

Getting started MBus2MBusASCII

PiiGAB M-Bus Explorer & PiiGAB M-Bus 900

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1. Document Information

This document will describe how to configure a PiiGAB 900 in PiiGAB Explorer for M-Bus ASCII communication. The document will use the internal M-Bus meter inside the PiiGAB 900 and two external M-Bus meters.

1.1 Versions

Version	Modified by	Detail
1.00.00	Stefan Eriksson	Initial version
1.00.01	Stefan Eriksson	Edited distributor contact information

2. Preconditions

Object	Detail/Other
One PiiGAB 900	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 Explorer / M-Bus OPC-server	Version 2.00.00.000 or later
Getting started PiiGAB Explorer M-Bus	

3. Requirements

- PiiGAB Explorer

4. Optional requirements

- PiiGAB M-Bus Setup wizard version 3.1.0 or later

5. Steps to setup M-Bus ASCII communication

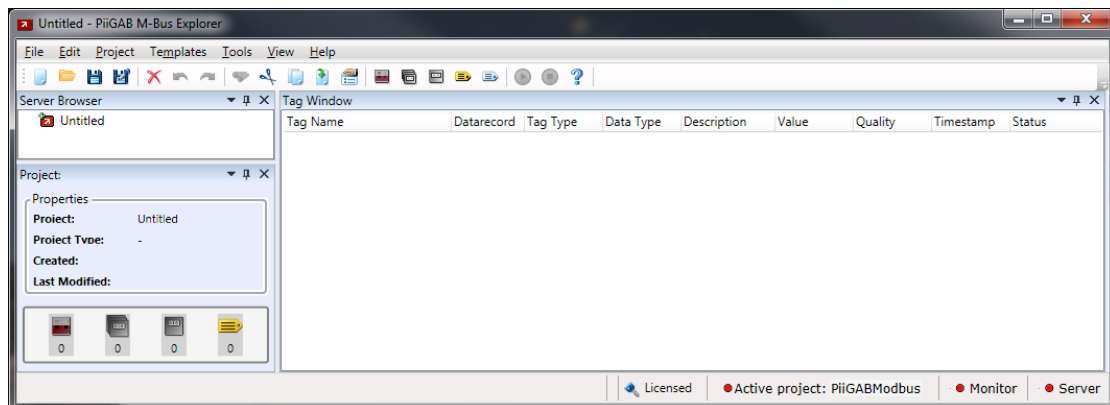
There are many steps to configure a PiiGAB 900 for M-Bus ASCII communication. Many of these steps require pure M-Bus communication and configuration in PiiGAB Explorer. There are some tips and tricks to make the configuration easier.

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

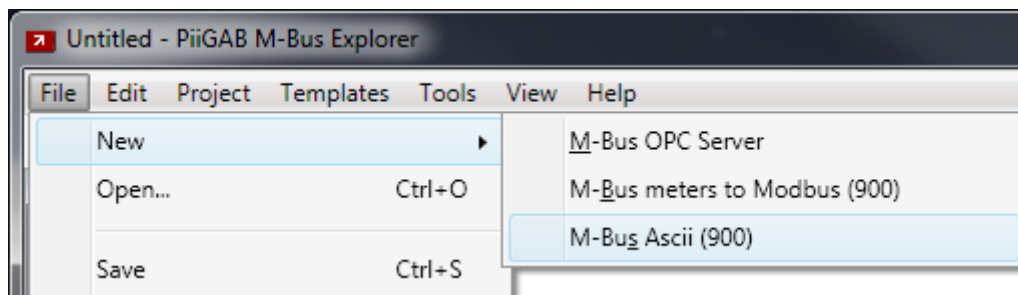
1. Make sure you have connection to the PiiGAB 900 and the M-Bus meters with PiiGAB Wizard
2. Your PiiGAB 900 must have M-Bus ASCII present in its license
3. There is a great advantage if your PiiGAB 900 has two slave ports available:
 - Slave port 1 for M-Bus communication with PiiGAB Wizard and PiiGAB Explorer
 - Slave port 2 for M-Bus ASCII communication with the M-Bus ASCII client
4. Two projects opened in PiiGAB Explorer is a good way when configuring:
 - One M-Bus project to monitor the M-Bus meters through slave port 1
 - One Modbus project for M-Bus ASCII configuration
5. The *Getting started PiiGAB Explorer M-Bus* is a great help to configure M-Bus
6. You should use the *Browse* template in PiiGAB 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 900 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 back
10. Avoid long read-outs of M-Bus meters by reading them separately
11. The M-bus ASCII client inside the PiiGAB M-Bus Setup Wizard may be used to test the M-Bus ASCII configuration

