

## DNP3

The DNP3 protocol support over Ethernet is available in firmware version 2.7.4 and above for PM5560, PM5563 and PM5563RD meter models.

The Distributed Network Protocol Version 3.0 (DNP3) is a multipoint communication protocol which specifies the coding of data and rules for exchanging the data between a slave device and a master control device. DNP3 is an open protocol which can be implemented on any communication device. The DNP3 is available on Ethernet communication.

The DNP3 protocol specifies the data that can be exchanged and the form in which they are transmitted.

### DNP3 device profile

The meter can be integrated into a DNP network as a DNP slave (pre-configured for basic DNP slave functionality).

The meter supports a maximum of three concurrent connections (sessions) using the DNP3 protocol.

The DNP3 is disabled by default. You can modify the meter's default DNP3 settings using webpages and HMI. The data can be imported into the meter from a DNP control relay or an analog output device.

The primary objects of the DNP3 are as follows:

- Analog input
- Binary counter
- Binary input

### DNP3 device profile document

Vendor name: <b>Schneider Electric</b>	
Device name: <b>PM5XXX</b>	
Highest DNP level supported: For requests: <b>Level 2</b> For responses: <b>Level 2</b>	Device function: Master <b>Slave</b>
For static (non-change-event) object requests, request qualifier codes 07 and 08 (limited quantity), and 17 and 28 (index) are supported. Static object requests sent with qualifiers 07 or 08 are responded with qualifiers 00 or 01.  16-bit, 32-bit and floating point functions are supported.	
Maximum data link frame size (octets): Transmitted: <b>292</b> Received: <b>292</b>	Maximum application fragment size (octets): Transmitted: <b>50 to 248</b> Received: <b>2048</b>
Maximum data link re-tries: None <b>Fixed</b>	Maximum application layer re-tries: <b>None</b> Configurable
Requires data link layer confirmation: <b>Never</b> Always Sometimes	
Requires application layer confirmation: <b>Never</b> Always When reporting event data (Slave devices only) Sometimes	

**DNP3 device profile document (Continued)**

Timeouts while waiting for:				
Data link confirm:	<b>None</b>	Fixed at ____	Variable	Configurable
Complete appl. fragment:	<b>None</b>	Fixed at ____	Variable	Configurable
Application confirm:	None	Fixed at <b>10 s</b>	Variable	Configurable
Complete appl. response:	<b>None</b>	Fixed at ____	Variable	Configurable
Sends/Executes control operations:				
WRITE binary outputs:	<b>Never</b>	Always	Sometimes	Configurable
SELECT/OPERATE:	<b>Never</b>	Always	Sometimes	Configurable
DIRECT OPERATE:	<b>Never</b>	Always	Sometimes	Configurable
DIRECT OPERATE – NO ACK:	<b>Never</b>	Always	Sometimes	Configurable
Count > 1	<b>Never</b>	Always	Sometimes	Configurable
Pulse on	<b>Never</b>	Always	Sometimes	Configurable
Pulse off	<b>Never</b>	Always	Sometimes	Configurable
Latch on	<b>Never</b>	Always	Sometimes	Configurable
Latch off	<b>Never</b>	Always	Sometimes	Configurable
Queue	<b>Never</b>	Always	Sometimes	Configurable
Clear queue	<b>Never</b>	Always	Sometimes	Configurable
Attach explanation if 'Sometimes' or 'Configurable' was checked for any operation.				
Reports binary input change events when no specific variation requested:		Reports time-tagged binary input change events when no specific variation requested:		
Never		Never		
<b>Only time-tagged</b>		<b>Binary input change with time</b>		
Only non-time-tagged		Binary input change with relative time		
Sends unsolicited responses:		Sends static data in unsolicited responses:		
<b>Never</b>		<b>Never</b>		
Configurable - enable/disable		When device restarts		
Only certain objects		When status flags changes		
Sometimes (attach explanation)		No other options are permitted		
ENABLE/DISABLE UNSOLICITED function codes supported				
Default counter object/variation:		Counters roll over at:		
No counters reported		No counters reported		
Configurable		<b>Configurable</b>		
<b>Default object</b>		16 bits		
Default variation		32 bits		
Point-by-point list attached		Other value ____		
		Point-by-point list attached		

