

NR500 Series Industrial Cellular VPN Router

Application Note 054

Modbus to DNP3

Version: V1.0.0
Date: Jul 2020
Status: Confidential



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1. Introduction

1.1 Overview

This document contains information regarding the configuration and use of Modbus to DNP3.

This guide has been written for use by technically competent personnel with a good understanding of the communications technologies used in the product, and of the requirements for their specific application.

1.2 Compatibility

This application note applies to:

Models Shown: NR500 series.

Firmware Version: V1.1.4(0c0c9fa) or newer

Other Compatible Models: None

1.3 Version

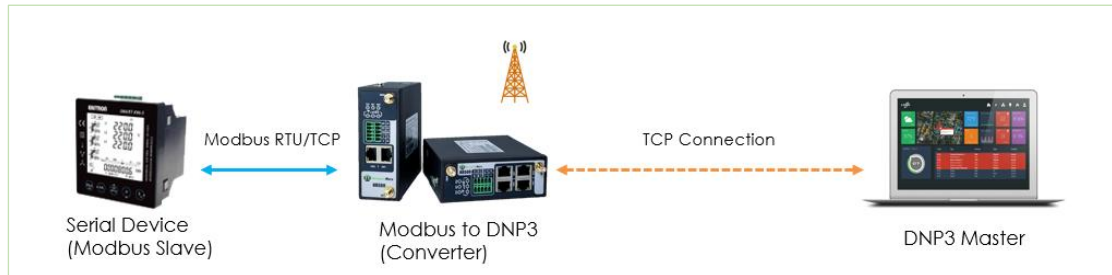
Updates between document versions are cumulative. Therefore, the latest document will include all the content of previous versions.

Release Date	Doc. Version	Firmware Version	Change Description
2020/07/17	V1.0.0	V1.1.4(0c0c9fa)	First released

1.4 Corrections

Appreciate for corrections or rectifications to this application note, and if any request for new application notes please email to: support@navigateworx.com

2. Topology

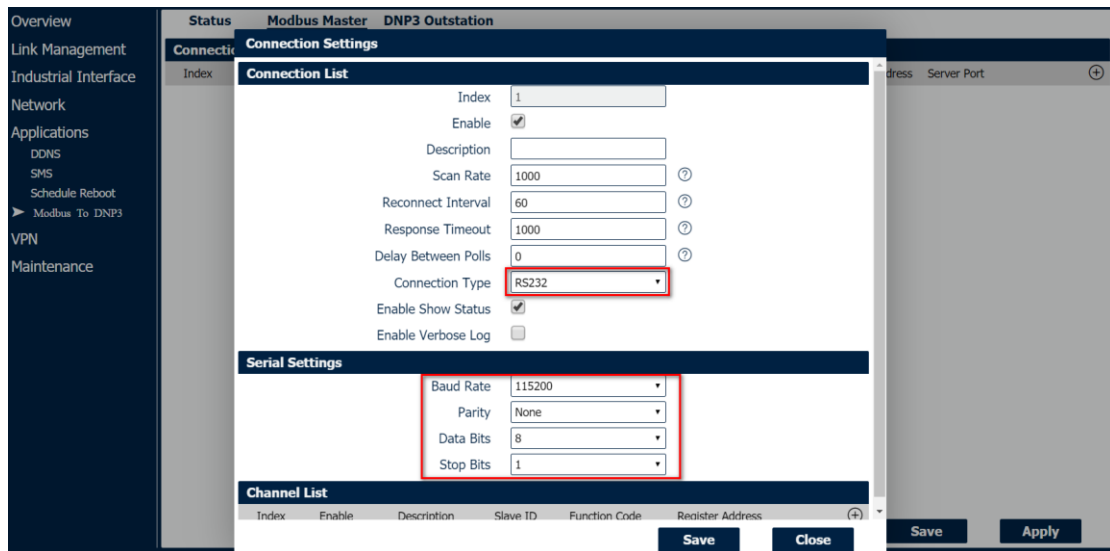


1. NR500 Router runs as Modbus to DNP3 converter, it acts as Modbus Master and DNP3 Outstation.
2. A serial device support Modbus protocol and acts as Modbus Slave. It connected to NR500 router via serial port or Ethernet port.
3. NR500 router poll the Modbus data from end device (Modbus Slave), after that, send the date to the remote DNP3 Master.

