



DNP3 Device Profile

Based on DNP XML Schema version 2.10.00

Document Name: microSpider2 Device Profile

Document Description: Device Profile for the Halytech microSpider2

Revision History

| Date | Time | Version | Reason for change | Edited by |
|-------------|-------------|----------------|--|------------------|
| 2016-07-28 | | 1 | First Release | David Meiklejohn |
| 2017-02-23 | | 2 | Updated for v1.30 firmware | David Meiklejohn |
| 2017-04-11 | | 3 | Added file transfer support (v1.32 firmware) | David Meiklejohn |

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: <i>Masters send DNP requests, while Outstations send DNP responses. If a single physical device can perform both functions, a separate Device Profile Document must be provided for each function.</i> | <input type="radio"/> Master <input checked="" type="radio"/> Outstation | <input type="radio"/> Master <input checked="" type="radio"/> Outstation | |
| 1.1.2 Vendor Name: <i>The name of the organization producing the device.</i> <i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 252.</i> | | Halytech | |
| 1.1.3 Device Name: <i>The model and name of the device, sufficient to distinguish it from any other device from the same organization.</i> <i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 250.</i> | | microSpider2 | |
| 1.1.4 Device manufacturer's hardware version string: <i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 243.</i> | | Device type: 30 = Environmental, 31 = Industrial | |
| 1.1.5 Device manufacturer's software version string: <i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 242.</i> | | 1.30 | |
| 1.1.6 Device Profile Document Version Number: <i>Version of the Device Profile Document is indicated by a whole number incremented with each new release. This should match the latest version shown in the Revision History at the beginning of this document.</i> | | 3 | |
| 1.1.7 DNP Levels Supported for: <i>Indicate each DNP3 Level to which the device conforms fully. For Masters, requests and responses can be indicated independently.</i> | Outstations Only Requests and Responses <input type="checkbox"/> None <input type="checkbox"/> Level 1 <input checked="" type="checkbox"/> Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/> Level 4 | Level 2 | |
| 1.1.8 Supported Function Blocks: | <input type="checkbox"/> Self Address Support <input type="checkbox"/> Data Sets <input type="checkbox"/> File Transfer <input type="checkbox"/> Virtual Terminal | | |

| | <input type="checkbox"/> Mapping to IEC 61850 Object Models defined in a DNP3 XML file <input type="checkbox"/> Function code 31, activate configuration <input type="checkbox"/> Secure Authentication (if checked then see 1.1.2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|----------------------------------|----------|-------------------------|--------------------------|--------------------------|-----------|-------------------------|--------------------------|--------------------------|--------------|-----------------------------|--------------------------|--------------------------|--------------|------------------------------|--|--------------------------|--------------|----------------------------------|--|----|-----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------|--------------------------|--------------------------|--------------|-------------------------------------|--------------------------|--------------|--|
| 1.1.9 Notable Additions: <i>A brief description intended to quickly identify (for the reader) the most obvious features the device supports in addition to the Highest DNP Level Supported. The complete list of features is described in the Implementation Table.</i> | TCP Initiating end point Analog inputs can report as floating point Timestamped analog input events Timestamped binary counter events File transfer (config and firmware) | TCP Initiating end point Analog inputs can report as floating point Timestamped analog input events Timestamped binary counter events File transfer (config and firmware) | other (Web interface) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.1.10 Methods to set Configurable Parameters: | <input type="checkbox"/> XML - Loaded via DNP3 File Transfer <input type="checkbox"/> XML - Loaded via other transport mechanism <input type="checkbox"/> Terminal - ASCII Terminal Command Line <input type="checkbox"/> Software - Vendor software named <input checked="" type="checkbox"/> Proprietary file loaded via DNP3 File Transfer <input checked="" type="checkbox"/> Proprietary file loaded via other transport mechanism <input type="checkbox"/> Direct - Keypad on device front panel <input checked="" type="checkbox"/> Factory - Specified when device is ordered <input type="checkbox"/> Protocol - Set via DNP3 (e.g. assign class) <input checked="" type="checkbox"/> Other - explain: Web interface <input checked="" type="checkbox"/> Other - explain: SMS commands | Factory Other, Web interface Other, SMS commands | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.1.11 DNP3 XML files available On-line: <i>XML configuration file names that can be read or written through DNP3 File Transfer to a device.</i> <i>A device's currently running configuration is returned by DNP3 on-line XML file read from the device.</i> <i>DNP3 on-line XML file write to a device will update the device's configuration when the Activate Configuration (function code 31) is received.</i> | <table border="1"> <thead> <tr> <th>Rd</th> <th>Wr</th> <th>Filename</th> <th>Description of Contents</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td></td> <td>dnpDP.xml</td> <td>Complete Device Profile</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>dnpDPCap.xml</td> <td>Device Profile Capabilities</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>dnpDPCfg.xml</td> <td>Device Profile config values</td> </tr> </tbody> </table> | Rd | Wr | Filename | Description of Contents | <input type="checkbox"/> | | dnpDP.xml | Complete Device Profile | <input type="checkbox"/> | | dnpDPCap.xml | Device Profile Capabilities | <input type="checkbox"/> | | dnpDPCfg.xml | Device Profile config values | <table border="1"> <thead> <tr> <th>Rd</th> <th>Wr</th> <th>Filename</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td></td> <td>dnpDP.xml</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>dnpDPCap.xml</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td>dnpDPCfg.xml</td> </tr> </tbody> </table> | Rd | Wr | Filename | <input type="checkbox"/> | | dnpDP.xml | <input type="checkbox"/> | | dnpDPCap.xml | <input type="checkbox"/> | | dnpDPCfg.xml | | | | | | | | |
| Rd | Wr | Filename | Description of Contents | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | dnpDP.xml | Complete Device Profile | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | dnpDPCap.xml | Device Profile Capabilities | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <input type="checkbox"/> | | dnpDP.xml | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | dnpDPCap.xml | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | dnpDPCfg.xml | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.1.12 External DNP3 XML files available Off-line: <i>XML configuration file names that can be read or written from an external system, typically from a system that maintains the outstation configuration.</i> <i>External off-line XML file read permits an XML definition of a new configuration to be supplied from off-line configuration tools.</i> <i>External off-line XML file write permits an XML definition of a new configuration to be supplied to off-line configuration tools.</i> | <table border="1"> <thead> <tr> <th>Rd</th> <th>Wr</th> <th>Filename</th> <th>Description of Contents</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>dnpDP.xml</td> <td>Complete Device Profile</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>dnpDPCap.xml</td> <td>Device Profile Capabilities</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>dnpDPCfg.xml</td> <td>Device Profile config values</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td>ms2dnpDP.xml</td> <td>Complete Device Profile Document</td> </tr> </tbody> </table> | Rd | Wr | Filename | Description of Contents | <input type="checkbox"/> | <input type="checkbox"/> | dnpDP.xml | Complete Device Profile | <input type="checkbox"/> | <input type="checkbox"/> | dnpDPCap.xml | Device Profile Capabilities | <input type="checkbox"/> | <input type="checkbox"/> | dnpDPCfg.xml | Device Profile config values | <input checked="" type="checkbox"/> | <input type="checkbox"/> | ms2dnpDP.xml | Complete Device Profile Document | <table border="1"> <thead> <tr> <th>Rd</th> <th>Wr</th> <th>Filename</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>dnpDP.xml</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>dnpDPCap.xml</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>dnpDPCfg.xml</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td>ms2dnpDP.xml</td> </tr> </tbody> </table> | Rd | Wr | Filename | <input type="checkbox"/> | <input type="checkbox"/> | dnpDP.xml | <input type="checkbox"/> | <input type="checkbox"/> | dnpDPCap.xml | <input type="checkbox"/> | <input type="checkbox"/> | dnpDPCfg.xml | <input checked="" type="checkbox"/> | <input type="checkbox"/> | ms2dnpDP.xml | |
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| <input checked="" type="checkbox"/> | <input type="checkbox"/> | ms2dnpDP.xml | Complete Device Profile Document | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <input checked="" type="checkbox"/> | <input type="checkbox"/> | ms2dnpDP.xml | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.1.13 Connections Supported: | <input type="checkbox"/> Serial (complete section 1.2) <input checked="" type="checkbox"/> IP Networking (complete section 1.3) <input type="checkbox"/> Other, explain | IP Networking | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.1.14 Conformance Testing: <i>Where conformance testing has been completed for the outstation or master station, specify the version of the published DNP3 test procedures that was successfully</i> | <input checked="" type="checkbox"/> Self-tested, version 2.7 <input type="checkbox"/> Independently tested, version | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

passed. If independently tested, identify the organization that performed the test.

| 1.3 IP NETWORKING | Capabilities | Current Value | If configurable list methods |
|--|---|---|------------------------------|
| 1.3.1 Port Name: <i>Name used to reference the communications port defined in this section.</i> | | microSpider2 | |
| 1.3.2 Type of End Point: | <input checked="" type="checkbox"/> TCP Initiating (Master Only) <input checked="" type="checkbox"/> TCP Listening (Outstation Only) <input type="checkbox"/> TCP Dual (required for Masters) <input checked="" type="checkbox"/> UDP Datagram (required) | TCP Initiating TCP Listening UDP Datagram | other (Web interface) |
| 1.3.3 IP Address of this Device: | | 192.168.0.177 | other (Web interface) |
| 1.3.4 Subnet Mask: | | 255.255.255.0 | other (Web interface) |
| 1.3.5 Gateway IP Address: | | 192.168.0.1 | other (Web interface) |
| 1.3.6 Accepts TCP Connections or UDP Datagrams from: | <input checked="" type="checkbox"/> Allows all (show as *.*.* in 1.3.7) <input checked="" type="checkbox"/> Limits based on IP address <input type="checkbox"/> Limits based on list of IP addresses <input type="checkbox"/> Limits based on a wildcard IP address <input type="checkbox"/> Limits based on list of wildcard IP addresses <input type="checkbox"/> Other, explain | Allows all | other (Web interface) |
| 1.3.7 IP Address(es) from which TCP Connections or UDP Datagrams are accepted: | | *.*.* | other (Web interface) |
| 1.3.8 TCP Listen Port Number: <i>If Outstation or dual end point Master, port number on which to listen for incoming TCP connect requests. Required to be configurable for Masters and recommended to be configurable for Outstations.</i> | <input type="checkbox"/> Not Applicable (Master w/o dual end point) <input type="checkbox"/> Fixed at 20,000 <input checked="" type="checkbox"/> Configurable, range 0 to 65535 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | 20000 | other (Web interface) |
| 1.3.9 TCP Listen Port Number of remote device: <i>If Master or dual end point Outstation, port number on remote device with which to initiate connection. Required to be configurable for Masters and recommended to be configurable for Outstations.</i> | <input type="checkbox"/> Not Applicable (Outstation w/o dual end point) <input type="checkbox"/> Fixed at 20,000 <input checked="" type="checkbox"/> Configurable, range 0 to 65535 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | 20000 | other (Web interface) |
| 1.3.10 TCP Keep-alive timer: <i>The time period for the keep-alive timer on active TCP connections.</i> | <input checked="" type="checkbox"/> Fixed at 60000 ms <input type="checkbox"/> Configurable, range to ms <input type="checkbox"/> Configurable, selectable from ms <input checked="" type="checkbox"/> Configurable, other, describe 0 for outgoing modem connections | 60000 ms | other (Web interface) |
| 1.3.11 Local UDP port: <i>Local UDP port for sending and/or receiving UDP datagrams. Masters may let system choose an available port. Outstations must use one that is known by the Master.</i> | <input checked="" type="checkbox"/> Fixed at 20,000 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe <input type="checkbox"/> Let system choose (Master only) | 20000 | |
| 1.3.12 Destination UDP port for DNP3 Requests (Masters Only): | <input type="checkbox"/> Fixed at 20,000 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | 20000 | |
| 1.3.13 Destination UDP port for initial unsolicited null responses (UDP only Outstations): | <input type="checkbox"/> None <input checked="" type="checkbox"/> Fixed at 20,000 | 20000 | |

