VanSoft Technologies

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MODBUS TESTER MANUAL

SOFTWARE VERSION 1-2-0-0

Before attempting to operate this software,
please read these instructions in its entirety.

Table of Contents

Document Changes

Version	Revision History	Date
1.0.0.0	First release	November 2010
1.1.0.0	Corrections and software updates	23 March 2012
1.2.0.0	Scanning display pages added	31 May 2013

1. INTRODUCTION

The windows based tool **Modbus Tester** is a stand alone modbus master controller and modbus slave. The tool supports the modbus RTU and modbus TCP/IP protocols. The tool can be used to simulate a slave unit when testing scada systems or as a master controller when developing modbus units.

2. SOFTWARE COMPARASON

The following table lists the functions available in each of the packages.

Modbus Tester			
Function Description	**Lite**	**Professional**	**Evaluation**
Pricing	Free	On Request	30 Day Trial
Maximum number of Modbus slaves	1	127	5
Save modbus slave setup	✗	✓	✓

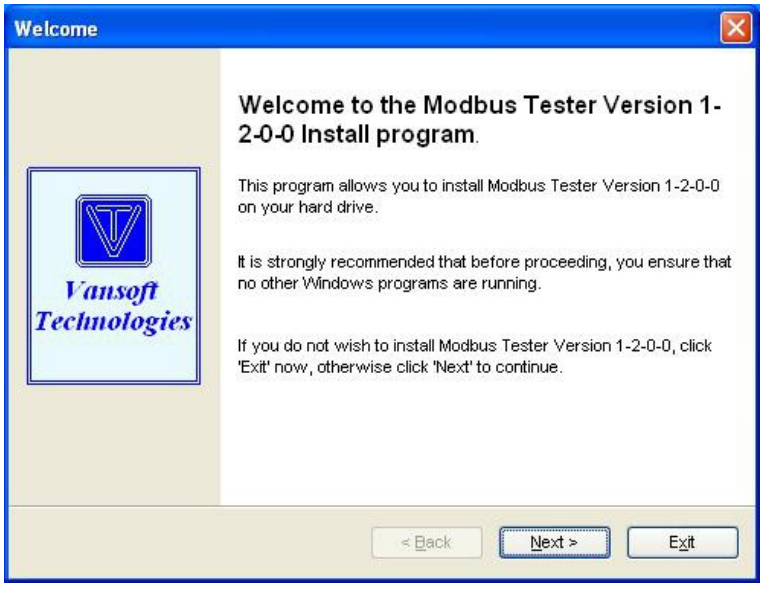
3. MODBUS TESTER INSTALLATION

3.1. Install the DOT Net Framework

The dot net version 4 framework is the core of the server and needs to be installed on the PC that will be running the program. It is freely available to download from Microsoft, just click on the following link: Microsoft NET Framework 4

3.2. Install the Modbus Tester Software

This section will guide you trough the installation process. To begin the process, download the Modbus Tester from www.vansoft.co.za web site download page. Once the download has been completed, double-click on the set-up file to start the installation process. The installation selection screen will be displayed as shown below. Follow the dialogue screens until the installation has been completed.



