PiiGAB
PROCESSINFORMATION

# Getting started MBus2MBusASCII

## PiiGAB M-Bus Explorer & PiiGAB M-Bus 900S

www.piigab.com

PiiGAB Processinformation i Göteborg AB • Anders Carlssons gata 7 • S-417 55 Göteborg • Sweden
Tel: +46(0)31 559977 • Fax: +46(0)31 227071 • email: info@piigab.se

# Contents

# 1. Document Information

This document will describe how to prepare the files used for MBusASCII in PiiGAB M-Bus Explorer for PiiGAB M-Bus 900S. The document will use the internal M-Bus meter inside the PiiGAB M-Bus 900S and two external M-Bus meters to show how to convert M-Bus meters to MBusASCII.

If you see something that is not correct in this document, that misleads you or if you are missing something please contact us so we can improve this document continuously. See contact information at the end of the document.

## 1.1 Versions

| Version | Modified by | Detail |
|---|---|---|
| 1.00.00 | Stefan Eriksson | Initial version |
| 1.00.01 | Stefan Eriksson | Edited distributor contact information |
| 1.01.00 | Stefan Eriksson | Minor changes for PiiGAB M-Bus 900S |

# 2. Preconditions

| Object | Detail/Other |
|---|---|
| One PiiGAB M-Bus 900S | IP-address set to 192.168.10.123 |
| Connection with two M-Bus meters set to primary address 1 and 11 with PiiGAB M-Bus Setup Wizard | M-Bus meters supports EN13757 |
| PiiGAB M-Bus Explorer / M-Bus OPC-server | Version 2.00.00.000 or later |
| Getting started PiiGAB M-Bus Explorer | |

# 3. Requirements

- PiiGAB M-Bus Explorer

## 3.1 Optional requirements

- PiiGAB M-Bus Setup wizard version 3.1.0 or later

# 4. Steps to setup MBus2MBusASCII communication

There are many steps to configure a PiiGAB M-Bus 900S for MBus2MBusASCII communication. Many of these steps require pure M-Bus communication and configuration in PiiGAB M-Bus Explorer. There are some tips and tricks to make the configuration easier.

Here is a list of points to have in mind while configuring for M-Bus ASCII communication with a PiiGAB M-Bus 900S.

1. Make sure you have connection to the PiiGAB M-Bus 900S and the M-Bus meters with PiiGAB M-Bus Setup Wizard. Please see *Getting started PiiGAB M-Bus 900S*.

2. Your PiiGAB M-Bus 900S must have M-Bus ASCII present in its license.

3. There is a great advantage if your PiiGAB M-Bus 900S has two slave ports available:
   - Slave port 1 for M-Bus communication with PiiGAB M-Bus Setup Wizard and PiiGAB M-Bus Explorer.
   - Slave port 2 for MBus2MBusASCII communication with the M-Bus ASCII client.

4. Two projects opened in PiiGAB M-Bus Explorer is a good way when configuring:
   - One M-Bus project to monitor the M-Bus meters through slave port 1.
   - One M-Bus ASCII project for M-Bus ASCII configuration.

5. The *Getting started PiiGAB M-Bus Explorer M-Bus* is a great help to configure M-Bus.

6. You should use the *Browse* template in PiiGAB M-Bus Explorer to explore an M-Bus meter.

7. Knowing how many M-Bus telegrams maximum you have to read from each M-Bus meter is mandatory.

8. Knowing how long it will take to read the M-Bus meters is also mandatory to trim the timeout settings in the PiiGAB M-Bus 900S and the M-Bus ASCII client.

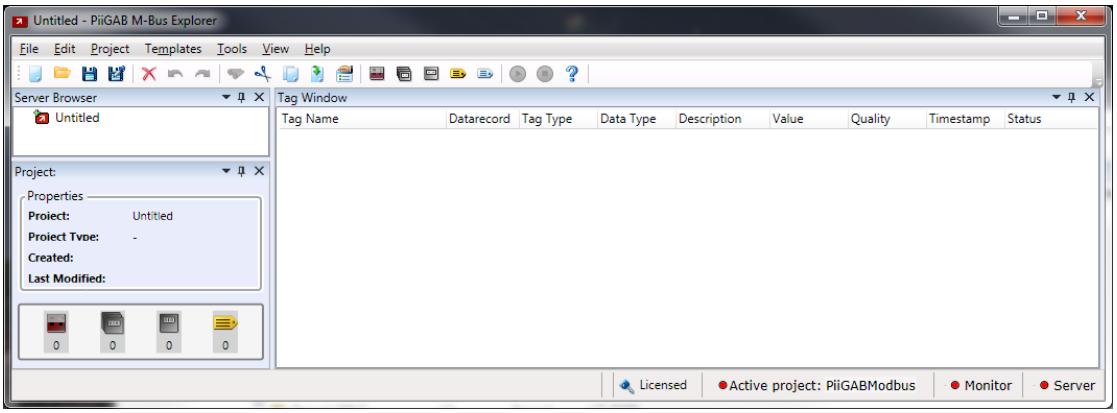
9. Trimming the polling time in the M-Bus ASCII client to handle how quick/slow the M-Bus meter can response.

10. Avoid long read-outs of by reading each M-Bus meter separately.

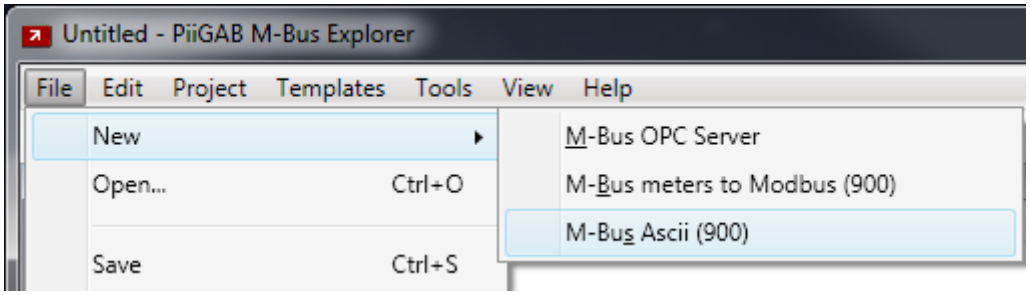
11. The M-Bus ASCII client inside the PiiGAB M-Bus Setup Wizard may be used to test the MBus2MBusASCII configuration.

# 5. Create a M-Bus ASCII project

1. Start PiiGAB M-Bus Explorer.

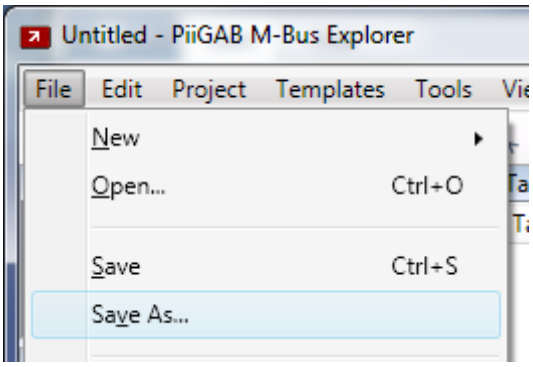



2. Go to *File* menu, select *New* and click on *M-Bus ASCII to M-Bus Ascii (900S).*




An M-Bus ASCII project is created in PiiGAB M-Bus Explorer.

