INTEGRA METERING

# AMBUS® Link

The intelligent M-Bus data central for configuration, operation and monitoring of M-Bus installations as a total system. The integrated web server offers a modern administration of consumption data.

## Table of contents



VD 9-925 e 02.2017

# 1 Safety

## 1.1 Intended use

The device AMBUS® Link is exclusively intended for the configuration, operation and monitoring of M-Bus installations as a total system.

Any improper or inappropriate use might result in a state in which the operational safety of the device cannot be guaranteed anymore. The manufacturer waives any liability for resulting damages of persons and materials.

## 1.2 Notes on safety instructions and symbols

The devices have been designed to fulfil modern safety requirements. They have been tested and delivered in a condition that ensures safe operation. However, improper or non-intended use of the device may result in it becoming dangerous. Please always pay attention to the safety instructions in this manual which are accompanied by the following symbols:

**WARNING**

**WARNING** indicates an action or measure which, if performed incorrectly, can potentially cause life-threatening injuries and lead to a high safety risk.

**ATTENTION**

CAUTION indicates an action or measure which, if performed incorrectly, can cause minor to medium severe injuries.

**NOTE**

NOTE indicates a dangerous situation which might lead to material damage, if not prevented.

**COMMENT**

COMMENT provides helpful tips and recommendations as well as information for efficient and trouble-free operation.

## 1.3 Safety instructions and precautionary measures

The manufacturer takes over no responsibility if the following safety instructions and precautionary measures are disregarded:

1. Changes to the device, which are implemented without prior written approval of the manufacturer, lead to the immediate termination of product liability and warranty.
2. Installation, operation, maintenance, repair and decommissioning of this device must only be performed by specialists authorised by the manufacturer, operator or owner of the device. The specialist needs to read and understand the entire installation and operation manual and is obliged to follow these instructions.
3. Control the supply voltage and information given on the type plate, before the device is installed.
4. Check all connections, settings and technical specifications of any available peripheral devices.
5. Open the housing or parts of the housing, which contain electrical or electronic components, only if the electric energy is turned off.
6. Touch no electronic components (ESD sensitivity).
7. Expose the system concerning the mechanical load (pressure, temperature, IP protection etc.) maximally to the specified classification.
8. For works concerning mechanical components of the system, the pressure in the pipe system has to be released or the temperature of the medium needs to be brought to values harmless for humans.
9. No information stated here or anywhere else releases planners, engineers, fitters and operators from their personal careful and comprehensive evaluation of the respective system configuration in terms of functionality and operational safety.
10. The local working and safety standards and statutes need to be met.

## 1.4 About the operation manual

The manufacturer reserves the right to change the technical details without prior notice. The newest information and versions of this operation manual are available at your local subsidiary or representation as well as on the website.

**WARNING**

Any liability is waived if the instructions and procedures in this manual are not followed!

**NOTE**

This installation instruction is intended for qualified personnel and contains thus no basic working steps. Before putting AMBUS® Link or the system into operation, the installation and operation manual needs to be read and understood completely.
Keep this manual for later reference!

# 2 Product description

We congratulate you for purchasing this high-quality M-Bus data central.

The device AMBUS® Link makes the configuration, operation and monitoring of M-Bus installations as a total system easier. The integrated web server serves for easy provision of your consumption data on any terminal devices or subordinate control systems.

## 2.1 Areas of application

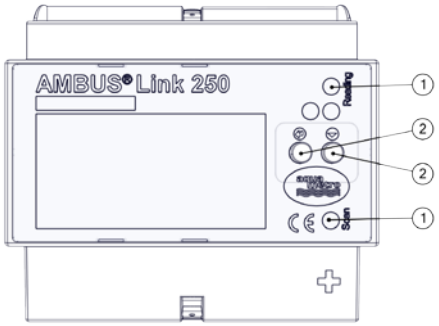
AMBUS® Link is designed for technical building management and also for building services and can be used as follows:

**Data concentrator**
As central function of your consumption data for analysis and documentation purposes of all flow and energy meters. For easy administration the integrated web server supports on all web-enabled terminal devices the user in recording, presentation and provision of consumption data for utility cost billing or monitoring.

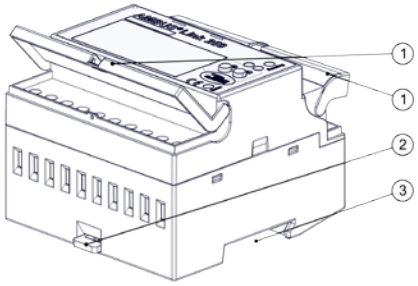
**System integration component**
With the versatile interfaces AMBUS® Link has to offer you can integrate your consumption data in the simplest way in subordinate building control systems.

## 2.2 Device design

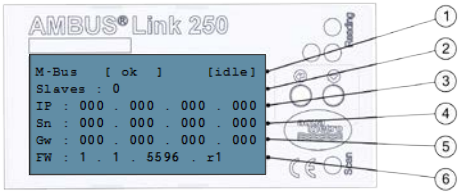
AMBUS® Link is intended for control cabinet installation. The device design is defined as follows:




① Optical signals/lights
LED reading and LED scanning
② Operating elements
- o Enter button
- o Function button



① Protection covers
② Mounting rail protection
③ Mounting rail guide




① Status logger, operating status
② M-Bus slaves
③ IP address
④ Subnet mask
⑤ Default gateway
⑥ Firmware version

## 2.3 Power supply

For using the product outside a control cabinet the power supply can be realised as follows.

External


Manufacturer recommendations

Switching power supply UNO POWER

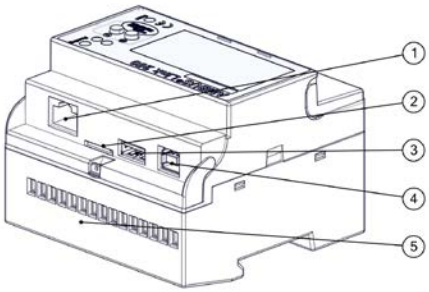
- Output voltage 24 VDC
- Output power 4.2 A
- Capacity 100 W

Dimensions W x H x D 55×90×84 mm

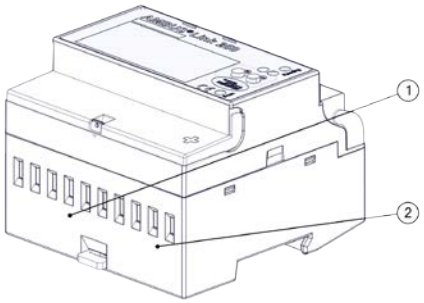
## 2.4 Interfaces

The data central consists of a TCP/IP interface with integrated data logger and combines the function of an M-Bus data logger and an M-Bus reading software. Thus the following software and hardware interfaces are implemented.

### 2.4.1. Connections




① RJ45 LAN connection
② Micro SD card slot
③ USB type A
④ USB type B
⑤ Terminal connection 1-15




① Pulse inputs terminals 1-8
② Power supply terminals 9-10

### 2.4.2. Protocols


Communication protocols

- Ethernet/LAN/WLAN
- BACnet/IP
- FTP/sFTP
- HTTP
- JSON
- CSV
- POP3

Options retrofittable via external router

- LTE
- UMTS/HSPA
- GPRS/EDGE

## 2.5 Memory card

The medium stores all system-specific parameters and contains parts of the operating system. It is a requirement for operating the AMBUS® Link.

**Micro SD**


microSDHC card Transcend Premium 400x

| | |
|---|---|
| • Storage capacity | 32 GB |
| • Class | 10 |
| • Reading (max.) | 60 MB/s |
| • Writing (max.) | 25 MB/s |

# 3 Scope of delivery and accessories

The scope of delivery is described on the delivery note and the content is displayed on the packaging. Please check all components and delivered parts immediately after receiving the product. Transport damages need to be reported immediately!

1x AMBUS® Link
1x microSDHC card
1x brief instruction
3x protective covers

# 4 Mounting

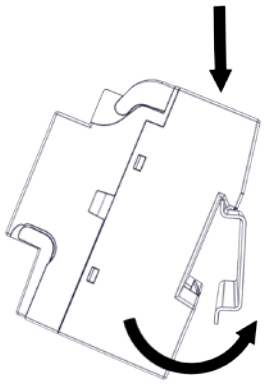
**ATTENTION**

Material damage caused by neglected ambient conditions

Danger of malfunction or damage!

- Assuring accessibility for installation, operation and maintenance
- Protected, dry surroundings
- Avoid exposure to heat/sun
- Keep a safe distance to sources of electrical noise

### Control cabinet mounting



1. Place recesses of the device at the top edge of the mounting rail
2. Press lightly on the AMBUS®Link
3. AMBUS®Link snaps onto the mounting rail

AMBUS®Link is firmly connected to the mounting rail

### Control cabinet removal


1. Remove the piston
2. Lift AMBUS®Link up from the mounting rail

AMBUS®Link is separated from the mounting rail

# 5 Installation

Carefully read the following calls for action and warning information to assure a trouble-free commissioning.

**WARNING**

Burns and paralysis resulting in death when touching or grabbing energised system parts.

Life hazard due to electrical shock!

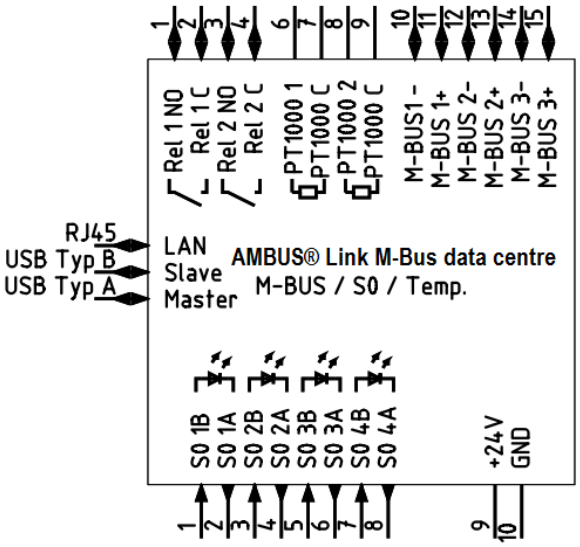
- Perform installation and maintenance work only when the system is off power
- Work on and with voltage shall only be performed by authorised specialists under consideration of applicable regulations
- Apply voltage only to the terminals intended
- Safeguarding by external protection elements to assure a safe switch-off in case of an error
- Install a labelled disconnector (fuse) at an accessible location
- Use a separate fuse circuit for installation

**NOTE**

Terminal connections cable cross section

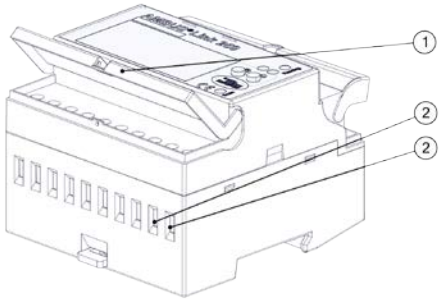
- Terminal connections relay, temperature sensor and M-Bus
  - Braid up to 2.5 $mm^2$
  - Torque 0.4 Nm
- Terminal connections S0 inputs and power supply
  - Braid up to 6 $mm^2$
  - Torque 1.3 - 1.6 Nm

