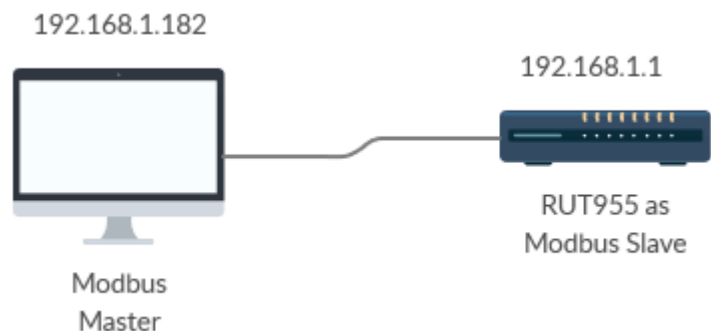


Modbus Guide

About Modbus TCP



Modbus TCP provides users with the possibility to set or get system parameters. The Modbus daemon acts as slave device. That means it accepts connections from a master (client) and sends out a response or sets some system related parameter in accordance with the given query.

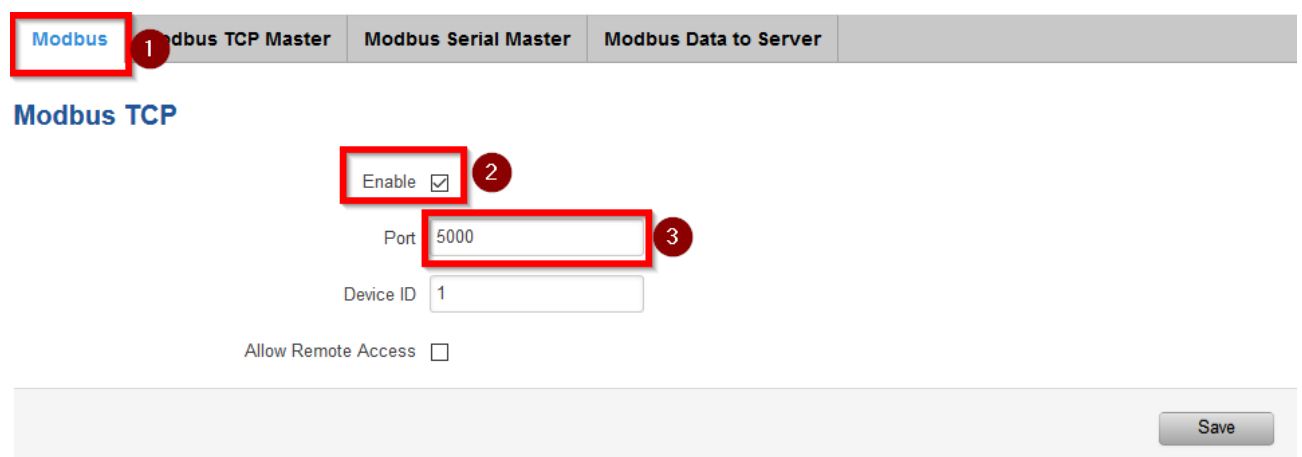
Device used throughout this guide will be RUT955

Prerequisites:

- **QmodMaster** (For Windows)

Enabling Modbus TCP on router.

1. Navigate to **Services > Modbus**
2. Check **Enable**
3. Enter port (In this example port 5000 will be used)
4. Leave Device ID as default
5. If you are going to connect Modbus master device to router from outside of your local network check **Allow Remote Access**, otherwise leave it unchecked.



