

Rs485-Modbus Master Application

User Manual

Version 1.0

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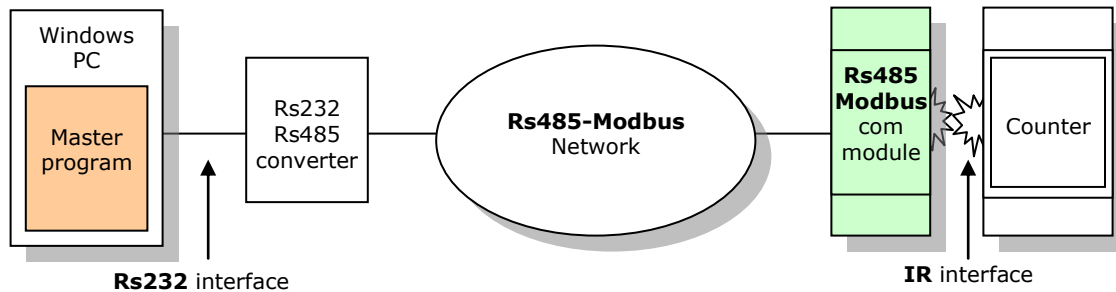
2. Preface

2.1. System description

This document describes the usage of the **Rs485-Modbus master application**.

The **Rs485-Modbus master** software application gives an easy way to manage a Modbus communication module. The present software hides for the most part the complexity of the communication protocols used by the module and allow a better decoding of the quantities provided by the Counter connected to the module itself.

Even more, it allows a diagnostic detection and it offers also the possibility to save the measures captured.



2.2. Hardware Requirements

To use this system you need at least:

- one com module connected to
- one electronic counter
- an Rs232/Rs485 (or even an USB/Rs485) converter
- a Windows PC

2.3. Software Requirements

The application is developed for Windows and consists in a simple executable file. It doesn't require any installation procedure. The minimum requirements are:

- Windows XP/2000
- Microsoft .NET Framework ver. 1.1

3. Get ready in few steps

3.1. Preliminary checks

In order to use successfully the present application, we assume that you are working with a system like the one introduced in the paragraph 2.1. Then be sure that:

- All the physical links are operating.
- The Rs232/Rs485 converter is well connected
- The communication module and the counter are powered-on

3.2. Application start-up

Copy the executable file of the application in your working folder and run it. Once in the application, you will see a sequence of panels, briefly described below:

PANEL	DESCRIPTION
COUNTERS	Management of the Interface database.
COMMUNICATION	Readings control. Window to show the current readings snapshot.
SETTINGS	Energy counters reset. Communication protocol settings. Storage control.

3.3. Connection to the network

The first operation is the **COM port selection**.

In the communication panel, select the right COM port you plan to use to communicate with the Rs232/Rs485 converter.

You have also to define the communication parameters: speed , parity and stop bits (the data bits are always 8). By default, the interfaces are set to work at 19200 baud, parity none, 1 stop bits.

The second operation is the **protocol selection**.

You have to define whether you want to manage a Modbus/RTU or a Modbus/Ascii protocol.

3.4. Adding a new interface

This paragraph described how to add new communication modules.

- ✓ Go to the counter panel
- ✓ Enter a convenient alias name for the interface
- ✓ Enter the Modbus address (001 is the default for an unconfigured interface)
- ✓ Press the ADD button



Warning!

If you have more than one Modbus module to add to the network, you have to add them one by one because they all comes with the same default address (001).

3.5. read out the values

- ✓ Go to the communication panel
- ✓ From the poll list box select the wanted interfaces
- ✓ Press the start button to enable the polling of the interfaces. At each reading a new interface will be enquired.

4. Functions description

The program allow you to:

