



EO Pro Hub Installation Guidelines

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1 Introduction

This document details the installation guidelines for the EO Pro Hub and associated Metering Information Directive compliant electricity meters (MID Meters for short) if they are being used on site. The MID meters are used to measure the current consumption by each of the charging station and an additional meter for the measuring of the site's current consumption.

This document details important information about how to wire up the hub and the appropriate MID meters.

The basic overview of the installation is as follows:

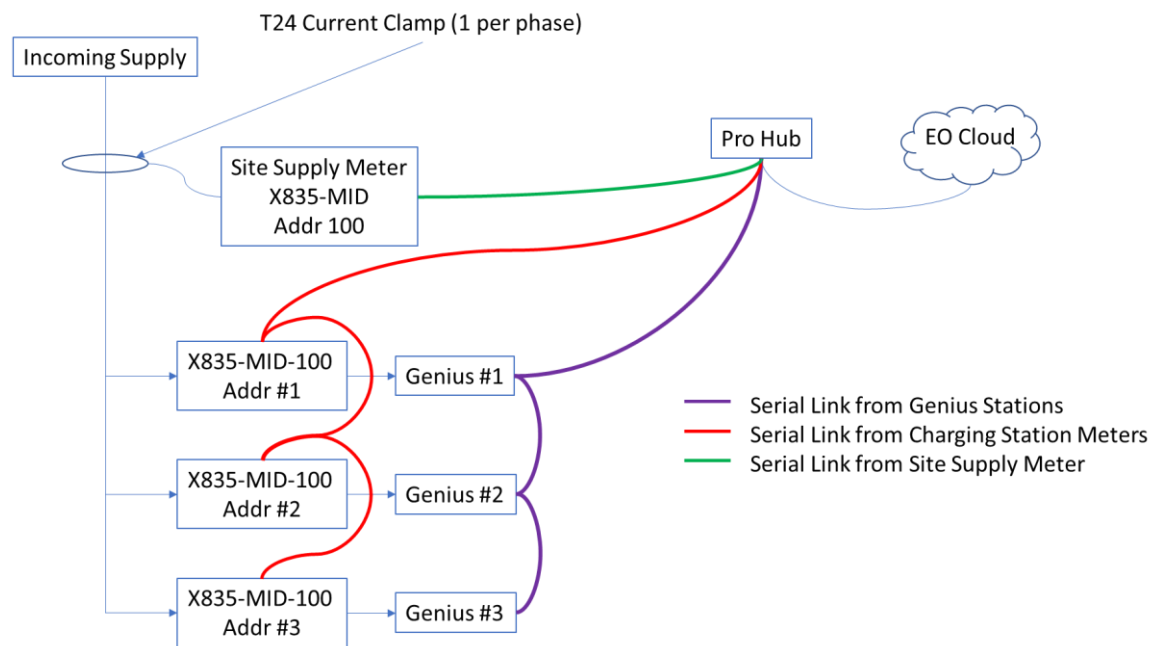


Figure 1 - Overview of the Pro Hub installation

2 MID Meters – Physical Installation

2.1 Type of Meters

The EO Pro Hub will work with the following meters

- Three phase meter for the charging stations
 - Smartrail X835-100-MID SPC 1/5A CT Op SP/TP Multifunction
 - This is a direct connect meter
 - **This meter is to be used for both single phase Genius stations and three phase Genius stations** (this is due to protocol issues)
 - This meter is 4 DIN wide

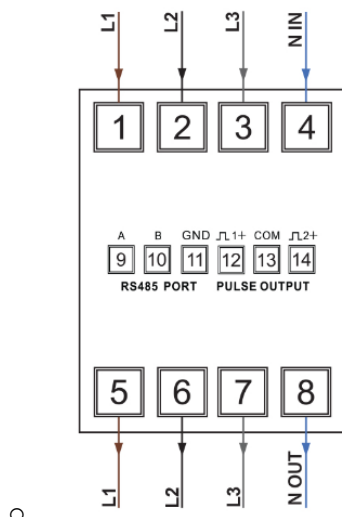


Figure 2 - Wiring Diagram for the X835-100-MID meter

- Three phase meter for the measurement of the site's consumption which is required for ALM
 - Smartrail X835-MID SPC 1/5A CT Op SP/TP Multi
 - This meter uses CT Clamps for measuring the site's current consumption
 - This meter is 4 DIN wide

