

User Manual M-Center

Document Reference: 2151

Version: 1.1

Date: 17.10.2023

Inhaltsverzeichnis

| | | |
|----------|---|-----------|
| 1 | General | 5 |
| | Safety Instructions | 5 |
| | Maintenance | 5 |
| | Disclaimer / Liability Exclusion | 5 |
| | Duties of the Customer | 5 |
| | Data & Security Backup | 5 |
| | Monitoring Obligation | 5 |
| | Access Authorization | 6 |
| | Responsibility for the IT-Environment | 6 |
| 2 | System | 7 |
| | Connection Diagram | 7 |
| | Physical Interface | 7 |
| | Software Interface | 8 |
| | Buttons on the Device | 8 |
| | Operational States | 8 |
| 3 | Connectors | 9 |
| | Power Supply | 9 |
| | Network Cable | 9 |
| | M-BUS | 9 |
| | Cable Length | 9 |
| | Topology | 10 |
| | USB-C | 10 |
| 4 | Startup | 11 |
| | Network Configuration | 11 |
| | Access the M-Center through the Web Interface | 11 |
| 5 | Overview Web Interface | 12 |
| 6 | Change M-Center Settings | 13 |
| | General Settings | 13 |
| | Network | 14 |
| | User Management | 15 |
| | Change Password | 16 |
| | Date/ Time | 16 |
| 7 | Additional Features | 17 |
| | Level Converter | 17 |
| | Restart | 17 |
| | Messages | 17 |
| 8 | Search and Configure Meters | 18 |
| | Start Scan | 18 |
| | Automatically | 18 |
| | Manually | 19 |
| | Examine Found Meters | 19 |
| | Edit Mode | 20 |
| | Delete Meter | 20 |
| | Templates | 21 |
| | Import | 21 |
| | Export | 21 |
| | Create Templates | 21 |
| | Apply Templates | 21 |
| | Edit Templates | 22 |

| | |
|--|-----------|
| 9 System Integration | 23 |
| Manual Data Export | 23 |
| FTP Server | 23 |
| FTP | 24 |
| FTPS | 24 |
| SFTP | 24 |
| Automatic data export into Joulio-Web | 24 |
| BACnet | 25 |
| BACNet BBMD | 25 |
| 10 Troubleshooting | 26 |
| One or more meters cannot be read | 26 |
| No meter can be read | 26 |
| Multiple meters cannot be read | 26 |
| One meter cannot be read | 26 |
| Measurement on the M-Center differs from the measurement on the meter by a constant factor | 26 |
| FTP-Upload fails | 26 |

| Version | Revision Date | Token | Changes |
|---------|---------------|-------|-------------------------|
| V1.1 | 17.10.2021 | met | Initial english version |

General

Safety Instructions

Please read this user manual as well as all other supplementary documents for the EMU M-Center carefully.



Please pay special attention to the safety instructions and warnings when using the EMU M-Center and this user manual. Nonobservance can lead to substantial damage to persons and/or property.

Please use the EMU M-Center only in its certified area of operation. Nonobservance of these boundaries can lead to substantial damage to persons and/or property.

Unauthorized changes to the EMU M-Center voids all warranties and precludes any and all rights for compensation on the part of EMU Electronic AG in case of damage.

The usual local security and work rules must be observed. The installation of the EMU M-Center must be carried out by qualified and trained personnel. Please read the installation instructions carefully.

The following symbols indicate areas where special attention is necessary:

-  This symbol combined with the word "Note:" is used to describe important information, an important procedure or handling.
-  This symbol indicates a potentially dangerous situation where nonobservance of these warnings can lead to substantial damage to persons and/or property.

Maintenance

The EMU M-Center is maintenance free. In case of damages (for example incorrect operation or incorrect storage) repairs may only be carried out by EMU Electronic AG .

Disclaimer / Liability Exclusion

The choice of the EMU datalogger and determination of the suitability of the datalogger for a particular purpose are solely the responsibility of the buyer. EMU Electronic AG takes no responsibility for this.

Data / information in catalogs and data sheets do not promise special properties, but are determined by experience and measurements.

Liability for damages caused by improper operation / projecting or malfunction of the datalogger is excluded. The operator / project engineer has to take care that improper operation / planning and malfunctions can not cause further damage. No warranty is given for defects or damage caused by improper use of the EMU datalogger or by not following the manual.

Duties of the Customer

Data & Security Backup

The customer is responsible for a suitable data backup regardless of the type of installation of the EMU M-Center. The risks and costs of operation lie with the customer. EMU can help with developing possible concepts for operation within the scope of further services.

The responsibility for establishing the required readout and security-backups for safe operations lie with the customer. The security-backups must be stored securely by the customer.

Monitoring Obligation

The customer is obligated to monitor the EMU M-Center to identify outages as soon as possible within the first 24 hours of the outage.

Access Authorization

The customer is responsible for the technical and organizational security against unauthorized third-party involvement for the EMU M-Center.

Responsibility for the IT-Environment

The customer is responsible for their IT-environment as well as the safeguarding of it's access.

