

DNP3
Device Profile Document
For
Time-Net Ltd.
SG-S Modul komunikacji GPRS

Revision Date: 2016-10-31

DEVICE PROFILE REVISION HISTORY

Date	Version ¹	Reason for change	Edited by
2016-10-31	1	Created	L. Sokolowski

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

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1 DEVICE PROPERTIES

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

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

This document may be used to show the device capabilities, the current value of each parameter, or both. If it is used to show the current values, the third column should be filled in even if a fixed parameter is selected in the capabilities section (“NA” may be entered for parameters that are Not Applicable).

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

1.1 DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable, list methods
<p>1.1.1 Device Function:</p> <p><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></p>	<p><input type="radio"/> Master</p> <p><input checked="" type="radio"/> Outstation</p>	<p><input type="radio"/> Master</p> <p><input checked="" type="radio"/> Outstation</p>	
<p>1.1.2 Vendor Name:</p> <p><i>The name of the organization producing the device.</i></p>		Time-Net Ltd.	
<p>1.1.3 Device Name:</p> <p><i>The model and name of the device, sufficient to distinguish it from any other device from the same organization.</i></p>		SG-S Modul komunikacji GPRS	
<p>1.1.4 Device manufacturer's hardware version string:</p>		1.00/1.00	
<p>1.1.5 Device manufacturer's software version string:</p>		4/1.02	
<p>1.1.6 Device Profile Document Version Number:</p> <p><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></p>		1	

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>	<div>Masters Only</div> <div>Requests Responses</div> <div><div><input type="checkbox"/></div>-----<div><input type="checkbox"/></div>-----None</div> <div><div><input type="checkbox"/></div>-----<div><input type="checkbox"/></div>-----Level 1</div> <div><div><input type="checkbox"/></div>-----<div><input type="checkbox"/></div>-----Level 2</div> <div><div><input type="checkbox"/></div>-----<div><input type="checkbox"/></div>-----Level 3</div> <div><div>Outstations Only</div><div>Requests and Responses</div><div><div><input type="checkbox"/></div>-----None</div><div><div><input checked="" type="checkbox"/></div>-----Level 1</div><div><div><input type="checkbox"/></div>-----Level 2</div><div><div><input type="checkbox"/></div>-----Level 3</div></div>		
1.1.8	Supported Function Blocks: .	<div><input type="checkbox"/> Self-Address Reservation</div> <div><input checked="" type="checkbox"/> Object 0 – attribute objects</div> <div><input type="checkbox"/> Data Sets</div> <div><input type="checkbox"/> File Transfer</div> <div><input type="checkbox"/> Virtual Terminal</div> <div><input type="checkbox"/> Mapping to IEC 61850 Object Models defined in a DNP3 XML file</div> <div><input type="checkbox"/> Function code 31, activate configuration</div>		
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>	<div>• Limited data quantity requests for Class 0, 1, 2, 3 data</div> <div>• Internal Indicators (group 80) reading</div> <div>• LAN and WAN time synchronization supported</div>		

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 <i>SG-Config</i> <input type="checkbox"/> Proprietary file loaded via DNP3 file transfer <input 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 checked="" type="checkbox"/> Other – explain _telnet client (using built-in telnet server)_																						
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>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> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>_____.xml</td> <td>_____</td> </tr> </tbody> </table> <p>* The Complete Device Profile Document contains the capabilities, Current Value, and configurable methods columns.</p> <p>* The Device Profile Capabilities contains only the capabilities and configurable methods columns.</p> <p>* The Device Profile Config. Values contains only the Current Value column.</p>	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	<input type="checkbox"/>	<input type="checkbox"/>	_____.xml	_____		
Rd	Wr	Filename	Description of Contents																				
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<input type="checkbox"/>		dnpDPcfg.xml	Device Profile config. values																				
<input type="checkbox"/>	<input type="checkbox"/>	_____.xml	_____																				

