

COMMISSIONING GUIDELINE

Provisioning and visualization in ABB Ability™ EDCS of ABB Energy Meters communicating via Modbus RTU

Getting started



In order to carry out the provisioning of ABB Energy meters in ABB Ability™ EDCS, please follow the procedure as described below. Before starting the provisioning via EPiC (Electrification Product intuitive Configurator) wizard, please make sure that pre-requisites verification and correct settings on the device itself are fulfilled, according to the procedure described below

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Provisioning and visualization in ABB Ability™ EDCS of Energy meters communicating via Modbus RTU

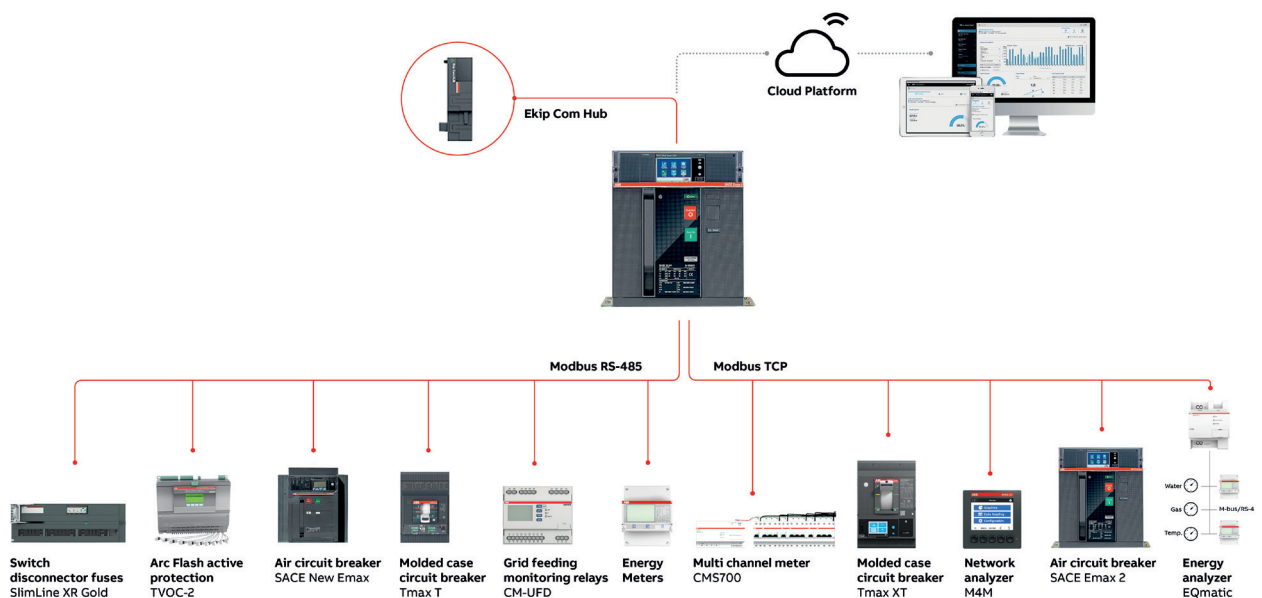
Architectures scenario

Before proceeding with the commissioning, please check all the possible architectures you can experience.

Embedded Solution

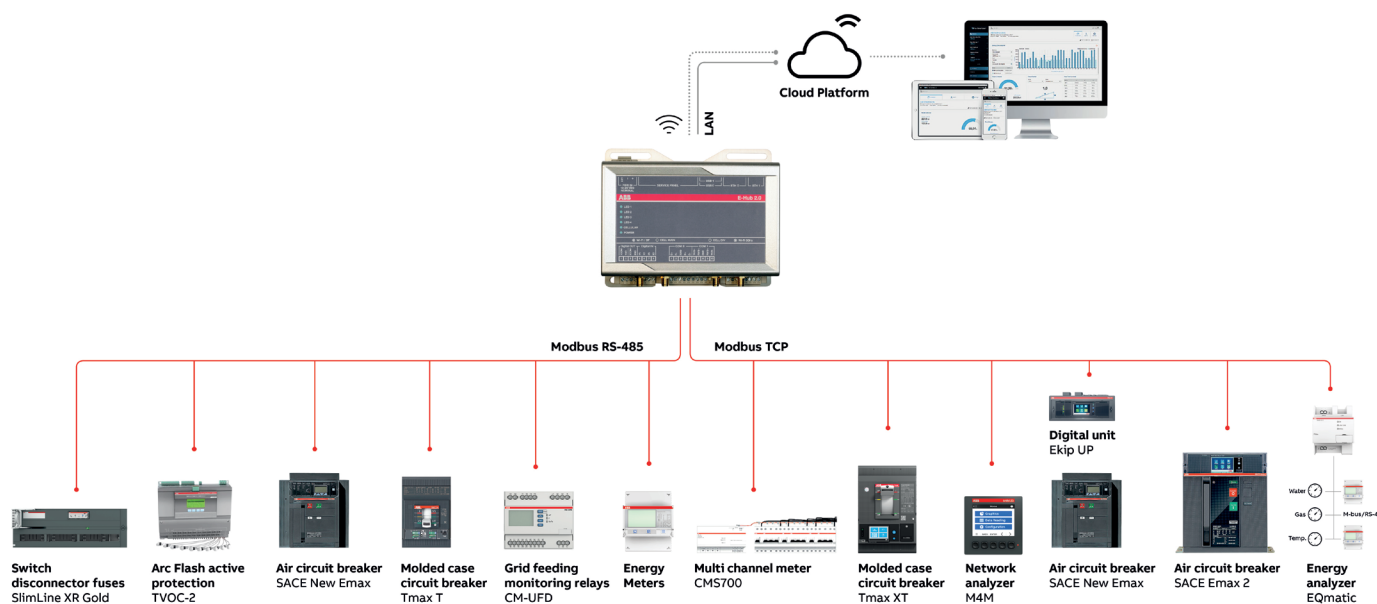
Emax 2 equipped with the new Ekip Com Hub establishes the cloud connection for the whole switchboard.

