



DNP3 Device Profile

Based on DNP XML Schema version 2.07.00

Document Name: CimWay DNP3 XML File

Document Description: CimWay DNP3 Complete Device Profile

Revision History				
Date	Time	Version	Reason for change	Edited by
2013-11-08		1.1	Final updates – PcVue 11 Release	CB
2016-07-01		1.2	Minor update – PcVue 11.2 Release	BL
2020-11-05		1.3	Editorial changes	BL

The last revision of the technical content accommodates changes in PcVue 11.2. Unless otherwise stated, this document is valid for releases made publicly available since.

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>	- Master	- Master	
1.1.2. Vendor Name: <i>The name of the organization producing the device. Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 252.</i>		ARC Informatique	

1.1. DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable list methods
<p>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. Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 250.</i></p>		CimWay	
<p>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></p>		N/A	

1.1. DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable list methods
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>		11.2	
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 start of this document.</i>		1.3	

1.1. DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable list methods
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 checked="" type="checkbox"/> None <input checked="" type="checkbox"/> Level 1 <input checked="" type="checkbox"/> Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/> Level 4	Level 2	
1.1.8. Supported Function Blocks:	<input type="checkbox"/> Self Address Reservation <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 1.12)		

1.1. DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable list methods
<p>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></p>	<p>Level 3: Device Attributes Level 3 and 4: Binary Input Level 3 and 4: Binary Output Level 4: Binary Output Event Level 3 and 4: Counter Level 3 and 4: Counter Event Level 3 and 4: Frozen Counter Level 3 and 4: Frozen Counter Event Level 3 and 4: Analog Input Level 3 and 4: Analog Input Event Level 3 and 4: Analog Output Status Level 3 and 4: Analog Output Block Level 3 and 4: Analog Output Event Level 3: Internal Indications Packed Format</p>		

1.1. DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable list methods
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 checked="" type="checkbox"/> Software - Vendor software named <input type="checkbox"/> Proprietary file loaded via DNP3 File Transfer <input checked="" type="checkbox"/> Proprietary file loaded via other transport mechanism <input type="checkbox"/> Direct - Keypad on device front panel <input type="checkbox"/> Factory - Specified when device is ordered <input type="checkbox"/> Protocol - Set via DNP3 (e.g. assign class) <input type="checkbox"/> Other - explain:	Software Vendor software named	

1.1. DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable list methods																																
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><thead><tr><th></th><th><u>Rd</u></th><th><u>Wr</u></th><th><u>Filename</u></th><th><u>Description of Contents</u></th></tr></thead><tbody><tr><td><input type="checkbox"/></td><td></td><td></td><td>dnpDP.xml</td><td>Complete Device Profile</td></tr><tr><td><input type="checkbox"/></td><td></td><td></td><td>dnpDPCap.xml</td><td>Device Profile Capabilities</td></tr><tr><td><input type="checkbox"/></td><td></td><td></td><td>dnpDPCfg.xml</td><td>Device Profile config values</td></tr></tbody></table>		<u>Rd</u>	<u>Wr</u>	<u>Filename</u>	<u>Description of Contents</u>	<input type="checkbox"/>			dnpDP.xml	Complete Device Profile	<input type="checkbox"/>			dnpDPCap.xml	Device Profile Capabilities	<input type="checkbox"/>			dnpDPCfg.xml	Device Profile config values	<table><thead><tr><th><u>Rd</u></th><th><u>Wr</u></th><th><u>Filename</u></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>	<u>Rd</u>	<u>Wr</u>	<u>Filename</u>	<input type="checkbox"/>		dnpDP.xml	<input type="checkbox"/>		dnpDPCap.xml	<input type="checkbox"/>		dnpDPCfg.xml	
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1.1.12. External DNP3 XML files available Off-line: <i>XML configuration file names that can be read or written from an external system, typically from a system that maintains the outstation configuration. External off-line XML file read permits an XML definition of a new configuration to be supplied from off-line configuration tools. External off-line XML file write permits an XML definition of a new configuration to be supplied to off-line configuration tools.</i>	<table><tr><th><u>Rd</u></th><th><u>Wr</u></th><th><u>Filename</u></th><th><u>Description of Contents</u></th></tr><tr><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td>dnpDP.xml</td><td>Complete Device Profile</td></tr><tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>dnpDPCap.xml</td><td>Device 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></table>	<u>Rd</u>	<u>Wr</u>	<u>Filename</u>	<u>Description of Contents</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	dnpDP.xml	Complete Device Profile	<input type="checkbox"/>	<input type="checkbox"/>	dnpDPCap.xml	Device Capabilities	<input type="checkbox"/>	<input type="checkbox"/>	dnpDPCfg.xml	Device Profile config values	<table><tr><th><u>Rd</u></th><th><u>Wr</u></th><th><u>Filename</u></th></tr><tr><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td>dnpDP.xml</td></tr><tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>dnpDPCap.xml</td></tr><tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>dnpDPCfg.xml</td></tr></table>	<u>Rd</u>	<u>Wr</u>	<u>Filename</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	dnpDP.xml	<input type="checkbox"/>	<input type="checkbox"/>	dnpDPCap.xml	<input type="checkbox"/>	<input type="checkbox"/>	dnpDPCfg.xml	
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1.1. DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable list methods
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	Proprietary File via Other Mechanism -----