Modbus 1 Modbus TCP Master Modbus Serial Master Modbus Data to Server

Modbus TCP

Enable ☒ 2

Port 5000 3

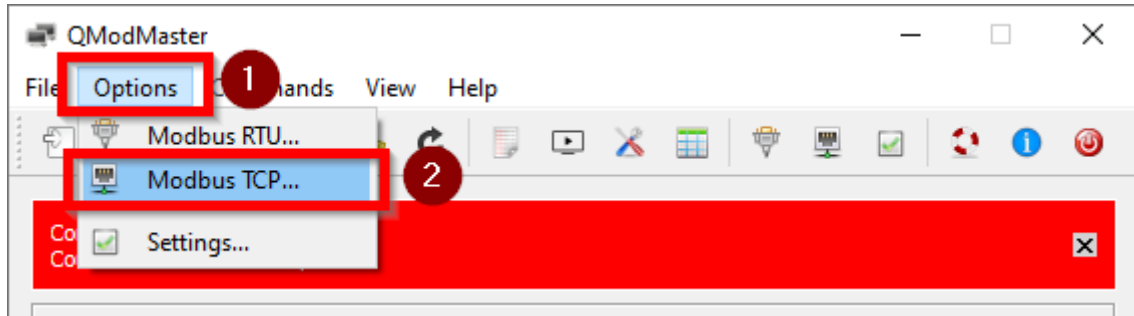
Device ID 1

Allow Remote Access ☐

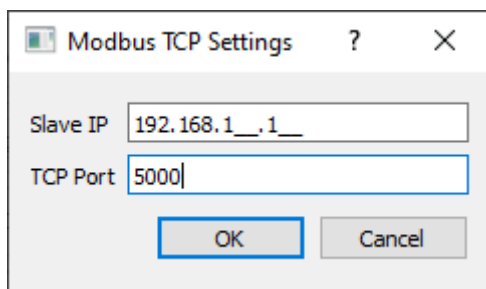
Save

Connecting QmodMaster to router

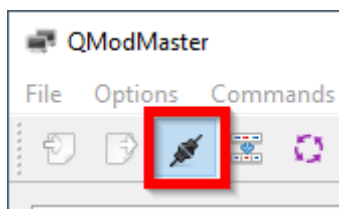
1. Open **QmodMaster**
2. Click Options > Modbus TCP



3. Enter your routers IP as a Slave IP and enter port which you chose while configuring the router and click OK.



4. Click connect



Now your PC's Modbus Master should be connected to your router's Modbus Slave.

