Elmatic Sparrow NW10
Industrial Cellular VPN Router

Application Note 048

Modbus Master

Version: V1.0.0
Date: Oct 2021
Status: Confidential

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Directory

1. Introduction

1.1 Overview

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

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: Sparrow NW10 / Sparrow NW20
Firmware Version: V1.1.2 or newer
Other Compatible Models: None

1.3 Version

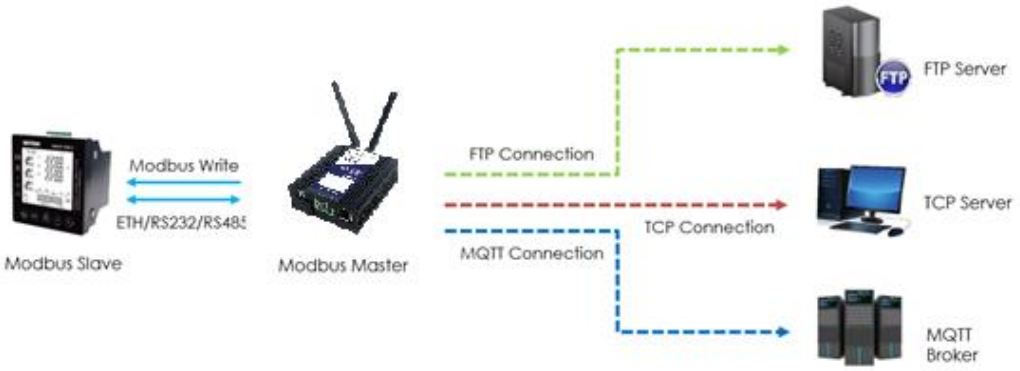
Updates between document versions are cumulative. Therefore, the latest document will include all the content of previous versions.

Release Date	Doc. Version	Firmware Version	Change Description
2021/09/30	V1.0.0	V1.1.2	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: **elmark@elmark.com.pl**

2. Topology



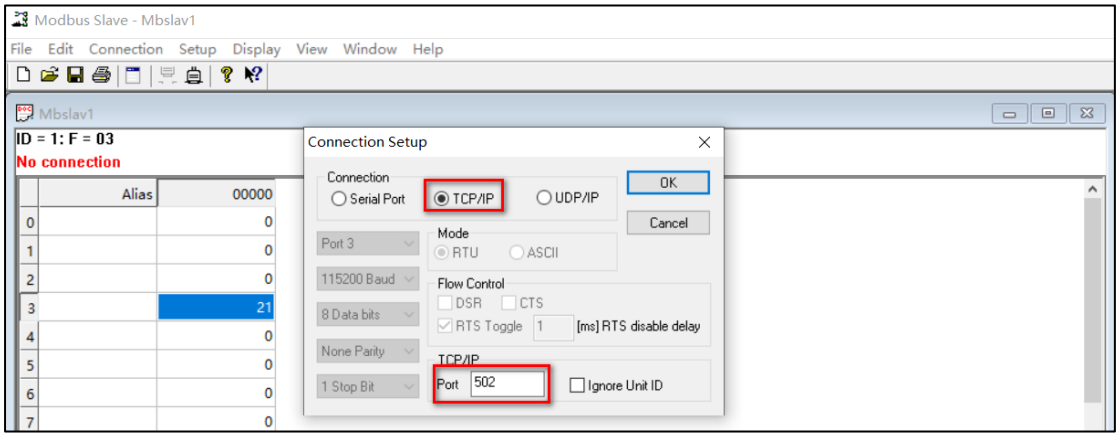
1. Sparrow Router runs as Modbus Master and connect to Modbus Slave via Ethernet, RS232 or RS485 interface.
2. Sparrow router poll the modbus data from modbus slave and send to the remote management center via TCP, FTP or MQTT protocol.
3. Sparrow as Modbus Master and write the register value or coil to Modbus Slave.

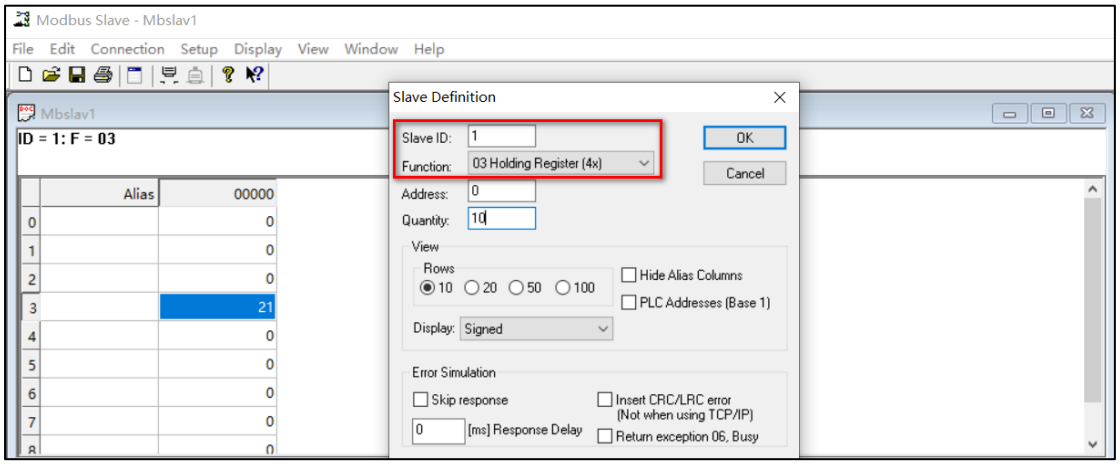
Note: For this Application Note, we will set the Connection Type as "TCP" as an example, which means that Sparrow(Modbus Master) will connect to the Modbus Slave and read the value via Ethernet port. Of course, it also works with Serial Port (RS232/RS485).

