RUTX50 DNP3

The information in this page is updated in accordance with firmware version **RUTX_R_00.07.08.3**.

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Contents

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 RUTX50 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:

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required value	index	group type
Uptime	0	Counter
Signal Strength	1	Octet String
Modem temperature (in 0.1 °C)	2	Octet String
Hostname	3	Octet String
Operator	4	Octet String

Router Serial Number	5	Octet String
LAN MAC Address	6	Octet String
Router name	7	Octet String
Currently active SIM card slot	8	Octet String
Network state	9	Octet String
Connection state	10	Octet String
Mobile data received today (SIM1)	20	Counter
Mobile data sent today (SIM1)	21	Counter
Mobile data received this week (SIM1)	22	Counter
Mobile data sent this week (SIM1)	23	Counter
Mobile data received this month (SIM1)	24	Counter
Mobile data sent this month (SIM1)	25	Counter
Mobile data received last 24h (SIM1)	26	Counter
Mobile data sent last 24h (SIM1)	27	Counter
Mobile data received last week (SIM1)	28	Counter
Mobile data sent last week (SIM1)	29	Counter
Mobile data received last month (SIM1)	30	Counter
Mobile data sent last month (SIM1)	31	Counter
Mobile data received today (SIM2)	32	Counter
Mobile data sent today (SIM2)	33	Counter
Mobile data received this week (SIM2)	34	Counter
Mobile data sent this week (SIM2)	35	Counter
Mobile data received this month (SIM2)	36	Counter
Mobile data sent this month (SIM2)	37	Counter
Mobile data received last 24h (SIM2)	38	Counter
Mobile data sent last 24h (SIM2)	39	Counter
Mobile data received last week (SIM2)	40	Counter
Mobile data sent last week (SIM2)	41	Counter
Mobile data received last month (SIM2)	42	Counter
Mobile data sent last month (SIM2)	43	Counter
GPS Fix Time	50	Octet String
GPS Longitude Coordinate	51	Octet String
GPS Latitude Coordinate	52	Octet String
GPS Altitude Coordinate	53	Octet String
GPS Angle	54	Octet String
GPS Speed	55	Octet String
GPS Accuracy	56	Octet String
GPS Satellite count	57	Octet String
IO din1, is high?	72	Binary
IO dout1, is high?	74	Binary

External Modem Parameters

If you are using an external modem on your device, use these index numbers for corresponding system values:

required value	index	group type
Modem VID and PID	100 + 50 * modem_number	Octet String
Mobile data received today (SIM1)	101 + 50 * modem_number	Counter
Mobile data sent today (SIM1)	102 + 50 * modem_number	Counter
Mobile data received this week (SIM1)	103 + 50 * modem_number	Counter
Mobile data sent this week (SIM1)	104 + 50 * modem_number	Counter
Mobile data received this month (SIM1)	105 + 50 * modem_number	Counter
Mobile data sent this month (SIM1)	106 + 50 * modem_number	Counter
Mobile data received last 24h (SIM1)	107 + 50 * modem_number	Counter
Mobile data sent last 24h (SIM1)	108 + 50 * modem_number	Counter
Mobile data received last week (SIM1)	109 + 50 * modem_number	Counter
Mobile data sent last week (SIM1)	110 + 50 * modem_number	Counter
Mobile data received last month (SIM1)	111 + 50 * modem_number	Counter
Mobile data sent last month (SIM1)	112 + 50 * modem_number	Counter
Mobile data received today (SIM2)	113 + 50 * modem_number	Counter
Mobile data sent today (SIM2)	114 + 50 * modem_number	Counter
Mobile data received this week (SIM2)	115 + 50 * modem_number	Counter
Mobile data sent this week (SIM2)	116 + 50 * modem_number	Counter
Mobile data received this month (SIM2)	117 + 50 * modem_number	Counter
Mobile data sent this month (SIM2)	118 + 50 * modem_number	Counter
Mobile data received last 24h (SIM2)	119 + 50 * modem_number	Counter
Mobile data sent last 24h (SIM2)	120 + 50 * modem_number	Counter
Mobile data received last week (SIM2)	121 + 50 * modem_number	Counter
Mobile data sent last week (SIM2)	122 + 50 * modem_number	Counter
Mobile data received last month (SIM2)	123 + 50 * modem_number	Counter
Mobile data sent last month (SIM2)	124 + 50 * modem_number	Counter
Modem temperature (in 0.1 °C)	125 + 50 * modem_number	Octet String
Operator	126 + 50 * modem_number	Octet String
Network state	127 + 50 * modem_number	Octet String
Connection state	128 + 50 * modem_number	Octet String
Signal Strength	129 + 50 * modem_number	Octet String

The **modem_number** of the external modem is **0** (internal modem is skipped).

To get the exact index of a parameter, use the formula in the table above. For example, the index of an external modem operator is 126. Formula is: 126 + 50 * 0.

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

The **TCP Client Configuration** section is used to configure the parameters of a DNP3 Outstation that the Client (this RUTX50 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: **off**	Turns communication with the outstation device on or off.
Name	string; default: **none**	Name of the TCP client, used for easier management purposes.
IP address	ip; default: **none**	DNP3 Outstation IP address.
Port	integer [0..65535]; default: **none**	DNP3 Outstation Port.
Local Address	integer [0..65535]; default: **none**	Clients Link-Layer address.
Remote Address	integer [0..65535]; default: **none**	Outstation Link-Layer address.
Period	integer [1..60]; default: **none**	Interval at which requests are sent to the outstation device.
Timeout	integer [1..60]; default: **none**	Maximum response wait time.
Save to flash	off | on; default: **off**	When enabled, stores request information in device flash.

Requests Configuration

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: **Unnamed**	Name of this Request Configuration. Used for easier management purposes.
Start Index	integer [0..65535]; default: **none**	Start index of the data subarray.
End Index	integer [0..65535]; default: **none**	End index of the data subarray.

Data Type	Binary | Double Binary | Counter | Frozen Counter | Analog | Octet String | Analog Output Status | Binary Output Status; default: **Binary**	Data object group of the requested index(-es).
Enabled	off | on; default: **off**	Turns the request on or off.
Actions	- interactive button	Deletes request configuration.

Request Configuration Testing

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:

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