MidTeQ PULSE EMS

QUICK START QUIDE

MidTeQ PULSE OM1 EMS

Midcosta s.r.o.,
Priemyselná 8E, 917 01 Trnava
Slovakia, www.midteq.com

Quick Start

Preparation

To configure the MidTeQ PULSE EMS you need an Installer account on www.pulse.midteq.com.

Make sure there is a working and supported grid meter.

Note

For accurate grid measurements, it is recommended to connect directly to the P1 port of the digital meter. It is (generally) not possible to use an energy meter that is already connected to another device (e.g., a hybrid inverter).

Warning

For installations in Belgium:
The P1 user port of the digital meter is disabled by default. Activation is done through "Mijn Fluvius". After activation online it may take several hours before the digital meter's P1 port provides measurements.

Step-by-step installation

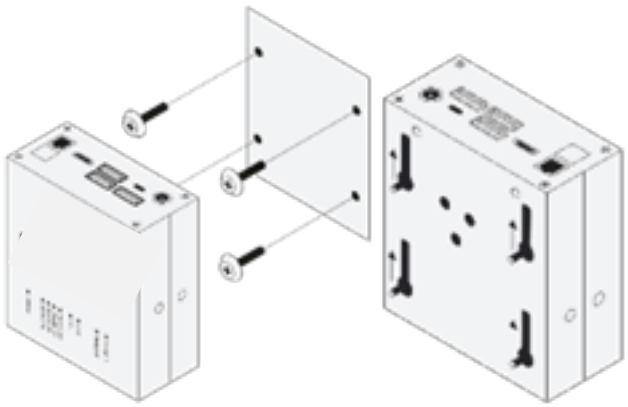
1. Installation
    - Securely place or install the MidTeQ PULSE EMS in its designated location.
    - Attach any additional equipment to the appropriate interfaces on the MidTeQ PULSE EMS.
    - Insert a network cable into the network port (RJ45) of the MidTeQ PULSE EMS.
    - Connect the MidTeQ PULSE EMS to a power source.
2. Configuration
    - Log in to the online portal www.pulse.midteq.com
    - Go to "Add controller"
        - Fill in the Serial Number and Verification Code of the controller
        - Claim the controller
    - Go to "Settings"

        - Under "Current Site" select the new controller
    - Go to "Controller Configuration"
    - Follow the quick start guide in the controller interface
3. Add the end user
    - Log in to your www.pulse.midteq.com
    - Go to "User Management"
        - Search for the serial number of the installed controller
        - Add the end-user's email address

Model OM1

Hardware Installation

Wall-mounted



1. Accurately measure the hole pattern for the mounting points.

Tip

The MidTeQ PULSE EMS has a hole pattern of 80mm x 63mm (W x H).
The screw head should not exceed a diameter of 7mm (e.g., a universal screw of 4 x 40mm is recommended).
For a flush mount, ensure the screws protrude no more than 8mm from the wall.

2. Insert the required screws into the surface where the MidTeQ PULSE EMS will be mounted, ensuring they are securely fastened.
3. Carefully align the MidTeQ PULSE EMS with the installed screws and slide it into place. Ensure it is securely mounted.

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DIN rail mount

1. Attach the DIN-rail mount to the MidTeQ PULSE EMS using the provided screw holes.
2. Carefully attach the MidTeQ PULSE EMS to the DIN-rail. Ensure it is securely mounted.

Note

DIN-rail mounts need to be ordered seperately.

Electrical Installation

Power Supply

The MidTeQ PULSE EMS requires a 12V (2A) DC power supply connected via a 5.5mm jack. The required power adapter is included in the delivery package.

Connecting the interfaces

Network Connection

The MidTeQ PULSE EMS must always be connected to a wired (RJ45) network interface to ensure reliable communication and functionality.

Wiring & connectivity guidelines

Info

The insulation class of the cables must be suitable for the intended signal voltage. Ensure that the cables used comply with the appropriate safety and operational standards for the specific voltage levels in the system.

