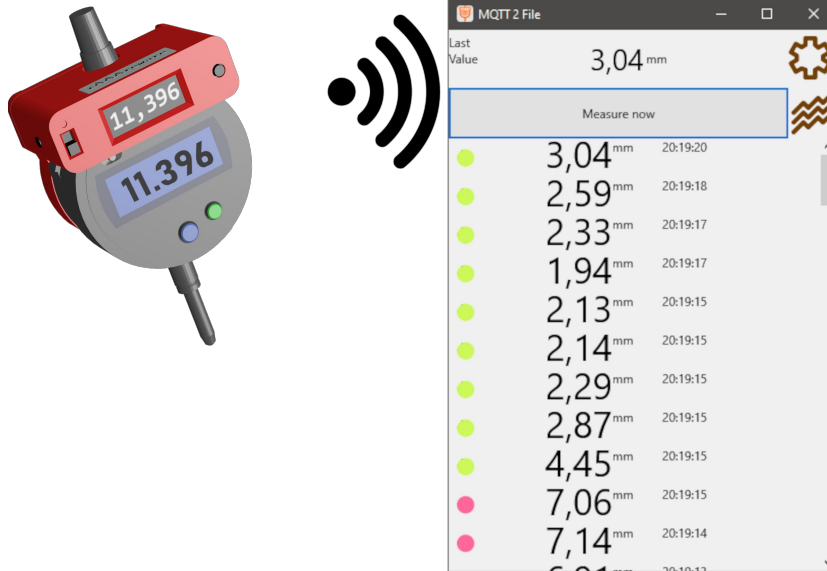


MQTT2File

Software

for the rAAreware WLAN Modules



User documentation

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Please see

<https://www.raaareware.de/service-support-download/>
for the latest version of the documentation.

1. About this document

This dokument describes the software [MQTT2File].

The software is used to configure the rAAAware WLAN modules and to do simple measurement tasks using MQTT and WLAN.

The software is available for MS Windows PC und Android smartphones or tablets.

To use the software you need

- a MQTT Broker¹
- a rAAAware WLAN module

The MQTT broker must be up and running, accessable in a TCP/IP network.

2. Installation

2.1. Windows

No special installation is required. The delivered zip file just has to be extracted into a directory. After extraction just start "mqtt2file.exe".

See

<https://www.raaaware.de/service-support-download/>
to check if you have the latest version.

2.2. Android

To install then software on Android you can use the Google AppStore (if the application is listet there for your market) or you install the mqtt2file.apk manual.

To install manual you need to allow installations of external program files. This is done within "Settings > Security > Allow unknown sources".

Next you can copy the file "mqtt2file.apk" to the device (by USB stick or using our download link) and start the file. May you have to allow the access and give allowance to the installation. Required rights can be granted during installation or at first run.

Please give all requested authorisations like storage and network access. WLAN network access also require authorisation for your location.

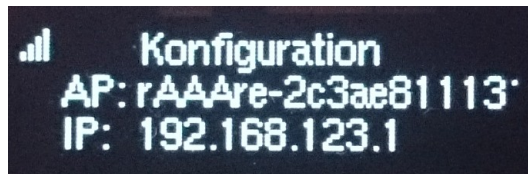
3. Introduction

A new wlan module is in config mode. During configuration you have to tell the module which WLAN and which MQTT broker to use.

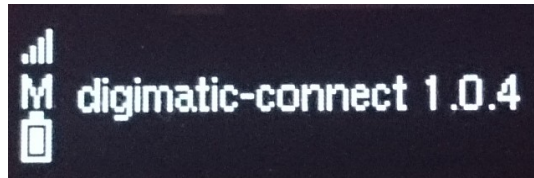
This has to be done once. After the device is configured it can be used within your network.

A module in config mode either show this on his small OLED display or by a inverse blinking of the LED.