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

| 1.4 LINK LAYER | Capabilities | Current Value | If configurable list methods |
|---|---|-------------------------|------------------------------|
| 1.4.1 Data Link Address: <i>Indicates if the link address is configurable over the entire valid range of 0 to 65,519. Data link addresses 0xFFFF0 through 0xFFFFF are reserved for broadcast or other special purposes.</i> | <input type="checkbox"/> Fixed at <input checked="" type="checkbox"/> Configurable, range 0 to 65519 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | 4 | other (Web interface) |
| 1.4.2 DNP3 Source Address Validation: <i>Indicates whether the Outstation will filter out requests not from a specific source address.</i> | <input type="checkbox"/> Never <input checked="" type="checkbox"/> Always, one address allowed (shown in 1.4.3) <input type="checkbox"/> Always, any one of multiple addresses allowed (each selectable as shown in 1.4.3) <input type="checkbox"/> Sometimes, explain | Always - single address | |
| 1.4.3 DNP3 Source Address(es) expected when Validation is Enabled: <i>Selects the allowed source address(es)</i> | <input checked="" type="checkbox"/> Configurable to any 16 bit DNP Data Link Address value <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | Any Data Link Address | other (Web interface) |
| 1.4.4 Self Address Support using address 0xFFFC: <i>If an Outstation receives a message with a destination address of 0xFFFC it shall respond normally with its own source address. It must be possible to diable this feature if supported.</i> | <input type="checkbox"/> Yes (only allowed if configurable) <input checked="" type="checkbox"/> No | No | |
| 1.4.5 Sends Confirmed User Data Frames: <i>A list of conditions under which the device transmits confirmed link layer services (TEST_LINK_STATES,</i> | <input checked="" type="checkbox"/> Never <input type="checkbox"/> Always <input type="checkbox"/> Sometimes, explain | Never | |

| | | | |
|--|--|----------|------------------------|
| <i>RESET_LINK_STATES, CONFIRMED_USER_DATA).</i> | | | |
| 1.4.6 Data Link Layer Confirmation Timeout: <i>This timeout applies to any secondary data link message that requires a confirm or response (link reset, link status, user data, etc).</i> | <input type="checkbox"/> None <input type="checkbox"/> Fixed at ms <input type="checkbox"/> Configurable, range to ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Configurable, other, describe <input checked="" type="checkbox"/> Variable, explain 2000 for LAN, 15000 for modem | Variable | other (Web interface) |
| 1.4.7 Maximum Data Link Retries: <i>The number of times the device will retransmit a frame that requests Link Layer confirmation.</i> | <input type="checkbox"/> None <input type="checkbox"/> Fixed at <input checked="" type="checkbox"/> Configurable, range 2 to 3 <input type="checkbox"/> Configurable, selectable from <input checked="" type="checkbox"/> Configurable, other, describe 3 for LAN, 2 for modem | 2 | other (Web interface) |
| 1.4.8 Maximum number of octets Transmitted in a Data Link Frame: <i>This number includes the CRCs. With a length field of 255, the maximum size would be 292.</i> | <input checked="" type="checkbox"/> Fixed at 292 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | 292 | |
| 1.4.9 Maximum number of octets that can be Received in a Data Link Frame: <i>This number includes the CRCs. With a field length of 255, the maximum size would be 292. The device must be able to receive 292 octets to be compliant.</i> | <input checked="" type="checkbox"/> Fixed at 292 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | 292 | |

| 1.5 APPLICATION LAYER | Capabilities | Current Value | If configurable list methods |
|---|---|---------------|------------------------------|
| 1.5.1 Maximum number of octets Transmitted in an Application Layer Fragment other than File Transfer: <i>This size does not include any transport or frame octets. - Masters must provide a setting less than or equal to 249 to be compliant. - Outstations must provide a setting less than or equal to 2048 to be compliant. Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 240.</i> | <input checked="" type="checkbox"/> Fixed at 2048 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | 2048 | |
| 1.5.2 Maximum number of octets Transmitted in an Application Layer Fragment containing File Transfer: | <input checked="" type="checkbox"/> Fixed at 2048 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | 2048 | |
| 1.5.3 Maximum number of octets that can be received in an Application Layer Fragment: <i>This size does not include any transport or frame octets. - Masters must provide a setting greater than or equal to 2048 to be compliant. - Outstations must provide a setting greater than or equal to 249 to be compliant. Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 241.</i> | <input checked="" type="checkbox"/> Fixed at 2048 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | 2048 | |
| 1.5.4 Timeout waiting for Complete Application Layer Fragment: <i>Timeout if all frames of a message fragment are not received in the specified time. Measured from time first frame of a fragment is received until the last frame is received.</i> | <input checked="" type="checkbox"/> None <input type="checkbox"/> Fixed at ms <input type="checkbox"/> Configurable, range to ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Configurable, other, describe <input type="checkbox"/> Variable, explain | None | |

| | | | |
|---|--|----|--|
| 1.5.5 Maximum number of objects allowed in a single control request for CROB (Group 12): <i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 216.</i> | <input checked="" type="checkbox"/> Fixed at 3 (enter 0 if controls are not supported for CROB) <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe <input type="checkbox"/> Variable, explain | 3 | |
| 1.5.6 Maximum number of objects allowed in a single control request for Analog Outputs (Group 41): | <input checked="" type="checkbox"/> Fixed at 0 (enter 0 if controls are not supported for Analog Outputs) <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe <input type="checkbox"/> Variable, explain | 0 | |
| 1.5.7 Maximum number of objects allowed in a single control request for Data Sets (Groups 85, 86, 87): | <input checked="" type="checkbox"/> Fixed at 0 (enter 0 if controls are not supported for Data Sets) <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe <input type="checkbox"/> Variable, explain | 0 | |
| 1.5.8 Supports mixed object groups (AOBs, CROBs and Data Sets) in the same control request: | <input type="checkbox"/> Not applicable - controls are not supported <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | No | |
| 1.5.9 Control Status Codes Supported: <i>Indicates which control status codes are supported by the device: - Masters must indicate which control status codes they accept in outstation responses. - Outstations must indicate which control status codes they generate in responses. Control status code 0 (success) must be supported by Masters and Outstations.</i> | <input type="checkbox"/> 1 - TIMEOUT <input type="checkbox"/> 2 - NO_SELECT <input type="checkbox"/> 3 - FORMAT_ERROR <input checked="" type="checkbox"/> 4 - NOT_SUPPORTED <input type="checkbox"/> 5 - ALREADY_ACTIVE <input type="checkbox"/> 6 - HARDWARE_ERROR <input checked="" type="checkbox"/> 7 - LOCAL <input type="checkbox"/> 8 - TOO_MANY_OBJIS <input type="checkbox"/> 9 - NOT_AUTHORIZED <input checked="" type="checkbox"/> 10 - AUTOMATION_INHIBIT <input type="checkbox"/> 11 - PROCESSING_LIMITED <input type="checkbox"/> 12 - OUT_OF_RANGE <input type="checkbox"/> 13 - DOWNSTREAM_LOCAL <input type="checkbox"/> 14 - ALREADY_COMPLETE <input type="checkbox"/> 15 - BLOCKED <input type="checkbox"/> 16 - CANCELLED <input type="checkbox"/> 17 - BLOCKED_OTHER_MASTER <input type="checkbox"/> 18 - DOWNSTREAM_FAIL <input type="checkbox"/> 126 - RESERVED <input type="checkbox"/> 127 - UNDEFINED | | |

| 1.7 FILL OUT THE FOLLOWING ITEMS FOR OUTSTATIONS ONLY | Capabilities | Current Value | If configurable list methods |
|---|--|------------------------------------|------------------------------|
| 1.7.1 Timeout waiting for Application Confirm of solicited response message: | <input type="checkbox"/> None <input checked="" type="checkbox"/> Fixed at 30000 ms <input type="checkbox"/> Configurable, range to ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Configurable, other, describe <input type="checkbox"/> Variable, explain | 30000ms | |
| 1.7.2 How often is time synchronization required from the master: <i>Details of when the master needs to perform a time synchronization to ensure that the outstation clock does not drift outside of an acceptable tolerance. If the option to relate this to IIN1.4 is used then details of when IIN1.4 is asserted are in section 1.10.2.</i> | <input type="checkbox"/> Never needs time <input type="checkbox"/> Within seconds after IIN1.4 is set <input checked="" type="checkbox"/> Periodically, fixed at 86400 seconds <input type="checkbox"/> Periodically, between and seconds | Periodically, every 86400 seconds. | |
| 1.7.3 Device Trouble Bit IIN1.6: <i>If IIN1.6 device trouble bit is set under certain conditions, explain the possible causes.</i> | <input checked="" type="checkbox"/> Never used <input type="checkbox"/> Reason for setting | Never used | |