1.1 DEVICE IDENTIFICATION	Capabilities	Current Value	If configurable, list methods																				
<p>1.1.12 External DNP3 XML files available Off-line:</p> <p><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></p> <p><i>External off-line XML file read permits an XML definition of a new configuration to be supplied from off-line configuration tools.</i></p> <p><i>External off-line XML file write permits an XML definition of a new configuration to be supplied to off-line configuration tools.</i></p>	<table> <tr> <th>Rd</th><th>Wr</th><th>Filename</th><th>Description of Contents</th></tr> <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 type="checkbox"/></td><td><input type="checkbox"/></td><td>_____.xml</td><td>_____</td></tr> </table> <p>* The Complete Device Profile Document contains the capabilities, Current Value, and configurable methods columns.</p> <p>* The Device Profile Capabilities contains only the capabilities and configurable methods columns.</p> <p>* The Device Profile Config. Values contains only the Current Value column.</p>	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 type="checkbox"/>	<input type="checkbox"/>	_____.xml	_____		
Rd	Wr	Filename	Description of Contents																				
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<input type="checkbox"/>	<input type="checkbox"/>	dnpDPcfg.xml	Device Profile config. values																				
<input type="checkbox"/>	<input type="checkbox"/>	_____.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 _____																						

1.3 IP NETWORKING	Capabilities	Current Value	If configurable, list methods
1.3.1 Port Name <i>Name used to reference the communication port defined in this section.</i>			
1.3.2 Type of End Point:	<input 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)	UDP datagram	
1.3.3 IP Address of this Device:		Assigned by DHCP	<ul style="list-style-type: none"> • SG-Config software • Telnet
1.3.4 Subnet Mask:		Assigned by DHCP	<ul style="list-style-type: none"> • SG-Config software • Telnet
1.3.5 Gateway IP Address:		Assigned by DHCP	<ul style="list-style-type: none"> • SG-Config software • Telnet
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 an 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 _____		
1.3.7 IP Address(es) from which TCP Connections or UDP Datagrams are accepted:		*.*.*.*	

1.3 IP NETWORKING	Capabilities	Current Value	If configurable, list methods
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 <u> 1 </u> to <u> 65535 </u> <input type="checkbox"/> Configurable, selectable from <u> </u> , <u> </u> , <u> </u> <input type="checkbox"/> Configurable, other, describe <u> </u>		SG-Config software Telnet
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 checked="" type="checkbox"/> Not Applicable (Outstation w/o dual end point) <input type="checkbox"/> Fixed at 20,000 <input type="checkbox"/> Configurable, range <u> </u> to <u> </u> <input type="checkbox"/> Configurable, selectable from <u> </u> , <u> </u> , <u> </u> <input type="checkbox"/> Configurable, other, describe <u> </u>	N/A	
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 <u> </u> ms <input type="checkbox"/> Configurable, range <u> </u> to <u> </u> ms <input type="checkbox"/> Configurable, selectable from <u> </u> , <u> </u> , <u> </u> ms <input type="checkbox"/> Configurable, other, describe <u> </u>	N/A	
1.3.11 Local UDP port: <i>Local UDP port for sending and/or receiving UDP datagrams. Master may let system choose an available port. Outstation must use one that is known by the master.</i>	<input type="checkbox"/> Fixed at 20,000 <input checked="" type="checkbox"/> Configurable, range <u> 1 </u> to <u>65535 </u> <input type="checkbox"/> Configurable, selectable from <u> </u> , <u> </u> , <u> </u> <input type="checkbox"/> Configurable, other, describe <u> </u> <input type="checkbox"/> Let system choose (Master only)	20000	<ul style="list-style-type: none"> • SG-Config software • Telnet
1.3.12 Destination UDP port for DNP3 Requests (Master Only):		N/A	
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 <u> </u> to <u> </u> <input type="checkbox"/> Configurable, selectable from <u> </u> , <u> </u> , <u> </u> <input checked="" type="checkbox"/> Configurable, other, describe <u>Automatically based on last request parameters </u>	20000	

<p>1.4.2 DNP3 Source Address Validation: <i>Indicates whether the device will filter out messages not from a specific source address.</i></p>	<p><input checked="" 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 _____</p>		
<p>1.4.3 DNP3 Source Address(es) expected when Validation is Enabled: <i>Selects the allowed source address(es).</i></p>	<p><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"/> Configurable, other, describe _____</p>	N/A	
<p>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 the feature if supported.</i></p>	<p><input type="checkbox"/> Yes (only allowed if configurable) <input checked="" type="checkbox"/> No</p>		
<p>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></p>	<p><input type="checkbox"/> Always <input type="checkbox"/> Sometimes, explain _____ <input checked="" type="checkbox"/> Never</p>		
<p>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></p>	<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"/> Configurable, other, describe _____ <input type="checkbox"/> Variable, explain _____</p>		
<p>1.4.7 Maximum Data Link Retries: <i>The number of times the device will retransmit a frame that requests Link Layer confirmation.</i></p>	<p><input checked="" type="checkbox"/> Never Retries <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>1.4.8 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>	<p><input checked="" type="checkbox"/> Fixed at _292_____</p> <p><input type="checkbox"/> Configurable, range _____ to _____</p> <p><input type="checkbox"/> Configurable, selectable from _____,_____,_____</p> <p><input type="checkbox"/> Configurable, other, describe_____</p>		
<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 length field of 255, the maximum size would be 292. The device must be able to receive 292 octets to be compliant.</i></p>	<p><input checked="" type="checkbox"/> Fixed at _292_____</p> <p><input type="checkbox"/> Configurable, range _____ to _____</p> <p><input type="checkbox"/> Configurable, selectable from _____,_____,_____</p> <p><input type="checkbox"/> Configurable, other, describe_____</p>		

