COMMISSIONING GUIDELINE

# Provisioning and visualization in ABB Ability™ EDCS of M2M

## Getting started

In order to carry out the provisioning of M2M 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

# Table of contents

# Provisioning and visualization in ABB Ability™ EDCS of M2M

## Material and tools you might need during provisioning

- User manual of M2M Network analyser available at this link (2CSG445010D1001)
- Ethernet interface user manual of M2M Ethernet available at this link (2CSG445012D0201)
- 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 M2M settings

Steps described below shall be completed per each M2M before starting provisioning on the wizard tool.
**TIP:** In order to facilitate explanation of following procedures, same terminology used in the user manual to indicate buttons on the product is considered. Control keys are reported in the table.

| | |
|---|---|
|  | **Return to an advanced level menu or pass on to the field more on the left in the data entry phase** |
|  | **Ascending navigation of the page or increase of a data in data entry phase** |
|  | **Descending navigation of the page or decrease of a data in data entry phase** |
|  | **Change to field further to the right in data entry phase** |
|  | **Access to an advance menu level or confirmation of a data in data entry phase** |

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

| Device | Minimum Firmware version |
|---|---|
| M2M RTU | 2.2.6 |
| M2M Ethernet | 2.2.5 |

To check the firmware version, please follow this procedure:

1. Press and hold for more than 2 seconds key 5
2. Press key 3 until “Info menu – enter?” is displayed. Then press key 5 to access the menu.
3. Press key 3 until “firmware version” is displayed.

In case of M2M Modbus RTU device, please follow the steps B and C.
In case of M2M Ethernet, please follow the steps from D to I.

**M2M Modbus RTU**

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=+)

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 “Communication menu” of M2M user manual. They are also reported here below:
   1. Press and hold for more than 2 seconds key 5
   2. Press key 3 until “Communication menu – enter?” is displayed. Then press key 5 to access the menu
   3. “Serial protocol” is displayed. Press key 5 to set the protocol. Select with key 2 or key 3 “MODBUS” option. Press key 5 to confirm
   4. Press key 3 to reach “Address”. Press key 5 to set the address. Use key 2 and key 3 to scroll numerical characters and key 4 to move the cursor between the characters. Once the address is set, press key 5 to confirm
   5. Press key 3 to reach “Baud rate”. Press key 5 to set the baudrate. Select with key 2 or key 3 the desired option. Available options are 4800, 9600 (default) and 19200. Press key 5 to confirm.
   6. Press key 3 to reach “Parity type”. Press key 5 to set the parity type. Select with key 2 or key 3 the desired option. Available options are none (default), even and odd. Press key 5 to confirm.
   7. Press key 3 to reach “Number of stop bits”. Press key 5 to set the number of stop bits. Select with key 2 or key 3 the desired option. Available options are 1 or 2. Press key 5 to confirm.

   **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.

**M2M Ethernet**

D. In case multiple M2M Ethernet are to be provisioned in ABB Ability EDCS, please commission one by one keeping the others switched off. Once commissioning in the webserver is completed, M2M Ethernet can be maintained in operations and it is possible to switch on and start provisioning the next M2M Ethernet.

E. Connect the laptop to the same Ethernet network of the M2M, i.e. to same ethernet switch.
   **Tip:** Wired connection of the PC is preferred due to more stable connection.

F. Set your laptop to static access with default factory settings. The procedure explaining how to set static IP address is explained in section “2.4 Configuration” (point 2) of the Ethernet interface user manual.
   a. Static IP address to assign= 192.168.1.XXX, where XXX is a value different from 239. Please make sure to assign a static IP address which is not already used in the LAN.
   b. Subnet mask = 255.255.255.0

   **Tip:** laptop firewall must be turned off during commissioning process. Firewall shall then be re-enabled at the end of commissioning.
   **Tip:** when configuring laptop to static IP address, keep DHCP of the device disabled, hence keep default settings.

G. Access to M2M webserver (default IP: 192.168.1.239) as described in section “2.4 Configuration” (point 2) of the Ethernet interface user manual.

H. In the webserver, enter the “Modbus TCP menu” and modify the Modbus settings of M2M (see section “3.4 Modbus TCP menu) as follows: check “Enable Modbus TCP” and set TCP Port: 502. Then save the configuration.
   **Tip:** “Modbus TCP Menu” is protected by a password. The default credentials are
   - User name: admin
   - Password: admin

I. In the webserver, set the static IP address dedicated to the M2M Ethernet device. Modify IP settings as described in section “3.6 Network Menu”
   **Tip:** the new static IP address shall be in the range of the sub-network for TCP devices to be provisioned in EDCS. Therefore, it has to be in the same sub-network of:
   - module Ekip Com TCP, in case of Emax 2 / Ekip UP
   - LAN2, in case of E-Hub.

