Configurable DNP Points and Implementation

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Introduction

These instructions provide DNP point and implementation information for a Universal Interface Module (UIM) applied in an S&C IntelliTeam® II Automatic Restoration System, and were prepared for use with software: **ITNInstaller, Rev. 1.6.12**. Releases after Rev. 1.6.12 can only be installed in the S&C IntelliNode Interface Module, and cannot be installed on the Universal Interface Module.

The software revision number is listed on the *Setup* > *General* > *Revisions* screen. The points listed here are only for the Universal Interface Module, and do not cover any of the external device points. DNP points sent and received by the external device will also be mapped to specific SCADA points used by your master station. Refer to your external device documentation for definitions of DNP points sent and received by that device.

DNP points for the UIM are configured to match the master station points list by using the status, analog input, analog output, counter, and control points defined in the following tables. Unless otherwise noted, each bit is set if the condition is logically true or active. Configuration settings for DNP point mapping are found on the *Setup* > *Communications* > *Point Mapping* screens, and allow you to assign the appropriate SCADA point numbers. Refer to the *Communication Setup* section of S&C Instruction Sheet 1043-530 *Setup Instructions*.

The status points are listed on the *Logs* > *Status Point Log* screen, and the counter points are listed on the *Logs* > *Special Events* screen. These screens are reviewed in the *Data Logging* section of S&C Instruction Sheet 1043-550 *Troubleshooting Instructions*.

STATUS POINTS		
Code #	Name	Definition
336	Any Phase LOV	Active when status points from the external device report voltage losses or the analog input from the external device is less than the Auto setup voltage loss threshold.
337	Hot Line Tag	Active when the UIM has detected that the hot line tag feature of the external device is active.
338	Remote Disabled	Active when the host relay/recloser device indicates it is not able to accept commands from a remote source. The remote source can be either SCADA or the Interface Module itself.
339	Frequency Trip	Active when the Interface Module has detected that the host tripped open due to a frequency anomaly on the circuit. The Interface Module forces a Stop Transfer condition, preventing IntelliTeam II from attempting to operate the relay/recloser device.
340	Ground Trip Mismatch	Active when the Interface Module has detected that the state of the host's Ground Trip feature is no longer in the expected state. The Interface Module assumes this change of state is due to human intervention and will force a Stop Transfer condition, preventing IntelliTeam II from attempting to operate the relay/recloser device.
341	Reclose Mismatch	Active when the Interface Module has detected that the state of the host's Reclosing feature is no longer in the expected state. The Interface Module assumes this change of state is due to human intervention and will force a Stop Transfer condition, preventing IntelliTeam II from attempting to operate the relay/recloser device.
342	Profile Mismatch	Active when the normal profile is supported , the reported status doesn't match, and the 30 second timer started to see if IntelliTeam is trying to change the profile has expired.
343	Protection Config. Error	Active when the UIM is programmed to control the profile in the external device, the UIM is programmed to block and unblock reclosing, or the UIM is programmed to initiate extended loss of voltage trips in the external device; and status points, control points or analog inputs have not been programmed to support these features.
344	Over Current	Active when the external device reports that an overcurrent condition has been detected on one or more phases, and is also active for Neutral Faults.
346	Tripped to Lockout	Active when the UIM has detected that the external device has tripped to the lockout state as a result of an event. Once in the lockout state IntelliTeam II may begin the reconfiguration process.
347	Recloser Cycling	Active when the recloser/relay is programmed for fault cycling and fault cycling is active.
348	Recloser Cycling Reset	Active when the recloser/relay is programmed for fault cycling and reset state is entered.
349	LOV Sect. Enabled	Active when teams are ready and IntelliTeam instructs the UIM to enable extended loss of voltage operation (if the UIM is programmed for this operation). Set to inactive when teams go out of ready and IntelliTeam disables the feature.
350	Single Phase Trip	Active when UIM is programmed to do extended phase loss protection and the switch trips for that reason. Cleared on any close operation.