| | | | |
|--|---|------------------|--|
| <p>1.7.4 File Handle Timeout:</p> <p><i>If there is no activity referencing a file handle for a configurable length of time, the outstation must do an automatic close on the file. The timeout value must be configurable up to 1 hour. When this condition occurs the outstation will send a File Transport Status Object (obj grp 70 var 6) using a status code value of handle expired (0x02).</i></p> | <input checked="" type="checkbox"/> Not applicable, files not supported <input type="checkbox"/> Fixed at ms <input type="checkbox"/> Configurable, range to ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Configurable, other, describe <input type="checkbox"/> Variable, explain | Not applicable | |
| <p>1.7.5 Event Buffer Overflow Behavior:</p> | <input checked="" type="checkbox"/> Discard the oldest event <input type="checkbox"/> Discard the newest event <input type="checkbox"/> Other, explain | Discard oldest | |
| <p>1.7.6 Event Buffer Organization:</p> <p><i>Explain how event buffers are arranged (per Object Group, per Class, single buffer, etc) and specify the number of events that can be buffered.</i></p> | <input checked="" type="checkbox"/> Per Object Group (see part 3) <input type="checkbox"/> Per Class Class 1: <input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe Class 2: <input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe Class 3: <input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe <input type="checkbox"/> Single Buffer <input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe <input type="checkbox"/> Other, describe | Per object group | |
| <p>1.7.7 Sends Multi-Fragment Responses:</p> <p><i>Indicates whether an Outstation sends multi-fragment responses (Masters do not send multi-fragment requests).</i></p> | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Yes | |
| <p>1.7.8 Last Fragment Confirmation:</p> <p><i>Indicates whether the Outstation requests confirmation of the last fragment of a multi-fragment response.</i></p> | <input type="checkbox"/> Always <input checked="" type="checkbox"/> Sometimes, explain Only when it contains events <input type="checkbox"/> Never | Sometimes | |
| <p>1.7.9 DNP Command Settings preserved through a device restart:</p> <p><i>If any of these settings are written through the DNP protocol and they are not preserved through a restart of the Outstation, the Master will have to write them again after it receives a response in which the Restart IIN bit is set.</i></p> | <input type="checkbox"/> Assign Class <input type="checkbox"/> Analog Deadbands <input type="checkbox"/> Data Set Prototypes <input type="checkbox"/> Data Set Descriptors <input type="checkbox"/> Function Code 31 Activate Configuration | | |
| <p>1.7.10 Supports configuration signature:</p> <p><i>Indicates whether an Outstation supports the Group 0 device attribute "Configuration signature" (variation 200). If yes, list the vendor-defined name(s) of the algorithm(s) available to calculate the signature.</i></p> <p><i>Note: The algorithm used for calculating the signature is identified by name in a string that</i></p> | <input type="checkbox"/> Configuration signature supported If configuration signature is supported, then the following algorithm(s) are available for calculating the signature: | Not Supported | |

| | | | |
|---|---|---|--|
| <i>can be determined remotely using protocol object Group 0 Variation 201. If only a single algorithm is available, identifying that algorithm in this object is optional.</i> | | | |
| <p>1.7.11 Requests Application Confirmation:</p> <p><i>Indicate if application confirmation is requested:</i></p> <p>- when responding with events - when sending non-final fragments of multi-fragment responses</p> <p><i>Note: to be compliant both must be selected as "yes".</i></p> | <p>For event responses:</p> <ul style="list-style-type: none"> <input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Configurable <p>For non-final fragments:</p> <ul style="list-style-type: none"> <input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Configurable | <p>Event responses: Yes</p> <p>Non-final fragments: Yes</p> | |

| 1.8 OUTSTATION UNSOLICITED RESPONSE SUPPORT | Capabilities | Current Value | If configurable list methods |
|---|---|---------------|------------------------------|
| <p>1.8.1 Supports Unsolicited Reporting:</p> <p><i>When the unsolicited response mode is configured "off", the device is to behave exactly like an equivalent device that has no support for unsolicited responses. If set to "on", the Outstation will send a null Unsolicited Response after it restarts, then wait for an Enable Unsolicited Response command from the master before sending additional Unsolicited Responses containing event data.</i></p> | <ul style="list-style-type: none"> <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Configurable, selectable from On and Off | On | other (Web interface) |
| <p>1.8.2 Master Data Link Address:</p> <p><i>The destination address of the master device where the unsolicited responses will be sent.</i></p> | <ul style="list-style-type: none"> <input type="checkbox"/> Fixed at <input checked="" type="checkbox"/> Configurable, range 0 to 65519 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | 3 | other (Web interface) |
| <p>1.8.3 Unsolicited Response Confirmation Timeout:</p> <p><i>This is the amount of time that the outstation will wait for an Application Layer confirmation back from the master indicating that the master received the unsolicited response message. As a minimum, the range of configurable values must include times from one second to one minute. This parameter may be the same one that is used for normal, solicited, application confirmation timeouts, or it may be a separate parameter.</i></p> | <ul style="list-style-type: none"> <input type="checkbox"/> Fixed at ms <input checked="" type="checkbox"/> Configurable, range 0 to 86400000ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Configurable, other, describe <input type="checkbox"/> Variable, explain | 15000 ms | |
| <p>1.8.4 Number of Unsolicited Retries:</p> <p><i>This is the number of retries that an outstation transmits in each unsolicited response series if it does not receive confirmation back from the master. The configured value includes identical and regenerated retry messages. One of the choices must provide for an indefinite (and potentially infinite) number of transmissions.</i></p> | <ul style="list-style-type: none"> <input type="checkbox"/> None <input type="checkbox"/> Fixed at <input checked="" type="checkbox"/> Configurable, range 0 to 65535 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe <input checked="" type="checkbox"/> Always infinite, never gives up | 3 | other (Web interface) |

| 1.9 OUTSTATION UNSOLICITED RESPONSE TRIGGER CONDITIONS | Capabilities | Current Value | If configurable list methods |
|--|--|---------------|------------------------------|
| <p>1.9.1 Number of class 1 events:</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Class 1 not used to trigger Unsolicited Responses <input checked="" type="checkbox"/> Fixed at 5 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | 5 | |
| <p>1.9.2 Number of class 2 events:</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Class 2 not used to trigger Unsolicited Responses | 5 | |

| | | | |
|--|---|-----------------|------------------------|
| | <p>Responses</p> <input checked="" type="checkbox"/> Fixed at 5 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | | |
| 1.9.3 Number of class 3 events: | <input type="checkbox"/> Class 3 not used to trigger Unsolicited Responses <input checked="" type="checkbox"/> Fixed at 5 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | 5 | |
| 1.9.4 Total number of events from any class: | <input checked="" type="checkbox"/> Total Number of Events not used to trigger Unsolicited Responses <input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | | |
| 1.9.5 Hold time after class 1 event: <i>A configurable value of 0 indicates that responses are not delayed due to this parameter.</i> | <input type="checkbox"/> Class 1 not used to trigger Unsolicited Responses <input checked="" type="checkbox"/> Fixed at 5000ms <input type="checkbox"/> Configurable, range to ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Configurable, other, describe | 5000 ms | |
| 1.9.6 Hold time after class 2 event: <i>A configurable value of 0 indicates that responses are not delayed due to this parameter.</i> | <input type="checkbox"/> Class 2 not used to trigger Unsolicited Responses <input checked="" type="checkbox"/> Fixed at 5000ms <input type="checkbox"/> Configurable, range to ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Configurable, other, describe | 5000 ms | |
| 1.9.7 Hold time after class 3 event: <i>A configurable value of 0 indicates that responses are not delayed due to this parameter.</i> | <input type="checkbox"/> Class 3 not used to trigger Unsolicited Responses <input checked="" type="checkbox"/> Fixed at 5000ms <input type="checkbox"/> Configurable, range to ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Configurable, other, describe | 5000 ms | |
| 1.9.8 Hold time after event assigned to any class: <i>A configurable value of 0 indicates that responses are not delayed due to this parameter.</i> | <input type="checkbox"/> Class events not used to trigger Unsolicited Responses <input checked="" type="checkbox"/> Fixed at 5000ms <input type="checkbox"/> Configurable, range to ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Configurable, other, describe | 5000 ms | |
| 1.9.9 Retrigger Hold Time: <i>The hold-time timer may be retriggered for each new event detected (increased possibility of capturing all the changes in a single response) or not retriggered (giving the master a guaranteed update time).</i> | <input type="checkbox"/> Hold-time timer will be retriggered for each new event detected (may get more changes in next response) <input checked="" type="checkbox"/> Hold-time timer will not be retriggered for each new event detected (guaranteed update time) | Not retriggered | |
| 1.9.10 Other Unsolicited Response Trigger Conditions: | | | other (Web interface) |

| 1.10 OUTSTATION PERFORMANCE | Capabilities | Current Value | If configurable list methods |
|---|--|---|------------------------------|
| 1.10.1 Maximum Time Base Drift (milliseconds per minute): <i>If the device is synchronized by DNP, what is the clock drift rate over the full operating temperature range.</i> | <input checked="" type="checkbox"/> Fixed at 1ms <input type="checkbox"/> Range to ms <input type="checkbox"/> Selectable from ms <input type="checkbox"/> Other, describe | 1 ms | |
| 1.10.2 When does outstation set IIN1.4: <i>When does the outstation set the internal indication IIN1.4 NEED_TIME</i> | <input type="checkbox"/> Never <input checked="" type="checkbox"/> Asserted at startup until first Time Synchronization request received <input type="checkbox"/> Periodically every seconds | At startup 86400 seconds after last sync | |

| | | | |
|---|---|-----------|------------------------|
| | <input type="checkbox"/> Periodically, range to seconds <input type="checkbox"/> Periodically, selectable from seconds <input checked="" type="checkbox"/> 86400 seconds after last time sync <input type="checkbox"/> Range to seconds after last time sync <input type="checkbox"/> Selectable from seconds after last time sync <input type="checkbox"/> When time error may have drifted by ms <input type="checkbox"/> When time error may have drifted by range to ms <input type="checkbox"/> When time error may have drifted by selectable from ms | | |
| 1.10.3 Maximum Internal Time Reference Error when set via DNP (ms): <i>The difference between the time set in DNP Write Time message, and the time actually set in the outstation.</i> | <input checked="" type="checkbox"/> Fixed at 32ms <input type="checkbox"/> Range to ms <input type="checkbox"/> Selectable from ms <input type="checkbox"/> Other, describe | 32 ms | |
| 1.10.4 Maximum Delay Measurement Error (ms): <i>The difference between the time reported in the delay measurement response and the actual time between receipt of the delay measurement request and issuing the delay measurement reply.</i> | <input checked="" type="checkbox"/> Fixed at 32ms <input type="checkbox"/> Range to ms <input type="checkbox"/> Selectable from ms <input type="checkbox"/> Other, describe | 32 ms | |
| 1.10.5 Maximum Response Time (ms): <i>The amount of time an outstation will take to respond upon receipt of a valid request. This does not include the message transmission time.</i> | <input type="checkbox"/> Fixed at ms <input checked="" type="checkbox"/> Range 0 to 1000ms <input type="checkbox"/> Selectable from ms <input type="checkbox"/> Other, describe | 0 ms | |
| 1.10.6 Maximum time from start-up to IIN 1.4 assertion (ms): | <input type="checkbox"/> Fixed at ms <input checked="" type="checkbox"/> Range 2000 to 5000ms <input type="checkbox"/> Selectable from ms <input type="checkbox"/> Other, describe | 3000 ms | |
| 1.10.7 Maximum Event Time-tag error for local Binary and Double Bit I/O (ms): <i>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.</i> | <input type="checkbox"/> Fixed at ms <input checked="" type="checkbox"/> Range 0 to 1000ms <input type="checkbox"/> Selectable from ms <input type="checkbox"/> 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): | <input type="checkbox"/> Fixed at ms <input checked="" type="checkbox"/> Range 1000 to 86400000ms <input type="checkbox"/> Selectable from ms <input checked="" type="checkbox"/> Other, describe inputs logged at user-configurable period (1s - 24h) | 300000 ms | other (Web interface) |