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**Tip:** It is recommended a sub-network with IP range 192.168.0.XXX, where XXX ranges from 1 to 254. In case of Ekip E-Hub used as access point, sub-network default IP range is 10.86.92.2 … 10.86.92.99 (LAN2 default configuration has static IP address which is 10.86.92.1).
**Tip:** in the list of settings, “Gateway” IP address shall be IP address of the connection point to the internet, i.e. IP address of the dedicated router if present.
**Tip:** do not give same IP address to different devices, otherwise only one of the devices with same IP 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.

   **Tip:** during first commissioning of M2M Ethernet, a static IP address for the laptop has been set. In order to continue with the provisioning, this IP address has to be changed: at this stage, laptop IP address shall be in the sub-network range. To access IP settings in Windows, access laptop “Control Panel”>”Network and Sharing Center”>”Change adapter settings”>right click on “Local Area Connection (LAN)”>”Properties”>”Internet Protocol Version” and “Properties”.
   Make sure communication is now set as described in the documents (see sections “Configuring the system” and “Laptop configuration”).
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”.

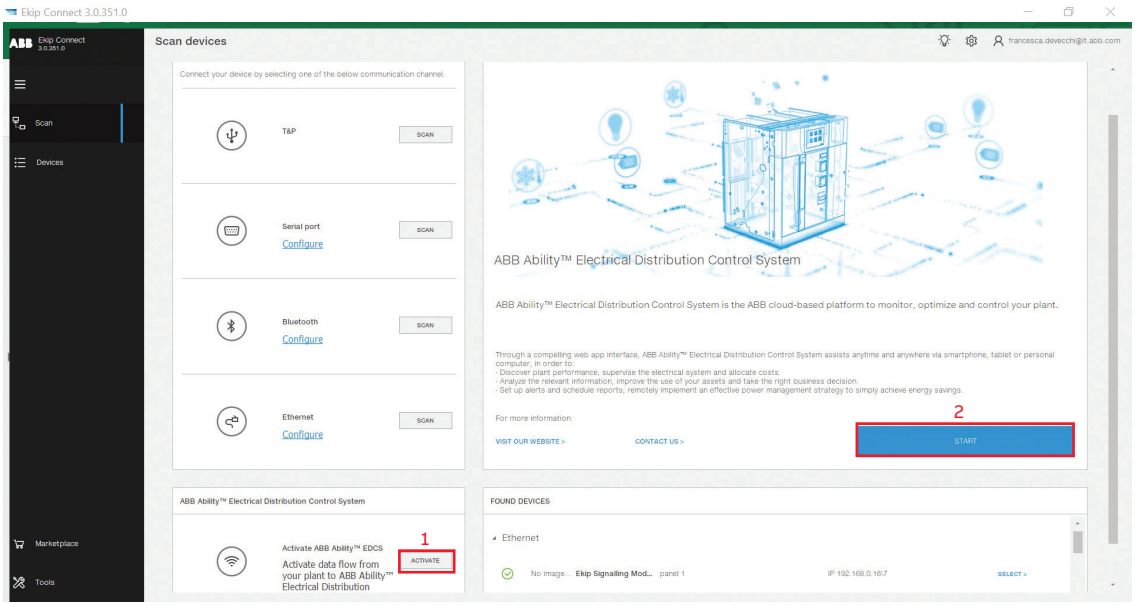


Image 1

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

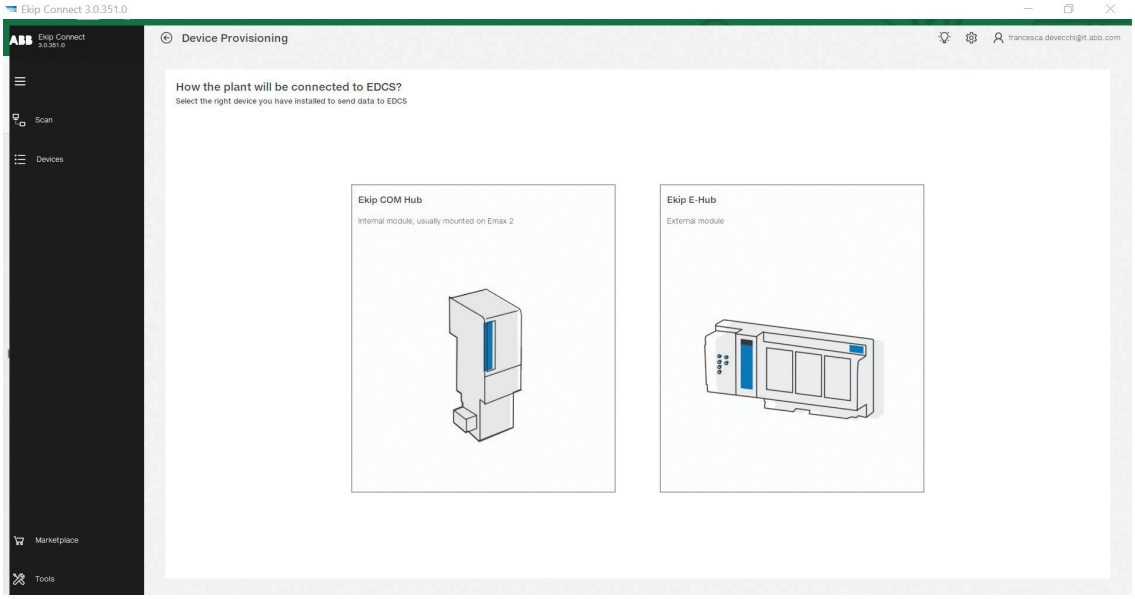


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Image 2