This dedicated cartridge-type communication module just needs to be inserted into the terminal box and connected to the internet.



External Solution

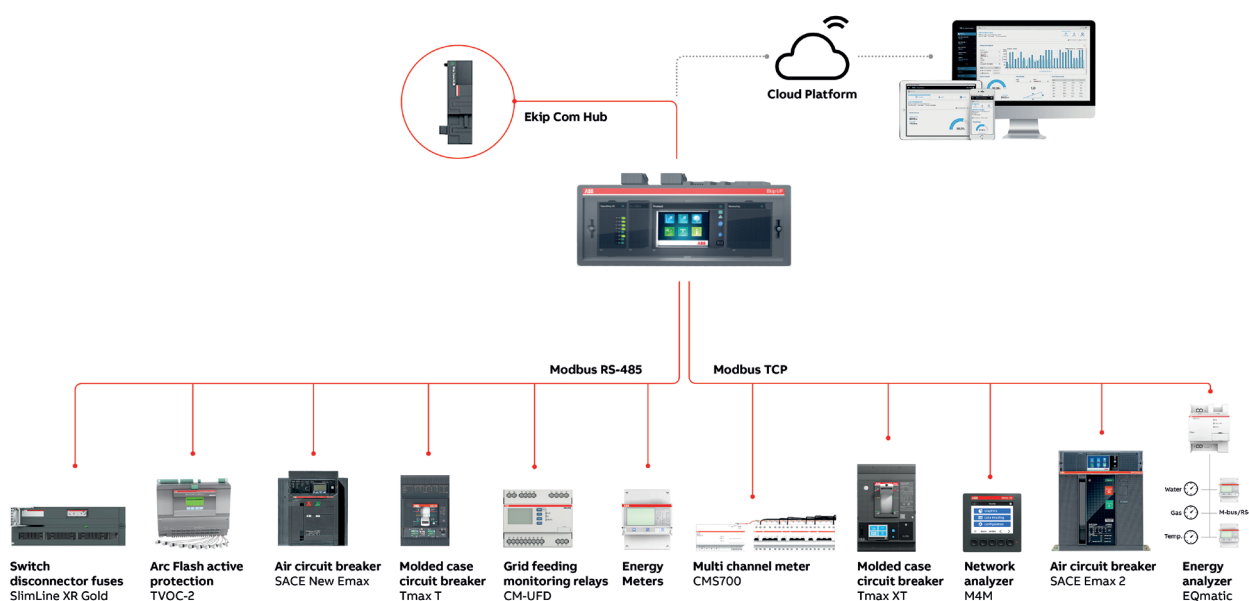
E-Hub 2.0 is an independent IoT gateway which can gather data from field devices as well as consumption of water, gas, etc. and connect to the system to ABB Ability™ Electrical Distribution Control System, the cloud platform. As a result, all the downstream field devices can be monitored from the cloud via ethernet cable, wi-fi or cellular connectivity.



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Upgrade Solution

Ekip UP equipped with Ekip Com Hub establishes the cloud connection for a specific feeding line, load or even for the whole distribution system. This dedicated cartridge type communication module just needs to be inserted into the terminal box and connected to the internet using an external router.



Material and tools you might need during provisioning:

- User manual of Energy meters, according to the type of devices to be connected in the system
 - In case of A41 meters, user manual is available at this [link](#) (2CMC484002M0201)
 - In case of A43 / A44 meters, user manual is available at this [link](#) (2CMC484001M0201)
 - In case of B21 meters, user manual is available at this [link](#) (2CMC485004M0201)
- EPiC 3 software, updated to the latest version. Please download the software tool from the ABB Library (1SDC20011X3000)
- In case the cloud access point is Ekip Com Hub, "Ekip Com Hub Getting started" document, available at this link (1SDC200063B0204)
- In case the cloud access point is Ekip E-Hub, "Ekip E-Hub Getting started" document, available at this [link](#) (1SDC200078B0201)

Pre-requisites verification and ABB Energy Meters settings

Steps described below shall be completed per each ABB Energy meter before starting provisioning on the wizard tool:

- A. On the device, please verify the Firmware version, to make sure it is compatible with ABB Ability™ Electrical Distribution Control System. Follow the table below to identify the minimum Firmware version.