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>			
1.3.2. Type of End Point:	<input checked="" type="checkbox"/> TCP Initiating (Master Only) <input type="checkbox"/> TCP Listening (Outstation Only) <input checked="" type="checkbox"/> TCP Dual (required for Masters) <input checked="" type="checkbox"/> UDP Datagram (required)	TCP Initiating UDP Datagram	Proprietary File via Other Mechanism -----
1.3.3. IP Address of this Device:		127.0.0.1	Proprietary File via Other Mechanism -----
1.3.4. Subnet Mask:			
1.3.5. Gateway IP Address:			

1.3. IP NETWORKING	Capabilities	Current Value	If configurable list methods
1.3.6. Accepts TCP Connections or UDP Datagrams from:	<input checked="" type="checkbox"/> Allows all (show as *.*.*.* in 1.3.7) <input 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 validation, explain:	Allows all	
1.3.7. IP Address(es) from which TCP Connections or UDP Datagrams are accepted:		*.*.*.*	
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 2147483647 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	20000	Proprietary File via Other Mechanism -----

1.3. IP NETWORKING	Capabilities	Current Value	If configurable list methods
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 2147483647 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	20000	Proprietary File via Other Mechanism -----
1.3.10. TCP Keep-alive timer: <i>The time period for the keep-alive timer on active TCP connections.</i>	<input type="checkbox"/> Fixed at ms <input checked="" type="checkbox"/> Configurable, range 0 to 2147483647 ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Other, explain:	3000 ms	Proprietary File via Other Mechanism -----
1.3.11. Local UDP port: <i>Local UDP port for sending and/or receiving UDP datagrams. Masters may let system choose an available port. Outstations must use one that is known by the Master.</i>	<input type="checkbox"/> Fixed at 20,000 <input checked="" type="checkbox"/> Configurable, range 0 to 2147483647 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain: <input type="checkbox"/> Let system choose (Master only)	20000	Proprietary File via Other Mechanism -----
1.3.12. Destination UDP port for DNP3 Requests (Master Only):	<input type="checkbox"/> Fixed at 20,000 <input checked="" type="checkbox"/> Configurable, range 0 to 2147483647 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	20000	Proprietary File via Other Mechanism -----

1.3. IP NETWORKING	Capabilities	Current Value	If configurable list methods
1.3.13. Destination UDP port for initial unsolicited null responses (UDP only Outstations): <i>For a UDP only Outstation, the destination UDP port for sending initial unsolicited Null response.</i>	<input type="checkbox"/> None <input type="checkbox"/> Fixed at 20,000 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:		Proprietary File via Other Mechanism -----
1.3.14. Destination UDP port for responses: <i>For a UDP only Outstation, the destination UDP port for sending all responses other than the initial unsolicited Null response.</i>	<input type="checkbox"/> None <input type="checkbox"/> Fixed at 20,000 <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain: <input type="checkbox"/> Use source port number		Proprietary File via Other Mechanism -----
1.3.15. Multiple outstation connections (Masters only): <i>Master only. Indicates whether multiple outstation connections are supported.</i>	<input checked="" type="checkbox"/> Supports multiple outstations (Masters only)	True	
1.3.16. Multiple master connections (Outstations only): <i>Outstations only. 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		