3. Transport via TCP

a) Configuration on Modbus Slave

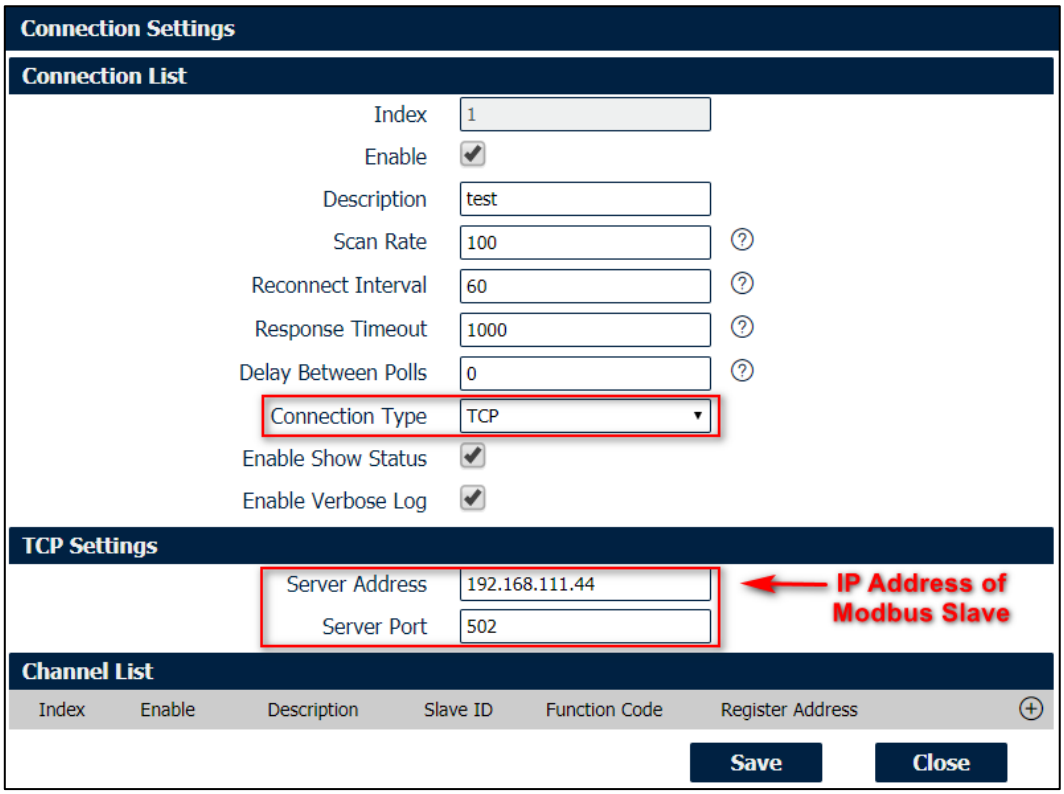
1. Here we use "Modbus Slave" software to simulate the end device (Modbus Slave device), and the **TCP Port: 502, Slave ID: 1, Function Code: 03-Holding-Register, like below setting:**





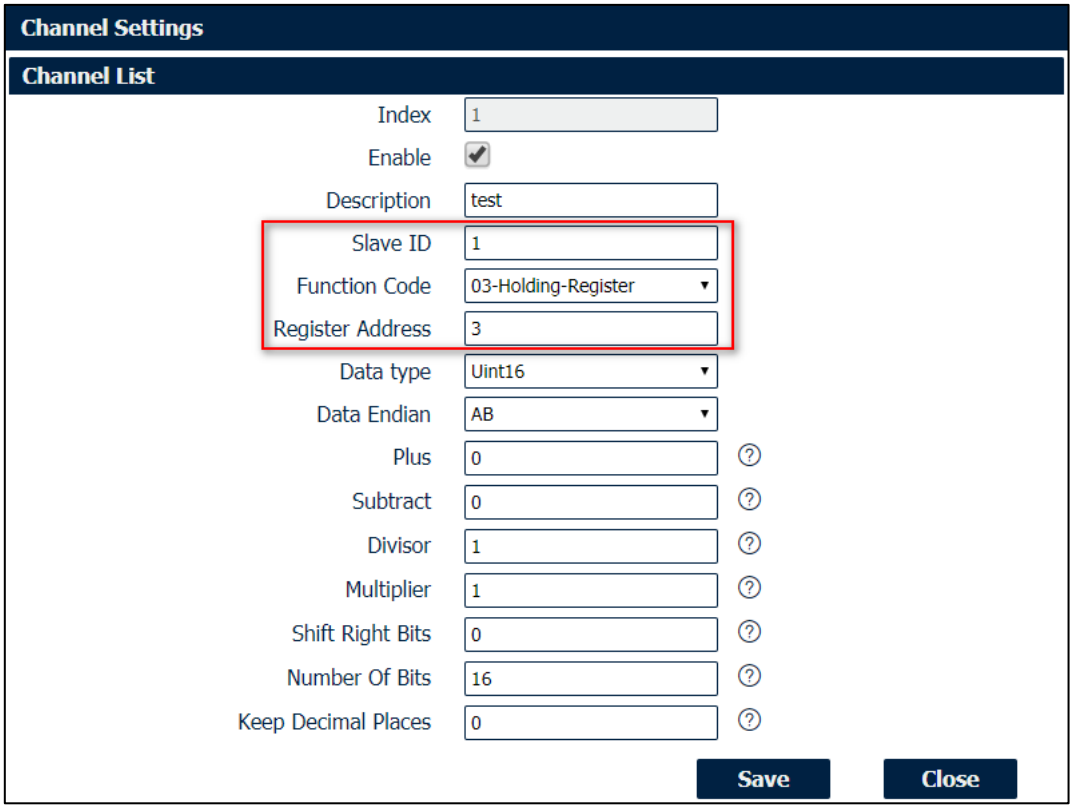
b) Configuration on Modbus Poll

1. Go to **Application>Modbus Master>Modbus Poll**, add a "Connection List" and specify the "Connection Type" as **"TCP"**, specify the "**TCP Setting**" to connect to Modbus Slave, like below:



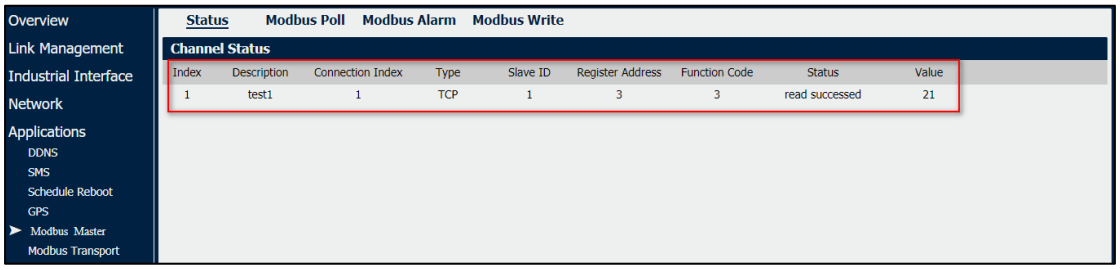
2. Click Save>Apply.

3. Enable "Channel List", and specify the Slave ID as " **1** ", Function Code as " **03-Holding -Register** ", Register Address to " **3** ", then it will poll the value from register address 3 of Modbus Slave:



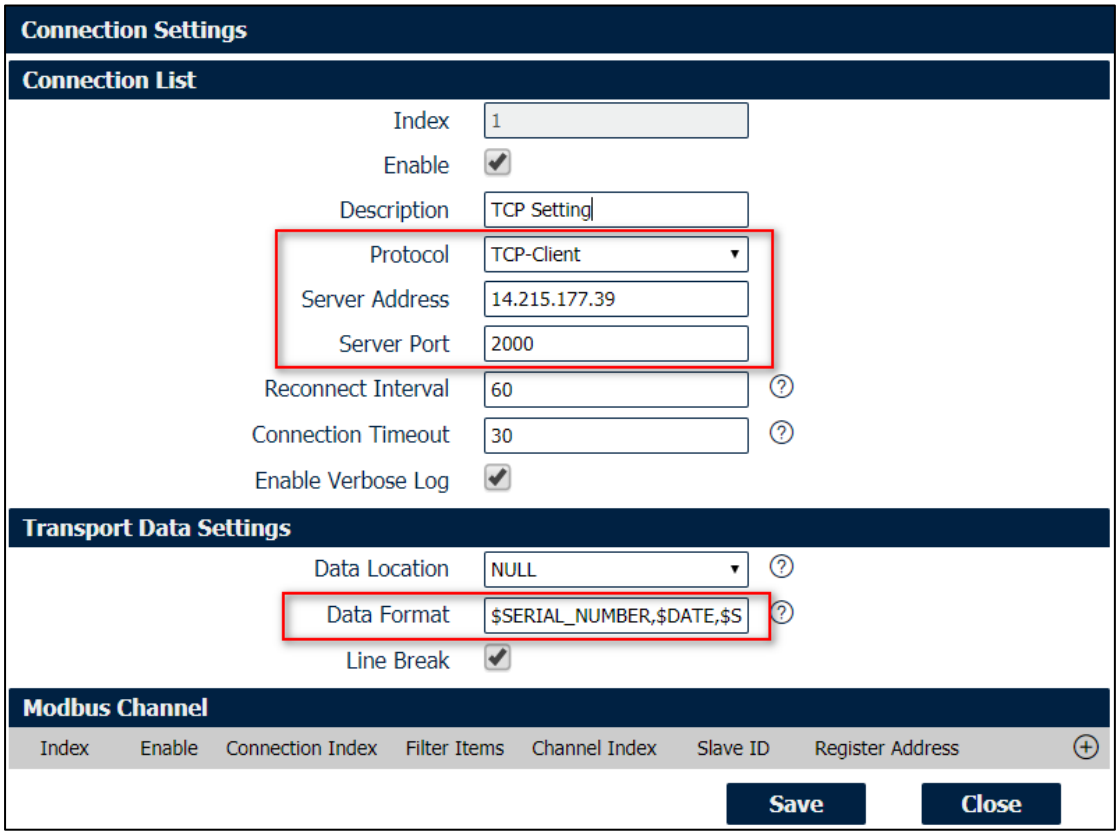
4. Click Save>Save>Apply. *(Note: This is a secondary list, it needs to double click save)*

5. Go to **Application>Modbus Master>Status**, then we can check the router had read the value from Modbus Slave successfully.

