Pi-900S/T Startup Config Documentation

PiiGAB
PROCESSINFORMATION

Contents

1 User starting points

Startup Config can handle a various range of user setups. Either the user uploads a meterlist to the 900-unit or initiates a search for meters via the web interface. Any of PiiGAB 900-units S/T, SW/TW are supported and if the user works on a unit without internal wireless card, the user has to connect a wireless node to receive wireless meters. The wireless nodes supported thus far are PiiGAB 900SW/TW and Elvaco CMi5110.

It's possible to upload a meterlist with only ID numbers where the user must then verify the meters. Verification happens by a REQ_UD2 request, reading meters from wireless nodes, or from the internal wireless card.

All verified meters can be viewed in real-time and their data can be sent to overriding system. Startup config handles wired and wireless M-Bus meters, Modbus meters converted to M-Bus, Han-meters and wireless nodes.

The template file created in Startup Config can be used in other facilities with the same setup and same composition of meters meaning it's possible to make one template file for multiple identical facilities.

2 WebPage: Search

All search functions shut down MBusHub and search directly on the wired M-Bus loop thus no slave ports are available during a search. All meters not connected through the M-Bus loop are excluded as well. Devices that will be found are: 1. Wired M-Bus meters 2. Wireless Nodes connected to the M-Bus loop. 3. Wireless meters that are detected by the wireless nodes.

The search function should ideally only find wired meters.

2.1 Button: Primary Search

synopsis: Search the wired M-Bus loop for M-Bus meters.

By default the search range is over 0 to 251 unless configured otherwise through the web interface. It's possible to supply any range within 0 to 251 inclusive.

The configuration of this function is only for search and thus won't have any effect on the rest of the system. Primary address configuration outside of the search function will arrive in a future update.

2.2 Button: Secondary Search

synopsis: Search the wired M-Bus loop for M-Bus meters using the secondary address of the device.

Depending if you are performing a fast search or slow search the timeout between the SLV_SEL will differ. If you have many meters within the same range it is recommended to perform a slow search. For example you have 30 meters with the id numbers 00012340 - 00012370. Then they will all answer to a SLV_SEL request for adress 0FFFFFFF. This will cause an overload on the mbus loop which it takes 3 seconds to recover from. When the search then sends a SLV_SEL request to 00FFFFFF the meters will not respond. If you have many meters within the same range and you do not find all meters, we recommend to perform an slow search.

	Fast search	Slow search
Timeout	0.3 s	3 s

Secondary search finds all wired meters connected to the M-Bus loop. Search duration depends on the configuration of the secondary address range, the number of meters (both wired and wireless), and on the distribution of ID numbers assigned. The search will take longer when a wireless node is present as each of the wireless meters will respond to the search.

Field	Default value	Description
Ident. Nr	FFFFFFFF	Device ID
Manufacturer	FFFF	Manufacturer number
Version	FF	Version number
Medium	FF	device medium

Only when a meter responds to a REQ_UD2 will the secondary address be saved. Otherwise, if a meter responds to a SLV_SEL but not a REQ_UD2, only the ID number will be saved. It's unlikely for two meters to have the same ID number; in such a case it's unlikely for the meters to respond to a REQ_UD2. This may also occur if there are two or more wireless nodes on the loop as meters within their range may overlap thus causing two responses from the same wireless meter.

The wildcard F will match any value in that specific position for the search. This is useful when searching meters with only partial information about them such as when searching for Kamstrup meters where only filling in the manufacturer code will return all connected Kamstrup meters on the M-Bus loop. The following is an example of search constrained by manufacturer:

Table 3: Wildcard search constrained to a specific manufacturer

Ident. nr	Manufacturer	Version	Medium
FFFFFFFF	2C2D	FF	FF

The search will only find meters with 2C2D in the manufacturer code.