3. Go to *File* menu, click on *Save As…*

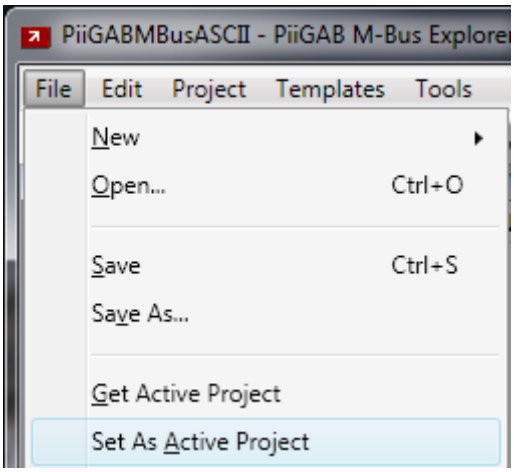



4. Save your project. This example saved the project as *PiiGABMBusASCII*.

## 5.1 Set project as active project for the OPC-server - Optional

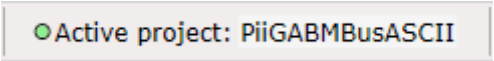
If you want to monitor the M-Bus meters in your M-Bus ASCII project then you have to set the project as the active OPC-server project. Ignore this section if you use the monitor in another project, for example an M-Bus project.

1. Go to *File* menu and click on *Set As Active Project*




By setting the project as the active, the OPC-server will know which configuration file it will load when starting. You must do this if you want to monitor the OPC-items in PiiGAB M-Bus Explorer.

2. Make sure your project is the active project in the bottom right corner of PiiGAB M-Bus Explorer

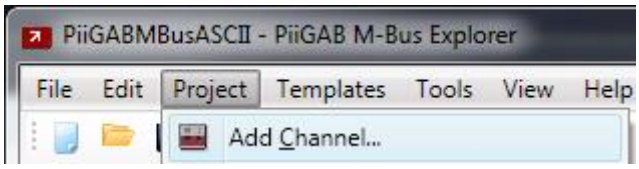



Note:
If you don't wish to monitor in your M-Bus ASCII project, this section is optional.

## 5.2 Create a channel (M-Bus master)

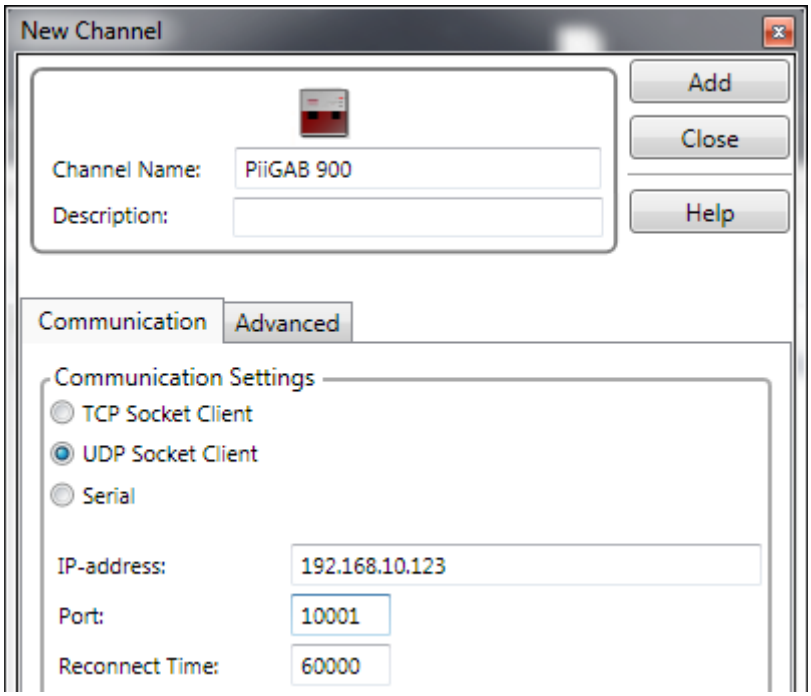
A channel in PiiGAB M-Bus Explorer represents an M-Bus master. The channel needs the M-Bus master's communication parameters. If you don't want to use the monitor function then the channel parameters are unnecessary. You must create a channel nonetheless.

1. Go to *Project* menu and click on *Add Channel…*




Your will see a window to configure the channel.

2. Configure the channel as specified in the picture below.



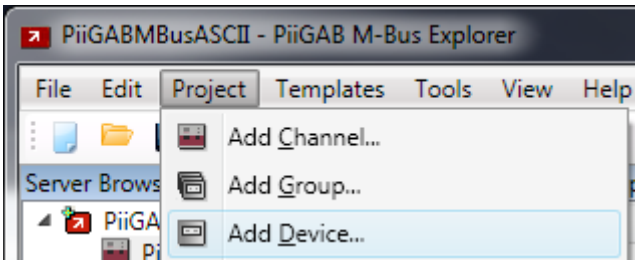

3. Press *Add* to create the channel and add it into the project's tree view.

<u>Note:</u>
The channel's settings are usually the same as used in the PiiGAB M-Bus Setup Wizard. Your gateway may have another IP-address; change the configuration for your setup. If your gateway communicates is serial, choose serial settings instead.

This configuration expects that Slave port 1 in the PiiGAB M-Bus 900S is configured for M-Bus communication on port 10001 with UDP protocol. Slave port 1 will be used to monitor the OPC-items in PiiGAB M-Bus Explorer.