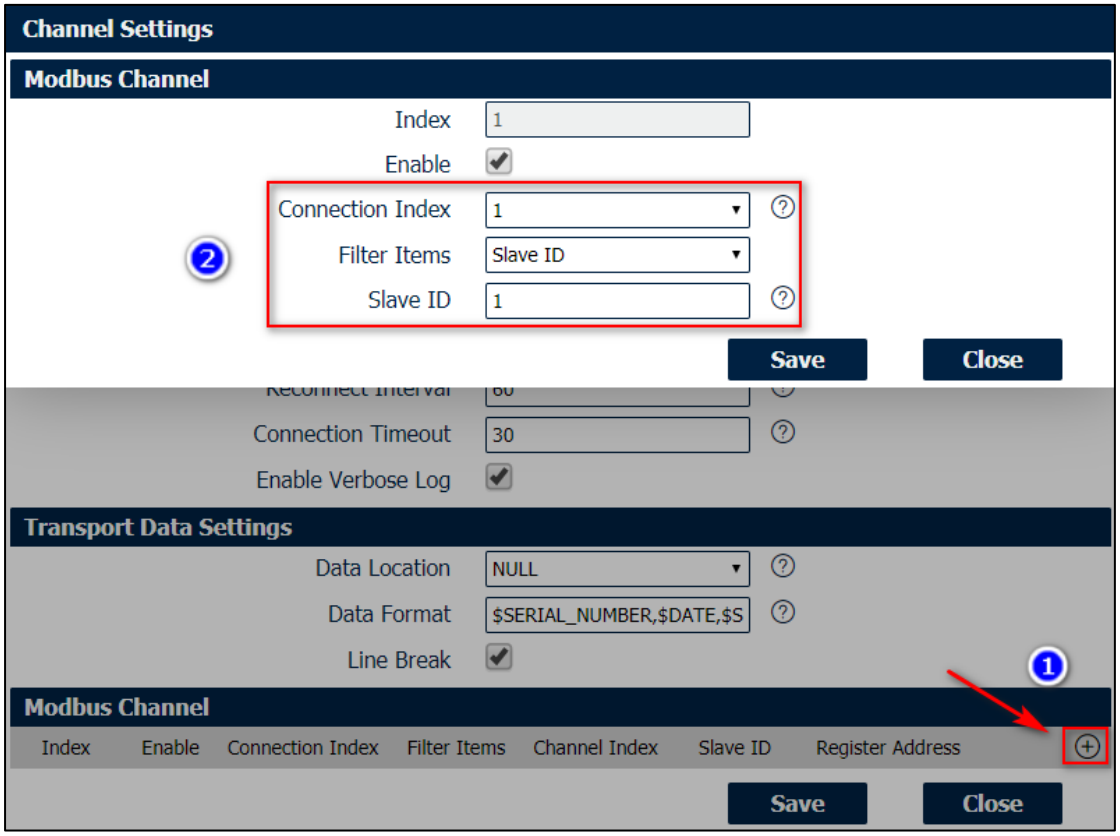


c) Configuration on Modbus Transport

1. Go to **Application>Modbus Transport>Modbus Transport**, enable "Connection List", and specify the TCP server IP address and port to send the data to remote TCP server. The Data Format could be defined accordingly or set it as default.