| 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): | "long location" field | other (Web interface) |
| 1.11.2 User-assigned ID code/number string (same as g0v246): | "short location" field | other (Web interface) |
| 1.11.3 User-assigned name string for the outstation (same as g0v247): | | |
| 1.11.4 Device Serial Number string (same as g0v248): | serial number as 6 hex digits | |

| 1.12 SECURITY PARAMETERS | Capabilities | Current Value | If configurable list methods |
|--------------------------|--------------|---------------|------------------------------|
|--------------------------|--------------|---------------|------------------------------|

| | | | |
|---|--|--|--|
| <p>1.12.1 DNP3 device support for secure authentication:</p> <p><i>The support for secure authentication is optional in DNP3 devices. Indicate here if the device supports secure authentication.</i></p> <p><i>If the device does not support secure authentication then ignore the rest of this section.</i></p> <p><i>If the device does support secure authentication then specify the version(s) that are supported in the device. The version number is an integer value defined in the 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.</i></p> | <p><input checked="" type="checkbox"/> Secure Authentication not supported</p> <p>If Secure Authentication is supported, what Version(s) are supported:</p> <p><input type="checkbox"/> Fixed at</p> <p><input checked="" type="checkbox"/> Configurable, selectable from 2, 5</p> | <p>Not Supported</p> | |
| <p>1.12.2 Maximum number of users:</p> <p><i>The secure authentication algorithm provides support for multiple users. The device must support details for each user (update keys, session keys, etc). A user is identified by a 16-bit user number, allowing a maximum of 65535 users. Devices are not mandated to support this number of potential users. Indicate here the actual limit to the number of simultaneous users that can be supported.</i></p> | <p>Maximum number of users supported:</p> | <p>Maximum number of users supported:</p> | |
| <p>1.12.3 Security message response timeout:</p> <p><i>Authentication of critical messages may involve additional message exchanges (challenges and responses) which can require an extension to the normal DNP3 message response timeout. This timeout specifies an additional time to be used when the extra security transactions are involved. The maximum allowable timeout extension should not exceed 120 seconds.</i></p> | <p><input type="checkbox"/> Fixed at ms</p> <p><input type="checkbox"/> Configurable, range to ms</p> <p><input type="checkbox"/> Configurable, selectable from ms</p> <p><input type="checkbox"/> Configurable, other, describe</p> | | |
| <p>1.12.4 Aggressive mode of operation (receive):</p> <p><i>DNP3 devices may (optionally) accept "aggressive" mode requests, where challenge data used for authentication is appended to a critical message rather than needing to be solicited via a separate message exchange.</i></p> | | <p><input type="radio"/> Yes, accepts aggressive mode requests</p> <p><input type="radio"/> No, does not accept aggressive mode requests</p> | |
| <p>1.12.5 Aggressive mode of operation (issuing):</p> <p><i>DNP3 devices must support the issuing of "aggressive" mode of operation, where challenge data used for authentication is appended to a critical message rather than needing to be solicited via a separate message exchange. Specific instances of devices may have the use of aggressive mode switched off.</i></p> | | <p><input type="radio"/> Yes, issues aggressive mode requests</p> <p><input type="radio"/> No, does not issue aggressive mode requests</p> | |
| <p>1.12.6 Session key change interval:</p> <p><i>To counter an attack that compromises the session key, the session key is changed at regular intervals. The maximum interval is 2 hours. Outstation devices invalidate the current set of session keys if they have not been changed by the master station after a period of twice this configured value.</i></p> <p><i>To accommodate systems with infrequent communications, this change interval can be</i></p> | <p><input type="checkbox"/> Can be disabled</p> <p>When enabled</p> <p><input type="checkbox"/> Configurable, range to seconds</p> | | |

| | | | |
|---|---|--|--|
| <p><i>disabled and just the session key change message count used (see 1.12.7)</i></p> | | | |
| <p>1.12.7 Session key change message count:</p> <p><i>In addition to changing the session key at regular intervals, the key shall also be changed after a specified number of messages have been exchanged. The maximum allowable value for this message count is 10,000</i></p> | <p><input type="checkbox"/> Configurable, range to</p> | | |
| <p>1.12.8 Maximum error count:</p> <p><i>To assist in countering denial of service attacks, a DNP3 device shall stop replying with error codes after a number of successive authentication failures. This error count has a maximum value of 10. Setting the error count to zero inhibits all error messages.</i></p> | <p><input type="checkbox"/> Configurable, range to</p> | | |
| <p>1.12.9 MAC algorithm requested in a challenge exchange:</p> <p><i>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).</i></p> | <p><input type="checkbox"/> SHA-1 (truncated to the leftmost 4 octets) <input type="checkbox"/> SHA-1 (truncated to the leftmost 8 octets) <input type="checkbox"/> SHA-1 (truncated to the leftmost 10 octets) <input type="checkbox"/> SHA-256 (truncated to the leftmost 8 octets) <input type="checkbox"/> SHA-256 (truncated to the leftmost 16 octets) <input type="checkbox"/> AES-GMAC <input type="checkbox"/> Other, explain:</p> | | |
| <p>1.12.10 Key-wrap algorithm to encrypt session keys:</p> <p><i>During the update of a session key, the key is encrypted using AES-128 or optionally using other algorithms.</i></p> | <p><input type="checkbox"/> AES-128 <input type="checkbox"/> AES-256 <input type="checkbox"/> Other, explain:</p> | | |
| <p>1.12.11 Cipher Suites used with DNP implementations using TLS:</p> <p><i>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.</i></p> | <p><input type="checkbox"/> Not relevant - TLS is not used <input type="checkbox"/> TLS_RSA encrypted with AES128 <input type="checkbox"/> TLS_RSA encrypted with RC4_128 <input type="checkbox"/> TLS_RSA encrypted with 3DES_EDE_CBC <input type="checkbox"/> TLS_DH, signed with DSS, encrypted with 3DES_EDE_CBC <input type="checkbox"/> TLS_DH, signed with RSA, encrypted with 3DES_EDE_CBC <input type="checkbox"/> TLS_DHE, signed with DSS, encrypted with 3DES_EDE_CBC <input type="checkbox"/> TLS_DHE, signed with RSA, encrypted with 3DES_EDE_CBC <input type="checkbox"/> TLS_DH, signed with DSS, encrypted with AES128 <input type="checkbox"/> TLS_DH, signed with DSS, encrypted with AES256 <input type="checkbox"/> TLS_DH encrypted with AES128 <input type="checkbox"/> TLS_DH encrypted with AES256 <input type="checkbox"/> Other, explain:</p> | | |
| <p>1.12.12 Change cipher request timeout:</p> <p><i>Implementations using TLS shall terminate the connection if a response to a change cipher request is not seen within this timeout period.</i></p> | <p><input type="checkbox"/> Not relevant - TLS is not used <input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe</p> | | |
| <p>1.12.13 Number of Certificate Authorities supported:</p> <p><i>Implementations using TLS shall support at least 4 Certificate Authorities. Indicate the number supported.</i></p> | | | |
| <p>1.12.14 Certificate Revocation check time:</p> | <p><input type="checkbox"/> Not relevant - TLS is not used</p> | | |

| | | | |
|--|--|----|--|
| <p>Implementations using TLS shall evaluate Certificate Revocation Lists on a periodic basis, terminating a connection if a certificate is revoked.</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Fixed at hours <input type="checkbox"/> Configurable, range to hours <input type="checkbox"/> Configurable, selectable from hours <input type="checkbox"/> Configurable, other, describe | | |
| <p>1.12.15 Additional critical function codes:</p> <p><i>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.</i></p> <p><i>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".</i></p> | <p>Additional function codes that are to be considered as "critical":</p> <ul style="list-style-type: none"> <input type="checkbox"/> 0 (Confirm) <input type="checkbox"/> 1 (Read) <input type="checkbox"/> 7 (Immediate freeze) <input type="checkbox"/> 8 (Immediate freeze - no ack) <input type="checkbox"/> 9 (Freeze-and-clear) <input type="checkbox"/> 10 (Freeze-and-clear - no ack) <input type="checkbox"/> 11 (Freeze-at-time) <input type="checkbox"/> 12 (Freeze-at-time - no ack) <input type="checkbox"/> 22 (Assign Class) <input type="checkbox"/> 23 (Delay Measurement) <input type="checkbox"/> 25 (Open File) - V2 only <input type="checkbox"/> 26 (Close File) - V2 only <input type="checkbox"/> 27 (Delete File) - V2 only <input type="checkbox"/> 28 (Get File Info) - V2 only <input type="checkbox"/> 30 (Abort File) - V2 only <ul style="list-style-type: none"> <input type="checkbox"/> 129 (Response) <input type="checkbox"/> 130 (Unsolicited Response) | | |
| <p>1.12.16 Other critical fragments:</p> <p><i>Other critical transactions can be defined and should be detailed here. Examples could be based on time (for example: the first transaction after a communications session is established). Other examples could be based on specific data objects (for example: the reading of specific data points).</i></p> | | | |
| <p>1.12.17 Support for remote update key changes:</p> <p><i>Devices implementing secure authentication version 5 or 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.</i></p> | <ul style="list-style-type: none"> <input type="checkbox"/> Remote update key change by symmetric cryptography <p style="margin-left: 20px;">Supported key change methods:</p> <ul style="list-style-type: none"> <input type="checkbox"/> AES-128 key wrap with SHA-1-HMAC <input type="checkbox"/> AES-256 key wrap with SHA-256-HMAC <input type="checkbox"/> AES-256 key wrap with AES-GMAC <ul style="list-style-type: none"> <input type="checkbox"/> Remote update key change by asymmetric cryptography <p style="margin-left: 20px;">Supported key change methods:</p> <ul style="list-style-type: none"> <input type="checkbox"/> RSAES-OAEP-1024/SHA-1 with DSA SHA-1 and SHA-1-HMAC <input type="checkbox"/> RSAES-OAEP-2048/SHA-256 with DSA SHA-256 and SHA-256-HMAC <input type="checkbox"/> RSAES-OAEP-3072/SHA-256 with DSA SHA-256 and SHA-256-HMAC <input type="checkbox"/> RSAES-OAEP-2048/SHA-256 with DSA SHA-256 and AES-GMAC <input type="checkbox"/> RSAES-OAEP-3072/SHA-256 with DSA SHA-256 and AES-GMAC | | |
| <p>1.12.18 "Default" user credentials are permitted to expire:</p> | <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No | No | |

| 1.13 BROADCAST FUNCTIONALITY | Capabilities | Current Value | If configurable list methods |
|--|--------------|---------------|------------------------------|
| <p>This section indicates which functions are supported by the device when using broadcast addresses.</p> | | | |
| <p>Note that this section shows only entries that may have a meaningful purpose when used with broadcast requests.</p> | | | |
| | | | |