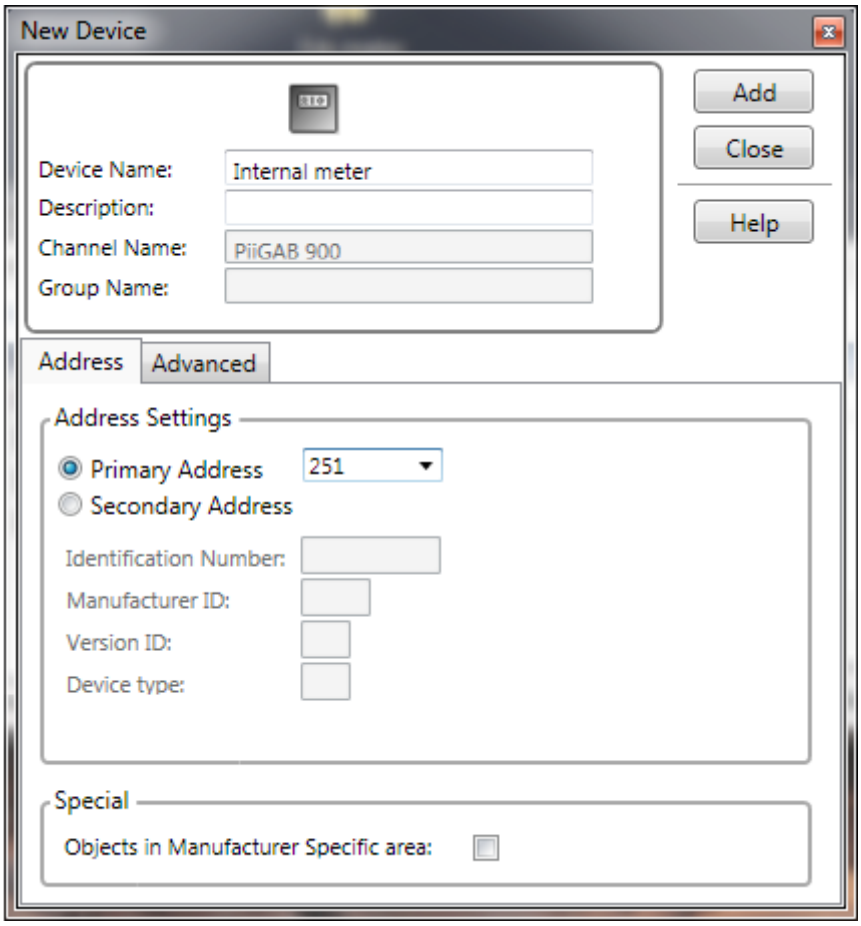
## 5.3 Create a meter for PiiGAB M-Bus 900S's internal meter

1. Go to the *Project* menu and click on *Add Device…*




Your will see a window to configure the device.

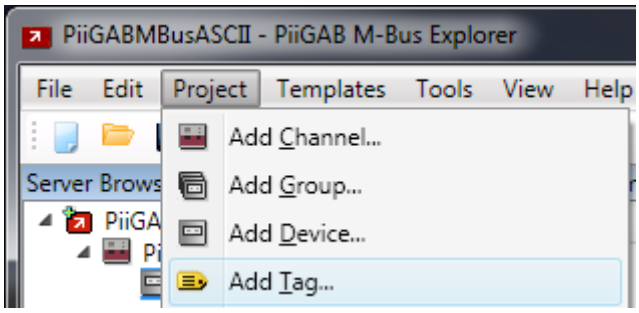
2. Configure the device as specified in the picture below.




3. Press *Add* to create the device and add it into the project.

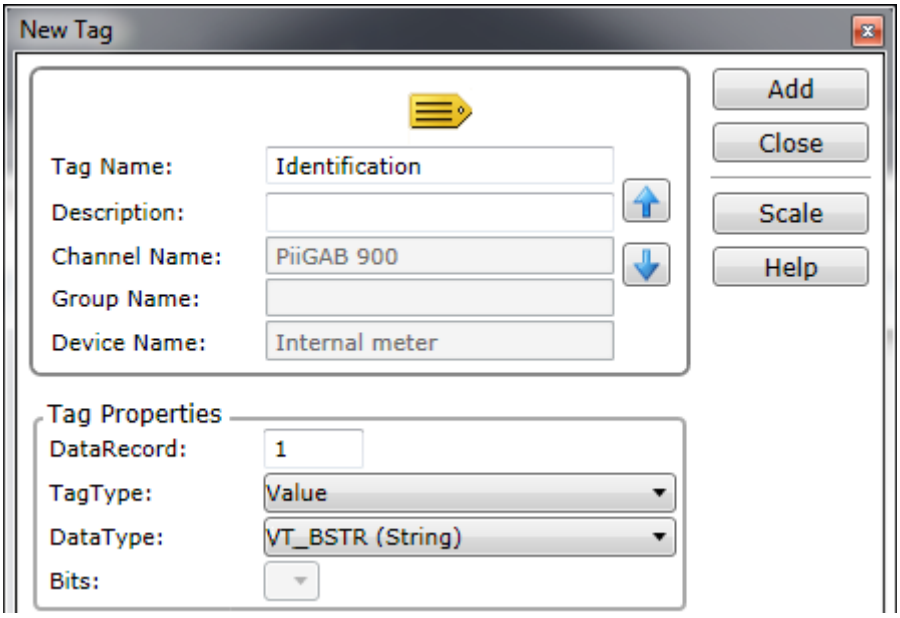
## 5.4 Create an OPC-item for the internal meter

1. Go to the *Project* menu and click on *Add Tag…*




Your will see a window to configure the OPC-item.

2. Configure the OPC-item as specified in the picture below




3. Press add to create the OPC-item and add it into the meter's view

   This OPC-item will read the PiiGAB M-Bus 900S's identification (serial number). Notice that the OPC-item's data type is string (VT_BSTR) which is mandatory for M-Bus ASCII.

Repeat the steps in section 5.3 and 5.4 until you have created a configuration for any meter for your site/project.

Please see the manual of the PiiGAB M-Bus 900S for a detailed list of what objects to read from the internal meter.

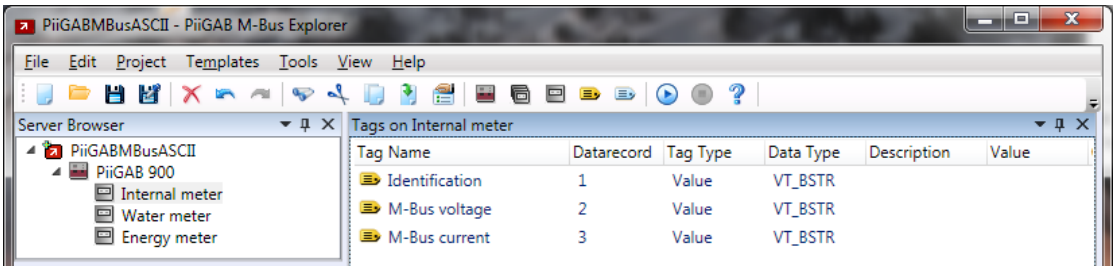
You may want to use *Getting started PiiGAB M-Bus Explorer* to find out what you can acquire from any M-Bus meter.

# 6. Simple M-Bus ASCII configuration of M-Bus meters

This section will show a simple configuration of three M-Bus meters. Please see the *Getting started PiiGAB M-Bus Explorer M-Bus* for more details on how to setup such a configuration as these three.

