

DNP Device Profile Document - Slave

DNP3 DEVICE PROFILE DOCUMENT	
Vendor Name: Control Microsystems Inc.	
Device Name: SCADAPack, SCADAPack LP (Firmware 1.47 and newer) SCADAPack 100 (Firmware 1.61 and newer) SCADAPack 32 (Firmware 1.13 and newer) SCADAPack 300-Series (Firmware 1.00 and newer)	
Highest DNP Level Supported: For Requests Level 2 For Responses Level 2	Device Function: <input type="checkbox"/> Master <input checked="" type="checkbox"/> Slave
Notable objects, functions, and/or qualifiers supported in addition to the Highest DNP Levels Supported (the complete list is described in the attached table): <u>Function code 14 (warm restart)</u> <u>Function code 20 (Enable Unsolicited Messages) for class 1, 2, 3 objects only.</u> <u>Function code 21 (Disable Unsolicited Messages) for class 1, 2, 3 objects only.</u> <u>Object 41, variation 1 (32-bit analog output block)</u>	
Maximum Data Link Frame Size (octets): Transmitted <u>292</u> Received (must be 292)	Maximum Application Fragment Size (octets): Transmitted <u>2048</u> Received <u>2048</u>
Maximum Data Link Re-tries: <input type="checkbox"/> None <input type="checkbox"/> Fixed at <input checked="" type="checkbox"/> Configurable, range 0 to 255	Maximum Application Layer Re-tries: <input type="checkbox"/> None <input checked="" type="checkbox"/> Configurable, range 0 to 255

Requires Data Link Layer Confirmation:

- Never
 Always
 Sometimes If 'Sometimes', when? _____
 Configurable for Always or Never

Requires Application Layer Confirmation:

- Never
 Always (not recommended)
 When reporting Event Data (Slave devices only)
 When sending multi-fragment responses (Slave devices only)
 Sometimes If 'Sometimes', when? _____
 Configurable for always or only when Reporting Event Data and Unsolicited Messages

Timeouts while waiting for:

- | | | | | |
|-------------------------|-------------------------------|---|-----------------------------------|--|
| Data Link Confirm | <input type="checkbox"/> None | <input type="checkbox"/> Fixed at _____ | <input type="checkbox"/> Variable | <input checked="" type="checkbox"/> Configurable |
| Complete Appl. Fragment | <input type="checkbox"/> None | <input type="checkbox"/> Fixed at _____ | <input type="checkbox"/> Variable | <input checked="" type="checkbox"/> Configurable |
| Application Confirm | <input type="checkbox"/> None | <input type="checkbox"/> Fixed at _____ | <input type="checkbox"/> Variable | <input checked="" type="checkbox"/> Configurable |
| Complete Appl. Response | <input type="checkbox"/> None | <input type="checkbox"/> Fixed at _____ | <input type="checkbox"/> Variable | <input checked="" type="checkbox"/> Configurable |
- Others _____

Sends/Executes Control Operations:

- | | | | | |
|-------------------------|---|---------------------------------|------------------------------------|--|
| WRITE Binary Outputs | <input type="checkbox"/> Never | <input type="checkbox"/> Always | <input type="checkbox"/> Sometimes | <input checked="" type="checkbox"/> Configurable |
| SELECT/OPERATE | <input type="checkbox"/> Never | <input type="checkbox"/> Always | <input type="checkbox"/> Sometimes | <input checked="" type="checkbox"/> Configurable |
| DIRECT OPERATE | <input type="checkbox"/> Never | <input type="checkbox"/> Always | <input type="checkbox"/> Sometimes | <input checked="" type="checkbox"/> Configurable |
| DIRECT OPERATE - NO ACK | <input type="checkbox"/> Never | <input type="checkbox"/> Always | <input type="checkbox"/> Sometimes | <input checked="" type="checkbox"/> Configurable |
| Count > 1 | <input type="checkbox"/> Never | <input type="checkbox"/> Always | <input type="checkbox"/> Sometimes | <input checked="" type="checkbox"/> Configurable |
| Pulse On | <input type="checkbox"/> Never | <input type="checkbox"/> Always | <input type="checkbox"/> Sometimes | <input checked="" type="checkbox"/> Configurable |
| Pulse Off | <input type="checkbox"/> Never | <input type="checkbox"/> Always | <input type="checkbox"/> Sometimes | <input checked="" type="checkbox"/> Configurable |
| Latch On | <input type="checkbox"/> Never | <input type="checkbox"/> Always | <input type="checkbox"/> Sometimes | <input checked="" type="checkbox"/> Configurable |
| Latch Off | <input type="checkbox"/> Never | <input type="checkbox"/> Always | <input type="checkbox"/> Sometimes | <input checked="" type="checkbox"/> Configurable |
| Queue | <input checked="" type="checkbox"/> Never | <input type="checkbox"/> Always | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Configurable |
| Clear Queue | <input checked="" type="checkbox"/> Never | <input type="checkbox"/> Always | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Configurable |