If you use wildcard in every position of the secondary address the search will then send a SLV_SEL to all ID numbers between 00000000 to 99999999 and finally a REQ_UD2 when the full address of a responding meter has been found. Thus it's recommended to always constrain the search with known parameters when possible. An example follows:

Table 4: Unconstrained wildcard search

Ident. nr	Manufacturer	Version	Medium
FFFFFFFF	FFFF	FF	FF

2.3 Button: Search For Wireless Nodes

synopsis: The wireless search function is the same operation as the general search with the difference of running once for every different kind of node.

This button is for finding wireless nodes without having to search the whole M-Bus loop. The wireless meters from the wireless nodes can then be integrated into your system. Note that all wired meters will be excluded from the result.

Manufacturer	Device
PiiGAB	PII 4129.01.36 (Pi-900S/T with wireless card)
Elvaco	ELV 1596.14.31 (Elvaco CMIB version 0x14)
Elvaco	ELV 1596.15.31 (Elvaco CMIB version 0x15)

3 WebPage: Overview

3.1 Button: Download meterlist

Download the list of all configured meters. The filename will be meterlist.csv. We recommend editing the meterlist in notepad++.

3.2 Button: Upload meterlist

Upload an existing meterlist from a PC. This may be a list with only ID-numbers or a full list. If you are unsure of the format, download the meterlist template by using the button "Download meterlist template".

If you do not have any wireless nodes in your system, then you must press the button "Verify meterlist" after uploading your meterlist.

If you have wireless nodes in your system, that are not fully defined, you must first upload your meterlist, then search for the wireless nodes. This will verify your meterlist automatically.

By fully defined for a wireless node we mean have all the neccessary information. See below: ID,Manufacturer,Version,Medium, Metertype. If the Node is defined as Node in the field Metertype and have the Status "Green" then it is fully defined.

3.3 Button: Download template

Download a template that explains the format for the meterlist.

3.4 Button: Auto-Create myconfig files

This button creates the main configuration file myconfig.csv. The modbus files myconfig_Mbus2Modbus.csv Mbus2Modbus.csv are also created. Afterwards it restarts mbushub and quickpost with myconfig.csv as configuration file. Before myconfig.csv are created, the file template.csv also will be created.

3.5 Button: Remove meterlist

The meterlist can be removed to start from scratch. The wired meters and wireless nodes found through the search function in the Pi-900S/T will still be saved in separate files.

3.6 Button: Test unverified meters

Testing unverifying meters involves the Pi-900S/T validating all fields which are necessary to create a meter template. This is a requirement for Quickpost to function correctly in both reading and sending meter data. Verification does not perform a check if the meters in the template work if the meter information is complete as shown in tbl. 6.

Table 6: Complete template

Id	Manufacturer	Version	Medium	Metertype	Fabrication number (only required for wireless meters)

If the meterlist have been uploaded with only Id-numbers and the setup contains wireless nodes, it is strongly recommended that the user starts with "Search for wireless nodes".

3.7 Button: Read all meters

This button checks if all the meters in your meterlist can answer to a REQ_UD2 request. The wired meters and wireless nodes in your meterlist will recieve up to three REQ_UD2 request. The wireless meters will be read out from the internal wireless card, if unit has one. Wireless meters will be read out from wireless nodes, if wireless nodes are connected to the M-Bus loop and present in meterlist. If a wireless meters duration is below one day then it get the status "Green". If the duration is higher it gets the status "Yellow". The time consumed during this operation depends on how many wired meters you have in your meterlist.

3.8 Button: Add Wireless Meters

When you press this button all wireless meters from your internal wireless card (if 900-unit has one) and all wireless meters from wireless nodes (if wireless nodes are connected) will be added to your meterlist. Meters with duration higher then 24*60 minutes will recieve the status "Yellow" while meters with lower duration will receieve the status "Green".

3.9 Button: Add Wired meters

When you press this button the wired meters and wireless nodes you have found through a Secondary Search or a Primary Search will be added to your meterlist. Warning: If the unit have been restarted or have lost power no meters will be added.