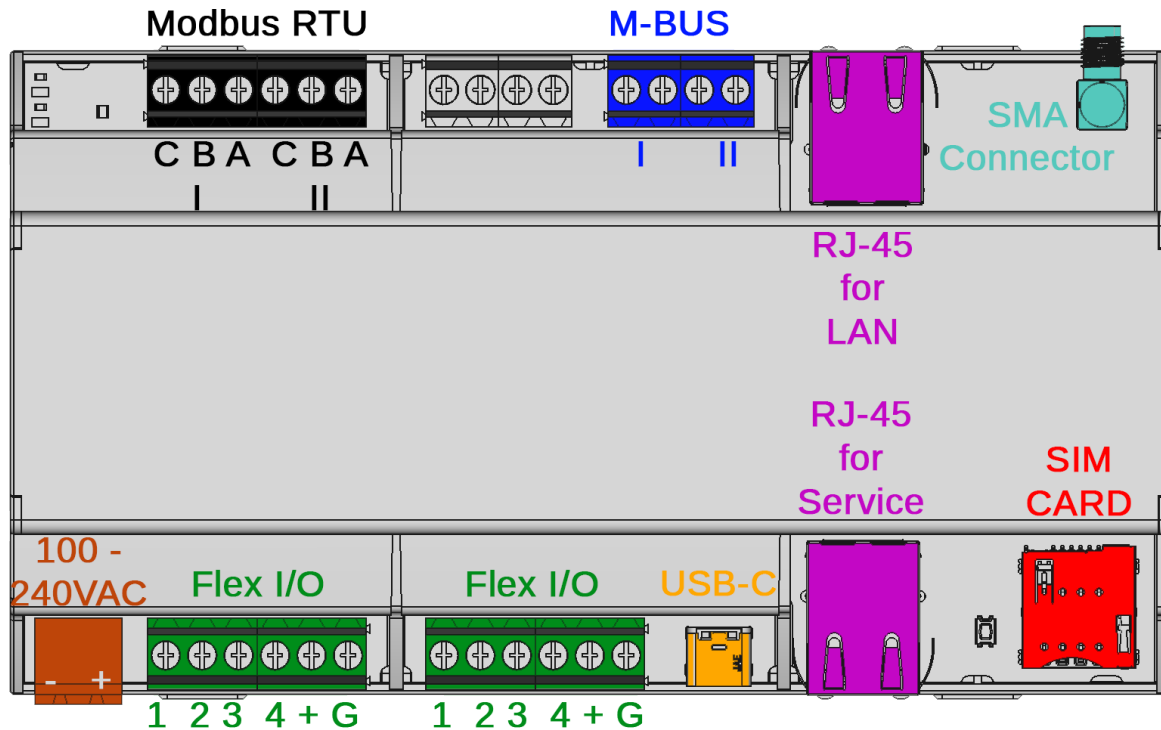
It is brought to the customers attention that the EMU M-Center as well as it's FW-Updates (Firmware) have certain system requirements. It is the responsibility of the customer to conform to these requirements. It is the exclusive responsibility of the customer to provide the necessary hardware and personnel required for the EMU -Firmware.

The customer is advised to take precautions in case of partial or full failure of the EMU M-Center (e.g. daily backups, interference diagnosis, regular examination of measurements, contingency plans). It is their sole responsibility to provide necessary infrastructure and ensure functionality of the work environment and it's technical capability.

The initial system requirements can change during operation or due to an update. The customer is responsible for keeping themselves up to date on these requirements and to ensure system compatibility before installing updates.

System

Connection Diagram



Physical Interface

Power supply

The M-Center needs a 230VAC supply voltage with a current of at least 1A. (see connection diagram, brown colored)

Network

Two RJ-45 connectors which allows remote access via a web browser. Supports BACNet / BACNet BBMD. (see connection diagram, violet colored)

2x M-BUS

Two parallel M-Bus connector terminals for practical wiring. The two terminals are internally connected to a single string. (see connection diagram, blue colored)

8x FlexIO

Eight freely programmable Inputs/Outputs with the possibility of two different supply voltages. (see connection diagram, green colored)

USB-C

USB Host connector for specific peripheral devices. (see connection diagram, orange colored)

SIM Card

The EMU M-Center has a slot for a SIM Card. (see connection diagram, red colored)



Attention: Please make sure to disconnect any power from the M-Center before the insertion or extraction of the SIM Card.

Modbus RTU (RS-485)

Two RS-485 connectors for two Modbus Strings with Modbus readout. (see connection diagram, black colored)

SMA Connector

The EMU M-Center has a SMA connector for a LTE Antenna. (see connection diagram, petrol colored)



Attention: Please make sure to disconnect any power from the M-Center before attaching the antenna.

Software Interface

Webbrowser

Readout of the M-Center can be monitored off-site via a web browser and exported as a .csv or .json file via the “FTP Configuration” tab on the browser interface.

FTP-Export

Export a file for each readout interval and meter. Select freely between the .csv and .json format. The M-Center supports the FTP, FTPS and SFTP protocols.

Cloud-Upload

Interface to the “Joulio-Web” energy management system.

BACNet & BACNet BBMD

Allows the integration of measurements into the automated systems of a building.

Pegelwandler

Allows the manual readout of the M-Bus meters via external software through USB or TCP.

Buttons on the Device

The M-Center has a “Reset” button and a “Recovery” button which are found next to the SIM Card.

The “Reset” button is akin to disconnecting the power supply of the M-Center. This can lead to corrupted internal memory and should be avoided unless absolutely necessary. For a secure reboot of the M-Center please use the **Reboot** software button on the web page under **Configuration**. This reboot requires a confirmation.

The Recovery button is needed in special cases for an Update of the M-Center. Only use this button if you have been explicitly instructed to do so by the EMU Electronic AG support.

Operational States

The green/red status circle on the web page shows the current status of the M-Center. A green circle signifies orderly and error free operation of the M-Center. A red circle shows an error on the M-Bus interface. In most cases this can be traced back to a short on the M-Bus.

Connectors

This chapter describes the M-Center connectors in detail.

Power Supply

The M-Center needs a 230VAC (100 - 240VAC) supply voltage with a current of at least 1A. The connectors are on the lower left.

Network Cable

The EMU M-Center has two RJ-45 LAN connections. The connections are on both sides of the device. The connection on top is meant for LAN, the lower connection for the service of the M-Centers.

- The LAN Port is set to DHCP ex factory.
- The Service Port has a fixed IP: 169.254.254.1



Note: The service port is meant for a direct connection with a computer.

M-BUS

The EMU M-Center has two parallel M-Bus connectors. They are found on the upper terminal.

Cable Length

The maximal Bus length is dependent on the following factors:

- Number of slave devices on the bus. The more devices the shorter the possible bus length.
- Readout baud rate. A lower baud rate (300) allows readout over longer distances, while higher baud rates (9600) have the opposite effect.
- Bus diameter. A greater diameter ($>0.8mm^2$) allows for greater distance readout.