1.3. IP NETWORKING	Capabilities	Current Value	If configurable list methods
1.3.17. Time synchronization support:	<input type="checkbox"/> DNP3 LAN procedure (function code 24) <input checked="" type="checkbox"/> DNP3 Write Time (not recommended over LAN) <input type="checkbox"/> Other, explain: <input type="checkbox"/> Not Supported	Write Time	Proprietary File via Other Mechanism -----
1.4. LINK LAYER	Capabilities	Current Value	If configurable list methods
1.4.1. Data Link Address: <i>Indicates if the link address is configurable over the entire valid range of 0 to 65,519. Data link addresses 0xFFFF0 through 0xFFFFF are reserved for broadcast or other special purposes.</i>	<input type="checkbox"/> Fixed at <input checked="" type="checkbox"/> Configurable, range 0 to 65519 <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	1	Proprietary File via Other Mechanism -----
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 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:		

1.4. LINK LAYER	Capabilities	Current Value	If configurable list methods
1.4.3. DNP3 Source Address(es) expected when Validation is Enabled: <i>Selects the allowed source address(es)</i>	<input type="checkbox"/> Configurable to any 16 bit DNP Data Link Address value <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:		
1.4.4. Self Address Support using address 0xFFFC: <i>If an Outstation receives a message with a destination address of 0xFFFC it shall respond normally with its own source address. It must be possible to disable this feature if supported.</i>	<input type="checkbox"/> Yes (only allowed if configurable) <input type="checkbox"/> 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, RESET_LINK_STATES, CONFIRMED_USER_DATA).</i>	<input checked="" type="checkbox"/> Never <input checked="" type="checkbox"/> Always <input checked="" type="checkbox"/> Sometimes, explain: Only for multiframe message fragments	Never	
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 checked="" type="checkbox"/> Configurable, range 0 to 2147483647 ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain:	10000ms	Proprietary File via Other Mechanism -----

1.4. LINK LAYER	Capabilities	Current Value	If configurable list methods
<p>1.4.7. Maximum Data Link Retries:</p> <p><i>The number of times the device will retransmit a frame that requests Link Layer confirmation.</i></p>	<input type="checkbox"/> None <input checked="" type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	3	Proprietary File via Other Mechanism -----
<p>1.4.8. Maximum number of octets Transmitted in a Data Link Frame:</p> <p><i>This number includes the CRCs. With a length field of 255, the maximum size would be 292.</i></p>	<input checked="" type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	292	Proprietary File via Other Mechanism -----
<p>1.4.9. Maximum number of octets that can be Received in a Data Link Frame:</p> <p><i>This number includes the CRCs. With a field length of 255, the maximum size would be 292. The device must be able to receive 292 octets to be compliant.</i></p>	<input checked="" type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	292	Proprietary File via Other Mechanism -----

1.5. APPLICATION LAYER	Capabilities	Current Value	If configurable list methods
<p>1.5.1. Maximum number of octets Transmitted in an Application Layer Fragment other than File Transfer: <i>This size does not include any transport or frame octets.</i> - Masters must provide a setting less than or equal to 249. - Outstations must provide a setting less than or equal to 2048. <i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 240.</i></p>	<input checked="" type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	2048	Proprietary File via Other Mechanism -----
<p>1.5.2. Maximum number of octets Transmitted in an Application Layer Fragment containing File Transfer:</p>	<input checked="" type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	2048	Proprietary File via Other Mechanism -----

1.5. APPLICATION LAYER	Capabilities	Current Value	If configurable list methods
<p>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.</i> - Masters must provide a setting greater than or equal to 2048. - Outstations must provide a setting greater than or equal to 249. <i>Note: The current value of this outstation parameter is available remotely using protocol object Group 0 Variation 241.</i></p>	<input checked="" type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain:	2048	Proprietary File via Other Mechanism -----
<p>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></p>	<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"/> Other, explain: <input type="checkbox"/> Variable, explain:	None	
<p>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></p>	<input checked="" type="checkbox"/> Fixed at 1(enter 0 if controls are not supported) <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain:		