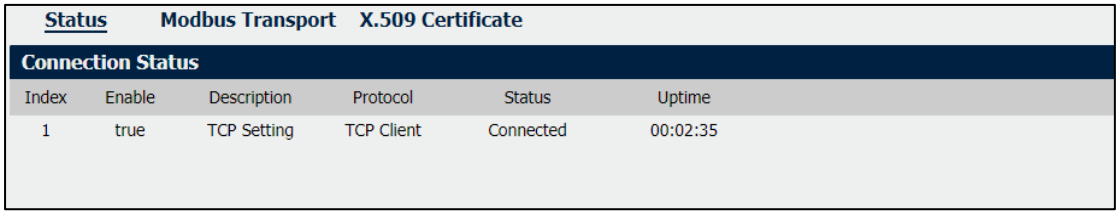


2. Enable "Modbus Channel", Modbus Master will select the value send to the remote TCP server from Modbus Slave.

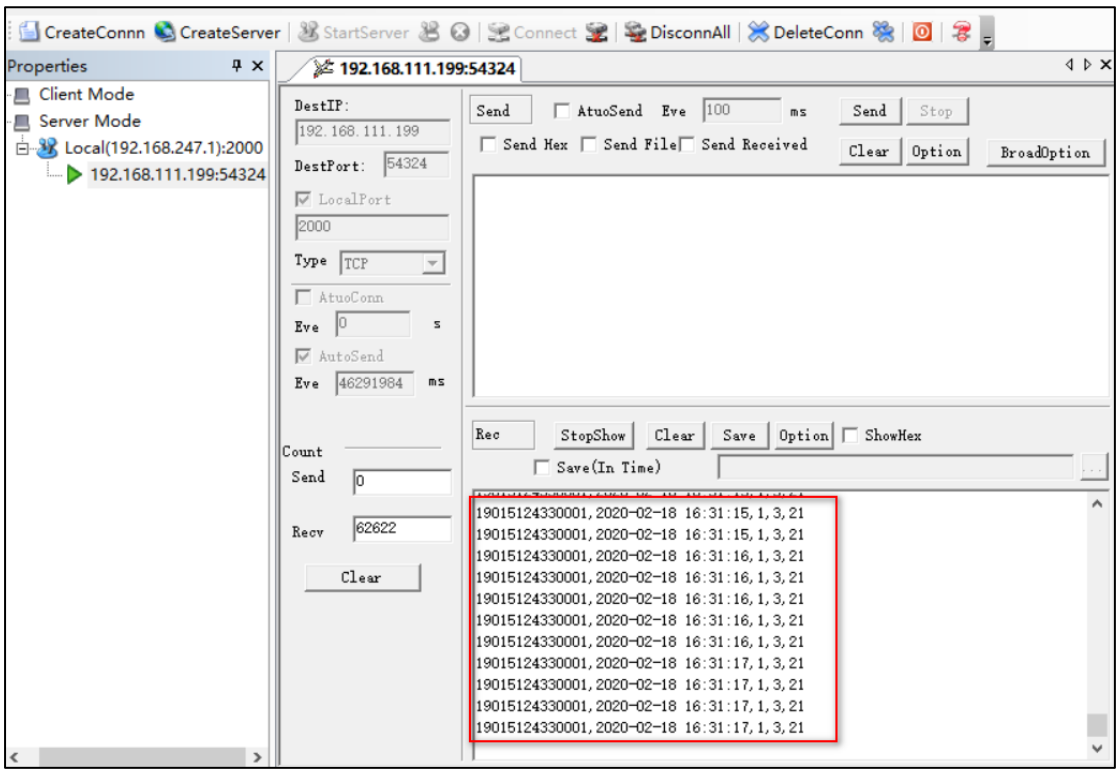


3. Click Save>Save>Apply.

4. Go to **Application>Modbus Transport>Status**, Sparrow(Modbus Mater) had connected to the remote server successfully via TCP protocol.



5. Remote TCP Server received the data successfully.


CreateConnn
CreateServer
StartServer
Connect
DisconnAll
DeleteConn
Properties
Client Mode
Server Mode
Local(192.168.247.1):2000
192.168.111.199:54324
192.168.111.199:54324
DestIP:
192.168.111.199
DestPort:
54324
LocalPort
2000
Type
TCP
AtuoConn
Eve
0
s
AutoSend
Eve
46291984
ms
Count
Send
0
Recv
62622
Clear
Send
AtuoSend
Eve
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ms
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BroadOption
Rec
StopShow
Clear
Save
Option
ShowHex
Save(In Time)
19015124330001,2020-02-18 16:31:15,1,3,21
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19015124330001,2020-02-18 16:31:16,1,3,21
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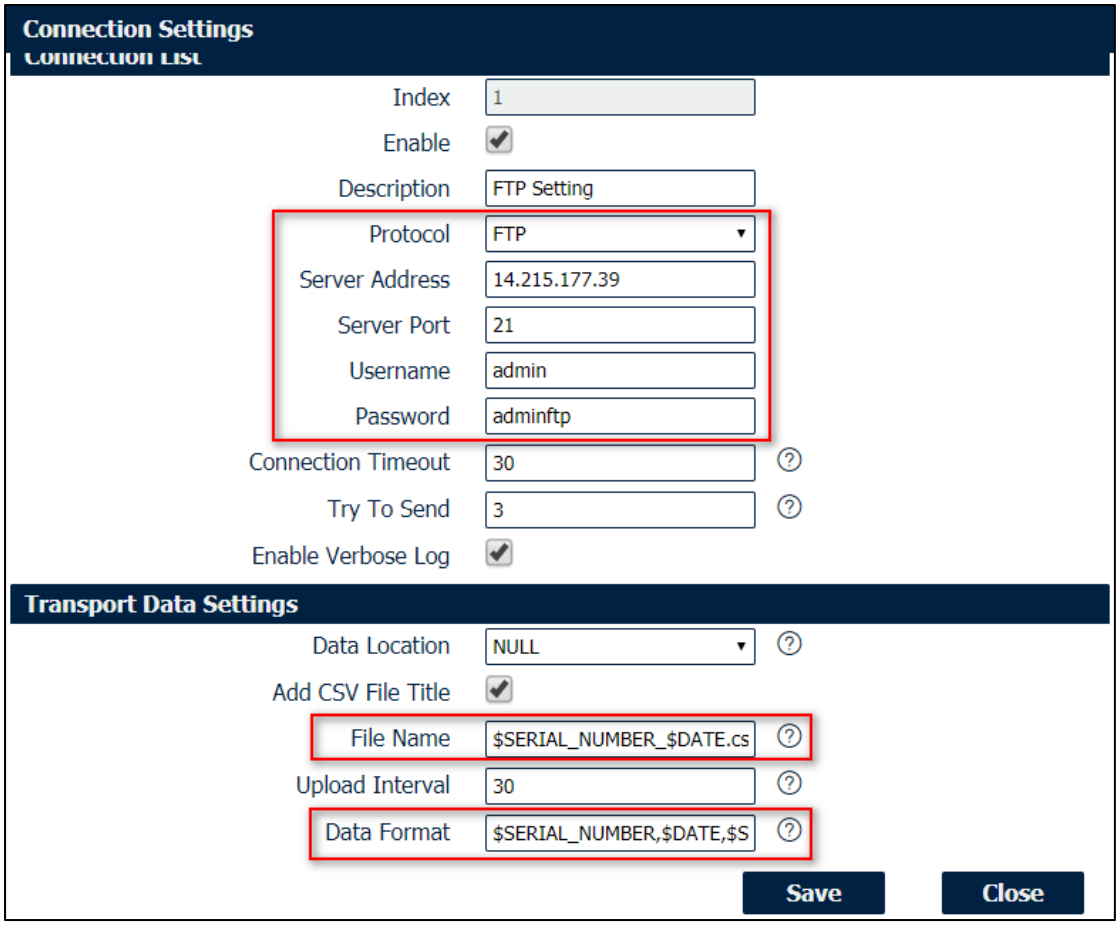
19015124330001,2020-02-18 16:31:17,1,3,21
19015124330001,2020-02-18 16:31:17,1,3,21
19015124330001,2020-02-18 16:31:17,1,3,21

