NR500 Series
Industrial Cellular VPN Router

Application Note 063

Transparent Mode with DNP3 Serial to DNP3 TCP on

RS485

Version: V1.0.0
Date: Aug 2022
Status: Confidential

Directory

1. Introduction

1.1 Overview

This document contains information regarding the configuration and use of Transparent Mode with DNP3 Serial to DNP3 TCP on RS485.

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: V1.1.7
**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
2022/08/05	V1.0.0	V1.1.7	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**
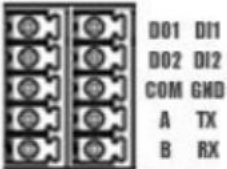
2. Topology
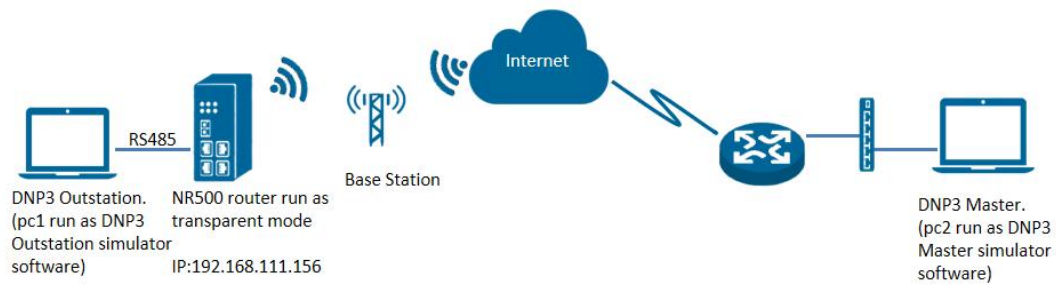
1. NR500 router runs as transparent mode and connect to Internet with SIM card.
2. PC1 simulate software as serial device and runs serial software, such as "OpenDNP3", the simulate will send the data to the DNP3 Master through NR500 router with TCP transparent mode.
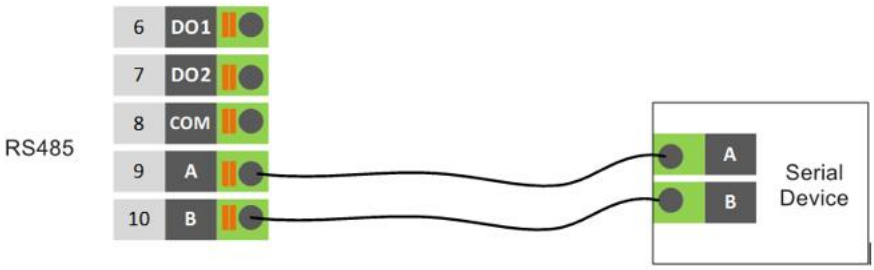3. PC2 runs as DNP3 Master simulate software and get data from the NR500 router.