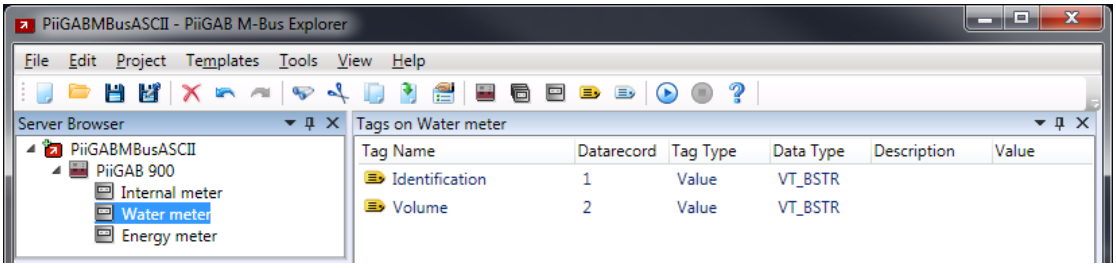
## 6.1 PiiGAB M-Bus 900S's internal meter

| Object | Value |
|---|---|
| Primary address | 251 |
| Telegrams | 1 |



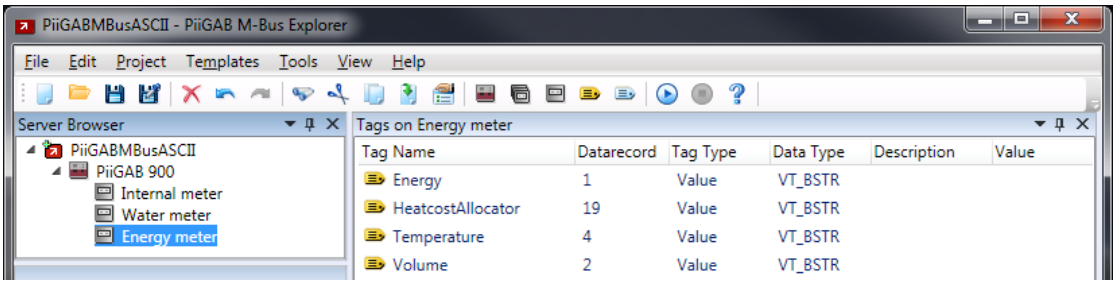

## 6.2 Water meter

| Object | Value |
|---|---|
| Primary address | 11 |
| Telegrams | 1 |




## 6.3 Energy meter

| Object | Value |
|---|---|
| Primary address | 1 |
| Telegrams | 3 |



# 7. Why M-Bus telegrams may cause problems

Those M-Bus meters that are multi telegram meters you must take in extra consideration. It is mandatory for you to specify how many telegrams you want to read from an M-Bus meters. Please see *Getting started PiiGAB M-Bus Explorer M-Bus* to find out if a meter is a single or multi telegram meter.

Multi telegram meters may contain two or more telegrams. In some cases there can be up to 40+ telegrams. If you don't specify how many telegrams you want to read from an M-Bus meter, PiiGAB M-Bus 900S will read all telegrams in the M-Bus meter. This can, in worst case, take several seconds or tens of seconds to complete the reading. As a result this may cause the M-Bus ASCII client to timeout.

## 7.1 Theoretic example

Image an M-Bus meter with 40 telegrams, each telegram take about 750ms to read.

| **Telegram** | **Time to read** |
|---|---|
| Telegram1 | 750ms |
| Telegram2 | 750ms |
| Telegram3 | 750ms |
| Telegram4 | 750ms |
| | … |
| Telegram15 | 750ms |
| Telegram16 | 750ms |
| Telegram17 | 750ms |
| Telegram18 | 750ms |
| Telegram19 | 750ms |
| | … |
| Telegram37 | 750ms |
| Telegram38 | 750ms |
| Telegram39 | 750ms |
| Telegram40 | 750ms |
| **Total** | **30000ms or 30s** |

The master port in PiiGAB M-Bus 900S will therefore be occupied for 30000ms reading just this M-Bus meter. The M-Bus ASCII client must wait at least 30000ms for the response.

It's very unlikely that you need to read all 40 telegrams from the M-Bus meters. You can specify how many telegrams you need to read for all M-Bus meters. Please see the *Getting started PiiGAB M-Bus Explorer M-Bus* which explains how to do this.

It's more likely you only need to read the first, second and third telegrams - but properly only the first telegram. The time to read will then only be 750ms. This will cause the timeout for the M-Bus ASCII client to decrease dramatically.

## 7.2 Find telegrams in an M-Bus meter and specify how many to read

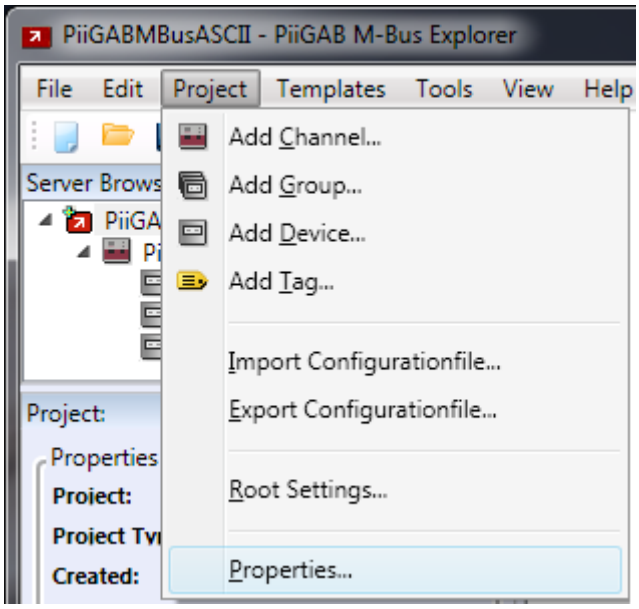
The *Getting started PiiGAB M-Bus Explorer M-Bus* describes the process of finding out how many telegrams it's necessary to read and how to specify that for a M-Bus meter. Section 7.*3 Energy meter* represents an M-Bus meter which contains many telegrams. Only three are useful to read. All other telegrams are useless and will only waste time and band width.

# 8. Configure the PiiGAB M-Bus 900S for M-Bus ASCII

When you have completed the configuring of your M-Bus ASCII project you are ready to try the configuration in your PiiGAB M-Bus 900S. Hopefully you have checked with the Monitor function that all OPC-items have a value that you expect. This is optional but it's well worth it if you can use the Monitor function.

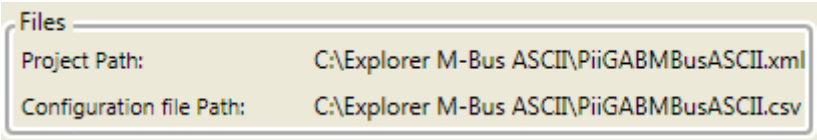
## 8.1 Finding the folder with the M-Bus ASCII configuration files

1. Go to the *Project* menu and click on *Properties…*




A new window will appear which will show some project data.

2. Look in the *Files* box which will display where the configuration files are located




The location of the CSV-file specified by *Configuration file Path* is the file that contains the MBus2MBusASCII configuration. These file must be uploaded into your PiiGAB M-Bus 900S to allow M-Bus ASCII communication with the M-Bus ASCII client.