Device	Minimum Firmware version
Energy Meter A41 / A43 / A44	A1.18.0
Energy Meter B23 / B24	B1.27.0
Energy Meter B21	B10.11.0

To check the firmware version, please follow this procedure:

- In case of A-series meter
 1. Click on "Set"
 2. Go on "Status", press "Ok", scroll to "About" with the down button and press "Ok"
 3. Firmware version and CRC is displayed
- In case of B-series meter
 1. Press on "Set"
 2. Scroll to "Upgrade" with the down button
 3. Press and hold "Ok" until "Instant" appears, press "Ok"
 4. Scroll to "Status" with the down button, press "Ok"
 5. Scroll to "About" with the down button, press "Ok"
 6. Scroll to "Version" with the down button, press "Ok"
 7. Firmware version is displayed

Tip: in case of new installations, check the firmware version before placing the sealing points in the front cover. In case of energy meters already sealed, the sealing points shall be broken (verify if the installation allows the procedure) and eventually replaced with a new one after all needed verification.

- B. Check that Modbus RTU cable connected to the ABB meter is correctly connected, in particular make sure that

W1=A=+

W2=B=-

TIP: in case the device is not communicating, re-cable the device by switching terminals (hence: W1=B=-; W2=A=+).

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- C. Verify that Modbus RTU communication settings are equal to “Modbus RTU” settings of the selected access point to the cloud. Here below the default settings of access points:
- Baud Rate = 19200
 - Protocol = 8E1 (8 bit data, even parity and 1 bit stop)
 - RTU address for Master Device = 1
 - RTU address for Slave device: to be inserted starting from 2 to 247.

Steps to set Modbus RTU communication parameters are described in section “Setting RS-485” of ABB Energy meters user manuals and reported here below:

- In case of A-series meter
1. Choose the “Settings” icon in the main menu, press “Ok”
 2. Choose “communication interface”
 3. Choose “Modbus”
 4. Press “down button” once to get to the next menu. Display will show the “baudrate”. Set baudrate
 5. Press “down button” once to get to the next menu. Display will show the “address”. Set address
 6. Press “down button” once to get to the next menu. Display will show the “Parity”. Set Parity.

- In case of B-series meter
1. Select “Set” in the main menu, press “Ok”
 2. Select “rs-485”, press “Ok”
 3. Select “Protoc”, press “Ok” to see the selected protocol. Press and hold “Ok” to step back to the previous menu
 4. If required, then use “Set” and “Ok” to set the protocol to Modbus. The display will go back to the default menu. Go to “Set”>“rs-485”. If not required, then press and hold “Ok” to step back to the previous menu
 5. Press “down button” once to get to the next menu. Display will show the baudrate (“baud”). Set baudrate
 6. Press “down button” once to get to the next menu. Display will show the address (“address”). Set address
 7. Press “down button” once to get to the next menu. Display will show the parity (“Parity”). Set Parity.

Tip: each device has to be provided with a different slave address. Otherwise, only one of the devices with the same slave address can be recognized.

EPiC provisioning wizard

- A. Make sure you have a MyABB account. If not, please register on MyABB to activate an account.
- B. To commission EDCS access point to the cloud please follow the configuration procedure of the selected access point:
 - Procedure for Ekip Com Hub is described in “Ekip Com Hub Getting started” document.
 - Procedure for Ekip E-Hub is described in “Ekip E-Hub Getting started” document.
- C. To start the provisioning of the electrical system in ABB Ability EDCS
 1. click on “Activate”, login with MyABB credentials
 2. click on “Start”.

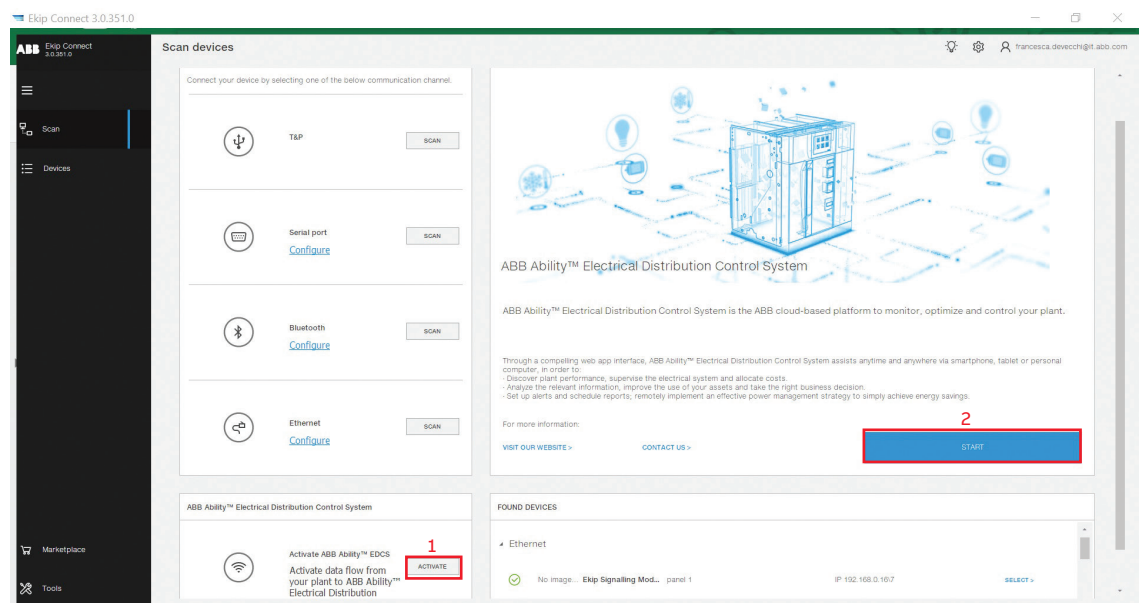


Image 1

- D. Follow the “Device Provisioning” procedure of the specific access point installed, either Ekip COM Hub or Ekip E-Hub