With the following assumptions, a bus length of 1 - 1.5km is viable

| Description | Value |
|----------------------------------|--------------------|
| Baud rate | 2400 |
| Cable in use | $2 \times 0.8mm^2$ |
| Capacity of one M-BUS device | $1nF$ |
| Avg. current of one M-BUS device | $1.5mA$ |



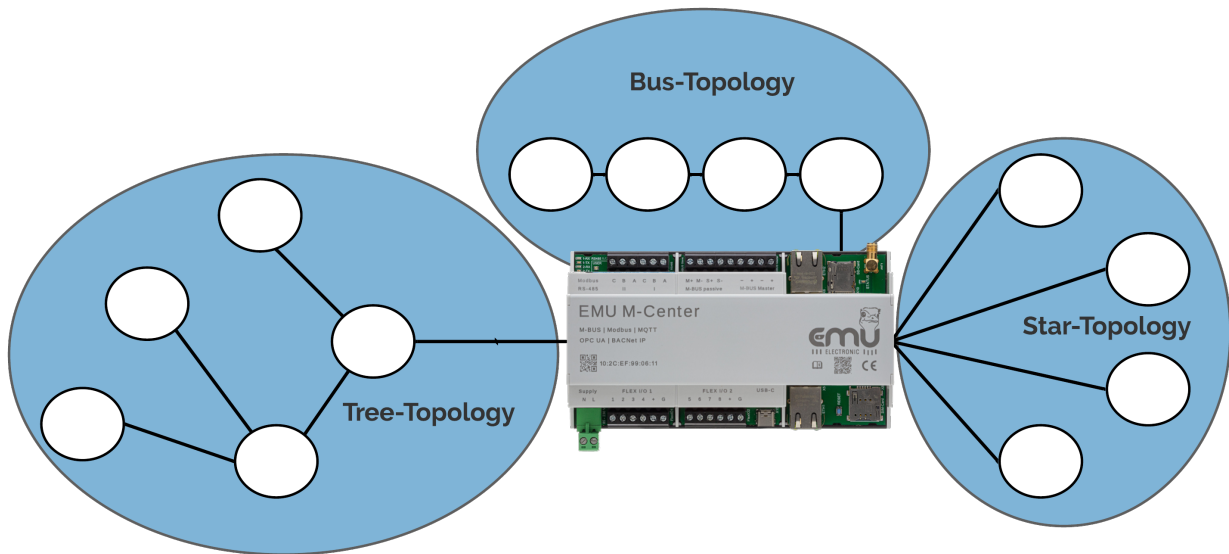
Note: These specifications are only to be used as a reference. The actually possible segment length may vary. Generally it is recommended to keep the segment length to a minimum.



Note: The maximum amount of devices connected on the M-Bus depends on their current draw. An EMU Professional II has a standard draw of $1.5mA$ (1 unit load) while certain water and heat meters draw up to 4 unit loads. The maximum M-Bus load on the M-Center is $375mA$ (1 unit load = $1.5mA$).

Topology

You are free to choose between star, bus or tree topology. Depending on your needs, a mix of the three is also possible.



Note: M-Bus does not allow for a ring topology.

USB-C

The USB-C Port is used for the level converter. Connect your computer with the USB port and access the M-Bus via the virtual COM port.

Startup

This chapter describes the recommended steps in configuring a newly installed M-Center. It is always possible to configure the device further at a later time.

After successfully connecting the M-Center, the device may be configured.

Network Configuration

The EMU M-Center is set to DHCP ex factory.

To setup the EMU M-Center on location, a laptop can be connected via the service port LAN interface. The connection has the fixed IP-Address 169.254.254.1. Computers connected to the service port automatically receive an IP-address via DHCP. The EMU M-Center can be configured via the web interface reachable with this address.

Service Port = Fixed IP-Address 169.254.254.1

For a remote setup, the EMU M-Center must be in the same network as your computer. You can now get the IP-Address of your M-Center by opening the command line interface and entering the following:

```
ping mcenter-'MACADDRESS'
```

The serial number of your M-Center is also it's MAC-Address and is printed onto the M-Center casing. Example with a M-Center with the serial number and MAC-Address 12:34:56:78:9a:bc

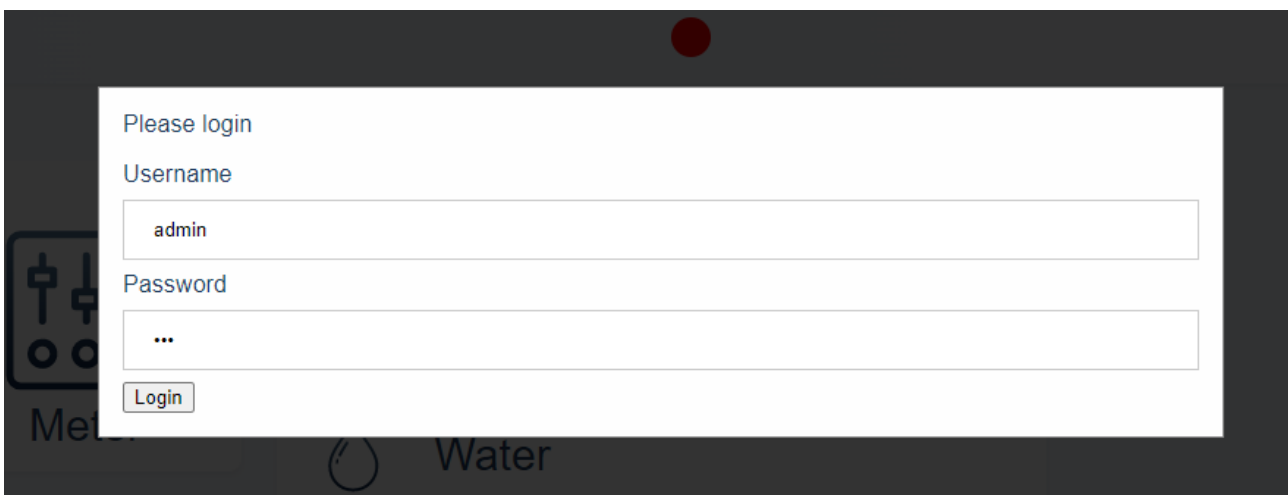
```
ping mcenter-123456789abc
```

Access the M-Center through the Web Interface

If the M-Center has a valid IP configuration, the device can be reached via their IP-address in any web browser.