FILL OUT THE FOLLOWING ITEM FOR MASTER DEVICES ONLY:

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
- Only time-tagged
- Only non-time-tagged
- Configurable to send both, one or the other (attach explanation)

Reports time-tagged Binary Input Change Events when no specific variation requested:

- Never
- Binary Input Change With Time
- Binary Input Change With Relative Time
- Configurable (attach explanation)

Sends Unsolicited Responses:

- Never
- Configurable by class
- Only certain objects
- Sometimes (attach explanation)
- ENABLE/DISABLE UNSOLICITED

Sends Static Data in Unsolicited Responses:

- Never
 - When Device Restarts
 - When Status Flags Change
- No other options are permitted.

Default Counter Object/Variation:

- No Counters Reported
- Configurable (attach explanation)
- Default Object 20
Default Variation 05
- Point-by-point list attached

Counters Roll Over at:

- No Counters Reported
- Configurable (attach explanation)
- 16 Bits
- 32 Bits
- 16 Bits for 16-bit counters
32 Bits for 32-bit counters
- Point-by-point list attached

Sends Multi-Fragment Responses: Yes No

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IMPLEMENTATION OBJECT

This table describes the objects, function codes and qualifiers used in the device:

OBJECT			REQUEST (slave must parse)		RESPONSE (master must parse)	
Obj	Var	Description	Func Codes (dec)	Qual Codes (hex)	Func Codes	Qual Codes (hex)
1	0	Binary Input - All Variations	1	06		
1	1	Binary Input			129, 130	00, 01
1	2	Binary Input with Status			129, 130	00, 01
2	0	Binary Input Change - All Variations	1	06,07,08		
2	1	Binary Input Change without Time	1	06,07,08	129, 130	17, 28
2	2	Binary Input Change with Time	1	06,07,08	129, 130	17, 28
2	3	Binary Input Change with Relative Time	1	06,07,08	129, 130	17, 28
10	0	Binary Output - All Variations	1	06		
10	1	Binary Output				
10	2	Binary Output Status			129, 130	00, 01
12	0	Control Block - All Variations				
12	1	Control Relay Output Block	3, 4, 5, 6	17, 28	129	echo of request
12	2	Pattern Control Block				
12	3	Pattern Mask				
20	0	Binary Counter - All Variations	1, 7, 8, 9, 10	06		
20	1	32-Bit Binary Counter			129, 130	00, 01
20	2	16-Bit Binary Counter			129, 130	00, 01
20	3	32-Bit Delta Counter				
20	4	16-Bit Delta Counter				
20	5	32-Bit Binary Counter without Flag			129, 130	00, 01
20	6	16-Bit Binary Counter without Flag			129, 130	00, 01
20	7	32-Bit Delta Counter without Flag				
20	8	16-Bit Delta Counter without Flag				
21	0	Frozen Counter - All Variations	1	06		