6. Create a M-Bus ASCII project

1. Start PiiGAB Explorer

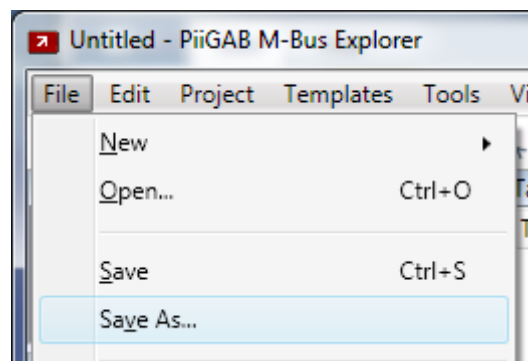


2. Go to *File* menu, select *New* and click on *M-Bus ASCII to M-Bus Ascii (900)*



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

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

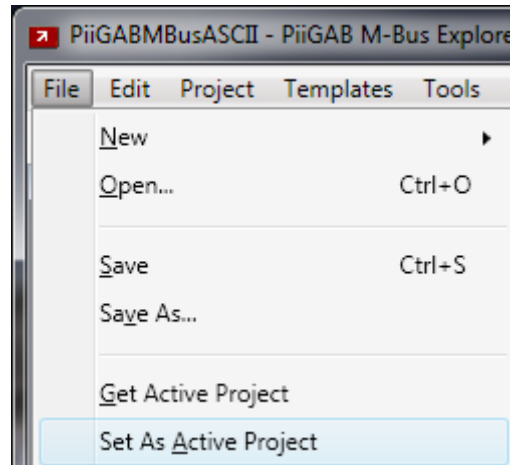


4. Save your project. This example saved the project as *PiiGABMBusASCII*.

6.1 Set project as active project for the OPC-server - Optional

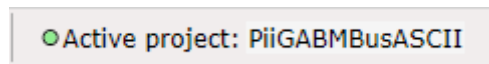
If you want to monitor the M-Bus meters in PiiGAB Explorer you have to set the project as the active OPC-server project.

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-tags in PiiGAB Explorer.

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



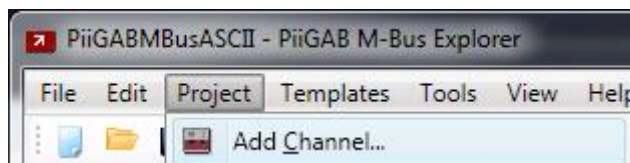
Note:

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

6.2 Create a channel (M-Bus master)

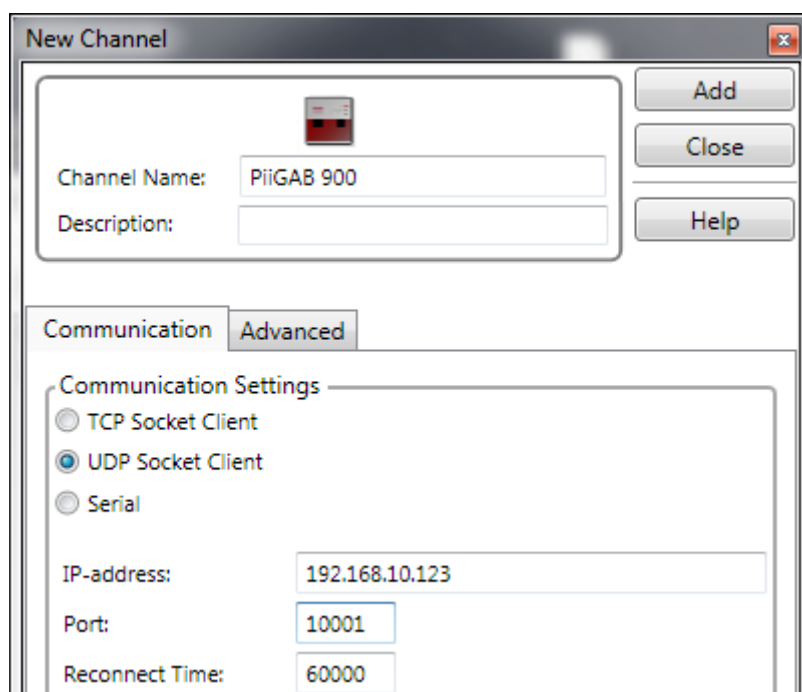
A channel in PiiGAB Explorer represents an M-Bus master. The channel needs the M-Bus master's communication parameters.