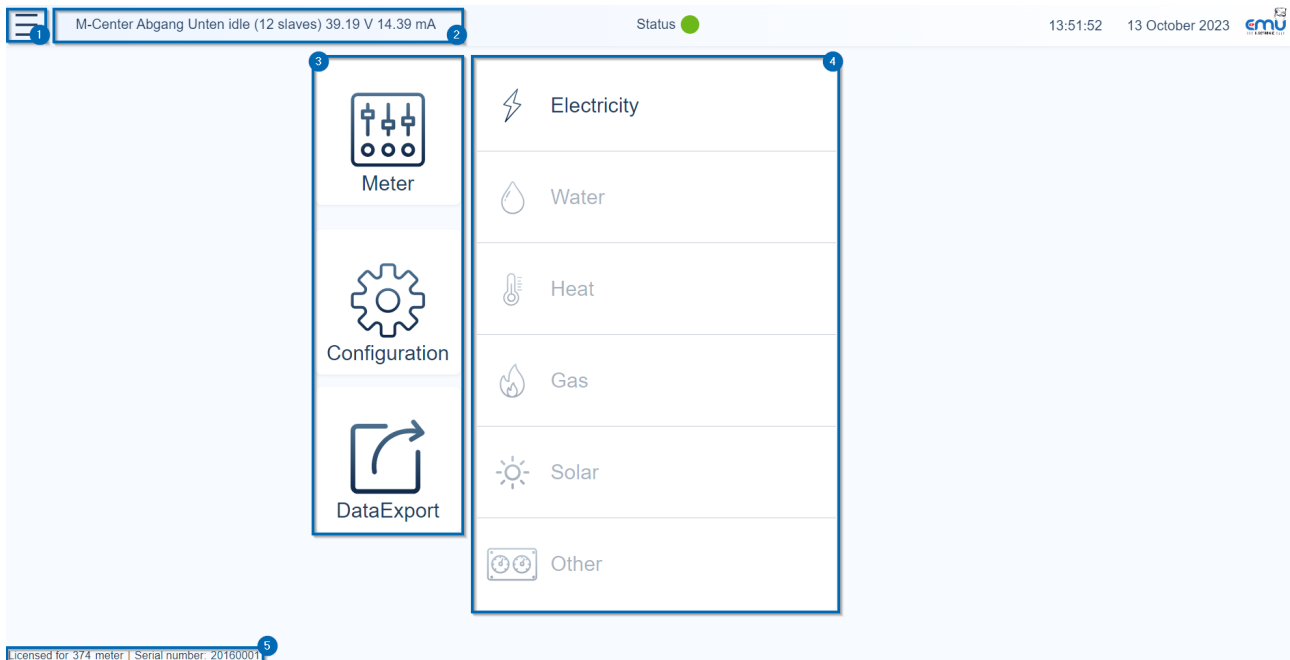
The default access data ex-factory for the M-Center are as follows:

- Username: admin
- Password: 123



Note: It is recommended to change the default password as soon as possible.

Overview Web Interface



1. You can change the language of the web interface, change the password of the current user or logout the current user.
2. The name of the M-Center as well as the M-Bus interface status is shown here.
 - Activity (wait, readout, scan, etc.)
 - Number of connected devices
 - Bus voltage
 - Bus current
3. Sub menus
 - “Meter” shows all connected meters
 - “Configuration” lets you configure the M-Center and it's different features
 - “Data export” lets you export and download meter data
4. Meter categories. Brings you to filtered lists of all the connected meters.
5. The serial number and the number of licensed meters is shown here. This information is also shown at the bottom of every sub menu.



Note: Expanding the scope of operation of the M-Center with additional licenses is possible at any point. Please contact your distribution partner for more information.

Change M-Center Settings

The screenshot shows the M-Center web interface. At the top, it displays 'M-Center Abgang Unten idle (12 slaves) 39.19 V 14.4 mA' and a 'Status' indicator with a green dot. The main menu consists of five large icons: 'Meter' (three vertical bars), 'Configuration' (a gear), 'DataExport' (a square with an arrow), 'Electricity' (a lightning bolt), 'Water' (a water drop), 'Heat' (a thermometer), 'Gas' (a flame), and 'Solar' (a sun). The 'Configuration' icon is highlighted with a blue border.

Click on “Configuration” on the web interface.



Note: To navigate between the different sub menus please use the menu bar. The return button on the browser works as a log out button.

General Settings

The following settings can be edited in the **Logger configuration** tab:

The screenshot shows the 'Logger configuration' tab in the M-Center web interface. The page title is 'Development 3A idle (7 slaves) 39.57 V 13.19 mA'. The 'Name' field is set to 'Development 3A'. The 'Location' is 'Garage, Level 2'. The 'Time zone' is 'Europe/Paris'. The 'Default read-out cycle' is '15 minutes'. The 'M-Bus Request Timeout [ms]' is '0'. The 'Import Configuration-Backup' section has a 'Datei auswählen' button and 'Keine ausgewählt' text. There are 'Import' and 'Import' buttons. A red 'x' and a green checkmark are visible in the top right corner.

- Recommended settings:
 - Set the correct **timezone**. This setting is essential for correct timestamps on the measurement values.
 - The **M-Bus readout timeout [ms]** sets the time before the M-Center interprets a missing answer from M-Bus devices as a timeout. The default timeout is 3s (3000ms). A “0” in this field sets the timeout to the default value.
 - **Standard readout interval** sets the interval in which the M-Center reads all connected M-Bus meters.

- By default the M-Center ignores date and time information in the M-Bus telegrams. Activate the option **interpret time and date values during M-Bus readout** to ensure that the date and time information is read and interpreted.



Note: This option must be set before adding any meters. Activating this option can lead to faulty readouts on meters added before activation.

- Optional settings:
 - **Name** optionally lets you set the name of the M-Center next to the language selection on the top left of the web interface.
 - **Location** lets you describe the place of installation.
 - If you worked with an EMU M-Center in the past, you can **import it's configuration file** here.
- **Save** all your settings by clicking on the green check mark on the top right.

The following readout intervals for M-Bus are available:

15min (default), 20min, 30min, 45min, 60min, 90min, 120min, 150min, 3h, 6h, 12h, 18h, 24h, 48h, 168h (7 days), 672h (28 days)

Recommended readout interval on meters without battery: 15 minutes.

For meters with a battery, please contact the manufacturer for a recommended readout interval

This allows for a robust readout with a good resolution of the data.