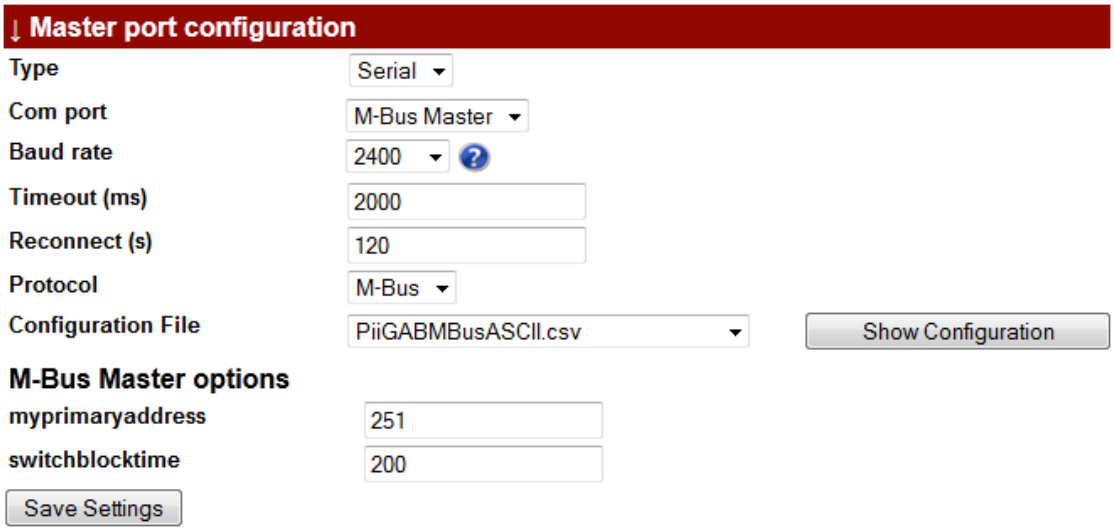
## 8.2 Upload the M-Bus ASCII configuration into the PiiGAB M-Bus 900S

1. Open PiiGAB M-Bus 900S's web interface.
2. Click on *Configuration*.
3. Find the *Upload CSV-file* section in the configuration page.


4. Press the browse button *(Bläddra…)* and browse to the CSV-file at the location specified in section 8.1 *step 2*.
5. Press the *Upload* button to upload the file.

## 8.3 Configure the Master port

1. Click on the *Master port* tab in the configuration page
2. In the *Configuration File* field, specify the CSV-file for the Master port.




3. Press the *Save Settings* button

## 8.4 Configure the slave port for the M-Bus ASCII client

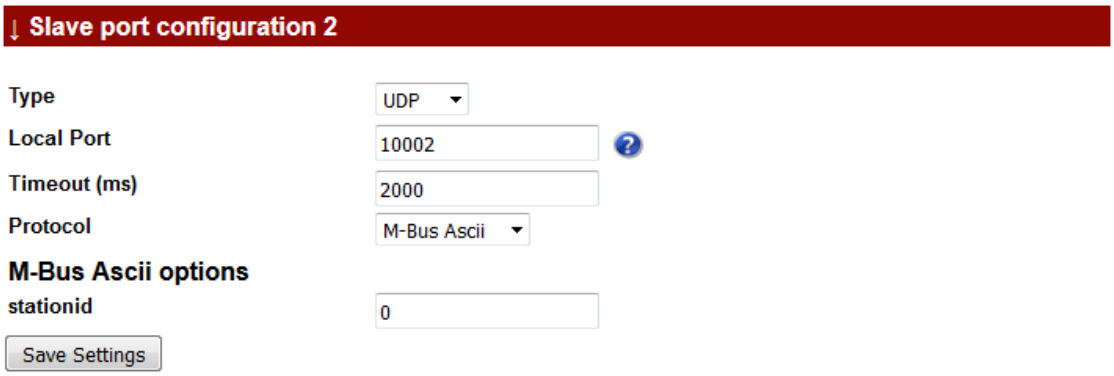
You are maybe already using one slave port for M-Bus communication with PiiGAB M-Bus Explorer and PiiGAB M-Bus Setup Wizard. It's recommended that you leave that slave port and don't re-configure it. That slave port can be used with PiiGAB M-Bus Explorer and PiiGAB M-Bus Setup Wizard for debugging and testing. If you have a slave port which is unused then please use it for the M-Bus ASCII client.

1. Click on the *Slave port* tab in the configuration page, for example *Slave port 2*.
2. Configure the slave port's parameters to communicate with the M-Bus ASCII client
3. The *Protocol* field must be *M-Bus ASCII*
4. Press the *Save Settings* button

Both Master port and Slave port are now configured to handle M-Bus ASCII request from the M-Bus ASCII client.

## 8.5 Configure the slave port for PiiGAB M-Bus Setup Wizard's M-Bus ASCII client - Optional

1. Click on the *Slave port* tab in the configuration page, for example *Slave port 2*
2. Configure the slave port as the picture below