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:</p> <p><i>This size does not include any transport or frame octets.</i></p> <ul style="list-style-type: none"> • Masters must provide a setting less than or equal to 249. • Outstations must provide a setting less than or equal to 2048. 	<p><input checked="" type="checkbox"/> Fixed at _249_</p> <p><input type="checkbox"/> Configurable, range _____ to _____</p> <p><input type="checkbox"/> Configurable, selectable from ____, ____, ____</p> <p><input type="checkbox"/> Configurable, other, describe _____</p>		
<p>1.5.2 Maximum number of octets Transmitted in an Application Layer Fragment containing File Transfer:</p>	<p><input checked="" type="checkbox"/> Fixed at __0__</p> <p><input type="checkbox"/> Configurable, range _____ to _____</p> <p><input type="checkbox"/> Configurable, selectable from ____, ____, ____</p> <p><input type="checkbox"/> Configurable, other, describe _____</p>		
<p>1.5.3 Maximum number of octets that can be Received in an Application Layer Fragment:</p> <p><i>This size does not include any transport or frame octets.</i></p> <ul style="list-style-type: none"> • Masters must provide a setting greater than or equal to 2048. • Outstations must provide a setting greater than or equal to 249. 	<p><input checked="" type="checkbox"/> Fixed at _249_</p> <p><input type="checkbox"/> Configurable, range _____ to _____</p> <p><input type="checkbox"/> Configurable, selectable from ____, ____, ____</p> <p><input type="checkbox"/> Configurable, other, describe _____</p>		
<p>1.5.4 Timeout waiting for Complete Application Layer Fragment:</p> <p><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>	<p><input checked="" type="checkbox"/> None</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><input type="checkbox"/> Variable, explain _____</p>		

1.5.5	Maximum number of objects allowed in a single control request for CROB (group 12):	<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"/> Configurable, other, describe _____ <input type="checkbox"/> Variable, explain _____	1	
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"/> Configurable, other, describe _____ <input type="checkbox"/> Variable, explain _____	1	
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) <input type="checkbox"/> Configurable, range _____ to _____ <input type="checkbox"/> Configurable, selectable from ____, ____, ____ <input type="checkbox"/> Configurable, other, describe _____ <input type="checkbox"/> Variable, explain _____		
1.5.8	Supports mixing 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		

1.7 FILL OUT THE FOLLOWING ITEMS FOR OUTSTATIONS ONLY	Capabilities	Current Value	If configurable, list methods
<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>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>		
<p>1.7.8 DNP Command Settings preserved through a device reset:</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 anytime the Restart IIN bit is set.</i></p>	<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 FILL OUT THE FOLLOWING ITEMS FOR OUTSTATIONS ONLY	Capabilities	Current Value	If configurable, list methods
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>	<input type="checkbox"/> Not Supported <input checked="" type="checkbox"/> Configurable, selectable from On and Off	<input checked="" type="radio"/> Off <input type="radio"/> On	SG-Config software Telnet
<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>	<input type="checkbox"/> Fixed at _____ <input type="checkbox"/> Configurable, range _____ to _____ <input type="checkbox"/> Configurable, selectable from _____, _____, _____ <input checked="" type="checkbox"/> Configurable, other, describe_Same as in last request__	1	
<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>	<input type="checkbox"/> Fixed at _____ms <input checked="" type="checkbox"/> Configurable, range __1 000__ to __5 000 000__ms <input type="checkbox"/> Configurable, selectable from _____, _____, _____ms <input type="checkbox"/> Configurable, other, describe _____ <input type="checkbox"/> Variable, explain _____	60 000 ms	SG-Config software Telnet Same as Solicited Response Confirmation Timeout

