

Metrologics, LLC

Modbus Client

Application User's Manual

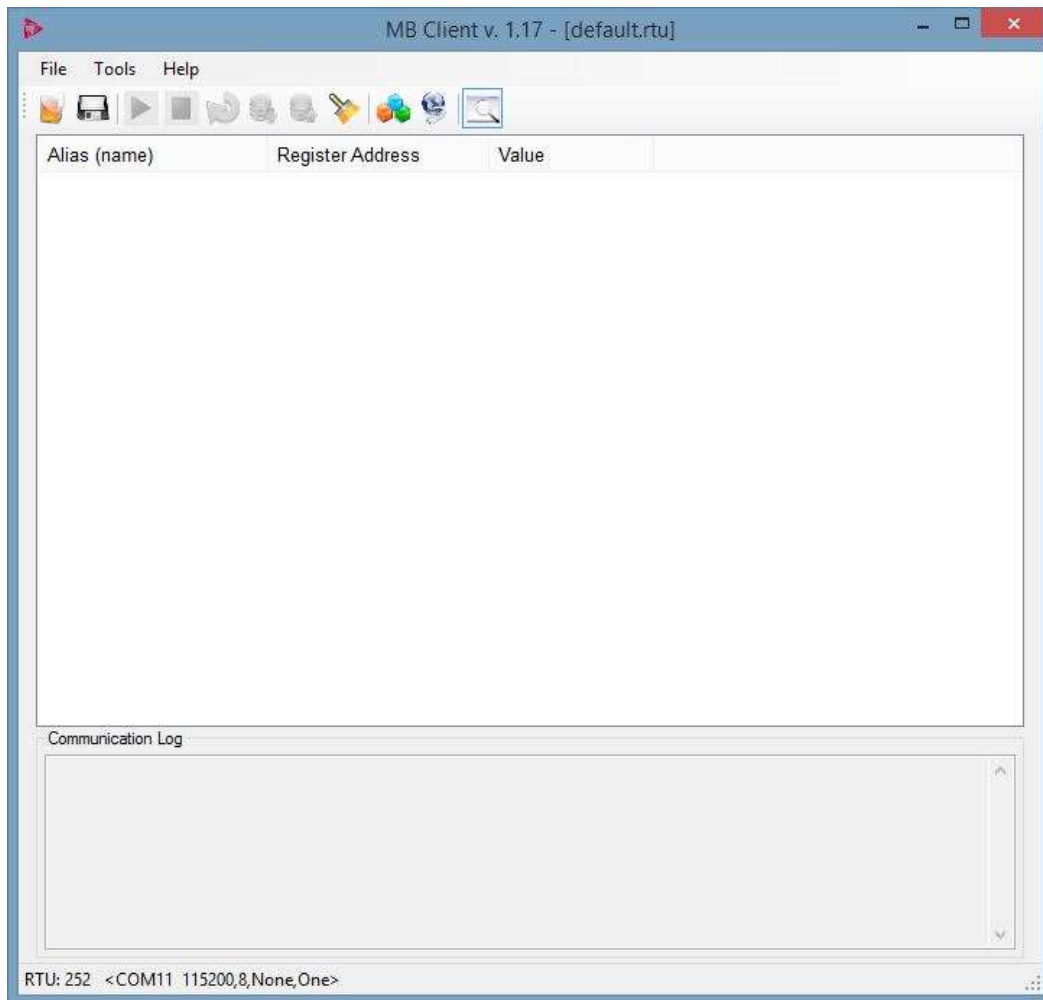
Version 1.0, June 2, 2015

Operation Details

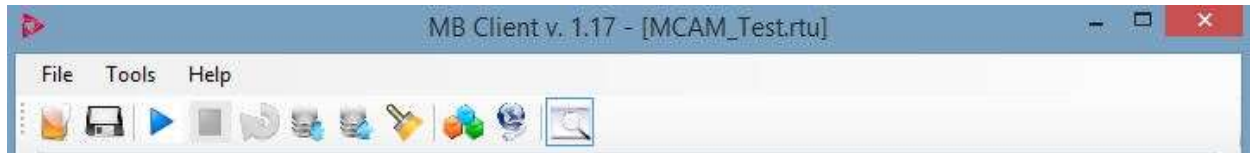
The Metrologics Modbus Client application is designed to run on any PC platform hardware, and has been tested to Microsoft Windows 8.1+ (standard and Pro) versions.