| | | | |
|--|--|-----------------------------------|---------------------------------------|
| 1.13.1 Support for broadcast functionality: | <input type="radio"/> Disabled <input checked="" type="radio"/> Enabled <input type="radio"/> Configurable | Enabled | |
| 1.13.2 Write functions (FC = 2) supported with broadcast requests: | <p>Write clock (g50v1 with qualifier code 07)</p> <input type="radio"/> Disabled <input checked="" type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Write clock: Enabled | Clock: Time: Restart: Other: |
| | <p>Write last recorded time (g50v3 with qualifier code 07)</p> <input type="radio"/> Disabled <input checked="" type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Write last recorded time: Enabled | |
| | <p>Clear restart (g80v1 with qualifier code 00 and index = 7, value = 0)</p> <input type="radio"/> Disabled <input checked="" type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Clear restart: Enabled | |
| | <p>Write to any other group / variation / qualifier code</p> <input type="radio"/> Disabled <input checked="" type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Write any other: Enabled | |
| | | | |
| 1.13.3 Direct operate functions (FC = 5) supported with broadcast requests: | <input type="radio"/> Disabled <input checked="" type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Enabled | |
| 1.13.4 Direct operate, no acknowledgement functions (FC = 6) supported with broadcast requests: | <input type="radio"/> Disabled <input checked="" type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Enabled | |
| 1.13.5 Immediate freeze functions (FC = 7) supported with broadcast requests: | <input type="radio"/> Disabled <input checked="" type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Enabled | |
| 1.13.6 Immediate freeze, no acknowledgement functions (FC = 8) supported with broadcast requests: | <input type="radio"/> Disabled <input checked="" type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Enabled | |
| 1.13.7 Freeze and clear functions (FC = 9) supported with broadcast requests: | <input type="radio"/> Disabled <input checked="" type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Enabled | |
| 1.13.8 Freeze and clear, no acknowledgement functions (FC = 10) supported with broadcast requests: | <input type="radio"/> Disabled <input checked="" type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Enabled | |
| 1.13.9 Freeze at time functions (FC = 11) supported with broadcast requests: | <input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Disabled | |
| 1.13.10 Freeze at time, no acknowledgement functions (FC = 12) supported with broadcast requests: | <input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Disabled | |
| 1.13.11 Cold restart functions (FC = 13) supported with broadcast requests: | <input type="radio"/> Disabled <input checked="" type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Enabled | |
| 1.13.12 Warm restart functions (FC = 14) supported with broadcast requests: | <input type="radio"/> Disabled <input checked="" type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Enabled | |
| 1.13.13 Initialize data functions (FC = 15) supported with broadcast requests: | <input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Disabled | |
| 1.13.14 Initialize application functions (FC = 16) supported with broadcast requests: | <input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Disabled | |
| 1.13.15 Start application functions (FC = 17) | <input checked="" type="radio"/> Disabled | Disabled | |

| | | | |
|---|--|---|------------------|
| supported with broadcast requests: | <input type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | | |
| 1.13.16 Stop application functions (FC = 18) supported with broadcast requests: | <input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Disabled | |
| 1.13.17 Save configuration functions (FC = 19) supported with broadcast requests: | <input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Disabled | |
| 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) <input type="radio"/> Disabled <input checked="" type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) Enable unsolicited for any other group / variation / qualifier code <input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | By event class: Enabled By any other: Disabled | Class: 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) <input type="radio"/> Disabled <input checked="" type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) Disable unsolicited for any other group / variation / qualifier code <input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | By event class: Enabled By any other: Disabled | Class: Other: |
| 1.13.20 Assign class functions (FC = 22) supported with broadcast requests: | <input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Disabled | |
| 1.13.21 Record current time functions (FC = 24) supported with broadcast requests: | <input type="radio"/> Disabled <input checked="" type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Enabled | |
| 1.13.22 Activate configuration functions (FC = 31) supported with broadcast requests: | <input checked="" type="radio"/> Disabled <input type="radio"/> Enabled <input type="radio"/> Configurable, other (described elsewhere) | Disabled | |

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 BINARY INPUTS

Static (Steady-State) Object Number: 1
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: | <input checked="" type="checkbox"/> Variation 1 - packed format <input type="checkbox"/> Variation 2 - with flag <input type="checkbox"/> Based on point index (add column to table in part 5) | One | |
| 3.1.2 Event Variation reported when variation 0 requested or in response to Class polls: <i>Note: The support for binary input events can be determined remotely using protocol object Group 0 Variation 237.</i> | <input type="checkbox"/> Variation 1 - without time <input type="checkbox"/> Variation 2 - with absolute time <input checked="" type="checkbox"/> Variation 3 - with relative time <input type="checkbox"/> Based on point index (add column to table in part 5) | Three | |
| 3.1.3 Event reporting mode: <i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event. "All events" must be checked to be compliant.</i> | <input type="checkbox"/> Only most recent <input checked="" type="checkbox"/> All events <input type="checkbox"/> Based on point index (add column to table in part 5) | All events | |
| 3.1.4 Binary Inputs included in Class 0 response: | <input checked="" type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to a class <input type="checkbox"/> Based on point index (add column to table in part 5) | Always | |
| 3.1.5 Binary Inputs Event Buffer Organization: <i>When event buffers are allocated per object group (see part 1.7.6), indicate the number of events that can be buffered for Binary Inputs. If event buffers are not allocated per object group then set "Fixed at 0".</i> | <input type="checkbox"/> Fixed at <input checked="" type="checkbox"/> Configurable, range 1 to 65535 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | Number of events = 65535 | |

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: | <input checked="" type="checkbox"/> Fixed at 100 ms (hardware may limit this further) <input type="checkbox"/> Based on point index (add column to table in part 5) | Fixed at 100 ms | |
| 3.3.2 Maximum pulse time allowed with Trip, Close and Pulse On commands: | <input checked="" type="checkbox"/> Fixed at 610000 ms (hardware may limit this further) <input type="checkbox"/> Based on point index (add column to table in part 5) | Fixed at 610000 ms | |
| 3.3.3 Binary Output Status included in Class 0 response: | <input checked="" type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to a class <input type="checkbox"/> Based on point index (add column to table in part 5) | Always | |
| 3.3.4 Reports Output Command Event Objects: | <input checked="" type="checkbox"/> Never <input type="checkbox"/> Only upon a successful Control <input type="checkbox"/> Upon all control attempts | Never | |
| 3.3.5 Static Variation reported when variation 0 requested or in response to Class polls: | <input type="checkbox"/> Variation 1 - packed format <input checked="" type="checkbox"/> Variation 2 - output status with flags <input type="checkbox"/> Based on point index (add column to table in part 5) | Two | |

| | | | |
|--|---|----------------------|--|
| 3.3.6 Event Variation reported when variation 0 requested or in response to Class polls: <i>Note: The support for binary output events can be determined remotely using protocol object Group 0 Variation 222.</i> | <input checked="" type="checkbox"/> Variation 1 - status without time <input type="checkbox"/> Variation 2 - status with time <input type="checkbox"/> Based on point index (add column to table in part 5) | One | |
| 3.3.7 Command Event Variation reported when variation 0 requested or in response to Class polls: | <input checked="" type="checkbox"/> Variation 1 - command status without time <input type="checkbox"/> Variation 2 - command status with time <input type="checkbox"/> Based on point index (add column to table in part 5) | One | |
| 3.3.8 Event reporting mode: <i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.</i> | <input type="checkbox"/> Only most recent <input checked="" type="checkbox"/> All events | All events | |
| 3.3.9 Command Event reporting mode: <i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event.</i> | <input type="checkbox"/> Only most recent <input checked="" type="checkbox"/> All events | All events | |
| 3.3.10 Maximum Time between Select and Operate: | <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Fixed at 5seconds <input type="checkbox"/> Configurable, range to seconds <input type="checkbox"/> Configurable, selectable from seconds <input type="checkbox"/> Configurable, other, describe <input type="checkbox"/> Variable, explain <input type="checkbox"/> Based on point index (add column to table in part 5) | 5 seconds | |
| 3.3.11 Binary Outputs Event Buffer Organization: <i>When event buffers are allocated per object group (see part 1.7.6), indicate the number of events that can be buffered for Binary Outputs. If event buffers are not allocated per object group then set "Fixed at 0".</i> | <input checked="" type="checkbox"/> Fixed at 0 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | Number of events = 0 | |
| 3.3.12 Binary Output Commands Event Buffer Organization: <i>When event buffers are allocated per object group (see part 1.7.6), indicate the number of events that can be buffered for Binary Output Commands. If event buffers are not allocated per object group then set "Fixed at 0".</i> | <input checked="" type="checkbox"/> Fixed at 0 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | Number of events = 0 | |

3.4 COUNTERS / FROZEN COUNTERS

Counter Group Number: 20

Frozen Counter Group Number: 21

Counter Event Group Number: 22

Frozen Counter Event Group 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: | <input type="checkbox"/> Variation 1 - 32-bit with flag <input type="checkbox"/> Variation 2 - 16-bit with flag <input checked="" type="checkbox"/> Variation 5 - 32-bit without flag <input type="checkbox"/> Variation 6 - 16-bit without flag <input type="checkbox"/> Based on point index (add column to table in part 5) | Five | |
| 3.4.2 Counter Event Variation reported when variation 0 requested or in response to Class polls: <i>Note: The support for counter events can be determined remotely using protocol object Group 0 Variation 227.</i> | <input type="checkbox"/> Variation 1 - 32-bit with flag <input type="checkbox"/> Variation 2 - 16-bit with flag <input checked="" type="checkbox"/> Variation 5 - 32-bit with flag and time <input type="checkbox"/> Variation 6 - 16-bit with flag and time <input type="checkbox"/> Based on point index (add column to table in part 5) | Five | |