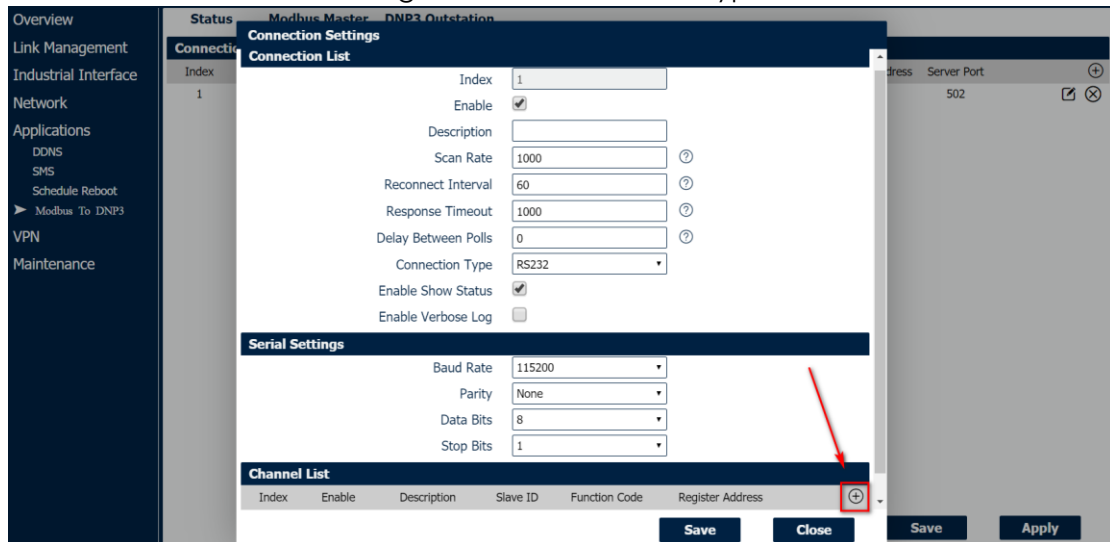
3. Configuration

3.1 Configuration on NR500

1. Go to **Applications>Modbus To DNP3>Modbus Master**, specify the serial settings to make the router connect to the Modbus Slave via RS232 interface:



2. Go to **Applications>Modbus To DNP3>Modbus Master>Channel List**, specify the Modbus Master settings and the DNP3 data type:



Channel Settings

Enable	<input checked="" type="checkbox"/>
Description	<input type="text"/>
Slave ID	<input type="text" value="1"/>
Function Code	<input type="text" value="03-Holding-Register"/>
Register Address	<input type="text" value="0"/>
Data type	<input type="text" value="Uint16"/>
Data Endian	<input type="text" value="AB"/>
Plus	<input type="text" value="0"/> ?
Subtract	<input type="text" value="0"/> ?
Divisor	<input type="text" value="1"/> ?
Multiplier	<input type="text" value="1"/> ?
Shift Right Bits	<input type="text" value="0"/> ?
Number Of Bits	<input type="text" value="16"/> ?
Keep Decimal Places	<input type="text" value="0"/> ?

DNP3 Outstation Settings

Data Type	<input type="text" value="Counter Input"/>
Class	<input type="text" value="2"/>
Enable Timestamp	<input checked="" type="checkbox"/>

- Go to **Applications>Modbus To DNP3>DNP3 Outstation**, specify the DNP3 outstation settings like below:

- Overview
- Link Management
- Industrial Interface
- Network
- Applications
 - DDNS
 - SMS
 - Schedule Reboot
 - ▶ Modbus To DNP3
- VPN
- Maintenance

Status
Modbus Master
DNP3 Outstation

DNP3 Outstation Settings

Enable	<input checked="" type="checkbox"/>
Local IP	<input type="text" value="0.0.0.0"/>
Local Port	<input type="text" value="20000"/>
Link Address	<input type="text" value="1024"/>
Master Link Address	<input type="text" value="1"/>
Enable Unsolicited	<input checked="" type="checkbox"/>

Data Settings

Data Location	<input type="text" value="FLASH"/>
Send Interval	<input type="text" value="60"/>
Number of Sent	<input type="text" value="5000"/>

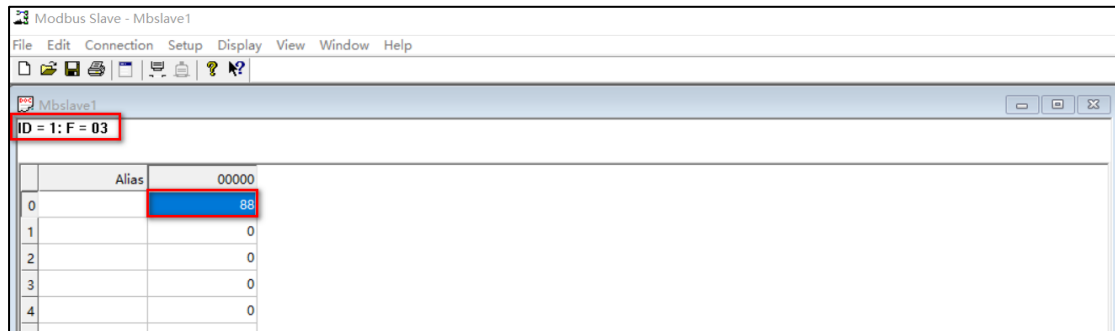
Advanced Settings

Server Accept Mode	<input type="text" value="Close New"/>
Keepalive Timeout	<input type="text" value="0"/>
Enable Verbose Log	<input type="checkbox"/>