After installing the Metrologics Modbus client on your PC, create a startup shortcut icon and click this to start the application.

Then main Modbus Client window below should now be in focus.



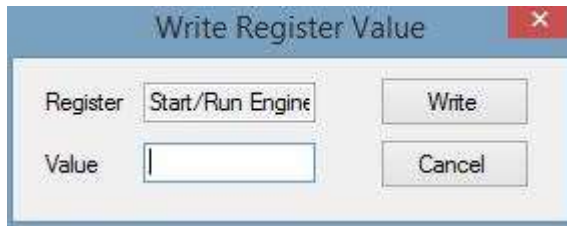
Menu Icons, Function Explanation



1 2 3 4 5 6 7 8 9 10 11

1. *Load Project*: saved projects can be loaded from the directly where you saved them.
2. *Save Project*: Projects can be saved to any directory you choose.
3. *Start Poll*: This button starts the registers to be polled, based on the communications setup.
4. *Stop Poll*: Stops register polling.
5. *Update Selected Values*: Only highlighted (selected) tags will be updated.
6. *Update Values*: Updates all tag values.
7. *Write Register*: Opens the register Write dialog box, where you can enter a value to write to the register in the slave device. After writing, the client value will show the confirmed register value you wrote to the slave. Writes can be performed while the master is polling. See Write Register page.
8. *Clear Register Values*: Clears all register values.
9. *Setup Registers*: Opens the register database dialog window. See “Setup Registers” page.
10. *Setup RTU*: Opens the slave communications setup window. See “Setup RTU” page.
11. *Hide Communication Log*: Hides the communication log window at the bottom of the main window.

Write Register Function

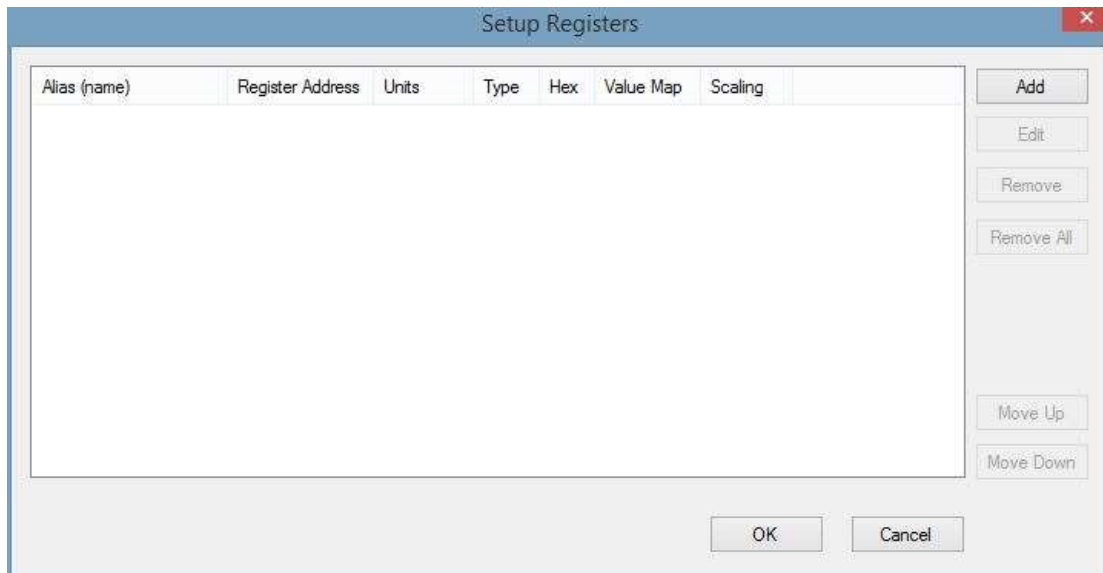


The dialog box above is presented after pressing the Write Register icon on the main menu screen.