STATUS POINTS		
Code #	Name	Definition
351	Three Phase Trip	Active when UIM is programmed to do extended three phase voltage loss protection and switch trips for that reason. Cleared on any close operation.
352	E.D. Comm Stopped	Active when BEGIN SETUP is set to “Stopped”. Cleared when BEGIN SETUP is set to “Running”.
353	E.D. Comm Lost	Active when the external device (E.D.) stops communicating, e.g. due to a radio problem.
354	E.D. Trouble	Active when trouble status points are programmed at the UIM and they become active.
355	E.D. Contacts Bad	Active when the external device is reporting that the switch open and closed status are the same.
512	Switch not xfer rdy	Active when the external device operation is not consistent with the expected team operation (i.e. incomplete or manual switch operation or inconsistent switch position).
513	Not all teams xfer rdy	Active if any teams where the local control is a member are not fully operational. This may be due to error conditions at individual team members (see Switch not xfer rdy), or team wide conditions such as isolation of a fault, team configuration errors, team coordination errors, automatic restoration prohibited, and team logic disabled on the TEAM: Setup screen. If Switch not xfer rdy is active in one switch control of a team, this will cause this indication to be set in the other team members.
514	Xfer in progress	Active while the team is in the process of reconfiguring the circuit and transferring load to an alternate source.
515	RTN in progress	Active while the team is returning the circuit to its normal configuration.
516	SCADA Prohibit Rest.	Active when a SCADA command was received to prevent the restoration of any load by this team member. Will also be activated when Prohibit Restoration is requested via IntelliLink or the Keypad.
517	Timer Prohibit Rest.	Active when the Prohibit Restoration timer for that team runs out. The timer command only affects the team on which it has expired. When enabled the timer countdown will be initiated at the same time a transfer process begins at a team, usually at the time a sectionalizing event occurs. Although it will often be the case that timers in adjacent teams start simultaneously, there is no requirement for this to occur. Each team will decrement its timer independently from other teams, and potentially enter the Prohibit Restoration state asynchronously. **WARNING:** Because teams may asynchronously enter the Prohibit Restoration state, one or more disconnected teams throughout a circuit, or a system, may be prohibited from further automatic restoration activity, while others may continue as necessary for subsequent events. For this reason it is extremely important that standard safety practices are adhered to when working on a circuit that has been involved in automatic transfer and restoration. Disabling automatic operation and tagging devices are strongly recommended before performing any manual switching or repair.

STATUS POINTS		
Code #	Name	Definition
518	Setup Data Revision	Active when the configuration data for an enabled team has been modified. It remains active until the field is disabled and then re-enabled. You can clear this point is two ways: 1. Set the Team Setup set point (on the SETUP: Team screen) to Stopped, and then set it to Running. 2. Reload the team configuration data using the IntelliLink software. Select File > Load Set points. This process automatically stops and restarts the "Team Setup" set point.
519	Err Get Local Sw. Data	Active when IntelliTeam fails to receive all data necessary for its operation from the external device.
520	Manual Op. Team Condition	Active if any team registered a manual switch operation (Open or Close) such that it became not fully operational. Some manual operations will *not* cause this condition, most notably closing a source switch on a previously faulted team to allow RTN (if RTN is enabled) to take place.
521	Src. Loading Data Active	This point will be set when the real-time feeder loading logic is active and in use. This point does not indicate whether the control is using actual real-time feeder loading data received from a DNP master, or using the Default Source Segment Loading setting.
522	RT-Load Data Problem	This point is set when the DNP analog output value received is less than the real-time 3-phase total load as reported by the host device, and is also set if the real-time feeder loading data has not updated within the configured time interval. This point will be set to 0 if the real-time feeder loading logic is inactive.
523	Team 1 in Ready	Active when Team 1 is in the Ready to Transfer state. This point will be inactive if the team is not in use, contains an error condition, or the line section represented by the team contains a fault.
524	Team 2 in Ready	Active when Team 2 is in the Ready to Transfer state. This point will be inactive if the team is not in use, contains an error condition, or the line section represented by the team contains a fault.
525	Team 3 in Ready	Active when Team 3 is in the Ready to Transfer state. This point will be inactive if the team is not in use, contains an error condition, or the line section represented by the team contains a fault.
526	Team 4 in Ready	Active when Team 4 is in the Ready to Transfer state. This point will be inactive if the team is not in use, contains an error condition, or the line section represented by the team contains a fault.
527	Team 5 in Ready	Active when Team 5 is in the Ready to Transfer state. This point will be inactive if the team is not in use, contains an error condition, or the line section represented by the team contains a fault.
528	Team 6 in Ready	Active when Team 6 is in the Ready to Transfer state. This point will be inactive if the team is not in use, contains an error condition, or the line section represented by the team contains a fault.
529	Team 7 in Ready	Active when Team 7 is in the Ready to Transfer state. This point will be inactive if the team is not in use, contains an error condition, or the line section represented by the team contains a fault.