3.10 Button: Id number button

When you press the Id-number button for a individual meter you can see the real-time values from the meter. This will have no effect on the status for the meter. To change the status you have to use the buttons "Verify meterlist" or "Read meters". The timestamp in the header information for the wired meters will be accurate. To see the correct timestamp for the wireless meter you have to look at the timestamp object in the telegram or the duration object. Since the system doesn't update the meterlist automatically we cannot guarantee there are only wireless meters with duration lower than *2460 minutes in the list. The status will not change when pressing this button even if the duration for the meter is higer than 24*60. To change the status you have to use the button "Verify meterlist" or "Read meters". "Verify meterlist" will only change status on wireless meters while "Read meters" will change status on both wired and wireless meters.

The Pi-900 ask a REQ_UD2 question to the M-Bus physical masterport and all applications connected to the masterports 20000, 20001 and 20002.

3.11 Button: Add single meter

Fill in the meters ID-number. 8 digits. Only digits are allowed. If you fill in less then 8 digits there will be zeros prepended so the number will consist of 8 digits. The description field can not contain any white-space characters.

Table 7: Add single meter

ID-number	Manufacturer	Version	Medium	Wireless-key	Description
8 digit BCD	4 digit hex	2 digit hex	2 digit hex	32 digits/alpha value	50 characters no white-spaces allowed
Mandatory	Optional	Optional	Optional	Optional	Optional

3.12 Button: Edit meter

Here you can edit the meters in your meterlist in the following fields:

Table 8: Add single meter

ID-number	Manufacturer	Version	Medium	Wireless-key	Description
8 digit BCD	4 digit hex	2 digit hex	2 digit hex	32 digits/alpha value	50 characters no white-spaces allowed
Mandatory	Optional	Optional	Optional	Optional	Optional

3.13 Button: Upload encryption keys

Upload a file with the following structure:

ID-number	Wireless-key
8 digit BCD	32-alphanumeric value

id;wireless-key

The file format must be either .txt or .csv. The values must be separated with a ";". A file, <wireless_include_startup_config.csv> will be created. The meter you upload must be present in the meterlist to be added to this file. After the wireless keys are uploaded you have to go to the wireless module and restart the module with <wireless_include_startup_config.csv> set to include file. If the wireless key are not 32 characters long or is not alphanumeric, the wireless key will not be added.

3.14 Button: Download encryption keys

Here you can download the encryption keys which are present in the meterlist. The same format as most wireless meter manufacturer use when they deliver the wireless-keys. The format is as follows:

ID-number	Wireless-key
8 digit BCD	32 digits/alpha value

id;wireless-key

4 WebPage: Templates

4.1 template.csv

This is a file containing all the different meter types in the facility. Each meter will get a template name. For example a Lansen meter with secondary address: 00015642.3033.02.2A will get the following template name: LAS_02_2A. It is a composition of each individual meters columns in the following way: LAS is manufacturer in text column[4] 02 is Medium column[2] 2A is Version column[3]

The template name is an important part of the template file. It's the template name which connects each individual meter to the correct template in myconfig.csv. If this connection can't be done then the meter cannot be read out in Quickpost.

4.2 Template Parameters

Table 11: Template parameters

Field	Description
Format	The format Quickpost will use to send the meter data.
Time format	Default yyyy-mm-ddTHH:MM:SS (24).
Tag type	Default Record (8)
Time stamp	For wired meters "Quickpost". For wireless meters "Telegram".
Time record no	For wireless meters recieved through a PiiGAB unit this value can be set to 4.
Read period	Default empty.
Read offset	Default empty.

For further information see documentation for Quickpost.

4.3 Auto-create Template

This function DO NOT work for facilities with wireless meters received through units which are not PiiGAB. In those facilities you have to manually add each metertype to the template.csv file. All metertypes in your meterlist will be added automatically.