| | | | |
|---|---|--------------------------|--|
| 3.4.3 Counters included in Class 0 response: | <input checked="" type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to a class <input type="checkbox"/> Based on point index (add column to table in part 5) | Always | |
| 3.4.4 Counter Event reporting mode: <i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event. Only the most recent event is typically reported for Counters. When reporting only the most recent event the counter value returned in the response may be either the value at the time that the event is queued or it may be the value at the time of the response.</i> | <input type="checkbox"/> A: Only most recent (value at time of event) <input type="checkbox"/> B: Only most recent (value at time of response) <input checked="" type="checkbox"/> C: All events <input type="checkbox"/> Based on point index (add column to table in part 5) | All events | |
| 3.4.5 Static Frozen Counter Variation reported when variation 0 requested or in response to Class polls: | <input type="checkbox"/> Variation 1 - 32-bit with flag <input type="checkbox"/> Variation 2 - 16-bit with flag <input type="checkbox"/> Variation 5 - 32-bit with flag and time <input type="checkbox"/> Variation 6 - 16-bit with flag and time <input checked="" type="checkbox"/> Variation 9 - 32-bit without flag <input type="checkbox"/> Variation 10 - 16-bit without flag <input type="checkbox"/> Based on point index (add column to table in part 5) | Nine | |
| 3.4.6 Frozen Counter Event Variation reported when variation 0 requested or in response to Class polls: <i>Note: The support for frozen counter events can be determined remotely using protocol object Group 0 Variation 225.</i> | <input checked="" type="checkbox"/> Variation 1 - 32-bit with flag <input type="checkbox"/> Variation 2 - 16-bit with flag <input type="checkbox"/> Variation 5 - 32-bit without flag <input type="checkbox"/> Variation 6 - 16-bit without flag <input type="checkbox"/> Based on point index (add column to table in part 5) | One | |
| 3.4.7 Frozen Counters included in Class 0 response: | <input checked="" type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to a class <input type="checkbox"/> Based on point index (add column to table in part 5) | Always | |
| 3.4.8 Frozen Counter Event reporting mode: <i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event. All events are typically reported for Frozen Counters</i> | <input type="checkbox"/> Only most recent frozen value <input checked="" type="checkbox"/> All frozen values <input type="checkbox"/> Based on point index (add column to table in part 5) | All events | |
| 3.4.9 Counters Roll Over at: | <input type="checkbox"/> 16 Bits (65,535) <input type="checkbox"/> 32 Bits (4,294,967,295) <input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input checked="" type="checkbox"/> Configurable, other, describe 999999 x channel divisor <input type="checkbox"/> Based on point index (add column to table in part 5) | | |
| 3.4.10 Counters frozen by means of: | <input checked="" type="checkbox"/> Master Request <input type="checkbox"/> Freezes itself without concern for time of day <input type="checkbox"/> Freezes itself and requires time of day <input type="checkbox"/> Other, explain: | Master Request | |
| 3.4.11 Counters Event Buffer Organization: <i>When event buffers are allocated per object group (see part 1.7.6), indicate the number of events that can be buffered for Counters. If event buffers are not allocated per object group then set "Fixed at 0".</i> | <input type="checkbox"/> Fixed at <input checked="" type="checkbox"/> Configurable, range 1 to 65535 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | Number of events = 65535 | |
| 3.4.12 Frozen Counters Event Buffer Organization: | <input checked="" type="checkbox"/> Fixed at 0 <input type="checkbox"/> Configurable, range to | Number of events = 0 | |

| | | | |
|--|---|-----|--|
| When event buffers are allocated per object group (see part 1.7.6), indicate the number of events that can be buffered for Frozen Counters. If event buffers are not allocated per object group then set "Fixed at 0". | <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | | |
| 3.4.13 Reports counter events for change of value: Indicate if counter events are created when the counter value changes. | <input checked="" type="checkbox"/> Yes for all counters <input type="checkbox"/> No for all counters <input type="checkbox"/> Based on point index (add column to table in part 5) | Yes | |

3.5 ANALOG INPUTS
Static (Steady-State) Object Number: 30
Event Object Number: 32
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: | <input type="checkbox"/> Variation 1 - 32-bit with flag <input type="checkbox"/> Variation 2 - 16-bit with flag <input type="checkbox"/> Variation 3 - 32-bit without flag <input type="checkbox"/> Variation 4 - 16-bit without flag <input type="checkbox"/> Variation 5 - single-precision floating point with flag <input checked="" type="checkbox"/> Variation 6 - double-precision floating point with flag <input type="checkbox"/> Based on point index (add column to table in part 5) | Six | |
| 3.5.2 Event Variation reported when variation 0 requested or in response to Class polls: <i>Note: The support for analog input events can be determined remotely using protocol object Group 0 Variation 231.</i> | <input type="checkbox"/> Variation 1 - 32-bit without time <input type="checkbox"/> Variation 2 - 16-bit without time <input type="checkbox"/> Variation 3 - 32-bit with time <input type="checkbox"/> Variation 4 - 16-bit with time <input type="checkbox"/> Variation 5 - single-precision floating point w/o time <input type="checkbox"/> Variation 6 - double-precision floating point w/o time <input type="checkbox"/> Variation 7 - single-precision floating point with time <input checked="" type="checkbox"/> Variation 8 - double-precision floating point with time <input type="checkbox"/> Based on point index (add column to table in part 5) | Eight | |
| 3.5.3 Event reporting mode: <i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event. Only the most recent event is typically reported for Analog Inputs. 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.</i> | <input type="checkbox"/> A: Only most recent (value at time of event) <input type="checkbox"/> B: Only most recent (value at time of response) <input checked="" type="checkbox"/> C: All events <input type="checkbox"/> Based on point index (add column to table in part 5) | All events | |
| 3.5.4 Analog Inputs included in Class 0 response: | <input checked="" type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to a class <input type="checkbox"/> Based on point index (add column to table in part 5) | Always | |
| 3.5.5 How Deadbands are set: | <input checked="" type="checkbox"/> A. Global Fixed <input type="checkbox"/> B. Configurable through DNP <input type="checkbox"/> C. Configurable via other means <input type="checkbox"/> D. Other, explain: <input type="checkbox"/> Based on point index - column in part 5 specifies which of the options applies, B, C, or D | A | |

| | | | |
|---|--|--------------------------|--|
| <p>3.5.6 Analog Deadband Algorithm:</p> <p>simple- just compares the difference from the previous reported value</p> <p>integrating- keeps track of the accumulated change</p> <p>other- indicating another algorithm</p> | <input checked="" type="checkbox"/> Simple <input type="checkbox"/> Integrating <input type="checkbox"/> Other, explain: <input type="checkbox"/> Based on point index (add column to table in part 5) | Simple | |
| <p>3.5.7 Static Frozen Analog Input Variation reported when variation 0 requested or in response to Class polls:</p> | <input type="checkbox"/> Variation 1 - 32-bit with flag <input type="checkbox"/> Variation 2 - 16-bit with flag <input type="checkbox"/> Variation 3 - 32-bit with time-of-freeze <input type="checkbox"/> Variation 4 - 16-bit with time-of-freeze <input type="checkbox"/> Variation 5 - 32-bit without flag <input type="checkbox"/> Variation 6 - 16-bit without flag <input type="checkbox"/> Variation 7 - single-precision floating point with flag <input checked="" type="checkbox"/> Variation 8 - double-precision floating point with flag <input type="checkbox"/> Based on point index (add column to table in part 5) | Eight | |
| <p>3.5.8 Frozen Analog Input Event Variation reported when variation 0 requested or in response to Class polls:</p> <p><i>Note: The support for frozen analog input events can be determined remotely using protocol object Group 0 Variation 230.</i></p> | <input type="checkbox"/> Variation 1 - 32-bit without time <input type="checkbox"/> Variation 2 - 16-bit without time <input type="checkbox"/> Variation 3 - 32-bit with time <input type="checkbox"/> Variation 4 - 16-bit with time <input type="checkbox"/> Variation 5 - single-precision floating point w/o time <input checked="" type="checkbox"/> Variation 6 - double-precision floating point w/o time <input type="checkbox"/> Variation 7 - single-precision floating point with time <input type="checkbox"/> Variation 8 - double-precision floating point with time <input type="checkbox"/> Based on point index (add column to table in part 5) | Six | |
| <p>3.5.9 Frozen Analog Inputs included in Class 0 response:</p> | <input type="checkbox"/> Always <input checked="" type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to a class <input type="checkbox"/> Based on point index (add column to table in part 5) | Never | |
| <p>3.5.10 Frozen Analog Input Event reporting mode:</p> <p><i>When responding with event data and more than one event has occurred for a data point, an Outstation may include all events or only the most recent event. All events are typically reported for Frozen Analog Inputs.</i></p> | <input type="checkbox"/> Only most recent frozen value <input checked="" type="checkbox"/> All frozen values <input type="checkbox"/> Based on point index (add column to table in part 5) | All events | |
| <p>3.5.11 Analog Inputs Event Buffer Organization:</p> <p><i>When event buffers are allocated per object group (see part 1.7.6), indicate the number of events that can be buffered for Analog Inputs. If event buffers are not allocated per object group then set "Fixed at 0".</i></p> | <input type="checkbox"/> Fixed at <input checked="" type="checkbox"/> Configurable, range 1 to 65535 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | Number of events = 65535 | |
| <p>3.5.12 Frozen Analog Inputs Event Buffer Organization:</p> <p><i>When event buffers are allocated per object group (see part 1.7.6), indicate the number of events that can be buffered for Frozen Analog Inputs. If event buffers are not allocated per object group then set "Fixed at 0".</i></p> | <input checked="" type="checkbox"/> Fixed at 0 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | Number of events = 0 | |

| | | | |
|--|--------------|---------------|-----------------|
| <p>3.7 FILE CONTROL Object Number: 70</p> | | | |
| | Capabilities | Current Value | If configurable |

| | | | list methods |
|--|--|--|--------------|
| 3.7.1 File Transfer Supported: | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (set 3.7.6 to "Fixed at 0" and do not complete other entries in section 3.7) | Yes | |
| 3.7.2 File Authentication: <i>Indicates whether a valid authentication key must be obtained prior to open and delete requests.</i> | <input checked="" type="checkbox"/> Always <input type="checkbox"/> Sometimes, explain <input type="checkbox"/> Never | Always | |
| 3.7.3 File Append Mode: <i>Indicates if a file can be opened and appended to versus just overwritten.</i> | <input type="checkbox"/> Always <input type="checkbox"/> Sometimes, explain <input checked="" type="checkbox"/> Never | Never | |
| 3.7.4 Permissions Support: <i>Indicates the device is capable of using the indicated permissions.</i> | <input checked="" type="checkbox"/> Owner Read Allowed: 0x0100 <input checked="" type="checkbox"/> Owner Write Allowed: 0x0080 <input checked="" type="checkbox"/> Owner Execute Allowed: 0x0040 <input checked="" type="checkbox"/> Group Read Allowed: 0x0020 <input checked="" type="checkbox"/> Group Write Allowed: 0x0010 <input checked="" type="checkbox"/> Group Execute Allowed: 0x0008 <input checked="" type="checkbox"/> World Read Allowed: 0x0004 <input checked="" type="checkbox"/> World Write Allowed: 0x0002 <input checked="" type="checkbox"/> World Execute Allowed: 0x0001 | Owner Read Owner Write Owner Execute Group Read Group Write Group Execute World Read World Write World Execute | |
| 3.7.5 Multiple Blocks in a Fragment: <i>File data is transferred in a series of blocks of a maximum specified size. This indicates whether only a single block or multiple blocks will be sent in fragment.</i> | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | No | |
| 3.7.6 Max number of Files Open at one time: | <input checked="" type="checkbox"/> Fixed at 1 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Configurable, other, describe | 1 | |