## 5.1 Connection scheme




| Terminals | Function | |
|---|---|---|
| Rel 1 NO/Rel 1 C | Relay 1 | Normally open |
| Rel 2 NO/Rel 2 C | Relay 2 | Normally open |
| PT1000 1/PT1000 C | Temperature sensor | PT1000 |
| PT1000 2/PT1000 C | Temperature sensor | PT1000 |
| M-BUS1-/M-BUS1+ | M-BUS output 1 | Master |
| M-BUS2-/M-BUS2+ | M-BUS output 2 | Master |
| M-BUS3-/M-BUS3+ | M-BUS output 3 | Master |
| S0 1A/S0 1B | S0 pulse input 1 | Active encoder signal |
| S0 2A/S0 2B | S0 pulse input 2 | Active encoder signal |
| S0 3A/S0 3B | S0 pulse input 3 | Active encoder signal |
| S0 4A/S0 4B | S0 pulse input 4 | Active encoder signal |
| +24V/GND | 24VDC supply voltage | |
| RJ45 | Ethernet port | |
| USB type A | USB interface of type A | WLAN and modems |
| USB type B | USB interface of type B | Level converter and maintenance |

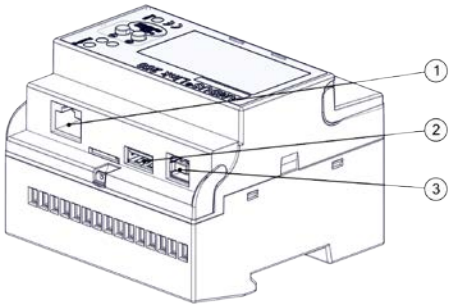
**5.1.1.** Power supply:




1. Assure that the power cable is voltage-free!
2. The disconnector needs to be switched off!
3. Flip up the protective cover①
4. Loosen the terminal connection (terminal 9 (+24V DC) /10 (GND))
5. Connect the power supply ② to terminal 9 (+24V DC) /10 (GND).
6. Tighten the terminal connection
7. Close the protective cover

AMBUS® Link is ready for use

**5.1.2.** Attach the protective covers




1. Attach included protection cover ① with slight pressure
2. Attach included protection cover ② with slight pressure
3. Attach included protection cover ③ with slight pressure

The interfaces are protected

## 5.2 M-Bus network (field level)

In the following the installation of the M-Bus network with AMBUS® Link is described

**ATTENTION**

Material damage caused by neglected installation conditions

Danger of malfunction or damage!

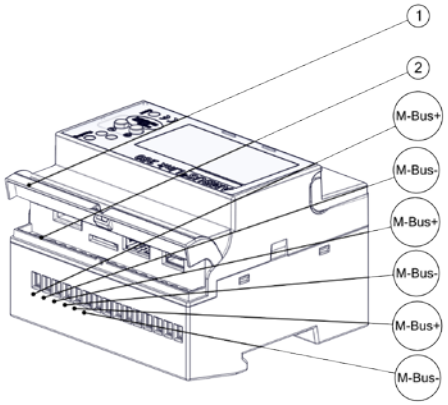
- Generously dimension the main cable cross section and possibly divide it into 3 terminal groups
- Apply voltage only to the intended terminals

**NOTE**

High voltage drops of 5 $V_{AC}$ on the M-Bus cables between data central and terminal node need to be avoided.

- Divide the main strand into several part strands (largest strands)
- Increase cable cross section
- Apply star shape network topology instead of chained network topology
- Apply no circular network topologies

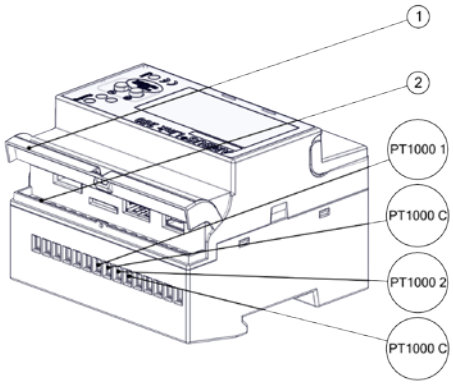
### 5.2.1. Connect M-Bus meter




1. Open the protective cover ①
2. Loosen the terminal connection ② (terminals 10-15)
3. Connect M-Bus participant to terminal 10/11, 12/13 or 14/15
4. Tighten the terminal connection ②
5. Close the protective cover ①

AMBUS®Link is physically connected with the M-Bus participants

### 5.2.2. Connect the temperature sensor




1. Open the protective cover ①
2. Loosen the terminal connection ② (terminals 6-9)
3. Connect the temperature sensor with the terminal 6/7 or 8/9
4. Tighten the terminal connection ②
5. Close the protective cover ①

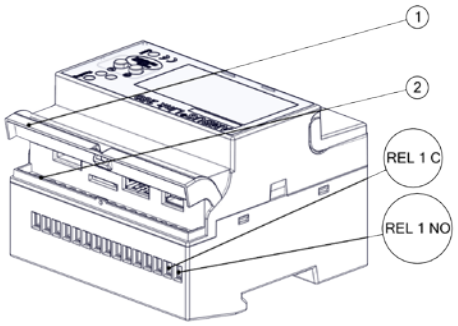
The temperature sensor is connected

**COMMENT**

Operating principle alarm relay 1

- Operating principle as normally open
- The following signals appear
  - Meter cannot be read out
  - Parameter error flag
  - M-Bus short circuit

### 5.2.3. Connect alarm relay 1




1. Open the protective cover ①
2. Loosen the terminal connection ② (terminals 1/2)
3. Connect the participant to terminal 1/2
4. Tighten the terminal connection ②
5. Close the protective cover ①

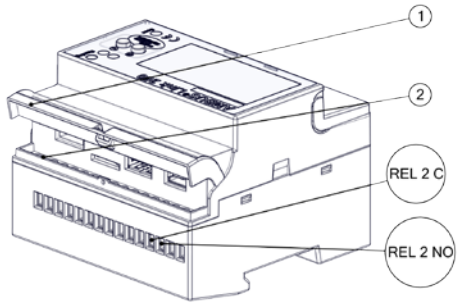
The relay output is connected

**COMMENT**

Operating principle alarm relay 2

- Operating principle as inverted normally open
- The following signals appear
  - Meter cannot be read out
  - Parameter error flag
  - M-Bus short circuit

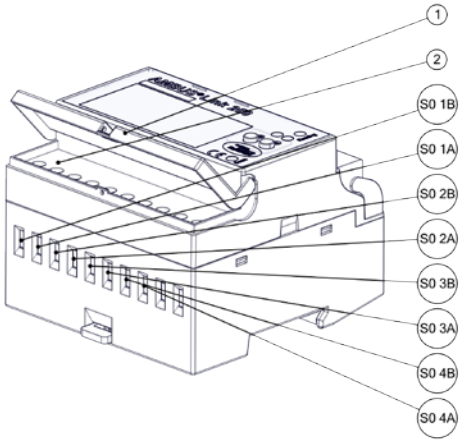
### 5.2.4. Connect alarm relay 2




1. Open the protective cover ①
2. Loosen the terminal connection ② (terminals 3/4)
3. Connect the participant to terminal 3/4
4. Tighten the terminal connection ②
5. Close the protective cover ①

The relay output is connected

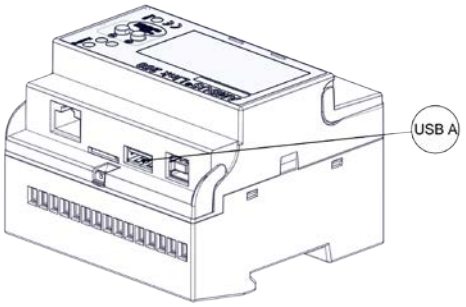
### 5.2.5. Connect pulse inputs




1. Open the protective cover ①
2. Loosen the terminal connection ② (terminals 1-8)
3. Connect pulser to terminal 1/2, 3/4, 5/6 or 7/8
4. Tighten the terminal connection ②
5. Close the protective cover ①

The pulser is connected

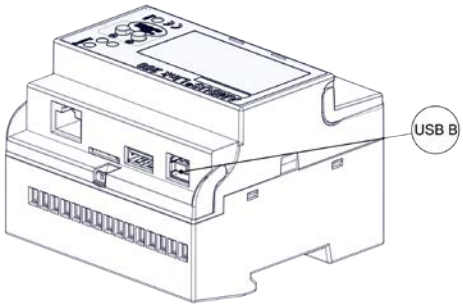
### 5.2.6. Connect USB type A




1. Plug the USB type A into the intended port

The external USB device is connected.

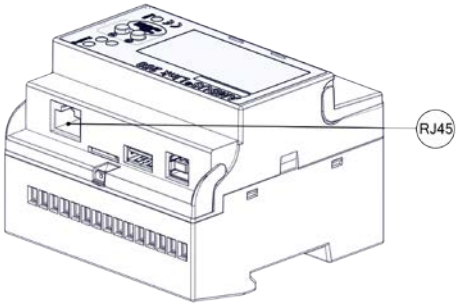
### 5.2.7. Connect USB type B




1. Plug the USB type B into the intended port

The external USB device is connected.

### 5.2.8. Connect network cable RJ45




1. Plug the RJ-45 connector into the intended port

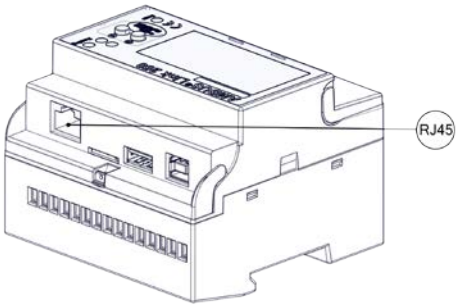
The network cable is connected

**NOTE**

In case of improper handling the microSD card falls into the housig between the slot and the surface.

- Control the exact positioning of the microSD card before inserting it
- Use a slotted screwdriver to insert it.

### 5.2.9. Inserting a mini SD card




1. Insert the microSD card centred into the intended port
2. Press the microSD card with slight pressure over the snap-in point
3. The microSD card snaps in the port

The microSD card is connected.

# 6 Commissioning

AMBUS® Link can be commissioned in two ways, which are described in the following chapter.

## 6.1 Switchig on the AMBUS® Link

**WARNING**

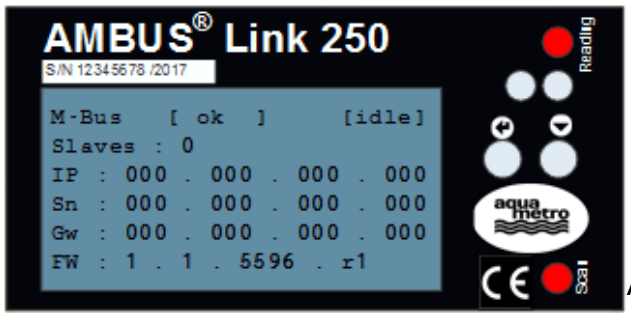
Burns and paralysis resulting in death when touching or grabbing energised system parts.