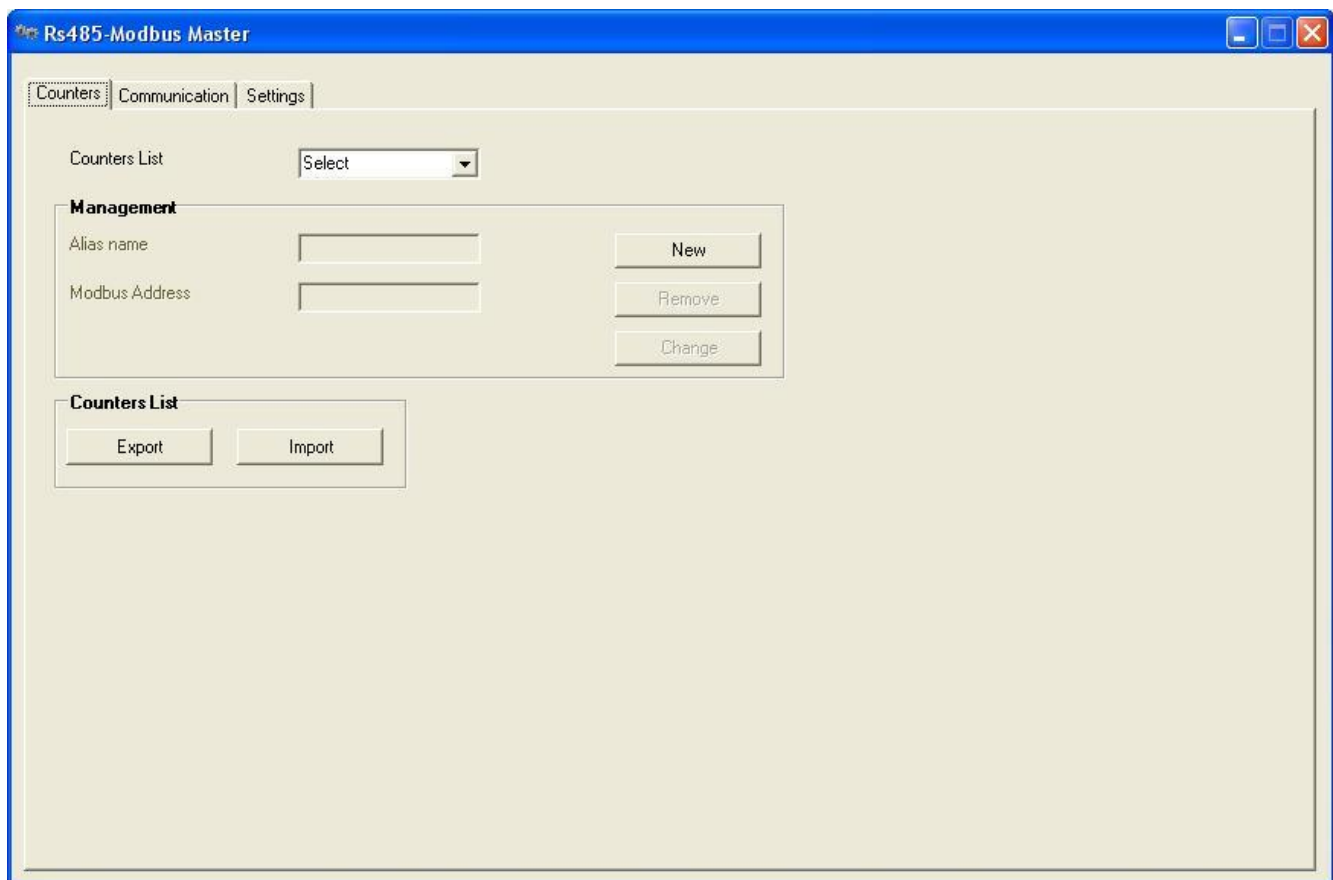
- Handle the local database of the communication modules
- Read out snapshots of the measures provided by the counters connected to the communication modules
- Make the essential configuration of the protocol parameters for each module
- Manage the measure storage



Warning!

Mind to select the proper **protocol** (RTU or ASCII) from the radio button placed near the start button.

4.1. The counters panel



4.1.1. Management

All the operations made in this section affects a local database of the interfaces (a simple XML file created in the working folder of the application). The communication on the rs485-Modbus network is not involved here.

New

The new button allow you to add a new interface.

Once clicked, you have to enter an alias name, for an easy identification of the interface, and the Modbus address for the new Modbus module. Note that the default address for an unconfigured module is always 001.



Warning!

If you have more than one Modbus module to add to the network, you have to add them one by one because they all comes with the same default address (001).

Remove

This button allow you to remove an interface from the local database. You have first to select the wanted interface from the interface listbox.