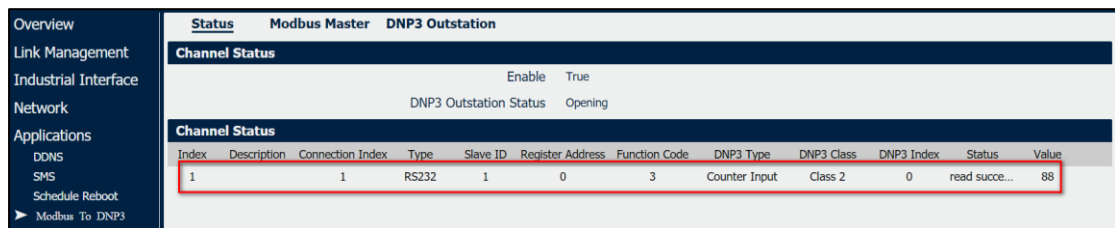
- Click Save>Apply.

3.2 Configuration on Modbus Slave

1. Set Slave ID as "1"; Function Code as "03", and the value "88" on Register "0":



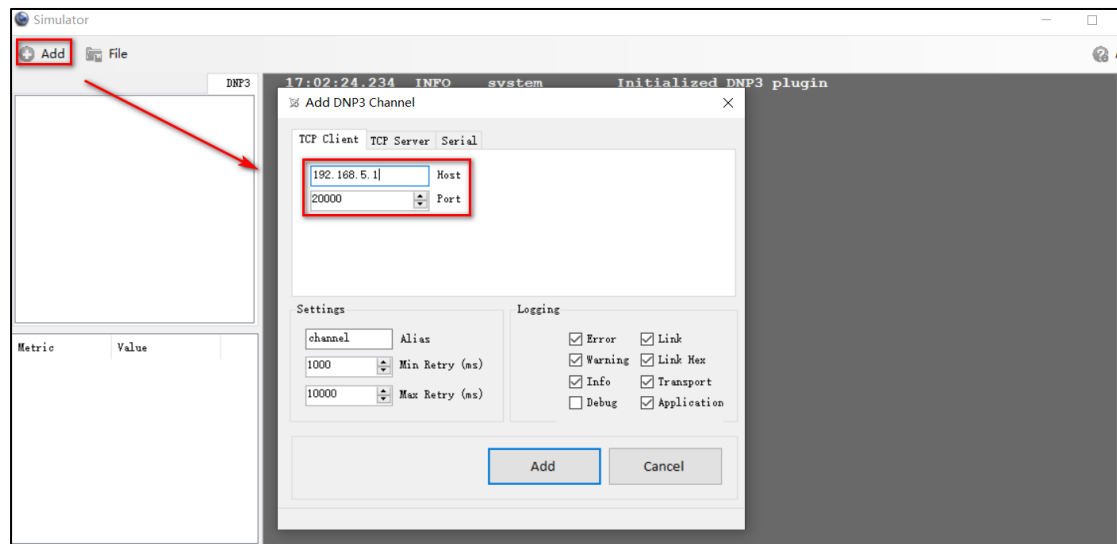
2. NR500 had polled the data from Modbus Slave successfully:



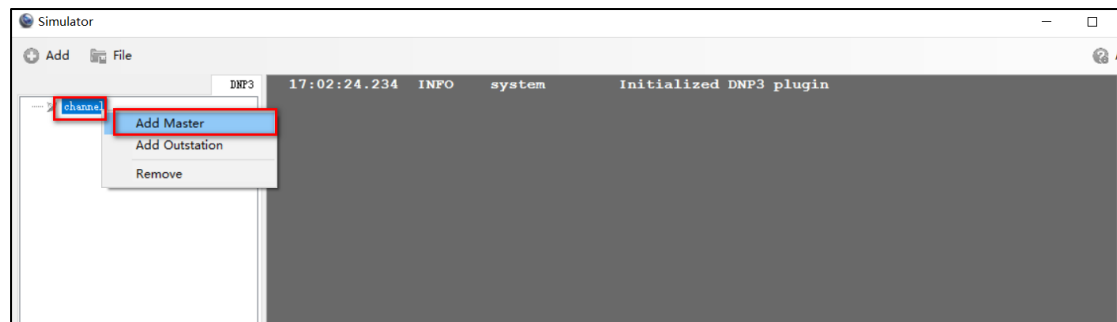
4. Testing

Here used the DNP3 Simulator "OpenDNP3" to do the testing.