Life hazard due to electrical shock!

- Perform installation and maintenance work only when the system is off power
- Work on and with voltage shall only be performed by authorised specialists under consideration of applicable regulations
- Apply voltage only to the intended terminals
- Protection by external protection elements to assure a safe switch-off in case of an error
- Install a labelled disconnector (fuse) at an accessible location

Use a separate fuse circuit for installation

**Switching AMBUS® Link on**




1. Start the supply via the disconnector
2. AMBUS® Link starts
3. The reading and scanning LEDs are "slightly" glowing
4. The display is flashing after 30 sec.

AMBUS® Link is ready for use

## 6.2 Operation via AMBUS® Link

**COMMENT**

The delivery state of the network configuration ex works

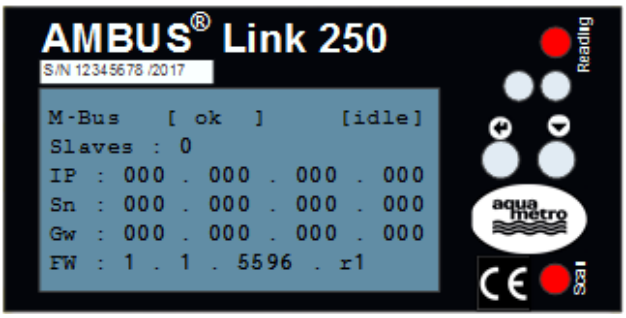
- DHCP is activated, IP address is automatically obtained
- DHCP is deactivated by manual entry of the network parameters
  - Activating DHCP by entering zeros for all network parameters

**COMMENT**

Functionality of the secondary search

- The search via secondary address is conducted as reverse search

### 6.2.1. Quick commissioning M-Bus network




1. Hold the ▼ button for more than 5 sec.
2. M-Bus meter search is started via secondary address
3. The reading and scanning LEDs are glowing "brightly"
4. The operating mode reports SCAN
5. Scanned meters are shown on the display (slaves)

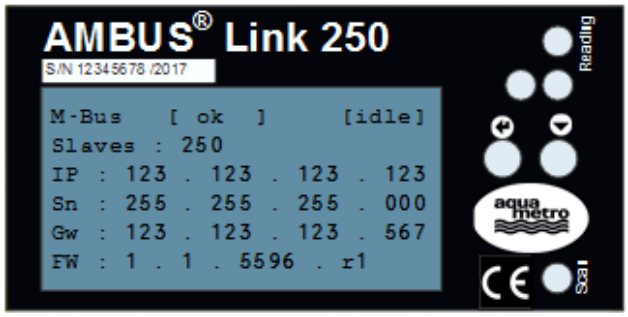
All meters have been read in

**COMMENT**

Finalising the quick configuration of the network parameters

- The set parameters are activated after the configuration has been finished
- The configuration is finished after de-selecting the last digit

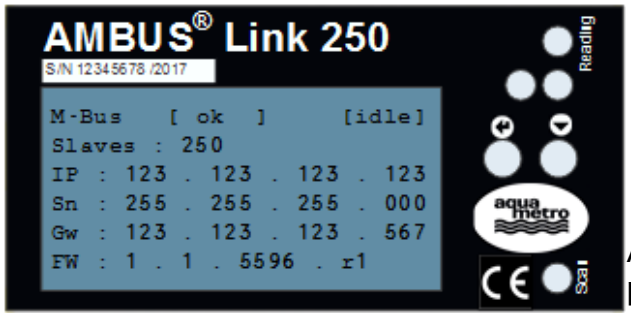
### 6.2.2. Quick configuration network parameters




1. Hold the ↵ button for more than 2 sec. first position at IP is selected and configurable
2. When pressing the ▼ button the marked digit increases by one (0-9)
3. The ↵ button confirms the set digit and jumps to the next

IP address, subnet mask and default gateway are set, the network is configured

### 6.2.3. Restart AMBUS® Link




1. Hold the ↵ button and ▼ button together longer than 5 sec.
2. After releasing the buttons a restart is performed

AMBUS® Link restarts and the settings remain preserved

## 6.3 Operation via web server

**COMMENT**

Operation

- Button for home screen view
- Automatic logout after 10 minutes without operation

**COMMENT**

Role rights

- The rights of each role are fixed and cannot be changed
- Administrator «all rights»
- Standard user «read rights» cannot make changes to the system
- In the delivery state a user is predefined
  - Admin (administrator role)

**COMMENT**

Reachability of the web server concerning the firewall

- The communication takes place via TCP, HTTP and websocket
- Port 80 is the communication port

**COMMENT**

Explanation of the connection indicator

- connected (connection established)
- connecting (connection in establishment)
- not connected (connection failed)

### 6.3.1. Language settings



1. Change language
   - German
   - English
   - French

Language is loaded

**COMMENT**

User administration, password

- Any number of users can be registered in the system
- Username minimum length 3 characters
- Password minimum length 3 characters
- Each logged in user can change their personal password

- The standard password for the «admin» user is 123

It is recommended to change the standard password!

### 6.3.2. Create a user profile



1. Enter a username
2. Select role
3. Enter password
4. Enter password again
5. Press 


The user is created

**COMMENT**

User management as administrator

- A role change for other users is possible
- A password change for other users is possible

### 6.3.3. Change a user profile



1. Select a user
2. Change role
3. Press Apply for role change
4. Enter password
5. Enter password again
6. Press Apply for password change

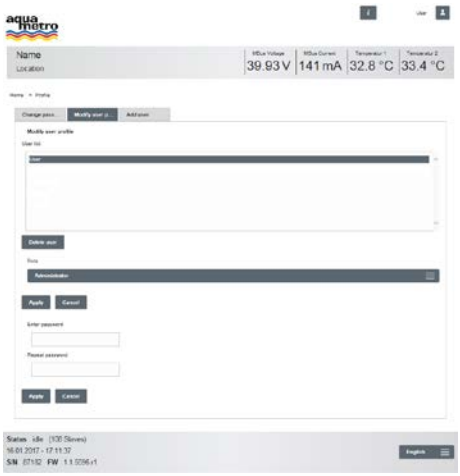
The settings are changed

**COMMENT**

User management as administrator

- Deleting other users is possible

### 6.3.4. Deleting a user profile





1. Select a user
2. Press Delete user
3. Confirm the prompt

The user is deleted

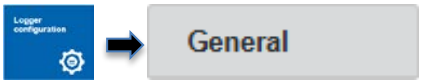
### 6.3.5. Changing the personal password



1. Enter current password
2. Enter new password
3. Enter new password again
4. Press Apply

The password is changed

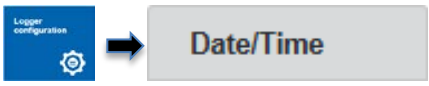
### 6.3.6. Basic settings


1. Enter name and location
2. Choose time zone
3. Press Save

Basic settings are defined and displayed in the banner

### 6.3.7. Setting date and time





1. Set date and time
2. Press Save

Date and time are set and displayed in the footer

## 6.4 Configuration meter via web server

**COMMENT**

Registration procedure of M-Bus participants

- Network search of connected M-Bus participants Search
  - All meters in the M-Bus network can be registered
- Offline registration of M-Bus participants Add
  - Configuration of the M-Bus network without M-Bus participants
  - Registration of participants after installation in the M-Bus network and first-time network reading

**COMMENT**

Restrictions of the address range

- When searching with the primary address the range can be freely selected between 1-250

### 6.4.1. Search all meters


Meter configuration → Search

1. Choose Baud rate
2. Start scan via Secondary address or via Primary address

The meters in the M-Bus network are registered

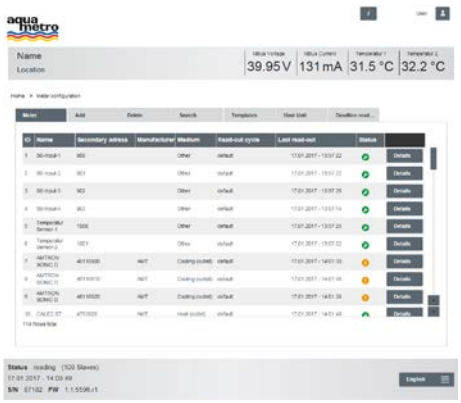
### 6.4.2. Recording individual meters


Meter configuration → Add

1. Choose recording Prim or Sec
2. Set Baud rate
3. Enter the primary and secondary address of the meter
4. Save Confirm

The individual meter is saved

### 6.4.3. Check recorded meters




Meter configuration → Meter

1. All registered meters are listed in a table
2. Check status
   - Found meters - successfully read
   - Existing meters - M-Bus alarm
   - Existing meters - Reading error
   - Missing meters - not yet read out

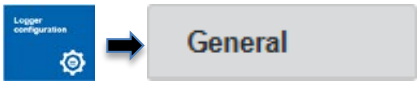
All meters are available

**COMMENT**

Definition of the global reading cycle

- The reading cycle is set with «15 min» as a standard
- The reading cycle can be set between 10 sec. - 48h
- The reading cycle is dependent on the entire M-Bus network

## 6.4.4. Configuring a global reading cycle





1. 15 min Choose reading cycle
2. Press Save

All meters are cyclically read out

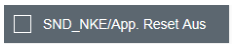
**COMMENT**

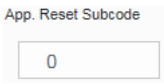
M-Bus protocol-specific parameters

- M-Bus protocol-specific values can be overmodulated via AMBUS® Link

  - Meter type
  - SND_NKE
  - Application reset (including subcodes)
  - Designation
  - Unit
  - Decimal place
  - Phase (phase number for electricity meters)
  - Tariff (tariff number for meters with several counting modules for different tariffs)
  - Mon. (Month number of a record date meter value)

Single meter configuration for Aquametro and third party meters

- Easy meter configuration for individual meters
- Individual configurations can be saved as templates and applied for all identical meters
- As a standard for each M-Bus request an SND-NKE and an application reset with subcode «0» are set. The function can be deactivated by using the checkbox 



- Application reset subcodes can be entered into the field
- Meter-specific reading cycles overmodulate global reading cycles

**COMMENT**

Correct the decimal places for value units

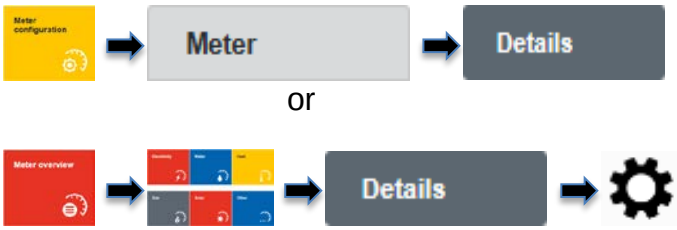
- For decimal places to the left «factor 1000»
- For decimal places to the right «factor 0.001»

