

# VestaTel Modbus Master Simulator User Manual

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# 1 Introduction

## 1.1 *Contact Information*

Developed by VestaTel  
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## 1.2 *References*

- [1] MODBUS over Serial Line Specification and Implementation Guide V1.02, Modbus.org, Dec 20, 2006
- [2] MODBUS Messaging on TCP/IP Implementation Guide V1.0b, Modbus-IDA, October 24, 2006
- [3] MODBUS Application Protocol Specification V1.1b3, Modbus.org, April 26, 2012

## 2 Licensing

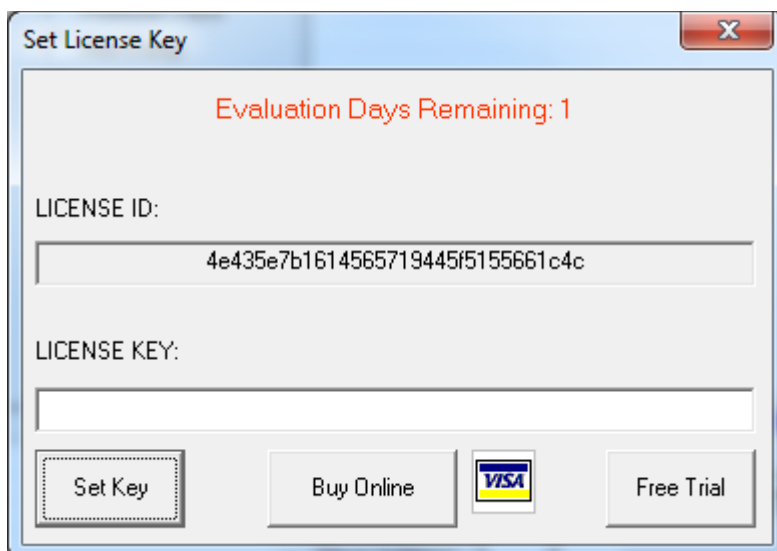
### 2.1 Evaluation Mode and Full Mode

If you have not yet purchased the software, the Modbus simulator runs in evaluation mode, in which it will run for 15 minutes before closing all sessions.

You can set the license key and switch into full mode at any time via the Windows GUI control application as explained in the following section.

### 2.2 Setting License Key

Run modbusmsgui.exe (From Start menu or directly from installation folder). Click “Set License Key” button., you will see the following dialog window:



VestaTel will issue you a License Key by email, after you pay for it (you can click “Buy online' button to do it).

Enter the received License key in the above dialog box in the file LICENSE KEY and click button “Set Key”.

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This Agreement may not be assigned without the consent of VestaTel.

## 3 Functional Description

### 3.1 Features

- Implements Modbus [3] Master Station communication protocol [3], including
  - Modbus over serial interface (Modbus RTU) [1]
  - Modbus over TCP/IP (Modbus-TCP) [2]
- Supports simultaneous communication to up to 32 slave devices
- Supports polling all register types
  - READ-DI – Read Discreet Inputs
  - READ-CO – Read Coils
  - READ-HR – Read Holding Registers
  - READ-IR – Read Input Registers
- Supports sending Modbus commands
- User Interface
  - Windows GUI control program
  - On-the-fly configuration of link parameters (no application restart needed):  
Adding, Removing, Modifying link properties
  - Built-in protocol analyzer / Protocol Trace
  - Extensive logging with configurable severity

## 4 Installation

### 4.1 System Requirements

- Windows 7 and later.

### 4.2 Delivery (release) Content

The VestaTel Modbus Master simulator is delivered as an installation executable: **vestatel-modbusms\_setup.exe** containing the following files:

- modbusmgui.exe – Windows based GUI control program for managing the modbusmsd.dll server application which implements the core protocol and application layer.
- modbus\_master\_simulator\_manual.pdf – this user manual