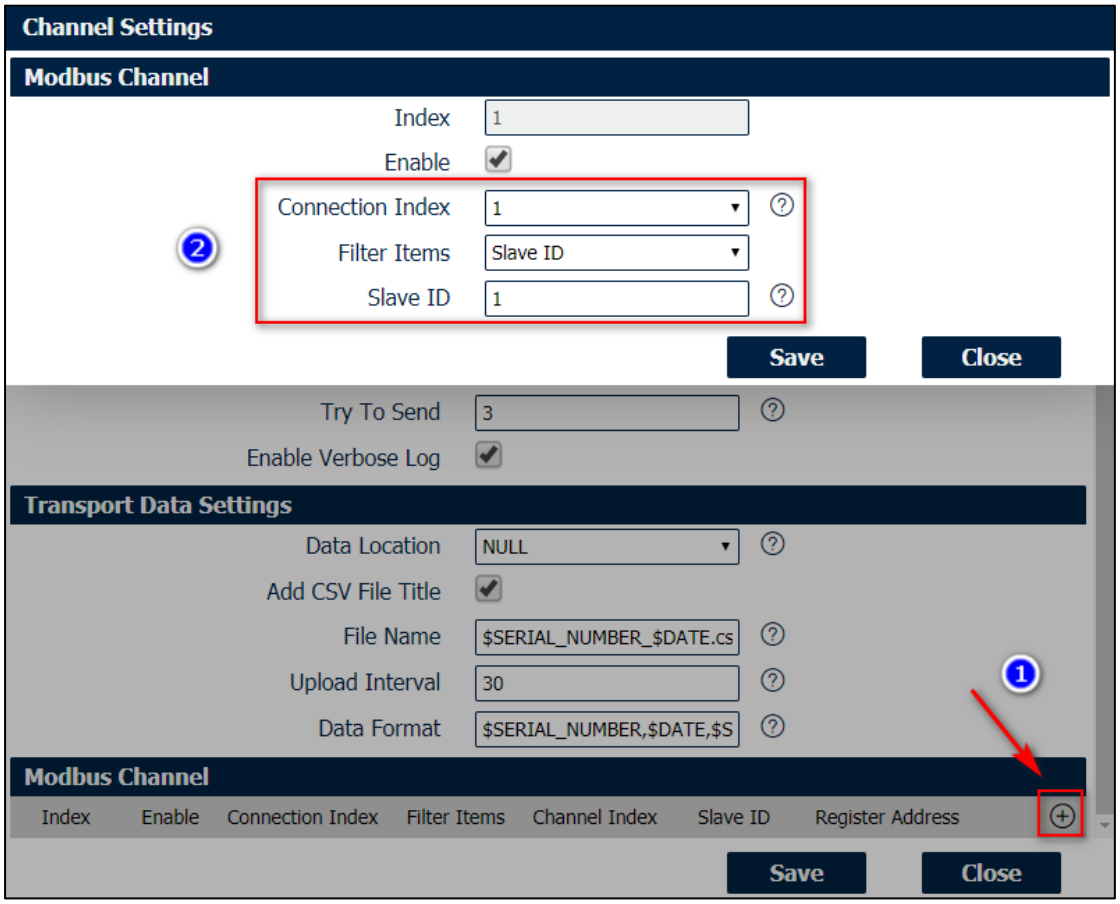
4. Transport via FTP

1. Please refer to the "3.1 Configuration on Modbus Slave" and "3.2 Configuration on Modbus Poll" to finish and setting.

2. Go to **Application>Modbus Transport>Modbus Transport**, enable "Connection List", and specify the FTP server IP address, port, username and password to send the data to remote FTP server. The File Name and Data Format could be defined accordingly or set it as default.

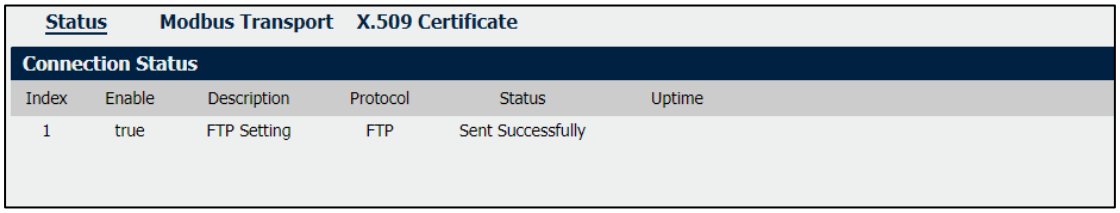


3. Enable "Modbus Channel", Modbus Master will select the value send to the remote FTP server from Modbus Slave.

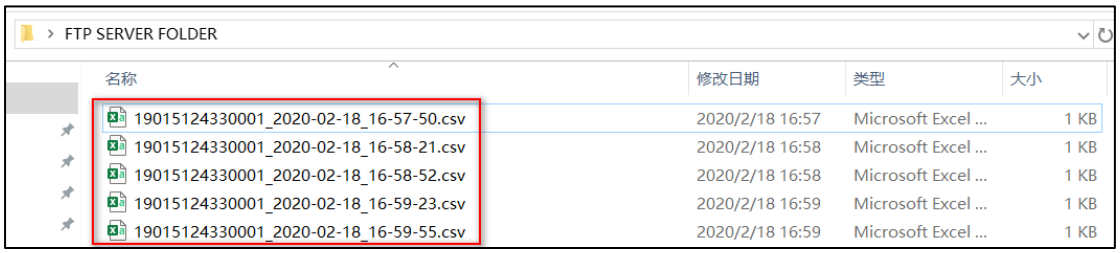


4. Click Save>Save>Apply.

5. Go to **Application>Modbus Transport>Status**, Sparrow(Modbus Mater) had connected to the remote server successfully via FTP protocol.