**NOTE**

Parameter changes for M-Bus participants might lead to wrong consumption data

- In case of manipulated meters (M-Bus), the meters need to be newly registered (registration)

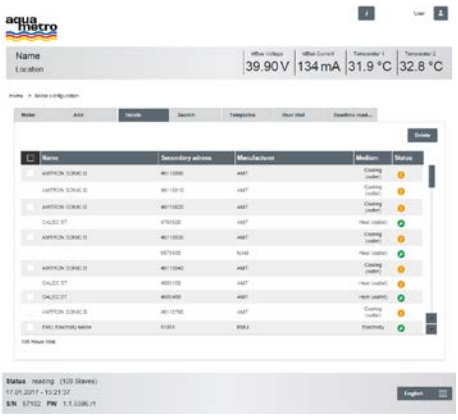
## 6.4.5. Editing meter details

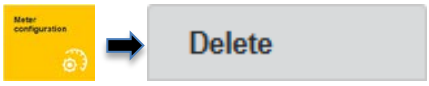




1. State name, location, cost centre and comment
2. Water meters choose meter type
3. Choose recording Prim or Sec
4. Choose reading cycle 5 min
5. Choose Baud rate
6. Tick battery operation Battery
7. Press Save
8. Confirm the designation
9. Mark the designation
10. Choose the unit
11. State phase, divisor, tariff
12. Press Save

The individual meter configuration is finished

## 6.4.6. Deleting a meter




1. Select all or individual meters
2. Press Delete
3. The data is updated

All/individual meters are deleted

## 6.5 Creating usage units via web server

In the following chapter the creation of user-defined, organisational units (usage units) for administration of M-Bus participants is described

**COMMENT**

Administration of usage units

- Formation of organisational units
- User-specific meter group allocation

### 6.5.1. Defining a usage units





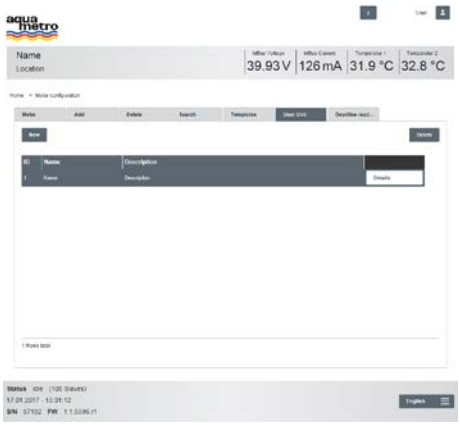
1. Press **New** to create a usage unit

1. Enter the name of the usage unit
2. Enter a description
3. Press **Add**

The usage unit is created

## 6.5.2. Deleting a usage unit

Meter configuration → User Unit

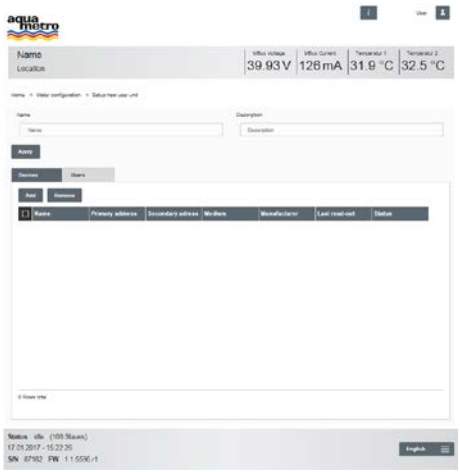



1. Select a usage unit
2. Press Delete

The usage unit is deleted

## 6.5.3. Allocating a meter to a usage unit

Meter configuration → User Unit → Devices



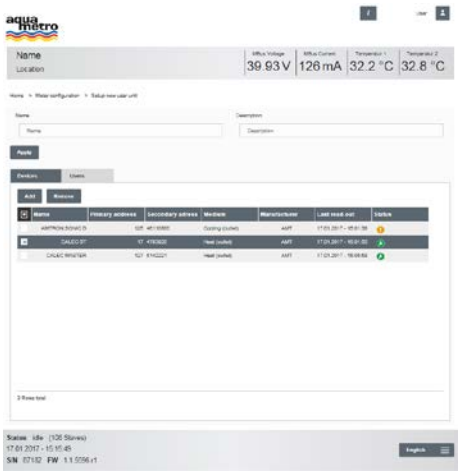

1. Select a usage unit
2. Press Details

1. Press Add
2. Select the meter for the usage unit
3. Press Apply

The meter is now allocated to a usage unit

## 6.5.4. Deleting a meter from a usage unit

Meter configuration → User Unit → Devices

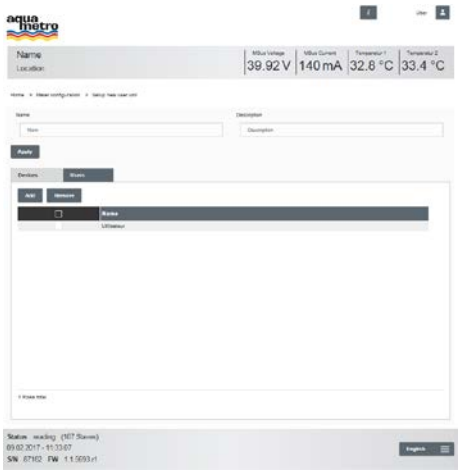



1. Select a usage unit
2. Press Details
3. Select the meter of the usage unit
4. Press Remove

The meters are now deleted from the usage unit

## 6.5.5. Add a user for a usage unit

Meter configuration → User Unit → Users

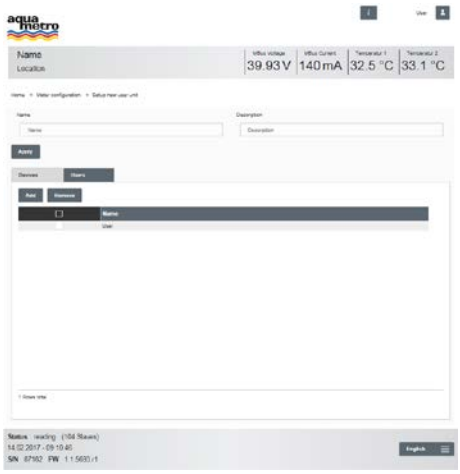



1. Select a usage unit
2. Press Details
3. Press Add
4. Select the user for the usage unit
5. Press Apply

The user is now allocated to the usage unit

### 6.5.6. Delete a user from a usage unit

Meter configuration → User Unit → Users



1. Select a usage unit
2. Press Details
3. Select the user for the usage unit
4. Press Remove

The user is now deleted from the usage unit

## 6.6 Configuring a reporting date reading via web server

**COMMENT**

Configuration of reporting date reading

- Use numeric input for month, day and hour
  - Month (1 -12)
  - Day (1-31)
  - Hour (0 -23)
- Report date data available in the export file

### 6.6.1. Creating a reporting date

Meter configuration → Deadline read...

1. Press Add
2. Enter month, day and hour
3. Confirm the last day On
4. Actively press On

The reporting date reading is set for the last day of the month and the specified reporting date

## 6.6.2. Deleting a reporting date



1. Mark the line
2. Press Delete

The reporting date reading is deleted

## 6.7 Driver configuration via web server

**COMMENT**

Driver configuration for Aquametro and third party meters

- Easy driver configuration for all meters
- M-Bus protocol-specific values can be overmodulated via AMBUS® Link
  - Designation
  - Unit
  - Decimal place
  - Phase (phase number for electricity meters)
  - Tariff (tariff number for meters with several counting modules for different tariffs)
  - Mon. (Month number of a record date meter value)
- Templates are applied on the basis of the following criteria
  - Manufacturer code
  - Version byte
  - Number of data records
- Driver templates can be exported and sent to Aquametro
  - Inclusion in third party meter library
  - Export file in JSON format
  - The exported file is saved in the download folder of the web browser

**COMMENT**

Correct the decimal places for value units

- For decimal places to the left «factor 1000»
- For decimal places to the right «factor 0.001»

**NOTE**

Parameter changes for M-Bus participants might lead to wrong consumption data

- In case of manipulated meters (M-Bus), the meters need to be newly registered (registration)

## 6.7.1. Creating a driver template

Meter configuration → Meter

1. Select a meter
2. Press Details
3. Press Save as template

The driver template for meters is created

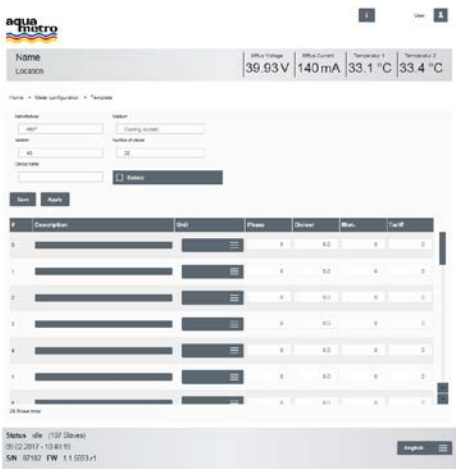
## 6.7.2. Editing a driver template

Meter configuration → Templates

1. Select a driver template
2. Press Details
3. Enter the device designation
4. Choose the device designation from the value definitions
5. Set the target unit
6. Enter the phase and divisor (if required)
7. Mon. enter (if required)
8. Enter tariff (if required)
9. Press Save

Update and save the driver template

## 6.7.3. Apply driver template to meter




Meter configuration → Templates

1. Select a driver template
2. Press Details
3. Press Apply

All meters with the same manufacturer code are configured according to the driver template

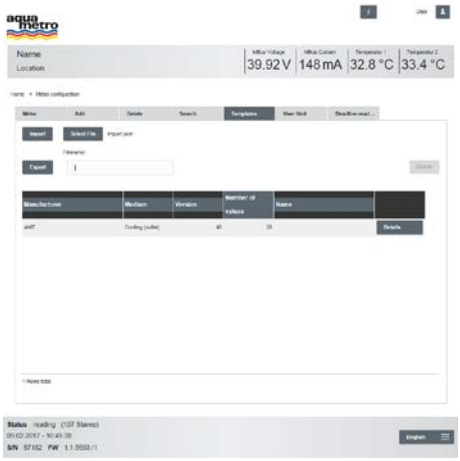
## 6.7.4. Export driver template


Meter configuration → Templates

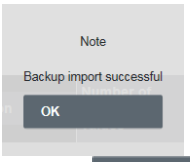
1. Select a driver template
2. Enter a file name
3. Press Export
4. Execute save file as