The minimal readout interval is determined by the readout duration of the connected devices. If a readout cycle for all connected devices goes on for more than 15 minutes, a slower interval must be chosen. Alternatively, each meter can have an individually set readout interval.

The M-Center supports raster readout:

- On a chosen interval of 15 minutes the readout starts at .00, .15, .30, .45 respectively.
- On a chosen interval of 1 hour the readout always starts at the full hour.



Note: By default the readout cycle is 15 min.

Network

In this menu you can configure the LAN interface. By default the M-Center is set to DHCP.

- The field **eth0 - Ethernet MAC address** shows the MAC address for the M-Center. The same address is also printed on the casing.
- To set up the interface manually choose "manual" in the **manual configuration** drop-down menu. Afterwards you can set the IP-Address, subnet mask and gateway.
- Save your settings by clicking on the green check mark on the top right.

M-Center (Firmware) | Users: idle (12 slaves) | 39.19 V | 14.4 mA | Status: ● | 13:37:24 | 13 October 2023 | emu

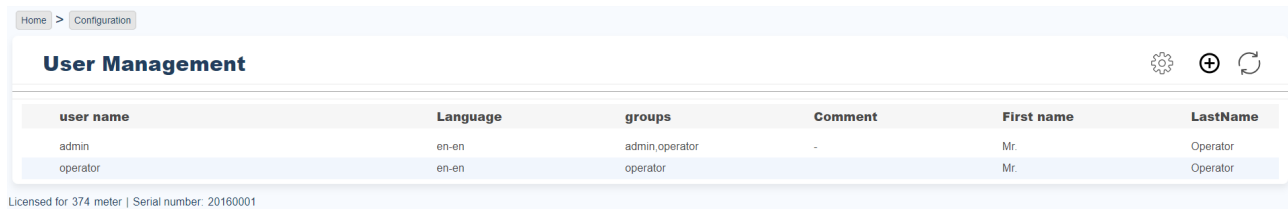
Home > Configuration

Network configuration

| | | | | | |
|-----------------------------|--|----------------------|---|------------------|--|
| eth0 - Ethernet MAC address | <input type="text" value="88:8B:45:83:8F:88"/> | IP address | <input type="text" value="10.255.255.113"/> | Subnet mask | <input type="text" value="255.255.255.0"/> |
| Gateway | <input type="text" value="10.255.255.1"/> | manual configuration | DHCP | | |
| Name Server 1 | <input type="text" value="192.168.1.236"/> | Name Server 2 | <input type="text" value="192.168.1.82"/> | DNS Mode: Manual | |

User Management

User Management can be found in the configuration. Here you can create new users and modify existing ones.



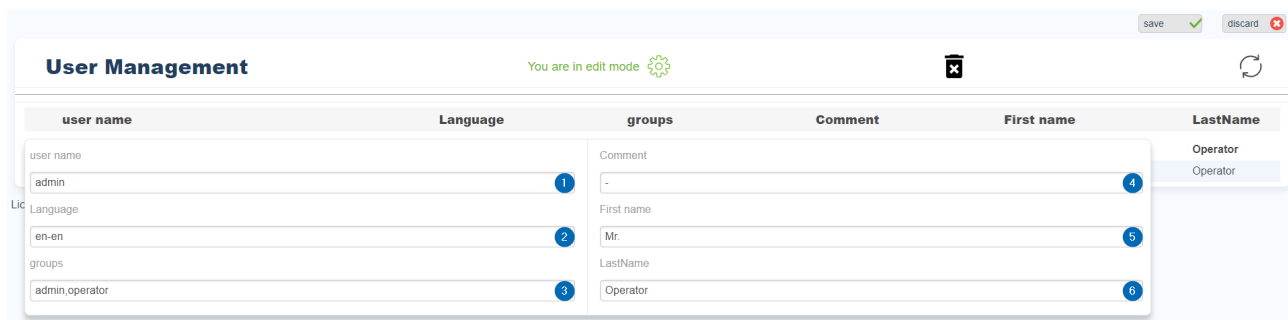
Home > Configuration

User Management

| user name | Language | groups | Comment | First name | LastName |
|-----------|----------|----------------|---------|------------|----------|
| admin | en-en | admin,operator | - | Mr. | Operator |
| operator | en-en | operator | | Mr. | Operator |

Licensed for 374 meter | Serial number: 20160001

1. This list shows all existing users. The user “admin” is the default user and exists ex factory.
2. Open the edit mode with this gear symbol. Once opened you can edit or modify a user by clicking on the name of the user. The options are the same as when a new user is created. A detailed description of the possible settings follows.
3. You can create a new user by clicking on the plus. A detailed description of the possible settings follows.
4. Refresh the sub menu.



save ✓ discard ✗

User Management

You are in edit mode

| user name | Language | groups | Comment | First name | LastName |
|-----------|----------|----------------|---------|------------|----------|
| admin | en-en | admin,operator | - | Mr. | Operator |

1. user name: admin
 2. Language: en-en
 3. groups: admin,operator
 4. Comment: -
 5. First name: Mr.
 6. LastName: Operator

1. Enter a username. This name is the login name.
2. Choose your preferred language for this user. The set language is automatically active if you log in as this user.
 - de-ch for german-switzerland
 - de-de for german-germany
 - de-at for german-austria
 - en-en for english
3. Add the user to a group.
4. This is an optional free field for comments on this user.
5. This is an optional free field for this user’s first name.
6. This is an optional free field for this user’s last name.

Save the new user, or changes to existing users by clicking on the “Save” button on the top right. Cancel any changes made or discard the new user by clicking on the “Cancel” button on the top right.



Note: The difference between the three German languages is amongst other things the thousands separator in exported files (.csv, .json).

You can delete a user by clicking on the waste bin while editing the user. This requires you to confirm the deletion.

To set the password for a newly created user you need to log out with the current user and log in again as the new user. The new user does not have a password so leave the password field empty. Once you logged in you can change the password in the language menu on the top left. In case of a new user the field “current password” can be left empty.

Change Password



To change the password of a user click on the language menu on the top left. In the drop-down menu choose “change password”. Enter your current, the new as well as a repeat of the new password and click on “change password” to save the new password.

Date/ Time



Note: It is recommended to use a NTP server to synchronize the time.