1.5. APPLICATION LAYER	Capabilities	Current Value	If configurable list methods
1.5.6. Maximum number of objects allowed in a single control request for Analog Outputs (Group 41):	<input checked="" type="checkbox"/> Fixed at 1(enter 0 if controls are not supported) <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain:		
1.5.7. Maximum number of objects allowed in a single control request for Data Sets (Groups 85, 86, 87):	<input type="checkbox"/> Fixed at (enter 0 if controls are not supported) <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain:		
1.5.8. Supports mixed object groups (AOBs, CROBs and Data Sets) in the same control request:	<input type="checkbox"/> Not applicable - controls are not supported <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
1.6. FILL OUT THE FOLLOWING ITEMS FOR MASTERS ONLY	Capabilities	Current Value	If configurable list methods
1.6.1. Timeout waiting for Complete Application Layer Responses (ms): <i>Timeout on Master if all fragments of a response message are not received in the specified time.</i>	<input type="checkbox"/> None <input type="checkbox"/> Fixed at ms <input checked="" type="checkbox"/> Configurable, range 0 to 2147483647ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain:	3000ms	

1.6. FILL OUT THE FOLLOWING ITEMS FOR MASTERS ONLY	Capabilities	Current Value	If configurable list methods
<p>1.6.2. Maximum Application Layer Retries for Request Messages: <i>The number of times a Master will retransmit an application layer request message if a response is not received. This parameter must never cause a Master to retransmit time sync messages.</i></p>	<p><input checked="" type="checkbox"/> None <input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain:</p>	None	
<p>1.6.3. Incremental Timeout waiting for First or Next Fragment of an Application Layer Response:</p>	<p><input type="checkbox"/> None <input checked="" type="checkbox"/> Fixed at ms <input type="checkbox"/> Configurable, range to ms <input type="checkbox"/> Configurable, selectable from ms <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain:</p>	10000ms	
<p>1.6.4 Issuing controls to off-line devices: <i>Indicates if the Master issues control requests to devices that are thought to be off-line (i.e. the Master has not seen responses to previous Master requests).</i></p>	<p><input type="checkbox"/> Not applicable - controls are not supported <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>	No	
<p>1.6.5 Issuing controls to off-scan devices: <i>Indicates if the Master issues control requests to devices that are currently off-scan (i.e. the Master has been configured not to issue poll requests to the device).</i></p>	<p><input type="checkbox"/> Not applicable - controls are not supported <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	Yes	

1.6. FILL OUT THE FOLLOWING ITEMS FOR MASTERS ONLY	Capabilities	Current Value	If configurable list methods
<p>1.6.6 Maximum Application Layer Retries for Control Select Messages (same sequence number):</p> <p><i>Indicates the number of times a Master will retransmit an application layer control select request message if a response is not received - using the same message sequence number.</i></p>	<input checked="" type="checkbox"/> None (required) <input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain:	None	
<p>1.6.7 Maximum Application Layer Retries for Control Select Messages (new sequence number):</p> <p><i>Indicates the number of times a Master will retransmit an application layer control select request message if a response is not received - using a new message sequence number.</i></p>	<input checked="" type="checkbox"/> None (required) <input type="checkbox"/> Fixed at <input type="checkbox"/> Configurable, range to <input type="checkbox"/> Configurable, selectable from <input type="checkbox"/> Other, explain: <input type="checkbox"/> Variable, explain:	None	
<p>1.6.8 Maximum error in the time that the Master issues freeze requests:</p> <p><i>If the Master is scheduled to issue freeze requests at a specific time, what is the maximum error in the time that the Master may actually issue a request?</i></p>		100 ms	

1.6. FILL OUT THE FOLLOWING ITEMS FOR MASTERS ONLY	Capabilities	Current Value	If configurable list methods
<p>1.6.9 Maximum error in the time that the Master schedules repetitive freeze requests: <i>If the Master is scheduled to issue freeze requests at a regular interval, what is the maximum error in the time interval that the Master may actually issue a request? (i.e. how early / late could the request actually be issued)?</i></p>		100 ms	
<p>1.6.10 Scheduled actions that may affect the accuracy of freeze requests: <i>Indicates if the Master's accuracy of issuing freeze requests may be affected by other scheduled operations such as poll requests or control requests.</i></p>	<p><input checked="" type="checkbox"/> Freeze time may be affected by Poll requests <input checked="" type="checkbox"/> Freeze time may be affected by Control requests</p>	Poll Requests Control Requests	
<p>1.6.11 Master's algorithm for scheduling request operations: <i>Describe the Master's algorithm for determination of which activity is performed when more than one is due at the same moment. Discuss precedence and priorities for activities such as time synchronization, poll requests, control requests and freeze requests.</i></p>			

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.