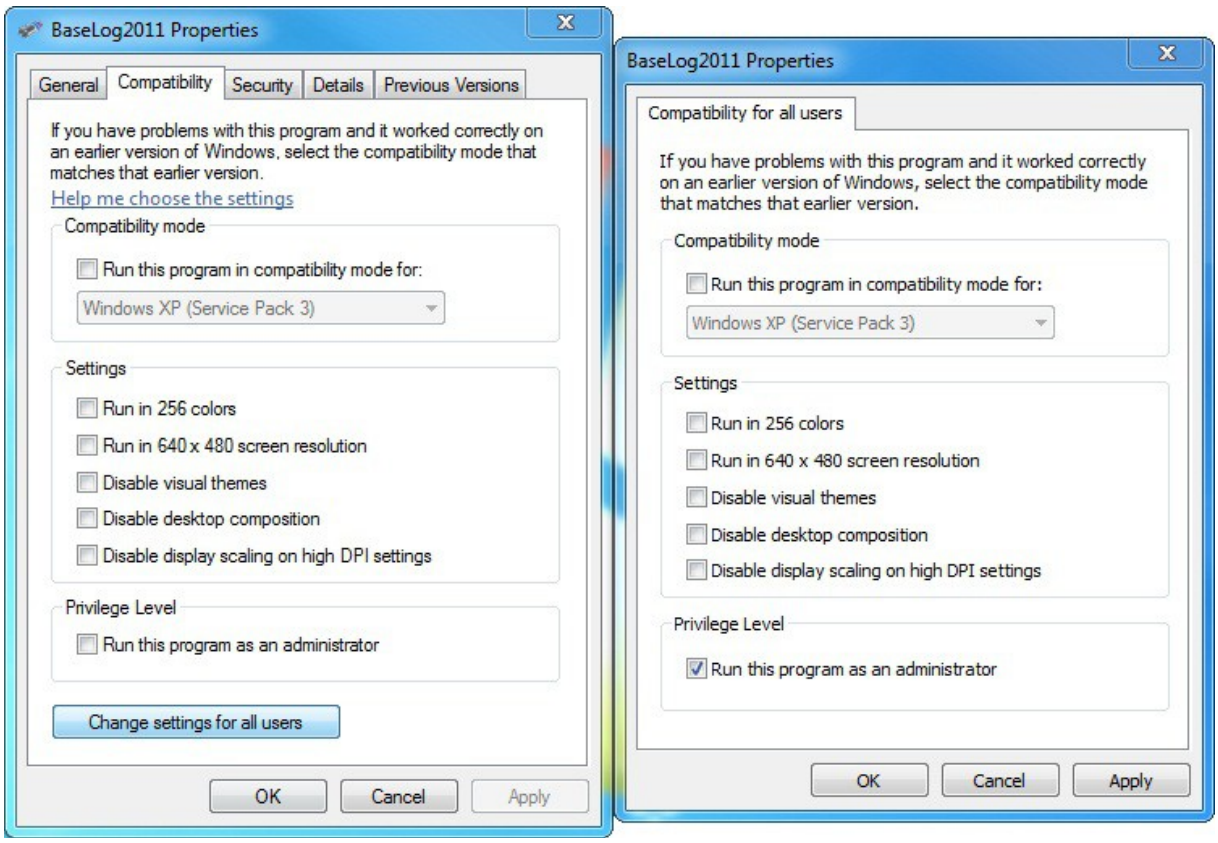
Please Note: Run as Administrator in Vista and Windows 7 operating systems. Under 64 Bit operating system run in XP compatible mode.

3.2.1. Setting Administrator mode in Windows 7

When operating the Modbus Tester under Vista or Windows 7 the properties of the executable file has to be set to Administrator. This will allow the Tester to interact with system resources. Follow the steps below to set the properties.

- Right click on the **Modbus Tester** file in **Windows Start → All Programs → Vansoft Technologies → Modbus Tester → Modbus Test 2010**

- Select the **Open file location** option as shown below.
- When the file location is open select the ModbusTest2012 application, right click on it and open the properties option.
- Select the Compatibility tab in the dialog, then click the Change settings for all users.
- Select the option Run this program as an administrator, then click the OK buttons to save and close the dialog screens. See below for details.



3.3. How to obtain an Activation Key

Menu: Help → Register Modbus Tester …

In order to activate all the functions of the Modbus Tester software, follow the steps below.