Getting Parameters

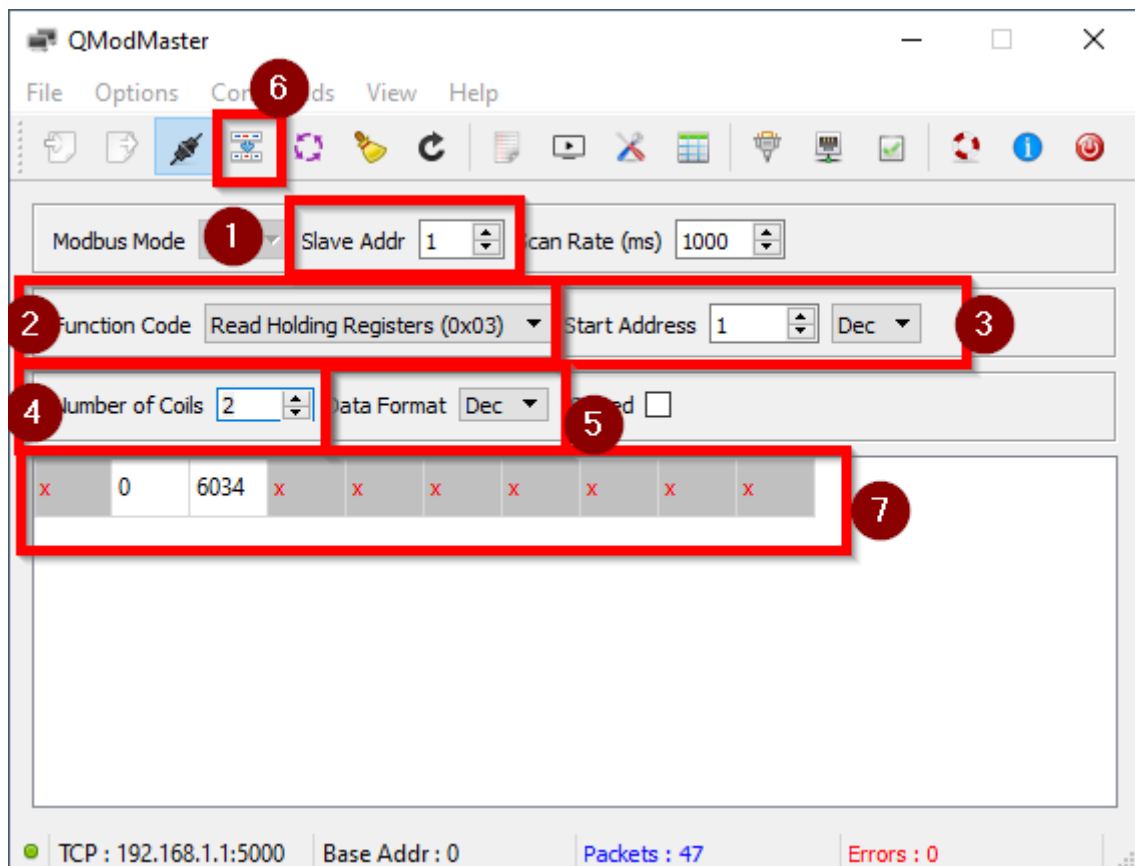
1. Getting integer parameters

You can find a list of parameters and their registers here:

https://wiki.teltonika.lt/view/RUT955_Modbus#Get_Parameters

Getting integer parameters:

1. Type in same **Slave Addr** as in router's configuration
2. Select **Function Code** as **Read Holding Registers (0x03)**
3. Select **Start Address** according to parameter which you selected from list (For this example **System Uptime** parameter will be used with Register Address: 1). And select **Dec**.
4. Select Number of Coils according to the parameter you selected from list (For this example **System Uptime** parameter will be used with **Number of Registers: 2**)
5. Select **Data Format** as **Dec**
6. Click **Read/Write** button
7. Results



The screenshot shows the QModMaster software interface with the following configuration and results:

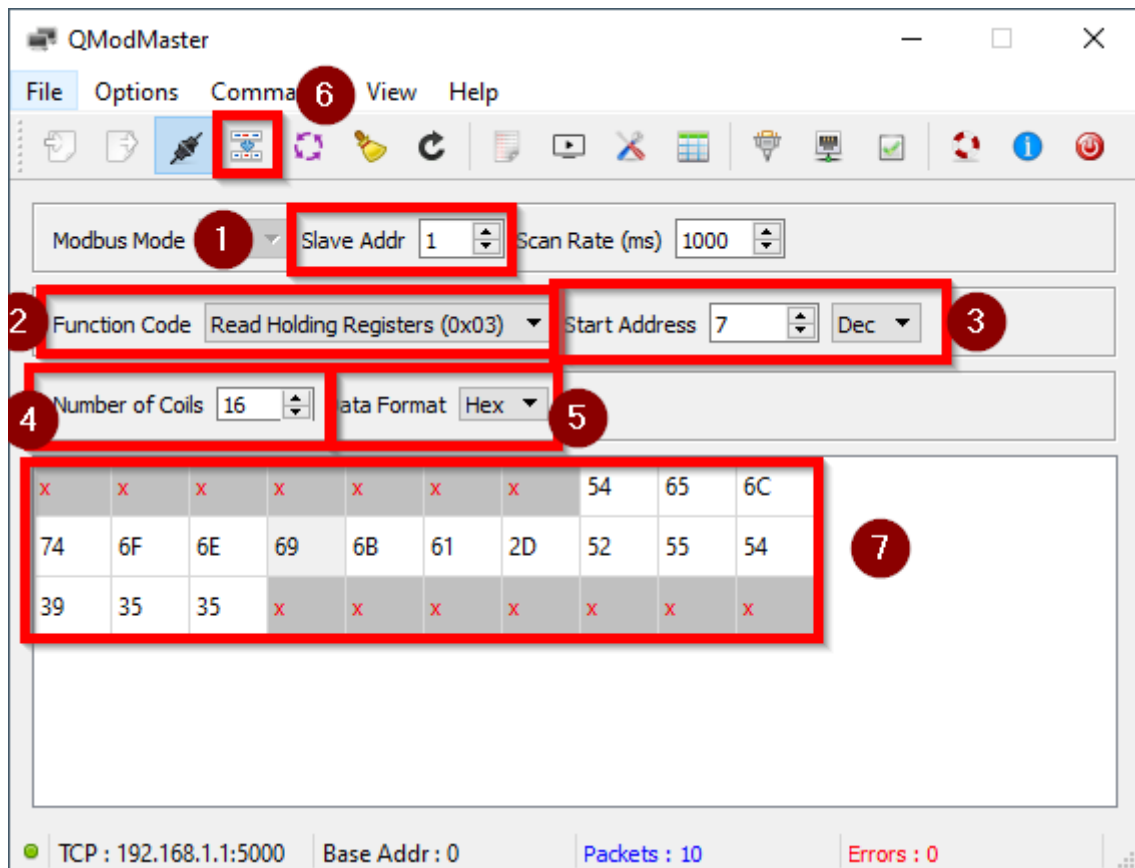
- Modbus Mode:** 1
- Slave Addr:** 1
- Scan Rate (ms):** 1000
- Function Code:** Read Holding Registers (0x03)
- Start Address:** 1
- Data Format:** Dec
- Number of Coils:** 2
- Read/Write button:** (indicated by a red circle 6)
- Results Table:**