STATUS POINTS		
Code #	Name	Definition
530	Team 8 in Ready	Active when Team 8 is in the Ready to Transfer state. This point will be inactive if the team is not in use, contains an error condition, or the line section represented by the team contains a fault.
768	Alarm Condition	Some off-normal condition that does not impair functionality of the firmware is present—see Status Point Log for details.
769	Warning Condition	Some off-normal condition that may impair non-critical functionality of the firmware is present—see Status Point Log for details.
770	Log Flooding	Some historic event message or messages have been occurring at abnormally high frequencies. The firmware has disabled this message or messages until the rate of their occurrence subsides sufficiently. That is done to conserve storage space.
2816	CFM: File Alloc in Progress	Compact Flash files are presently in the process of being allocated. Occurs on startup either because the card is empty or because the present version of firmware loaded into the device requires a different file structure than the previous version of firmware.
2817	CFM: Serious Disk Problem	An error occurred while accessing the Compact Flash card. All writing to Compact Flash card has been disabled. All data destined for Compact Flash is being lost.
2818	CFM: Disk Tampered With	The file structure on Compact Flash was found to be different than what is expected by the firmware. Usually that means that the user has deleted files from the card manually, which is not recommended. The firmware will attempt to recover from this, but data integrity may be compromised.

ANALOG OUTPUT POINTS	
Name	Definition
Application Layer Confirmation Retry Time	Time (100 to 65535 mSec.) that UIM will wait for an application layer confirmation to an event response message before resending the request for confirmation.
Application Layer Confirmation Retry Count	Number of times (0 to 10) UIM will send an event response message if a confirmation is not received.
Control Point Select Time	During a select-before-operate procedure, the time (10 to 1000 tenths of a second) allowed to elapse between receiving the select function for a point and receiving the operate function for it. If an operate function is not received within this period, the point is de-selected; another select function is required before the point will operate.
Real-Time Feeder Loading	Total averaged three-phase feeder loading in amperes, measured at the source breaker. This value is used in determining if the load can be transferred to another source. Each count equals 1 ampere.

COUNTER POINTS		
Code #	Name	Definition
512	New coach generated on team	This event occurs when the coach does not arrive within a predetermined timeout. This causes the team member to generate a new coach and attempt to restore team synchronization.
513	Team Comm Error	This event occurs when any team related message is not successfully transmitted via DNP.
514	Unexpected state change	This event occurs if in the course of team transfer an unexpected sequence of steps is taken.
515	Rebuilding coach	This event occurs if the coach is lost during operation of the system. The team circulates a special coach to restore synchronization. This counter increments whenever the special coach arrives at a member.
516	Err. put coach task list	This event occurs when a list of pending tasks that the coach carries between team members is full. No more tasks can be put on this list until one or more of the existing tasks have been completed.
517	Err. put event task list	This event occurs when a list of pending team-related events is full. No more events can be put on this list until one or more of the existing events have been completed.
518	Err. put member task list	This event occurs when a list of pending member-process tasks is full. No more tasks can be put on this list until one or more of the existing tasks have been completed.
519	Err. put comm task on list	This event occurs when the coach or the team member needs to send a new message to another team member and the DNP communications buffer is full. Existing transactions must be completed before more are put on the communications list.
520	Seq num resynch	This event occurs when the sequence numbers of events have fallen out of synchronization.
768	Compact Flash Failure	This event occurs when a compact flash disk error is detected while saving logs to the compact flash card. There may be many reasons for this but the message should come up very rarely, if ever. If this happens persistently, replace the compact flash card to ensure continued logging and notify S&C.
769	Logging Overflow	A large but not infinite number of events can be logged per unit of time. This event occurs when that limit is reached or exceeded. When this event occurs data may be lost. If you see this often, please contact S&C.
770	CF Data Likely Lost on Err	This event occurs when a compact flash operation was interrupted before completion. The file on which this occurred was saved with a .ERR extension and abandoned. Some events may have been lost from CF log. The primary reason for this condition is a loss of power while CF card is active—a highly improbable but possible event. Another reason is that the card was pulled out while data was being written to it—this is why it is necessary to disable CF logging either with the IntelliLink screen, or the Keypad, before removing the card. Notify S&C if you see this more than a few times.

