | Proprietary File via Other Mechanism<br>---------- |

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| 1.2.6 Supports DNP3 Collision Avoidance:<br><br>*Indicates whether an Outstation uses a collision avoidance algorithm.*<br><br>*Collision avoidance may be implemented by a back-off timer with two parameters that define the back-off time range or by some other vendor-specific mechanism.*<br><br>*The recommended back-off time is specified as being a fixed minimum delay plus a random delay, where the random delay has a maximum value specified. This defines a range of delay times that are randomly distributed between the minimum value and the minimum plus the maximum of the random value.*<br><br>*If a back-off timer is implemented with only a fixed or only a random value, select the Back-off time method and set the parameter that is not supported to "Fixed at 0 ms".* | ☑ No<br>☐ Yes, using Back-off time = (Min + Random) method<br>☐ Other, explain | No | |
| 1.2.7 Receiver Inter-character Timeout:<br><br>*When serial interfaces with asynchronous character framing are used, this parameter indicates if the receiver makes a check for gaps between characters. (i.e. extensions of the stop bit time of one character prior to the start bit of the following character within a message). If the receiver performs this check and the timeout is exceeded then the receiver discards the current data link frame. A receiver that does not discard data link frames on the basis of inter-character gaps is considered not to perform this check.*<br><br>*Where no asynchronous serial interface is fitted this parameter is not applicable. In this case none of the options shall be selected.* | ☑ Not Checked<br>☐ No gap permitted<br>☐ Fixed at bit times<br>☐ Fixed at ms<br>☐ Configurable, range to bit times<br>☐ Configurable, range to ms<br>☐ Configurable, selectable from bit times<br>☐ Configurable, selectable from ms<br>☐ Configurable, other, describe<br>☐ Variable, explain | Not Checked | |
| 1.2.8 Inter-character gaps in transmission:<br><br>*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.*<br><br>*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)<br>☐ Maximumbit times<br>☐ Maximumms | None | |

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

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| 1.3.3 IP Address of this Device: | | *.*.*.* | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.3.4 Subnet Mask: | | | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.3.5 Gateway IP Address: | | | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.3.6 Accepts TCP Connections or UDP Datagrams from: | ☑ Allows all (show as *.*.*.* in 1.3.7)<br>☑ Limits based on IP address<br>☑ Limits based on list of IP addresses<br>☐ Limits based on a wildcard IP address<br>☐ Limits based on list of wildcard IP addresses<br>☐ Other, explain | Allows all | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.3.7 IP Address(es) from which TCP Connections or UDP Datagrams are accepted: | | *.*.*.* | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.3.8 TCP Listen Port Number:<br><br>*If Outstation or dual end point Master, port number on which to listen for incoming TCP connect requests. Required to be configureable for Masters and recommended to be configurable for Outstations.* | ☐ Not Applicable (Master w/o dual end point)<br>☐ Fixed at 20,000<br>☑ Configurable, range **0** to **65535**<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | 20000 | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.3.9 TCP Listen Port Number of remote device:<br><br>*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)<br>☐ Fixed at 20,000<br>☑ Configurable, range **0** to **65535**<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | 20000 | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.3.10 TCP Keep-alive timer:<br><br>*The time period for the keep-alive timer on active TCP connections.* | ☐ Fixed at ms<br>☑ Configurable, range **0** to **2147483647**ms<br>☐ Configurable, selectable from ms<br>☐ Configurable, other, describe | 0 ms | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.3.11 Local UDP port:<br><br>*Local UDP port for sending and/or receiving UDP datagrams. Masters may let system choose an available port. Outstations must use one that is known by the Master.* | ☐ Fixed at 20,000<br>☑ Configurable, range **0** to **65535**<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe<br>☑ Let system choose (Master only) | 20000 | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.3.12 Destination UDP port for DNP3 Requests (Masters Only): | ☐ Fixed at 20,000<br>☑ Configurable, range **0** to **65535**<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | 20000 | Proprietary File via Other Mechanism<br>---<br>--- |

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| 1.3.13 Destination UDP port for initial unsolicited null responses (UDP only Outstations):<br><br>*The destination UDP port for sending initial unsolicited Null response.* | ☐ None<br>☐ Fixed at 20,000<br>☑ Configurable, range **0** to **65535**<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.3.14 Destination UDP port for responses (UDP only Outstations):<br><br>*The destination UDP port for sending all responses other than the initial unsolicited Null response.* | ☐ None<br>☐ Fixed at 20,000<br>☑ Configurable, range **0** to **65535**<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe<br>☐ Use source port number | 20000 | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.3.15 Multiple outstation connections (Masters only):<br><br>*Indicates whether multiple outstation connections are supported.* | ☐ Supports multiple outstations (Masters only) | | |
| 1.3.16 Multiple master connections (Outstations only):<br><br>*Indicates whether multiple master connections are supported and the method that can be used to establish connections.* | ☑ Supports multiple masters (Outstations only)<br><br>If supported, the following methods may be used:<br>☑ Method 1 (based on IP address) - required<br>☑ Method 2 (based on IP port number) - recommended<br>☐ Method 3 (browsing for static data) - optional | IP address | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.3.17 Time synchronization support: | ☑ DNP3 LAN procedure (function code 24)<br>☑ DNP3 Write Time (not recommended over LAN)<br>☐ Other, explain<br><br>☐ Not Supported | LAN procedure | Proprietary File via Other Mechanism<br>---<br>--- |

| **1.4 Link Layer** | **Capabilities** | **Current Value** | **If configurable list methods** |
|---|---|---|---|
| 1.4.1 Data Link Address:<br><br>*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<br>☑ Configurable, range **0** to **65519**<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | 1 | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.4.2 DNP3 Source Address Validation:<br><br>*Indicates whether the Outstation will filter out requests not from a specific source address.* | ☐ Never<br>☑ Always, one address allowed (shown in 1.4.3)<br>☐ Always, any one of multiple addresses allowed (each selectable as shown in 1.4.3)<br>☐ Sometimes, explain | | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.4.3 DNP3 Source Address(es) expected when Validation is Enabled:<br><br>*Selects the allowed source address(es)* | ☐ Configurable to any 16 bit DNP Data Link Address value<br>☑ Configurable, range **0** to **65519**<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | 3 | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.4.4 Self Address Support using address 0xFFFC:<br><br>*If an Outstation receives a message with a destination address of 0xFFFC it shall respond normally with its own source address. It must be possible to diasble this feature if supported.* | ☐ Yes (only allowed if configurable)<br>☑ No | No | Proprietary File via Other Mechanism<br>---<br>--- |

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| 1.4.5 Sends Confirmed User Data Frames:<br><br>*A list of conditions under which the device transmits confirmed link layer services (TEST_LINK_STATES, RESET_LINK_STATES, CONFIRMED_USER_DATA).* | ☑ Never<br>☑ Always<br>☐ Sometimes, explain | Never | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.4.6 Data Link Layer Confirmation Timeout:<br><br>*This timeout applies to any secondary data link message that requires a confirm or response (link reset, link status, user data, etc).* | ☑ None<br>☐ Fixed at ms<br>☐ Configurable, range to ms<br>☐ Configurable, selectable from ms<br>☐ Configurable, other, describe<br>☐ Variable, explain | | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.4.7 Maximum Data Link Retries:<br><br>*The number of times the device will retransmit a frame that requests Link Layer confirmation.* | ☑ None<br>☐ Fixed at<br>☐ Configurable, range to<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.4.8 Maximum number of octets Transmitted in a Data Link Frame:<br><br>*This number includes the CRCs. With a length field of 255, the maximum size would be 292.* | ☑ Fixed at **292**<br>☐ Configurable, range to<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | 292 | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.4.9 Maximum number of octets that can be Received in a Data Link Frame:<br><br>*This number includes the CRCs. With a field length of 255, the maximum size would be 292. The device must be able to receive 292 octets to be compliant.* | ☑ Fixed at **292**<br>☐ Configurable, range to<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | | Proprietary File via Other Mechanism<br>---<br>--- |

| **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:<br><br>*This size does not include any transport or frame octets.*<br>*- Masters must provide a setting less than or equal to 249 to be compliant.*<br>*- Outstations must provide a setting less than or equal to 2048 to be compliant.*<br><br>*Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 240.* | ☐ Fixed at<br>☑ Configurable, range **248** to **4096**<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | 2048 | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.5.2 Maximum number of octets Transmitted in an Application Layer Fragment containing File Transfer: | ☐ Fixed at<br>☑ Configurable, range **256** to **65535**<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | 2048 | Proprietary File via Other Mechanism<br>---<br>--- |

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| 1.5.3 Maximum number of octets that can be received in an Application Layer Fragment:<br><br>*This size does not include any transport or frame octets.*<br>*- Masters must provide a setting greater than or equal to 2048 to be compliant.*<br>*- Outstations must provide a setting greater than or equal to 249 to be compliant.*<br><br>*Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 241.* | ☑ Fixed at **256**<br>☐ Configurable, range to<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | 2048 | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.5.4 Timeout waiting for Complete Application Layer Fragment:<br><br>*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<br>☐ Fixed at ms<br>☑ Configurable, range **100** to **65000**ms<br>☐ Configurable, selectable from ms<br>☐ Configurable, other, describe<br>☐ Variable, explain | | |
| 1.5.5 Maximum number of objects allowed in a single control request for CROB (Group 12):<br><br>*Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 216.* | ☑ Fixed at **256**(enter 0 if controls are not supported for CROB)<br>☐ Configurable, range to<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe<br>☐ Variable, explain | 10 | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.5.6 Maximum number of objects allowed in a single control request for Analog Outputs (Group 41): | ☑ Fixed at **256**(enter 0 if controls are not supported for Analog Outputs)<br>☐ Configurable, range to<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe<br>☐ Variable, explain | | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.5.7 Maximum number of objects allowed in a single control request for Data Sets (Groups 85, 86, 87): | ☐ Fixed at (enter 0 if controls are not supported for Data Sets)<br>☐ Configurable, range to<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe<br>☐ Variable, explain | | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.5.8 Supports mixed object groups (AOBs, CROBs and Data Sets) in the same control request: | ☐ Not applicable - controls are not supported<br>☑ Yes<br>☑ No | Yes | Proprietary File via Other Mechanism<br>---<br>--- |

| **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<br>☐ Fixed at ms<br>☑ Configurable, range **100** to **65000**ms<br>☐ Configurable, selectable from ms<br>☐ Configurable, other, describe<br>☐ Variable, explain | 10000ms | Proprietary File via Other Mechanism<br>---<br>--- |