The meter driver template is exported

### 6.7.5. Import driver template



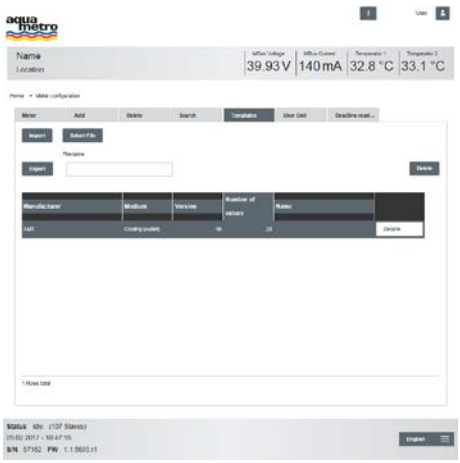
Meter configuration → Templates

1. Press Select File
2. Press Import
3. 

4. Press OK

Import driver template

### 6.7.6. Delete driver template



Meter configuration → Templates

1. Select a driver template
2. Press Delete

The reporting date reading is deleted

## 6.8 Configuring a logger via web server

**COMMENT**

Correctly choose reading times

- Reading times depend on the circumstances and the dimensioning of the M-Bus network
- The reading cycle applies for the entire M-Bus network
- For 100 or more meters at least 2 min per reading
- For 250 meters at least 5 min per reading

**COMMENT**

Define network parameters via DHCP

- DHCP needs to be activated at the router
- Set that the IP address is automatically allocated from the DHCP server

## 6.8.1. Network settings

Logger configuration → Network

1. Enter IP address of the AMBUS® Link
2. Enter subnet mask
3. Enter the gateway of the router
4. Enter the DNS server address 1 and 2 on demand
5. Activate ☐ DHCP on demand
6. Press Save

Established connection with AMBUS® Link

**COMMENT**

Requirements for correct logging of consumption data

- The system time is correctly set (see basic settings)
- AMBUS® Link is working with UTC time
- The UTC time is calculated with the defined local time and time zone
- The system time is defined via an NTP server
  - e.g. metasntp11.admin.ch

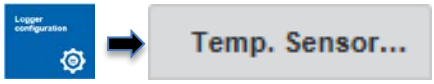
## 6.8.2. Set up an NTP time server

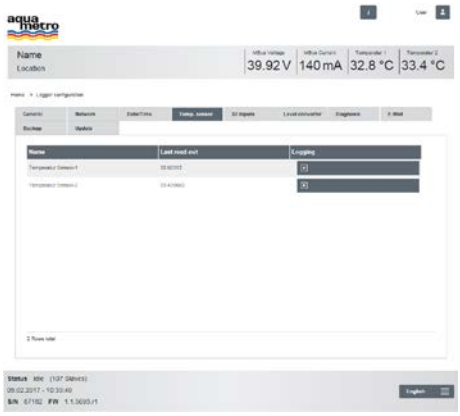
Logger configuration → Date/Time

1. Define the NTP server
2. Press Save

The system time is synchronised with the defined server

### 6.8.3. Logging the temperature sensors

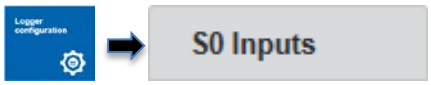


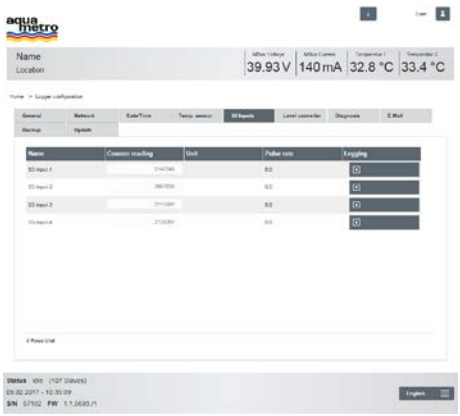




1. Mark the line
2. Activate

The temperature sensor is logged

### 6.8.4. Logging the S0 inputs




1. Mark the line
2. Enter the starting value
3. Activate

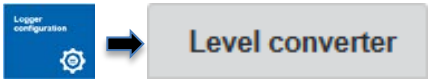
S0 input is logged

**COMMENT**

Using the level converter

- Using the level converter via USB type B interface
- Setting «Default» complies with 2400 Baud
- When the level converter is activated the status changes
  - to web server «Level converter RS232» is on
  - to AMBUS® Link «[< - - >]» is on
- The logger function is deactivated in the level converter operation

### 6.8.5. Switching on the level converter


1. Choose the Baud rate of the meter
   default
2. Activate the level converter
3. Press Save

The level converter is activated

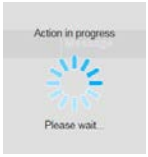
**COMMENT**

Filtering the status messages

- Status details
  - 0 - After switching on the device, start process "logger"
  - 1 - M-Bus overcurrent
  - 2 - Start cloud upload
  - 3 - Error cloud upload
  - 4 - Cloud upload successfully completed
  - 5 - Start FTP/sFTP upload
  - 6 - Error FTP/sFTP upload
  - 7 - FTP/sFTP upload successfully completed
  - 8 - Meter (serial number), reading failed
  - 9 - Email transmission failed
  - 10 - Error on a meter
- It is recommended to regularly delete the status messages to prevent long updating times.

## 6.8.6. Status messages

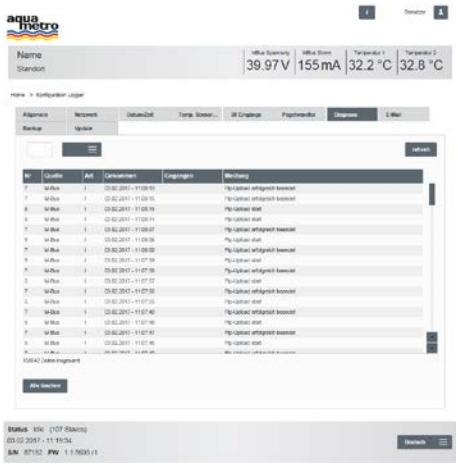
Logger configuration → Diagnosis

1. Enter status number
2. 

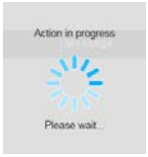
The data is updated
3. Press refresh for actualisation

Status information is displayed

## 6.8.7. Message type selection



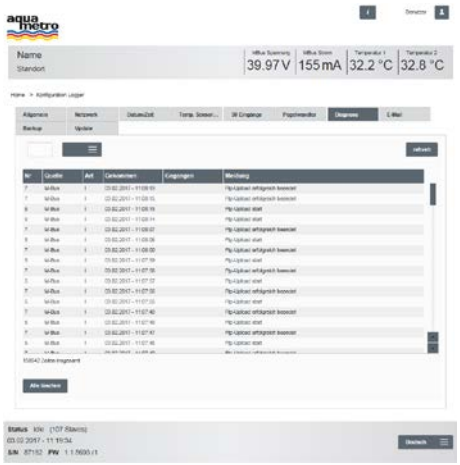
Logger configuration → Diagnosis

1. Select a message
   a. Error
   b. Warning
   c. Info
2. 

The data is updated
3. Press refresh for actualisation

Message type selected

### 6.8.8. Delete status messages



Logger configuration → Diagnosis

1. Press Delete all

All status messages are deleted

**COMMENT**

Configuration email

- Several email addresses possible by using a semicolon as separator
- Sending of
  - M-Bus alarm (warning)
  - Reading error (error)

### 6.8.9. Sending alarms via email

Logger configuration → E-Mail

1. Enter email server and port
2. Enter name and email address of the sender
3. Enter email address of the recipient
4. Select connection type
   - TCP
   - SSL
   - TLS
5. Select login
   - Login
   - Plain
6. Adjust timeouts
7. Enter username and password
8. On/Off Activate/deactivate function
9. Press Save

Alarms have been sent via email

**COMMENT**

Configuration logger

- Backup file
  - Export file in JSON format
  - The exported file is saved in the download folder of the web browser
- Contains complete logger configuration
  - Without meter

## 6.8.10. Export logger configuration

Logger configuration → Backup

1. Press Download for saving the current logger configuration
2. Data is downloaded

Data is exported

## 6.8.11. Import logger configuration

Logger configuration → Backup

1. Press Select File (format JSON)
2. Select file
3. Configuration_Name_28_11_2016_10_2.json File is displayed
4. Press Import
5. Backup is imported

Logger configuration is imported

**NOTE**

Failed firmware updates might lead to a loss of data

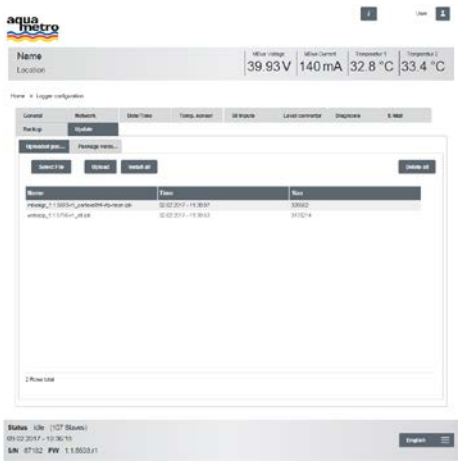
- Perform configuration logger «Backup» (6.8.10)

**COMMENT**

Install firmware updates

- Updating individual functional units
  - M-Bus logger
  - BACnet/IP
  - Connect
  - Websocket
  - Web server
- Package update as format «*.ipk»
- Multiple selection for package updates possible
- Fail-safe firmware update with intermediate storage

## 6.8.12. Firmware package update


1. Press Select File
2. Select file
3. Press Upload
4.  File is uploaded
5. Data is displayed in table
6. Repeat step 1-4 for additional files
7. Install all Updates are installed
8. Execute firmware package overview (see 6.8.13)
9. Press Delete all

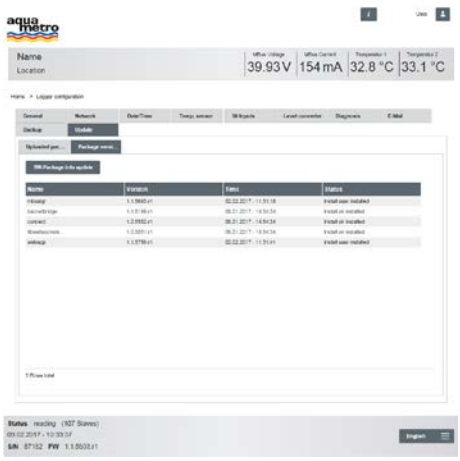
Updates have been installed

**COMMENT**

Installed firmware packages

- View of all firmware packages with time stamp and status
- Control of successful installations with the time stamp
- The update process might take several minutes

### 6.8.13. Firmware package overview

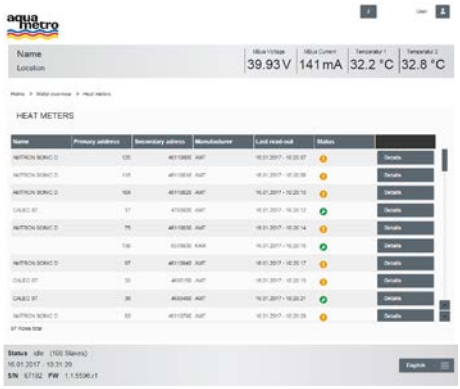



1. Press SW-Package info update

The overview of installed updates is refreshed

## 6.9 Data management via web server

### 6.9.1. Overview of meter statuses

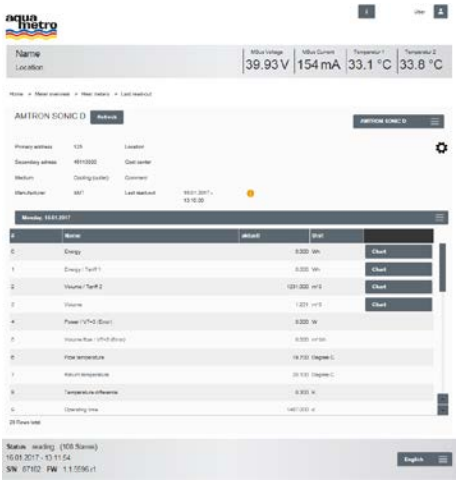

1. Select Details of a meter

The table with current meter statuses is displayed

**COMMENT**

The function "Update" reads the current data of the last reading process from a database. No M-Bus reading is performed.