3. RS485 Cable

1. Please follow below picture to make the RS485 cable:

- **Serial Port & DIDO**

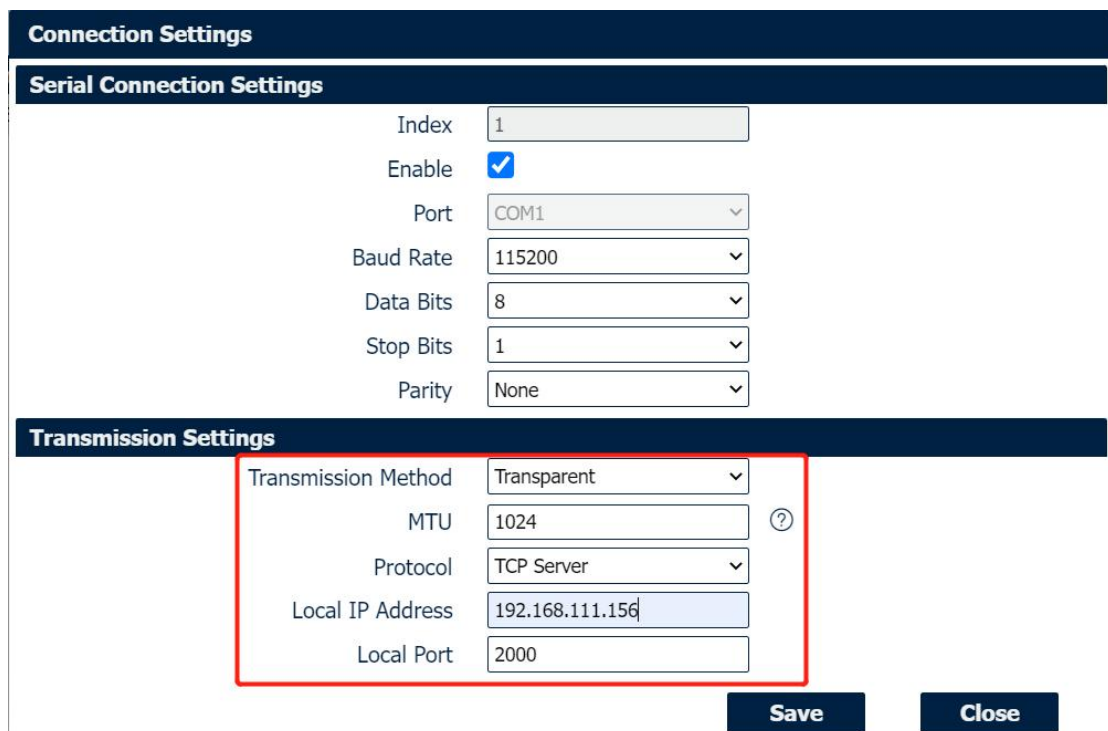| PIN	RS232	RS485	DI	DO	Direction
1	--	--	--	DO1	Router-->Device
2	--	--	--	DO2	Router-->Device
3	--	--	--	COM	--
4	--	A	--	--	Router<-->Device
5	--	B	--	--	Router<-->Device
6	--	--	DI1	--	Router<--Device
7	--	--	DI2	--	Router<--Device
8	GND	--	--	--	--
9	TX	--	--	--	Router-->Device
10	RX	--	--	--	Router<--Device
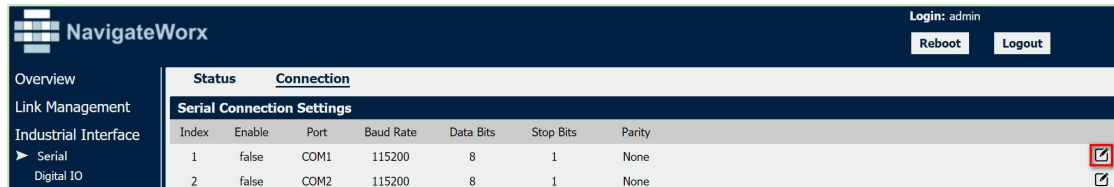
4. Configuration