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| 1.7.2 How often is time synchronization required from the master:<br><br>*Details of when the master needs to perform a time synchronization to ensure that the outstation clock does not drift outside of an acceptable tolerance. If the option to relate this to IIN1.4 is used then details of when IIN1.4 is asserted are in section 1.10.2.* | ☐ Never needs time<br>☐ Within seconds after IIN1.4 is set<br>☑ Periodically, fixed at **1800** seconds<br>☐ Periodically, between and seconds | Periodically, every 1800 seconds. | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.7.3 Device Trouble Bit IIN1.6:<br><br>*If IIN1.6 device trouble bit is set under certain conditions, explain the possible causes.* | ☐ Never used<br>☑ Reason for setting**When communication to the operating interface is lost** | | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.7.4 File Handle Timeout:<br><br>*If there is no activity referencing a file handle for a configurable length of time, the outstation must do an automatic close on the file. The timeout value must be configurable up to 1 hour. When this condition occurs the outstation will send a File Transport Status Object (obj grp 70 var 6) using a status code value of handle expired (0x02).* | ☑ Not applicable, files not supported<br>☐ Fixed at ms<br>☐ Configurable, range to ms<br>☐ Configurable, selectable from ms<br>☐ Configurable, other, describe<br>☐ Variable, explain | | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.7.5 Event Buffer Overflow Behavior: | ☑ Discard the oldest event<br>☐ Discard the newest event<br>☑ Other, explain**Can also be configured to stop logging when max is reached** | Discard oldest | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.7.6 Event Buffer Organization:<br><br>*Explain how event buffers are arranged (per Object Group, per Class, single buffer etc) and provide their sizes.* | Each data point can be configured to have it's own DNP event class.This can be done using the PLX50CU software or from the DNP Master. | Each data point can be configured to have it's own DNP event class.This can be done using the PLX50CU software or from the DNP Master. | Proprietary File via Other Mechanism<br>---<br>protocol<br>---<br>--- |
| 1.7.7 Sends Multi-Fragment Responses:<br><br>*Indicates whether an Outstation sends multi-fragment responses (Masters do not send multi-fragment requests).* | ☑ Yes<br>☑ No | Yes | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.7.8 Last Fragment Confirmation:<br><br>*Indicates whether the Outstation requests confirmation of the last fragment of a multi-fragment response.* | ☐ Always<br>☑ Sometimes, explain**Only when it contains events or it is a multi application segment response**<br>☐ Never | Sometimes | |
| 1.7.9 DNP Command Settings preserved through a device restart:<br><br>*If any of these settings are written through the DNP protocol and they are not preserved through a restart of the Outstation, the Master will have to write them again after it receives a response in which the Restart IIN bit is set.* | ☑ Assign Class<br>☑ Analog Deadbands<br>☐ Data Set Prototypes<br>☐ Data Set Descriptors<br>☐ Function Code 31 Activate Configuration | | Proprietary File via Other Mechanism<br>---<br>--- |

| **1.8 Outstation Unsolicited Response Support** | **Capabilities** | **Current Value** | **If configurable list methods** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 1.8.1 Supports Unsolicited Reporting:<br><br>*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<br>☑ Configurable, selectable from On and Off | Off | Proprietary File via Other Mechanism<br>---<br>protocol<br>--- |
| 1.8.2 Master Data Link Address:<br><br>*The destination address of the master device where the unsolicited responses will be sent.* | ☐ Fixed at<br>☑ Configurable, range **0** to **65519**<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | | Proprietary File via Other Mechanism<br>--- |
| 1.8.3 Unsolicited Response Confirmation Timeout:<br><br>*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<br>☑ Configurable, range **100** to **65000**ms<br>☐ Configurable, selectable from ms<br>☐ Configurable, other, describe<br>☐ Variable, explain | 10000 ms | Proprietary File via Other Mechanism<br>--- |
| 1.8.4 Number of Unsolicited Retries:<br><br>*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<br>☐ Fixed at<br>☑ Configurable, range **0** to **10**<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe<br>☐ Always infinite, never gives up | 3 | Proprietary File via Other Mechanism<br>--- |

| **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<br>☐ Fixed at<br>☑ Configurable, range **1** to **512**<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | 5 | Proprietary File via Other Mechanism<br>--- |
| 1.9.2 Number of class 2 events: | ☑ Class 2 not used to trigger Unsolicited Responses<br>☐ Fixed at<br>☑ Configurable, range **1** to **512**<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | 5 | Proprietary File via Other Mechanism<br>--- |
| 1.9.3 Number of class 3 events: | ☑ Class 3 not used to trigger Unsolicited Responses<br>☐ Fixed at<br>☑ Configurable, range **1** to **512**<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | 5 | Proprietary File via Other Mechanism<br>--- |

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|---|---|---|---|
| 1.9.4 Total number of events from any class: | ☑ Total Number of Events not used to trigger Unsolicited Responses<br>☐ Fixed at<br>☐ Configurable, range to<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | | |
| 1.9.5 Hold time after class 1 event:<br><br>*A configurable value of 0 indicates that responses are not delayed due to this parameter.* | ☑ Class 1 not used to trigger Unsolicited Responses<br>☐ Fixed at ms<br>☑ Configurable, range **0** to **65535000**ms<br>☐ Configurable, selectable from ms<br>☐ Configurable, other, describe | 5000 ms | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.9.6 Hold time after class 2 event:<br><br>*A configurable value of 0 indicates that responses are not delayed due to this parameter.* | ☑ Class 2 not used to trigger Unsolicited Responses<br>☐ Fixed at ms<br>☑ Configurable, range **0** to **65535000**ms<br>☐ Configurable, selectable from ms<br>☐ Configurable, other, describe | 5000 ms | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.9.7 Hold time after class 3 event:<br><br>*A configurable value of 0 indicates that responses are not delayed due to this parameter.* | ☑ Class 3 not used to trigger Unsolicited Responses<br>☐ Fixed at ms<br>☑ Configurable, range **0** to **65535000**ms<br>☐ Configurable, selectable from ms<br>☐ Configurable, other, describe | 5000 ms | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.9.8 Hold time after event assigned to any class:<br><br>*A configurable value of 0 indicates that responses are not delayed due to this parameter.* | ☑ Class events not used to trigger Unsolicited Responses<br>☐ Fixed at ms<br>☐ Configurable, range to ms<br>☐ Configurable, selectable from ms<br>☐ Configurable, other, describe | | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.9.9 Retrigger Hold Time:<br><br>*The hold-time timer may be retriggered for each new event detected (increased possibility of capturing all the changes in a single response) or not retriggered (giving the master a guaranteed update time).* | ☑ Hold-time timer will be retriggered for each new event detected (may get more changes in next response)<br>☐ Hold-time timer will not be retriggered for each new event detected (guaranteed update time) | | |
| 1.9.10 Other Unsolicited Response Trigger Conditions: | | Other, | |

| **1.10 Outstation Performance** | **Capabilities** | **Current Value** | **If configurable list methods** |
|---|---|---|---|
| 1.10.1 Maximum Time Base Drift (milliseconds per minute):<br><br>*If the device is synchronized by DNP, what is the clock drift rate over the full operating temperature range.* | ☑ Fixed at **0**ms<br>☐ Range to ms<br>☐ Selectable from ms<br>☐ Other, describe | 0 ms | |

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| 1.10.2 When does outstation set IIN1.4:<br><br>*When does the outstation set the internal indication IIN1.4 NEED_TIME* | ☐ Never<br>☑ Asserted at startup until first Time Synchronization request received<br>☑ Periodically every **1800** seconds<br>☐ Periodically, range to seconds<br>☐ Periodically, selectable from seconds<br>☐ seconds after last time sync<br>☐ Range to seconds after last time sync<br>☐ Selectable from seconds after last time sync<br>☐ When time error may have drifted by ms<br>☐ When time error may have drifted by range to ms<br>☐ When time error may have drifted by selectable from ms | | Proprietary File via Other Mechanism<br>---------- |
| 1.10.3 Maximum Internal Time Reference Error when set via DNP (ms):<br><br>*The difference between the time set in DNP Write Time message, and the time actually set in the outstation.* | ☑ Fixed at **0** ms<br>☐ Range to ms<br>☐ Selectable from ms<br>☐ Other, describe | 0 ms | |
| 1.10.4 Maximum Delay Measurement Error (ms):<br><br>*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 **0** ms<br>☐ Range to ms<br>☐ Selectable from ms<br>☐ Other, describe | 0 ms | |
| 1.10.5 Maximum Response Time (ms):<br><br>*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 **0** ms<br>☐ Range to ms<br>☐ Selectable from ms<br>☐ Other, describe | 0 ms | |
| 1.10.6 Maximum time from start-up to IIN 1.4 assertion (ms): | ☑ Fixed at **0** ms<br>☐ Range to ms<br>☐ Selectable from ms<br>☐ Other, describe | 0 ms | |
| 1.10.7 Maximum Event Time-tag error for local Binary and Double Bit I/O (ms):<br><br>*The error between the time-tag reported and the absolute time of the physical event. This error includes the Internal Time Reference Error. Note: The current value of this parameter is available remotely using protocol object Group 0 Variation 217.* | ☑ Fixed at **0** ms<br>☐ Range to ms<br>☐ Selectable from ms<br>☐ Other, describe | 0 ms | |
| 1.10.8 Maximum Event Time-tag error for local I/O other than Binary and Double Bit data types (ms): | ☑ Fixed at **0** ms<br>☐ Range to ms<br>☐ Selectable from ms<br>☐ Other, describe | 0 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): | | Proprietary File via Other Mechanism<br>---------- |