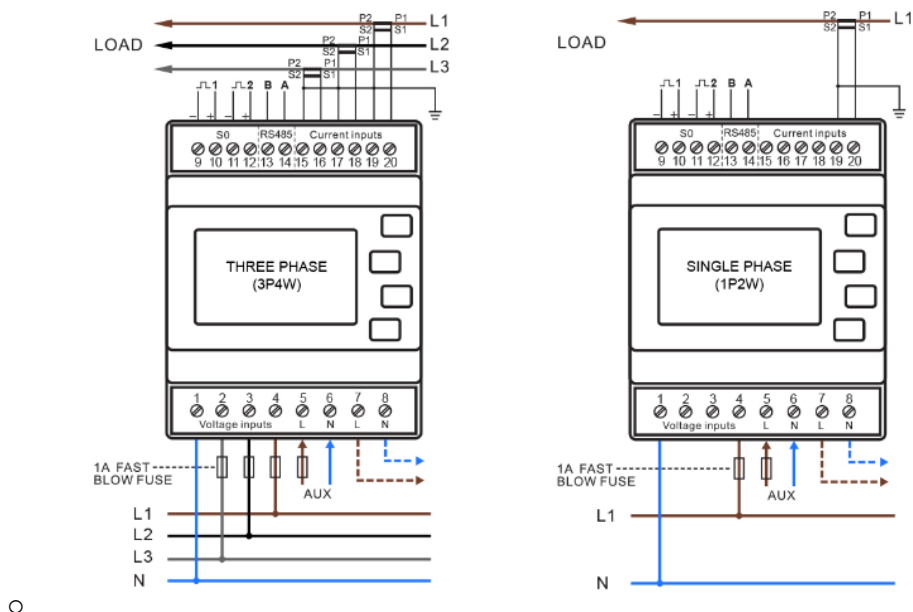


Figure 3 - Wiring Diagram for X835-MID meter - 1Ph and 3Ph

- CT Clamps for measuring the site supply
 - Smart Process T24 current core transformer

The wiring instructions for the MID meters are enclosed in the packaging of the MID meters.

2.2 Location of the MID Meter for the Site Supply

Due to the design of the meter it is important that the output of the T24 current clamps are fed directly into the three phase MID meter. i.e. no extension cables

This is because if the cables are extended then the losses in the cable are too great and cause the accuracy of the MID meter to drop. This must not happen for ALM to work correctly.

2.3 Phase rotation

It is important that the phase rotation of the station is taken into account when installing the stations and meters.

The MID meter and EO Charging Station must be on the same phase rotation

This is so that accurate readings are returned and ALM can function correctly. Therefore the Phase Rotation must occur before the MID meter. An example of the wiring is shown below:

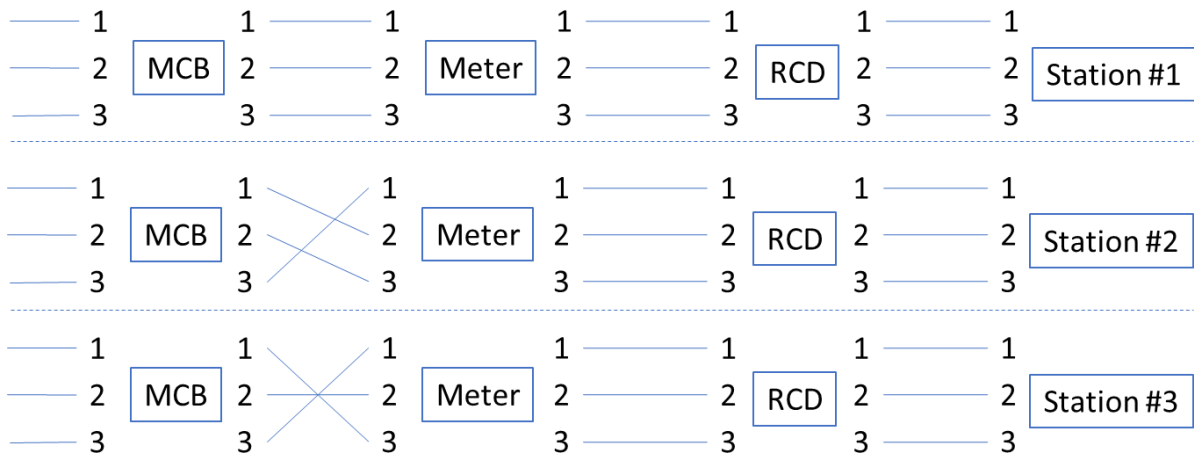


Figure 4 - Location of the phase rotations

2.4 Serial Bus

Care needs to be taken over the serial bus connection between the meters and the EO Pro Hub. If there is a meter measuring the site consumption for ALM then there needs to be two serial buses:

- 1) Serial Bus 1 – all MID Meters measuring the charging stations
- 2) Serial Bus 2 – MID for the site supply meter with the CT Clamps

3 MID Meters – Configuration

When the MID meters have been installed and powered, then there are some software configuration settings that need to be made to ensure that the EO Pro Hub can communicate successfully to the MID Meters

3.1 Meter Operation

There are four buttons on the side of the meter which allow you to cycle through various Menus





	Selects the Voltage and Current display screens. In Set-up Mode, this is the “Left” (press) or “Escape” (hold 3sec) button.
	Select the Frequency and Power factor display screens. In Set-up Mode, this is the “Up” (press) button.
	Select the Power display screens. In Set-up Mode, this is the “Down” (press) button.
	Select the Energy display screens. In Set-up mode, this is the “Right” (press) or “Enter” (hold 3sec) button.