4.1 RS485 Configuration

1. Go to Link **Industrial Interface>Serial>Connection>Index 1**, Click the **Edit button** of COM1.

2. Enable RS485 setting, select Protocol as "TCP Server" and enter the Local ip address and Local Port. Click Save.
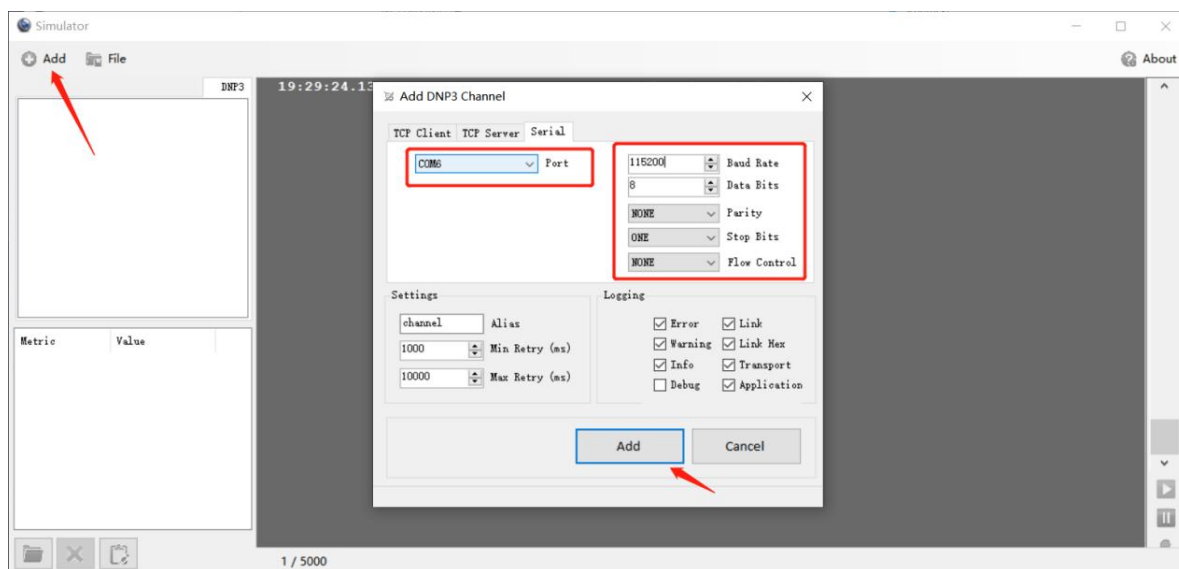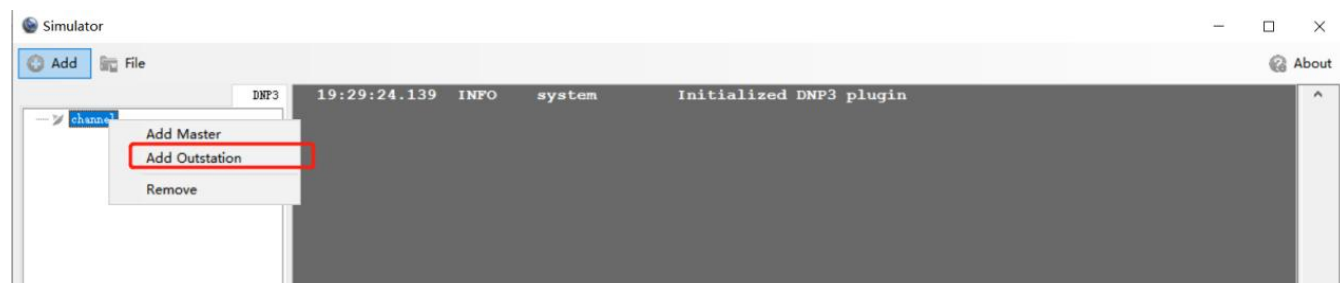

3. Click Save>Apply.

4.2 DNP3 Outstation Configuration

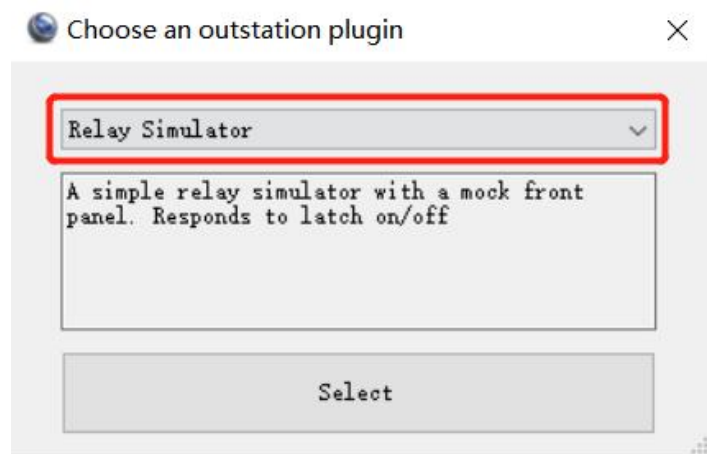Here used the DNP3 Simulator "OpenDNP3" to do the testing.