**DNP3 device profile document (Continued)**

Sends multi-fragment responses:		
<b>Yes</b>		
No		
Sequential file transfer support:		
Append file mode	Yes	<b>No</b>
Custom status code strings	Yes	<b>No</b>
Permissions field	Yes	<b>No</b>
File events assigned to class	Yes	<b>No</b>
File events send immediately	Yes	<b>No</b>
Multiple blocks in a fragment	Yes	<b>No</b>
Max number of files open	<b>0</b>	

**DNP3 implementation objects**

Object			Request (Slave must parse)		Response (Master must parse)	
Objects	Variation	Description	Functional codes (dec)	Qualifier codes (hex)	Functional codes (dec)	Qualifier codes (hex)
1	0	Binary input - Any variation	1	00,01,06,07,08,17,28	-	-
1	1	Binary input	1	00,01,06,07,08,17,28	129	00,01,17,28
1	2	Binary input with status	1	00,01,06,07,08,17,28	129	00,01,17,28
20	0	Binary counter - Any variation	1	00,01,06,07,08,17,28	-	-
			7,8	0,01,06,07,08	-	-
20	1	32-bit binary counter	1	00,01,06,07,08,17,28	129	00,01,17,28
20	2	16-bit binary counter	1	00,01,06,07,08,17,28	129	00,01,17,28
20	5	32-bit binary counter without flag	1	00,01,06,07,08,17,28	129	00,01,17,28
20	6	16-bit binary counter without flag	1	00,01,06,07,08,17,28	129	00,01,17,28
30	4	16-bit analog input without flag	1	00,01,06,07,08,17,28	129	00,01,17,28
30	5	Short floating point	1	00,01,06,07,08,17,28	129	00,01,17,28
30	6	Long floating point	1	00,01,06,07,08,17,28	129	00,01,17,28
50	0	Time and date - Any variation	-	-	-	-
50	1	Time and date	1	00,01,06,07,08	129	00,01,17,28
			2	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	Not defined	-	-	-	-
60	1	Class 0 data	1	06,07,08	-	-
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	-	-

## Default DNP3 configuration

### Analog input objects

16-bit analog input without flag (Object 30, Variation 4)	
Point	Measurement
0	VIn a
1	VIn b
2	VIn c
3	VIn avg
4	VII ab
5	VII bc
6	VII ca
7	VII avg
8	I a
9	I b
10	I c
11	I avg
12	kW a
13	kW b
14	kW c
15	kW tot
16	kVAR a
17	kVAR b
18	kVAR c
19	kVAR tot
20	kVA a
21	kVA b
22	kVA c
23	kVA tot
24	PFsign a
25	PFsign b
26	PFsign c
27	PFsign tot
28	V unbal (Voltage unbalance L-L worst)
29	I unbal (Current unbalance worst)
30	I4
31	Freq
32	kW sd del-rec2
33	kVAR sd del-rec3
34	kVA sd del+rec3

### Binary counter objects

16-bit binary counter without flag (Object 20, Variation 6)	
Point	Measurement
0	kWh del (Import)
1	kWh rec (Export)

16-bit binary counter without flag (Object 20, Variation 6)	
Point	Measurement
2	kWh del+rec (Total)
3	kWh del-rec (Net)
4	kVARh del (Import)
5	kVARh rec (Export)
6	kVARh del+rec (Total)
7	kVARh del-rec (Net)
8	kVAh del+rec (Total)

### Binary input objects

16-bit binary input without flag (Object 1)	
Point	Measurement
0	Digital input 1
1	Digital input 2
2	Digital input 3
3	Digital input 4
4	Digital output 1
5	Digital output 2

## Configuring DNP3 setting using the display

The Ethernet setup screen on the meter allows you to configure DNP3 communication.

1. Navigate to **Maint > Setup**.
2. Enter the setup password (default is "0"), then press **OK**.
3. Navigate to **Comm > Enet**.
4. Move the cursor to point to the parameter **DNP3** you want to modify, then press **Edit**.
5. Modify the parameter as required (**Enabled/Disabled**), then press **OK**.
6. Press the up arrow to exit.
7. Press **Yes** to save your changes.

## Configuring DNP3 setting using the webpages

You can use the meter's webpages to configure DNP3 settings.

1. Login to the meter webpages using Product Master or Web Master credentials.
2. Navigate to **Settings > DNP3 Settings**.
3. Click **Yes** to enable DNP3 or click **No** to disable DNP3 as required.
4. Click **Save changes** to send and save the new settings to the meter.