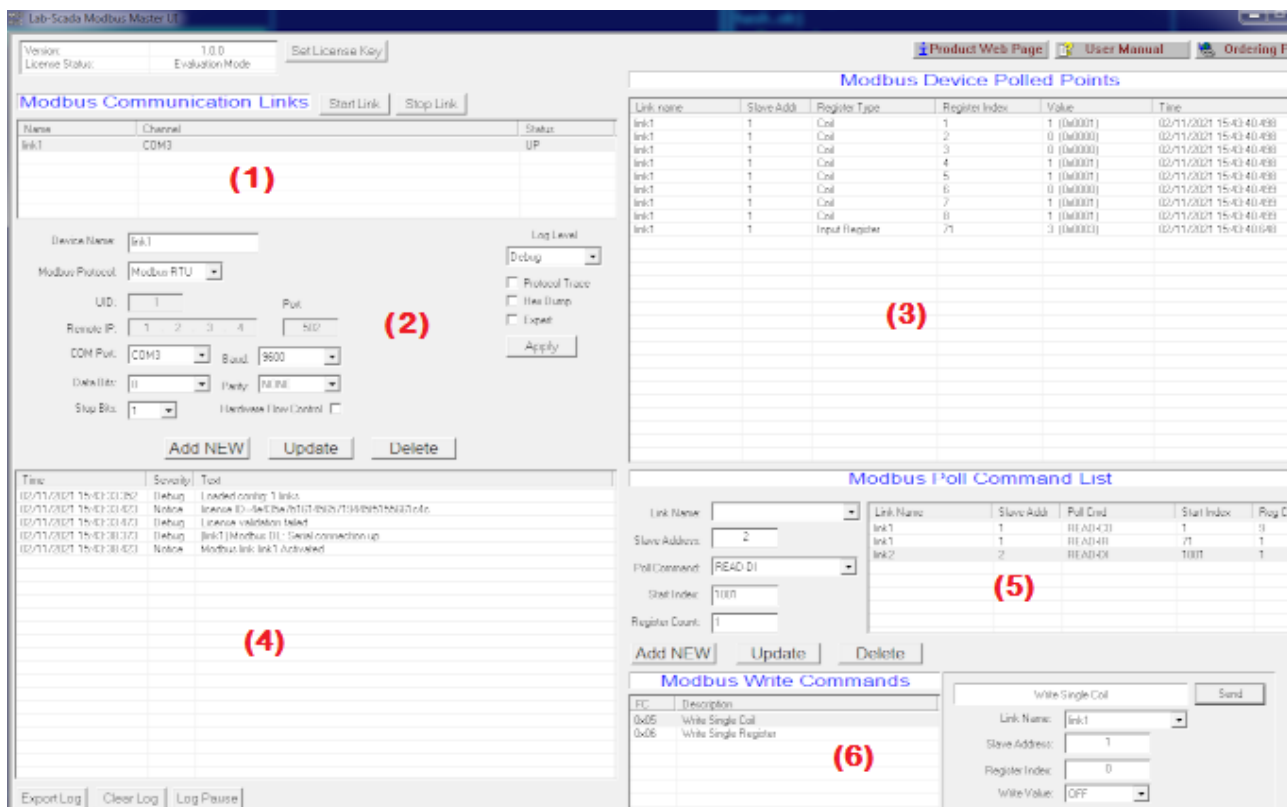
### 4.3 Installation Procedure

1. Download **vestatel-modbusms\_setup.exe** to your Windows PC.
2. Run the installation program **vestatel-modbusms\_setup.exe**
3. During the installation, read and accept the Software License Agreement and click Next. At the end of installation, click “Finish”.
4. By default, the release delivery files are installed in <c:\VestaTel-ModbusMs>
5. The application is automatically installed into installation folder (see item 4)

## 5 Configuring and Running the Modbus Master Simulator

### 5.1 Introduction

Main program's views and control areas are shown below:



- (1) List of configured Modbus channels
- (2) Configuration of Modbus channels
- (3) List of polled data points, received from Modbus devices
- (4) Event log
- (5) List of poll commands and controls for adding, editing and deleting the polling commands
- (6) Area for sending Modbus write commands

## 5.2 Creating a Modbus link

To add a new link, enter a unique link name, select protocol from Modbus-RTU (Modbus over serial interfaces) or Modbus-TCP, set the other parameters that are specific to the protocol (remote IP, port or COM port, Baud rate, number of data bits, stop bits, parity settings and flow control) and click “Add NEW” button.

The screenshot shows the 'Lab-Scada Modbus Master UI' window. At the top, there's a header bar with the title. Below it, a status bar shows 'Version: 1.0.0' and 'License Status: Evaluation Mode', along with a 'Set License Key' button. The main area is titled 'Modbus Communication Links' and contains a table with columns 'Name', 'Channel', and 'Status'. The table has one row with 'link1', 'COM3', and 'UP'. Below the table, there are configuration fields for the selected link. The 'Device Name' is 'link1'. The 'Modbus Protocol' is set to 'Modbus-RTU'. The 'UID' is '1'. The 'Port' is '502'. The 'Remote IP' is '1 . 2 . 3 . 4'. The 'COM Port' is 'COM3'. The 'Baud' rate is '9600'. The 'Data Bits' are '8'. The 'Parity' is 'NONE'. The 'Stop Bits' are '1'. The 'Hardware Flow Control' is unchecked. On the right, there's a 'Log Level' dropdown set to 'Debug', and checkboxes for 'Protocol Trace', 'Hex Dump', and 'Expert'. An 'Apply' button is below these. At the bottom, there are 'Add NEW', 'Update', and 'Delete' buttons.