Figure 5 - Description of Buttons on the MID Meter

3.2 Entering configuration mode

There is a config mode on the MID meters which needs to be entered before settings can be changed:

- 1) Ensure the unit is powered
- 2) Press and hold the “E” button
- 3) Enter a pass code of 1000 (use the up, down and across arrows on the buttons)
- 4) Press and hold the “E” button


At this point the config mode shall be entered

3.3 Configuration setting of all MID Meters

Whilst in the Meter config mode, the following parameters need to be set

1) Address



- Site Supply Meter Address = 100
- Station Meter address = a sequential number from 1 e.g. 1 (for station1), 2 (for station 2), 3 (for station 3),....
- The important number is that the site supply is always allocated to address 100
- Pressing "Down Button"  will take you to the next menu item

2) Baud Rate



- 38.4K

3) Parity



- None

4) Stop Bit

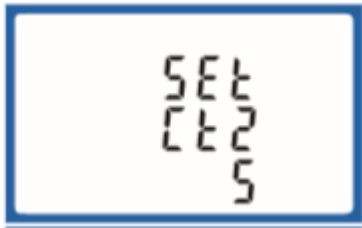


- One

3.4 Additional settings for the site supply meter

The Site Supply meter with the CT Clamps has additional configuration settings which need to be entered carefully as **the options can only be entered once**. These are the CT output current and the CT rate. Both of these values depend on the CT clamp that has been installed and if the recommended Smart Process T24 Current Clamps have been installed then set the following options

- CT 2 = 5



- The output current is rated at 5 A

- CT Rate = 20



- The rate is calculated by the input current divided by the output current. For the T24 clamp this rating is $100/5 = 20$

4 Installation of the Pro Hub

- 1) Mount the Pro Hub to the wall
 - a. Note that the Pro Hub is not weather proof due to the ventilation holes and so therefore the hub should be mounted inside an appropriate cabinet