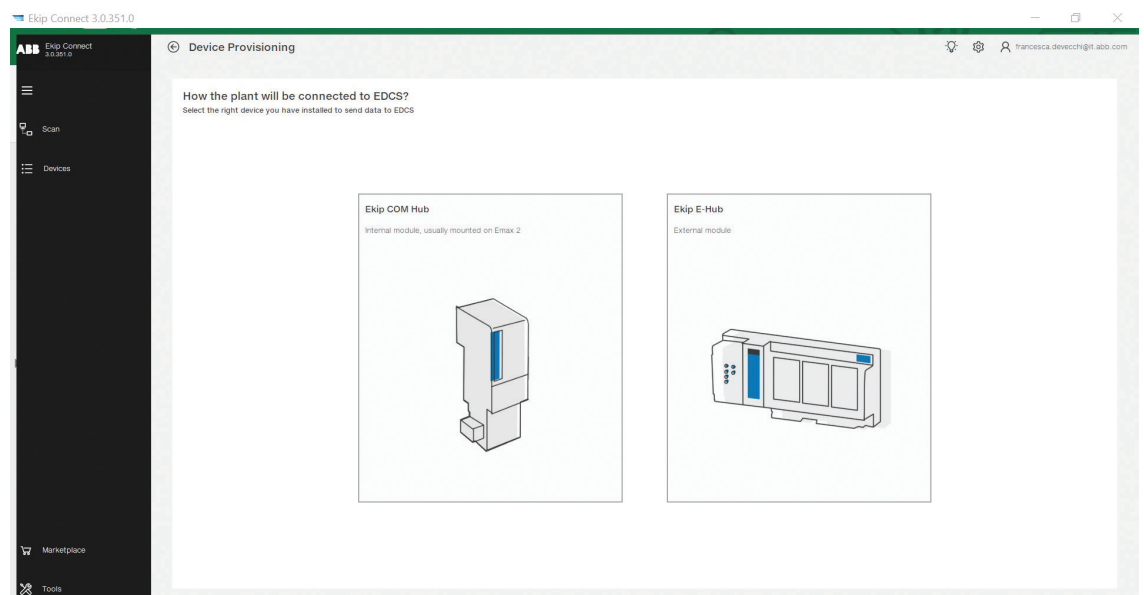


Image 2

Provisioning and visualization in ABB Ability™ EDCS of Energy meters communicating via Modbus RTU

E. When the “Discover configuration” page is reached, EPiC scans the whole Modbus network, looking for devices to provision. With “Manual discovery”, it is possible to insert specific Modbus RTU addresses to narrow the addresses range to be scanned. Before proceeding with manual discovery, please make sure to know all ID slave addresses to be provisioned.
Tip: Manual discovery is preferred because it allows shorter scanning time.

Here the steps to follow to scan for devices:

1. Click on “Manual discovery settings”
2. select IP addresses of all devices to be provisioned, and, in the drop-down menu, slave addresses of all devices connected via Modbus RTU to be provisioned. In the example, two ABB Energy meters whose slave address is 2 and 5 are to be provisioned.
3. Then press “OK” and “Start Discovery”.