## 6.9.2. Viewing meter statuses


1. CALEC ST ☰ Selecting a meter
2. Press Refresh

Data of selected meters are shown


1. Select Chart for diagram view
2. Monday, 13.02.2017 ☰ Choose starting time

Meter statuses are displayed from starting time. Comparison with the previous day, week, month or year is displayed

## 6.9.3. Print/save charts



1. Select Chart for diagram view
2. Monday, 13.02.2017 ☰ Choose starting time
3. Press ☰
4. Select Print or Save

Charts are saved or printed

## 6.10 System integration via web server

**COMMENT**

Data export

- Data can be exported manually or via FTP/sFTP
- For a larger time period the process takes several minutes
- Export type CSV
  - Option «Standard» see chapter 11.2
  - Option «Standard» see chapter 11.3
  - Enter separator
- The exported files are saved in a compressed ZIP archive (DataExport.zip) in the download folder of the web browser.
- FTP files are saved after each reading cycle in the indicated directory (push process)

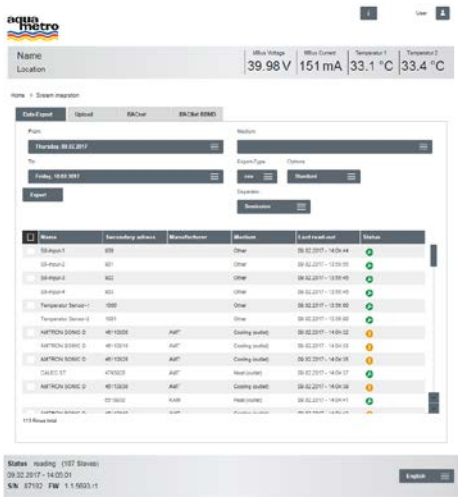
Integration of a cloud solution

- ISO 500001 certified energy management software solution
- Please contact your Aquametro contact person

Integration via BACnet/IP

- All registered M-Bus meters are also available as BACnet objects
- AMBUS® Link is BBMD-capable
- At maximum 16 BBMD servers can be set up
- The M-Bus can be permanently read out
  - Permanent reading: It is not waited for the next reading cycle. As soon as the reading is finished the next query is started

### 6.10.1. Export meter data



System integration → Data-Export

1. Select individual meters ☐ or all meters ☐
2. Select a time period
3. Choose a medium (optional)
4. Select export type csv
5. Select options Standard
6. Select a separator Semicolon
7. Press Export

Export file is generated and saved in the ZIP archive

**COMMENT**

FTP upload File path
10-46110815-20161122102732
ID-Secondary address-YearMonthDayHourMinuteSecond

ID : Internal AMBUS Link identification number (configuration meter 6.4.5)

### 6.10.2. Meter data upload via FTP /sFTP

System integration → Upload → FTP

1. Define information about FTP/sFTP server
   - Server address
   - Port
   - Username
   - Password
   - Path
2. ☑ On Activate/deactivate upload
3. Activate/deactivate ☐ SSL
4. Select export type csv
5. Select a separator Semicolon
6. Select options Standard
7. Select language Ger...
8. Press Save
9. Press Upload (manual upload)

Data is pushed to the FTP/sFTP server

### 6.10.3. Upload of meter data via cloud

System integration → Upload → Cloud

1. Specify information about the cloud server
    - Server address
    - Port
    - ID
2. On Activate/deactivate upload
3. Press Save
4. Select pem
5. Press Upload (manual upload)
6. Delete pem

Data is pushed in the cloud

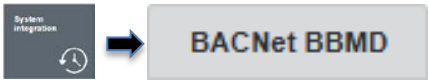
### 6.10.4. Switch on BACnet/IP

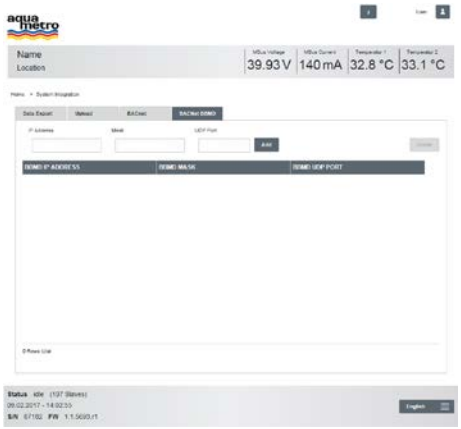
System integration → BACNet

1. Define BACnet settings
    - D-Net number
    - Port number
    - Device instance number
2. Activate/deactivate BBMD on
3. Activate/deactivate BACNet on
4. Activate/deactivate M-Bus continuous reading on
5. Press Save

BACnet/IP is switched on

### 6.10.5. Define a BACnet BBMD server

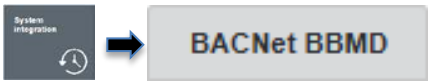


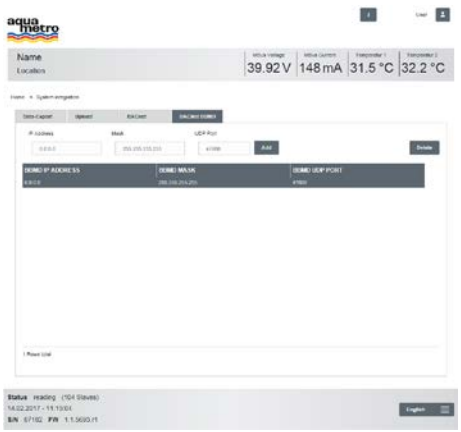




1. Define BACnet BBMD settings
    - IP address
    - Subnet mask
    - UDP port
2. Press Add

BACnet BBMD server has been defined

### 6.10.6. Delete BACnet BBMD server




1. Select server
2. Press Delete

BACnet BBMD server is deleted

# 7 Maintenance and repair

The product requires no maintenance. Cleaning shall only be performed with a moistened cloth. No solvents or other aggressive agents shall be applied.

**WARNING**

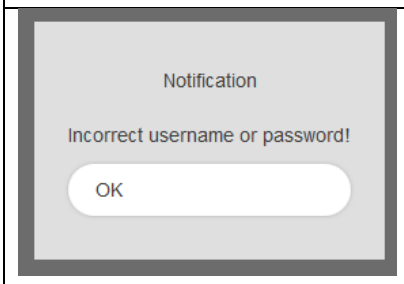
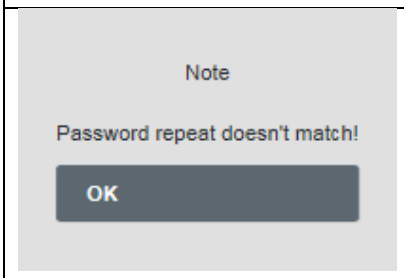
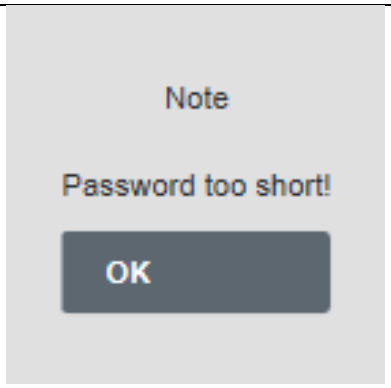
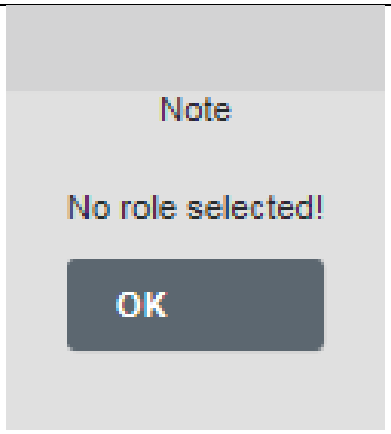
Risk of death by electric shock from live cables and parts.

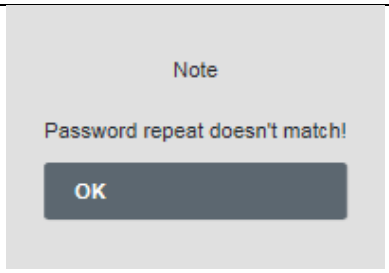
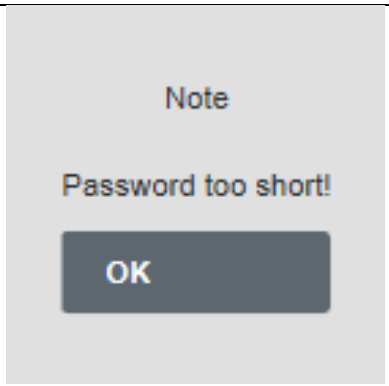
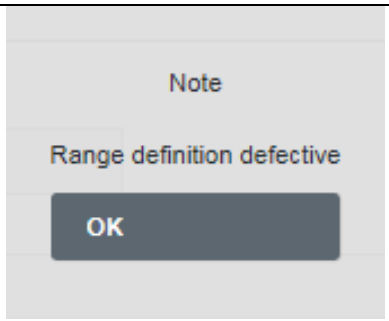
Risk of electric shock!

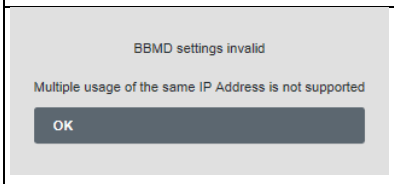
1. Perform installation and maintenance work only when the system is off power.
2. Work on and with voltage shall only be performed by authorised specialists under consideration of applicable regulations.
3. For connections to the power supply only the intended terminals shall be used.