CONTROL POINTS	
Name	Definition
Clr Man Op	A momentary pulse point used to clear a manual operation indication. This signals to IntelliTeam II that it may return to the ready state provided the switch contacts are in their normal open or closed position. Command may be issued using Pulse-On, Latch-On, or Close.
Pro Rest	Enable or disable IntelliTeam Prohibit Restoration. Enable command may be issued using Pulse-On, Latch-On, or Close. Disable command may be issued using Pulse-Off, Latch-Off, or Trip.
UIM LOV	Enable or disable the Loss of Voltage sectionalizing provided by the Universal Interface Module logic. Enable command may be issued using Pulse-On, Latch-On, or Close. Disable command may be issued using Pulse-Off, Latch-Off, or Trip.
Netlist Propagation Enab/Disab	Enable or disable netlist propagation. Enable command may be issued using Pulse-On, Latch-On, or Close. Disable command may be issued using Pulse-Off, Latch-Off, or Trip.

This implementation of DNP and this section of documentation conform to the document DNP V3.00 Subset Definitions.

Device Profile Description

This section describes the compatibility of S&C's implementation of DNP with other devices.

DNP Implementation

This implementation of DNP and this section of documentation conform to the document DNP V3.00 Subset Definitions, Version 2.00, available from the DNP Users Group.

Device Profile Description

This section describes the compatibility of S&C's implementation of DNP with other devices.

<table>
<tr><td colspan="2">DNP V3.00
DEVICE PROFILE DOCUMENT</td></tr>
<tr><td colspan="2">Vendor Name: S&C Electric Company</td></tr>
<tr><td colspan="2">Device Name: S&C Universal Interface Module</td></tr>
<tr><td>Highest DNP Level Supported:
For Requests - Level 2
For Responses - Level 2</td><td>Device Function:
___ Master X Slave</td></tr>
<tr><td colspan="2">Notable objects, functions, and/or qualifiers supported in addition to the Highest DNP Levels Supported (the complete list is described in the attached table):