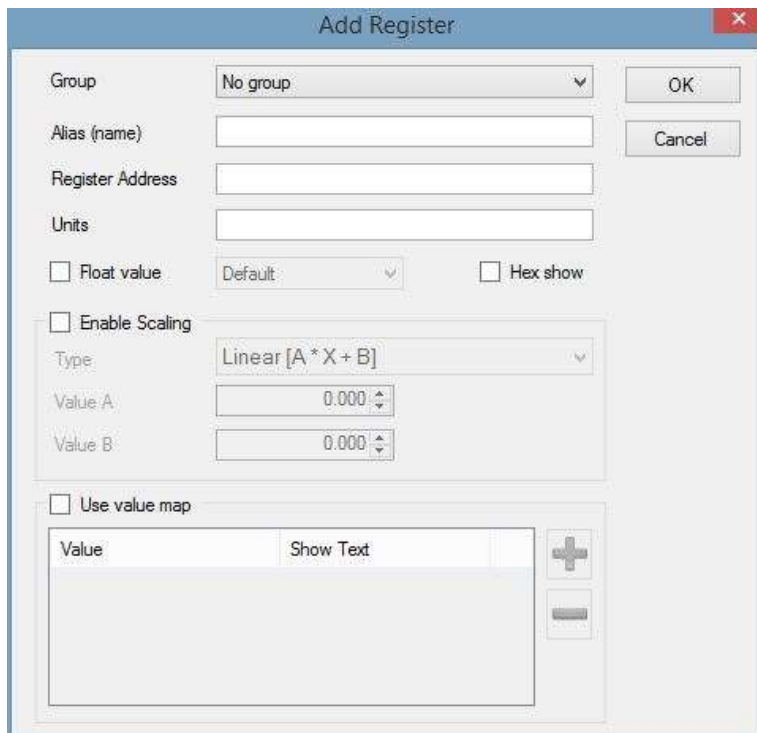
First highlight the register you want to write to from the register main window. In the above example, the Start/Run Engine register was selected. This example register is a WORD, and requires a 0, 1, or 2 for the intended function, so writing one of these values into the “Value” entry field, then pressing the “Write” button, will write the value to the register.

Note: It is assumed that the user understands and is aware of the correct values available to the register type, and its control functions, if any. User assumes responsibility for resulting slave device actions after writing to any slave registers.

Setup Registers



To add a new register to your tag database, press the “Add” button located in the upper right hand corner of the Tags Database window (see below).



Groups can be created that allow for ordered tags by type or area, or any freeform tag groupings, which make for easier tag reading in the main polling window. See Tag Groups Setup page.

Alias (name) is used to define the tag name.

Register Address is used for entering the actual register to be polled. It is assumed the user understands the difference between Modbus register numbering schemes. For further information on the Modbus protocol, please visit www.modbus.org website and download the Modbus documentation.

Units field is used to define an engineering units tag field. Examples: VDC, ACV, PSIG, Inches, Feet, Gallons, Barrels, etc.

Float Value. Checking this box enables the floating point register value to be configured based on its slave device setup. Choices are: Default (most common), Byte Swap, Word Swap, Byte Word Swap.

Hex Show. Checking this box will display the hexadecimal value of the register in the main poll window.

Enable Scaling (see below) allows for scaling of the slave polled register to be converted at the master poll window into a new value other than what is actually in the slave native register. Choices are Linear $[A * X + B]$, and quadratic $[A * (X ^ B)]$. In the example below, we are reading an analog value from the slave, which is an INTEGER and is represented by a value of 12500. To scale this value to VDC, you would select the Linear scaling method, then enter in 0.001 in the Value A field. The resulting poll window display will be scaled and will show a register value of 12.500 VDC.

The screenshot shows the 'Edit Register' dialog box with the following configuration:

- Group: Analog Inputs
- Alias (name): Battery
- Register Address: 30003
- Units: (empty)
- Float value: Default
- Hex show:
- Enable Scaling:
- Type: Linear $[A * X + B]$
- Value A: 0.001
- Value B: 0.000
- Use value map:

At the bottom, there is a table with columns 'Value' and 'Show Text', and a '+' button to the right.