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



You 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

Note:

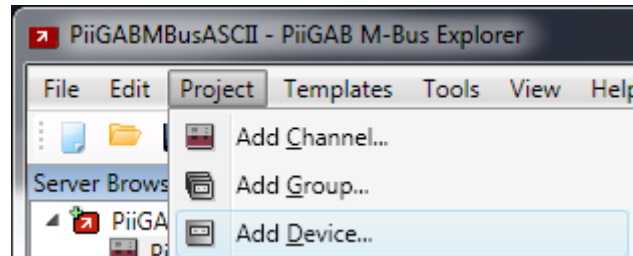
The channel's settings are usually the same as used in the PiiGAB M-Bus Setup Wizard. Your gateway may have another IP-address; change the configuration for your setup. If your gateway communicates serial, choose serial settings instead.

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

If you don't want to use the monitor function then the channel parameters are unnecessary.

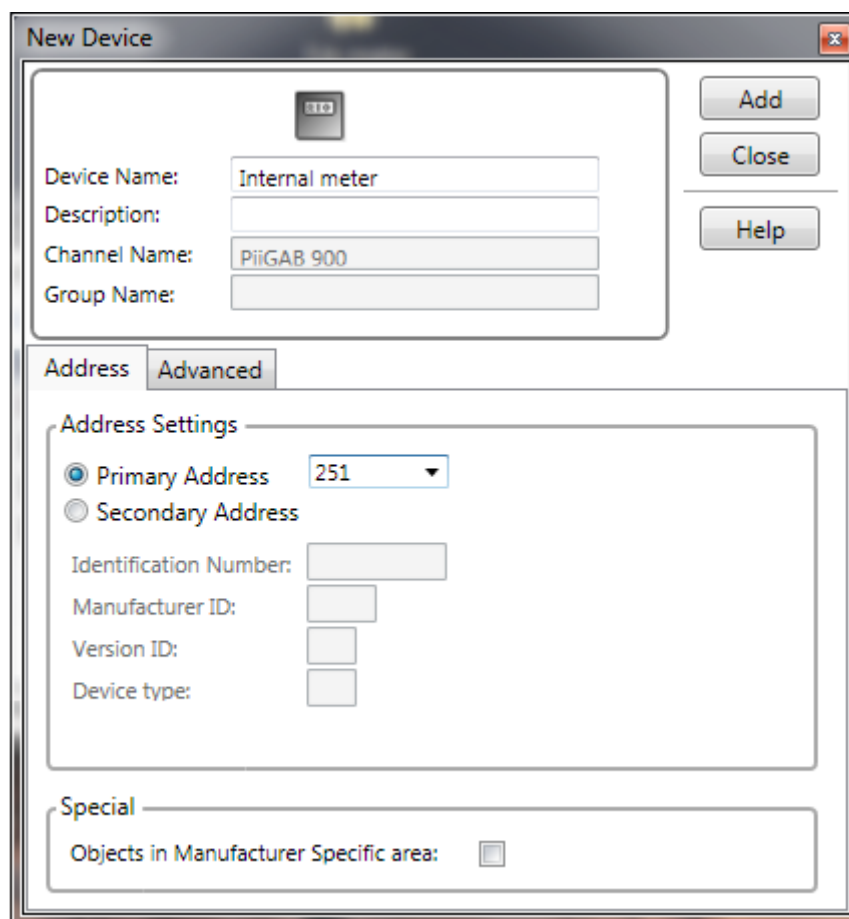
6.3 Create a meter for PiiGAB 900's internal meter

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



You will see a window to configure the device.