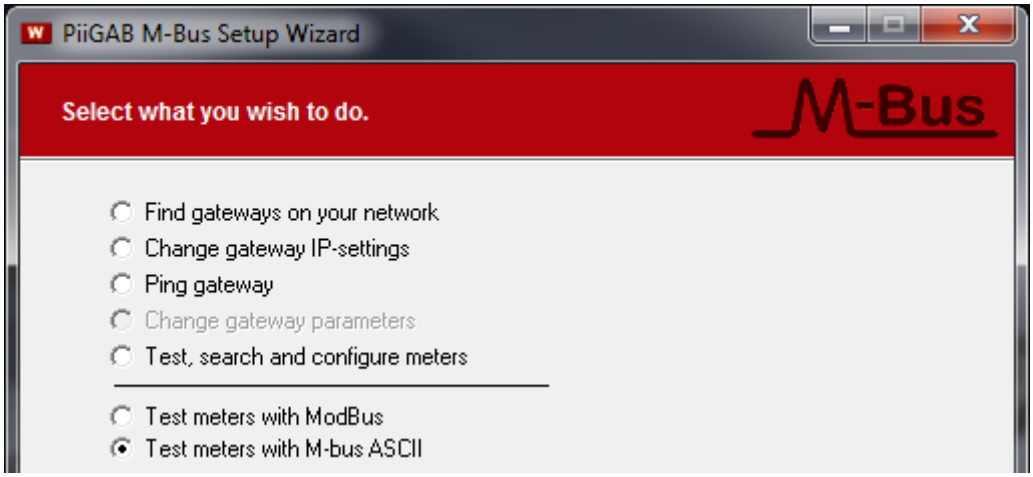

3. Press the *Save Settings* button

# 9. Test M-Bus ASCII configuration with PiiGAB M-Bus Setup Wizard – Optional

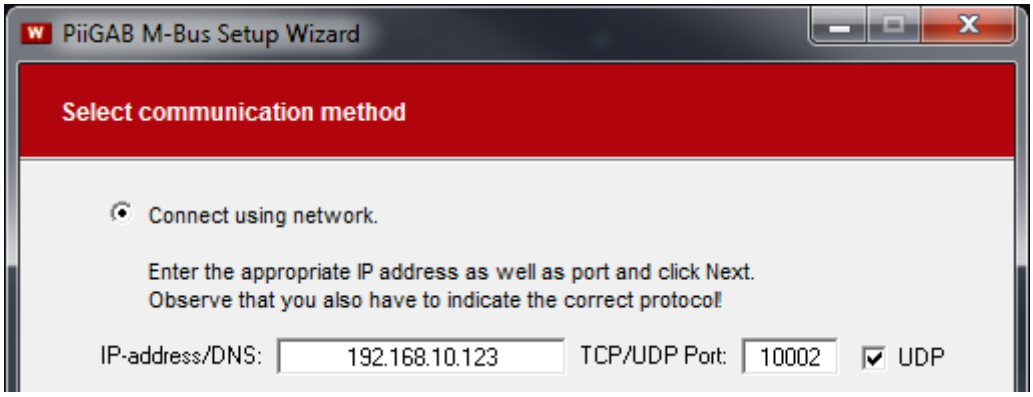
Before you test with the actual M-Bus ASCII client, you may test the M-Bus ASCII configuration with the built-in M-Bus ASCII client in PiiGAB M-Bus Setup wizard. The M-Bus ASCII client in PiiGAB M-Bus Setup Wizard is free and is a generic M-Bus ASCII client not in any way bound to PiiGAB's hardware.

Note:
Please make sure you have configured a slave port for M-Bus ASCII communication according to section 8.5.

1. Download and install the latest version of *PiiGAB M-Bus Setup Wizard* on PiiGAB's home page: www.piigab.com.
2. Start PiiGAB M-Bus Setup Wizard and make sure you have at least version 3.1.0
3. In the main menu, select *Test meters with M-bus ASCII*




4. Press *Next* to continue
5. Select *Connect using network* and configure the connection as shown in the picture below




Note:
Your PiiGAB M-Bus 900S's IP-address may not be 192.168.10.123. Change to your PiiGAB M-Bus 900S's IP-address.

6. Press *Next* to continue

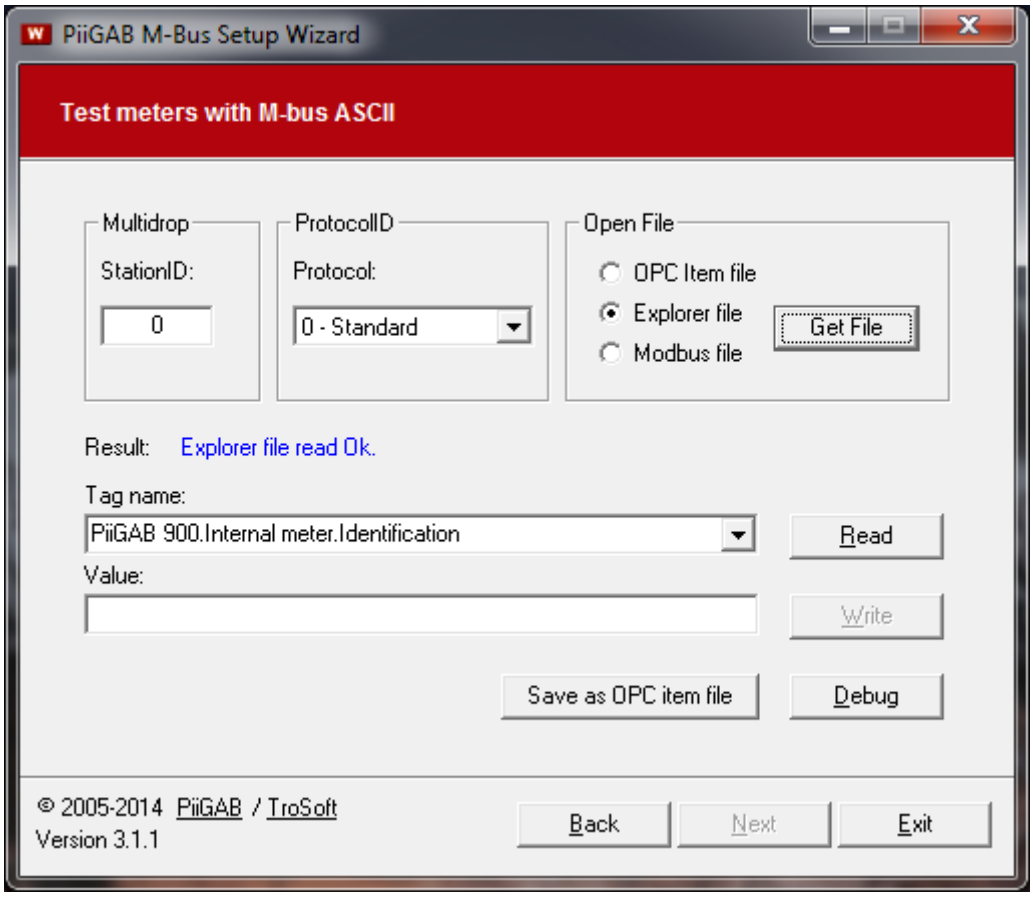
Note:
The following configurations will follow the configuration made in PiiGAB M-Bus Explorer at section 6 *Simple M-Bus ASCII configuration of M-Bus meters*. All three M-Bus meters will be tested. You may have PiiGAB M-Bus Explorer running with the Monitor function active to verify that you receive the same values both in PiiGAB M-Bus Explorer and PiiGAB M-Bus Setup Wizard.

## 9.1 Load the M-BUS ASCII CSV-file configuration

The configuration you made in PiiGAB M-Bus Explorer can be loaded into PiiGAB M-Bus Setup Wizard so you don't need to manual type what OPC-item you want to read.

1. Select *Explorer file* in the *Open File* box
2. Press the *Get File* button
3. Browse to the CSV-file at the location specified in section 8.*1 step 2*.

PiiGAB M-Bus Setup Wizard will load the CSV-file, in *Tag name* you can select the OPC-items you created.