¹ z.B. den mosquitto MQTT Broker, siehe <https://mosquitto.org>



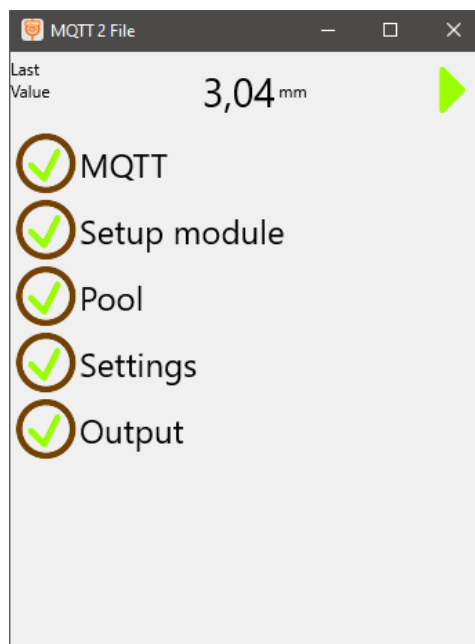
In config mode the device show the accesspoint to connect with the device and the IP address of the device to do the configuration.



After successfull configuration the module start in normal mode. The display show the firmware version. The LED blink or blip not inverted.

4. Functions

The main screen show the overview of the functions.



Click or tap on a subject to open or close this topic.

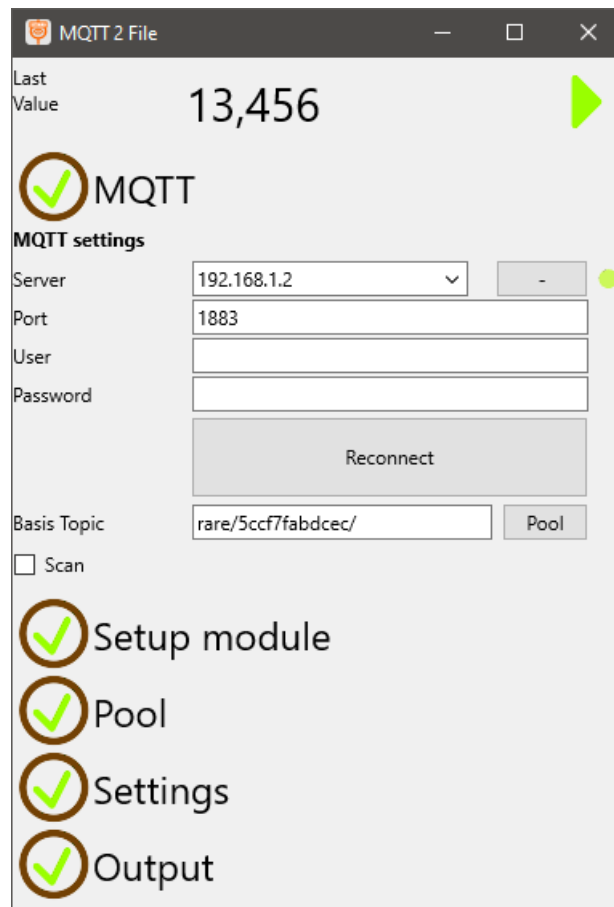
A topic which is marked with a green symbol is configured already.

If all configurations are done you can enter the measurement mode by the green arrow.

At top the latest measurement of the current configured device is shown.

4.1. MQTT settings

This topic is used to config the connection to the MQTT broker. This is the broker a device will use and also the broker this software use to communicate with the device after configuration.



Attention:

If you use a local MQTT broker you can connect to your local broker entering "localhost" or "127.0.0.1". Anyway: If you configure your device with this setting the module will not be able to connect to the broker, due the device then try to connect its own localhost.

To tell a module where to connect to you need to enter the server as seen in the network. This may be an address like "192.168.1.123".

"Base topic" is the base topic of the device you want to connect to using the MQTT broker. May this is the device you have just configured or another or your devices.

Using the option "Scan" you can list all devices which send a measurement to the broker. If you do not know the topic of your device just check "Scan" and send a measurement with the device. Doubleclick on the entry in the list to use that topic.

To configure a device it is not mandatory that you can connect to the configured MQTT broker at the moment of configuration. It can happen, that you can not connect to the broker while you are connected to the accesspoint of the device to config.

If you see a button "Pool" you can use this button to add the current device to your device pool. Use the function "Pool" in the main menu to administrate the devices in your pool.

4.2. Configure module

Use this function to configure a WLAN module for first use or after a factory reset.

MQTT 2 File

Last Value: 13,456

Setup module

Devices in config mode:
No module in config mode found.
Module [ON] and in config mode?