Change

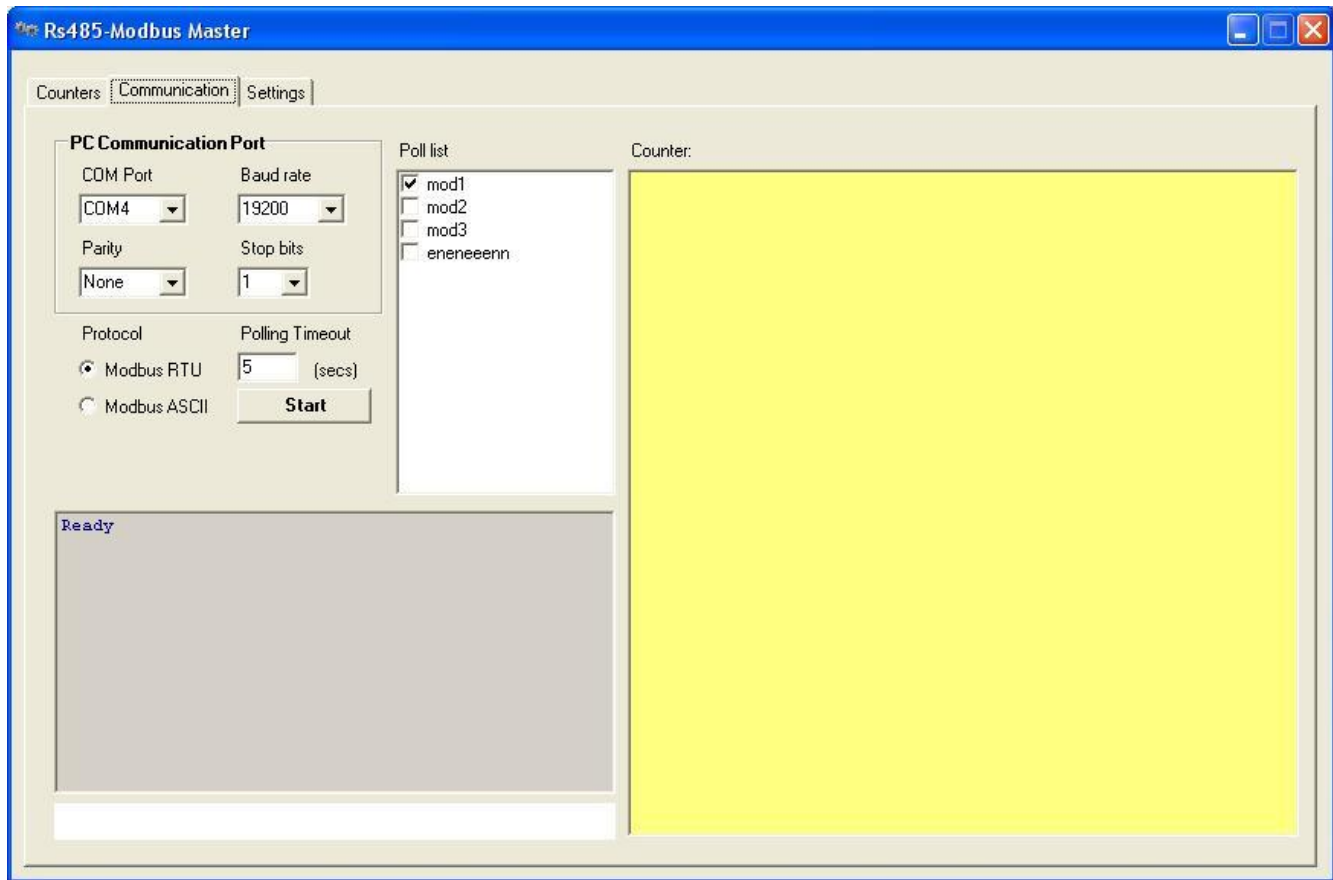
The change button allow you to make changes to the local database. Nothing happens to the remote interface

4.1.2. Interfaces list

As told before, the local database of the communication interfaces is stored locally into an XML file. If you want install the Modbus master application on different PCs, can be useful to transport the database from a station to another one.

Click to the **export** button if you want to easily access to the XML file of your original PC in order to saving it somewhere. Then, on the target PC, click on the **import** button and find out the location where you have previously exported the XML file.

4.2. Communication



4.2.1. COM Port

The first section of the communication panel allow you to select which **COM port** you used to control the network. For your Modbus network you have also to define the communication parameters: **speed**, **parity** and **stop bits** (the data bits are always 8). By default, the interfaces are set to work at 19200 baud, parity none, 1 stop bits.

4.2.2. The polling process

The **poll list** window shows all the devices currently present in the local database. If you want to perform a reading from one or more of them, you have to flag the corresponding alias.