4. Implementation Table

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

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
Object Group Number	Variation Number	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
0	211	Device Attributes - Identification of support for user-specific attributes	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	212	Device Attributes - Number of master-defined data set prototypes	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
0	213	Device Attributes - Number of outstation-defined data set prototypes	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	214	Device Attributes - Number of master-defined data sets	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	215	Device Attributes - Number of outstation-defined data sets	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	216	Device Attributes - Maximum number of binary output objects per request	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
0	217	Device Attributes - Local timing accuracy	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	218	Device Attributes - Duration of time accuracy	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	219	Device Attributes - Support for analog output events	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	220	Device Attributes - Maximum analog output index	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
0	221	Device Attributes - Number of analog outputs	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	222	Device Attributes - Support for binary output events	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	223	Device Attributes - Maximum binary output index	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	224	Device Attributes - Number of binary outputs	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
0	225	Device Attributes - Support for frozen counter events	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	226	Device Attributes - Support for frozen counters	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	227	Device Attributes - Support for counter events	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	228	Device Attributes - Maximum counter index	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
0	229	Device Attributes - Number of counter points	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	230	Device Attributes - Support for frozen analog inputs	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	231	Device Attributes - Support for analog input events	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	232	Device Attributes - Maximum analog input index	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
0	233	Device Attributes - Number of analog input points	1(read)	00 (start- stop), 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start- stop), 01 (start- stop), 17 (index), 27, 28 (index)
0	234	Device Attributes - Support for double- bit binary input events	1(read)	00 (start- stop), 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start- stop), 01 (start- stop), 17 (index), 27, 28 (index)
0	235	Device Attributes - Maximum double-bit binary index	1(read)	00 (start- stop), 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start- stop), 01 (start- stop), 17 (index), 27, 28 (index)
0	236	Device Attributes - Number of double- bit binary input points	1(read)	00 (start- stop), 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start- stop), 01 (start- stop), 17 (index), 27, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
0	237	Device Attributes - Support for binary input events	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	238	Device Attributes - Maximum binary input index	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	239	Device Attributes - Number of binary input points	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	240	Device Attributes - Maximum transmit fragment size	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
0	241	Device Attributes - Maximum receive fragment size	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
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)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 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)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
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)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
0	247	Device Attributes - User-assigned device name	1(read)	00 (start- stop), 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start- stop), 01 (start- stop), 17 (index), 27, 28 (index)
0	248	Device Attributes - Device serial number	1(read)	00 (start- stop), 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start- stop), 01 (start- stop), 17 (index), 27, 28 (index)
0	249	Device Attributes - DNP subset and conformance	1(read)	00 (start- stop), 01 (start- stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00 (start- stop), 01 (start- stop), 17 (index), 27, 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)	129 (Response)	00 (start- stop), 01 (start- stop), 17 (index), 27, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
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)	129 (Response)	00 (start-stop), 01 (start-stop), 17 (index), 27, 28 (index)
0	254	Device Attributes - Non-specific all attributes request	1(read)	00 (start-stop), 06 (no range, or all)		
0	255	Device Attributes - List of attribute variations	1(read)	00 (start-stop), 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	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)		

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
1	1	Binary Input - Single-bit packed	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	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)	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)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
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)		
10	2	Continuous Control - output status with flags	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00, 01 (start-stop), 17, 28 (index)
11	0	Binary Output Change Event - any variation	1(read)	06 (no range, or all), 07, 08 (limited qty)		
11	1	Binary Output Change Event - status without time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
11	1	Binary Output Change Event - status without time			130 (Unsol. Resp.)	17, 28 (index)
11	2	Binary Output Change Event - status with time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
11	2	Binary Output Change Event - status with time			130 (Unsol. Resp.)	17, 28 (index)
12	1	Binary Output Command (CROB) - control relay output block	3(select)	17, 28 (index)	129 (Response)	echo of request
12	1	Binary Output Command (CROB) - control relay output block	4(operate)	17, 28 (index)	129 (Response)	echo of request
12	1	Binary Output Command (CROB) - control relay output block	5(direct op.)	17, 28 (index)	129 (Response)	echo of request
12	1	Binary Output Command (CROB) - control relay output block	6(direct op, no ack)	17, 28 (index)	129 (Response)	echo of request
20	0	Counter - any variation	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)		