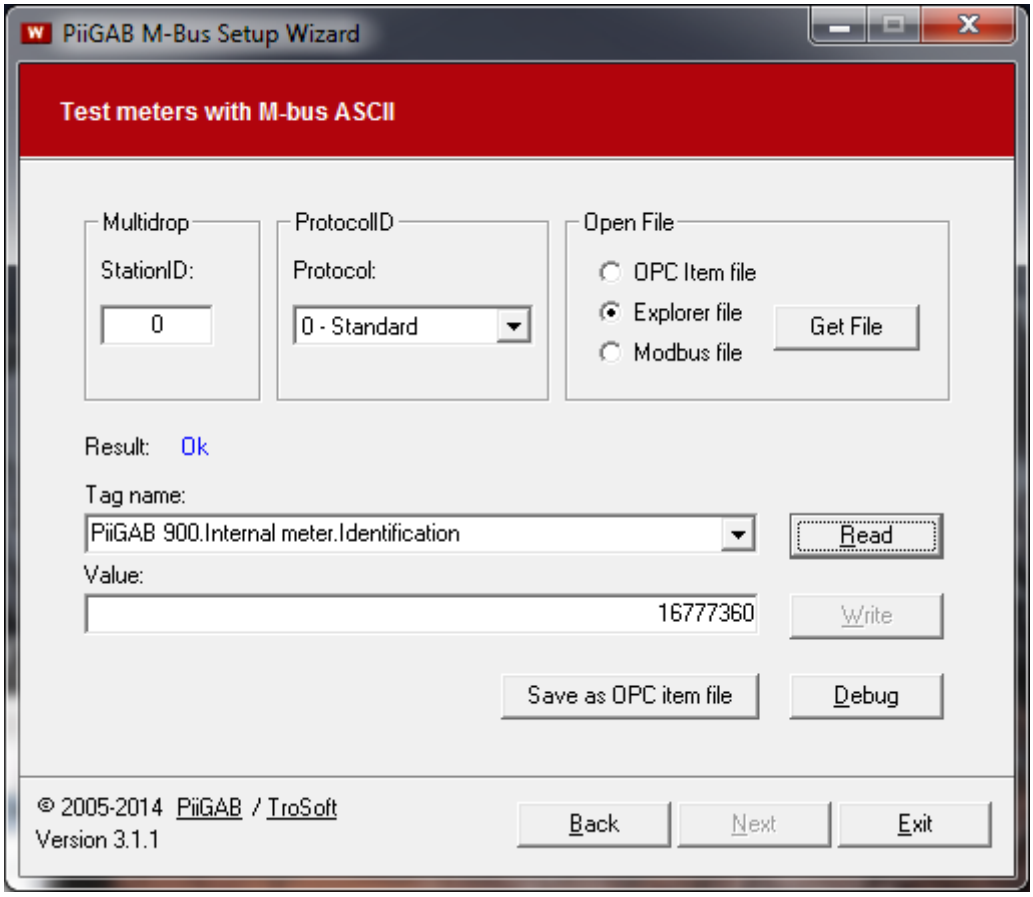
## 9.2 Test M-Bus ASCII configuration with the PiiGAB M-Bus 900S's internal meter

This configuration of PiiGAB M-Bus Setup Wizard will read the internal meter inside the PiiGAB M-Bus 900S.

1. In *Tag name* drop-down-list select either of:
    - PiiGAB 900.Internal meter.Identification
    - PiiGAB 900.Internal meter.M-Bus voltage
    - PiiGAB 900.Internal meter.M-Bus current

2. Press the *Read* button to read the internal meter

Here is the result of PiiGAB M-Bus Setup Wizard reading the *Internal meter* over M-Bus ASCII.



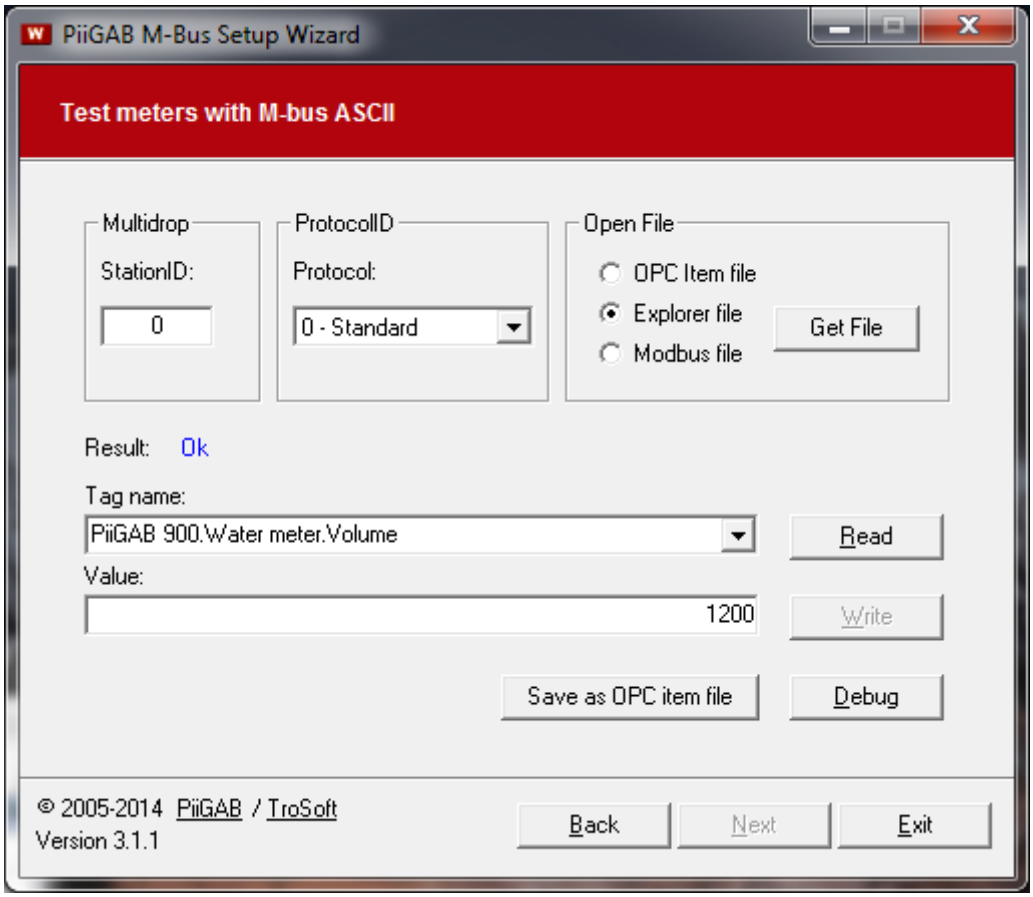
## 9.3 Test M-Bus ASCII configuration with the water meter

This configuration of PiiGAB M-Bus Setup Wizard will read the internal meter inside the PiiGAB M-Bus 900S.

1. In *Tag name* drop-down-list select either of:
   - PiiGAB 900.Water meter.Identification
   - PiiGAB 900.Water meter.Volume

2. Press the *Read* button to read the water meter

Here is the result of PiiGAB M-Bus Setup Wizard reading the *Water meter* over M-Bus ASCII.