2. Configure the device as specified in the picture below



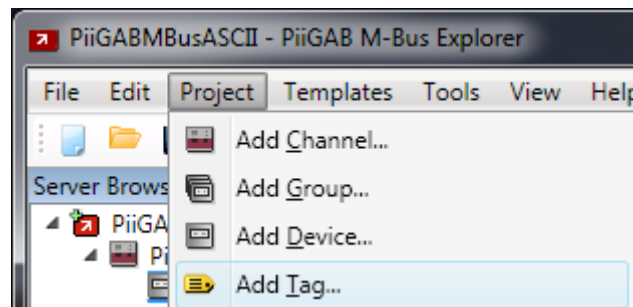
The 'New Device' window contains the following fields and controls:

- Device Name:** Internal meter
- Description:** (empty)
- Channel Name:** PiiGAB 900
- Group Name:** (empty)
- Buttons:** Add, Close, Help
- Address Settings:**
 - ☒ Primary Address: 251
 - ☐ Secondary Address
 - Identification Number: (empty)
 - Manufacturer ID: (empty)
 - Version ID: (empty)
 - Device type: (empty)
- Special:**
 - Objects in Manufacturer Specific area: ☐

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

6.4 Create a tag for the internal meter for M-Bus ASCII

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



You will see a window to configure the tag.

2. Configure the tag as specified in the picture below

New Tag

Tag Name: Identification

Description:

Channel Name: PiiGAB 900

Group Name:

Device Name: Internal meter

Tag Properties

DataRecord: 1

TagType: Value

DataType: VT_BSTR (String)

Bits:

Buttons: Add, Close, Scale, Help

3. Press add to create the tag and add it into the meter's view

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

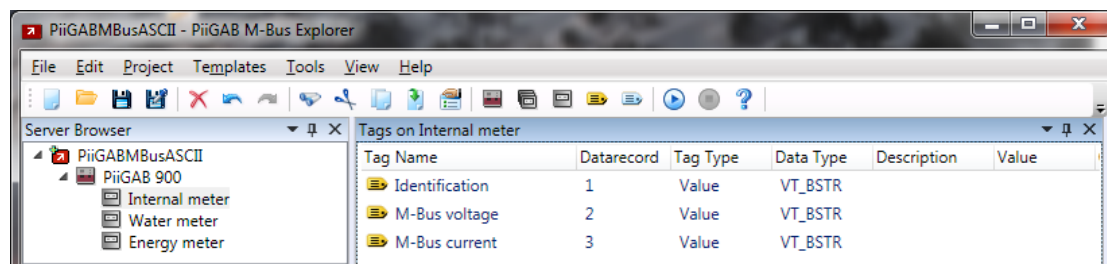
Repeat the steps in section 6.3 and 6.4 until you have created a configuration that suits your site. You may want to use *Getting started PiiGAB Explorer M-Bus* to find out what you can acquire from an M-Bus meter.

7. 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 Explorer M-Bus* for more details on how to setup such a configuration as these three.