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
20	0	Counter - any variation	7(freeze)	06 (no range, or all)		
20	0	Counter - any variation	8(freeze, no ack)	06 (no range, or all)		
20	0	Counter - any variation	9(freeze & clear)	06 (no range, or all)		
20	0	Counter - any variation	10(frz & clr, no ack)	06 (no range, or all)		
20	1	Counter - 32-bit with flag	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00, 01 (start-stop), 17, 28 (index)
20	2	Counter - 16-bit with flag	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00, 01 (start-stop), 17, 28 (index)
20	5	Counter - 32-bit without flag	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00, 01 (start-stop), 17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
20	6	Counter - 16-bit without flag	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00, 01 (start-stop), 17, 28 (index)
21	0	Frozen Counter - any variation	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty), 17 (index)		
21	1	Frozen Counter - 32-bit with flag	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00, 01 (start-stop)
21	2	Frozen Counter - 16-bit with flag	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00, 01 (start-stop)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
21	5	Frozen Counter - 32-bit with flag and time	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00, 01 (start-stop), 17, 28 (index)
21	6	Frozen Counter - 16-bit with flag and time	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	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)	129 (Response)	00, 01 (start-stop), 17, 28 (index)
21	10	Frozen Counter - 16-bit without flag	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00, 01 (start-stop), 17, 28 (index)
22	0	Counter Change Event - any variation	1(read)	06 (no range, or all), 07, 08 (limited qty)		