Use Value Map

Group: Informational

Alias (name): Cell Modem Model

Register Address: 40121

Units:

Float value: Default

Hex show

Enable Scaling

Type: Linear [A * X + B]

Value A: 0.000

Value B: 0.000

Use value map

Value	Show Text
2	HE-910D 3G Modem
0	Unknown
1	WPM50 2G Modem

In the above example, the Use Values Map check box is selected and then values can be added to the values map by pressing the green “+” add button. Deleting an added value field can be performed using the “-” button. See example below.

Add value map

Value:

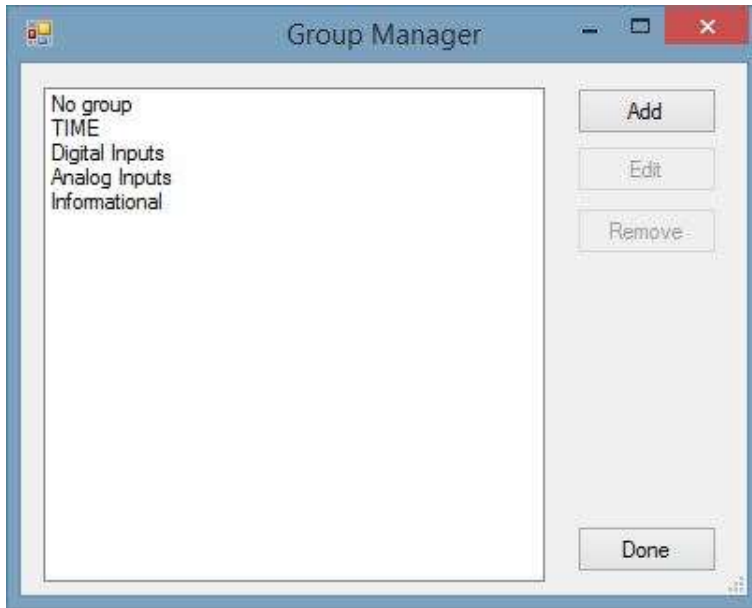
Show text:

OK

Cancel

In the example “Use Values Map” window above, we are reading a WORD register that houses the codes to indicate the type of modem that is detected in our MCAM product. A value of 0, 1, or 2 in the slave register will display the enumerations indicated above.