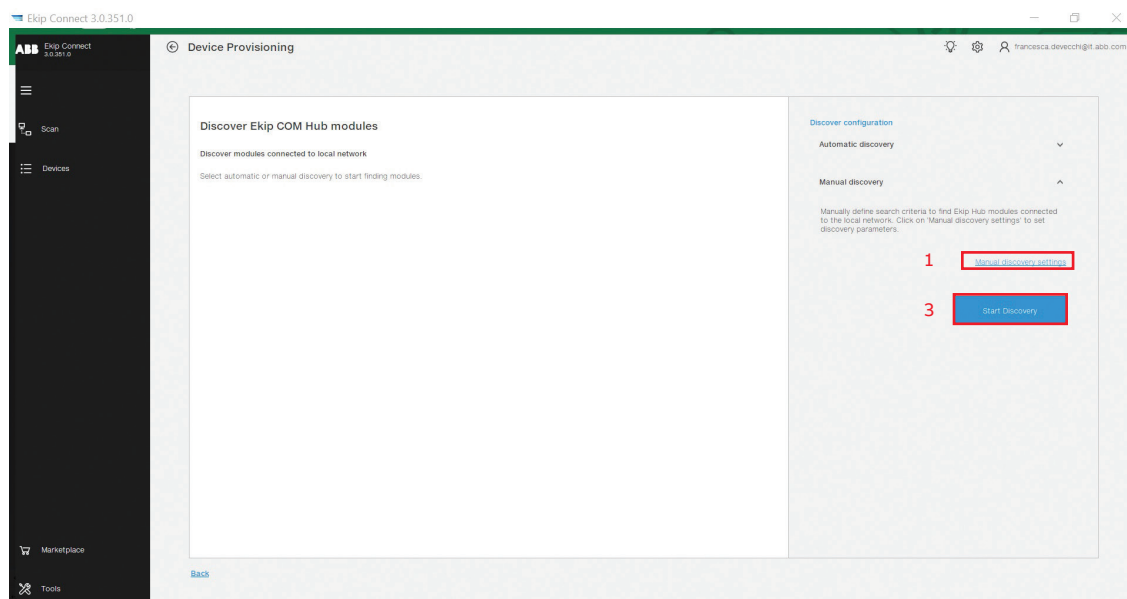


Image3

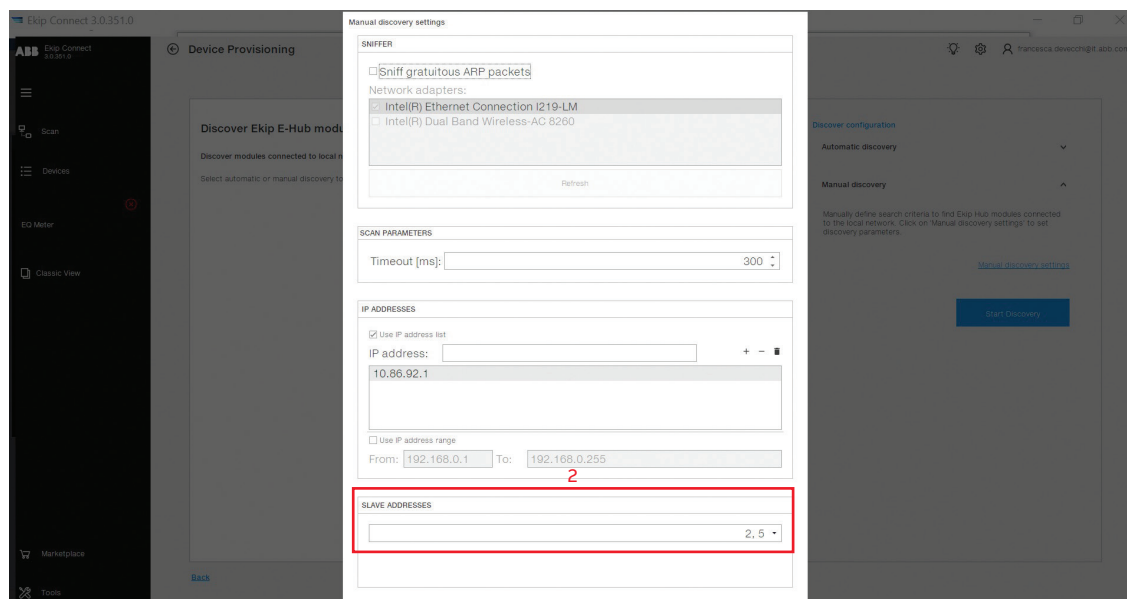


Image4

F. Once Energy Meter is found and inserted into the list of the connected devices, click on the blue arrow on the right of the selected device (see box 1 in the picture below). In the section “Device information”, please add a tag name (see box 2 in the picture below).

TIP: “TAG Name” shall have the following characteristics:

- Do not give same TAG Name to different devices
- Each TAG Name cannot be more than 10 characters
- Special characters are not allowed
- Backspace is not allowed (please use underscore)

G. Please ensure “Enable device to send data” is ON. After completing assignment of tag names to all devices, complete the commissioning by clicking on “Add to ABB Ability EDCS”

H. Follow instructions on “Ekip Com Hub Getting started”/“Ekip E-Hub Getting started” document to publish the plant on ABB Ability EDCS. Due to security checks between module and platform, you might not be able to see any real time data on the ABB Ability EDCS webapp during the first 15 to 30 minutes after completing the commissioning

Tip: In case after 15 minutes you do not see data in the platform, please turn off and then back on the power supply to the Ekip Com Hub module or Ekip E-Hub.