To log measurement values correctly, the M-Center requires a correctly configured system time. The M-Center internally uses UTC-Time. This time is calculated from the set timezone and the synchronized NTP time. If any NTP server is reachable the M-Center synchronizes automatically with it.

Set a valid NTP server in the sub menu **Time** (e.g. *ch.pool.ntp.org*).

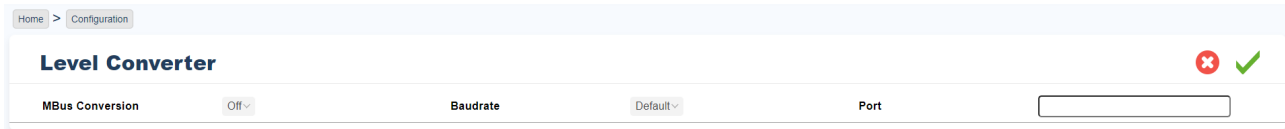


Note: The M-Center tries to continually synchronize its time over NTP. Should you want to set the time manually please make sure that the M-Center cannot connect to any NTP server.

Additional Features

The M-Center has the following additional features.

Level Converter



The level converter allows for a readout of all connected M-Bus meters over TCP or USB via an external program. It is generally used for diagnostic purposes as well as a configuration tool for the EMU Allrounder/Professional registers.

Please enter the correct **Baud rate** if you use the USB port for the level converter, or the correct **Port** if you use the LAN port.

Save your settings by clicking on the green check mark on the top right.



Note: While using the level converter feature, the M-Center stops any normal interval readouts over M-Bus.



Note: The level converter must be turned off for the automatic readout of the connected meters. Make sure to deactivate the level converter after use.

Restart

The EMU M-Center can be rebooted directly via the web interface by clicking on the **Reboot** button in the configuration screen. This reboot needs a confirmation. Once confirmed the M-Center reboots and is available again after one minute.



Note: This reboot is a programmed reboot that should be used instead of the “Reset” button if a restart is necessary.

Messages

This sub menu lists all messages from the M-Center. The following messages are listed here:

- The M-Center sent the time synchronization signal to it's connected meters over M-Bus
- A meter sends errors
- Cloud upload started/ended
- Start/restart of the M-Center
- FTP upload status
- and more

Search and Configure Meters

You can scan for connected meters manually or let the M-Center search for them automatically. Once connected meters have been added to the M-Center you can configure them on the web interface.

Start Scan

Scan for connected meters over M-Bus.

Automatically

The screenshot shows the 'Configuration' page with a 'Scan' section. The 'Baudrate' is set to 'All'. The 'read datalogger from EMU Professional II (instead of instantaneous values)' option is set to 'no'. The 'Address Type' is set to 'Secondary Address'. A 'Scan' button is visible at the bottom of the configuration area.

Any meters connected to the M-Center via M-Bus can be scanned for automatically or through its primary or secondary address. The automatic scan can be done over all or just one baud rate.

Follow these steps to add meters to the M-Center:

- Click on **Scan** in the configuration menu
- Choose the preferred baud rate (2400 recommended). Choosing specific baud rates may shorten scan time.
- Choose between a data logger readout or the normal momentary values readout. This option only works with EMU Professional II meters.
- Choose with which address type you want to scan
 - A secondary address scan scans for all addresses
 - On a primary address scan you can restrict the scanned address range
- Start the scan with the “scan” button



Note: The data logger readout only works on the EMU Professional II energy meter. Any meters from other manufacturers added with this option activated are added as if the option were not active.



Note: Be aware that connected Professional II meters synchronize their time over M-Bus. For a correct data logger time stamp please make sure to connect the M-Center to a network with access to a NTP server.



Note: A Professional II energy meter that is added with the data logger readout will have its entire data logger read out. This can lead to long readout times. The M-Center can read out 8 days worth of data logger entries (default data logger interval of 15min) in one hour.

Manually

To add a meter manually please go to **add meter** and enter the baud rate, the address type and the address of the meter in the corresponding fields. Click on “add meter” to save this meter into the list.

Home > Configuration

Add Meter


Baudrate 2400 ▾

Address Type

Primary Address

Secondary Address

Secondary Address



Add Meter

Examine Found Meters

To review the measurement values of connected and added meters please follow these steps:

- For an overview of all connected meters click on **Meter** on the main web page.
- For a categorized overview of all connected meters click on the desired category on the main web page. This allows you, for example, to list connected electricity meters only.

On the top right of the list view you can update the list manually. Keep in mind that this does not update the measurement values but only refreshes the web interface.

Home

Meters

| Name | Primary Address | Secondary Address | Manufacturer | Last Readout | State |
|---------------------|-----------------|-------------------|--------------|------------------------|--|
| 0 19010176 | 21 | 19010176 | HVT | 10/4/2023, 11:15:00 AM | ✔ ⓘ |
| HVT Comb 0 320 | 0 | 320 | HVT | 10/4/2023, 11:15:01 AM | ✔ ⓘ |
| EMU Elec 3 22230470 | 3 | 22230470 | EMU | 10/4/2023, 11:15:03 AM | ✔ ⓘ |
| EMU Elec 1 198202 | 1 | 198202 | EMU | 10/4/2023, 11:15:05 AM | ✔ ⓘ |
| HVT Wate 0 22175046 | 0 | 22175046 | HVT | 10/4/2023, 11:15:07 AM | ✔ ⓘ |
| HVT Comb 0 3000458 | 0 | 3000458 | HVT | 10/4/2023, 11:15:08 AM | ✔ ⓘ |

Once you have found the desired meter you can view its measurements by clicking on it.

Home > Meters

EMU Elec 0 23010103 6Std ✔ ⓘ

⚙️ 🗑️ 📄 ↔️ 🔄 ☰

1. The name of the meter. This name can be changed if you are in edit mode (3).
2. Status of the meter. A green wrench indicates a successful readout while a red lightning bolt indicates an error during readout.
3. Edit mode. You can open the edit mode by clicking on the cogwheel. While in edit mode you can edit the properties of the meter.
4. Delete meter. Click on the waste bin to delete this meter from the list. Attention! This deletes all saved data of this meter on the M-Center too.
5. Create Template. Click here to save all settings made in edit mode to a template. This template can later be used to apply the same settings to different meters.

