

# DNP V3.00

## DEVICE PROFILE DOCUMENT

This table must be accompanied by a table having the following headings:

Object Group  
Object Variation

Request Function Codes  
Request Qualifiers  
Object Name (optional)

Response Function Codes  
Response Qualifiers

Vendor Name: Weschler Instruments

Device Name: Advantage Models SC, DC, TC, LTC, CT, CTX and CT/LTC

Highest DNP Level Supported:

For Requests: Level 1

For Responses: Level 1

Device Function:

Master

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):

Maximum Data Link Frame Size (octets):

Transmitted: 292  
Received: 292

Maximum Application Fragment Size (octets):

Transmitted: 249  
Received: 249

Maximum Data Link Re-tries:

- None  
 Fixed at \_\_\_\_\_  
 Configurable, range \_\_\_\_ to \_\_\_\_

Maximum Application Layer Re-tries:

- None  
 Configurable, range \_\_\_\_\_ to \_\_\_\_\_  
(fixed is not permitted)

Requires Data Link Layer Confirmation:

- Never  
 Always  
 Sometimes If 'Sometimes', when? \_\_\_\_\_  
 Configurable If 'Configurable', how? \_\_\_\_\_

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 If 'Configurable', how? \_\_\_\_\_

Timeouts While Waiting For:

- |                               |  |  |                                   |  |
|-------------------------------|--|--|-----------------------------------|--|
| Data link confirm             | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Fixed at ____ | <input type="checkbox"/> Variable | <input type="checkbox"/> Configurable* |
| Complete application fragment | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Fixed at ____ | <input type="checkbox"/> Variable | <input type="checkbox"/> Configurable* |
| Application confirm           | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Fixed at ____ | <input type="checkbox"/> Variable | <input type="checkbox"/> Configurable* |
| Complete application response | <input checked="" type="checkbox"/> None | <input type="checkbox"/> Fixed at ____ | <input type="checkbox"/> Variable | <input type="checkbox"/> Configurable* |
| Others _____                  |  |  |                                   |  |

Attach an explanation if 'Variable' or 'Configurable' was checked for any timeout

Send / Executes Control Operations:

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

\* See attached point table for control operations checked as 'Sometimes'

**FILL OUT THE FOLLOWING ITEMS 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 ITEM 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 (attach explanation)
- Only certain objects
- Sometimes (attach explanation)
- ENABLE / DISABLE UNSOLICITED Function Codes Supported

Sends Static Data in Unsolicited Responses

- Never
- When device restarts
- When status flags change

No Other Options Are Permitted

<p>Default Counter Object / Variation:</p> <p><input type="checkbox"/> No counters reported</p> <p><input type="checkbox"/> Configurable (attach explanation)</p> <p><input checked="" type="checkbox"/> Default object <u>  20  </u></p> <p style="padding-left: 20px;">Default Variation <u>  1  </u></p> <p><input type="checkbox"/> Point-by-point list attached</p>	<p>Counters Roll Over At:</p> <p><input type="checkbox"/> No counters reported</p> <p><input type="checkbox"/> Configurable (attach explanation)</p> <p><input type="checkbox"/> 16 Bits</p> <p><input checked="" type="checkbox"/> 32 Bits</p> <p><input type="checkbox"/> Other value _____</p> <p><input type="checkbox"/> point-by-point list attached</p>
<p>Sends Multi-Fragment Responses: <input type="checkbox"/> Yes      <input checked="" type="checkbox"/> No</p>	

### Advantage Implementation Table

OBJECT			REQUEST (slave must parse)		RESPONSE (master must parse)	
OBJECT GROUP	VARIATION	DESCRIPTION	Function Codes (decimal)	Qualifier Codes (hex)	Function Codes (decimal)	Qualifier Codes (hex)
1	2	Binary Input with Status			129	00,01
2	2	Binary Input Change with Time			129	17, 28
10	2	Binary Output Status			129	00, 01
12	1	Control Relay Output Block	3, 4, 5, 6	17, 28	129	echo of request
20	1	32 Bit Binary Counter			129	00, 01
30	1	32 Bit Analog Input			129	00, 01
40	2	16 Bit Analog Output status			129	00, 01
41	2	16 Bit Analog Output Block	3, 4, 5, 6	17, 28	129	echo of request
50	1	Time and Date	1, 2	07 quantity=1		
60	0	Class Zero Data Read		06		