E. When the “Discover configuration” page is reached, EPiC scans the whole Ethernet and Modbus network, looking for devices to provision. With “Manual discovery”, it is possible to insert specific IP addresses and Modbus RTU addresses to narrow the addresses range to be scanned. Before proceeding with manual discovery, please make sure
   - all TCP devices to be provisioned have a static IP address in the sub-network range, as described at point I in the first part
   - to know all ID slave addresses of Modbus RTU devices to be provisioned

   **Tip:** Manual discovery is preferred because it allows shorter scanning time.
   **Tip:** for M2M Modbus RTU with Firmware version equal to 2.2.5, inserting its slave address is not necessary at this stage since the device will not be automatically found by EPiC 3.
   In this case, please insert IP addresses and slave addresses of all other devices to provisioned in this system, except for M2M slave address.

Here the steps to follow to scan for devices:
1. Click on “Manual discovery settings”
2. In order to scan the whole Ethernet and Modbus RTU network
   a. In the section “IP addresses”, insert the IP address of M2M Ethernet in the list of IP addresses to be scanned, together with IP addresses of selected access point and other TCP devices. It is possible to either add IP addresses one by one (“Use IP address list”), or input IP address range (“Use IP address range”).
   b. in the drop-down menu, select slave addresses of all devices connected via Modbus RTU to be provisioned. In the example, one M2M whose slave address is 141 is to be provisioned.
3. Then press “OK” and “Start Discovery”.