6. Read out meters. If you click on this button, the M-Center will immediately read out this meter over M-Bus again.
7. Update web interface. This button refreshes the web interface. Be aware that this does **not** trigger a new readout.

Edit Mode

You can open the edit mode by clicking on the cogwheel on the meter you want to edit.

The two buttons on the top right let you save or discard (13) any changes you made.

1. Change the name of the meter. This is the name that is displayed in the meter list.
2. Set the baud rate with which the meter is read out during the automatic M-Bus readout.
3. Set whether the meter has a battery. Any meter with this option set to “yes” will always only be read out in the defined readout interval even if the M-Center is set to “continuous readout”.
4. Choose whether the meter is read out via its primary or secondary address.
5. This is an optional free field for your project specific comments.
6. Set the BACnet instance number for this meter.
7. Set the category of this meter. This affects in which list the meter can be found.
8. This is an optional free field for your location specific comments.
9. This option defines if the M-Center sends the SND_NKE-Flag before any readout or not.
10. Set a specific readout interval for this meter. This setting only affects this meter and does not change the global readout interval. If the option “default” is set, the meter adopts the global setting made in **general settings**.
11. This is an optional free field for your cost center specific comments.
12. Any value in this field will be sent to this meter before any readout.



Attention: This configuration may trigger a reconfiguration of all read out registers which leads to a loss of historical data.

13. Save any settings with “save” or discard them with “cancel”.
14. Unfold (+) or fold (-) additional settings.
15. Delete this meter from the list. Attention! This also deletes all data of this meter on the M-Center.
16. Save all settings as a new template. This template can later be used to apply these settings to other meters.



Warning: Deleting a meter also deletes any historical data.

Delete Meter

To delete a meter from the M-Center click on the meter in the list and then click on the waste bin. The M-Center will ask for a confirmation of the deletion. Click “OK” to remove the meter from the M-Center. Be advised that this deletes all data from this meter from the M-Center.



Warning: Deleting a meter also deletes all historical data on the M-Center of this meter.

Templates

| Medium | Version | # of values | Type name | Details |
|-------------|---------|-------------|------------------------------|---------|
| Electricity | 16 | 15 | 000_EMU_Allrounder_Default | |
| Electricity | 16 | 17 | 001_EMU_Allrounder_Default | |
| Electricity | 16 | 32 | 010_EMU_Professional_Default | |
| Electricity | 16 | 31 | 011_EMU_Professional_Default | |
| Electricity | 4 | 15 | 020_EMU_1_40_Default | |
| Electricity | 0 | 28 | 100_HVT_UMD96M | |
| Cold water | 8 | 9 | 110_HVT_H2O | |

You can create templates to simplify the register configuration of connected meters. Once created, these templates can be used indefinitely. There can be only one template per meter type. A meter type is characterized by the following fields:

- Manufacturer
- Medium
- Version
- Number of registers

The M-Center comes with templates for the standard registers for the energy meters EMU Allrounder, EMU Professional and EMU Professional II.

Import

You can import previously created templates. Choose the .json file of the template by clicking on “choose file” and import it with “import”. The template should then appear in the template list.

Export

If you have edited or created a template you can export it for backup purposes or to use it on a different M-Center with the same meters. For this you need to give your export file a name and click on “export”. This exports all templates on this M-Center as one .json file.

Create Templates

Templates can be created directly in the meter settings. Further information can be found in the chapter Edit mode.

Apply Templates

| Name | Unit | Phase | Divisor | Tariff |
|----------------------|------|-------|---------|--------|
| Active energy import | kWh | | 1000 | 1 |

A template is always applied to all meters with identical “Manufacturer”, “Medium”, “Version” and “Number of Values” fields.

1. Open the edit mode of the template by clicking on the cogwheel.
2. Delete this template by clicking on the waste bin. Deletion of a template requires a confirmation.
3. If you click on this button the template is applied to all relevant meters.
4. With this button you can update the web interface.

Edit Templates

To edit a template you need to click on the template you wish to edit and then open the edit mode.

The screenshot shows the 'Edit Templates' interface in M-Center. At the top, there's a header with the template name '011_EMU_Professional_Defa' (1), a status 'you are in edit mode', a delete icon (2), and an apply icon (3). Below the header, there's a table with columns: # of Values (31), Battery, No, Readoutcycle (Default), and a plus icon. The table lists templates, with 'Active energy import' selected (4). The edit form for this template is shown, with fields for Name, Unit (6), Divisor (7), Phase, and OBIS-Code (9). There's also a checkbox for 'save value in database' (8) and a dropdown for 'Tariff 2' (5). The bottom of the form shows 'Active power' with unit 'kW', divisor '1000', and tariff '0'.

1. Change the name of the template.
2. You can delete this template by clicking on the waste bin. This requires you to confirm the deletion.
3. By clicking on "Apply" this template ist applied to all relevant meters.
4. You can edit a register by clicking on it in the list.
5. The four left fields are entirely informative and can be changed to whatever you wish.
6. Set the unit of this register.
7. Set a multiplicative factor that will be calculated onto the read out measurements. This allows for easier calculation between unit magnitudes (e.g. Wh to kWh).
8. This option lets you set which registers are saved on the M-Center.
9. Set the OBIS-Code of the register.

System Integration

You can integrate the EMU M-Center into your energy management software.

Manual Data Export

| | Name | Secondary Address | Manufacturer | Last Readout |
|-------------------------------------|----------------------------|-------------------|--------------|-------------------------|
| <input type="checkbox"/> | 3 Std neuer Wert | 23010101 | EMU | 10/13/2023, 11:00:00 AM |
| <input checked="" type="checkbox"/> | EMU Elec 0 23020101 2 Std | 23020101 | EMU | 10/13/2023, 10:00:00 AM |
| <input checked="" type="checkbox"/> | EMU Elec 0 23010102 24 Std | 23010102 | EMU | 10/13/2023, 2:00:07 AM |

Choose **Data Export** on the main page of the web interface. In the following sub menu click on **export data** for a manual export of historical meter data. In this menu you can set the desired time frame, the format of the export (.csv or .json) and the separator (if .csv is chosen) of the export.