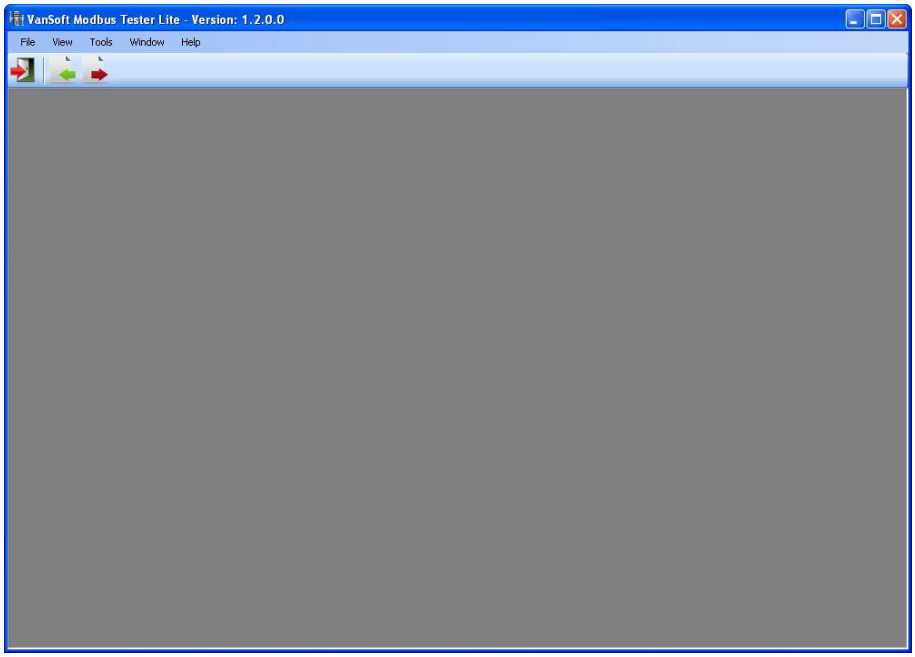
- Open the registration screen, copy and mail the software serial number together with your name, company name, e-mail address and contact number to info @vansoft.co.za to obtain your 30 day free Evaluation Version key.
- A key will be generated and mailed back to the you within 24 hours.
- Enter the supplied key into the software registration screen and then click the register button. (*Clicking on the **Software Key** text will display a screen where the key can be pasted into and then automatically enter into the key fields.*)
- Once registered click the **OK** button to exit.

4. SCREEN DESCRIPTIONS

The following sections describe the function of the main screens. These are the modbus master and modbus slave display screens.

4.1. Main Screen

The main screen is the container screen for the modbus master and slave screens. See the image below for detail.



File ➔ Exit

Exit the Modbus Tester Tool.

View ➔ Modbus Master Controller

Display the modbus master controller screen.

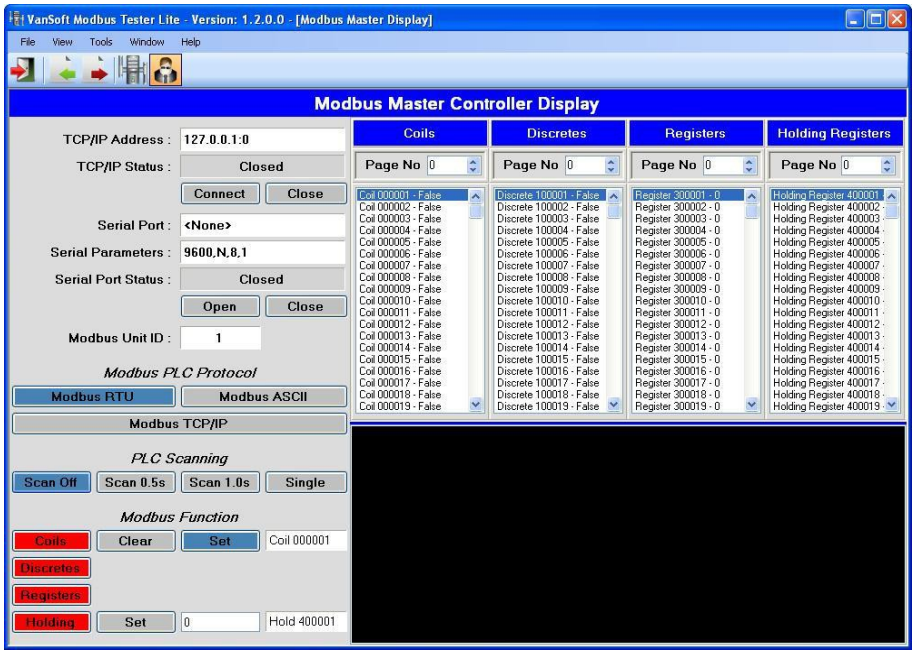
View ➔ Modbus Slave Unit

Display the modbus slave controller screen.