1.7 FILL OUT THE FOLLOWING ITEMS FOR OUTSTATIONS ONLY	Capabilities	Current Value	If configurable, list methods
<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>	<p> <input type="checkbox"/> None <input type="checkbox"/> Fixed at _____ <input checked="" type="checkbox"/> Configurable, range __1__ to __255__ <input type="checkbox"/> Configurable, selectable from ____,__,__ <input type="checkbox"/> Configurable, other, describe _____ <input checked="" type="checkbox"/> Always infinite, never gives up </p>	1	<p>SG-Config software</p> <p>Telnet</p>

1.10 OUTSTATION PERFORMANCE	Capabilities	Current Value	If configurable, list methods
<p>1.10.1 Maximum Time Base Drift (milliseconds per minute):</p> <p><i>If the protocol is synchronized by DNP, what is the clock drift rate over the full operating temperature range.</i></p>		1	
<p>1.10.2 When does outstation set IIN1.4?</p>	<p><input type="checkbox"/> Never</p> <p><input checked="" type="checkbox"/> Asserted at startup until first Time Synchronization request received</p> <p><input checked="" type="checkbox"/> Periodically, range _1800__to_1800__ seconds</p> <p><input type="checkbox"/> Periodically, selectable from ____, ____, __ seconds</p> <p><input type="checkbox"/> Range ____to____ seconds after last time sync</p> <p><input type="checkbox"/> Selectable from ____, ____, __ seconds after last time sync</p> <p><input type="checkbox"/> When time error may have drifted by range ____to____ ms</p> <p><input type="checkbox"/> When time error may have drifted by selectable from ____, ____, ____</p>	Both cases apply	
<p>1.10.3 Maximum Internal Time Reference Error when set via DNP (ms):</p> <p><i>The difference between the time set in a DNP Write Time message, and the time actually set in the Outstation.</i></p>		2	
<p>1.10.4 Maximum Delay Measurement error (ms):</p> <p><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></p>		2	

1.10 OUTSTATION PERFORMANCE	Capabilities	Current Value	If configurable, list methods
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>		1	
1.10.6 Maximum time from start-up to IIN 1.4 assertion (ms):		5 000; IIN 1.4 is always asserted before connecting to the network	
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.</i>		30	
1.10.8 Maximum Event Time-tag error for local I/O other than Binary and Double-bit data types (ms):		N/A	

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

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

3.1 SINGLE-BIT BINARY INPUTS Static (Steady-State) Group Number: 1 Event Group Number: 2	Capabilities	Current Value	If configurable, list methods
3.1.1 Static Variation reported when variation 0 requested:	<input type="checkbox"/> Variation 1 – Single-bit Packed format <input checked="" type="checkbox"/> Variation 2 – Single-bit with flag <input type="checkbox"/> Based on point Index (add column to table below)		
3.1.2 Event Variation reported when variation 0 requested:	<input type="checkbox"/> Variation 1 – without time <input checked="" type="checkbox"/> Variation 2 – with absolute time <input type="checkbox"/> Variation 3 – with relative time <input type="checkbox"/> Based on point Index (add column to table below)		
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 are typically reported for Binary Inputs.</i>	<input type="checkbox"/> Only most recent <input checked="" type="checkbox"/> All events		
3.1.4 Binary Inputs included in Class 0 response: <i>If Binary Inputs are not included in the Class 0 response, Binary Input Events (group 2) may not be reported.</i>	<input checked="" type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to Class 1, 2, or 3 <input type="checkbox"/> Based on point Index (add column to table below)		
3.1.5 Definition of Binary Input Point List: <i>List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.</i>	<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_____		