x	0	6034	x	x	x	x	x	x	x
---	---	------	---	---	---	---	---	---	---
- Status Bar:**
 - TCP : 192.168.1.1:5000
 - Base Addr : 0
 - Packets : 47
 - Errors : 0

2. Getting text parameters

Getting text parameters:

8. Type in same **Slave Addr** as in router's configuration
9. Select **Function Code** as **Read Holding Registers (0x03)**
10. Select **Start Address** according to parameter which you selected from list (For this example System hostname parameter will be used with Register Address: **7**). And select **Dec**.
11. Select Number of Coils according to the parameter you selected from list (For this example System hostname parameter will be used with **Number of Registers: 16**)
12. Select **Data Format** as **Hex**
13. Click **Read/Write** button
14. Results



The screenshot shows the QModMaster software interface with the following configuration and results:

- Modbus Mode:** 1
- Slave Addr:** 1
- Scan Rate (ms):** 1000
- Function Code:** Read Holding Registers (0x03)
- Start Address:** 7
- Data Format:** Dec
- Number of Coils:** 16
- Data Format:** Hex

The results table shows the following data:

x	x	x	x	x	x	x	54	65	6C
74	6F	6E	69	6B	61	2D	52	55	54
39	35	35	x	x	x	x	x	x	x

At the bottom of the interface, the status bar shows: TCP : 192.168.1.1:5000 | Base Addr : 0 | Packets : 10 | Errors : 0

3. Converting results from HEX to ASCII

To convert results, we have got from router to human readable form we will use online HEX to ASCII converter. <https://www.scadacore.com/tools/programming-calculators/online-hex-converter/>