8-Bit Unsigned Integers_____
_____
_____
_____
_____</td></tr>
<tr><td>Maximum Data Link Frame Size (bytes)
Transmitted - 292
Received - 292</td><td>Max Application Fragment Size (bytes)
Transmitted - 2048
Received - 2048</td></tr>
<tr><td>Maximum Data link Re-tries:
X None
__ Fixed at _____
__ Configurable, range 1 to 25</td><td>Maximum Application Layer Re-tries:
__ None
__ Fixed at _____
X Configurable, range 0 to 10</td></tr>
</table>

```
Requires Data Link Layer Confirmation:
   X  Never
   __ Always
   __ Sometimes      If ‘Sometimes’, when?
   __ Configurable   If ‘Configurative’, how?
```

```
Requires Application Layer Confirmation:
    __ Never
    __ Always (not recommended)
    X  When reporting Event Data (Slave devices only)
    __ When sending multi-fragment responses (Slave devices only)
    __ Sometimes     If ‘Sometimes’, when?
    __ Configurable  If ‘Configurable’, how?
```

```
Timeouts while waiting for:
    Data Link Confirm        X  None  __ Fixed  __ Variable  __ Config
    Complete Appl. Fragment  __ None  X  Fixed  __ Variable  __ Config
    Application Confirm      __ None  __ Fixed  __ Variable  X  Config
    Complete Appl. Response  X  None  __ Fixed  __ Variable  __ Config
    Others _____________________________________________________
    Attach explanation if ‘Variable’ or ‘Configurable’ was checked
    (see Note 1 below for explanation)
```

```
Sends/Executes Control Operations:
    WRITE Binary Outputs     X  Never  __ Always  __ Sometimes  __ Config
    SELECT/OPERATE           __ Never  __ Always  X  Sometimes  __ Config
    DIRECT OPERATE           __ Never  __ Always  X  Sometimes  __ Config
    DIRECT OPERATE - NO ACK  __ Never  __ Always  X  Sometimes  __ Config

    Count > 1                X  Never  __ Always  __ Sometimes  __ Config
    Pulse On                 __ Never  __ Always  X  Sometimes  __ Config
    Pulse Off                __ Never  __ Always  X  Sometimes  __ Config
    Latch On                 __ Never  __ Always  X  Sometimes  __ Config
    Latch Off                __ Never  __ Always  X  Sometimes  __ Config

    Queue                    X  Never  __ Always  __ Sometimes  __ Config
    Clear Queue              X  Never  __ Always  __ Sometimes  __ Config

    Attach explanation if ‘Sometimes’ or ‘Configurable’ was checked
    (see Note 2 below for explanation)
```

FILL OUT THE FOLLOWING ITEM FOR MASTER DEVICES ONLY:	
Master Expects Binary Input Change Events: __ Either time-tagged or non-time-tagged for a single event __ Both time-tagged and non-time-tagged for a single event __ Configurable (attach explanation)	
FILL OUT THE FOLLOWING ITEMS FOR SLAVE DEVICES ONLY:	
Reports Binary Input Change Events when no specific variation requested: __ Never X Only time-tagged __ Only non-time-tagged __ Configurable to send both	Reports time-tagged Binary Input Change Events when no specific variation requested: __ Never X Binary Input Change with Time __ Bin In Change Relative Time __ Configurable (explain)
Sends Unsolicited Responses: __ Never X Configurable (explain) __ Only certain objects __ Sometimes (explain) __ ENABLE/DISABLE UNSOLICITED Function codes supported (see Note 3 below)	Sends Static Data in Unsolicited Responses: __ Never __ When Device Restarts X When Status Flags Change No other options are permitted. (see Note 3 below)
Default Counter Object/Variation: __ No Counters Reported __ Configurable (explain) X Default Object - 20 Default Variation - 5 __ Point-by-point list attached	Counters Roll Over at: __ No Counters Reported __ Configurable (explain) __ 16 Bits X 32 Bits __ Other Value _____ __ Point-by-point list attached
Sends Multi-Fragment Responses (Slave Only): X Yes __ No	

NOTE 1: Timeouts While Waiting for Confirmations

When an application layer response confirmation is requested, the Interface Module waits before sending another response/confirmation attempt (if the retry number has not been reached), or stopping the confirmation process.

You can set the "Time Delay Between Retries" with the Setup software or via SCADA. (See the Setup chapter for more details.)

NOTE 2: Control Operations Executed

For all Binary Output Relay operations and Analog Output operations, the allowed control functions are:

- `Select/Operate`
- `Direct Operate`
- `Direct Operate No Ack`

The master station can choose which of these three functions to use at any given time.

The Switch Control ignores the On Time and Off Time values and the Queue and Clear flags in the Control Code.

For more details, see the Control Relay Output Block section of the document object library in the DNP V3.00 Basic 4 Document Set, available from the DNP Users Group.