Configuration:

Config: [dropdown] + -

Name: Auto rare-5ccf7fabdcec

MQTT first topic (company): rare

WLAN to connect:

SSID: planet_earth [dropdown]

Password: [input]

DHCP

Send configuration

not connected

Current firmware < V1.1.0

Standby after [sec.]: 120

Battery low at [%]: 30

All WLAN SSIDs that can be assigned to a module are displayed in the list. If only one configuration is available, this is selected automatically.

It will be shown all suitable WLAN SSIDs. Those are all SSIDs starting with "rare" or the company prefix, followed by the MAC address of the device. Names are e.g. "abc-010203F1E2" oder "rare-AB0102C1A2".

On Android:

If the module SSID is not displayed even though it is listed among the available WLAN SSIDs there is most likely an authorization problem.

Ensure to give the application the rights for "Memory" and "Location". The Symbols for WIFI and Location has to be active and shown on the toolbar.

4.2.1. Configuration data

In the fields below, the configuration data for this module are specified.

A name for the configuration can be assigned in the "Config" field and saved in the list of saved configurations with [+]. This allows a frequently used configuration to be easily selected later via the drop-down list.

The name is a freely definable name for the WLAN module or measurement device. This name can be retrieved later via an MQTT topic and is only used for information. Normally, "Auto" is selected here. The name is then formed from the unique MAC address assigned to the module.

As "MQTT first topic" you can define the base token of all MQTT messages of this device. Default this is "rare". An MQTT topic then looks may like:
rare/a021a61a53f2/adc/voltage

The WLAN contact data is required so that the radio module can connect to an existing WLAN network in operating mode.

Normally the wireless module is configured for DHCP operation. This gives the module an Internet address defined by the network. Optionally, by deselecting the DHCP option, a fixed IP address with a corresponding subnet mask and a suitable gateway can be specified. Entries are required in all 3 fields. The gateway can optionally also be assigned with "0.0.0.0".

4.2.2. Sending the configuration

Under Windows, a connection must be established manually with the displayed device SSID (via the icon in the Windows taskbar (Taskbar Notification Area [TNA])). As soon as the connection is established, the "Send configuration" button is activated and can be clicked.

On smartphones (Android), "Send configuration" can be tapped directly after entering the values: The smartphone will then automatically establish a connection to this WLAN and send the configuration. If this does not happen after a short time, the connection can also be established manually via the Android taskbar.

As soon as the required connection is established, the configuration data is sent to the WLAN radio module.

Make shure the entry in the SSID list is selected and click "Send configuration". A successful transfer will be confirmed as "Configuration sent".

Switch the module OFF and ON to ensure the configuration will be loaded and the module will connect to the configures WLAN and MQTT Broker.

The entire item "Set up device" is marked as "OK" if no (further) WLAN access point was found for configuring a module.

If a WLAN module has been configured, the Mac address of this module is copied to the clipboard. This Mac address can then be pasted under MQTT base topic to then receive the measurement data for this module. Optional you just click the "!" button next to the confirmation to copy this topic to the "Base topic" field in the MQTT section.

A Module always send some basic information direct after establishing a connection with the broker. You may use a general MQTT client like "mqtt.fx" or the MQTT server log to check if your module send data.

4.3. Pool

Under the program item "Pool" all modules can be found, which were saved under MQTT with the Pool button. By clicking on a pool entry and "Use", this entry is taken over into the MQTT area. After clicking on an entry, an individual name for the module can be assigned in the "Name" field. This name can then be used to identify the module in the list again. Within the list, the entries are stored in the form <name>@<base-topic>.

4.4. Settings

Settings for the radio module can be specified here.