Point Index	Name	Default Class Assigned to Events (1, 2, 3 or none)	Name for State when value is 0	Name for State when value is 1	Description
0	ZM1	1	OK (no fault)	FAULT	Phase-to-phase fault indicated by SMZ device number 1
1	ZD1	1	OK (no fault)	FAULT	Phase-to earth fault indicated by SMZ device number 1
2	ZM2	1	OK (no fault)	FAULT	Phase-to-phase fault indicated by SMZ device number 2
3	ZD2	1	OK (no fault)	FAULT	Phase-to earth fault indicated by SMZ device number 2
4	ZM3	1	OK (no fault)	FAULT	Phase-to-phase fault indicated by SMZ device number 3
5	ZD3	1	OK (no fault)	FAULT	Phase-to earth fault indicated by SMZ device number 3
6	ZM4	1	OK (no fault)	FAULT	Phase-to-phase fault indicated by SMZ device number 4
7	ZD4	1	OK (no fault)	FAULT	Phase-to earth fault indicated by SMZ device number 4
8	SYG. DRZWI	1	OPEN	CLOSED	External switch state
9	Mains Present	1	PRESENT	ABSENT	Mains voltage presence (230 V AC)
10	+24V Overload	1	OK (no overload)	OVERLOAD	Internal +24V source status
11	INTSTATUS_E	1	OK (no error)	ERROR	Internal errors (set and held whenever any internal error occurs, erasable)
12	INTSTATUS	NONE	OK (no error)	ERROR	Internal device status
13	BATTREPLACE_E	1	OK (no error)	REPLACE	Battery needs to be replaced (set and held whenever an error occurs, erasable)
14	BATTREPLACE	NONE	OK (no error)	REPLACE	Battery needs to be replaced
15	BATTSTATUS	1	OK (present)	NO BATT	Battery presence indicator
16	BATTCHRG	1	OK (charged)	LOW	Battery charge level
17	GSM Signal	NONE	OK	LOWSIGNAL	GSM signal level (1 when signal level is below threshold value)
18	Test	1	TEST LOW	TEST HIGH	Test input used to simulate events during test procedures

3.3 BINARY OUTPUT STATUS AND CONTROL RELAY OUTPUT BLOCK Binary Output Status Group Number: 10 Binary Output Event Group Number: 11 CROB Group Number: 12 Binary Output Command Event Object Num: 13	Capabilities	Current Value	If configurable, list methods
3.3.1 Minimum pulse time allowed with Trip, Close, and Pulse On commands:	<input checked="" type="checkbox"/> Fixed at _100_ms (hardware may limit this further) <input type="checkbox"/> Based on point Index (add column to table below)		
3.3.2 Maximum pulse time allowed with Trip, Close, and Pulse On commands:	<input checked="" type="checkbox"/> Fixed at _2000__ms (hardware may limit this further) <input type="checkbox"/> Based on point Index (add column to table below)		
3.3.3 Binary Output Status included in Class 0 response: <i>If Binary Output Status points are not included in the Class 0 response, Binary Output Status Events (group 11) may not be reported.</i>	<input type="checkbox"/> Always <input checked="" type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to Class 1, 2, or 3 <input type="checkbox"/> Based on point Index (add column to table below)		
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		
3.3.5 Event Variation reported when variation 0 requested:	<input type="checkbox"/> Variation 1 – without time <input type="checkbox"/> Variation 2 – with absolute time <input type="checkbox"/> Based on point Index (add column to table below)	N/A	
3.3.6 Command Event Variation reported when variation 0 requested:	<input type="checkbox"/> Variation 1 – without time <input type="checkbox"/> Variation 2 – with absolute time <input type="checkbox"/> Based on point Index (add column to table below)	N/A	
3.3.7 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 type="checkbox"/> All events	N/A	

<p>3.3.8 Command 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.</i></p>	<input type="checkbox"/> Only most recent <input type="checkbox"/> All events	N/A	
<p>3.3.9 Maximum Time between Select and Operate:</p>	<input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Fixed at _60_ seconds <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 below)		
<p>3.3.10 Definition of Binary Output Status/Control relay output block (CROB) Point List:</p> <p><i>List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.</i></p>	<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 _____		

Point Index	Name	Supported Control Operations											Name for State when value is 0	Name for State when value is 1	Default Class Assigned to Events (1, 2, 3 or none)		Description
		Select/Operate	Direct Operate	Direct Operate – No Ack	Pulse On	Pulse Off	Latch On	Latch Off	Trip	Close	Count > 1	Cancel Currently Running Operation			Change	Command	
0	KA	X	X	X	X								OFF	CLEAR	NONE	NONE	Clears fault states in external devices
1	TEST1	X	X	X	X								OFF	TEST	NONE	NONE	Starts internal test procedure for SMZ device 1
2	TEST2	X	X	X	X								OFF	TEST	NONE	NONE	Starts internal test procedure for SMZ device 2
3	TEST3	X	X	X	X								OFF	TEST	NONE	NONE	Starts internal test procedure for SMZ device 3
4	TEST4	X	X	X	X								OFF	TEST	NONE	NONE	Starts internal test procedure for SMZ device 4
5	INTSTATUS_ERASE	X	X	X	X								OFF	CLEAR	NONE	NONE	Clears internal fault indicator (input index 11)
6	BATTREPLACE_ERASE	X	X	X	X								OFF	CLEAR	NONE	NONE	Clears battery replacement indicator (input index 13)