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Ethernet

The following guidelines apply:

- **Cable type**: You must use CAT5e or higher cables for optimal performance. In commercial and industrial settings, it is recommended to use shielded cables.
- **Network connection**: Check with your computer if you have internet on the ethernet cable before connecting it to the MidTeQ PULSE EMS or device.
- **Maximum distance**: The individual cable length is limited to 100 meters. For longer distances you need a signal booster or switch.
- **Subnet**: The MidTeQ PULSE EMS and the devices have to be on the same subnet to be able to communicate (e.g. a MidTeQ PULSE EMS in subnet 192.168.1.x can generally not talk with a device in subnet 192.168.200.x).
- **Outbound ports**: See network configuration on firewall configurations.

Powerline adapters

For places in residential settings that have no ethernet cabling installed, you may consider Powerline adapters. Please note that only wall sockets that are on the same phase can be used with most powerline adapters.

Other interfaces

Additional I/O's

All MidTeQ PULSE models are extendible with additionaly I/O's through the accessories. See accessories for more information.

- **Model OM1**
- **Model EDS**

MidTeQ PULSE (Model OM1)

The permissible wire cross-section for the connectors is as follows:

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Type	Section (AWG)	Section (mm^2)
Solid Wires	26-16 AWG	0,129-1,31
Stranded (Flexible) Wires	26-16 AWG	0,129-1,31

Digital inputs & reay outputs

Warning

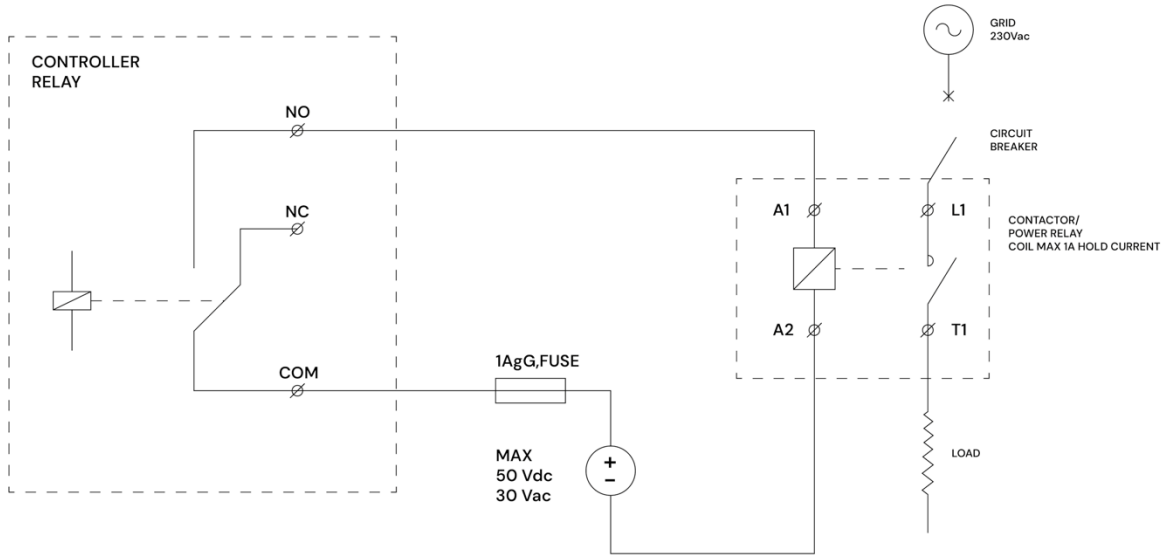
You MUST respect the voltage & current ratings from the Specifications. Using the device outside of its rated values is dangerous and may lead to damage and injuries.

Interface	Voltage (V)	Current (A)
Relay	Max. 30Vac / 50Vdc	1.0 A
Digital input	5-50Vdc	N/A

Tip

If you need the switch higher voltages or currents than what the relay is rated for, then use the relay of the MidTeQ PULSE EMS to switch another relay that has the voltage or current rating that you need.

RELAY USAGE EXAMPLE SCHEMATIC



The following guidelines apply:

- **Cable type**: It is recommended to use **shielded** cables with **twisted pairs** for optimal performance.