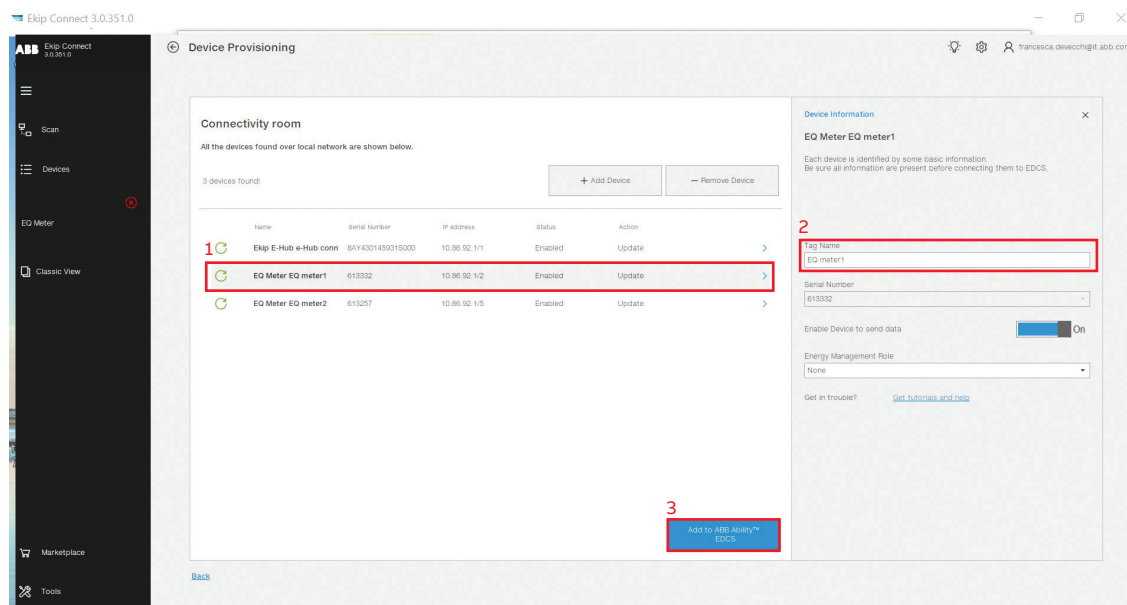


Image5

ABB Energy meters visualization in ABB Ability™ EDCS

Information

Information of the device are available on ABB Ability EDCS webapp once the device is connected.

Go to Monitor > devices > select device (EQMETER) > information. Four tabs are available:

- State
- General Parameters
- Maintenance
- Electronics.

Reports

Through EDCS it is possible to create and download reports. On ABB Ability EDCS webapp, go on "Optimize"> "Report". Then select "Report type", "Period", "Aggregation time range" and devices to be included in the report. It is also possible to compare different plants.

To create the report, click on "Generate report". In the reports the following measurements for each Energy meter can be downloaded:

- Avg, max and min currents
- Avg, max and min voltages (line and phase to phase voltages)
- Avg, max and min active, reactive and apparent power, total and per phase
- Avg, max and min THD
- Avg, max and min frequency
- Avg, max and min power factor
- Avg, max and min total energy

All these measurements can be included in the report only if those measurements are actually available from the selected meter. In case some measurements are not supported by the device itself, it will not be possible to visualize them in ABB Ability EDCS. In order to select the correct Energy meter with all required functionalities, please refer to the catalogue available at this [link](#) (9AKK106930A8017).

Widgets where ABB Energy meters can be displayed

Widgets and measurements described below will be visualized only if those measurements are actually available from the selected meter. In case some measurements are not supported by the device itself, it will not be possible to visualize them in ABB Ability EDCS.

In order to select the correct Energy meter with all required functionalities, please refer to the catalogue available at this [link](#) (9AKK106930A8017).



Image6

A. How to add a widget

Widgets can be added in the dashboard according to user's preferences and needs. Widgets can be added and removed any time.

1. go on "Monitor">"Dashboards">"Overview"
2. Click on "Add widget"

3. A new window with all available widgets appears ("Dashboard – Add widget" window). Click on "Add" to add the wanted widget. It is possible to add as many widgets as needed, also of the same type.

The green number on the upper right of each widget indicates how many widgets of that type are visible in the dashboard.

4. After adding all needed widgets, close the "Add widget" window.

Tip: you can add as many widgets as needed, e.g. one per ABB Energy meter connected.