Figure 6 - Hub Pro with Cover

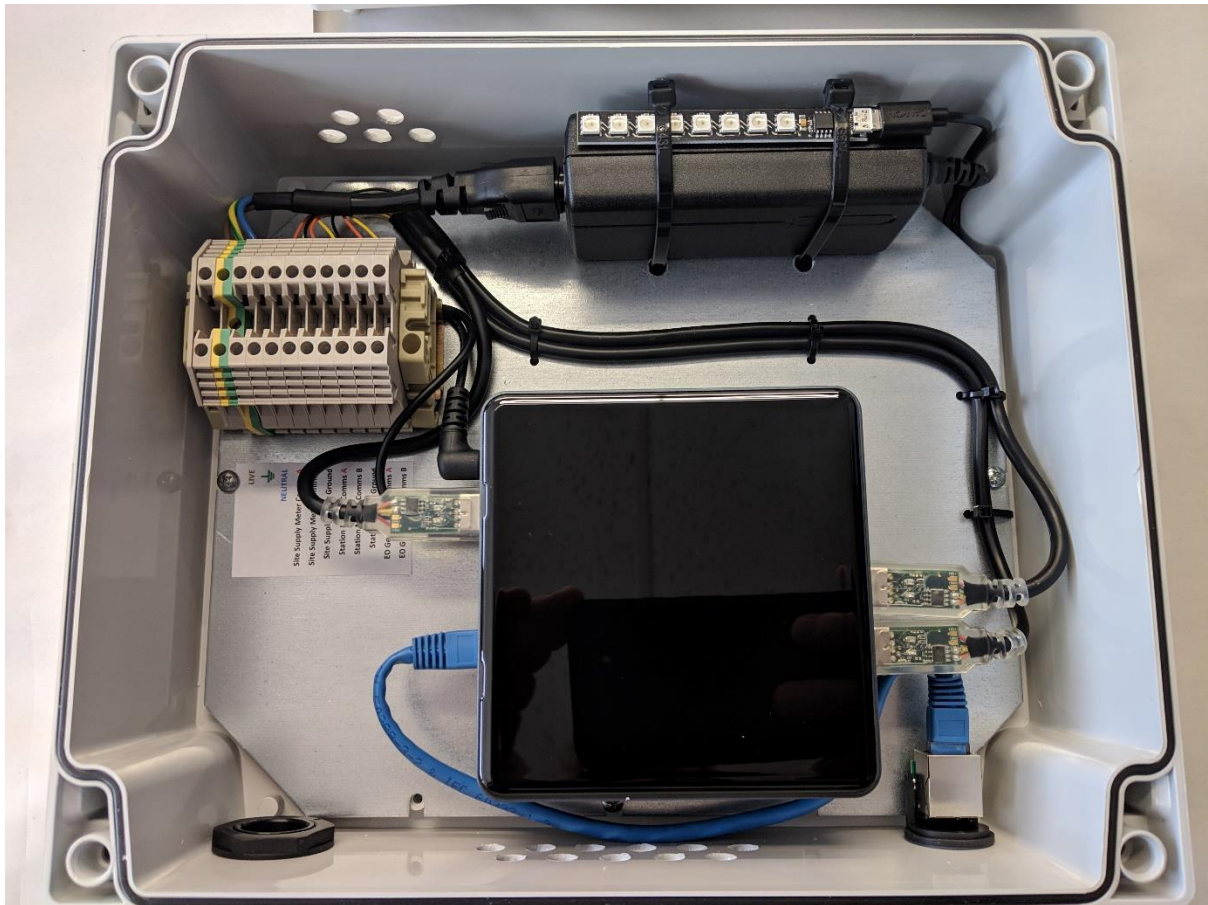


Figure 7 - Pro Hub with cover removed

- 2) Connect the inputs to the terminal rail
 - a. Terminal Stop
 - b. Live
 - c. Earth
 - d. Neutral
 - e. Site Supply Comms A - USB 1 – Orange
 - f. Site Supply Comms B - USB 1 – Yellow
 - g. Site Supply Comms GND - USB 1 – Black
 - h. Station Meters Comms A - USB 2 – Orange
 - i. Station Meters Comms B - USB 2 – Yellow
 - j. Station Meters Comms GND - USB 2 – Black
 - k. EO Genius Serial Comms A - USB 3 – Orange
 - l. EO Genius Serial Comms B - USB 3 – Yellow
 - m. Terminal Stop
- 3) Connect the Ethernet connection for access to the internet
- 4) Apply Power

When the power has been applied then the 3 USB to Serial adaptors shall start to flash green. This will indicate that the communications has been wired up correctly.

Additionally there is a LED panel which displays the same LED sequence as the standard EO Hub. This sequence is as follows:

4.1 LEDs

There are three status LEDs on the EO Hub as shown. LED1 is on the far left, LED2 is in the middle and LED3 is on the far right. These LEDs are either illuminated green or off. The LEDs indicate different stages of operation with the principle stages being “Start Up” and “Normal Operation”

4.1.1 Start Up

Stage	LED1	LED2	LED3	Repeats	Description
1				6 times	Start Up
2				Solid	Error state – contact EO
3				2 Flashes	Connecting to primary server
4				2 Flashes	Connecting to Secondary server if primary failed
5				6 times	Failure to Connect – Check Internet connections
6				6 times	Start Up successful
7				5 times	Fatal Error – Contact EO

After a successful start up, then the EO Hub shall enter into Normal Operation.

4.1.2 Normal Operation

Stage	LED1	LED2	LED3	Repeats	Description
1				6 times	Secondary Start Up
2				Solid	Internet Connection Test
3				Solid	Configuring Hub – this can take up to 60sec
4				LED1&2= Solid LED3 = Blinks rapidly	The EO Hub is communicating with the EO Genius charging stations. This is the normal operational state.
5				LED1,2,3 = Solid	The EO Hub is connected to the EO Cloud but no charging stations have been allocated to the EO Hub

5 EO Cloud Settings

There are some important settings which need to be made to the EO Cloud to ensure that the MID meter value readings are used for billing and session history.

At the moment this can only be done by the EO administrators but this functionality will be made available through the EO Cloud. Therefore to finalise the installation the following information must be made available:

	INSTALLER TO COMPLETE THIS TABLE	
	MID Meter Address	Serial Number
Genius Station 1	(suggested value of 1)	e.g EG-00123
Genius Station 1	(suggested value of 2)	
Genius Station 1	(suggested value of 3)	
....	

6 Further Technical Support

All EO Charging technical documentation is published in the EO Resource Centre, this is found at:
<https://www.eocharging.com/service-support/>

The EO Support team can be reached at:

- Email: support@eocharging.com
- Phone: +44 (0) 333 77 20383