The **polling timeout** box (in seconds) allow you to define the interval of time between two consecutive readings (by default is 5 seconds). Note that if you have flagged more then one interface in the poll list, an interface is polled every $N * t$ seconds (where N is the number of interfaces under poll and t is the poll timeout in seconds).

Mind that you have also to specify which **protocol subtype** you want to use (Modbus RTU or Modbus ASCII).

To activate the polling process just click the **start** button.

You can see the measure snapshots in the main yellow window, while in the grey window, you have a dump of the data exchanged during the communication process (useful for diagnostic) and some event reports too.



Tip!

If you want to capture the dump either from the diagnostic window or from the readings windows, click with the mouse right button on the window and select the "copy to clipboard" option. All the window content will be copied to the Windows clipboard to make it available to any application.

Click the **stop** button to end the capture process.

Please refer to the settings chapter for a detailed description of the **storage** feature.

4.3. Settings

The settings panel collects a list of functions useful at runtime to manage the behaviour of the interface and the behaviour of the counter attached to the interface.

Concerning the counter, you can:

- Require the reset of the internal energy counters (active and reactive energy)

Concerning the interface you can:

- Change the Modbus address
- Change the communication protocol (RTU/ASCII)
- Change the communication settings (speed, parity and stop bits)

In order to perform any command, **you have first to select your target** from the interface list box.
Note that, in any case, you will be prompted for a confirmation.

Even more, you can manage here the data storage process.

4.3.1. Resetting the energy counters

This section allow to reset the energy registers internal to the counter connected to the Rs485-Modbus interface. Just check the type of registers you want to reset (the ones related to the active energy, the ones for the reactive energy or both) and eventually select the RTU/ASCII subtype. Then click the **reset** button.

4.3.2. Modbus settings

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The modules have some parameters to be configured. By this part of the window you can change on the remote selected interface the following settings:

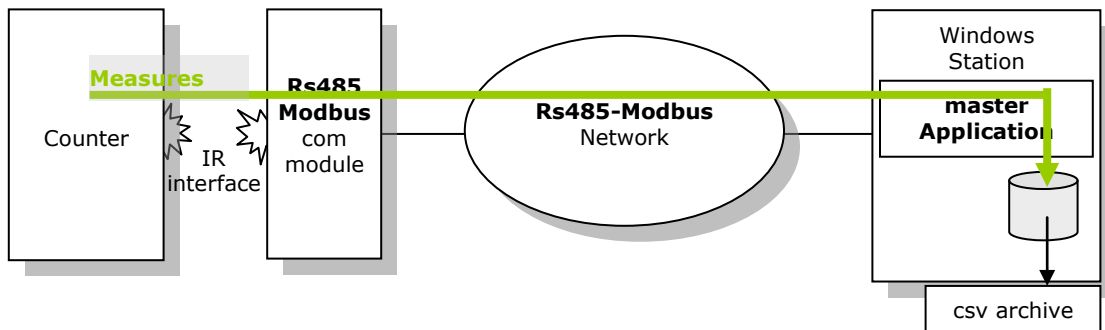
- Protocol subtype (RTU/ASCII)
- Modbus address
- Baud rate (from 1200 to 115200)
- Parity (none, even, odd)
- Stop bits (1 or 2)

4.3.3. Storage

This panel controls the storage feature that allow you to store the incoming measures into .csv (comma separated values) archives that can be imported into the most common applications.

The storage works in junction with the readings functionality:

- Go to the storage panel and enable the function (see below for details)
- Go to the communication panel, select the wanted interfaces and click the start button.



Path of the measured data.

All the .csv file are created in the master application working folder.

Each file is automatically named using the alias name entered into the local interface database.

4.3.3.1. Main controls

Start button: enable the storage

Stop button: stop the storage process

An information string placed in one corner of the section, reports the current state of the storage process.

4.3.3.2. Advanced settings

You can decide to start the storage activity at a desired date and time and/or to stop the activity at another definable date and time. Also the storage period can be defined. Consider, in-fact, that every instrument sends data approximately once per second, so it could be useful to store only a subset of the data received filling the storage time box with a convenient period of time.

If you leave the start and the stop time at the same value, the storage will remain always active.

To enable the described section, you have to flag the **advanced settings** check box.



Tip!

Due to the country differences you would define the decimal separator used to store the measures in the .csv files. By the **decimal separator** control you can select the separator suitable for you.