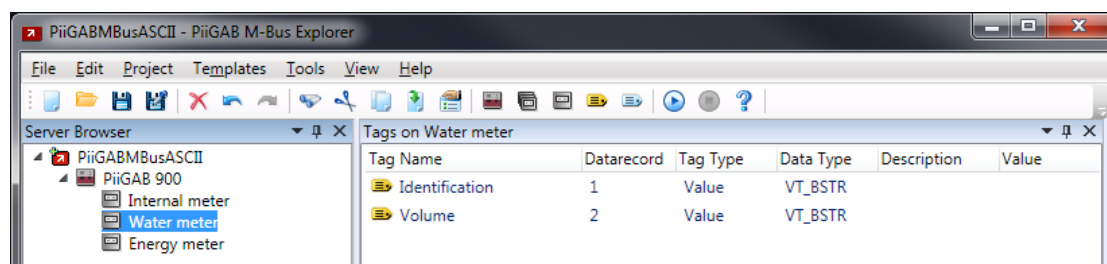
7.1 PiiGAB 900's internal meter

Object	Value
Primary address	251
Telegrams	1



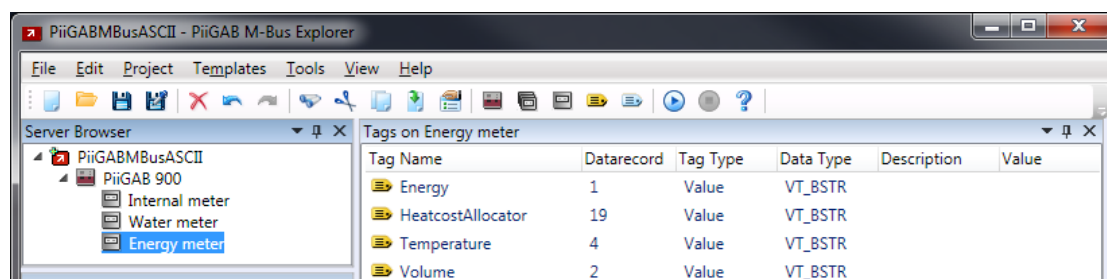
7.2 Water meter

Object	Value
Primary address	11
Telegrams	1



7.3 Energy meter

Object	Value
Primary address	1
Telegrams	3



8. 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 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 900 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 Modbus client to timeout.

8.1 Theoretic example

Imagine 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 900 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 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.

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

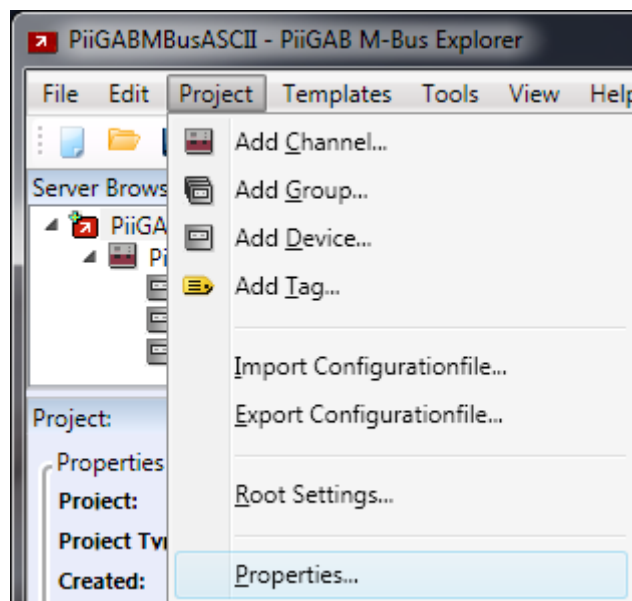
The *Getting started PiiGAB Explorer M-Bus* describes the process of finding out how many telegrams it's necessary to read and how to specify that for a M-Bus meter. Section 7.3 *Energy meter* represents an M-Bus meter which contains many telegrams. Only three are useful to read. All other telegrams are useless and will only waste time and band width.

9. Configure the PiiGAB 900 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 900. Hopefully you have checked with the Monitor function that all tags have a value that you expect. This is optional but it's well worth it if you can use the Monitor function.

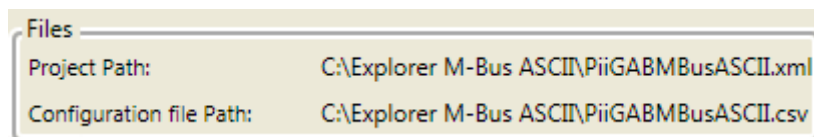
9.1 Finding the folder with the M-Bus ASCII configuration files

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 M-Bus ASCII configuration. These file must be uploaded into your PiiGAB 900 to allow M-Bus ASCII communication with the M-Bus ASCII client.

9.2 Upload the M-bus ASCII configuration into the PiiGAB 900

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

Upload CSV-File

Bläddra...

Upload

4. Press the browse button (*Bläddra...*) and browse to the CSV-file at the location specified in section 9.1 step 2
5. Press the *Upload* button to upload the file

9.3 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.

Master port configuration

Type

Serial

Com port

M-Bus Master

Baud rate

2400

?