# Provisioning and visualization in ABB Ability™ EDCS of M2M

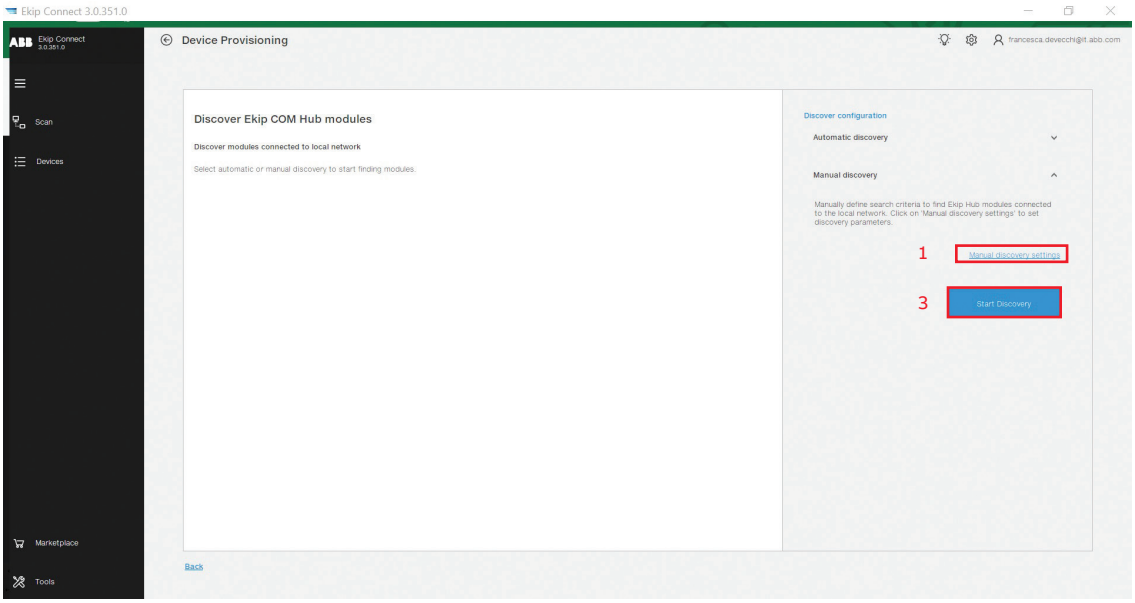


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Image3

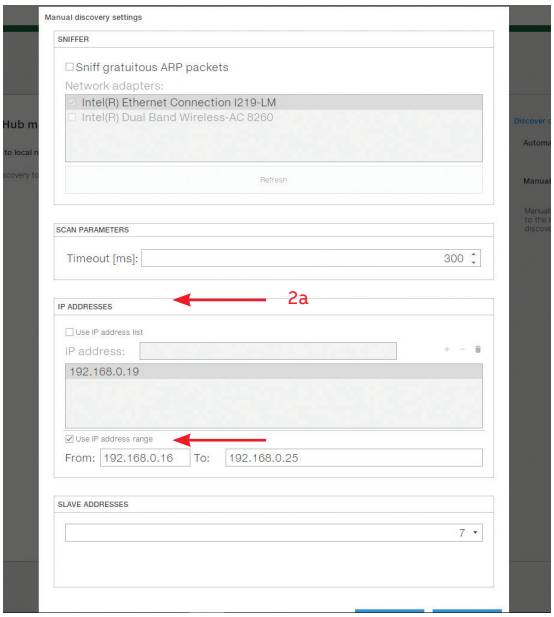


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Image4

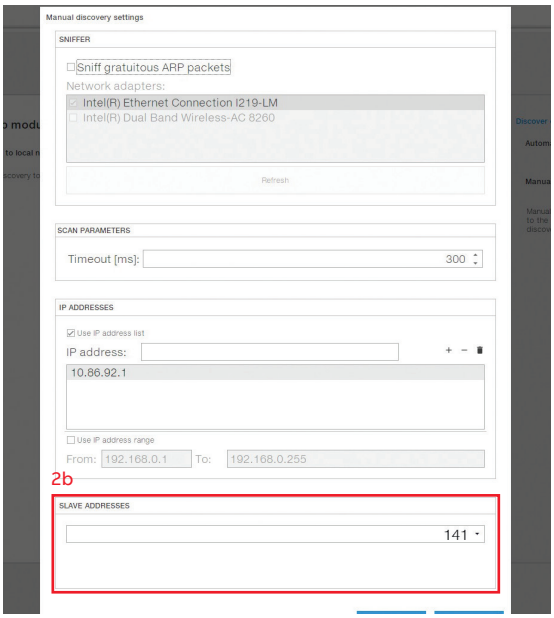


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Image5

F. In case of M2M with Firmware version equal to 2.2.5, please skip the remaining steps (F and G) and follow instructions in the dedicated section to complete provisioning.
Once M2M is found and inserted into the list of the connected devices,
1. click on the blue arrow on the right of the selected device
2. In the section “Device information”, please add a tag name.

**TIP:** “TAG Name” shall have the following characteristics:
a) Do not give same TAG Name to different devices
b) Each TAG Name cannot be more than 10 characters
c) Special characters are not allowed
d) Backspace is not allowed (please use underscore).

Please ensure “Enable device to send data” is ON.

G. After completing assignment of tag names to all devices, complete the commissioning by clicking on “Add to ABB Ability EDCS” (3).