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
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	2	Counter Change Event - 16-bit with flag	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
22	2	Counter Change Event - 16-bit with flag			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)
22	6	Counter Change Event - 16-bit with flag and time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
22	6	Counter Change Event - 16-bit with flag and time			130 (Unsol. Resp.)	17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
23	0	Frozen Counter Change Event - any variation	1(read)	06 (no range, or all), 07, 08 (limited qty)		
23	1	Frozen Counter Change Event - 32-bit with flag	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
23	1	Frozen Counter Change Event - 32-bit with flag			130 (Unsol. Resp.)	17, 28 (index)
23	2	Frozen Counter Change Event - 16-bit with flag	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
23	2	Frozen Counter Change Event - 16-bit with flag			130 (Unsol. Resp.)	17, 28 (index)
23	5	Frozen 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)
23	5	Frozen Counter Change Event - 32-bit with flag and time			130 (Unsol. Resp.)	17, 28 (index)
23	6	Frozen Counter Change Event - 16-bit with flag and time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
23	6	Frozen Counter Change Event - 16-bit with flag and time			130 (Unsol. Resp.)	17, 28 (index)
30	0	Analog Input - any variation	1(read)	00, 01 (start-stop), 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)	129 (Response)	00, 01 (start-stop), 17, 28 (index)
30	2	Analog Input - 16-bit with flag	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	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)	129 (Response)	00, 01 (start-stop), 17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
30	4	Analog Input - 16-bit without flag	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00, 01 (start-stop), 17, 28 (index)
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)	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)	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)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
32	2	Analog Input Change Event - 16-bit without time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
32	2	Analog Input Change Event - 16-bit without time			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	4	Analog Input Change Event - 16-bit with time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
32	4	Analog Input Change Event - 16-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)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
32	6	Analog Input Change Event - double-precision, floating-point without time	1(<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)	129 (<i>Response</i>)	17, 28 (<i>index</i>)
32	6	Analog Input Change Event - double-precision, floating-point without time			130 (<i>Unsol. Resp.</i>)	17, 28 (<i>index</i>)
32	7	Analog Input Change Event - single-precision, floating-point with time	1(<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)	129 (<i>Response</i>)	17, 28 (<i>index</i>)
32	7	Analog Input Change Event - single-precision, floating-point with time			130 (<i>Unsol. Resp.</i>)	17, 28 (<i>index</i>)
32	8	Analog Input Change Event - double-precision, floating-point with time	1(<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)	129 (<i>Response</i>)	17, 28 (<i>index</i>)
32	8	Analog Input Change Event - double-precision, floating-point with time			130 (<i>Unsol. Resp.</i>)	17, 28 (<i>index</i>)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
40	0	Analog Output Status - any variation	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)		
40	1	Analog Output Status - 32-bit with flag	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00, 01 (start-stop), 17, 28 (index)
40	2	Analog Output Status - 16-bit with flag	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00, 01 (start-stop), 17, 28 (index)
40	3	Analog Output Status - single-precision, floating-point with flag	1(read)	00, 01 (start-stop), 06 (no range, or all), 07, 08 (limited qty)	129 (Response)	00, 01 (start-stop), 17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
40	4	Analog Output Status - double-precision, floating-point 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>)	129 (<i>Response</i>)	00, 01 (<i>start-stop</i>), 17, 28 (<i>index</i>)
41	1	Analog Output Block - 32-bit	3(<i>select</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	1	Analog Output Block - 32-bit	4(<i>operate</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	1	Analog Output Block - 32-bit	5(<i>direct op.</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	1	Analog Output Block - 32-bit	6(<i>direct op, no ack</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	2	Analog Output Block - 16-bit	3(<i>select</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	2	Analog Output Block - 16-bit	4(<i>operate</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	2	Analog Output Block - 16-bit	5(<i>direct op.</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	2	Analog Output Block - 16-bit	6(<i>direct op, no ack</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	3	Analog Output Block - single-precision, floating-point	3(<i>select</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	3	Analog Output Block - single-precision, floating-point	4(<i>operate</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	3	Analog Output Block - single-precision, floating-point	5(<i>direct op.</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
41	3	Analog Output Block - single-precision, floating-point	6(<i>direct op, no ack</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	4	Analog Output Block - double-precision, floating-point	3(<i>select</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	4	Analog Output Block - double-precision, floating-point	4(<i>operate</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	4	Analog Output Block - double-precision, floating-point	5(<i>direct op.</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
41	4	Analog Output Block - double-precision, floating-point	6(<i>direct op, no ack</i>)	17, 28 (<i>index</i>)	129 (<i>Response</i>)	echo of request
42	0	Analog Output Change Event - any variation	1(<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)		
42	1	Analog Output Change Event - 32-bit without time	1(<i>read</i>)	06 (<i>no range, or all</i>), 07, 08 (<i>limited qty</i>)	129 (<i>Response</i>)	17, 28 (<i>index</i>)
42	1	Analog Output Change Event - 32-bit without time			130 (<i>Unsol. Resp.</i>)	17, 28 (<i>index</i>)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
42	2	Analog Output Change Event - 16-bit without time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
42	2	Analog Output Change Event - 16-bit without time			130 (Unsol. Resp.)	17, 28 (index)
42	3	Analog Output Change Event - 32-bit with time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
42	3	Analog Output Change Event - 32-bit with time			130 (Unsol. Resp.)	17, 28 (index)
42	4	Analog Output Change Event - 16-bit with time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
42	4	Analog Output Change Event - 16-bit with time			130 (Unsol. Resp.)	17, 28 (index)
42	5	Analog Output Change Event - single-precision, floating-point without time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
42	5	Analog Output Change Event - single-precision, floating-point without time			130 (Unsol. Resp.)	17, 28 (index)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
42	6	Analog Output Change Event - double-precision, floating-point without time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
42	6	Analog Output Change Event - double-precision, floating-point without time			130 (Unsol. Resp.)	17, 28 (index)
42	7	Analog Output Change Event - single-precision, floating-point with time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
42	7	Analog Output Change Event - single-precision, floating-point with time			130 (Unsol. Resp.)	17, 28 (index)
42	8	Analog Output Change Event - double-precision, floating-point with time	1(read)	06 (no range, or all), 07, 08 (limited qty)	129 (Response)	17, 28 (index)
42	8	Analog Output Change Event - double-precision, floating-point with time			130 (Unsol. Resp.)	17, 28 (index)
50	1	Time and Date - absolute time			129 (Response)	07 (limited qty = 1)
50	1	Time and Date - absolute time	2(write)	07 (limited qty = 1)		

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
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	3	Class Objects - class 2 data	1(read)	06 (no range, or all), 07, 08 (limited qty)		
60	4	Class Objects - class 3 data	1(read)	06 (no range, or all), 07, 08 (limited qty)		
80	1	Internal Indications - packed format	1(read)	00, 01 (start-stop)	129 (Response)	00, 01 (start-stop)