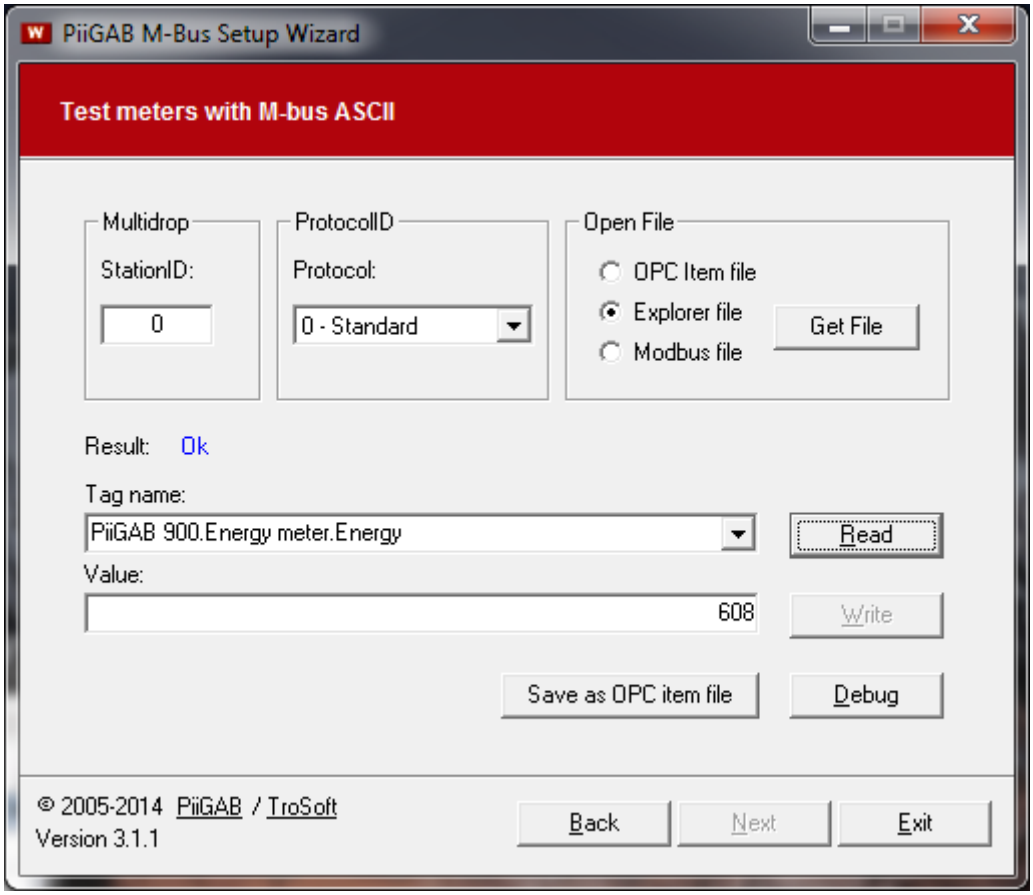
## 9.4 Test M-Bus ASCII configuration with the energy meter

This configuration of PiiGAB M-Bus Setup Wizard will read the internal meter inside the PiiGAB M-Bus 900S.

1. In *Tag name* drop-down-list select either of:
    - PiiGAB 900.Energy meter.Energy
    - PiiGAB 900.Energy meter.Volume
    - PiiGAB 900.Energy meter.Temperature
    - PiiGAB 900.Energy meter.HeatcostAllocator

2. Press the *Read* button to read the energy meter

Here is the result of PiiGAB M-Bus Setup Wizard reading the *Energy meter* over M-Bus ASCII.



# 10. Timeout, polling time and M-Bus meters readout

To get a stable M-Bus ASCII communication there are several parameters which might cause problems if they are incorrect or ignored.

## 10.1 Timeouts

The example with the *Energy meter* in section 7.3 describes an M-Bus meter with three telegrams which takes about 2,6 seconds in total to read. For this configuration this is the longest time where the PiiGAB M-Bus 900S is occupied before it will return with a response to the M-Bus ASCII client. The M-Bus ASCII client's timeout must take this time into consideration.

### 10.1.1 Slave port timeout

The slave port's timeout is really simple to set. Since the slave port awaits a response from the Master port the slave port's timeout can be specified to 3000ms.

### 10.1.2 M-Bus ASCII client's timeout

Since the M-Bus ASCII client awaits a response from the slave port the M-Bus ASCII client must await a minimum of 3000ms. But the M-Bus ASCII client's must also take in consideration how long it will take to transport the response from the slave port back to the M-Bus ASCII client. This time, which might in some cases can be ignored, but with serial communication this might cause some extra time to elapse before the response arrives. The M-Bus ASCII client's timeout must handle this possible extra time. Try with 4000ms to start and adjust if necessary.

## 10.2 Polling time

Try to avoid reading the M-Bus meters with extremely fast polling frequency in your M-Bus ASCII client. When you combine M-Bus meters to an M-Bus ASCII site through a PiiGAB M-Bus 900S you have to take in consideration how long it will take to read the M-Bus meters and what value the timeout is specified for the M-Bus ASCII client. The *Energy meter* in section 7.3 has a total read-out time of 2,6 seconds. Requesting data from this M-Bus meter faster then 2,6 seconds is meaningless and will only cause problems. Also if your M-Bus ASCII client's timeout is set to 4000ms (maybe to handle the Energy meter) then there is no need to request data faster than that timeout. You can also consider how often you shall acquire data from the M-Bus meters. Maybe you only need to read the M-Bus meters once each minute, each hour or once each day. Avoiding extremely fast requesting time will make a more stable site. If you cannot control the polling time then your M-Bus ASCII client might not be suited for your site.

## 10.3 Read M-Bus meters separately

This document's example has three M-Bus meters. Requesting all three M-Bus meters from the M-Bus ASCII client at the same time will cause higher response time then reading meter per meter.

| M-Bus meter | Response time | Round up time |
|---|---|---|
| Internal | < 1000ms | 1000ms |
| Water | < 1000ms | 1000ms |
| Energy | About 2600ms | 3000ms |
| **Total** | **4600ms** | **5000ms** |

Requesting all M-Bus meter will take about 4600ms but can be rounded up to 5000ms. The M-Bus ASCII client's timeout must be higher, for instance about 6000ms. Therefore you are better to request each M-Bus meter separately to avoid long read-out times.

# 11. Appendix

## 11.1 Contacts

**PiiGAB Processinformation**
Anders Carlssons gata 7
417 55 Göteborg
Sweden

Phone + 46 31 55 99 77
www.piigab.com

## Distributors

Please contact our distributors in respective countries:

### Germany

**Relay GmbH**
Stettiner Str. 38
33106 Paderborn
Germany

Phone +49 5251 17670
www.relay.de

### Norway

**Autic Systems AS**
Stoltenbergs gate 48
3110 Tønsberg
Norway

Phone +47 33 30 09 50
www.autic.no

### Czech Republic

**Papouch store s.r.o.**
Strasnicka 3165/1b
102 00 PRAGUE 10
Czech Republic

Phone +420 267 314 267-8
www.papouch.com