

# TRB160 DNP3

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## Summary

**Distributed Network Protocol 3 (DNP3)** is a set of communications protocols used between components in process automation systems. It is primarily used for communications between a client station and Remote Terminal Units (RTUs) or Intelligent Electronic Devices (IEDs).

This manual page provides an overview of the DNP3 functionality in TRB160 devices.

**Note:** DNP3 is additional software that can be installed from the **System** → [Package Manager](#) page.

## DNP3 Parameters

DNP3 parameters are held within **indexes**. The index numbers and corresponding system values are described in the table below:

|                               | required value | index | group type      |
|-------------------------------|----------------|-------|-----------------|
| Uptime                        |                | 0     | Counter         |
| Signal Strength               |                | 1     | Octet<br>String |
| Modem temperature (in 0.1 °C) |                | 2     | Octet<br>String |
| Hostname                      |                | 3     | Octet<br>String |
| Operator                      |                | 4     | Octet<br>String |
| Router Serial Number          |                | 5     | Octet<br>String |
| LAN MAC Address               |                | 6     | Octet<br>String |

|                                 |    |              |
|---------------------------------|----|--------------|
| Router name                     | 7  | Octet String |
| Network state                   | 9  | Octet String |
| Connection state                | 10 | Octet String |
| Mobile data received today      | 20 | Counter      |
| Mobile data sent today          | 21 | Counter      |
| Mobile data received this week  | 22 | Counter      |
| Mobile data sent this week      | 23 | Counter      |
| Mobile data received this month | 24 | Counter      |
| Mobile data sent this month     | 25 | Counter      |
| Mobile data received last 24h   | 26 | Counter      |
| Mobile data sent last 24h       | 27 | Counter      |
| Mobile data received last week  | 28 | Counter      |
| Mobile data sent last week      | 29 | Counter      |
| Mobile data received last month | 30 | Counter      |
| Mobile data sent last month     | 31 | Counter      |

## TCP Client

A client in DNP3 is a component that communicates (requests data) with a single outstation via a communication channel. By default, the client list is empty. To add a new client, click the 'Add' button.



After clicking 'Add' you will be redirected to the newly added client's configuration page.

## TCP Client Configuration

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The **TCP Client Configuration** section is used to configure the parameters of a DNP3 Outstation that the Client (this TRB160 device) will be querying with requests. The figure below is an example of the TCP Client Configuration and the table below provides information on the fields contained in that section:



| Field          | Value                                    | Description  |
|----------------|--|--|
| Enable         | off   on; default: <b>off</b>            | Turns communication with the outstation device on or off.    |
| Name           | string; default: <b>none</b>             | Name of the TCP client, used for easier management purposes. |
| IP address     | ip; default: <b>none</b>                 | DNP3 Outstation IP address.                                  |
| Port           | integer [0..65535]; default: <b>none</b> | DNP3 Outstation Port.  |
| Local Address  | integer [0..65535]; default: <b>none</b> | Clients Link-Layer address.                                  |
| Remote Address | integer [0..65535]; default: <b>none</b> | Outstation Link-Layer address.                               |

|               |                                       |   |
|---------------|---------------------------------------|---|
| Period        | integer [1..60]; default: <b>none</b> | Interval at which requests are sent to the outstation device. |
| Timeout       | integer [1..60]; default: <b>none</b> | Maximum response wait time.                                   |
| Save to flash | off   on; default: <b>off</b>         | When enabled, stores request information in device flash.     |

## Requests Configuration

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A DNP3 **request** is a way of obtaining data from DNP3 Outstations. The client sends a request to an outstation specifying the function codes to be performed. The outstation then sends the requested data back to the DNP3 client.

The Request Configuration list is empty by default. To add a new Request Configuration look to the Add New Instance section. Enter a custom name into the 'New Configuration Name' field and click the 'Add' button:



The new Request Configuration should become visible in the list:



| Field       | Value   | Description  |
|-------------|---|--|
| Name        | string; default: <b>Unnamed</b>   | Name of this Request Configuration. Used for easier management purposes. |
| Start Index | integer [0..65535]; default: <b>none</b>  | Start index of the data subarray.  |
| End Index   | integer [0..65535]; default: <b>none</b>  | End index of the data subarray.  |
| Data Type   | Binary   Double Binary   Counter   Frozen Counter   Analog   Octet String   Analog Output Status   Binary Output Status; default: <b>Binary</b> | Data object group of the requested index(-es).                           |
| Enabled     | off   on; default: <b>off</b>   | Turns the request on or off.   |
| Actions     | - interactive button  | Deletes request configuration.   |

## Request Configuration Testing

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This section is used to check whether the configuration works correctly. Simply click the 'Test' button and a response should appear in the box below. The last value represents the configured request data. A successful response to a test may look something like this:



## DNP3 Outstation

An outstation in DNP3 is a component that communicates with a single client via a communication channel. It makes measurements of the physical world and then sends them to a client upon request

(solicited) or on its own accord (unsolicited). Occasionally a client requests that it do something by sending it a control. This provides the user with the possibility to get system parameters.

The figure below is an example of the DNP3 Outstation window section and the table below provides information on the fields contained in that window:



| <b>Field</b>                | <b>Value</b>                             | <b>Description</b>   |
|-----------------------------|--|--|
| Enable                      | off   on; default: <b>off</b>            | Turns DNP3 Outstation on or off.   |
| Local Address               | integer [0..65535]; default: <b>none</b> | Outstation Link-Layer address.   |
| Remote Address              | integer [0..65535]; default: <b>none</b> | Client Link-Layer address.   |
| Unsolicited enabled         | off   on; default: <b>none</b>           | Enables the transmission of unsolicited messages.  |
| Protocol                    | TCP   <b>UDP</b> ; default: <b>TCP</b>   | Protocol used for DNP3 communications.   |
| Port                        | integer [0..65535]; default: <b>none</b> | Port used for DNP3 communications.   |
| <b>UDP response address</b> | ipv4; default: <b>none</b>               | UDP response address.  |
| <b>UDP response port</b>    | integer [0..65535]; default: <b>none</b> | UDP response port.   |
| Allow Remote Access         | off   on; default: <b>off</b>            | Allows remote DNP3 connections by adding an exception to the device's firewall on the port specified in the field above. |