# 8 Malfunctions and error messages

| Symptom | Reason | Correction |
|---|---|---|
| LEDs are not glowing | • No supply available | Check power supply incl. supply isolation terminal according to installation manual |
| AMBUS®Link finds no meter | • No or wrongly installed meters | Check meter installations |
| | • Wrong Baud rate selected | Check the selected Baud rate according to chapter 6.4.1 |
| AMBUS®Link finds not all meters | • Addresses have been assigned twice | Control M-Bus network with a suitable M-Bus tool for bus numbers, which have been assigned twice |
| | • Meter with wrong Baud rate | Control the Baud rate at the meter, select a lower Baud rate at the meter, if possible. |
| The operating status shows «OFF» during startup and «MMC Missing» appears on the display | • No mini SD card in the slot. | • Disconnect AMBUS® Link from the power supply<br>• Enter a microSD card in the respective slot<br>• Switch AMBUS® Link on |

| | | |
|---|---|---|
| **Login** | | |
|  | • Wrong username or password | • Enter correct username and password |
| **Create a user profile** | | |
|  | • The current password is not corresponding with the repeated password | • Enter the password correctly again |
|  | • The minimum length of 3 characters has not been complied with | • Enter a password with at least 3 characters |
|  | • The details have not been filled out completely. | • Repeat the registration and fill out all details |

| | | |
|---|---|---|
| **Changing the password** | | |
|  | • The current password is not corresponding with the repeatedly entered password | • Enter the password correctly again |
|  | • The minimum length of 3 characters has not been complied with | • Enter a password with at least 3 characters |
| **Search all meters** | | |
|  | • Primary address range set too small | • Set the primary address range generously |

| | | |
|---|---|---|
| **Define BACnet/IP BBMD server** | | |
|  | • A BBMD server with an identical IP address already exists. | • Select new, unique IP address |

# 9 Decommissioning, disassembly and disposal

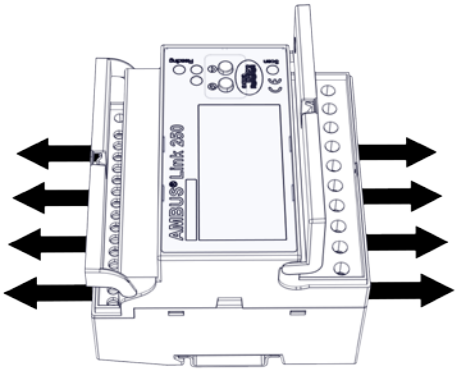
**WARNING**

Risk of death by electric shock from live cables and parts.

<u>Risk of electric shock!</u>

1. Perform installation and maintenance work only when the system is off power.
2. Work on and with voltage shall only be performed by authorised specialists under consideration of applicable regulations.
3. For connections to the power supply only the intended terminals shall be used.

## 9.1 Decommissioning

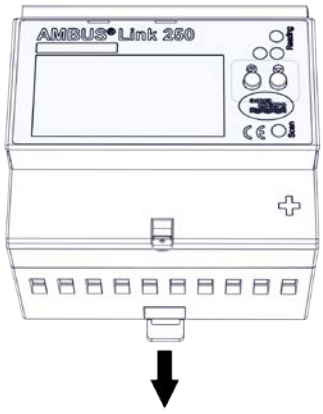



1. Disconnect from all sources of energy
2. Remove all cables and connections from the device
3. Remove the device from the system

AMBUS® Link is out of service

## 9.2 Disassembly

### Control cabinet removal




1. Remove the piston
2. Lift AMBUS®Link up from the mounting rail

AMBUS®Link is separated from the mounting rail

### 9.3 Disposal

At the end of the life cycle this product must be recycled or disposed according to the local provisions.

Remove batteries and accumulators and dispose them separately.

The separate collection and recycling of old devices helps to preserve natural resources and assures that they are disposed in a way that the protection of the environment and nature is assured.

# 10 Technical data

| **Basic data** | |
|---|---|
| Power supply: | 24 VDC |
| Power consumption | Max. 1A |
| Temperature range | 0 - 55°C |
| Display | LCD display with background lighting (128x64 dots) |
| Weight | Approx. 400g |
| Installation | 35mm DIN rail |
| Housing: | Polycarbonate, recyclable, non-flammable |
| Evaluation | Web server/diagram |
| Data export | As JSON or CSV file |
| Data memory | Micro SD card (needs to have more than 32 GB free space available) |
| Firmware update | Yes, is possible |
| Configuration | Local and remote configuration with web browser |
| Inputs | 3x M-Bus<br>2x temperature PT1000 (-20°C to +100°C)<br>4x S0 |

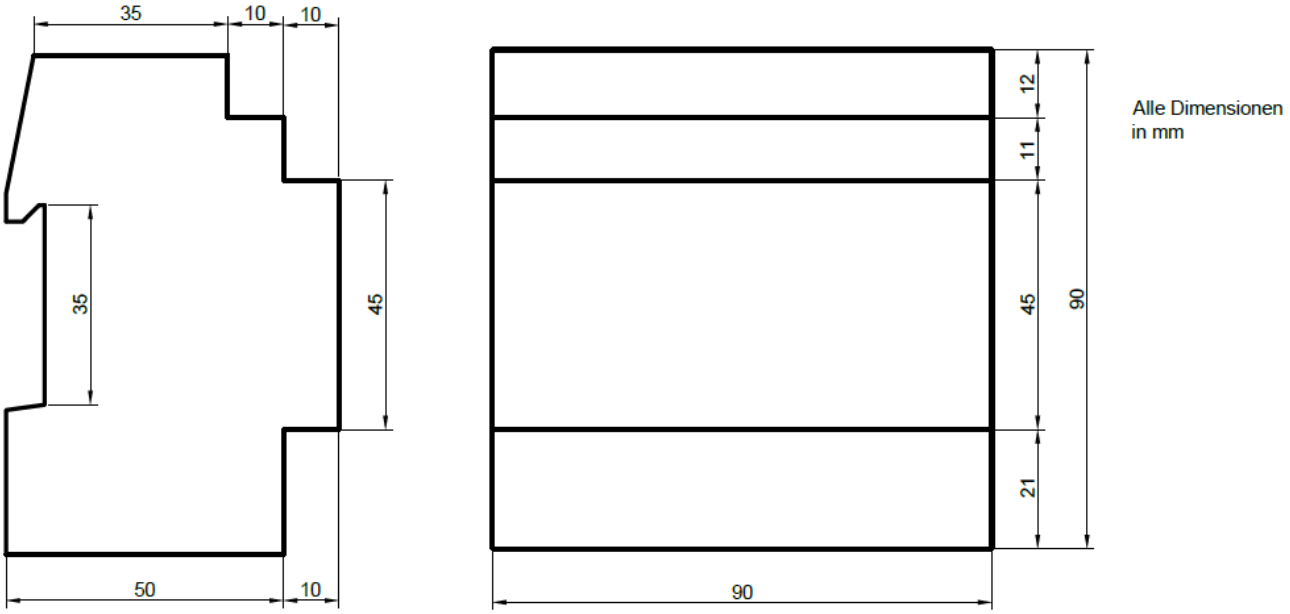
| | |
|---|---|
| Outputs | 2 x relay |
| Interfaces | 1x Ethernet 10/100 Base RJ45<br>1x USB type A<br>1x USB type B |

| **M-Bus** | |
|---|---|
| Baud rates | 300, 600, 1200, 2400, 4800, 9600 |
| Compatibility | Heat, water, fas and electricity meter with M-Bus according to EN 13757-2,-3 (former EN1434-3) |
| Level converter | Integrated<br>Transparently operatable via USB type B |
| M-Bus closed current | Max. 375mA (250 x 1.5mA) |
| Number of M-Bus slaves | Max. 250 (see order information) |
| Galvanic separation | Yes |
| Short-circuit protection | Yes |
| Overload protection | Yes |

| **BACnet/IP** | |
|---|---|
| Specifications | All M-Bus meters registered on AMBUS® Link are automatically translated into BACnet/IP objects. |
| BBMD | Yes |
| Protocol Implementation Conformance Statement | The PICS document can be found on our website at: www.aquametro.com/ambuslink |

| Approvals and norms | |
|---|---|
| Safety | CE-declaration |
| EMC metering | EN 610000-6.2 |
| Interference immunity | EN 61000-6-3 |
| M-Bus norm | EN 13757-2,-3 |
| Energy management | Suitable for ISO 50001 |
| BACnet | Certified |

## 10.1 Dimensions




5 TE Gehäuse
5 Module Case

# 11 Appendix

## 11.1 CE declaration of conformity

**Konformitätserklärung**
**Declaration of conformity**
**Déclaration de conformité**
**Dichiarazione di conformità**

aqua metro
everything that counts

**AQUAMETRO AG, Ringstrasse 75, CH-4106 Therwil**

| | | |
|---|---|---|
| erklärt, dass das Produkt<br>declares that the product<br>déclare que le produit<br>dichiara che i prodotti | **Datenzentrale**<br>**data center**<br>**centre de données**<br>**data center** | **AMBUS® Link** |

mit den Vorschriften folgender Richtlinien übereinstimmt :
*conforms with the regulations of the following European Council Directives :*
*est conforme aux prescriptions et directives Européennes suivantes :*
*è conforme alle seguenti prescrizioni e direttive Europee :*

**CE-Konformität**

| **Richtlinie**<br>**Directive**<br>**Directive**<br>**Direttiva** CE | **Beurteilungsverfahren**<br>**Method of assessment**<br>**Méthode d'évaluation**<br>**Metodo di valutazione** | **Benannte Stelle**<br>**Notified body**<br>**Organisme notifié**<br>**Organizzazione notificata** |
|---|---|---|
| **EMC 2014/30/EU**<br>EMV Richtlinie<br>EMC directive<br>Directive CEM<br>Direttiva CEM | Report:<br>**E2159-05-16** | QUINEL AG (STS 0037)<br>CH-6035 Perlen |

**Weitere Konformitäten**

| **Richtlinie**<br>**Directive**<br>**Directive**<br>**Direttiva** | **Beurteilungsverfahren**<br>**Method of assessment**<br>**Méthode d'évaluation**<br>**Metodo di valutazione** | **Benannte Stelle**<br>**Notified body**<br>**Organisme notifié**<br>**Organizzazione notificata** |
|---|---|---|
| | | |

Therwil, 30.01.2017

Thomas Bisang
Leiter Qualitätsmanagement
Head Quality Management
Responsable gestion de qualité
Direttore gestione qualità

Remo Bucheli
Produkt Management
Product Management
Management des produits
Management del prodotto