Name	Channel	Status
link1	COM3	UP

Device Name:

Modbus Protocol:

UID:  Port:

Remote IP:

COM Port:  Baud:

Data Bits:  Parity:

Stop Bits:  Hardware Flow Control ☐

Log Level:

☐ Protocol Trace  
☐ Hex Dump  
☐ Expert

## 5.3 Deleting a Modbus link

To delete an existing link, select a link in the “Modbus Communication Links” view, then click “Delete” button.

## 5.4 Modifying a Modbus link

To change existing link parameters, select a link in the “Modbus Communication Links” view, then change the required link parameters then click “Update”

## 5.5 Managing Modbus Poll Command List

The VestaTel Modbus Master Simulator works by polling cyclically all slave devices of all configured Modbus links using the Modbus Poll Command List.

To build the list of poll commands:

- Choosing the link name,
- Enter or edit the slave address
- Choosing the poll command
  - READ-DI – Read Discreet Inputs
  - READ-CO – Read Coils
  - READ-HR – Read Holding Registers
  - READ-IR – Read Input Registers
- Enter the start register address (Start Index)
- Enter the count of registers
- Click Add New or Update button

To remove a poll command from the list, select the required command from the listview and click Delete.

The screenshot displays the VestaTel Modbus Master Simulator interface. The top section is titled "Modbus Poll Command List". It features a form on the left for configuring a new poll command and a table on the right showing the current list of commands.

**Modbus Poll Command List Form:**

- Link Name:
- Slave Address:
- Poll Command:
- Start Index:
- Register Count:

**Modbus Poll Command List Table:**

Link Name	Slave Addr	Poll Cmd	Start Index	Reg Count
link1	1	READ-CO	1	9
link1	1	READ-IR	71	1
link2	2	READ-DI	1001	1

Below the table are three buttons: "Add NEW", "Update", and "Delete".

The bottom section is titled "Modbus Write Commands". It contains a table of write commands and a form for sending a write command.

**Modbus Write Commands Table:**

FC	Description
0x05	Write Single Coil
0x06	Write Single Register

**Modbus Write Commands Form:**

- Write Single Coil:
- Link Name:
- Slave Address:
- Register Index:
- Write Value:
- Send:

## 5.6 Receiving Modbus Data Point Updates

When a Modbus link or links and the desired Modbus Poll Commands (see previous section) are configured, the VestaTel Modbus Master simulator continually and periodically polls slaves specified in the poll command and shows the received data point updates in the “Modbus Device Polled Points” view.

For each point received the following data is shown:

- Modbus link name
- Modbus slave address
- Modbus register type (Coil, Discreet Input, Holding Resiter, Input Register)
- Modbus Register Index
- Received value
- Receive timestamp

Modbus Device Polled Points					
Link name	Slave Addr	Register Type	Register Index	Value	Time
link1	1	Coil	1	1 (0x0001)	02/11/2021 16:03:52.022
link1	1	Coil	2	0 (0x0000)	02/11/2021 16:03:52.022
link1	1	Coil	3	0 (0x0000)	02/11/2021 16:03:52.022
link1	1	Coil	4	1 (0x0001)	02/11/2021 16:03:52.023
link1	1	Coil	5	1 (0x0001)	02/11/2021 16:03:52.023
link1	1	Coil	6	0 (0x0000)	02/11/2021 16:03:52.023
link1	1	Coil	7	1 (0x0001)	02/11/2021 16:03:52.023
link1	1	Coil	8	1 (0x0001)	02/11/2021 16:03:52.023
link1	1	Input Register	71	3 (0x0003)	02/11/2021 16:03:52.172

## 5.7 Sending Modbus Commands

In the current version it is possible to send Write Single Coil and Write Single Register commands. To send a command, pick the required command under “Modbus Write Commands list”, choos link name. Enter slave address, register index and set the value, then click “Send”

Modbus Write Commands	
FC	Description
0x05	Write Single Coil
0x06	Write Single Register

Write Single Coil

Send

Link Name:

Slave Address:

Register Index:

Write Value:



- Expert – enables debug level logging of various functions of the Modbus master simulator.

The application writes system log events to the text file modbus\_msd.log located by default at <c:\VestaTel-ModbusMs>