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OBJECT			REQUEST (slave must parse)		RESPONSE (master must parse)	
Obj	Var	Description	Func Codes (dec)	Qual Codes (hex)	Func Codes	Qual Codes (hex)
21	1	32-Bit Frozen Counter			129, 130	00, 01
21	2	16-Bit Frozen Counter			129, 130	00, 01
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			129, 130	00, 01
21	10	16-Bit Frozen Counter without Flag			129, 130	00, 01
21	11	32-Bit Frozen Delta Counter without Flag				
21	12	16-Bit Frozen Delta Counter without Flag				
22	0	Counter Change Event - All Variations	1	06,07,08		
22	1	32-Bit Counter Change Event without Time			129, 130	17, 28
22	2	16-Bit Counter Change Event without Time			129, 130	17, 28
22	3	32-Bit Delta Counter Change Event without Time				
22	4	16-Bit Delta Counter Change Event without Time				
22	5	32-Bit Counter Change Event with Time				
22	6	16-Bit Counter Change Event with Time				
22	7	32-Bit Delta Counter Change Event with Time				
22	8	16-Bit Delta Counter Change Event with 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				

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OBJECT			REQUEST (slave must parse)		RESPONSE (master must parse)	
Obj	Var	Description	Func Codes (dec)	Qual Codes (hex)	Func Codes	Qual Codes (hex)
23	3	32-Bit Frozen Delta Counter Event without Time				
23	4	16-Bit Frozen Delta Counter Event without 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 with Time				
23	8	16-Bit Frozen Delta Counter Event with Time				
30	0	Analog Input - All Variations	1	06		
30	1	32-Bit Analog Input			129, 130	00, 01
30	2	16-Bit Analog Input			129, 130	00, 01
30	3	32-Bit Analog Input without Flag			129, 130	00, 01
30	4	16-Bit Analog Input without Flag			129, 130	00, 01
30	5	Short Floating Point Analog Input			129, 130	00, 01
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		
32	1	32-Bit Analog Change Event without Time			129,130	17,28
32	2	16-Bit Analog Change Event without Time			129,130	17,28
32	3	32-Bit Analog Change Event with Time			129,130	17,28
32	4	16-Bit Analog Change Event with Time			129,130	17,28
32	5	Short Floating Point Analog Change Event without Time			129,130	17,28
33	0	Frozen Analog Event - All Variations				

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OBJECT			REQUEST (slave must parse)		RESPONSE (master must parse)	
Obj	Var	Description	Func Codes (dec)	Qual Codes (hex)	Func Codes	Qual Codes (hex)
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		
40	1	32-Bit Analog Output Status			129, 130	00, 01
40	2	16-Bit Analog Output Status			129, 130	00, 01
40	3	Short Floating Point Analog Output Status			129, 130	00, 01
41	0	Analog Output Block - All Variations				
41	1	32-Bit Analog Output Block	3, 4, 5, 6	17, 28	129	echo of request
41	2	16-Bit Analog Output Block	3, 4, 5, 6	17, 28	129	echo of request
41	3	Short Floating Point Analog Output Block	3, 4, 5, 6	17, 28	129	echo of request
50	0	Time and Date - All Variations				
50	1	Time and Date	2 (see 4.14)	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			129, 130	07, quantity=1
51	2	Unsynchronized Time and Date CTO			129, 130	07, quantity=1
52	0	Time Delay - All Variations				
52	1	Time Delay Coarse			129	07, quantity=1
52	2	Time Delay Fine			129	07, quantity=1
60	0					

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OBJECT			REQUEST (slave must parse)		RESPONSE (master must parse)	
Obj	Var	Description	Func Codes (dec)	Qual Codes (hex)	Func Codes	Qual Codes (hex)
60	1	Class 0 Data	1	06		
60	2	Class 1 Data	1 20,21	06,07,08 06		
60	3	Class 2 Data	1 20,21	06,07,08 06		
60	4	Class 3 Data	1 20,21	06,07,08 06		
70	1	File Identifier				
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				
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				
No Object			13			
No Object			14			
No Object			23 (see 4.14)			

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TIME SYNCHRONISATION PARAMETERS

This table describes the worst-case time parameters relating to time synchronization, as required by DNP Level 2 Certification Procedure section 8.7

PARAMETER	VALUE
Time base drift	+/- 1 minute/month at 25°C +1 / -3 minutes/month 0 to 50°C
Time base drift over a 10-minute interval	+/- 14 milliseconds at 25°C +14 / -42 milliseconds 0 to 50°C
Maximum delay measurement error	+/- 100 milliseconds
Maximum internal time reference error when set from the protocol	+/- 100 milliseconds
Maximum response time	100 milliseconds