4.2. Modbus Master Display

View ➔ Modbus Master Controller

The modbus master controller screen is used to control the scanning to the a modbus slave unit. This section describes the operation of the master controller, see the image below for detail.



4.2.1. Set Modbus scanning functions.

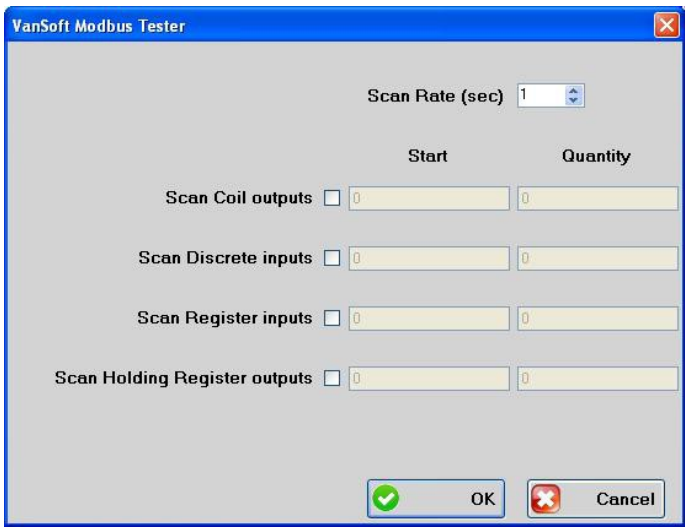
Tools ➔ Set Scanning Options

In order to start the scanning process the communications parameters has to be configured first. See the section on **Configure Communications** to set the parameters.

Each of the modbus functions can be configured to retrieve data from the remote slave unit. Follow the steps below to configure the scanning.

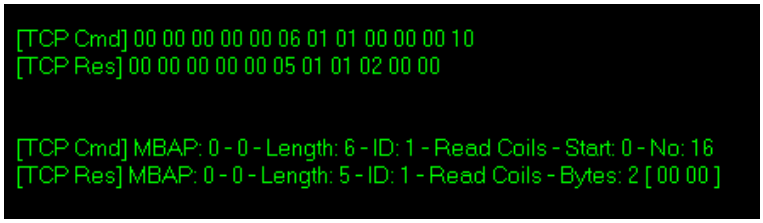
- Click the check box of the scanning function to enable it.
- Enter the start address from where the modbus slots must be scanned.
- Enter the quantity of values that must be read. Note that the total length of the packet must not exceed the modbus packet length specification.

Enabling and disabling of the functions can also be done from the master controller screen. See the image below for more detail.



Tools ➔ Decode Modbus Packets

Click the button to toggle the decoding of the modbus packets on and off. The image below shows a hex display and then the decoded display of a TCP/IP coil request.

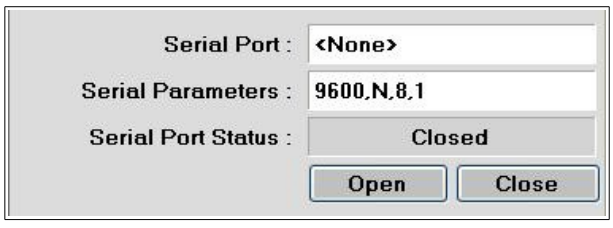


4.2.2. Modbus Communications Ports

The communications section controls the configured TCP/IP port and the serial port.

- Click the **Connect** button to establish the TCP/IP connection and **Close** to disconnect it.

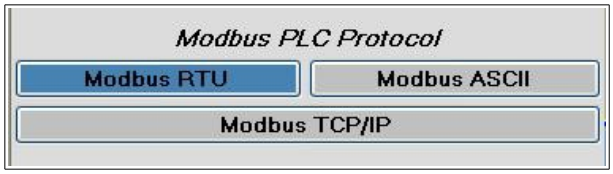
- Click the **Open** button to open the port and the **Close** button to close it.



4.2.3. Modbus Protocols

The protocol section selects the protocol to be used on the opened communications channel.