## Advantage Point Table

Object	Variation	Type	Point	Description
1	2	Binary Input with Status (Static, Read)  Status Octet: Bit 7 = State (0, 1) Bit 6 = N/A Bit 5 = N/A Bit 4 = N/A Bit 3 = N/A Bit 2 = N/A Bit 1 = N/A Bit 0 = On / Off Line  Bit 0: 0 = True (Off Line) 1 = False (On Line)	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	LCAM Channel A LCAM Channel B LCAM Channel C LCAM Channel 1 LCAM Channel 2 LCAM Channel 3 LCAM Channel 4 LCAM Channel 5 LCAM Channel A (with relay association) LCAM Channel B (with relay association) LCAM Channel C (with relay association) LCAM Channel 1 (with relay association) LCAM Channel 2 (with relay association) LCAM Channel 3 (with relay association) LCAM Channel 4 (with relay association) LCAM Channel 5 (with relay association)  All points will return a cleared bit 7 if unalarmed and a set bit 7 if in the alarm state. Points 0 - 7 will be in the alarmed state if the corresponding input measures a process value that is outside of the defined normal band. Points 8 - 15 will be in the alarmed state if the value of the process started by its associated relay is outside of the defined normal band. Points 8 -15 are typically used to monitor cooling apparatus that is controlled by Advantage.
2	2	Binary Input Change with Time (Read, Event)  Status Octet: Bit 7 = State (0, 1) Bit 6 = N/A Bit 5 = N/A Bit 4 = N/A Bit 3 = N/A Bit 2 = N/A Bit 1 = N/A Bit 0 = On / Off Line  Bit 0: 0 = True (Off Line) 1 = False (On Line)	0 1 2 3 4 5 6 7 8 9 10 12 13 14 15 16 17 18 19 20 21 22 23 24	RTD Channel 1 Peak RTD Channel 2 Peak RTD Channel 3 Peak RTD Channel 1 Valley RTD Channel 2 Valley RTD Channel 3 Valley Winding Temperature 1 Peak (CT Series Only) Winding Temperature 2 Peak (CT Series Only) Winding Temperature 3 Peak (CT Series Only) Highest Winding Temperature Peak (CT Series Only) Winding Temperature 1 Valley (CT Series Only) Winding Temperature 2 Valley (CT Series Only) Winding Temperature 3 Valley (CT Series Only) Highest Winding Temperature Valley (CT Series Only) Current 1 Peak (CT Series Only) Current 2 Peak (CT Series Only) Current 3 Peak (CT Series Only) Highest Current Peak (CT Series Only) Current 1 Valley (CT Series Only) Current 2 Valley (CT Series Only) Current 3 Valley (CT Series Only) Highest Current Valley (CT Series Only) LTC Differential Temperature Peak (LTC and CT/LTC Only) Deviation Temp. (Change from initial differential, LTC and CT/LTC Only)  Bit 7 is set, and the time is updated whenever a new peak or valley is recorded. The bit is cleared for a point immediately after the point's previous peak or valley is reset. Use this function in combination with object 30, variation 1 to time-stamp peak and valley values.

Object	Variation	Type	Point	Description
10	2	Binary Output With Status. (Static, Read)  Status Octet: Bit 7 = State (0, 1) Bit 6 = N/A Bit 5 = N/A Bit 4 = N/A Bit 3 = N/A Bit 2 = N/A Bit 1 = N/A Bit 0 = On / Off Line  Bit 0: 0 = Off Line 1 = On Line	0	Relay 1 Remote Control. Enabled = 1, Disabled = 0
			1	Relay 2 Remote Control. Enabled = 1, Disabled = 0
			2	Relay 3 Remote Control. Enabled = 1, Disabled = 0
			3	Relay 4 Remote Control. Enabled = 1, Disabled = 0
			4	Relay 5 Remote Control. Enabled = 1, Disabled = 0
			5	Relay 6 Remote Control. Enabled = 1, Disabled = 0
			6	Relay 7 Remote Control. Enabled = 1, Disabled = 0
			7	Relay 8 Remote Control. Enabled = 1, Disabled = 0
			8	Relay 9 Remote Control. Enabled = 1, Disabled = 0
			9	Relay 10 Remote Control. Enabled = 1, Disabled = 0
			10	Relay 11 Remote Control. Enabled = 1, Disabled = 0
			11	Relay 12 Remote Control. Enabled = 1, Disabled = 0
			12	Relay 1 coil state. Energized = 1, De-energized = 0
			13	Relay 2 coil state. Energized = 1, De-energized = 0
			14	Relay 3 coil state. Energized = 1, De-energized = 0
			15	Relay 4 coil state. Energized = 1, De-energized = 0
			16	Relay 5 coil state. Energized = 1, De-energized = 0
			17	Relay 6 coil state. Energized = 1, De-energized = 0
			18	Relay 7 coil state. Energized = 1, De-energized = 0
			19	Relay 8 coil state. Energized = 1, De-energized = 0
			20	Relay 9 coil state. Energized = 1, De-energized = 0
			21	Relay 10 coil state. Energized = 1, De-energized = 0
			22	Relay 11 coil state. Energized = 1, De-energized = 0
			23	Relay 12 coil state. Energized = 1, De-energized = 0
			24	Relay 1 Normal Coil State. Energized = 1, De-energized = 0
			25	Relay 2 Normal Coil State. Energized = 1, De-energized = 0
			26	Relay 3 Normal Coil State. Energized = 1, De-energized = 0
			27	Relay 4 Normal Coil State. Energized = 1, De-energized = 0
			28	Relay 5 Normal Coil State. Energized = 1, De-energized = 0
			29	Relay 6 Normal Coil State. Energized = 1, De-energized = 0
			30	Relay 7 Normal Coil State. Energized = 1, De-energized = 0
			31	Relay 8 Normal Coil State. Energized = 1, De-energized = 0
			32	Relay 9 Normal Coil State. Energized = 1, De-energized = 0
			33	Relay 10 Normal Coil State. Energized = 1, De-energized = 0
			34	Relay 11 Normal Coil State. Energized = 1, De-energized = 0
35	Relay 12 Normal Coil State. Energized = 1, De-energized = 0			