3.5 ANALOG INPUT POINTS Static (Steady-State) Group Number: 30 Event Group Number: 32	Capabilities	Current Value	If configurable, list methods
3.5.1 Static Variation reported when variation 0 requested:	<input type="checkbox"/> Variation 1 – 32-bit with flag <input checked="" 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 type="checkbox"/> Variation 6 – double-precision floating point with flag <input type="checkbox"/> Based on point Index (add column to table below)		
3.5.2 Event Variation reported when variation 0 requested:	<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 type="checkbox"/> Variation 8 – double-precision floating point with time <input type="checkbox"/> Based on point Index (add column to table below)	N/A	
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.</i>	<input type="checkbox"/> Only most recent <input type="checkbox"/> All events	N/A	
3.5.4 Analog Inputs Included in Class 0 response: <i>If Analog Inputs are not included in the Class 0 response, Analog Input Events (group 32) may not be reported.</i>	<input type="checkbox"/> Always <input checked="" type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to Class 1, 2, or 3 <input type="checkbox"/> Based on point Index (add column to table below)		

3.5 ANALOG INPUT POINTS Static (Steady-State) Group Number: 30 Event Group Number: 32	Capabilities	Current Value	If configurable, list methods
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 specifies which of the options applies, B, C, or D	Never set	
3.5.6 Analog Deadband Algorithm: <i>simple - just compares the difference from the previous reported value</i> <i>integrating - keeps track of the accumulated change</i> <i>other - indicating another algorithm</i>	<input type="checkbox"/> Simple <input type="checkbox"/> Integrating <input type="checkbox"/> Other, explain _____	N/A	
3.5.7 Definition of Analog Input Point List: <i>List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.</i>	<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_____		

Point Index	Name	Default Class Assigned to Events (1, 2, 3 or none)	Transmitted Value ²		Scaling ³		Units	Resolution ⁴	Description
			Minimum	Maximum	Multiplier	Offset			
0	SIGSTR	None	0	100	1	0	Percent	1	GSM signal strength
1	BATTCHRG	None	0	100	1	0	Percent	1	Battery remaining charge level
2	SIGSTRBARS	None	0	5	1	0	Bar	1	GSM signal strength sent as 0 to 5 bars
3	SIGSTRDBM	None	-115	-49	1	0	dBm	1	GSM signal strength in dBm

² The minimum and maximum transmitted values are the lowest and highest values that the outstation will report in DNP analog input objects. These values are integers if the outstation transmits only integers. If the outstation is capable of transmitting both integers and floating-point, then integer and floating-point values are required for the minimums and maximums.

For example, a pressure sensor is able to measure 0 to 500 kPa. The outstation provides a linear conversion of the sensor's output signal to integers in the range of 0 to 25000 or floating-point values of 0 to 500.000. The sensor and outstation are used in an application where the maximum possible pressure is 380 kPa. For this input, the minimum transmitted value would be stated as 0 / 0.0 and the maximum transmitted value would be stated as 19000 / 380.000.

³ The scaling information for each point specifies how data transmitted in integer variations (16 bit and 32 bit) is converted to engineering units when received by the Master (i.e. scaled according to the equation: $\text{scaled value} = \text{multiplier} * \text{raw} + \text{offset}$). Scaling is not applied to Floating point variations since they are already transmitted in engineering units.

⁴ Resolution is the smallest change that may be detected in the value due to quantization errors and is given in the units shown in the previous column. This parameter does not represent the accuracy of the measurement.

3.6 ANALOG OUTPUT STATUS AND ANALOG OUTPUT CONTROL BLOCK Analog Output Status Group Number: 40 Analog Output Control Block Group Number: 41 Analogue Output Event Group Number: 42 Analogue Output Command Event Group Number: 43	Capabilities	Current Value	If configurable, list methods
3.6.1 Static Analog Output Status Variation reported when variation 0 requested:	<input type="checkbox"/> Variation 1 – 32-bit with flag <input checked="" type="checkbox"/> Variation 2 – 16-bit with flag <input type="checkbox"/> Variation 3 – single-precision floating point with flag <input type="checkbox"/> Variation 4 – double-precision floating point with flag <input type="checkbox"/> Based on point Index (add column to table below)		
3.6.2 Analog Output Status Included in Class 0 response: <i>If Analog Output Status points are not included in the Class 0 response, Analog Output Events (group 42) may not be reported.</i>	<input type="checkbox"/> Always <input checked="" type="checkbox"/> Never <input type="checkbox"/> Only if point is assigned to Class 1, 2, or 3 <input type="checkbox"/> Based on point Index (add column to table below)		
3.6.3 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		
3.6.4 Event Variation reported when variation 0 requested:	<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 type="checkbox"/> Variation 8 – double-precision floating point with time <input type="checkbox"/> Based on point Index (add column to table below)	N/A	