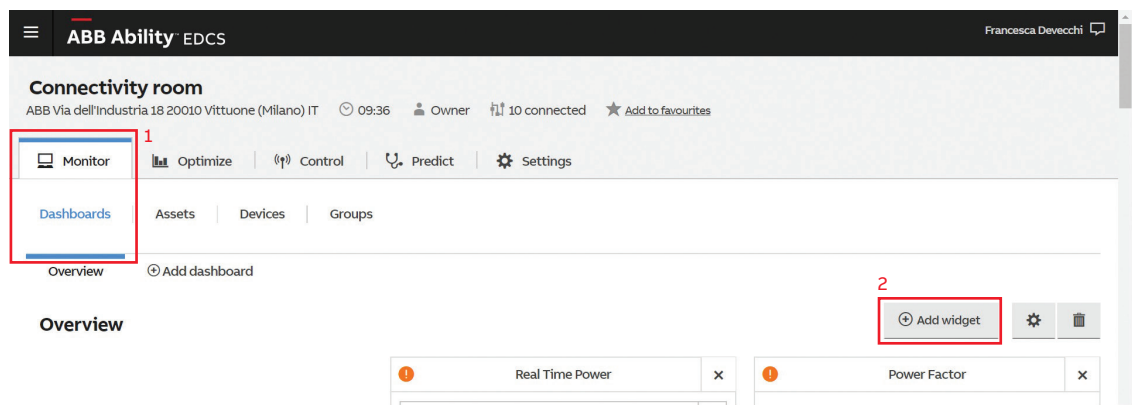


Image7

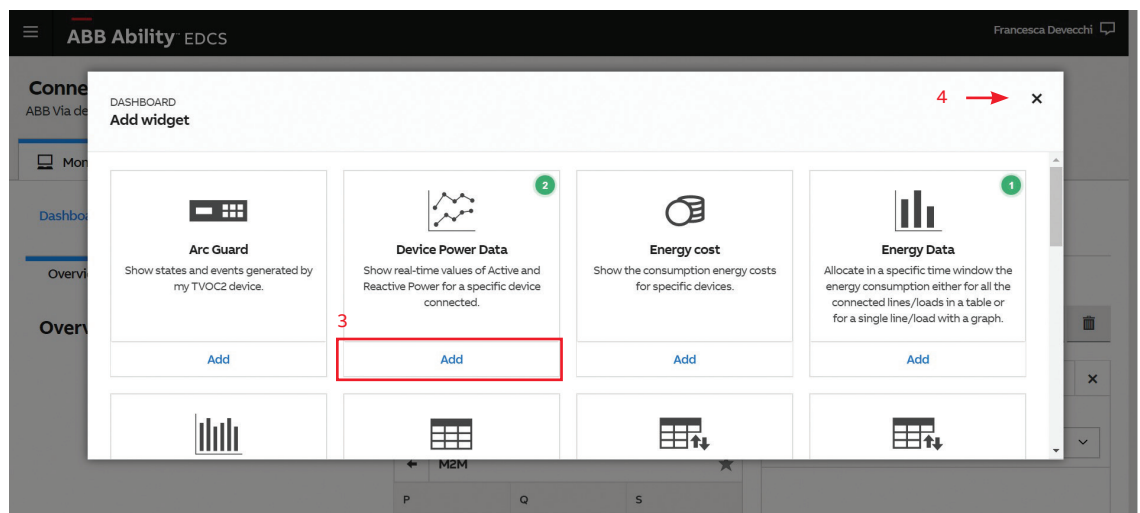


Image8

ABB Energy meters visualization in ABB Ability™ EDCS

B. Real Time Powers widget

The widget “Real Time Powers” monitors real-time data of Active, Reactive and Apparent Power for each connected device.

In case “all devices” is selected in the widget, measured powers from all devices are listed in a table.

Real Time Power				✕
Device				
<div>All devices</div>				
Device	P	Q	S	
Meter B	0,0 kW	-0,01 kVAR	0,02 kVA	
Meter C	0,0 kW	-0,01 kVAR	0,01 kVA	
Meter D	2,18 kW	-0,11 kVAR	2,19 kVA	
Meter E	0,0 kW	-0,01 kVAR	0,02 kVA	
EV charger				

Image9

In case only one ABB Energy meter shall be visualized, select the device in the drop-down list of available devices in the widget. Measured Active, Reactive and Apparent Power are displayed as a graph.



Image10

C. Real Time Currents widget

The widget “Real Time Currents” monitors real-time data of phase current for each connected device.

In case “all devices” is selected, measured currents from all devices in the plant (measuring current) are listed in a table.

Real Time Currents			
Device			
All devices			
Device	IL1	IL2	IL3
Meter B	0,0 A	0,0 A	0,0 A
Meter C	0,0 A	0,0 A	0,0 A
Meter D	10,0 A	0,0 A	0,0 A
Meter E	0,0 A	0,0 A	0,0 A

Image11

In case only one ABB Energy meter shall be visualized, select the device in the drop-down list of available devices in the widget. Measured currents are displayed in a graph.

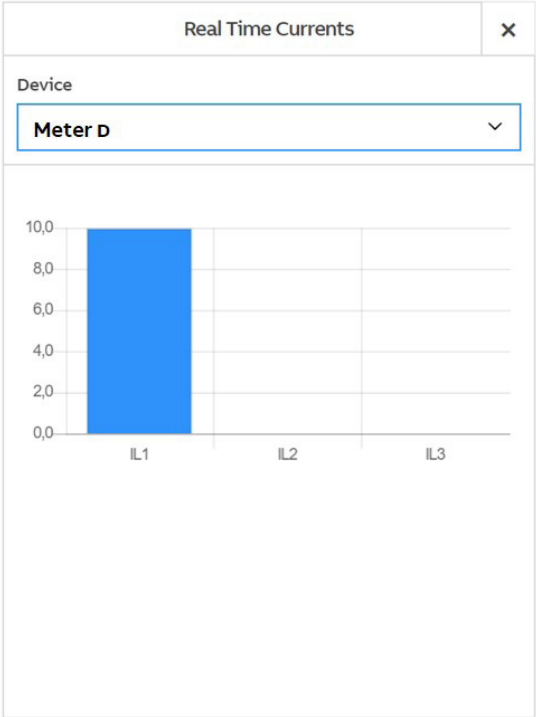


Image12

ABB Energy meters visualization in ABB Ability™ EDCS

D. Real Time Voltage widget

The widget “Real Time Voltage” shows real-time data of the voltage, either phase-phase voltage or phase-neutral voltage.

In case “all devices” is selected, measured voltages from all devices in the plant (measuring voltage) are listed in a table.