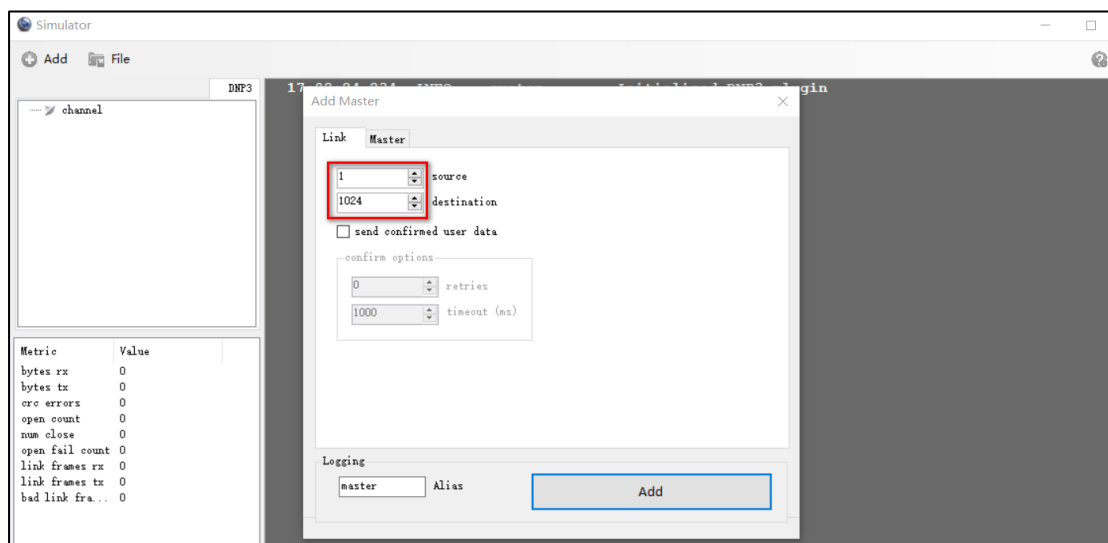
1. Run DNP3 simulator and enter the IP Address and Port to make it connect to NR500(DNP3 Outstation):



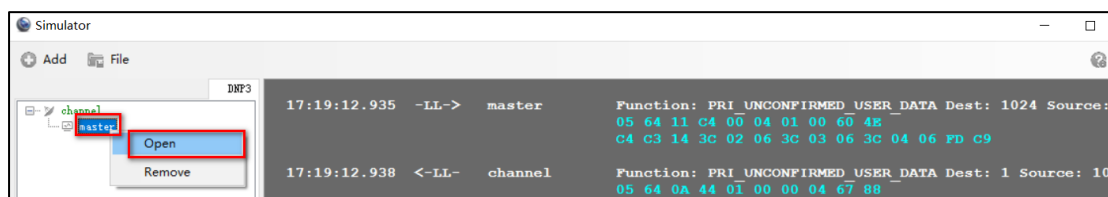
2. Right Click "channel", and Add Master:



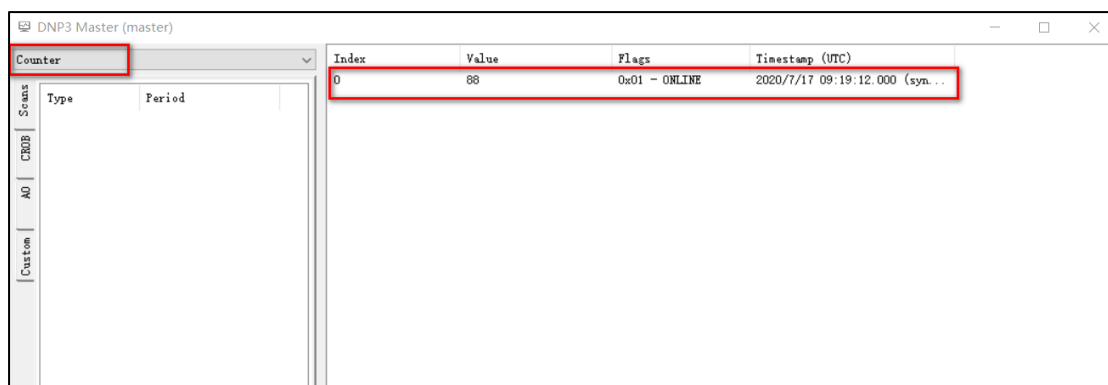
- Specify the address on DNP3 Master, to make it match the settings on NR500(DNP3 Outstation):



- Right Click "Master" and open it:



- Select the data type as "Counter", then we can see the data had been sent to DNP3 Master from NR500(DNP3 Outstation) successfully:



- Test successfully.