Timeout (ms)

2000

Reconnect (s)

120

Protocol

M-Bus

Configuration File

PiiGABMBusASCII.csv

Show Configuration

M-Bus Master options

myprimaryaddress

251

switchblocktime

200

Save Settings

3. Press the *Save Settings* button

9.4 Configure the slave port for the M-Bus ASCII client

You are maybe already using one slave port for M-Bus communication with PiiGAB 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 Explorer and PiiGAB 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.

9.5 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

↓ Slave port configuration 2

Type: UDP

Network card: ALL

Local Port: 10002

Timeout (ms): 3000

Protocol: M-Bus Ascii

M-Bus Ascii options

stationid: 0

Save Settings

3. Press the *Save Settings* button

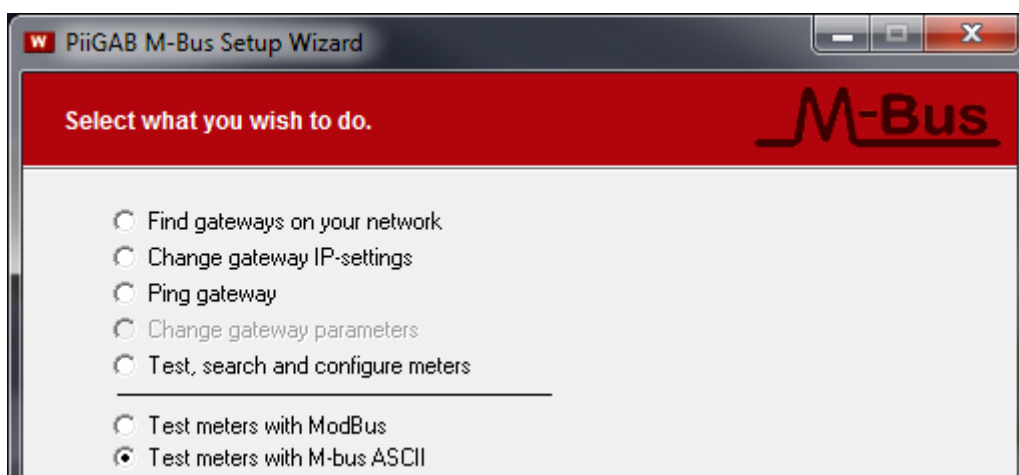
10. Test M-Bus ASCII configuration with PiiGAB M-Bus Setup Wizard – Optional

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 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 9.5.

1. Download and install the latest version of *PiiGAB M-Bus Setup Wizard* on PiiGAB's home page: www.piigab.com
2. Start PiiGAB 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 900's IP-address may not be 192.168.10.123. Change to your PiiGAB 900's IP-address.

6. Press *Next* to continue

Note:

The following configurations will follow the configuration made in PiiGAB Explorer at section 7 *Simple M-Bus ASCII configuration of M-Bus meters*. All three M-Bus meters will be tested. You may have PiiGAB Explorer running with the Monitor function active to verify that you receive the same values both in PiiGAB Explorer and PiiGAB Wizard.

10.1 Load the M-BUS ASCII CSV-file configuration

The configuration you made in PiiGAB Explorer can be loaded into PiiGAB M-Bus Setup Wizard so you don't need to manual type what tag 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 9.1 *step 2*

PiiGAB M-Bus ASCII will load the CSV-file with the M-Bus ASCII configuration an in *Tag name* you can select the tags you created.

PiiGAB M-Bus Setup Wizard

Test meters with M-bus ASCII

Multidrop
StationID: 0

ProtocolID
Protocol: 0 - Standard

Open File
☐ OPC Item file
☒ Explorer file
☐ Modbus file

Get File

Result: Explorer file read Ok.

Tag name:
PiiGAB 900.Internal meter.Identification

Value:

Read Write

Save as OPC item file Debug

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Version 3.1.1

Back Next Exit

10.2 Test M-Bus ASCII configuration with the PiiGAB 900's internal meter

This configuration of PiiGAB Wizard will read the internal meter inside the PiiGAB 900.

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 Wizard reading the *Internal meter* over M-Bus ASCII.