Real Time Voltage				×
Device				
All devices				▼
Voltage type				
Phase-Phase				▼
Device	U12	U23	U31	
Meter B	393,0 V	393,0 V	392,0 V	
Meter C	392,0 V	393,0 V	391,0 V	
Meter D	393,0 V	393,0 V	392,0 V	
Meter E	393,0 V	393,0 V	392,0 V	

Image13

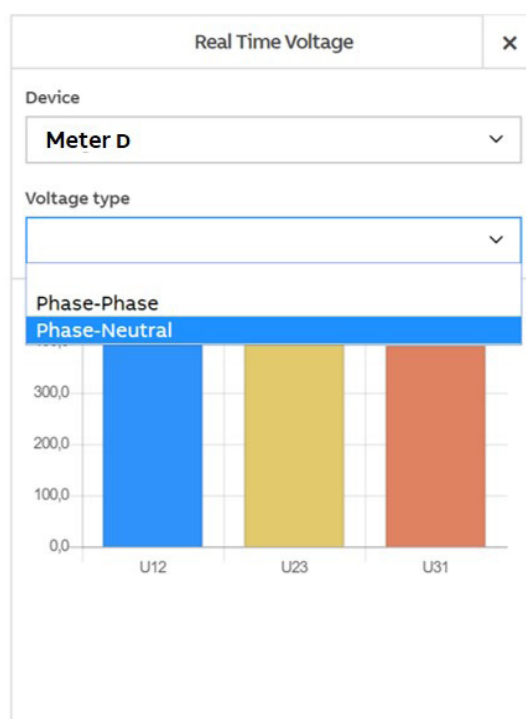


Image14

In case only one ABB Energy meter shall be visualized, select the device in the drop-down list of available devices in the widget. Measured voltages are displayed in a graph.

E. Device Power Data widget

The widget “Device Power Data” shows in a graph the real-time values of Active and Reactive Power for a specific device connected and for a selected period of time.

The widget allows the visualization of one device at a time. Select the device in the drop-down list of available devices in the widget.

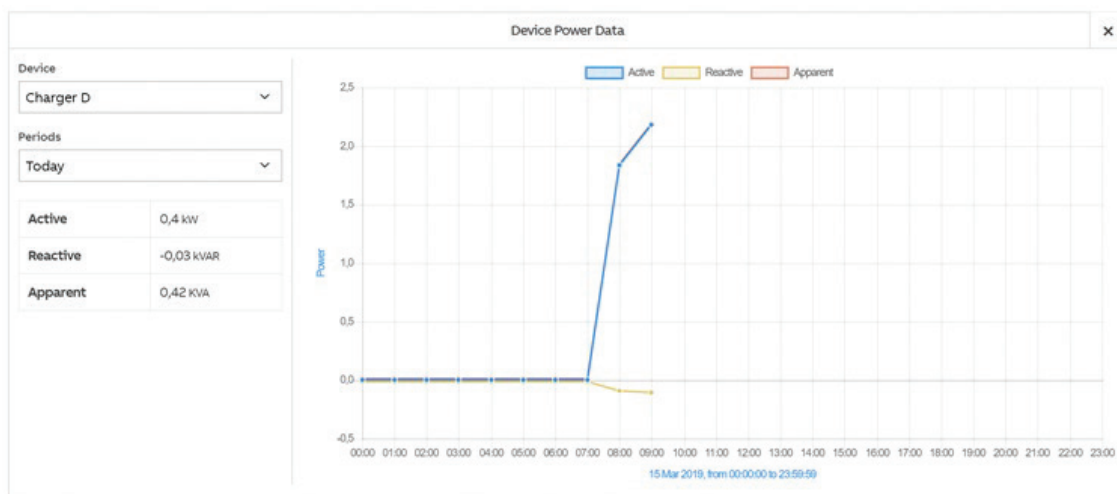


Image15

F. Power factor widget

The Power Factor can also be monitored by the dedicated widget “Power Factor”. A specific period of time can be selected.

The widget allows the visualization of one device at a time. Select the device in the drop-down list of available devices in the widget.

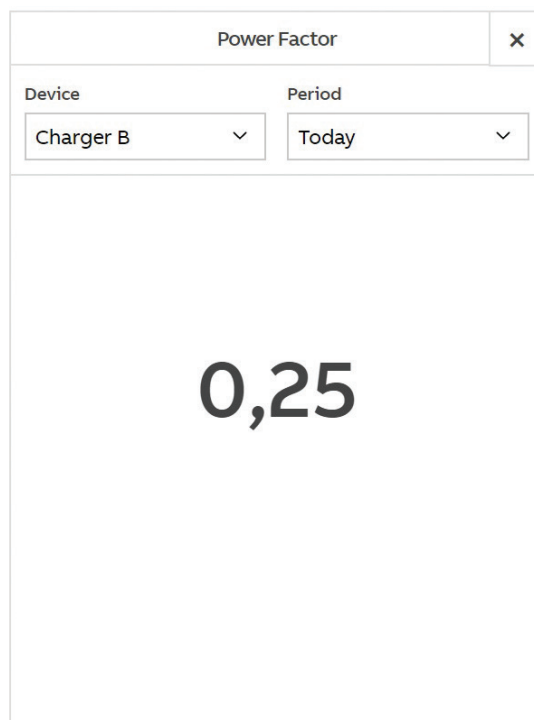


Image16

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