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|---|---|---|
| 1.11.2 User-assigned ID code/number string (same as g0v246): | | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.11.3 User-assigned name string for the outstation (same as g0v247): | This can be configured in PLX50CU software or directly read from the local module (instance name in PXL50CU) | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.11.4 Device Serial Number string (same as g0v248): | This can be configured in PLX50CU software or directly read from the local module (module serial number) | Proprietary File via Other Mechanism<br>---<br>--- |

| **1.12 Security Parameters** | **Capabilities** | **Current Value** | **If configurable list methods** |
|---|---|---|---|
| 1.12.1 DNP3 device support for secure authentication:<br><br>*The support for secure authentication is optional in DNP3 devices. Indicate here if the device supports secure authentication.*<br><br>*If the device does not support secure authentication then ignore the rest of this section.*<br><br>*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 DNP3 Specification. The Secure Authentication procedure defined in IEEE 1815-2010 is version 2. The Secure Authentication procedure defined in IEEE 1815-2012 is version 5.* | ☐ Secure Authentication not supported<br><br>If Secure Authentication is supported, what Version(s) are supported:<br>☐ Fixed at<br>☑ Configurable, selectable from **2**, **5** | Supports security Version: 5 | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.12.2 Maximum number of users:<br><br>*The secure authentication algorithm provides support for multiple users. The device must support details for each user (update keys, session keys, etc). A user is identified by a 16-bit user number, allowing a maximum of 65535 users. Devices are not mandated to support this number of potential users. Indicate here the actual limit to the number of simultaneous users that can be supported.* | Maximum nunber of users supported: 1 | Maximum number of users supported: 1 | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.12.3 Security message response timeout:<br><br>*Authentication of critical messages may involve additional message exchanges (challenges and responses) which can require an extension to the normal DNP3 message response timeout. This timeout specifies an additional time to be used when the extra security transactions are involved. The maximum allowable timeout extension should not exceed 120 seconds.* | ☐ Fixed at ms<br>☑ Configurable, range **1** to **65**ms<br>☐ Configurable, selectable from ms<br>☐ Configurable, other, describe | 2 ms | Proprietary File via Other Mechanism<br>---<br>--- |

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| 1.12.4 Aggressive mode of operation (receive):<br><br>*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<br>○ No, does not accept aggressive mode requests | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.12.5 Aggressive mode of operation (issuing):<br><br>*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<br>○ No, does not issue aggressive mode requests | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.12.6 Session key change interval:<br><br>*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.*<br><br>*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<br><br>When enabled<br>☑ Configurable, range **1** to **4294967**seconds | Enabled<br>86400 seconds | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.12.7 Session key change message count:<br><br>*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 | | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.12.8 Maximum error count:<br><br>*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 **1** to **1** | 1 | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.12.9 MAC algorithm requested in a challenge exchange:<br><br>*Part of the authentication message is hashed using an MAC algorithm. Secure Authentication version 2 specifies that DNP3 devices must support SHA-1 and may optionally support SHA-256 for this hashing process. Secure Authentication version 5 specifies that SHA-256 is the default. The output of the MAC algorithm is truncated (the resulting length dependant on the media being used).* | ☑ SHA-1 (truncated to the leftmost 4 octets)<br>☑ SHA-1 (truncated to the leftmost 8 octets)<br>☑ SHA-1 (truncated to the leftmost 10 octets)<br>☑ SHA-256 (truncated to the leftmost 8 octets)<br>☑ SHA-256 (truncated to the leftmost 16 octets)<br>☑ AES-GMAC<br>☐ Other, explain: | SHA-256 (16) | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.12.10 Key-wrap algorithm to encrypt session keys:<br><br>*During the update of a session key, the key is encrypted using AES-128 or optionally using other algorithms.* | ☑ AES-128<br>☑ AES-256<br>☐ RSAES-OAEP-1024 / SHA-1<br>☐ RSAES-OAEP-2048 / SHA-256<br>☐ RSAES-OAEP-3072 / SHA-256<br>☐ Other, explain: | AES-128 | Proprietary File via Other Mechanism<br>---<br>--- |

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| 1.12.11 Cipher Suites used with DNP implementations using TLS:<br><br>*When TLS is supported, DNP3 Secure Authentication mandates the support of TLS_RSA_WITH_AES_128_SHA. The specification has a number of recommended cipher suite combinations. Indicate the supported Cipher Suites for implementations using TLS.* | ☑ Not relevant - TLS is not used<br>☐ TLS_RSA encrypted with AES128<br>☐ TLS_RSA encrypted with RC4_128<br>☐ TLS_RSA encrypted with 3DES_EDE_CBC<br>☐ TLS_DH, signed with DSS, encrypted with 3DES_EDE_CBC<br>☐ TLS_DH, signed with RSA, encrypted with 3DES_EDE_CBC<br>☐ TLS_DHE, signed with DSS, encrypted with 3DES_EDE_CBC<br>☐ TLS_DHE, signed with RSA, encrypted with 3DES_EDE_CBC<br>☐ TLS_DH, signed with DSS, encrypted with AES128<br>☐ TLS_DH, signed with DSS, encrypted with AES256<br>☐ TLS_DH encrypted with AES128<br>☐ TLS_DH encrypted with AES256<br>☐ Other, explain: | Not relevant | |
| 1.12.12 Change cipher request timeout:<br><br>*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<br>☐ Fixed at<br>☐ Configurable, range to<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | Not relevant | |
| 1.12.13 Number of Certificate Authorities supported:<br><br>*Implementations using TLS shall support at least 4 Certificate Authorities. Indicate the number supported.* | | 0 | |
| 1.12.14 Certificate Revocation check time:<br><br>*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<br>☐ Fixed at hours<br>☐ Configurable, range to hours<br>☐ Configurable, selectable from hours<br>☐ Configurable, other, describe | Not relevant | |
| 1.12.15 Additional critical function codes:<br><br>*The DNP3 specification 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.*<br><br>*Note: Secure Authentication version 5 defines additional functions as critical that were not considered critical in version 2. These are shown in the next column annotated with "V2 only".* | Additional function codes that are to be considered as "critical":<br>☑ 0 (Confirm)<br>☑ 1 (Read)<br>☑ 7 (Immediate freeze)<br>☑ 8 (Immediate freeze - no ack)<br>☑ 9 (Freeze-and-clear)<br>☑ 10 (Freeze-and-clear - no ack)<br>☑ 11 (Freeze-at-time)<br>☑ 12 (Freeze-at-time - no ack)<br>☑ 22 (Assign Class)<br>☑ 23 (Delay Measurement)<br>☐ 25 (Open File) - V2 only<br>☐ 26 (Close File) - V2 only<br>☐ 27 (Delete File) - V2 only<br>☐ 28 (Get File Info) - V2 only<br>☐ 30 (Abort File) - V2 only<br><br>☐ 129 (Response)<br>☐ 130 (Unsolicited Response) | | Proprietary File via Other Mechanism<br>---------- |

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| 1.12.16 Other critical fragments:<br><br>*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).* | | | |
| 1.12.17 Support for remote update key changes:<br><br>*Devices implementing secure authentication version 5 of later have the option to support remote update key changes. If remote update key change is supported then the procedure using symmetric cryptography is mandatory. Additional support for the procedure using asymmetric (public key) cryptography is optional.* | ☐ Remote update key change by symmetric cryptography<br>☐ Remote update key change by asymmetric cryptography | | |

| **1.13 Broadcast Functionality** | **Capabilities** | **Current Value** | **If configurable list methods** |
|---|---|---|---|
| This section indicates which functions are supported by the device when using broadcast addresses. Note that it is mandatory for outstations to be configurable to enable or disable the support for each function in order to comply with the requirements of the IED conformance tests dated 2012 and later.<br><br>Note that this section shows only entries that may have a meaningful purpose when used with broadcast requests. | | | |
| 1.13.1 Support for broadcast functionality: | ○ Disabled<br>◉ Enabled<br>○ Configurable | Enabled | Proprietary File via Other Mechanism<br>--- |
| 1.13.2 Write functions (FC = 2) supported with broadcast requests: | Write clock (g50v1 with qualifier code 07)<br>○ Disabled<br>◉ Enabled<br>○ Configurable, other (described elsewhere)<br><br>Write last recorded time (g50v3 with qualifier code 07)<br>○ Disabled<br>◉ Enabled<br>○ Configurable, other (described elsewhere)<br><br>Clear restart (g80v1 with qualifier code 00 and index = 7, value = 0)<br>○ Disabled<br>◉ Enabled<br>○ Configurable, other (described elsewhere)<br><br>Write to any other group / variation / qualifier code<br>○ Disabled<br>○ Enabled<br>◉ Configurable, other (described elsewhere) | Write clock: Enabled<br><br>Write last recorded time: Enabled<br><br>Clear restart: Enabled<br><br>Write any other: Enabled | Clock: Proprietary File via Other Mechanism<br>---<br><br>Time: Proprietary File via Other Mechanism<br>---<br><br>Restart: Proprietary File via Other Mechanism<br>---<br><br>Other: Proprietary File via Other Mechanism<br>--- |