PiiGAB M-Bus Setup Wizard

Test meters with M-bus ASCII

Multidrop StationID:

ProtocolID Protocol:

Open File

☐ OPC Item file

☒ Explorer file

☐ Modbus file

Result: Ok

Tag name:

Value:

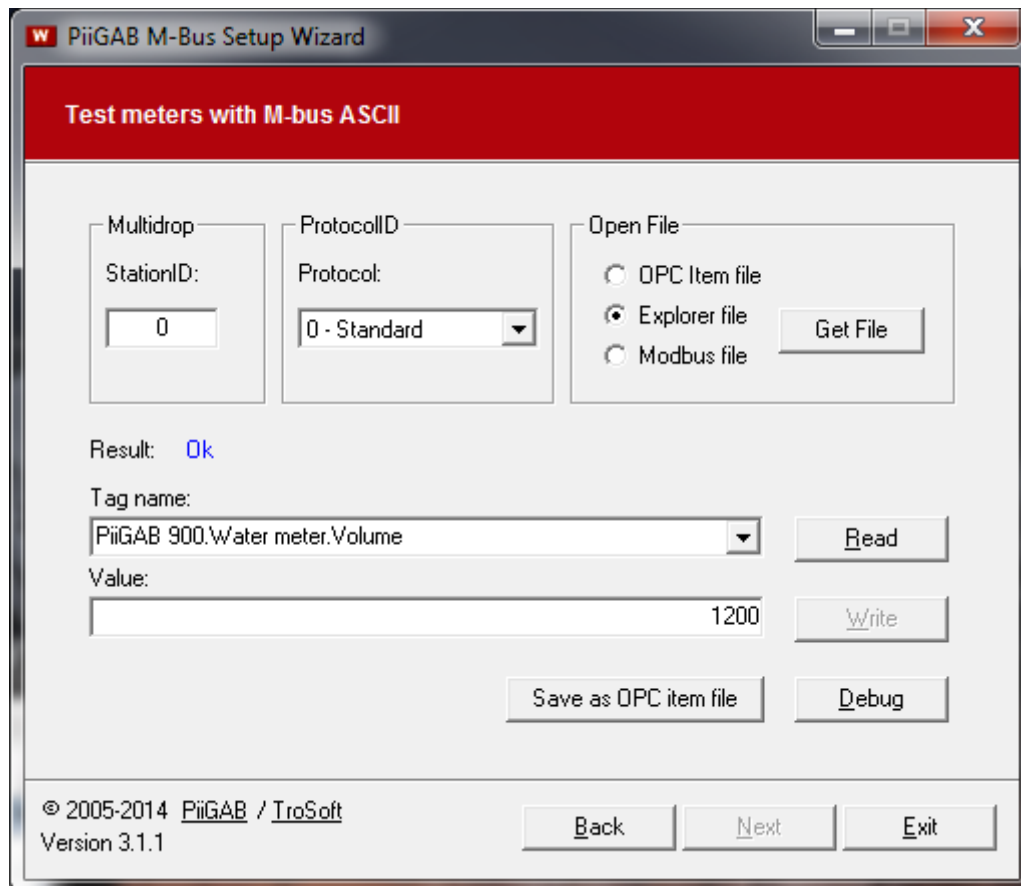
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Version 3.1.1

10.3 Test M-Bus ASCII configuration with the water meter

This configuration of PiiGAB Wizard will read the internal meter inside the PiiGAB 900.

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 Wizard reading the *Water meter* over M-Bus ASCII.



10.4 Test M-Bus ASCII configuration with the energy meter

This configuration of PiiGAB Wizard will read the internal meter inside the PiiGAB 900.

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 Wizard reading the *Energy meter* over M-Bus ASCII.

PiiGAB M-Bus Setup Wizard

Test meters with M-bus ASCII

Multidrop: StationID:

ProtocolID: Protocol:

Open File: ☐ OPC Item file ☒ Explorer file ☐ Modbus file

Result: Ok

Tag name:

Value:

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Version 3.1.1

11. 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.

11.1 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 900 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.

11.1.1 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.

11.1.2 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.

11.2 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 900 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.

11.3 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.

12. Appendix

12.1 Contacts

PiiGAB Processinformation

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