RS485

Wiring

Tip

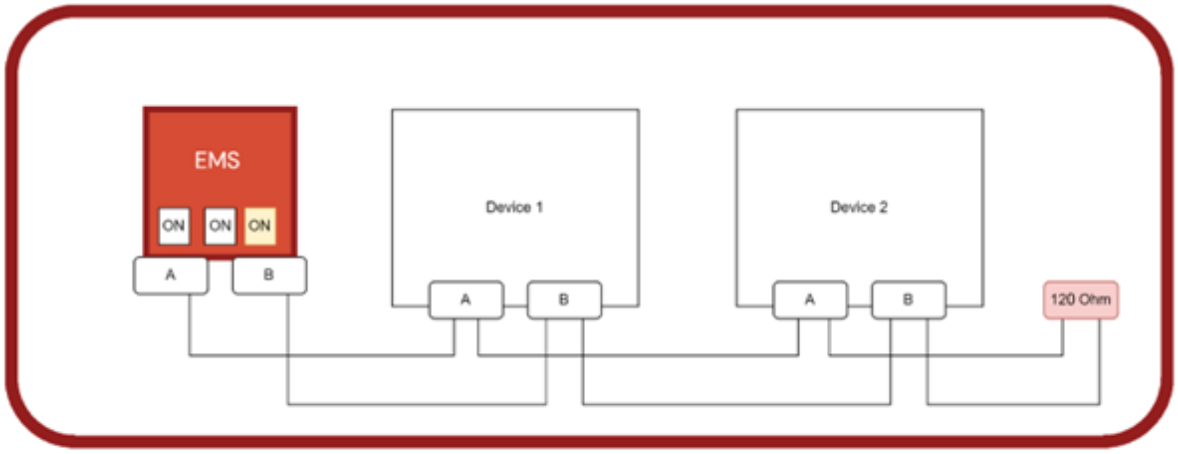
The color of the wires does not matter. You may choose this, as long as both the A and B are from a single twisted pair.

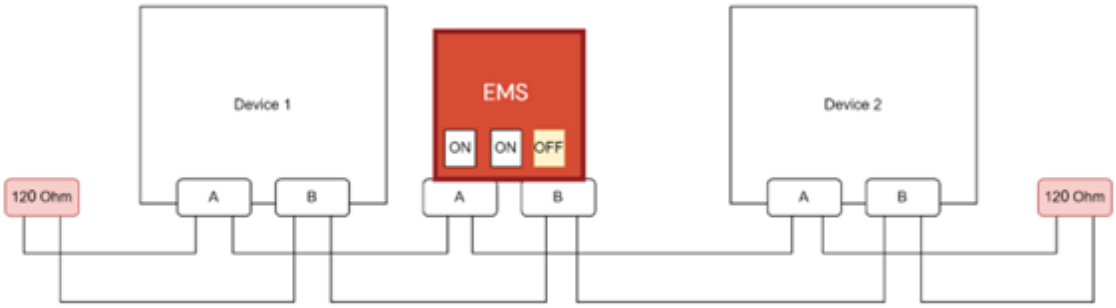
The following guidelines apply:

- **Cable type**:
    - You must use **shielded** cables with **twisted pairs** for optimal performance.
    - **Use a single pair** for a RS485 connection. One cable of this pair is used for RS485-A and the other one for RS485-AB. Do not split A and B over different pairs). If there is a ground wire, use another pair for the ground wire.
    - For short distances, a twisted pair from a network cable (minimum CAT5e) can be used.

- Avoid using SVV cables or alarm cables, as they are not suitable for these purposes.
- The cable must have a characteristic impedance of 100 to 120 ohm.

- **Connecting multiple devices**: The cable must be **daisy-chained** from device to device. Place the MidTeQ PULSE EMS like the picture below.





- **Maximum number of devices**: The absolute maximum number of devices that the MidTeQ PULSE EMS supports on the same RS485 bus is 20 (provided that each device has 1/4th unit load on the RS485 bus, which almost all devices do).
- **Maximum distance**: The total cable length is limited to 1000 meters - but it is recommended to limit the maximum to 100m.
- **Long Distances**:
  - MidTeQ PULSE EMS model OM1: It is recommended to activate the **termination resistor** on the MidTeQ PULSE EMS (already active by default from the factory), and install a 120Ω termination resistor at the opposite end of the daisy chain.

    - Other MidTeQ PULSE EMS models: Install a 120Ω termination resistor at the both ends of the daisy chain.

- **Grounding the cable shield**: If the cable is shielded, then you must connect the shield to the electrical earth of the installation at one end of the cable.