1. PC1 open DNP3 simulator to run as DNP3 Outstation and enter the serial port and serial settings, then make it connect to NR500 and click Add:
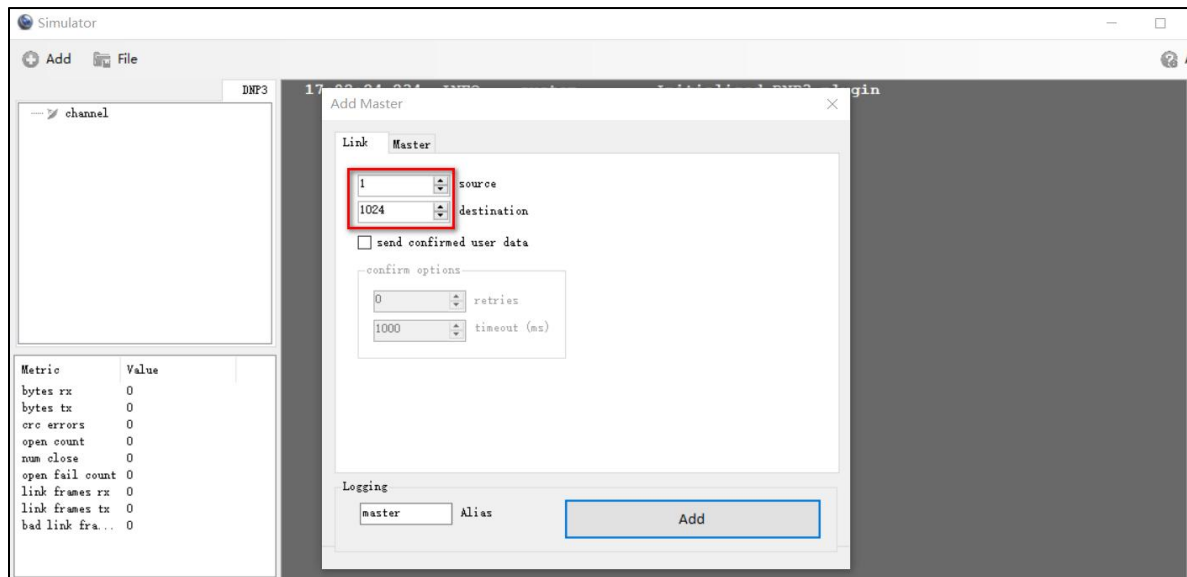