4.4 Add metertype

To add a metertype to the template.csv press the meters Id-number in the list. Choose which Mbus-objects you want to report by pressing the ON/OFF field for each Mbus-object. Press the button "Add metertype" to add the metertype template to template.csv.

4.5 Button: Remove Template

This button will remove the template.csv file. When you press this button all meters which id-number buttons are greyed out, will be available to add to the template file again. You can use this button when you want to start all over creating a template.csv file.

5 WebPage: My Meters

5.1 myconfig.csv

This is the configuration file to use when reading out meter data in Quickpost. You have to place this file in MBusHub master port and in Quickpost to be able to read out meter data in Quickpost.

5.2 Device name

The default device name format is `<ID><MFCT><VER><MED>`. This should be used if there are no other specific demands on the output file.

5.3 Channel name

Default channel name in the "myconfig.csv" file is the 900-units serial number. Channel name used in the template.csv file is "channel".

5.4 Create myconfig.csv

This will create the configuration file which is used in the MBusHub masterport and in Quickpost to enable sending meter data with Quickpost.

5.5 Create myconfig.csv without shifting modbus registers

If you are NOT using Mbus2Modbus conversion you do not need to care about this button. Just use the regular create myconfig.csv button instead.

Here the meters which are not present in an earlier version of masterport_Mbus2Modbus.csv will be appended in the end of the masterport_Mbus2Modbus.csv file. The previously added modbus registers will not be affected by new meters.

6 Status description

The status will only change if the user press any of the buttons "Verify meterlist" or "Read meters". When the user press the meters ID-number to read out the real-time values, the status will not change.

The functions mbus_secondary_search and mbus_primary_search set the status to "Green" if a response is received from a REQ_UD2 request to the wired meter and the wireless node.

The make_node_meterlist set the status "Yellow" to wireless meters if the meters id-number is found in /tmp/meterlist_wireless.txt and the duration is higher then one day. If the duration is lower the meter gets the status "Green".

For wired meters the function verify_meterlist give the status "Green" if the meter recieve a respons from a REQ_UD2 request. The REQ_UD2 request will only be asked to a meter with either not enough information in the meter fields or the parameter verifyMeter is set to "True".

Table 12: Meter status

Status	Value	Description
Red	0	No response or not enough information to add the meter to the template thus not all of the required fields have been filled.
Yellow	10	There's enough information to construct a template (wireless meters must have a fabrication number). If a wired meter have the status "Green", and recieves a REQ_UD2 but give no response, when user press "Read meters", the status will go from "Green" to "Yellow".

Status	Value	Description
Green	20	For wired meters all required fields are present and can answer a REQ_UD2 request. For wireless meters all fields are present, can answer to a REQ_UD2 request, and have a duration lower then one day. If a meter in `meterlist_wireless.txt` to not contain all the fields. Id,Mfct,Ver,Med,Fabrication,Metertype, then it is an error.

7 File descriptions

Type	Description
integer	A non-negative whole number of the range
hexadecimal	A non-negative number in base 16 consisting of `0-9` and `a-f` representing ranges `0-9` and `10-15` respectively.
text	Ascii is preferable, ISO-8859-1 is ok. All ISO-8859 should work ok. UTF-8 needs more testing.
verification set	Integers: 0 not verified, 10 info ok, 20 REQ_UD2 response

Table 14: meterlist.csv (colon or semiclon separated)

Field	Type
ID	Identification number in BCD form (see 1, pp. 34-35)
Manufacturer	Hexadecimal
Version	Hexadecimal
Medium	Hexadecimal (see 1, pp. 76 for the list of possible values)
Manufacturer (text)	Text representing the manufacturer
Fabrication number	Integer
Primary address	Integer between 0 and 251
Status	Integers: 0,10,20
Meter type	set of types as a string (see tbl. 15)

Field	Type
Wireless key	32 byte long alpha/numeric value

Table 15: Meter type

Meter type	Description
R	Wireless
W	Wired
N	Wireless Node
H	Hanbus meter
M	Modbus meter