NOTE 3: Unsolicited Responses

The Switch Control returns unsolicited responses to the configured master station address when a change occurs in any mapped status point that is configured for event reporting, when the configured deadband is exceeded in any mapped analog input point that is configured for event reporting, or when the configured deadband is exceeded for any mapped counter point that is configured for event reporting.

You can control the delivery of unsolicited response messages by adjusting the "Unsolicited Transmit Delay Event Count" and the "Unsolicited Transmit Delay Time" in the Setup software.

You can enable and disable unsolicited responses from the Setup software or via SCADA (function code 20 to enable, function code 21 to disable).

Implementation Table

This section describes which objects and requests this implementation accepts and which responses are returned. Object, Variation, and Qualifier Codes in the request must exactly match what is expected. All application layer responses use the standard response function code 129. Unsolicited responses, if configured, will always use function code 130. Included in the table is the default variation returned if no specific variation is requested. This also applies to Class data and unsolicited reports where applicable.

OBJECT			REQUEST		RESPONSE
Obj	Var	Description	Func Code (dec)	Qualifier Codes (hex)	Default Var. (hex)
1	0	Binary Input - All Variations	1	06	01
1	1	Binary Input	1	06	
1	2	Binary Input with Status	1	06	
2	0	Binary Input Change - All Variations	1	06,07,08	02
2	1	Binary Input Change without Time	1	06,07,08	
2	2	Binary Input Change with Time	1	06,07,08	
2	3	Binary Input Change with Relative Time (object parsed but no data to return)	1	06,07,08	
10	0	Binary Output - All Variations	1	06	02
10	1	Binary Output (object parsed but WRITE not used)			
10	2	Binary Output Status (only the on-line bit is used)	1	06	
12	0	Control Block - All Variations			
12	1	Control Relay Output Block	3,4, 5,6	17,28	echo of request
12	2	Pattern Control Block			
12	3	Pattern Mask			

OBJECT			REQUEST		RESPONSE
Obj	Var	Description	Func Code (dec)	Qualifier Codes (hex)	Default Var. (hex)
20	0	Binary Counter - All Variations	1,7,8 9,10	06	05
20	1	32-Bit Binary Counter	1	06	
20	2	16-Bit Binary Counter	1	06	
20	3	32-Bit Delta Counter			
20	4	16-Bit Delta Counter			
20	5	32-Bit Binary Counter without Flag	1	06	
20	6	16-Bit Binary Counter without Flag	1	06	
20	7	32-Bit Delta Counter without Flag			
20	8	16-Bit Delta Counter without Flag			
21	0	Frozen Counter - All Variations	1	06	09
21	1	32-Bit Frozen Counter	1	06	
21	2	16-Bit Frozen Counter	1	06	
21	3	32-Bit Frozen Delta Counter			
21	4	16-Bit Frozen Delta Counter			
21	5	32-Bit Frozen Counter with Time of Freeze			
21	6	16-Bit Frozen Counter with Time of Freeze			
21	7	32-Bit Frozen Delta Counter with Time of Freeze			
21	8	16-Bit Frozen Delta Counter with Time of Freeze			
21	9	32-Bit Frozen Counter without Flag	1	06	
21	10	16-Bit Frozen Counter without Flag	1	06	
21	11	32-Bit Frozen Delta Counter without Flag			
21	12	16-Bit Frozen Delta Counter without Flag			