Adding Register Groups

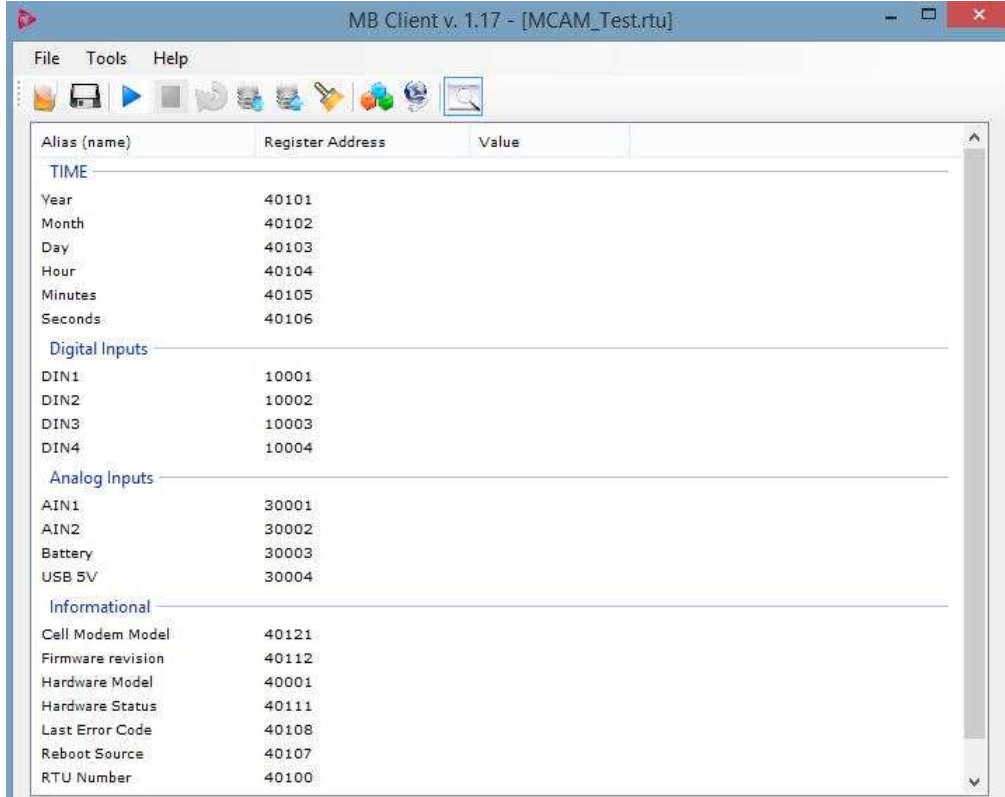


The Groups Manager window can be accessed by selecting the Tools, Group Manager drop down menu from the main screen.



In the example above, the "Add" button is selected and the Group creation screen below is used to enter the new tag group to create. It is suggested to add your register groups using this method first before creating your tag database, which will allow you to select which group you want your tags to go into during the tag creation process.

The example screen below shows the result of creating and ordering tags into Groups. This can be a very effective tool in segregating specific registers into meaningful groupings, which when large tags databases are being used, will result in easier register value observations.



The screenshot displays the MB Client v. 1.17 interface for [MCAM_Test.rtu]. The main window contains a table with three columns: 'Alias (name)', 'Register Address', and 'Value'. The data is organized into several groups, each separated by a horizontal line. The groups are: TIME, Digital Inputs, Analog Inputs, and Informational. The 'Value' column is currently empty for all entries.

Alias (name)	Register Address	Value
TIME		
Year	40101	
Month	40102	
Day	40103	
Hour	40104	
Minutes	40105	
Seconds	40106	
Digital Inputs		
DIN1	10001	
DIN2	10002	
DIN3	10003	
DIN4	10004	
Analog Inputs		
AIN1	30001	
AIN2	30002	
Battery	30003	
USB 5V	30004	
Informational		
Cell Modem Model	40121	
Firmware revision	40112	
Hardware Model	40001	
Hardware Status	40111	
Last Error Code	40108	
Reboot Source	40107	
RTU Number	40100	

Setup RTU Functions

The screenshot shows the 'RTU Configuration' dialog box. At the top, the title is 'RTU Configuration' with a close button (X) on the right. Below the title, there is a text box for 'RTU Number' containing the value '252'. To the right of this are two radio buttons: 'Serial Client' (which is selected) and 'TCP Client'. Further right are 'OK' and 'Cancel' buttons. The 'Serial Configuration' section contains several dropdown menus: 'COM Port', 'Handshakes' (set to 'None'), 'Baudrate' (set to '115200'), 'Stop Bits' (set to 'One'), 'Parity' (set to 'None'), and 'Data Bits' (set to '8'). The 'TCP Configuration' section contains two text boxes: 'IP Address' (set to '127.0.0.1') and 'Port' (set to '502'). Below these are three text boxes for timeouts: 'Read timeout' (set to '5000 ms'), 'Write timeout' (set to '1000 ms'), and 'Polling interval' (set to '100 ms').

In the RTU Configuration screen example above, you can configure your communications settings with your target slave device. See explanations below.

RTU Number: Enter the slave device ID.

Serial Client: Select when connecting to slave devices using your PC's serial port (native or USB converter). If using a USB serial converter, it is recommended to insert that device before starting the Modbus client application. Use the drop down list box to select the available desired comm port. Select the appropriate slave device Baud Rate, Parity, Handshake, Stop Bits, and Data Bits.

TCP Client: Select this option if connecting to a slave device using Modbus TCP and an Ethernet connection. Enter the slave IP address and the routing port number for connectivity to the slave Ethernet port.

Read Timeout: Enter the desired read timeout in milliseconds.

Write Timeout: Enter the desired write timeout in milliseconds.

Polling Interval: Enter the polling interval in milliseconds.

Select "OK" after configuring the communications parameters.

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