Choose from which meter(s) you want to export the data by checking the box next to their name and click on “Data Export” to ready the data on the M-Center. Once this is done you can download the exported data under **Data Export** → **Download Data**.

The export file is labeled as follows: X-“Serial number”-“date and time of export”.csv/.json



Note: If a meter has no data stored for the chosen time frame the M-Center will not export a file for this meter.

FTP Server

To configure the automatic data transfer to an external server please click on **FTP configuration** in the configuration menu. If the FTP upload is activated, the M-Center uploads one data file per meter per readout interval to your set server. The files are named as follows: < Meter ID >-< Secondary address >-< yyyyMMddhhMMss >.< Format >

1. Set the address of your server.
2. Enter the user name for the upload.
3. Set the path for the uploaded files.
4. Set the port to which the M-Center sends the files.
5. Enter the password for the upload.
6. Activate the automatic data transfer. The M-Center does not upload any files if this box is not checked.

The option “show password” lets you control the password more easily.

The options “SSL”, “Export type”, “Separator” and “Export Language” lets you customize the uploaded files further.

Save your settings by clicking on the green check mark on the top right or discard any changes by clicking on the red cross.



Note: It may be necessary to change the used port. For further questions regarding SSL export please refer to your server provider.

FTP

To use the FTP protocol, please enter the server and the port.

FTPS

By ticking the box next to “SSL” you can use the FTPS protocol.

It may be necessary to change the used port. For further questions regarding SSL export please refer to your server provider.

SFTP

To use the SFTP protocol the server entry must be set as follows:

sftp://[HOST]



Note: The option “SSL” must not be selected for SFTP to work.

Automatic data export into Joulio-Web

To add the M-Center to your Joulio-Web energy management software go to **Cloud configuration** in the configuration. Here you can upload the configuration file which the Joulio-Web provided. The file has the .pem format.

The option “activated” lets you manually activate and deactivate the M-Center data uploads to Joulio-Web. This box must show a blue check mark to start the automatic upload into Joulio-Web.

Save the settings by clicking on the green check mark on the top right or discard the changes by clicking on the red cross.

BACnet

Home > Configuration

Bacnet

BACnet D-Net: 4444 Port: 47808 Device Instance: 4194099

BBMD active: BACnet active: Continuous reading:

Licensed for 374 meter | Serial number: 20160001

To add your M-Center into your BACnet environment you need to save the BACnet details in the **BACnet** sub menu and activate certain options by clicking on the following boxes:

- activate BBMD: This option allows for readout over all BBMD devices added in **BACnet BBMD**.
- activate BACnet: This box must be checked to allow the M-Center to communicate with your BACnet.
- permanent readout: The M-Center reads all connected meters continually to keep the values as up to date as possible.



Note: If the option “permanent readout” is activated the M-Center will only save the values read at the readout intervals. The permanently read out values are only updated in your BACnet and further interfaces.



Note: The M-Center uses the two-hop broadcast method.

Save the settings by clicking on the green check mark on the top right or discard the changes by clicking on the red cross.

BACnet BBMD

BACnet BBMD

IP address: 0.0.0.0 Subnet mask: 255.255.255.255 UDP Port: 47808

Add BBMD Delete Selected

| | BBMD IP Address | BBMD Mask | BBMD UDP Port |
|--------------------------|-----------------|-----------------|---------------|
| <input type="checkbox"/> | 10.255.255.153 | 255.255.255.255 | 47808 |

You can add your BACnet BBMD devices under **BACnet BBMD** in the configuration menu. To add a device enter the IP-address, the subnet mask and the UDP port of the device into the corresponding fields and save the device by clicking on “add BBMD”.

You can delete added devices by selecting them in the list and clicking “Delete Selected”.

Troubleshooting

One or more meters cannot be read

Battery operated devices oftentimes have an internal access counter. This counter prevents the readout of meter data after a certain number of readouts in a predefined time frame (usually one day). This functionality exists to prolong the battery life of these meters. For further questions regarding the battery life of such meters, please contact the manufacturer.

No meter can be read

Check for short circuits on the M-Bus:

- The M-BUS voltage should be around 40 VDC.
- The current on the M-BUS should be in a reasonable scope. EMU meters use 1.5mA on average per meter, while battery powered meters use up to 3 or 4 times that amount.

Make sure to avoid any ring topologies on the bus.

If the M-Bus current indicator on the web interface shows 0mA, no meters have been connected via M-Bus to the M-Center.

Multiple meters cannot be read

- Check if all these meters are connected via the same strand and if that strand is interrupted.
- Check the M-Bus voltage on the meter (with a Multimeter). The voltage measured should be between 36VDC and 41VDC.
- Check for a faulty addressing mode on primary or secondary addressing modes. Multiple meters with the same address leads to communication errors.

One meter cannot be read

- Check if the selected readout interval is supported by the meter.
- Check if the meter is connected correctly.
- Check the M-BUS voltage on the meter (with a Multimeter). The voltage measured should be between 36VDC and 41VDC.
- Check if the meter communicates if it alone is connected to a different M-Bus master. If this works follow the points under Multiple meters cannot be read and No meter can be read.

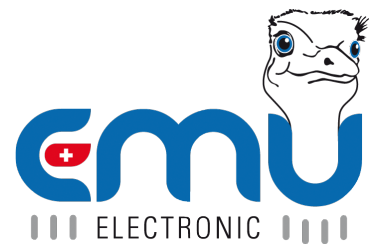
Measurement on the M-Center differs from the measurement on the meter by a constant factor

Check the divisor of the affected register. If needed, set the divisor to the correct value.

FTP-Upload fails

Try and test the connection via another program. Possible cause for this error:

- One of the parameters is incorrect.
- No DNS-server address is given.
- The M-Center has no Internet connection
- The M-Center has no access rights to the specified directory.
- The user may be barred from the FTP server due to repeated failed attempts.



EMU Metering GmbH

Friemarier Str. 38
99867 Gotha
Deutschland

Phone: +49 (0)3621 510 40 70

hello@emu-metering.de
www.emu-metering.de

EMU Electronic AG

Jöchlerweg 2
CH-6340 Baar
Switzerland

Phone: +41 (0)41 545 03 00

helpdesk@emuag.ch
www.emuag.ch