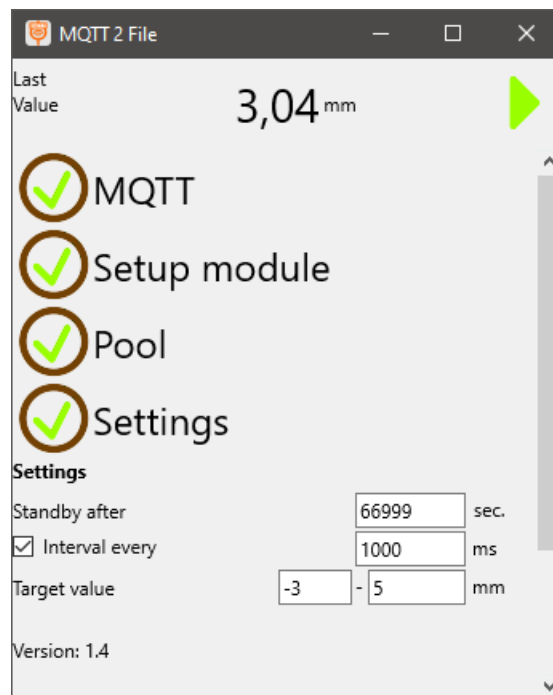
The settings for Standby and Interval are sent to the WLAN module via MQTT and remain stored there.

The settings for standby and limit for battery warning are sent to the measuring device directly after each input. The device restarts after each transmission of a configuration. The values must therefore not be changed too quickly one after the other.

The settings for the target value are used for the visualization of the results.

If target value lower/upper limit are identical, only one target line is displayed.

If, for example, only an upper limit is specified, only target overshoots are evaluated as NOK.



At the very end of the settings, the version number is displayed for the user's information.

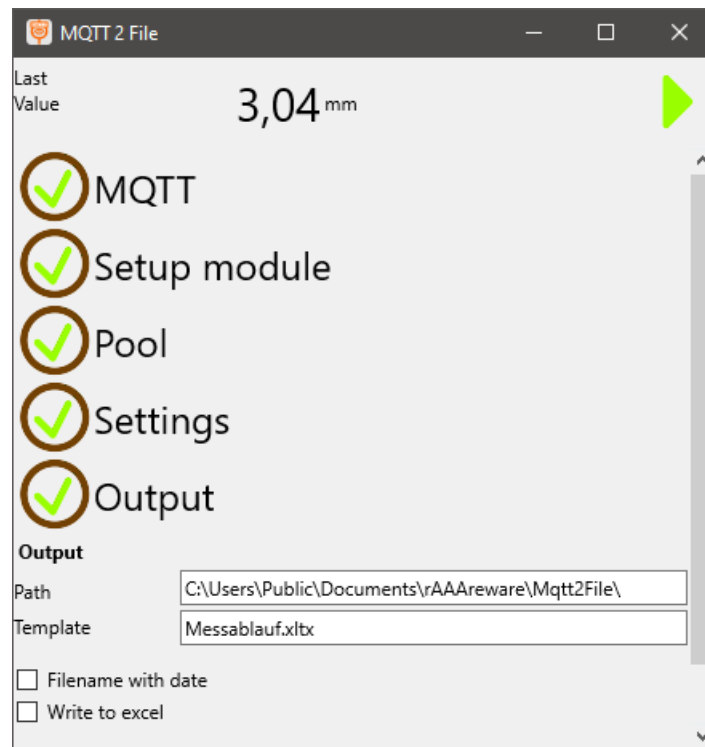
The "Settings" selection item is always marked with "OK", since settings can be changed at any time and these settings are optional.

4.5. Output

In this area options for the output of the measurement results are made.

In Output path the file path is specified where the results will be saved. The measurement results are saved in this directory in a file "Mqtt2File.csv".

The file content contains the column names in the first line and the individual measured values in the further lines.



```
Timestamp;Value;UOM;Result;TargetMin;TargetMax
20220226201507;6.945;mm;Ok;5;10
20220226201507;6.281;mm;Ok;5;10
20220226201508;5.762;mm;Ok;5;10
20220226201508;5.183;mm;Ok;5;10
20220226201509;4.278;mm;Min;5;10
20220226201510;6.211;mm;Ok;5;10
20220226201510;6.565;mm;Ok;5;10
20220226201510;6.457;mm;Ok;5;10
20220226201511;6.519;mm;Ok;5;10
```

If the "File name with date" option is enabled, the file name will additionally contain the date when the application was started, e.g. "Mqtt2File.20190131.csv". The date format is YYYYMMDD to enable a easy sorting by date.

If an invalid directory is specified, no text output is created.
If no directory is specified, default paths are entered.