OBJECT			REQUEST		RESPONSE
Obj	Var	Description	Func Code (dec)	Qualifier Codes (hex)	Default Var. (hex)
22	0	Counter Change Event - All Variations	1	06,07,08	05
22	1	32-Bit Counter Change Event without Time	1	06,07,08	
22	2	16-Bit Counter Change Event without Time	1	06,07,08	
22	3	32-Bit Delta Counter Change Event w/o Time			
22	4	16-Bit Delta Counter Change Event w/o Time			
22	5	32-Bit Counter Change Event with Time	1	06,07,08	
22	6	16-Bit Counter Change Event with Time	1	06,07,08	
22	7	32-Bit Delta Counter Change Event w/ Time			
22	8	16-Bit Delta Counter Change Event w/ Time			
23	0	Frozen Counter Event - All Variations			
23	1	32-Bit Frozen Counter Event without Time			
23	2	16-Bit Frozen Counter Event without Time			
23	3	32-Bit Frozen Delta Counter Event w/o Time			
23	4	16-Bit Frozen Delta Counter Event w/o Time			
23	5	32-Bit Frozen Counter Event with Time			
23	6	16-Bit Frozen Counter Event with Time			
23	7	32-Bit Frozen Delta Counter Event w/ Time			
23	8	16-Bit Frozen Delta Counter Event w/ Time			
30	0	Analog Input - All Variations	1	06	04
30	1	32-Bit Analog Input	1	06	
30	2	16-Bit Analog Input	1	06	
30	3	32-Bit Analog Input without Flag	1	06	

OBJECT			REQUEST		RESPONSE
Obj	Var	Description	Func Code (dec)	Qualifier Codes (hex)	Default Var. (hex)
30	4	16-Bit Analog Input without Flag	1	06	
31	0	Frozen Analog Input - All Variations			
31	1	32-Bit Frozen Analog Input			
31	2	16-Bit Frozen Analog Input			
31	3	32-Bit Frozen Analog Input with Time of Freeze			
31	4	16-Bit Frozen Analog Input with Time of Freeze			
31	5	32-Bit Frozen Analog Input without Flag			
31	6	16-Bit Frozen Analog Input without Flag			
32	0	Analog Change Event - All Variations	1	06,07,08	04
32	1	32-Bit Analog Change Event without Time	1	06,07,08	
32	2	16-Bit Analog Change Event without Time	1	06,07,08	
32	3	32-Bit Analog Change Event with Time	1	06,07,08	
32	4	16-Bit Analog Change Event with Time	1	06,07,08	
33	0	Frozen Analog Event - All Variations			
33	1	32-Bit Frozen Analog Event without Time			
33	2	16-Bit Frozen Analog Event without Time			
33	3	32-Bit Frozen Analog Event with Time			
33	4	16-Bit Frozen Analog Event with Time			
40	0	Analog Output Status - All Variations	1	06	02
40	1	32-Bit Analog Output Status	1	06	
40	2	16-Bit Analog Output Status	1	06	

OBJECT			REQUEST		RESPONSE
Obj	Var	Description	Func Code (dec)	Qualifier Codes (hex)	Default Var. (hex)
41	0	Analog Output Block - All Variations			
41	1	32-Bit Analog Output Block	3,4, 5,6	17,28	echo of request
41	2	16-Bit Analog Output Block	3,4, 5,6	17,28	echo of request
50	0	Time and Date - All Variations			
50	1	Time and Date	2	07 where quantity=1	
50	2	Time and Date with Interval			
51	0	Time and Date CTO - All Variations			
51	1	Time and Date CTO			
51	2	Unsynchronized Time and Date CTO			
52	0	Time Delay - All Variations			
52	1	Time Delay Coarse (response for a restart request)	13		
52	2	Time Delay Fine (response for a delay measure request)	23		
60	1	Class 0 Data	1	06	
60	2	Class 1 Data	1	06,07,08	
60	3	Class 2 Data	1	06,07,08	
60	4	Class 3 Data	1	06,07,08	
80	1	Internal Indications	2	00 index=7	
81	1	Storage Object			
82	1	Device Profile			
83	1	Private Registration Object			
83	2	Private Registration Object Descriptor			

OBJECT			REQUEST		RESPONSE
Obj	Var	Description	Func Code (dec)	Qualifier Codes (hex)	Default Var. (hex)
90	1	Application Identifier			
100	1	Short Floating Point			
100	2	Long Floating Point			
100	3	Extended Floating Point			
101	1	Small Packed Binary-Coded Decimal			
101	2	Medium Packed Binary-Coded Decimal			
101	3	Large Packed Binary-Coded Decimal			
102	0	8-Bit Unsigned Integer			
102	1	8-Bit Unsigned Integer	1,2	04	
No Object			13		
No Object			23		

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