Object	Variation	Type	Point	Description
12	1	Control Relay Output Block. (Static, Write)  Notes: In order to set or change the values of points 11 through 21, the corresponding relay's remote control function must be enabled. In order for local control to be restored to points 11 through 21, the relay's remote control function must be disabled.	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	Relay 1 Remote Control. See supported control codes. Relay 2 Remote Control. See supported control codes. Relay 3 Remote Control. See supported control codes Relay 4 Remote Control. See supported control codes Relay 5 Remote Control. See supported control codes Relay 6 Remote Control. See supported control codes Relay 7 Remote Control. See supported control codes Relay 8 Remote Control. See supported control codes Relay 9 Remote Control. See supported control codes Relay 10 Remote Control. See supported control codes Relay 11 Remote Control. See supported control codes Relay 12 Remote Control. See supported control codes Relay 1 Coil State. See supported control codes. Relay 2 Coil State. See supported control codes. Relay 3 Coil State. See supported control codes. Relay 4 Coil State. See supported control codes. Relay 5 Coil State. See supported control codes. Relay 6 Coil State. See supported control codes. Relay 7 Coil State. See supported control codes. Relay 8 Coil State. See supported control codes. Relay 9 Coil State. See supported control codes. Relay 10 Coil State. See supported control codes. Relay 11 Coil State. See supported control codes. Relay 12 Coil State. See supported control codes.  Control Codes Supported: 0 = NUL 1 = Pulse on. Relay energized until timer times out. 2 = Pulse off. Relay de-energized until timer times out. 3 = Latch on. Local Control will not supercede if set point exceeded. 4 = Latch off. 5 through 15 are undefined.  Queue, Clear and Trip/Close bits set to 0.
20	1	Binary Counter (Static, Read)	0 1 2	Advantage Model (3 to 9 = G3T to G9T) Firmware Version Number. (0-3E7 Hex) Firmware Revision Number (0-63 Hex)

Object	Variation	Type	Point	Description
30	1	32 Bit Analog Input with Status. (Static, Read)  Status Octet: Bit 7 = N/A Bit 6 = Ref Check Bit 5 = N/A Bit 4 = N/A Bit 3 = N/A Bit 2 = N/A Bit 1 = N/A Bit 0 = Flag  Bit 6: 0 = Normal 1 = Error  Bit 0: 0 = True (Off Line) 1 = False (On Line)	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43	RTD Channel 1 Present Value. Bit 6 = Sensor, Internal Failure? RTD Channel 2 Present Value. Bit 6 = Sensor, Internal Failure? RTD Channel 3 Present Value. Bit 6 = Sensor, Internal Failure? Winding 1 Present Temperature (CT Series Only) Winding 2 Present Temperature (CT Series Only) Winding 3 Present Temperature (CT Series Only) Highest Present Winding Temperature (CT Series Only) Dedicated Current 1 Present Value.(CT Series Only) Bit 6 > 150%? Dedicated Current 2 Present Value.(CT Series Only) Bit 6 > 150%? Dedicated Current 3 Present Value.(CT Series Only) Bit 6 > 150%? Highest Present Current Value (CT Series Only) LTC Differential Present Temperature. Bit 0, 6 = Over Range? Deviation Temp. (Change from initial differential, LTC and CT/LTC Only) LCAM Channel A (general purpose aux input, non-CT series) LCAM Channel B (general purpose aux input) LCAM Channel C (general purpose aux input) LCAM Channel 1 (general purpose aux input) LCAM Channel 2 (general purpose aux input) LCAM Channel 3 (general purpose aux input) LCAM Channel 4 (general purpose aux input) LCAM Channel 5 (general purpose aux input) RTD Channel 1 Peak RTD Channel 2 Peak RTD Channel 3 Peak RTD Channel 1 Valley RTD Channel 2 Valley RTD Channel 3 Valley Winding 1 Peak Temperature (CT Series Only) Winding 2 Peak Temperature (CT Series Only) Winding 3 Peak Temperature (CT Series Only) Highest Winding Temperature Peak (CT Series Only) Winding 1 Valley Temperature (CT Series Only) Winding 2 Valley Temperature (CT Series Only) Winding 3 Valley Temperature (CT Series Only) Highest Winding Temperature Valley (CT Series Only) Current 1 Peak Value.(CT Series Only) Bit 6 = Beyond 150%? Current 2 Peak Value.(CT Series Only) Bit 6 = Beyond 150%? Current 3 Peak Value.(CT Series Only) Bit 6 = Beyond 150%? Highest Peak Current Value (CT Series Only) Current 1 Valley Value.(CT Series Only) Bit 6 = Beyond 150%? Current 2 Valley Value.(CT Series Only) Bit 6 = Beyond 150%? Current 3 Valley Value.(CT Series Only) Bit 6 = Beyond 150%? Highest Valley Current Value (CT Series Only) LTC Differential Peak Temperature. Bit 6 = Over Range?
				<p>See object 2, variation 2 for peak and valley time-stamp capability.</p> <p>In cases where a model does not support a point, or the measurement function is disabled, bit zero will be cleared (offline indication) and a value of zero will be returned.</p> <p>LCAM channels A, B and C may be equipped to measure current only, or to serve as a general purpose inputs. When an Advantage model is NOT using these channels for winding current measurement, points 7, 8 and / or 9 will return a cleared bit zero and a zero value. If an Advantage model <i>is</i> using LCAM channels A, B and / or C for winding current measurement, points 13, 14 and / or 15 will return a cleared bit zero and a zero value</p>