- The Modbus RTU and Modbus ASCII buttons select the protocols on the serial connection and the Modbus TCP/IP button on the IP connection.



4.2.4. Scanning Interval

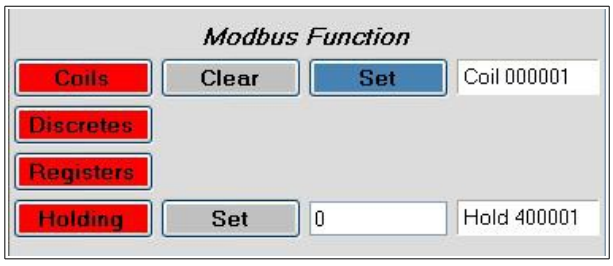
The scanning section selects the rate that the commands is send to the slave unit.

- The **Scan Off** button stops the scanning, the **Scan 0.5s** button sends a command every half second and the **Scan 1.0s** every second.
- The **Single** button sends a single scan function to the slave unit. Use this scan rate to test and fault find slave units and RS485 transmission lines.

4.2.5. Modbus Function Control.

The final section controls the modbus functions that are used to scan the slave unit.

- The **Coils**, **Discretes**, **Registers** and **Holding** buttons toggle the respective scanning functions on and off.
- To control a coil, select the coil number in the list in the right hand panel. When selected click the **Clear** or **Set** buttons to send a **Write Single Coil** modbus command to the slave unit.
- To control a holding register, select the holding register number in the right hand panel. When selected enter the value into the text field and the click the **Set** button to send a **Write Single Register** modbus command to the slave unit.



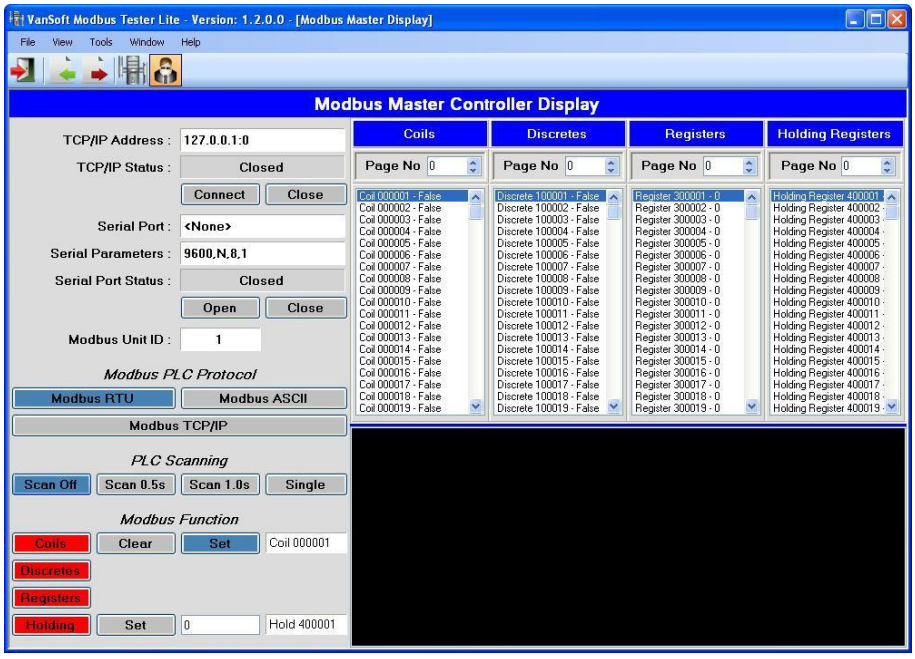
4.2.6. Modbus Slot Display

The right hand panel display the slots and values of the in pages in the master controller. Each page contains 256 slots of a function type and the page number can be set from 0 to 255.