The base default path is the directory of public documents.
For windows:

```
C:\Users\<name>\Documents\rAAAreware\mqtt2file
```

For Android:

/storage/emulated/0/Documents/rAAAreware/mqtt2file

The item is marked as "OK" if the specified file path is correct.

If the item is not shown as "OK", it may be that the permission to create the directory has not been given.

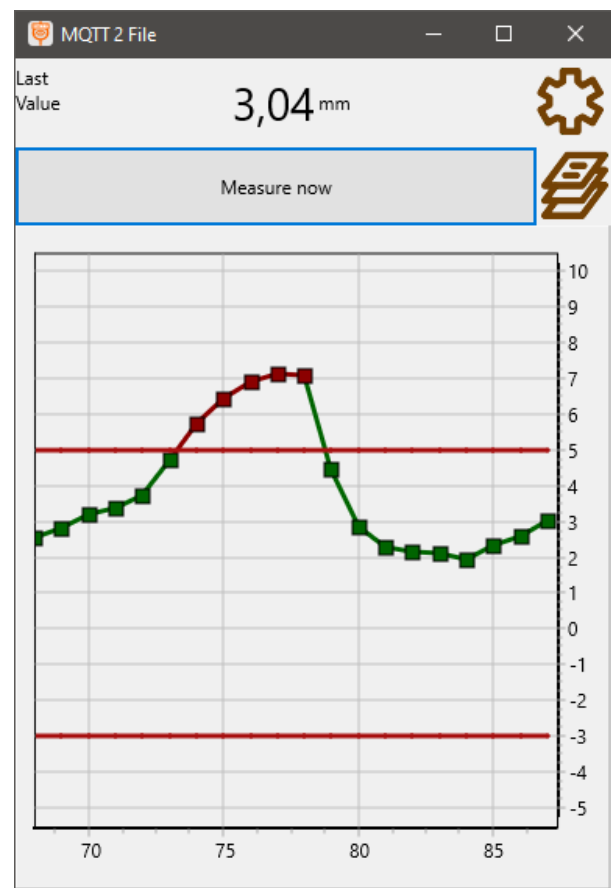
Make sure that permission to write the volume is given in the Android application settings or choose a different location, e.g. "/storage/emulated/0/tmp".

4.6. Measurements

Click on the green arrow in the upper right corner to switch to the measuring mode.

In the measuring mode, measurements can be initiated and results can be viewed.

The measuring mode has 2 display modes. Clicking on the symbols to the right of the measurement button switches the view.



On the left the view as a list. The latest measurement is at the top.

On the right, the view as a graph. The latest measurement is on the right.

In the list view, the mouse or gestures can be used to scroll up and down.

In the graphic you can scroll to the right and left.

A measurement is triggered by

- Clicking/tapping on the "Perform measurement" area.
- Pressing the "Data" key on the module.
- Pressing the "Data" key on the dial gauge, caliper or outside micrometer (if present).
- Receiving a "digimatic/request/set" message from another authorized MQTT participant.
- A time (if a cyclic measurement is configured).

4.7. Measurement pauses / power saving function

After a time that can be set via MQTT, the module goes into standby mode.

The display is switched off and the WLAN connection is switched off.

The module is woken up by switching off the module and switching it on again using the module's slide switch.

5. Others

5.1. Troubleshooting

5.1.1. No WLAN network of the device found (Android)

If the application does not detect and find WLAN networks, it is most likely that the application does not have the appropriate permissions. Make sure the application has the right for

- Memory
- Location
- Phone/Network

5.1.2. Debug output (Windows)

For troubleshooting a debug output can be displayed under MS Windows.

The log output is output to the console.

To display the console output of a GUI program under Windows, the "DebugView" program from Microsoft out of the "Sysinternals" package can be used.

5.1.3. Debug output (Android)

For troubleshooting, a debug output can be displayed on a connected PC under Android via the ADB interface.

Info about the installation of the ADB tools can be found on the Internet.

A connected android device the will be listed using

```
adb devices -l
```

To list debug information of the application you may use:

```
adb -s DECIVE123 logcat *:S mqtt2file:* WifiConfigStore:* WifiStateMachine:*
```

"DECIVE123" is the device ID as listed with the command before.

5.2. Legal

All product names mentioned in this document are trademarks or registered trademarks of their respective owners.

5.3. Contact data

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