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|---|---|---|---|
| 1.13.3 Direct operate functions (FC = 5) supported with broadcast requests: | ◯ Disabled<br>◯ Enabled<br>◉ Configurable, other (described elsewhere) | Enabled | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.13.4 Direct operate, no acknowledgement functions (FC = 6) supported with broadcast requests: | ◯ Disabled<br>◯ Enabled<br>◉ Configurable, other (described elsewhere) | Enabled | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.13.5 Immediate freeze functions (FC = 7) supported with broadcast requests: | ◯ Disabled<br>◉ Enabled<br>◯ Configurable, other (described elsewhere) | Enabled | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.13.6 Immediate freeze, no acknowledgement functions (FC = 8) supported with broadcast requests: | ◯ Disabled<br>◉ Enabled<br>◯ Configurable, other (described elsewhere) | Enabled | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.13.7 Freeze and clear functions (FC = 9) supported with broadcast requests: | ◯ Disabled<br>◉ Enabled<br>◯ Configurable, other (described elsewhere) | Enabled | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.13.8 Freeze and clear, no acknowledgement functions (FC = 10) supported with broadcast requests: | ◯ Disabled<br>◉ Enabled<br>◯ Configurable, other (described elsewhere) | Enabled | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.13.9 Freeze at time functions (FC = 11) supported with broadcast requests: | ◯ Disabled<br>◉ Enabled<br>◯ Configurable, other (described elsewhere) | Enabled | |
| 1.13.10 Freeze at time, no acknowledgement functions (FC = 12) supported with broadcast requests: | ◯ Disabled<br>◉ Enabled<br>◯ Configurable, other (described elsewhere) | Enabled | |
| 1.13.11 Cold restart functions (FC = 13) supported with broadcast requests: | ◯ Disabled<br>◉ Enabled<br>◯ Configurable, other (described elsewhere) | Enabled | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.13.12 Warm restart functions (FC = 14) supported with broadcast requests: | ◉ Disabled<br>◯ Enabled<br>◯ Configurable, other (described elsewhere) | Disabled | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.13.13 Initialize data functions (FC = 15) supported with broadcast requests: | ◉ Disabled<br>◯ Enabled<br>◯ Configurable, other (described elsewhere) | Disabled | |
| 1.13.14 Initialize application functions (FC = 16) supported with broadcast requests: | ◉ Disabled<br>◯ Enabled<br>◯ Configurable, other (described elsewhere) | Disabled | |

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| 1.13.15 Start application functions (FC = 17) supported with broadcast requests: | ◉ Disabled<br>◯ Enabled<br>◯ Configurable, other (described elsewhere) | Disabled | |
| 1.13.16 Stop application functions (FC = 18) supported with broadcast requests: | ◉ Disabled<br>◯ Enabled<br>◯ Configurable, other (described elsewhere) | Disabled | |
| 1.13.17 Save configuration functions (FC = 19) supported with broadcast requests: | ◉ Disabled<br>◯ Enabled<br>◯ Configurable, other (described elsewhere) | Disabled | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.13.18 Enable unsolicited functions (FC = 20) supported with broadcast requests: | Enable unsolicited by event Class (g60v2, g60v3 and g60v4 with qualifier code 06)<br>◯ Disabled<br>◯ Enabled<br>◉ Configurable, other (described elsewhere)<br><br>Enable unsolicited for any other group / variation / qualifier code<br>◯ Disabled<br>◯ Enabled<br>◉ Configurable, other (described elsewhere) | By event class: Enabled<br><br>By any other: Enabled | Class:<br>Proprietary File via Other Mechanism<br>---<br>---<br><br>Other: |
| 1.13.19 Disable unsolicited functions (FC = 21) supported with broadcast requests: | Disable unsolicited by event Class (g60v2, g60v3 and g60v4 with qualifier code 06)<br>◯ Disabled<br>◯ Enabled<br>◉ Configurable, other (described elsewhere)<br><br>Disable unsolicited for any other group / variation / qualifier code<br>◯ Disabled<br>◯ Enabled<br>◉ Configurable, other (described elsewhere) | By event class: Enabled<br><br>By any other: Enabled | Class:<br>Proprietary File via Other Mechanism<br>---<br>---<br><br>Other:<br>Proprietary File via Other Mechanism<br>---<br>--- |
| 1.13.20 Assign class functions (FC = 22) supported with broadcast requests: | ◯ Disabled<br>◯ Enabled<br>◉ Configurable, other (described elsewhere) | Enabled | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.13.21 Record current time functions (FC = 24) supported with broadcast requests: | ◉ Disabled<br>◯ Enabled<br>◯ Configurable, other (described elsewhere) | Disabled | Proprietary File via Other Mechanism<br>---<br>--- |
| 1.13.22 Activate configuration functions (FC = 31) supported with broadcast requests: | ◉ Disabled<br>◯ Enabled<br>◯ Configurable, other (described elsewhere) | Disabled | Proprietary File via Other Mechanism<br>---<br>--- |

## 2 Mapping between DNP3 and IEC 61850 Objects

This optional section allows each configuration parameter or point in the DNP Data map to be tied to an attribute in the IEC 61850 object models (and vice-versa).

Earlier versions of this section (up to version 2.07) used mappings based on an "access point" (section 2.1.1 and then a series of XPath references (section 2.1.2). Section 2.1.2 has been superseded in version 2.08 onwards with mappings defined using either predefined rules (section 2.1.3) or specified as an equation (section 2.1.4). The list of pre-defined rules is found in the IEEE 1815-1 document.

The following display has been selected to be in a tabular form.

| **MAPPING BETWEEN DNP3 AND IEC 61850 OBJECTS** |
|---|

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

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

| **3.1 SINGLE-BIT BINARY INPUT POINTS**<br>**Static (Steady-State) Object Number: 1**<br>**Event Object Number: 2** | | | |
|---|---|---|---|
| | **Capabilities (leave tick-boxes blank if this data type is not supported)** | **Current Value** | **If configurable list methods** |
| 3.1.1 Static Variation reported when variation 0 requested or in response to Class polls: | ☑ Variation 1 - Single-bit packed format<br>☑ Variation 2 - Single-bit with flag<br>☑ Based on point index (add column to table in part 5) | One | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.1.2 Event Variation reported when variation 0 requested or in response to Class polls:<br><br>*Note: The support for binary input events can be determined remotely using protocol object Group 0 Variation 237.* | ☑ Variation 1 - without time<br>☑ Variation 2 - with absolute time<br>☐ Variation 3 - with relative time<br>☑ Based on point index (add column to table in part 5) | One | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.1.3 Event reporting mode:<br><br>*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.*<br>*"All events" must be checked to be compliant.* | ☐ Only most recent<br>☑ All events<br>☐ Based on point index (add column to table in part 5) | | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.1.4 Binary Inputs included in Class 0 response: | ☑ Always<br>☐ Never<br>☐ Only if point is assigned to a class<br>☐ Based on point index (add column to table in part 5) | Always | Proprietary File via Other Mechanism<br>---<br>--- |

| **3.2 DOUBLE-BIT INPUT POINTS**<br>**Static (Steady-State) Object Number: 3**<br>**Event Object Number: 4** | | | |
|---|---|---|---|
| | **Capabilities (leave tick-boxes blank if this data type is not supported)** | **Current Value** | **If configurable list methods** |

| | | | |
|---|---|---|---|
| 3.2.1 Static Variation reported when variation 0 requested or in response to Class polls:<br><br>*Note: The support for double-bit inputs can be determined remotely using protocol object Group 0 Variation 234.* | ☑ Variation 1 - Double-bit packed format<br>☑ Variation 2 - Double-bit with flag<br>☑ Based on point index (add column to table in part 5) | One | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.2.2 Event Variation reported when variation 0 requested or in response to Class polls: | ☑ Variation 1 - without time<br>☑ Variation 2 - with absolute time<br>☐ Variation 3 - with relative time<br>☑ Based on point index (add column to table in part 5) | One | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.2.3 Event reporting mode:<br><br>*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.*<br>*"All events" must be checked to be compliant.* | ☐ Only most recent<br>☑ All events<br>☐ Based on point index (add column to table in part 5) | | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.2.4 Double Bit Inputs included in Class 0 response: | ☑ Always<br>☐ Never<br>☐ Only if point is assigned to a class<br>☐ Based on point index (add column to table in part 5) | Always | Proprietary File via Other Mechanism<br>---<br>--- |