4.3. Modbus Slave Display

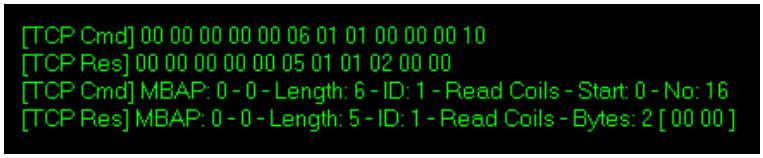
View ➔ Modbus Slave Unit

The modbus slave controller screen is used to display and control the slots of slave unit. This section describes the operation of the slave controller, see the image below for detail.



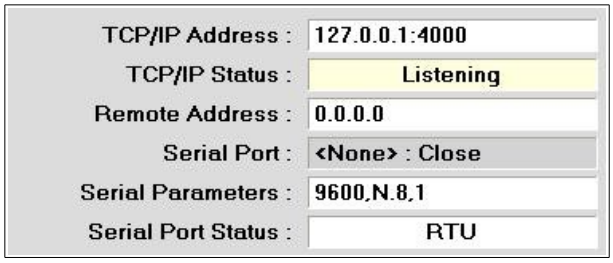
Tools ➔ Decode Modbus Packets

Click the button to toggle the decoding of the modbus packets on and off. The image below shows a hex display and then the decoded display of a TCP/IP coil request.



4.3.1. Modbus Communications

In order to start the scanning process the communications parameters has to be configured first. See the section on **Configure Communications** to set the parameters. Once set the ports will be initialised automatically and the slave section will respond on any commands received from either the serial port or the TCP/IP port. See the image below for detail.



4.3.2. Modbus Protocol

This section selects the modbus protocol that is received on the serial port.

- Click the **Modbus RTU** button to respond to the RTU packet structure and the **Modbus ASCII** for the ASCII packet structure.

4.3.3. Function Control

This section controls the value of the modbus slave slot. See the descriptions below for the control of all the slot types.

- To control a coil, select the coil number in the coil list on the right hand panel. When selected click the **Clear** or **Set** buttons to change the value.

- To control a discrete, select the discrete number in the discrete list on the right hand panel. When selected click the **Clear** or **Set** buttons to change the value.

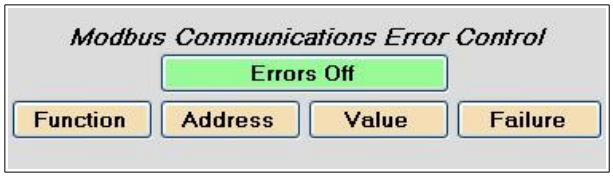
- To control a register, select the register number in the register list on the right hand panel. When selected click the **Clear** button to set the slot value to zero. Enter a value into the text field and then click the **Set** button to change the slot value to the entered value.

- To control a holding register, select the holding register number in the holding list on the right hand panel. When selected click the **Clear** button to set the slot value to zero. Enter a value into the text field and then click the **Set** button to change the slot value to the entered value.

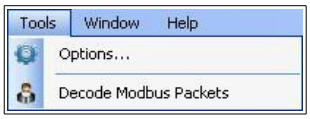
4.3.4. Error Control

The error control section controls the generation of error responses. When active all requests will be responded by the selected error packet as described below.

- Click the **Errors Off** button to stop the error generation.
- Click the **Function** button to generate the **Illegal Function (Code 01)** error.
- Click the **Address** button to generate the **Illegal Data Address (Code 02)** error.
- Click the **Value** button to generate the **Illegal Data Value (Code 03)** error.
- Click the **Failure** button to generate the **Slave Device Failure (Code 04)** error.