## 11.2 Export file type csv standard

| Date/Time(UTC) | PrimaryAddress | Serial | ManufacturerId | Version |
|---|---|---|---|---|
| 26.01.2017 16:12 | 10 | 4800181 | AMT | 192 |
| 26.01.2017 16:27 | 10 | 4800181 | AMT | 192 |
| 26.01.2017 16:43 | 10 | 4800181 | AMT | 192 |

| Medium | Energy | Energy_Einheit | Volume | Volume_Einheit |
|---|---|---|---|---|
| Heat (outlet) | 2709840000 | Wh | 43240.1 | m^3 |
| Heat (outlet) | 2709870000 | Wh | 43240.5 | m^3 |
| Heat (outlet) | 2709890000 | Wh | 43240.8 | m^3 |

| Units for H. C. A. | Units for H. C. A._Einheit | Units for H. C. A. | Units for H. C. A._Einheit | Power |
|---|---|---|---|---|
| 0 | | 0 | | 86269.3 |
| 0 | | 0 | | 86212.8 |
| 0 | | 0 | | 86216.5 |

| Power_Einheit | Volume flow | Volume flow_Einheit | Flow temperature | Flow temperature_Einheit |
|---|---|---|---|---|
| W | 1.37621 | m^3/h | 131.759 | Degree C |
| W | 1.37584 | m^3/h | 131.766 | Degree C |
| W | 1.37555 | m^3/h | 131.759 | Degree C |

| Return temperature | Return temperature_Einheit | Temperature difference | Temperature difference_Einheit | Energy (per kelvinliter) |
|---|---|---|---|---|
| 76.9198 | Degree C | 54.8394 | K | 1.14265 |
| 76.9266 | Degree C | 54.8395 | K | 1.14264 |
| 76.9061 | Degree C | 54.8531 | K | 1.14264 |

| Energy (per kelvinliter)_Einheit | Mass (per liter) | Mass (per liter)_Einheit | On time | On time_Einheit |
|---|---|---|---|---|
| Wh | 0.974371 | kg | 45865 | h |
| Wh | 0.974366 | kg | 45866 | h |
| Wh | 0.974362 | kg | 45866 | h |

| On time / VT=3 (Error) | On time / VT=3 (Error)_Einheit | Volume (per input pulse ch. 0) | Volume (per input pulse ch. 0)_Einheit | Units for H. C. A. (per input pulse ch. 0) |
|---|---|---|---|---|
| 0 | h | 0.00101 | m^3 | 1 |
| 0 | h | 0.00101 | m^3 | 1 |
| 0 | h | 0.00101 | m^3 | 1 |

| Units for H. C. A. (per input pulse ch. 0)_Einh | Units for H. C. A. (per input pulse ch. 0) | Units for H. C. A. (per input pulse ch. 0)_Einh | Address | Address_Einheit |
|---|---|---|---|---|
| | 1 | | 10 | None |
| | 1 | | 10 | None |
| | 1 | | 10 | None |

| Fabrication | Fabrication_Einheit | Timestamp (future value) / Monat 1 | Timestamp (future value) / Monat 1_Einheit | Timestamp (future value) / Monat 2 |
|---|---|---|---|---|
| 4800181 | None | 2024246144 | UTC | 2040143744 |
| 4800181 | None | 2024246144 | UTC | 2040143744 |
| 4800181 | None | 2024246144 | UTC | 2040143744 |

| Timestamp (future value) / Monat 2_Einheit | Customer | Customer_Einheit | Metrology (firmware) version | Metrology (firmware) version_Einheit |
|---|---|---|---|---|
| UTC | 0 | None | 10500 | None |
| UTC | 0 | None | 10500 | None |
| UTC | 0 | None | 10500 | None |

| Hardware version | Hardware version_Einheit |
|---|---|
| 0 | None |
| 0 | None |
| 0 | None |

| | |
|---|---|
| Date/time (UTC) | Coordinated world time |
| PrimaryAddress | Primary address |
| Serial | Secondary address/serial number |
| ManufacturedId | Manufacturer identification number according to M-Bus |
| Version | M-Bus version byte |
| Medium | Medium |
| Energy | Energy value |
| Energy unit | Unit of the energy value |
| Volume | Volume |
| Volume unit | Unit of the volume |

| | |
|---|---|
| Units for H.C.A. | Heat Cost Allocator allocation formula |
| Units for H.C.A. Unit | No unit ("none") |
| Units for H.C.A. | Heat Cost Allocator allocation formula |
| Units for H.C.A. Unit | No unit ("none") |
| Power | Power |
| Power unit | Unit of the power |
| Volume flow | Flow value |
| Volume flow_unit | Unit of the flow |
| Flow temperature | Flow temperature |
| Flow temperature_unit | Unit of the flow temperature |
| Return temperature | Return temperature |
| Return temperature_unit | Unit of the return temperature |
| Temperature difference | Temperature difference |
| Temperature difference_unit | Unit of the temperature difference |
| Energy (per kelvin litre) | Correction factor |
| Energy (per kelvin litre)_unit | Unit of the correction factor |
| Mass (per litre) | Density |

| | |
|---|---|
| On time | Operating hours |
| On time_unit | Unit of the operating hours |
| On time/VT=3 (error) | Error hours |
| On time/VT=3 (error)_unit | Unit of the error hours |
| Volume (per input pulse ch. 0) | Pulse value |
| Volume (per input pulse ch. 0)_unit | Unit of the pulse value |
| Units for H.C.A. (per input pulse ch. 0) | Pulse value auxiliary meter 1 |
| Units for H.C.A. (per input pulse ch. 0)_unit | No unit ("none") |
| Units for H.C.A. (per input pulse ch. 0) | Pulse value auxiliary meter 2 |
| Units for H.C.A. (per input pulse ch. 0)_unit | No unit ("none") |
| Address | Primary address |
| Address_unit | No unit ("none") |
| Fabrication | Fabrication number |
| Fabrication_unit | No unit ("none") |
| Time stamp (future value)/month 1 | Reporting date 1 |
| Time stamp (future value)/month 1_unit | Unit of the reporting date |

| | |
|---|---|
| Time stamp (future value)/month 2 | Reporting date 2 |
| Time stamp (future value)/month 2_unit | Unit of the reporting date |
| Customer | Customer text field |
| Customer_unit | Text |
| Metrology (firmware) version | Firmware version |
| Metrology (firmware) version_unit | No unit ("none") |
| Hardware version | Hardware version |
| Hardware version_unit | No unit ("none") |

## 11.3 Export file type csv FULL-DB

| Device.Id | AddressMode | PrimaryAddress | ManufacturerId | Serial | Version | Medium | Device.Active | ReadoutCycle | BaudRate |
|---|---|---|---|---|---|---|---|---|---|
| 29 | 0 | 10 | AMT | 4800181 | 192 | Heat (outlet) | -1 | 0 | 2400 |
| 29 | 0 | 10 | AMT | 4800181 | 192 | Heat (outlet) | -1 | 0 | 2400 |
| 29 | 0 | 10 | AMT | 4800181 | 192 | Heat (outlet) | -1 | 0 | 2400 |

| BACNetDevInstNumber | Name | Site | CostUnit | CommentStr | LoggerLastReadoutOk | LoggerReadoutState | LoggerReadoutCycle | MediumGroup | Battery |
|---|---|---|---|---|---|---|---|---|---|
| 4194077 | CALEC ST | | | | 1485440274 | 1 | 0 | 3 | 0 |
| 4194077 | CALEC ST | | | | 1485440274 | 1 | 0 | 3 | 0 |
| 4194077 | CALEC ST | | | | 1485440274 | 1 | 0 | 3 | 0 |

| Position | DescriptionStr | UnitStr | ScalePower | ScaleMantissa | EncodeType | ValueType | StorageNum | Tariff | ValueDesc.Active |
|---|---|---|---|---|---|---|---|---|---|
| 0 | Energy | Wh | 0 | 0 | 0 | 0 | 0 | 0 | -1 |
| 0 | Energy | Wh | 0 | 0 | 0 | 0 | 0 | 0 | -1 |
| 0 | Energy | Wh | 0 | 0 | 0 | 0 | 0 | 0 | -1 |

| LoggerLastValue | CfgDescription | CfgUnit | CfgPhase | CfgFactor | CfgStorageNum | CfgTariff | TimeStamp | Val1 | ValueDesc.Id |
|---|---|---|---|---|---|---|---|---|---|
| 2709680000 | 0 | 0 | 0 | 0 | 0 | 0 | 1485303093 | 2706390000 | 3438 |
| 2709680000 | 0 | 0 | 0 | 0 | 0 | 0 | 1485304020 | 2706420000 | 3438 |
| 2709680000 | 0 | 0 | 0 | 0 | 0 | 0 | 1485304945 | 2706440000 | 3438 |

Explanation CSV export (FullDB)

| | |
|---|---|
| Device .ID | Internal AMBUS Link identification number (configuration meter) |
| AddressMode | Primary switch - secondary reading |
| PrimaryAddress | Primary address |
| ManufacturedId | Manufacturer identification number according to M-Bus |
| Serial | Secondary address/serial number |
| Version | M-Bus version byte |

| | |
|---|---|
| Medium | Medium |
| Device.Active | Defines if a meter is logged during reading and transferred with the report. Value 1: Meter is logged and transferred<br><br>Value 0: Meter is not transferred<br><br>Value -1: not configured |
| ReadoutCycle | Meter-specific reading cycle (only configuration, without reading) |
| Baud rate | Baud rate |
| BACNetDevInstNumber | BACnet device instance number |
| Name | Name |
| Site | Location |
| CostUnit | Cost centre |
| CommentStr | Comment |
| LoggerLastReadoutOk | Last successfuly readout (UNIX time stamp) |
| LoggerReadoutState | Satus of readout<br><br>Value 0: not defined<br><br>Value 1: OK<br><br>Value 2: Error |
| LoggerReadoutCycle | Individual reading cycle (position in dropdown) |

| | |
|---|---|
| MediumGroup | Individual meter type (value from dropdown) |
| Battery | Battery flag |
| Position | N/A |
| DescriptionStr | M-Bus parameter name |
| UnitStr | M-Bus unit |
| ScalePower | Scale factor for the integrated reading value |
| ScaleMantissa | Scale factor (mantissa) |
| EncodeType | Encoding type of the meter in the M-Bus package (e.g.: INT8, INT32, BCD8 or VARIABLEDATA).<br><br>Within the logging integer-based meter values are listed as numbers, text-based meter values as text and binary data as text-based hexadecimal characters. |
| ValueType | Value MAXIMUM: Meter value is a maximum value over a timespan.<br><br>Value MINIMUM: Meter value is a minimum value over a timespan.<br><br>Value ERRORSTATE: Meter value is in error status.<br><br>Value INSTANTANEOUS: Meter value is an instantaneous value. |
| StorageNum | The storage number of the meter value defined by the meter.<br><br>Value 0 defines that the associated meter value for the current time has been recorded.<br><br>A value unequal 0 defines that a meter value at a specific time (defined by the meter manufacturer) has been recorded. |

| | |
|---|---|
| | An associated time stamp is also included in the CSV log (time stamp). |
| Tariff | Tariff |
| ValueDesc.Active | N/A |
| LoggerLastValue | Last value |
| CfgDescription | Designation (manual from template) |
| CfgUnit | Unit (manual from template) |
| CfgPhase | Phase (manual from template) |
| CfgFactor | Factor |
| CfgStorageNum | Storage number (transmitted by meter) |
| CfgTariff | Tariff (manual from template) |
| TimeStamp | Time stamp |
| Val1 | Value |
| ValueDesc.Id | Value identification number |

INTEGRA METERING

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**www.integra-metering.com**