2. Right Click "channel", and Add Outstation:

3. Choose "Relay Simulator" :

4. Specify the address on DNP3 Outstation, to make it match the settings on DNP3 Master and click Add:

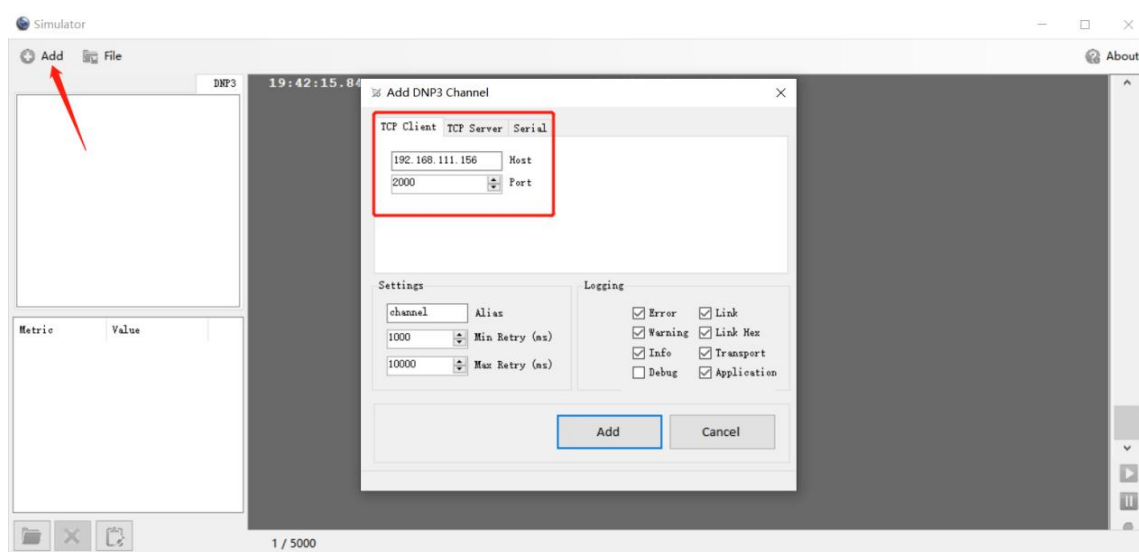5. Right click "Relay", then we can see the simulator:

6. Then DNP3 Outstation will connect to NR500 router automatically.
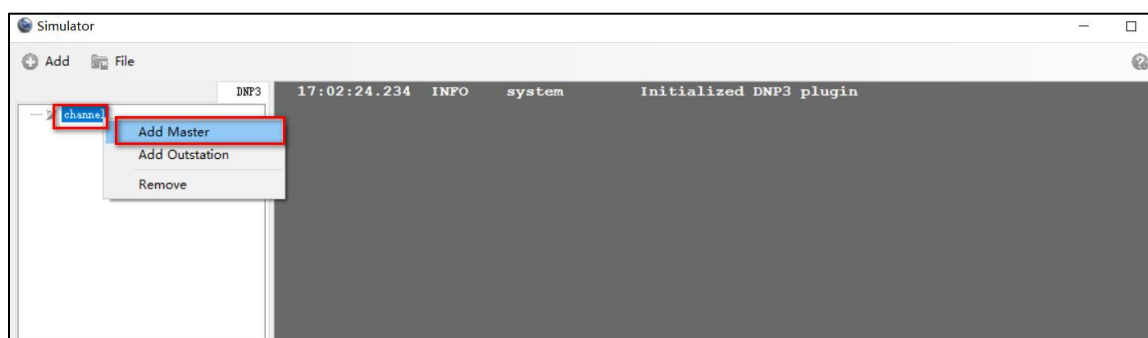
4.3 DNP3 Master Configuration

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

1. PC1 open DNP3 simulator to run as DNP3 Master and enter the IP Address and
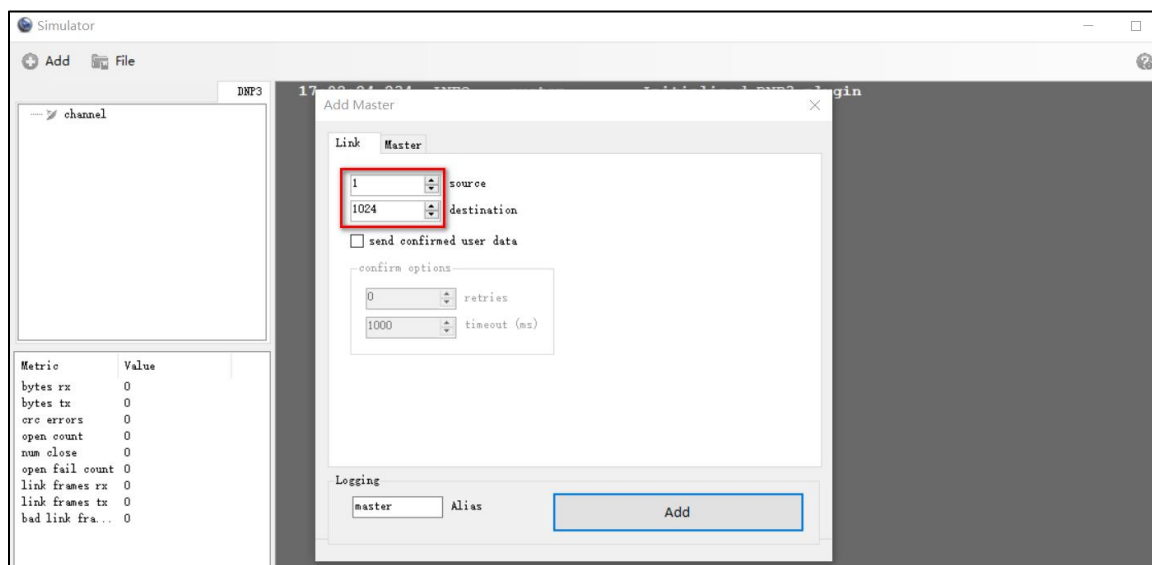
Port to make it connect to NR500 and click Add:

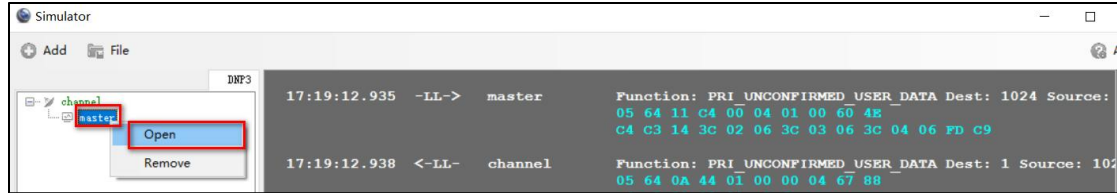2. Right Click "channel", and Add Master:

3. Specify the address on DNP3 Master, to make it match the settings on DNP3 Outstation and click Add:
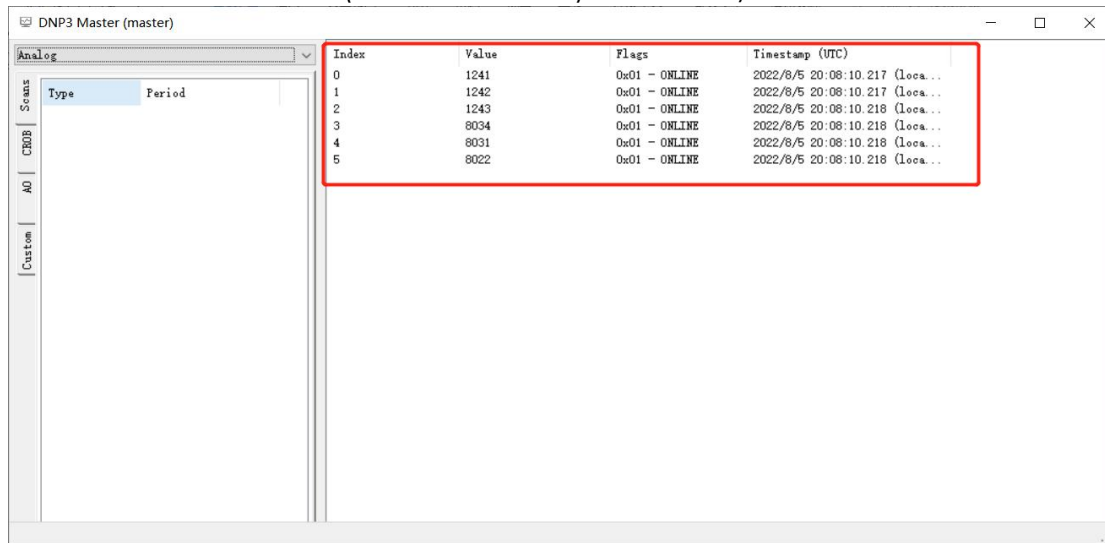
5. Testing

1. Open DNP3 Master, right Click "Master" and open it:

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

Test successfully.