Object	Variation	Type	Point	Description
40	2	16 Bit Analog Output Status (Static, Read) Status Byte: Bit 7 = N/A Bit 6 = N/A Bit 5 = N/A Bit 4 = N/A Bit 3 = N/A Bit 2 = N/A Bit 1 = N/A Bit 0 = N/A  See note 1 at the bottom of the table.	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	Alarm 1 Set Point Alarm 2 Set Point Alarm 3 Set Point Alarm 4 Set Point Alarm 5 Set Point Alarm 6 Set Point Alarm 7 Set Point Alarm 8 Set Point Alarm 9 Set Point Alarm 10 Set Point Alarm 11 Set Point Alarm 12 Set Point Alarm 1 Hysteresis Alarm 2 Hysteresis Alarm 3 Hysteresis Alarm 4 Hysteresis Alarm 5 Hysteresis Alarm 6 Hysteresis Alarm 7 Hysteresis Alarm 8 Hysteresis Alarm 9 Hysteresis Alarm 10 Hysteresis Alarm 11 Hysteresis Alarm 12 Hysteresis
41	2	16 Bit Analog Output Block (Static, Write) Control Codes Supported: 0 = 0 (NUL) 1 = 0 2 = 0 3 = 0 4 = 0 5 through 15 are undefined.  Queue = 0 Clear = 0 Trip/Close bit = 0  See note 2 at the bottom of the table.	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	Alarm 1 Set Point Alarm 2 Set Point Alarm 3 Set Point Alarm 4 Set Point Alarm 5 Set Point Alarm 6 Set Point Alarm 7 Set Point Alarm 8 Set Point Alarm 9 Set Point Alarm 10 Set Point Alarm 11 Set Point Alarm 12 Set Point Alarm 1 Hysteresis Alarm 2 Hysteresis Alarm 3 Hysteresis Alarm 4 Hysteresis Alarm 5 Hysteresis Alarm 6 Hysteresis Alarm 7 Hysteresis Alarm 8 Hysteresis Alarm 9 Hysteresis Alarm 10 Hysteresis Alarm 11 Hysteresis Alarm 12 Hysteresis
50	1	Time & Date (Read & Write)	0	Time and Date
60	0	Class 0 Data (Read)	All	Using qualification code 06 returns all static data.

Notes:

- Actual load current set point and displayed values are allowed to range from 0 to 99999 amps. Set point values for DNP-3 level 1 slaves, however, are limited to the range of  $\pm 2^{15} - 1$  ( $\pm 32767$ ). In order to remain within that range, and alarm up to 99990 amps, the load current read from the data point is 1/10 of the actual value. The range of values read directly would therefore be 0 to 9999 (no negative range for load current) and the user's application program must multiply by 10 to restore the actual value of the set point. This limitation applies to load current values only.
- For the reasons expressed in note 1, load current values which are written to the set point must be 1/10 of the actual value, up to a maximum of 9999 amps. The user's application program must divide the desired set point value by 10 to create the value which is written to the set point. This limitation applies to load current values only.