5. SYSTEM CONFIGURATION

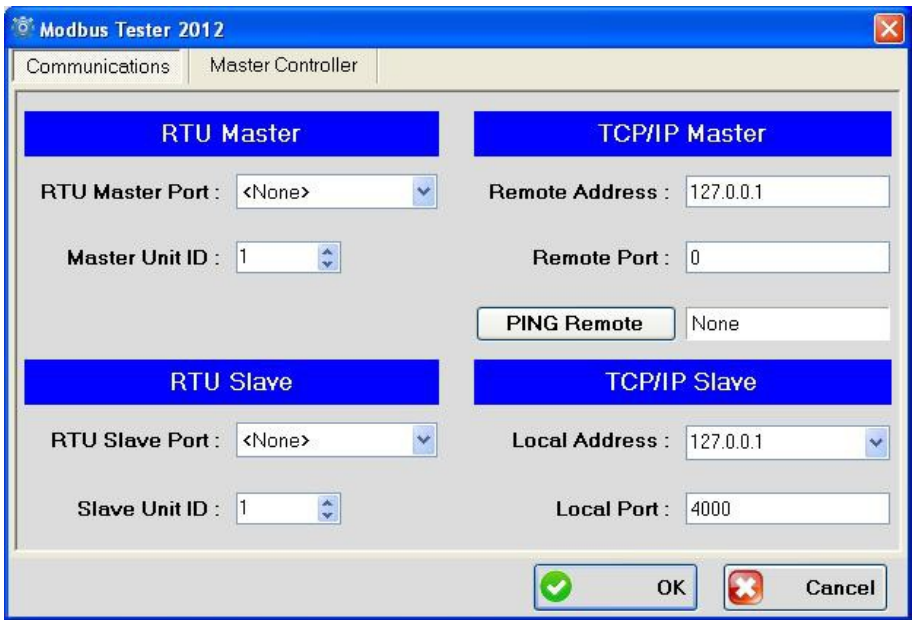


Tools ➔ Options …

Selects the Modbus Tester configuration dialogue screens.

5.1. Configure Communications

Select the Communications tab to set the Master and Slave settings as described below.



5.1.1. Modbus Mast Communications

- Select the master RTU port from the drop down list.
- Set the remote TCP/IP address and port number that the master will connect to.
- Click the PING Remote button to check if the remote TCP/IP slave is reachable.
- The remote modbus slave ID is set in the Master Unit ID field.

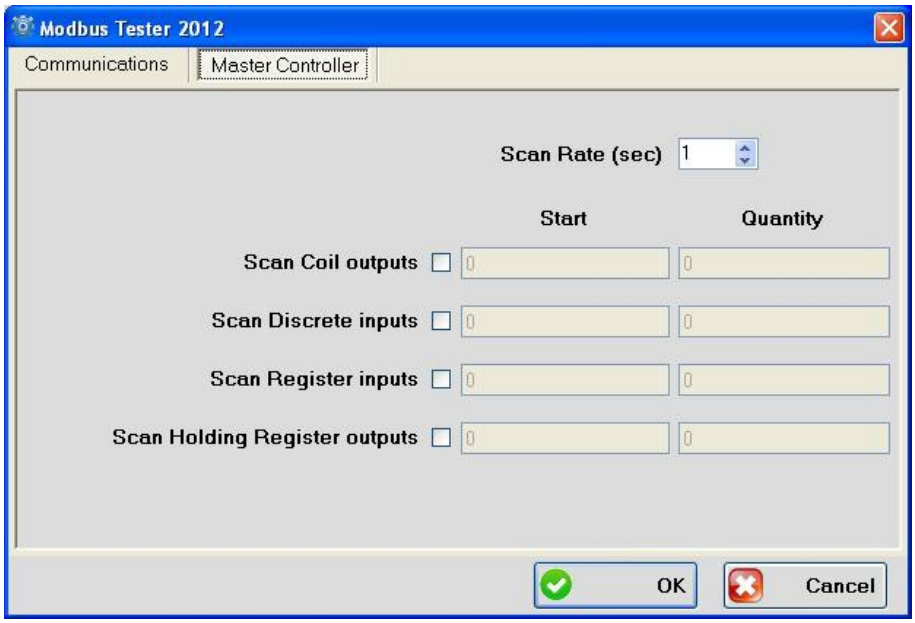
5.1.2. Modbus Slave Communications

- Select the slave RTU port from the drop down list.
- Set the TCP/IP address and port number that the slave will monitor for activity.
- The local modbus slave ID is set in the Slave Unit ID field.

5.2. Configure Master Controller

Select the Master Controller tab to set the scanning functions as described below.

- Click the check box to enable the function. Enable / disable can also be controlled from the Modbus Master screen.
- Set the functions start address and quantity of slots in the fields provided.



Note that configurable scan rate option is not implemented in this version.

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