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 | 242 | Device Attributes - Device manufacturer's software version | 1(read) | 00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | 129 (Response) | 00 (start-stop), 01 (start-stop), 17 (index), 28 (index) |
| 0 | 243 | Device Attributes - Device manufacturer's hardware version | 1(read) | 00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | 129 (Response) | 00 (start-stop), 01 (start-stop), 17 (index), 28 (index) |
| 0 | 245 | Device Attributes - User-assigned location name | 1(read) | 00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | 129 (Response) | 00 (start-stop), 01 (start-stop), 17 (index), 28 (index) |
| 0 | 245 | Device Attributes - User-assigned location name | 2(write) | 00 (start-stop), 01 (start-stop) | | |
| 0 | 246 | Device Attributes - User assigned ID code/number | 1(read) | 00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | 129 (Response) | 00 (start-stop), 01 (start-stop), 17 (index), 28 (index) |
| 0 | 246 | Device Attributes - User assigned ID code/number | 2(write) | 00 (start-stop), 01 (start-stop) | | |
| 0 | 248 | Device Attributes - Device serial number | 1(read) | 00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | 129 (Response) | 00 (start-stop), 01 (start-stop), 17 (index), 28 (index) |
| 0 | 250 | Device Attributes - Device manufacturer's product name and model | 1(read) | 00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | 129 (Response) | 00 (start-stop), 01 (start-stop), 17 (index), 28 (index) |
| 0 | 252 | Device Attributes - Device manufacturer's name | 1(read) | 00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | 129 (Response) | 00 (start-stop), 01 (start-stop), 17 (index), 28 (index) |
| 0 | 254 | Device Attributes - Non-specific all attributes request | 1(read) | 00 (start-stop), 01 (start-stop), 06 (no range, or | | |

| | | | | | | |
|----|-----|--|---------|--|--------------------|--|
| | | | | all), 07, 08 (limited qty), 17, 27, 28 (index) | | |
| 0 | 255 | Device Attributes - List of attribute variations | 1(read) | 00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | 129 (Response) | 00 (start-stop), 01 (start-stop), 5B (free format) |
| 1 | 0 | Binary Input - any variation | 1(read) | 00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | | |
| 1 | 1 | Binary Input - Single-bit packed | 1(read) | 00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | 129 (Response) | 00, 01 (start-stop), 17, 28 (index) |
| 1 | 2 | Binary Input - Single-bit with flag | 1(read) | 00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | 129 (Response) | 00, 01 (start-stop), 17, 28 (index) |
| 2 | 0 | Binary Input Change Event - any variation | 1(read) | 06 (no range, or all), 07, 08 (limited qty) | | |
| 2 | 1 | Binary Input Change Event - without time | 1(read) | 06 (no range, or all), 07, 08 (limited qty) | 129 (Response) | 17, 28 (index) |
| 2 | 1 | Binary Input Change Event - without time | | | 130 (Unsol. Resp.) | 17, 28 (index) |
| 2 | 2 | Binary Input Change Event - with absolute time | 1(read) | 06 (no range, or all), 07, 08 (limited qty) | 129 (Response) | 17, 28 (index) |
| 2 | 2 | Binary Input Change Event - with absolute time | | | 130 (Unsol. Resp.) | 17, 28 (index) |
| 2 | 3 | Binary Input Change Event - with relative time | 1(read) | 06 (no range, or all), 07, 08 (limited qty) | 129 (Response) | 17, 28 (index) |
| 2 | 3 | Binary Input Change Event - with relative time | | | 130 (Unsol. Resp.) | 17, 28 (index) |
| 10 | 0 | Binary Output - any variation | 1(read) | 00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 28 (index) | | |
| 10 | 1 | Binary Output - packed format | 1(read) | 00, 01 (start- | 129 (Response) | 00, 01 (start- |

| | | | | | | |
|----|---|---|------------------------------------|--|-------------------------|--|
| | | | | <i>stop</i>), 06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>), 17, 28 (<i>index</i>) | | <i>stop</i>), 17, 28 (<i>index</i>) |
| 10 | 1 | Binary Output - packed format | 2(<i>write</i>) | 00, 01 (<i>start-stop</i>) | | |
| 10 | 2 | Continuous Control - output status with flags | 1(<i>read</i>) | 00, 01 (<i>start-stop</i>), 06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>), 17, 28 (<i>index</i>) | 129 (<i>Response</i>) | 00, 01 (<i>start-stop</i>), 17, 28 (<i>index</i>) |
| 12 | 1 | Binary Output Command (CROB) - control relay output block | 3(<i>select</i>) | 17, 27, 28 (<i>index</i>) | 129 (<i>Response</i>) | echo of request |
| 12 | 1 | Binary Output Command (CROB) - control relay output block | 4(<i>operate</i>) | 17, 27, 28 (<i>index</i>) | 129 (<i>Response</i>) | echo of request |
| 12 | 1 | Binary Output Command (CROB) - control relay output block | 5(<i>direct op.</i>) | 17, 27, 28 (<i>index</i>) | 129 (<i>Response</i>) | echo of request |
| 12 | 1 | Binary Output Command (CROB) - control relay output block | 6(<i>direct op, no ack</i>) | 17, 27, 28 (<i>index</i>) | 129 (<i>Response</i>) | echo of request |
| 20 | 0 | Counter - any variation | 1(<i>read</i>) | 00, 01 (<i>start-stop</i>), 06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>), 17, 27, 28 (<i>index</i>) | | |
| 20 | 0 | Counter - any variation | 7(<i>freeze</i>) | 00, 01 (<i>start-stop</i>), 06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>) | | |
| 20 | 0 | Counter - any variation | 8(<i>freeze, no ack</i>) | 00, 01 (<i>start-stop</i>), 06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>) | | |
| 20 | 0 | Counter - any variation | 9(<i>freeze & clear</i>) | 00, 01 (<i>start-stop</i>), 06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>) | | |
| 20 | 0 | Counter - any variation | 10(<i>frz & clr, no ack</i>) | 00, 01 (<i>start-stop</i>), 06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>) | | |
| 20 | 1 | Counter - 32-bit with flag | 1(<i>read</i>) | 00, 01 (<i>start-stop</i>), 06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>), 17, 27, 28 (<i>index</i>) | 129 (<i>Response</i>) | 00, 01 (<i>start-stop</i>), 17, 28 (<i>index</i>) |
| 20 | 5 | Counter - 32-bit without flag | 1(<i>read</i>) | 00, 01 (<i>start-stop</i>), 06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>), | 129 (<i>Response</i>) | 00, 01 (<i>start-stop</i>), 17, 28 (<i>index</i>) |

| | | | | | | |
|----|---|---|---------|--|--------------------|--|
| | | | | 17, 27, 28 (index) | | |
| 21 | 0 | Frozen Counter - any variation | 1(read) | 00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | | |
| 21 | 1 | Frozen Counter - 32-bit with flag | 1(read) | 00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | 129 (Response) | 00, 01 (start-stop), 17, 28 (index) |
| 21 | 9 | Frozen Counter - 32-bit without flag | 1(read) | 00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | 129 (Response) | 00, 01 (start-stop), 17, 28 (index) |
| 22 | 0 | Counter Change Event - any variation | 1(read) | 06 (no range, or all), 07, 08 (limited qty) | | |
| 22 | 1 | Counter Change Event - 32-bit with flag | 1(read) | 06 (no range, or all), 07, 08 (limited qty) | 129 (Response) | 17, 28 (index) |
| 22 | 1 | Counter Change Event - 32-bit with flag | | | 130 (Unsol. Resp.) | 17, 28 (index) |
| 22 | 5 | Counter Change Event - 32-bit with flag and time | 1(read) | 06 (no range, or all), 07, 08 (limited qty) | 129 (Response) | 17, 28 (index) |
| 22 | 5 | Counter Change Event - 32-bit with flag and time | | | 130 (Unsol. Resp.) | 17, 28 (index) |
| 30 | 0 | Analog Input - any variation | 1(read) | 00, 01 (start-stop), 06 (no range, or all) | | |
| 30 | 1 | Analog Input - 32-bit with flag | 1(read) | 00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | 129 (Response) | 00, 01 (start-stop), 17, 28 (index) |
| 30 | 3 | Analog Input - 32-bit without flag | 1(read) | 00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | 129 (Response) | 00, 01 (start-stop), 17, 28 (index) |
| 30 | 5 | Analog Input - single-precision, floating-point with flag | 1(read) | 00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | 129 (Response) | 00, 01 (start-stop), 17, 28 (index) |

| | | | | | | |
|----|---|---|----------------------|--|--------------------|--|
| 30 | 6 | Analog Input - double-precision, floating-point with flag | 1(read) | 00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17, 27, 28 (index) | 129 (Response) | 00, 01 (start-stop), 17, 28 (index) |
| 32 | 0 | Analog Input Change Event - any variation | 1(read) | 06 (no range, or all), 07, 08 (limited qty) | | |
| 32 | 1 | Analog Input Change Event - 32-bit without time | 1(read) | 06 (no range, or all), 07, 08 (limited qty) | 129 (Response) | 17, 28 (index) |
| 32 | 1 | Analog Input Event – 32-bit without time | | | 130 (Unsol. Resp.) | 17, 28 (index) |
| 32 | 3 | Analog Input Change Event - 32-bit with time | 1(read) | 06 (no range, or all), 07, 08 (limited qty) | 129 (Response) | 17, 28 (index) |
| 32 | 3 | Analog Input Change Event - 32-bit with time | | | 130 (Unsol. Resp.) | 17, 28 (index) |
| 32 | 5 | Analog Input Change Event - single-precision, floating-point without time | 1(read) | 06 (no range, or all), 07, 08 (limited qty) | 129 (Response) | 17, 28 (index) |
| 32 | 5 | Analog Input Change Event - single-precision, floating-point without time | | | 130 (Unsol. Resp.) | 17, 28 (index) |
| 32 | 6 | Analog Input Change Event - double-precision, floating-point without time | 1(read) | 06 (no range, or all), 07, 08 (limited qty) | 129 (Response) | 17, 28 (index) |
| 32 | 6 | Analog Input Change Event - double-precision, floating-point without time | | | 130 (Unsol. Resp.) | 17, 28 (index) |
| 32 | 7 | Analog Input Change Event - single-precision, floating-point with time | 1(read) | 06 (no range, or all), 07, 08 (limited qty) | 129 (Response) | 17, 28 (index) |
| 32 | 7 | Analog Input Change Event - single-precision, floating-point with time | | | 130 (Unsol. Resp.) | 17, 28 (index) |
| 32 | 8 | Analog Input Change Event - double-precision, floating-point with time | 1(read) | 06 (no range, or all), 07, 08 (limited qty) | 129 (Response) | 17, 28 (index) |
| 32 | 8 | Analog Input Change Event - double-precision, floating-point with time | | | 130 (Unsol. Resp.) | 17, 28 (index) |
| 40 | 0 | Analog Output Status - any variation | 1(read) | 06 (no range, or all) | | |
| 41 | 2 | Analog Output Block - 16-bit | 3(select) | 17, 27, 28 (index) | | |
| 41 | 2 | Analog Output Block - 16-bit | 4(operate) | 17, 27, 28 (index) | | |
| 41 | 2 | Analog Output Block - 16-bit | 5(direct op.) | 17, 27, 28 (index) | | |
| 41 | 2 | Analog Output Block - 16-bit | 6(direct op, no ack) | 17, 27, 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) | | |
| 51 | 1 | Time and Date CTO - absolute time, synchronized | | | 129 (Response) | 07 (limited qty = 1) |