3.6 ANALOG OUTPUT STATUS AND ANALOG OUTPUT CONTROL BLOCK Analog Output Status Group Number: 40 Analog Output Control Block Group Number: 41 Analogue Output Event Group Number: 42 Analogue Output Command Event Group Number: 43	Capabilities	Current Value	If configurable, list methods
3.6.5 Command Event Variation reported when variation 0 requested:	<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 type="checkbox"/> Variation 8 – double-precision floating point with time <input type="checkbox"/> Based on point Index (add column to table below)	N/A	
3.6.6 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 type="checkbox"/> All events	N/A	
3.6.7 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 type="checkbox"/> All events	N/A	
3.6.8 Maximum Time between Select and Operate:	<input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Fixed at _60_ seconds <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 below)		

3.6 ANALOG OUTPUT STATUS AND ANALOG OUTPUT CONTROL BLOCK Analog Output Status Group Number: 40 Analog Output Control Block Group Number: 41 Analogue Output Event Group Number: 42 Analogue Output Command Event Group Number: 43	Capabilities	Current Value	If configurable, list methods
3.6.9 Definition of Analog Output Status/Analog Output Control Block Point List: <i>List all addressable points. Points that do not exist (for example, because an option is not installed) shall be omitted from the table.</i>	<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_____		

Point Index	Name	Supported Control Operations			Transmitted Value		Scaling ⁵		Units	Resolution ⁶	Default Event Assigned Class (1, 2, 3 or none)		Description
		Select/Operate	Direct Operate	Direct Operate – No Ack	Minimum	Maximum	Multiplier	Offset			Change	Command	
0	GSMSIGTHRESHOLD	X	X	X	10	90	1	0	Percent	1	NONE	NONE	GSM signal level threshold (signal level given as Analog Input 0)

⁵ The scaling information for each point specifies how data transmitted in integer variations (16 bit and 32 bit) is converted to engineering units when received by the Master (i.e. scaled according to the equation: $\text{scaled value} = \text{multiplier} * \text{raw} + \text{offset}$). Scaling is not applied to Floating point variations since they are already transmitted in engineering units.

⁶ Resolution is the smallest change that may be detected in the value due to quantization errors and is given in the units shown in the previous column. This parameter does not represent the accuracy of the measurement.

3.8 SEQUENTIAL FILE TRANSFER Group Number: 70	Capabilities	Current Value	If configurable, list methods
3.8.1 File Transfer Supported:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (do not complete any further entries in section 3.8)		
3.8.2 File Authentication: <i>Indicates whether a valid authentication key must be obtained prior to open and delete requests.</i>	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes, explain _____ <input type="checkbox"/> Never		
3.8.3 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 type="checkbox"/> Never		
3.8.4 Permissions Support: <i>Indicates the device is capable of using the indicated permissions.</i>	<input type="checkbox"/> Owner Read Allowed: 0x0100 <input type="checkbox"/> Owner Write Allowed: 0x0080 <input type="checkbox"/> Owner Execute Allowed: 0x0040 <input type="checkbox"/> Group Read Allowed: 0x0020 <input type="checkbox"/> Group Write Allowed: 0x0010 <input type="checkbox"/> Group Execute Allowed: 0x0008 <input type="checkbox"/> World Read Allowed: 0x0004 <input type="checkbox"/> World Write Allowed: 0x0002 <input type="checkbox"/> World Execute Allowed: 0x0001		
3.8.5 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 type="checkbox"/> No		

⁷ The scaling information for each point specifies how data transmitted in integer variations (16 bit and 32 bit) is converted to engineering units when received by the Master (i.e. scaled according to the equation: scaled value = multiplier * raw + offset). Scaling is not applied to Floating point variations since they are already transmitted in engineering units.