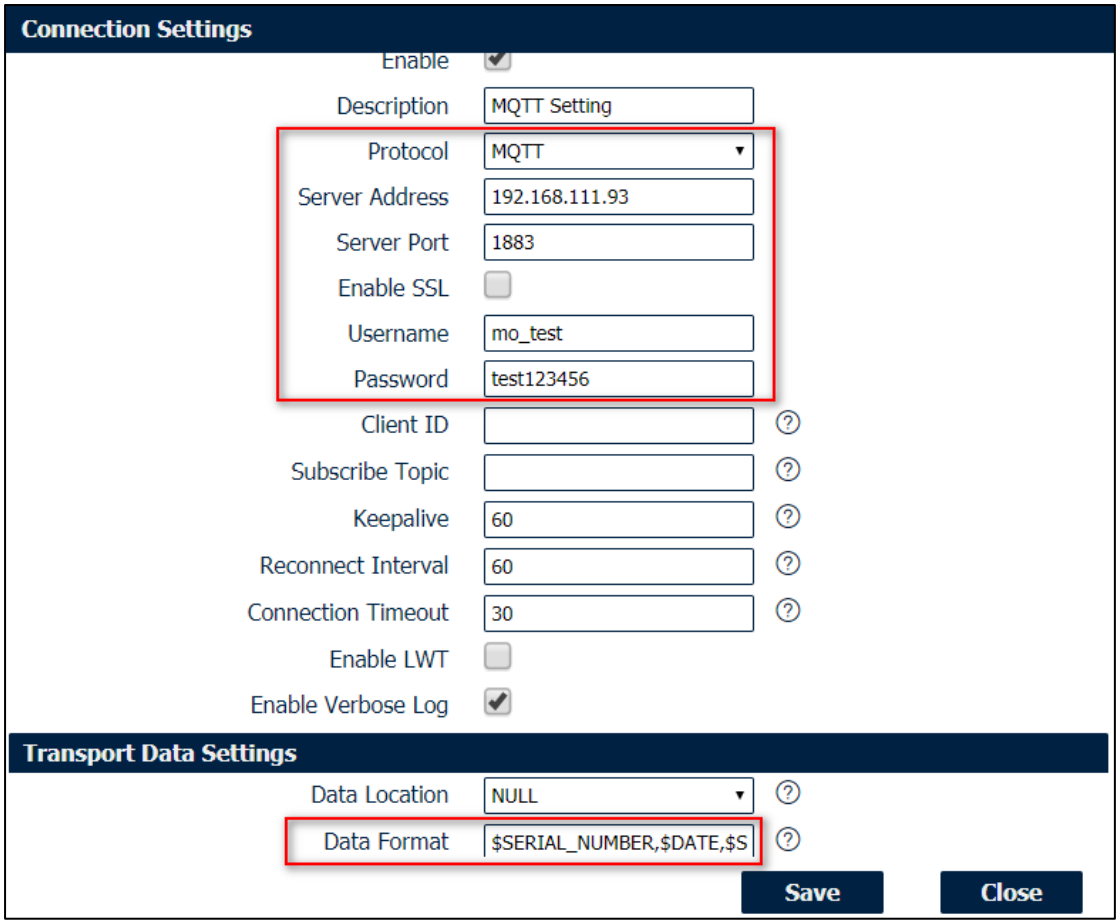
6. Remote FTP Server received the CSV file successfully.