| | | | | | | |
|----|---|---|-----------------------|--|--------------------|----------------------|
| 51 | 1 | Time and Date CTO - absolute time, synchronized | | | 130 (Unsol. Resp.) | 07 (limited qty = 1) |
| 51 | 2 | Time and Date CTO - absolute time, unsynchronized | | | 129 (Response) | 07 (limited qty = 1) |
| 51 | 2 | Time and Date CTO - absolute time, unsynchronized | | | 130 (Unsol. Resp.) | 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 | 2 | Class Objects - class 1 data | 1(read) | 06 (no range, or all), 07, 08 (limited qty) | | |
| 60 | 2 | Class Objects - class 1 data | 20(enable unsol.) | 06 (no range, or all) | | |
| 60 | 2 | Class Objects - class 1 data | 21(disable unsol.) | 06 (no range, or all) | | |
| 60 | 3 | Class Objects - class 2 data | 1(read) | 06 (no range, or all), 07, 08 (limited qty) | | |
| 60 | 3 | Class Objects - class 2 data | 20(enable unsol.) | 06 (no range, or all) | | |
| 60 | 3 | Class Objects - class 2 data | 21(disable unsol.) | 06 (no range, or all) | | |
| 60 | 4 | Class Objects - class 3 data | 1(read) | 06 (no range, or all), 07, 08 (limited qty) | | |
| 60 | 4 | Class Objects - class 3 data | 20(enable unsol.) | 06 (no range, or all) | | |
| 60 | 4 | Class Objects - class 3 data | 21(disable unsol.) | 06 (no range, or all) | | |
| 70 | 0 | File Control - any variation | 1(read) | 06, 07, 08 | | |
| 70 | 2 | File Control - authentication | 29(authenticate file) | 5B (Cnt = 1) | 129 (Response) | 5B (Cnt = 1) |
| 70 | 3 | File Control - file command | 25(open file) | 5B (Cnt = 1) | | |
| 70 | 3 | File Control - file command | 27(delete file) | 5B (Cnt = 1) | | |
| 70 | 4 | File Control - file command status | 26(close file) | 5B (Cnt = 1) | 129 (Response) | 5B (Cnt = 1) |
| 70 | 4 | File Control - file command status | 30(abort file) | 5B (Cnt = 1) | 129 (Response) | 5B (Cnt = 1) |
| 70 | 5 | File Control - file transport | 1(read) | 5B (Cnt = 1) | 129 (Response) | 5B (Cnt = 1) |
| 70 | 5 | File Control - file transport | 2(write) | 5B (Cnt = 1) | | |
| 70 | 6 | File Control - file transport status | | | 129 (Response) | 5B (Cnt = 1) |
| 70 | 7 | File Control - file descriptor | 28(get file info) | 5B (Cnt = 1) | 129 (Response) | 5B (Cnt = 1) |
| 70 | 8 | File Control - file specification string | 31(activate config) | 5B (free format) | | |
| 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.



| Supported Control Operations | | | | | | | | | | | | | Event Class Assigned (1,2,3 or none) | | | | |
|------------------------------|------|----------------|----------------|-------------------------|----------|-----------|----------|-----------|------|-------|-----------|------------------------------------|--------------------------------------|--------------------------------|--------|---------|--------------------|
| Point Index | Name | Select/Operate | Direct Operate | Direct Operate - No Ack | Pulse On | Pulse Off | Latch On | Latch Off | Trip | Close | Count > 1 | Cancel Currently Running Operation | Name for State when value is 0 | Name for State when value is 1 | Change | Command | Description |
| 0 | CN0 | Y | Y | Y | Y | | Y | Y | | | | | OFF | ON | | | Switched Power Out |
| 1 | CN1 | Y | Y | Y | Y | | Y | Y | | | | | OFF | ON | | | Open Collector |
| 2 | CN2 | Y | Y | Y | Y | | Y | Y | | | | | OFF | ON | | | Low Voltage Out |

5.4 Definition of Counter / Frozen Counter Point List:

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

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

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

Counter / Frozen Counter points list:

| Point Index | Name | Event Class Assigned to Counter Events (1, 2, 3 or none) | Frozen Counter Exists (Yes or No) | Event Class Assigned to Frozen Counter Events (1, 2, 3 or none) | Description |
|-------------|------------|--|-----------------------------------|---|---|
| 0 | Counter 1 | one | Y | | Maps to channel 1 if configured as counter or event type |
| 1 | Counter 2 | one | Y | | Maps to channel 2 if configured as counter or event type |
| 2 | Counter 3 | one | Y | | Maps to channel 3 if configured as counter or event type |
| 3 | Counter 4 | one | Y | | Maps to channel 4 if configured as counter or event type |
| 4 | Counter 5 | one | Y | | Maps to channel 5 if configured as counter or event type |
| 5 | Counter 6 | one | Y | | Maps to channel 6 if configured as counter or event type |
| 6 | Counter 7 | one | Y | | Maps to channel 7 if configured as counter or event type |
| 7 | Counter 8 | one | Y | | Maps to channel 8 if configured as counter or event type |
| 8 | Counter 9 | one | Y | | Maps to channel 9 if configured as counter or event type |
| 9 | Counter 10 | one | Y | | Maps to channel 10 if configured as counter or event type |
| 10 | Counter 11 | one | Y | | Maps to channel 11 if configured as counter or event type |
| 11 | Counter 12 | one | Y | | Maps to channel 12 if configured as counter or event type |
| 12 | Counter 13 | one | Y | | Maps to channel 13 if configured as counter or event type |
| 13 | Counter 14 | one | Y | | Maps to channel 14 if configured as counter or event type |
| 14 | Counter 15 | one | Y | | Maps to channel 15 if configured as counter or event type |
| 15 | Counter 16 | one | Y | | Maps to channel 16 if configured as counter or event type |
| 16 | Counter 17 | one | Y | | Maps to channel 17 if configured as counter or event type |
| 17 | Counter 18 | one | Y | | Maps to channel 18 if configured as counter or event type |
| 18 | Counter 19 | one | Y | | Maps to channel 19 if configured as counter or event type |
| 19 | Counter 20 | one | Y | | Maps to channel 20 if configured as counter or event type |

5.5 Definition of Analog Input Point List:

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

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

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

Analog Input points list:

| Point Index | Name | Event Class Assigned (1, 2, 3 or none) | Transmitted Value | | Scaling | | Units | Resolution | Description |
|-------------|-----------|--|-------------------|--------------|------------|--------|-------|------------|---|
| | | | Min int /flt | Max int /flt | Multiplier | Offset | | | |
| 0 | Analog 1 | one | -999999 / | 999999 / | | | | | Maps to channel 1 if not configured as a switch type |
| 1 | Analog 2 | one | -999999 / | 999999 / | | | | | Maps to channel 2 if not configured as a switch type |
| 2 | Analog 3 | one | -999999 / | 999999 / | | | | | Maps to channel 3 if not configured as a switch type |
| 3 | Analog 4 | one | -999999 / | 999999 / | | | | | Maps to channel 4 if not configured as a switch type |
| 4 | Analog 5 | one | -999999 / | 999999 / | | | | | Maps to channel 5 if not configured as a switch type |
| 5 | Analog 6 | one | -999999 / | 999999 / | | | | | Maps to channel 6 if not configured as a switch type |
| 6 | Analog 7 | one | -999999 / | 999999 / | | | | | Maps to channel 7 if not configured as a switch type |
| 7 | Analog 8 | one | -999999 / | 999999 / | | | | | Maps to channel 8 if not configured as a switch type |
| 8 | Analog 9 | one | -999999 / | 999999 / | | | | | Maps to channel 9 if not configured as a switch type |
| 9 | Analog 10 | one | -999999 / | 999999 / | | | | | Maps to channel 10 if not configured as a switch type |
| 10 | Analog 11 | one | -999999 / | 999999 / | | | | | Maps to channel 11 if not configured as a switch type |
| 11 | Analog 12 | one | -999999 / | 999999 / | | | | | Maps to channel 12 if not configured as a switch type |
| 12 | Analog 13 | one | -999999 / | 999999 / | | | | | Maps to channel 13 if not configured as a switch type |
| 13 | Analog 14 | one | -999999 / | 999999 / | | | | | Maps to channel 14 if not configured as a switch type |
| 14 | Analog 15 | one | -999999 / | 999999 / | | | | | Maps to channel 15 if not configured as a switch type |
| 15 | Analog 16 | one | -999999 / | 999999 / | | | | | Maps to channel 16 if not configured as a switch type |
| 16 | Analog 17 | one | -999999 / | 999999 / | | | | | Maps to channel 17 if not configured as a switch type |
| 17 | Analog 18 | one | -999999 / | 999999 / | | | | | Maps to channel 18 if not configured as a switch type |
| 18 | Analog 19 | one | -999999 / | 999999 / | | | | | Maps to channel 19 if not configured as a switch type |
| 19 | Analog 20 | one | -999999 / | 999999 / | | | | | Maps to channel 20 if not configured as a switch type |

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

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

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

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

Analog Output points list:

| Supported Control Operations | Transmitted Value | Scaling | Event Class Assigned (1, 2, 3 or none) |
|------------------------------|-------------------|---------|--|
| | | | |

| Point Index | Name | Select/Operate | Direct Operate | Direct Operate - No Ack | Min | Max | Min | Max | Units | Resolution | Change | Command | Description |
|-------------|------|----------------|----------------|-------------------------|-----|-----|-----|-----|-------|------------|--------|---------|-------------|
|-------------|------|----------------|----------------|-------------------------|-----|-----|-----|-----|-------|------------|--------|---------|-------------|

| | |
|--|--|
| 5.7 Definition of File Names that may be read or written: | <input checked="" type="checkbox"/> Fixed, list shown in table below <input type="checkbox"/> Configurable (current list may be shown in table below) <input type="checkbox"/> Other, explain: |
|--|--|

Sequential Files list:

| File Name | Event Class Assigned (1, 2, 3 or none) | Authentication Required for: | | | Description |
|---------------|--|------------------------------|-------|--------|--|
| | | Read | Write | Delete | |
| mScSERNUM.cfg | three | Y | Y | Y | System configuration (read/write, SERNUM = device serial number) |
| msfSERNUM.hal | three | Y | Y | Y | Software upgrade (write only, SERNUM = device serial number) |

| | |
|---|---|
| 5.8 Definition of Octet String and Extended Octet String Point List: | <input checked="" type="checkbox"/> Fixed, list shown in table below <input checked="" type="checkbox"/> Configurable (current list may be shown in table below) <input type="checkbox"/> Other, explain: |
| <i>List of addressable points. Points that do not exist (for example, because an option is not installed) are omitted from the table.</i> | |

Octet String and Extended Octet String points list:

| Point Index | Name | Event Class Assigned (1, 2, 3 or none) | Group Number used to transport the object | Description |
|-------------|------|--|---|-------------|
|-------------|------|--|---|-------------|

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

Ports list:

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

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

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

| |
|--|
| 5.12 Data Set Descriptors - Point Index Attributes |
| <i>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.</i> |

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

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