### 3.3 Binary Output Status and Control Relay Output Block

**Binary Output Status Object Number: 10**
**Binary Output Event Object Number: 11**
**CROB Object Number: 12**
**Binary Output Command Event Object Number: 13**

| | **Capabilities (leave tick-boxes blank if this data type is not supported)** | **Current Value** | **If configurable list methods** |
|---|---|---|---|
| 3.3.1 Minimum pulse time allowed with Trip, Close and Pulse On commands: | ☐ Fixed at ms (hardware may limit this further)<br>☐ Based on point index (add column to table in part 5) | | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.3.2 Maximum pulse time allowed with Trip, Close and Pulse On commands: | ☐ Fixed at ms (hardware may limit this further<br>☐ Based on point index (add column to table in part 5) | | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.3.3 Binary Output Status included in Class 0 response: | ☑ Always<br>☐ Never<br>☐ Only if point is assigned to a class<br>☐ Based on point index (add column to table in part 5) | Always | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.3.4 Reports Output Command Event Objects: | ☐ Never<br>☐ Only upon a successful Control<br>☑ Upon all control attempts | On all attempts | Proprietary File via Other Mechanism<br>---<br>--- |

| | | | |
|---|---|---|---|
| 3.3.5 Static Variation reported when variation 0 requested or in response to Class polls: | ☑ Variation 1 - Continuous control<br>☑ Variation 2 - Continuous control, binary output status<br>☑ Based on point index (add column to table in part 5) | One | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.3.6 Event Variation reported when variation 0 requested or in response to Class polls:<br><br>*Note: The support for binary output events can be determined remotely using protocol object Group 0 Variation 222.* | ☑ Variation 1 - without time<br>☑ Variation 2 - with absolute time<br>☑ Based on point index (add column to table in part 5) | One | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.3.7 Command Event Variation reported when variation 0 requested or in response to Class polls: | ☑ Variation 1 - without time<br>☑ Variation 2 - with absolute time<br>☑ Based on point index (add column to table in part 5) | One | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.3.8 Event reporting mode:<br><br>*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<br>☑ All events | | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.3.9 Command Event reporting mode:<br><br>*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<br>☑ All events | All events | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.3.10 Maximum Time between Select and Operate: | ☑ Not Applicable<br>☐ Fixed at seconds<br>☐ Configurable, range to seconds<br>☐ Configurable, selectable from seconds<br>☐ Configurable, other, describe<br>☐ Variable, explain ☐ Based on point index (add column to table in part 5) | | Proprietary File via Other Mechanism<br>---<br>--- |

**3.4 COUNTERS / FROZEN COUNTERS**
**Static Counter Object Number: 20**
**Static Frozen Counter Object Number: 21**
**Counter Event Object Number: 22**
**Frozen Counter Event Object Number: 23**

| | **Capabilities (leave tick-boxes blank if this data type is not supported)** | **Current Value** | **If configurable list methods** |
|---|---|---|---|
| 3.4.1 Static Counter Variation reported when variation 0 requested or in response to Class polls: | ☑ Variation 1 - 32-bit with flag<br>☑ Variation 2 - 16-bit with flag<br>☑ Variation 5 - 32-bit without flag<br>☑ Variation 6 - 16-bit without flag<br>☑ Based on point index (add column to table in part 5) | One | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.4.2 Counter Event Variation reported when variation 0 requested or in response to Class polls:<br><br>*Note: The support for counter events can be determined remotely using protocol object Group 0 Variation 227.* | ☑ Variation 1 - 32-bit with flag<br>☑ Variation 2 - 16-bit with flag<br>☑ Variation 5 - 32-bit with flag and time<br>☑ Variation 6 - 16-bit with flag and time<br>☑ Based on point index (add column to table in part 5) | One | Proprietary File via Other Mechanism<br>---<br>--- |

| | | | |
|---|---|---|---|
| 3.4.3 Counters included in Class 0 response: | ☑ Always<br>☐ Never<br>☐ Only if point is assigned to a class<br>☐ Based on point index (add column to table in part 5) | Always | Proprietary File via Other Mechanism<br>---------- |
| 3.4.4 Counter Event reporting mode:<br><br>*When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event. Only the most recent event is typically reported for Counters. When reporting only the most recent event the counter value returned in the response may be either the value at the time that the event is queued or it may be the value at the time of the response.* | ☐ A: Only most recent (value at time of event)<br>☐ B: Only most recent (value at time of response)<br>☑ C: All events<br>☐ Based on point index (add column to table in part 5) | | |
| 3.4.5 Static Frozen Counter Variation reported when variation 0 requested or in response to Class polls: | ☑ Variation 1 - 32-bit with flag<br>☑ Variation 2 - 16-bit with flag<br>☑ Variation 5 - 32-bit with flag and time<br>☑ Variation 6 - 16-bit with flag and time<br>☑ Variation 9 - 32-bit without flag<br>☑ Variation 10 - 16-bit without flag<br>☑ Based on point index (add column to table in part 5) | One | Proprietary File via Other Mechanism<br>---------- |
| 3.4.6 Frozen Counter Event Variation reported when variation 0 requested or in response to Class polls:<br><br>*Note: The support for frozen counter events can be determined remotely using protocol object Group 0 Variation 225.* | ☑ Variation 1 - 32-bit with flag<br>☑ Variation 2 - 16-bit with flag<br>☑ Variation 5 - 32-bit without flag<br>☑ Variation 6 - 16-bit without flag<br>☑ Based on point index (add column to table in part 5) | One | Proprietary File via Other Mechanism<br>---------- |
| 3.4.7 Frozen Counters included in Class 0 response: | ☑ Always<br>☐ Never<br>☐ Only if point is assigned to a class<br>☐ Based on point index (add column to table in part 5) | Always | Proprietary File via Other Mechanism<br>---------- |
| 3.4.8 Frozen Counter Event reporting mode:<br><br>*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 frozen value<br>☑ All frozen values<br>☐ Based on point index (add column to table in part 5) | | Proprietary File via Other Mechanism<br>---------- |
| 3.4.9 Counters Roll Over at: | ☑ 16 Bits (65,535)<br>☑ 32 Bits (4,294,967,295)<br>☐ Fixed at<br>☐ Configurable, range to<br>☐ Configurable, selectable from<br>☑ Configurable, other, describe **In a Logix system the Logix controller can be configured to select the rollover value**<br>☑ Configurable, other, describe **In a Modbus system the Modbus controller can be configured to select the rollover value**<br>☑ Based on point index (add column to table in part 5) | Based on point index | |

| | | | |
|---|---|---|---|
| 3.4.10 Counters frozen by means of: | ☑ Master Request<br>☑ Freezes itself without concern for time of day<br>☑ Freezes itself and requires time of day<br>☑ Other, explain: **In a Logix system, the Logix controller can also determine when the counters must be frozen**<br>☑ Other, explain: **In a Modbus system, the Modbus controller can also determine when the counters must be frozen** | Master Request | |

| **3.5 Analog Input Points**<br>**Static (Steady-State) Object Number: 30**<br>**Event Object Number: 32**<br>**Deadband Object Number: 34** | | | |
|---|---|---|---|
| | **Capabilities (leave tick-boxes blank if this data type is not supported)** | **Current Value** | **If configurable list methods** |
| 3.5.1 Static Variation reported when variation 0 requested or in response to Class polls: | ☑ Variation 1 - 32-bit with flag<br>☑ Variation 2 - 16-bit with flag<br>☑ Variation 3 - 32-bit without flag<br>☑ Variation 4 - 16-bit without flag<br>☑ Variation 5 - single-precision floating point with flag<br>☐ Variation 6 - double-precision floating point with flag<br>☑ Based on point index (add column to table in part 5) | Three | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.5.2 Event Variation reported when variation 0 requested or in response to Class polls:<br><br>*Note: The support for analog input events can be determined remotely using protocol object Group 0 Variation 231.* | ☑ Variation 1 - 32-bit without time<br>☑ Variation 2 - 16-bit without time<br>☑ Variation 3 - 32-bit with time<br>☑ Variation 4 - 16-bit with time<br>☑ Variation 5 - single-precision floating point w/o time<br>☐ Variation 6 - double-precision floating point w/o time<br>☑ Variation 7 - single-precision floating point with time<br>☐ Variation 8 - double-precision floating point with time<br>☑ Based on point index (add column to table in part 5) | One | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.5.3 Event reporting mode:<br><br>*When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event. Only the most recent event is typically reported for Analog Inputs. When reporting only the most recent event the analog value returned in the response may be either the value at the time that the event is queued or it may be the value at the time of the response.* | ☐ A: Only most recent (value at time of event)<br>☐ B: Only most recent (value at time of response)<br>☑ C: All events<br>☐ Based on point index (add column to table in part 5) | | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.5.4 Analog Inputs included in Class 0 response: | ☑ Always<br>☐ Never<br>☐ Only if point is assigned to a class<br>☐ Based on point index (add column to table in part 5) | Always | Proprietary File via Other Mechanism<br>---<br>--- |

| | | | |
|---|---|---|---|
| 3.5.5 How Deadbands are set: | ☐ A. Global Fixed<br>☑ B. Configurable through DNP<br>☑ C. Configurable via other means<br>☐ D. Other, explain:<br><br>☑ Based on point index - column in part 5 specifies which of the options applies, B, C, or D | | Proprietary File via Other Mechanism<br>---------- |
| 3.5.6 Analog Deadband Algorithm:<br><br>simple- just compares the difference from the previous reported value<br>integrating- keeps track of the accumulated change<br>other- indicating another algorithm | ☑ Simple<br>☐ Integrating<br>☐ Other, explain:<br>☐ Based on point index (add column to table in part 5) | Simple | Proprietary File via Other Mechanism<br>---------- |
| 3.5.7 Static Frozen Analog Input Variation reported when variation 0 requested or in response to Class polls: | ☐ Variation 1 - 32-bit with flag<br>☐ Variation 2 - 16-bit with flag<br>☐ Variation 3 - 32-bit with time-of-freeze<br>☐ Variation 4 - 16-bit with time-of-freeze<br>☐ Variation 5 - 32-bit without flag<br>☐ Variation 6 - 16-bit without flag<br>☐ Variation 7 - single-precision floating point with flag<br>☐ Variation 8 - double-precision floating point with flag<br>☐ Based on point index (add column to table in part 5) | | |
| 3.5.8 Frozen Analog Input Event Variation reported when variation 0 requested or in response to Class polls:<br><br>*Note: The support for frozen analog input events can be determined remotely using protocol object Group 0 Variation 230.* | ☐ Variation 1 - 32-bit without time<br>☐ Variation 2 - 16-bit without time<br>☐ Variation 3 - 32-bit with time<br>☐ Variation 4 - 16-bit with time<br>☐ Variation 5 - single-precision floating point w/o time<br>☐ Variation 6 - double-precision floating point w/o time<br>☐ Variation 7 - single-precision floating point with time<br>☐ Variation 8 - double-precision floating point with time<br>☐ Based on point index (add column to table in part 5) | | |
| 3.5.9 Frozen Analog Inputs included in Class 0 response: | ☐ Always<br>☐ Never<br>☐ Only if point is assigned to a class<br>☐ Based on point index (add column to table in part 5) | | |
| 3.5.10 Frozen Analog Input Event reporting mode:<br><br>*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 Analog Inputs.* | ☐ Only most recent frozen value<br>☐ All frozen values<br>☐ Based on point index (add column to table in part 5) | | |