⁸ Resolution is the smallest change that may be detected in the value due to quantization errors and is given in the units shown in the previous column. This parameter does not represent the accuracy of the measurement.

3.8 SEQUENTIAL FILE TRANSFER Group Number: 70	Capabilities	Current Value	If configurable, list methods
3.8.6 Max number of Files Open at one time:	<input type="checkbox"/> Fixed at _____(enter 0 if files are not supported) <input type="checkbox"/> Configurable, range _____ to _____ <input type="checkbox"/> Configurable, selectable from _____,_____,_____ <input type="checkbox"/> Configurable, other, describe_____		
3.8.7 Definition of File Names that may be read or written:	<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_____		

4 IMPLEMENTATION TABLE

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

NOTE	The implementation table must list all functionality required by the device whether Master or Outstation as defined within the DNP3 IED Conformance Test Procedures. Any functionality beyond the highest subset level supported is indicated by highlighted rows. Any Object Groups not provided by an outstation or not processed by a Master are indicated by strikethrough (note these Object Groups will still be parsed).
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DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
Group Num	Var Num	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
1	0	Binary Input – Any variation	1 (read)	06 (no range, or all)		
4	4	Binary Input – Packed Format			129 (response)	00,01 (start-stop)
1	2	Binary Input – With flags			129 (response)	00,01 (start-stop)
2	4	Binary Input Event – Without time			129 (response) 130 (unsolicited resp.)	17, 28 (index)
2	2	Binary Input Event – With absolute time			129 (response) 130 (unsolicited resp.)	17, 28 (index)
2	3	Binary Input Event – With relative time			129 (response) 130 (unsolicited resp.)	17, 28 (index)
10	0	Binary Output – Any variation	1 (read)	06 (no range, or all)		
10	2	Binary Output – Output status with flags			129 (response)	00,01 (start-stop)
12	1	Binary Command – Control relay output block (CROB)	3 (select) 4 (operate) 5 (direct operate) 6 (direct op., no ack)	17, 28 (index)	129 (response)	Echo of request
20	4	Counter – 32-bit with flag			129 (response)	00,01 (start-stop)
20	2	Counter – 16-bit with flag			129 (response)	00,01 (start-stop)
20	5	Counter – 32-bit without flag			129 (response)	00,01 (start-stop)
20	6	Counter – 16-bit without flag			129 (response)	00,01 (start-stop)

DNP OBJECT GROUP & VARIATION			REQUEST Master may issue Outstation must parse		RESPONSE Master must parse Outstation may issue	
Group Num	Var Num	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
22	1	Counter Event – 32-bit with flag			129 (response) 130 (unsolicited resp.)	17, 28 (index)
22	2	Counter Event – 16-bit with flag			129 (response) 130 (unsolicited resp.)	17, 28 (index)
30	0	Analog Input – Any variation	1 (read)	06 (no range, or all)		
30	1	Analog Input – 32-bit with flag			129 (response)	00,01 (start-stop)
30	2	Analog Input – 16-bit with flag			129 (response)	00,01 (start-stop)
30	3	Analog Input – 32-bit without flag			129 (response)	00,01 (start-stop)
30	4	Analog Input – 16-bit without flag			129 (response)	00,01 (start-stop)
32	1	Analog Input Event – 32-bit without time			129 (response) 130 (unsolicited resp.)	17, 28 (index)
32	2	Analog Input Event – 16-bit without time			129 (response) 130 (unsolicited resp.)	17, 28 (index)
40	0	Analog Output Status – Any variation	1 (read)	06 (no range, or all)		
40	2	Analog Output Status – 16-bit with flag			129 (response)	00,01 (start-stop)
41	2	Analog Output – 16-bit	3 (select) 4 (operate) 5 (direct operate) 6 (direct op., no ack)	17, 28 (index)	129 (response)	Echo of request
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	
Group Num	Var Num	Description	Function Codes (dec)	Qualifier Codes (hex)	Function Codes (dec)	Qualifier Codes (hex)
51	1	Time and Date CTO — Absolute time, synchronized			129 (response) 130 (unsolicited resp.)	07 (limited qty = 1)
51	2	Time and Date CTO — Absolute time, unsynchronized			129 (response) 130 (unsolicited 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	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)
			2 (write)	00 (start-stop) index=7		
No Object (function code only)			13 (cold restart)			
No Object (function code only)			14 (warm restart)			
No Object (function code only)			23 (delay meas.)			
No Object (function code only)			24 (record cur. time)			