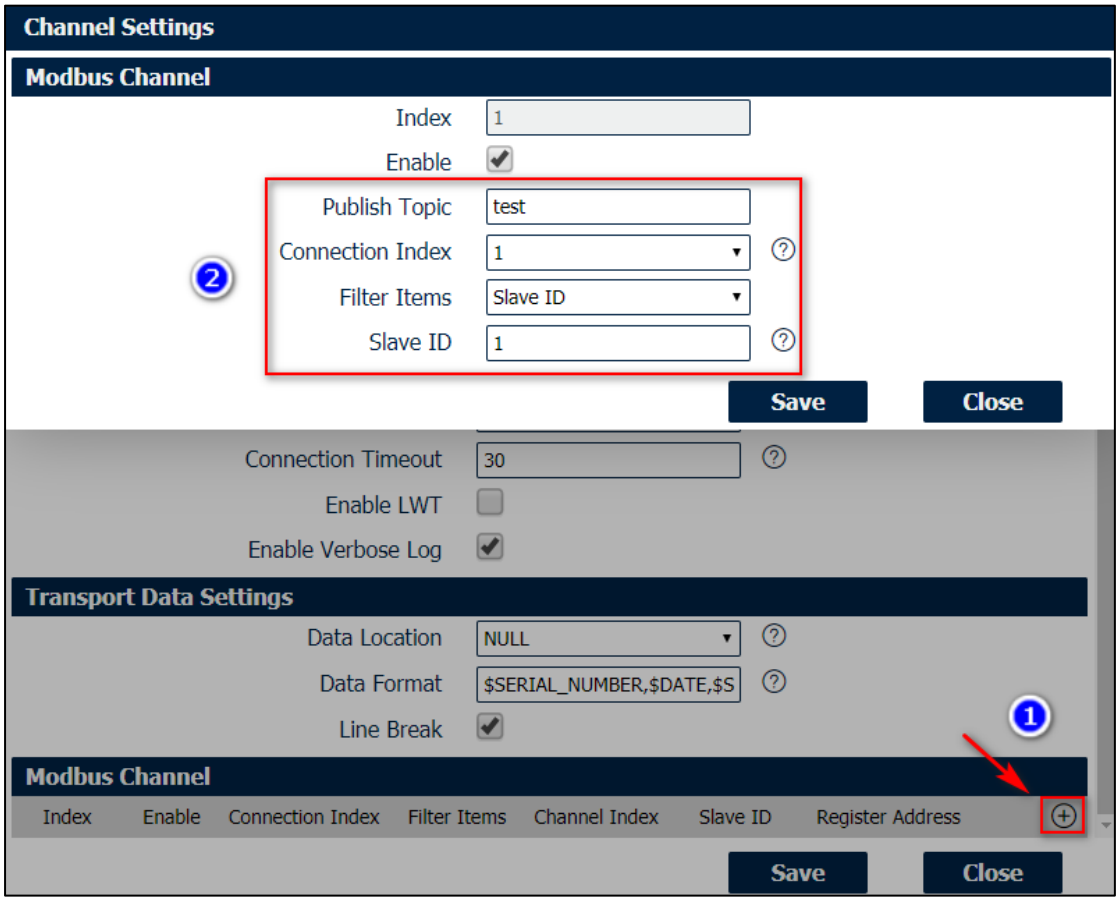
5. Transport via MQTT

1. Please refer to the "3.1 Configuration on Modbus Slave" and "3.2 Configuration on Modbus Poll" to finish and setting.

2. Go to **Application>Modbus Transport>Modbus Transport**, enable "Connection List", and specify the MQTT Broker IP address, port, username and password to Publish the Topic with Modbus data to remote MQTT Broker. The Data Format could be defined accordingly or set it as default.

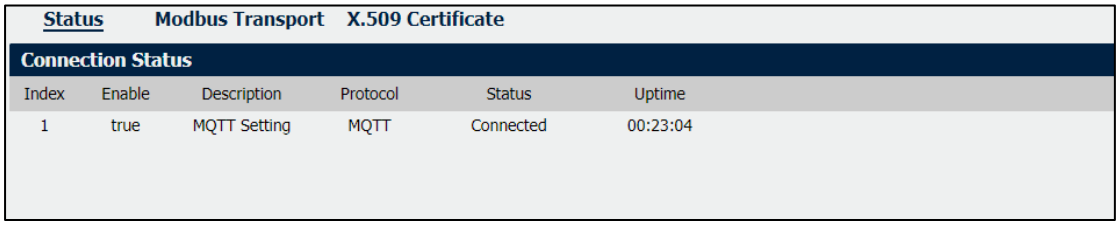


3. Enable "Modbus Channel", define the "Topic" to publish to MQTT Broker with Modbus data.

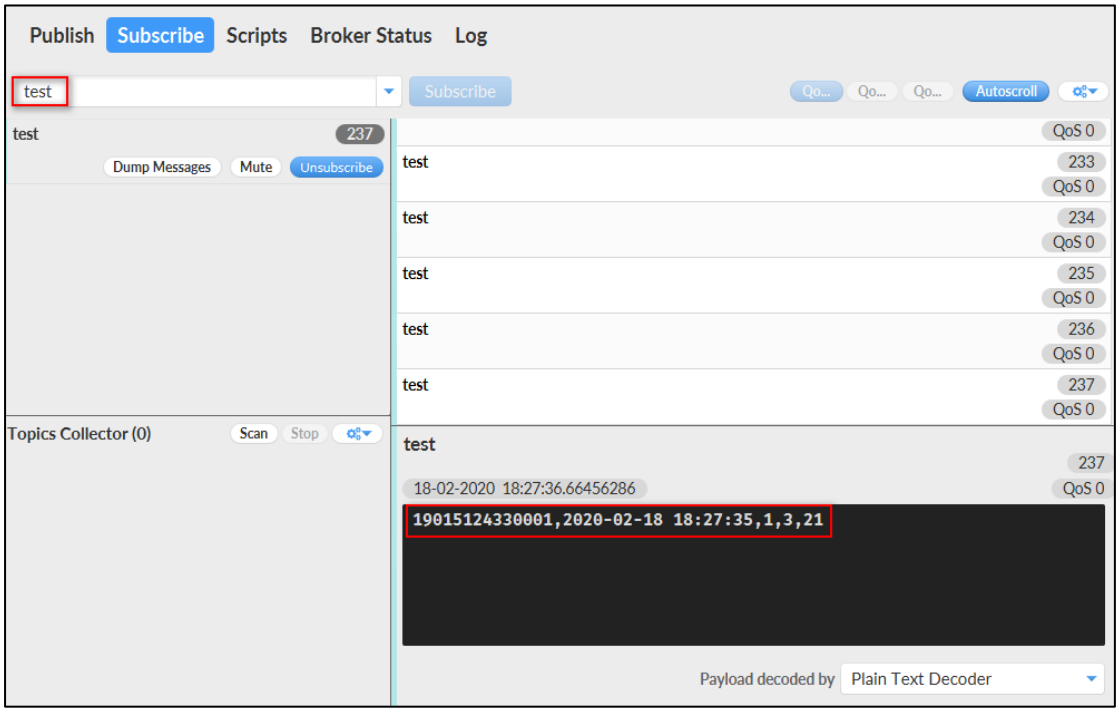


4. Click Save>Save>Apply.

5. Go to **Application>Modbus Transport>Status**, Sparrow(Modbus Mater) had connected to the remote MQTT broker successfully.



6. Run the MQTT Client (MQTT Subscriber), to subscribe the topic just published to MQTT broker with modbus data. Then we can get the modbus data successfully.


Publish
Subscribe
Scripts
Broker Status
Log
test
Subscribe
Qo...
Qo...
Qo...
Autoscroll
test
237
Dump Messages
Mute
Unsubscribe
QoS 0
test
233
QoS 0
test
234
QoS 0
test
235
QoS 0
test
236
QoS 0
test
237
QoS 0
Topics Collector (0)
Scan
Stop
test
237
18-02-2020 18:27:36.66456286
QoS 0
19015124330001,2020-02-18 18:27:35,1,3,21
Payload decoded by
Plain Text Decoder