## 3.6 Analog Output Status and Analog Output Control Block

**Analog Output Status Object Number: 40**
**Analog Output Control Block Object Number: 41**
**Analog Output Event Object Number: 42**
**Analog Output Command Event Object Number: 43**

| | **Capabilities (leave tick-boxes blank if this data type is not supported)** | **Current Value** | **If configurable list methods** |
|---|---|---|---|
| 3.6.1 Static Analog Output Status Variation reported when variation 0 requested or in response to Class polls: | ☑ Variation 1 - 32-bit with flag<br>☑ Variation 2 - 16-bit with flag<br>☑ Variation 3 - single-precision floating point with flag<br>☐ Variation 4 - double-precision floating point with flag<br>☑ Based on point index (add column to table in part 5) | Two | Proprietary File via Other Mechanism ---------- --- |
| 3.6.2 Analog Output Status included in Class 0 response: | ☑ Always<br>☐ Never<br>☐ Only if point is assigned to a class<br>☐ Based on point index (add column to table in part 5) | Always | Proprietary File via Other Mechanism ---------- --- |
| 3.6.3 Reports Output Command Event Objects: | ☐ Never<br>☑ Only upon a successful Control<br>☑ Upon all control attempts | | Proprietary File via Other Mechanism ---------- --- |
| 3.6.4 Event Variation reported when variation 0 requested or in response to Class polls:<br><br>*Note: The support for analog output events can be determined remotely using protocol object Group 0 Variation 219.* | ☑ Variation 1 - 32-bit without time<br>☑ Variation 2 - 16-bit without time<br>☑ Variation 3 - 32-bit with time<br>☑ Variation 4 - 16-bit with time<br>☑ Variation 5 - single-precision floating point w/o time<br>☐ Variation 6 - double-precision floating point w/o time<br>☑ Variation 7 - single-precision floating point with time<br>☐ Variation 8 - double-precision floating point with time<br>☐ Based on point index (add column to table in part 5) | Two | Proprietary File via Other Mechanism ---------- --- |
| 3.6.5 Command Event Variation reported when variation 0 requested or in response to Class polls: | ☑ Variation 1 - 32-bit without time<br>☑ Variation 2 - 16-bit without time<br>☑ Variation 3 - 32-bit with time<br>☑ Variation 4 - 16-bit with time<br>☑ Variation 5 - single-precision floating point w/o time<br>☐ Variation 6 - double-precision floating point w/o time<br>☑ Variation 7 - single-precision floating point with time<br>☐ Variation 8 - double-precision floating point with time<br>☐ Based on point index (add column to table in part 5) | Two | Proprietary File via Other Mechanism ---------- --- |
| 3.6.6 Event reporting mode:<br><br>*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<br>☑ All events | All events | Proprietary File via Other Mechanism ---------- --- |

| | | | |
|---|---|---|---|
| 3.6.7 Command Event reporting mode:<br><br>*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<br>☑ All events | All events | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.6.8 Maximum Time between Select and Operate: | ☑ Not Applicable<br>☐ Fixed at seconds<br>☐ Configurable, range to seconds<br>☐ Configurable, selectable from seconds<br>☐ Configurable, other, describe<br>☐ Variable, explain ☐ Based on point index (add column to table in part 5) | | Proprietary File via Other Mechanism<br>---<br>--- |

## 3.7 Sequential File Transfer
**Object Number: 70**

| | Capabilities | Current Value | If configurable list methods |
|---|---|---|---|
| 3.7.1 File Transfer Supported: | ☑ Yes<br>☑ No (set 3.7.6 to "Fixed at 0" and do not complete other entries in section 3.7) | Yes | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.7.2 File Authentication:<br><br>*Indicates whether a valid authentication key must be obtained prior to open and delete requests.* | ☑ Always<br>☑ Sometimes, explain<br><br>☑ Never | Sometimes | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.7.3 File Append Mode:<br><br>*Indicates if a file can be opened and appended to versus just overwritten.* | ☑ Always<br>☑ Sometimes, explain<br><br>☑ Never | Always | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.7.4 Permissions Support:<br><br>*Indicates the device is capable of using the indicated permissions.* | ☑ Owner Read Allowed: 0x0100<br>☑ Owner Write Allowed: 0x0080<br>☑ Owner Execute Allowed: 0x0040<br>☑ Group Read Allowed: 0x0020<br>☑ Group Write Allowed: 0x0010<br>☑ Group Execute Allowed: 0x0008<br>☑ World Read Allowed: 0x0004<br>☑ World Write Allowed: 0x0002<br>☑ World Execute Allowed: 0x0001 | Owner Read<br>Owner Write<br>Owner Execute<br>Group Read<br>Group Write<br>Group Execute<br>World Read<br>World Write<br>World Execute | Proprietary File via Other Mechanism<br>---<br>--- |
| 3.7.5 Multiple Blocks in a Fragment:<br><br>*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<br>☑ No | No | |
| 3.7.6 Max number of Files Open at one time: | ☑ Fixed at **1**<br>☐ Configurable, range to<br>☐ Configurable, selectable from<br>☐ Configurable, other, describe | 1 | |

## 3.8 Octet String Points
**Static (Steady-State) Object Number: 110**
**Event Object Number: 111**

| | Capabilities | Current Value | If configurable list methods |
|---|---|---|---|
| 3.8.1 Event reporting mode:<br><br>*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<br>☐ All events<br>☐ Based on point index (add column to table in part 5) | | |
| 3.8.2 Octet Strings included in Class 0 response: | ☐ Always<br>☑ Never<br>☐ Only if point is assigned to a class<br>☐ Based on point index (add column to table in part 5) | | |

**3.10 Data Set Prototype**
**Object Number: 85**
**Variation Number: 1**

| | Capabilities | Current Value | If configurable list methods |
|---|---|---|---|

This version of the Device Profile has no requirement for describing Data Set Prototype capabilities and current settings. This page is intentionally left blank, existing as placeholder for future use.

**3.11 Data Set Descriptor Contents and Characteristics**
**Object Number: 86**
**Variation Numbers: 1 and 2**

This version of the Device Profile has no requirement for describing Data Set Descriptor capabilities and current settings. This page is intentionally left blank, existing as placeholder for future use.

## 4 Implementation Table

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

| DNP OBJECT GROUP & VARIATION | | | REQUEST Master may issue Outstation must parse | | RESPONSE Master must parse Outstation may issue | |
|---|---|---|---|---|---|---|
| **Object Group Number** | **Variation Number** | **Description** | **Function Codes (dec)** | **Qualifier Codes (hex)** | **Function Codes (dec)** | **Qualifier Codes (hex)** |
| 0 | 211 | Device Attributes – Identification of support for user-specific attributes | 1 *(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 212 | Device Attributes - Number of master-defined data set prototypes | 1 *(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 213 | Device Attributes - Number of outstation-defined data set prototypes | 1 *(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 214 | Device Attributes - Number of master-defined data sets | 1 *(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 215 | Device Attributes - Number of outstation-defined data sets | 1 *(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 216 | Device Attributes - Max number of binary outputs per request | 1 *(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 217 | Device Attributes - Local timing accuracy | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 218 | Device Attributes - Duration of timing accuracy | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 219 | Device Attributes - Support for analog output events | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 220 | Device Attributes - Max analog output index | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 221 | Device Attributes - Number of analog outputs | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 222 | Device Attributes - Support for binary output events | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 223 | Device Attributes - Max binary output index | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 224 | Device Attributes - Number of binary outputs | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 225 | Device Attributes - Support for frozen counter events | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 226 | Device Attributes - Support for frozen counters | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 227 | Device Attributes - Support for counter events | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 228 | Device Attributes - Max counter index | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 229 | Device Attributes - Number of counter points | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 230 | Device Attributes - Support for frozen analog inputs | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 231 | Device Attributes - Support for analog input events | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 232 | Device Attributes - Maximum analog input index | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 233 | Device Attributes - Number of analog input points | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 234 | Device Attributes - Support for double-bit binary input events | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 235 | Device Attributes - Maximum double-bit binary input index | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 236 | Device Attributes - Number of double-bit binary input points | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 237 | Device Attributes - Support for binary input events | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 238 | Device Attributes - Max binary input index | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 239 | Device Attributes - Number of binary input points | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 240 | Device Attributes - Max transmit fragment size | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 240 | Device Attributes - Max transmit fragment size | 2*(write)* | 00 *(start-stop)* | | |
| 0 | 241 | Device Attributes - Max receive fragment size | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 242 | Device Attributes - Device manufacturer’s software version | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 243 | Device Attributes - Device manufacturer’s hardware version | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |

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|---|---|---|---|---|---|---|
| 0 | 245 | Device Attributes – User-assigned location name | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 245 | Device Attributes – User-assigned location name | 2*(write)* | 00 *(start-stop)* | | |
| 0 | 246 | Device Attributes - User assigned ID code/number | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 246 | Device Attributes - User assigned ID code/number | 2*(write)* | 00 *(start-stop)* | | |
| 0 | 247 | Device Attributes - Device Attributes – User-assigned device name | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 247 | Device Attributes - Device Attributes – User-assigned device name | 2*(write)* | 00 *(start-stop)* | | |
| 0 | 248 | Device Attributes - Device Attributes – Device serial number | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 249 | Device Attributes - Device Attributes – DNP subset and conformance | 1*(read)* | 00 *(start-stop)* | 129 *(Response)* | 00 *(start-stop)*, 17 *(index)* |
| 0 | 250 | Device Attributes - 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 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)* | | |
| 0 | 255 | Device Attributes – List of attribute variations | 1*(read)* | 00 *(start-stop)*, 06 *(no range, or all)* | 129 *(Response)* | 00 *(start-stop)*, 5B *(free format)* |
| 1 | 0 | Binary Input – Any Variation | 1*(read)* | 06 *(no range, or all)* | | |
| 1 | 0 | Binary Input – Any Variation | 22*(assign class)* | 00, 01 *(start-stop)*, 06 *(no range, or all)* | | |
| 1 | 1 | Binary Input – Packed format | 1*(read)* | 00, 01 *(start-stop)*, 06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 1 | 2 | Binary Input – With Flags format | 1*(read)* | 00, 01 *(start-stop)*, 06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 2 | 0 | Binary Input Event – Any Variation | 1*(read)* | 06 *(no range, or all)*, 07, 08 *(limited qty)* | | |
| 2 | 1 | Binary Input Event – Without time | 1*(read)* | 06 *(no range, or all)*, 07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 2 | 1 | Binary Input Event – Without time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 2 | 2 | Binary Input Event – With absolute time | 1*(read)* | 06 *(no range, or all)*, 07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 2 | 2 | Binary Input Event – With absolute time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 3 | 0 | Double-bit Binary Input – Any Variation | 1*(read)* | 00, 01 *(start-stop)*, 06 *(no range, or all)* | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | 0 | Double-bit Binary Input – Any Variation | 22*(assign class)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | | |
| 3 | 1 | Double-bit Binary Input – Packed format | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 3 | 2 | Double-bit Binary Input – With flags | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 4 | 0 | Double-bit Binary Input Event – Any Variation | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | | |
| 4 | 1 | Double-bit Binary Input Event – Without time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 4 | 1 | Double-bit Binary Input Event – Without time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 4 | 2 | Double-bit Binary Input Event – With absolute time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 4 | 2 | Double-bit Binary Input Event – With absolute time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 10 | 0 | Binary Output – Any Variation | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | | |
| 10 | 2 | Binary Output – Output status with flags | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 11 | 0 | Binary Output Event – Any Variation | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | | |
| 11 | 1 | Binary Output Event – Status without time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 18 |
| 11 | 1 | Binary Output Event – Status without time | | | 130 *(Unsol. Resp.)* | 17, 18 |
| 11 | 2 | Binary Output Event – Status with time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 18 |
| 11 | 2 | Binary Output Event – Status with time | | | 130 *(Unsol. Resp.)* | 17, 18 |
| 12 | 1 | Binary Command – Control relay output block (CROB) | 3*(select)* | 17, 28 *(index)* | 129 *(Response)* | echo of request |
| 12 | 1 | Binary Command – Control relay output block (CROB) | 4*(operate)* | 17, 28 *(index)* | | |
| 12 | 1 | Binary Command – Control relay output block (CROB) | 5*(direct op.)* | 17, 28 *(index)* | | |
| 12 | 1 | Binary Command – Control relay output block (CROB) | 6*(direct op, no ack)* | 17, 28 *(index)* | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 13 | 0 | Binary Output Command Event – Any Variation | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | | |
| 13 | 1 | Binary Output Command Event – Command status without time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 13 | 1 | Binary Output Command Event – Command status without time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 13 | 2 | Binary Output Command Event – Command status with time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 13 | 2 | Binary Output Command Event – Command status with time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 20 | 0 | Counter – Any Variation | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | | |
| 20 | 0 | Counter – Any Variation | 7*(freeze)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | | |
| 20 | 0 | Counter – Any Variation | 8*(freeze, no ack)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | | |
| 20 | 0 | Counter – Any Variation | 9*(freeze & clear )* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | | |
| 20 | 0 | Counter – Any Variation | 10*(frz & clr, no ack)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | | |
| 20 | 1 | Counter – 32-bit with flag | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 20 | 2 | Counter – 16-bit with flag | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 20 | 5 | Counter – 32-bit without flag | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 20 | 6 | Counter – 16-bit without flag | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 21 | 0 | Counter – Any Variation | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | | |
| 21 | 0 | Counter – Any Variation | 22*(assign class)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | | |

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|---|---|---|---|---|---|---|
| 21 | 1 | Frozen Counter – 32-bit with flag | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 21 | 2 | Frozen Counter – 16-bit with flag | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 21 | 5 | Frozen Counter – 32-bit with flag and time | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 21 | 6 | Frozen Counter – 16-bit with flag and time | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 21 | 9 | Frozen Counter – 32-bit without flag | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 21 | 10 | Frozen Counter – 16-bit without flag | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 22 | 0 | Counter Event – Any Variation | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | | |
| 22 | 1 | Counter Event – 32-bit with flag | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 22 | 1 | Counter Event – 32-bit with flag | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 22 | 2 | Counter Event – 16-bit with flag | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 22 | 2 | Counter Event – 16-bit with flag | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 23 | 0 | Frozen Counter Event – Any Variation | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | | |
| 23 | 1 | Frozen Counter Event – 32-bit with flag | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 23 | 1 | Frozen Counter Event – 32-bit with flag | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 23 | 2 | Frozen Counter Event – 16-bit with flag | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 23 | 2 | Frozen Counter Event – 16-bit with flag | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 23 | 5 | Frozen Counter Event – 32-bit with flag and time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 23 | 5 | Frozen Counter Event – 32-bit with flag and time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 23 | 6 | Frozen Counter Event – 16-bit with flag and time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |

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|---|---|---|---|---|---|---|
| 23 | 6 | Frozen Counter Event – 16-bit with flag and time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 30 | 0 | Analog Input – Any Variation | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | | |
| 30 | 0 | Analog Input – Any Variation | 22*(assign class)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | | |
| 30 | 1 | Analog Input – Analog Input – 32-bit with flag | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 30 | 2 | Analog Input – Analog Input – 16-bit with flag | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 30 | 3 | Analog Input – 32-bit without flag | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 30 | 4 | Analog Input – 16-bit without flag | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 30 | 5 | Analog Input – Single-prec flt-pt with flag | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 32 | 0 | Analog Input Event – Any Variation | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 32 | 1 | Analog Input Event – 32-bit without time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 32 | 1 | Analog Input Event – 32-bit without time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 32 | 2 | Analog Input Event – 16-bit without time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 32 | 2 | Analog Input Event – 16-bit without time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 32 | 3 | Analog Input Event – 32-bit with time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 32 | 3 | Analog Input Event – 32-bit with time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 32 | 4 | Analog Input Event – 16-bit with time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 32 | 4 | Analog Input Event – 16-bit with time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 32 | 5 | Analog Input Event – Single-prec flt-pt without time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 32 | 5 | Analog Input Event – Single-prec flt-pt without time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |

| | | | | | | |
|---|---|---|---|---|---|---|
| 32 | 7 | Analog Input Event – Single-prec flt-pt with time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 32 | 7 | Analog Input Event – Single-prec flt-pt with time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 34 | 0 | Analog Input Deadband – Any Variation | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | | |
| 34 | 1 | Analog Input Deadband – 16-bit | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 34 | 1 | Analog Input Deadband – 16-bit | 2*(write)* | 00, 01 *(start-stop)* | | |
| 34 | 2 | Analog Input Deadband – 32-bit | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 34 | 2 | Analog Input Deadband – 32-bit | 2*(write)* | 00, 01 *(start-stop)* | | |
| 34 | 3 | Analog Input Deadband – Single-prec flt-pt | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 34 | 3 | Analog Input Deadband – Single-prec flt-pt | 2*(write)* | 00, 01 *(start-stop)* | | |
| 40 | 0 | Analog Output Status – Any Variation | 1*(read)* | 00, 01 *(start-stop)* | | |
| 40 | 1 | Analog Output Status – 32-bit with flag | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 40 | 2 | Analog Output Status – 16-bit with flag | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 40 | 3 | Analog Output Status – Single-prec flt-pt with flag | 1*(read)* | 00, 01 *(start-stop)*,<br>06 *(no range, or all)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 41 | 1 | Analog Output – 32-bit with flag | 3*(select)* | 17, 28 *(index)* | 129 *(Response)* | echo of request |
| 41 | 1 | Analog Output – 32-bit with flag | 4*(operate)* | 17, 28 *(index)* | | |
| 41 | 1 | Analog Output – 32-bit with flag | 5*(direct op.)* | 17, 28 *(index)* | | |
| 41 | 1 | Analog Output – 32-bit with flag | 6*(direct op, no ack)* | 17, 28 *(index)* | | |
| 41 | 2 | Analog Output – 16-bit with flag | 3*(select)* | 17, 28 *(index)* | 129 *(Response)* | echo of request |
| 41 | 2 | Analog Output – 16-bit with flag | 4*(operate)* | 17, 28 *(index)* | | |
| 41 | 2 | Analog Output – 16-bit with flag | 5*(direct op.)* | 17, 28 *(index)* | | |
| 41 | 2 | Analog Output – 16-bit with flag | 6*(direct op, no ack)* | 17, 28 *(index)* | | |
| 41 | 3 | Analog Output – Single-prec flt-pt with flag | 3*(select)* | 17, 28 *(index)* | 129 *(Response)* | echo of request |
| 41 | 3 | Analog Output – Single-prec flt-pt with flag | 4*(operate)* | 17, 28 *(index)* | | |
| 41 | 3 | Analog Output – Single-prec flt-pt with flag | 5*(direct op.)* | 17, 28 *(index)* | | |
| 41 | 3 | Analog Output – Single-prec flt-pt with flag | 6*(direct op, no ack)* | 17, 28 *(index)* | | |
| 42 | 0 | Analog Output Event – Any Variation | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | | |

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|---|---|---|---|---|---|---|
| 42 | 1 | Analog Output Event – 32-bit without time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 42 | 1 | Analog Output Event – 32-bit without time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 42 | 2 | Analog Output Event – 16-bit without time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 42 | 2 | Analog Output Event – 16-bit without time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 42 | 3 | Analog Output Event – 32-bit with time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 42 | 3 | Analog Output Event – 32-bit with time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 42 | 4 | Analog Output Event – 16-bit with time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 42 | 4 | Analog Output Event – 16-bit with time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 42 | 5 | Analog Output Event – Single-prec flt-pt without time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 42 | 5 | Analog Output Event – Single-prec flt-pt without time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 42 | 7 | Analog Output Event – Single-prec flt-pt with time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 42 | 7 | Analog Output Event – Single-prec flt-pt with time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 43 | 0 | Analog Output Command Event – Any Variation | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | | |
| 43 | 1 | Analog Output Command Event – 32-bit without time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 43 | 1 | Analog Output Command Event – 32-bit without time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 43 | 3 | Analog Output Command Event – 32-bit with time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 43 | 3 | Analog Output Command Event – 32-bit with time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 43 | 4 | Analog Output Command Event – 16-bit with time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 43 | 4 | Analog Output Command Event – 16-bit with time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 43 | 5 | Analog Output Command Event – Single-prec flt-pt without time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 43 | 5 | Analog Output Command Event – Single-prec flt-pt without time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |

| | | | | | | |
|---|---|---|---|---|---|---|
| 43 | 7 | Analog Output Command Event – Single-prec flt-pt with time | 1*(read)* | 06 *(no range, or all)*,<br>07, 08 *(limited qty)* | 129 *(Response)* | 17, 28 *(index)* |
| 43 | 7 | Analog Output Command Event – Single-prec flt-pt with time | | | 130 *(Unsol. Resp.)* | 17, 28 *(index)* |
| 50 | 1 | Time and Date – Absolute time | 1*(read)* | 07 *(limited qty = 1)* | 129 *(Response)* | 07 *(limited qty = 1)* |
| 50 | 1 | Time and Date – Absolute time | 2*(write)* | 07 *(limited qty = 1)* | | |
| 50 | 3 | Time and Date – Absolute time at last recorded time | 2*(write)* | 07 *(limited qty = 1)* | | |
| 52 | 1 | Time Delay – Coarse | | | 129 *(Response)* | 07 *(limited qty = 1)* |
| 52 | 2 | Time Delay – Fine | | | 129 *(Response)* | 07 *(limited qty = 1)* |
| 60 | 1 | Class Objects – Class 0 data | 1*(read)* | 06 *(no range, or all)* | | |
| 60 | 1 | Class Objects – Class 0 data | 22*(assign class)* | 06 *(no range, or all)* | | |
| 60 | 2 | Class Objects – Class 1 data | 1*(read)* | 06 *(no range, or all)*,<br>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 | 2 | Class Objects – Class 1 data | 22*(assign class)* | 06 *(no range, or all)* | | |
| 60 | 3 | Class Objects – Class 2 data | 1*(read)* | 06 *(no range, or all)*,<br>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 | 3 | Class Objects – Class 2 data | 22*(assign class)* | 06 *(no range, or all)* | | |
| 60 | 4 | Class Objects – Class 3 data | 1*(read)* | 06 *(no range, or all)*,<br>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)* | | |
| 60 | 4 | Class Objects – Class 3 data | 22*(assign class)* | 06 *(no range, or all)* | | |
| 80 | 1 | Internal Indications – Packed format | 1*(read)* | 00, 01 *(start-stop)* | 129 *(Response)* | 00, 01 *(start-stop)* |
| 80 | 1 | Internal Indications – Packed format | 2*(write)* | 00 *(start-stop)* | | |

## 5 Data Points List (outstation only)

This part of the Device Profile shows, for each data type, a table defining the data points available in the device or a description of how this information can be obtained if the database is configurable.

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

Binary Input points list:

| 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 |
|---|---|---|---|---|---|

| **5.2 Definition of Double Bit Input Point List:**<br><br>*List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.*<br><br>*Note: the number of double-bit inputs present in the device, and the maximum double-bit input index, are available remotely using object Group 0 Variations 236 and 235.* | ☐ Fixed, list shown in table below<br>☑ Configurable (current list may be shown in table below)<br>☐ Other, explain: |
|---|---|

Double-bit Input points list:

| Point Index | Name | Event Class Assigned (1, 2, 3 or none) | Name for State when value is 0 (intermediate) | Name for State when value is 1 (off) | Name for State when value is 2 (on) | Name for State when value is 3 (indeterminate) | Description |
|---|---|---|---|---|---|---|---|

| **5.3 Definition of Binary Output Status / Control Relay Output Block Points List:**<br><br>*List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.*<br><br>*Note: the number of binary outputs present in the device, and the maximum binary output index, are available remotely using object Group 0 Variations 224 and 223.* | ☐ Fixed, list shown in table below<br>☑ Configurable (current list may be shown in table below)<br>☐ Other, explain: |
|---|---|

Binary Output Status and CROB points list:

| | | 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 |

| **5.4 Definition of Counter / Frozen Counter Point List:**<br><br>*List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.*<br><br>*Note: the number of counters present in the device, and the maximum counter index, are available remotely using object Group 0 Variations 229 and 228.* | ☐ Fixed, list shown in table below<br>☑ Configurable (current list may be shown in table below)<br>☐ Other, explain: |
|---|---|

Counter / Frozen Counter points list:

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

| **5.5 Definition of Analog Input Point List:**<br><br>*List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.*<br><br>*Note: the number of analog inputs present in the device, and the maximum analog input index, are available remotely using object Group 0 Variations 233 and 232.* | ☐ Fixed, list shown in table below<br>☑ Configurable (current list may be shown in table below)<br>☐ Other, explain: |
|---|---|

Analog Input points list:

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

| **5.6 Definition of Analog Output Status / Analog Output Block Point List:**<br><br>*List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.*<br><br>*Note: the number of analog outputs present in the device, and the maximum analog output index, are available remotely using object Group 0 Variations 221 and 220.* | ☐ Fixed, list shown in table below<br>☑ Configurable (current list may be shown in table below)<br>☐ Other, explain: |
|---|---|

Analog Output points list:

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

| **5.7 Definition of File Names that may be read or written:** | ☑ Fixed, list shown in table below<br>☑ Configurable (current list may be shown in table below)<br>☐ Other, explain: |
|---|---|

Sequential Files list:

| | Authentication Required for: | |
|---|---|---|

| File Name | Event Class Assigned (1, 2, 3 or none) | Read | Write | Delete | Description |
|---|---|---|---|---|---|

| **5.8 Definition of Octet String Point List:**<br><br>*List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.* | ☐ Fixed, list shown in table below<br>☑ Configurable (current list may be shown in table below)<br>☐ Other, explain: |
|---|---|

Octet String points list:

| Point Index | Name | Event Class Assigned (1, 2, 3 or none) | Description |
|---|---|---|---|

| **5.9 Definition of Virtual Terminal Port Numbers:**<br><br>*List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.* | ☑ Fixed, list shown in table below<br>☑ Configurable (current list may be shown in table below)<br>☐ Other, explain: |
|---|---|

Ports list:

| Virtual Port Number (Point Index) | Name | Event Class Assigned (1, 2, 3 or none) | Description |
|---|---|---|---|

| **5.10 Definition of Data Set Prototypes:**<br><br>*List of all data set prototypes. The following table is repeated for each Data Set Prototype defined.*<br><br>*Note: the number of data set prototypes known to the device are available remotely using object Group 0 Variations 212 and 213.* | ☐ Fixed, list shown in table below<br>☐ Configurable (current list may be shown in table below)<br>☐ Other, explain: |
|---|---|

| **5.11 Definition of Data Set Descriptors:**<br><br>*List of all data set descriptors. The following table is repeated for each Data Set Descriptor defined.*<br><br>*Note: the number of data sets known to the device are available remotely using object Group 0 Variations 214 and 215.* | ☐ Fixed, list shown in table below<br>☐ Configurable (current list may be shown in table below)<br>☐ Other, explain: |
|---|---|

**5.12 Data Set Descriptors - Point Index Attributes**

*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 (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.*

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

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