HexString Input

54 65 6c 74 6f 6e 69 6b 61 2d 52 55 54 39 35 35

AnalyzeData

ASCII

Teltonika-RUT955

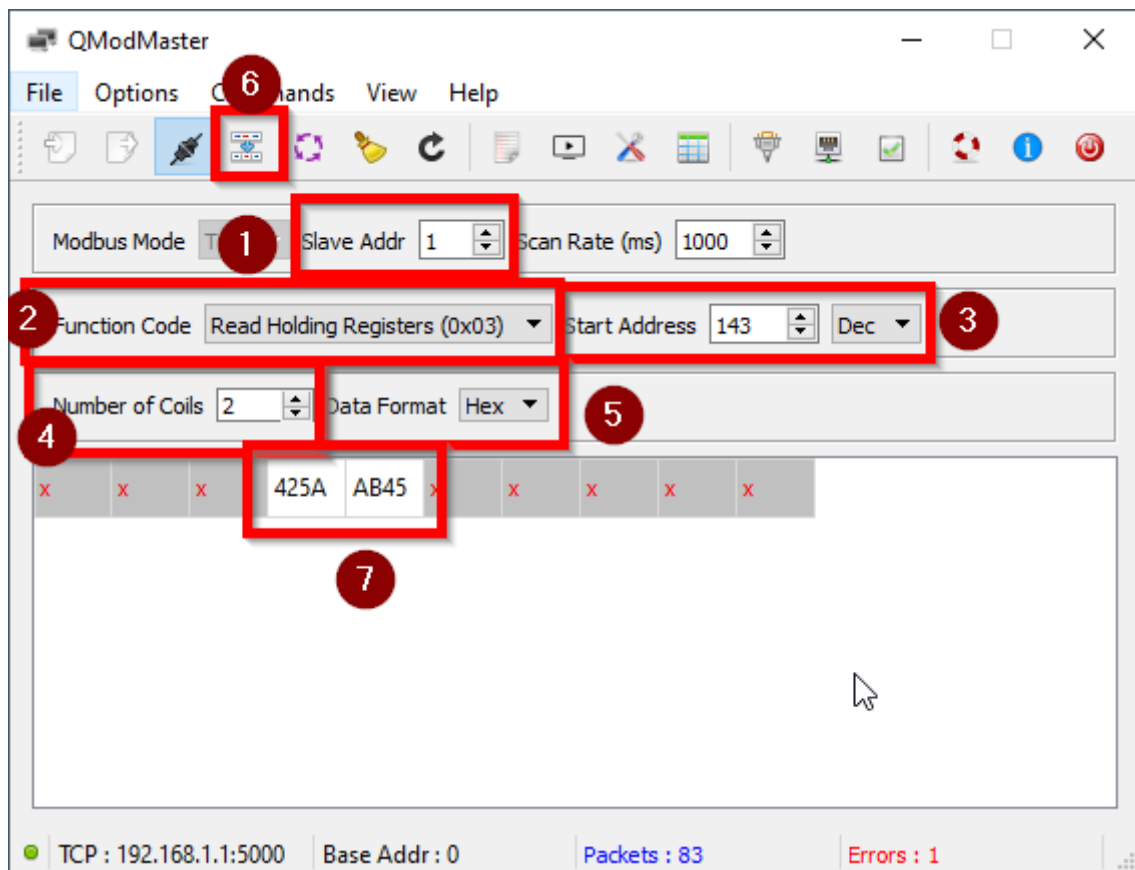
Binary

#	Raw	Binary
0	54 65	0101010001100101
2	6C 74	0110110001110100
4	6F 6E	0110111101101110
6	69 6B	0110100101101011
8	61 2D	0110000100101101
10	52 55	0101001001010101
12	54 39	0101010000111001

4. Getting float parameters

Getting text parameters:

1. Type in same **Slave Addr** as in router's configuration
2. Select **Function Code** as **Read Holding Registers (0x03)**
3. Select **Start Address** according to parameter which you selected from list (For this example **GPS latitude coordinate** parameter will be used with Register Address: **143**). And select **Dec**.
4. Select Number of Coils according to the parameter you selected from list (For this example **GPS latitude coordinate** parameter will be used with **Number of Registers: 2**)
5. Select **Data Format** as **Hex**
6. Click **Read/Write** button
7. Results



5. Converting HEX format to Float format

To convert results, we have got from router to human readable form we will use online HEX to Float converter. <https://www.scadacore.com/tools/programming-calculators/online-hex-converter/>

HexString Input

425A AB45

AnalyzeData

ASCII

BZ«E

Binary

#	Raw	Binary
0	42 5A	0100001001011010
2	AB 45	1010101101000101

Float - Big Endian (ABCD)

#	Raw	Float
0	42 5A AB 45	54.6672554

Float - Little Endian (DCBA)

#	Raw	Float
0	45 AB 5A 42	5483.282

Float - Mid-Big Endian (BADC)

#	Raw	Float
0	5A 42 45 AB	136706866000...

Float - Mid-Little Endian (CDAB)

#	Raw	Float
0	AB 45 42 5A	-7.008054e-13

Setting Parameters

List of parameters you can set: https://wiki.teltonika.lt/view/RUT955_Modbus#Set_Parameters

Setting parameters:

1. Select slave device address
2. Select **Function Code** as **Write Single Register (0x06)**
3. Select Start Address you want to set from the list. (For this example, **Digital Output 2** with Register Address **202** will be used)
4. Select Data Format as **Hex**
5. Change address according to list (For this example value is either **0001** or **0000**)
6. Click **Read/Write** and value should be written successfully (With **Digital Output 2** there should be audible *click* coming from the router)