TIP: In case of many devices

- If you have many devices on the RS485 bus, the control system gets slower. This is because over an RS485 bus only one device can communicate at a time.
- For this reason we recommend connecting no more than 5 devices on the same RS485 bus.
- If you have more devices, it is recommended to use one of the RS485 expansion accessories.

Grounding shielded cables

- Ground the shield at a single end of the cable only. Do not ground the shield at multiple points along the cable, not even the other end of the cable. If you use a daisy chain, then ground each individual cable at a single end (you may use the shield of another cable as the grounding point at the end of the cable, but this is not recommended).
- Ground the shield to the earth ground of the electrical installation. Do not ground it to the signal ground.

Termination resistor & bias resistors

To the left of the I/O connections on the MidTeQ PULSE EMS, there are three DIP switches for terminating and biasing the RS485 communication bus.

The correct configuration depends on the topology of the RS485 bus. In most cases, activating all resistors is the recommended choice. Do this if you are unsure. This is different if the MidTeQ PULSE EMS is not at the end of the communication bus or if another device has active bias resistors.

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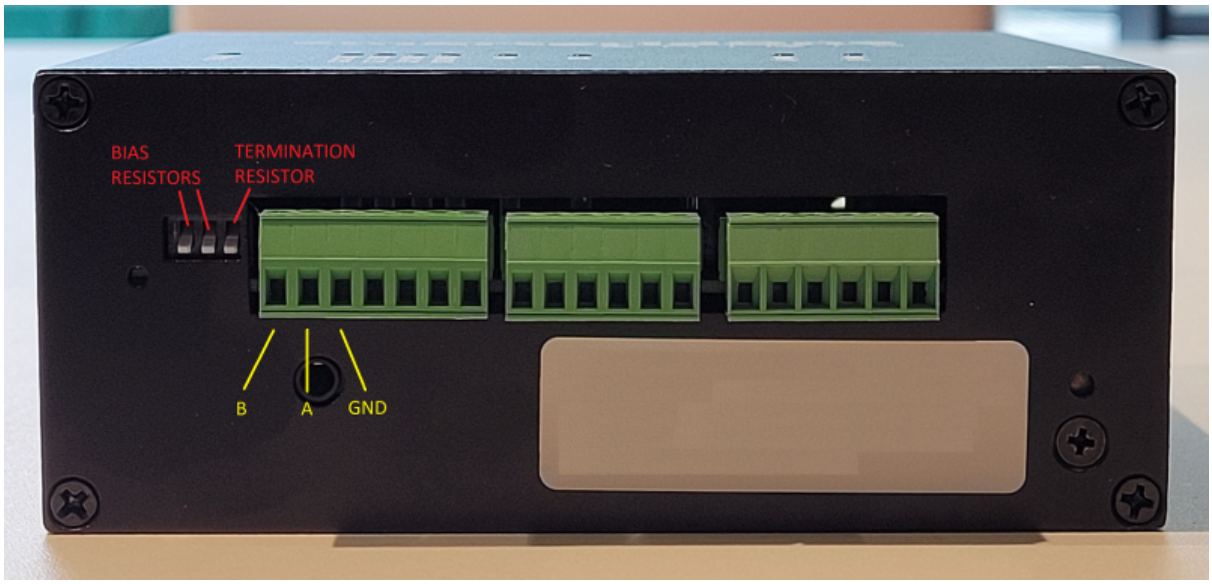

Whether the resistors are active or not depends on the position of the DIP switches. To do this, you need to consider the production date of the MidTeQ PULSE EMS. You can deduce this from the serial number. The serial number starts with production code OM1, followed by six digits representing the production date. E.g. OM1240315 was produced on 15/03/2024.

If your is manufactured before 1 August 2024: (These devices have white switches coming from a black component).

- The termination resistor is active when the corresponding DIP switch is in the down position.
- The bias resistors are active when the corresponding DIP switches are in the down position.

If your is manufactured after 1 August 2024: (These devices have white switches coming from a red component).

- The termination resistor is active when the corresponding DIP switch is in the up position.
- The bias resistors are active when the corresponding DIP switches are in the up position.

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Addresses

warning

You MUST give each device on the RS485 bus a unique address.

Tip

Use lower addresses first (1, 2, ...), because the MidTeQ PULSE EMS will find them faster!

Tip

Stick with the factory default baud rate, parity and stop bits. The MidTeQ PULSE EMS will scan on those first.

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