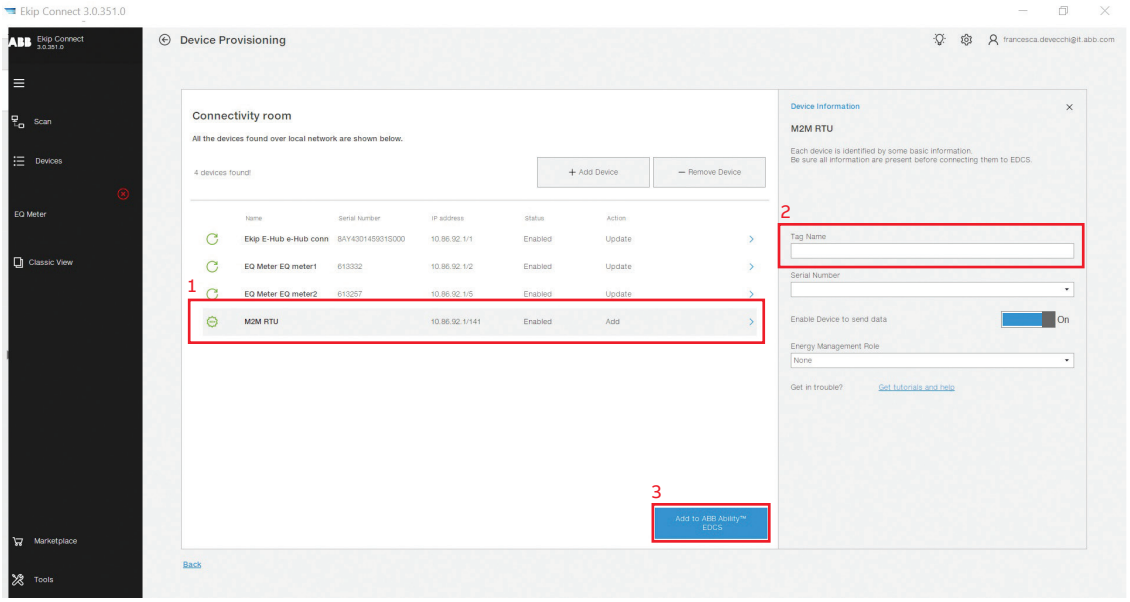


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Image6

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.

# Provisioning and visualization in ABB Ability™ EDCS of M2M

**Provisioning of M2M RTU with Firmware version 2.2.5**

In case M2M to be provisioned has a firmware version which is 2.2.5, the device will not automatically be found by EPiC 3. Therefore, it is not necessary to insert M2M slave address during step E and step F shall be skipped.

When the page “Here’s your local network” is reached, other devices to be provisioned are listed while M2M shall be inserted manually:

1. click on “Add device”. A new section on the right of the page appears
2. In “Device type” select M2M RTU
3. Type in “IP address” the IP address of the access point: either IP address of Ekip Com Hub or IP address of LAN2 in case of Ekip E-Hub Type in “slave address” the RTU slave address of M2M, previously set on the device
4. Click on blue box “Add device”

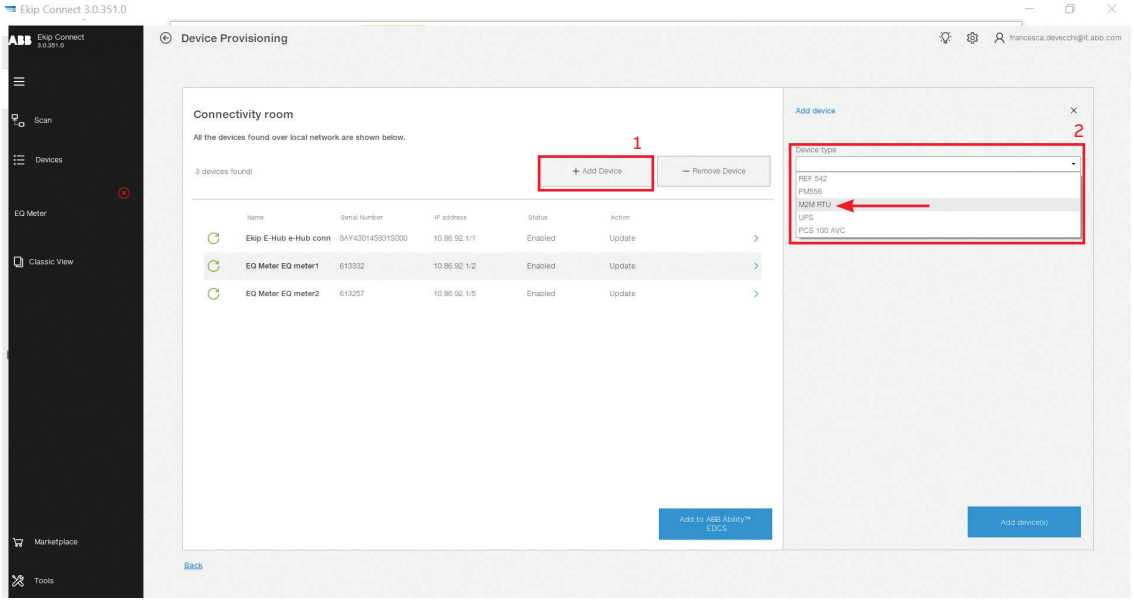


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Image7

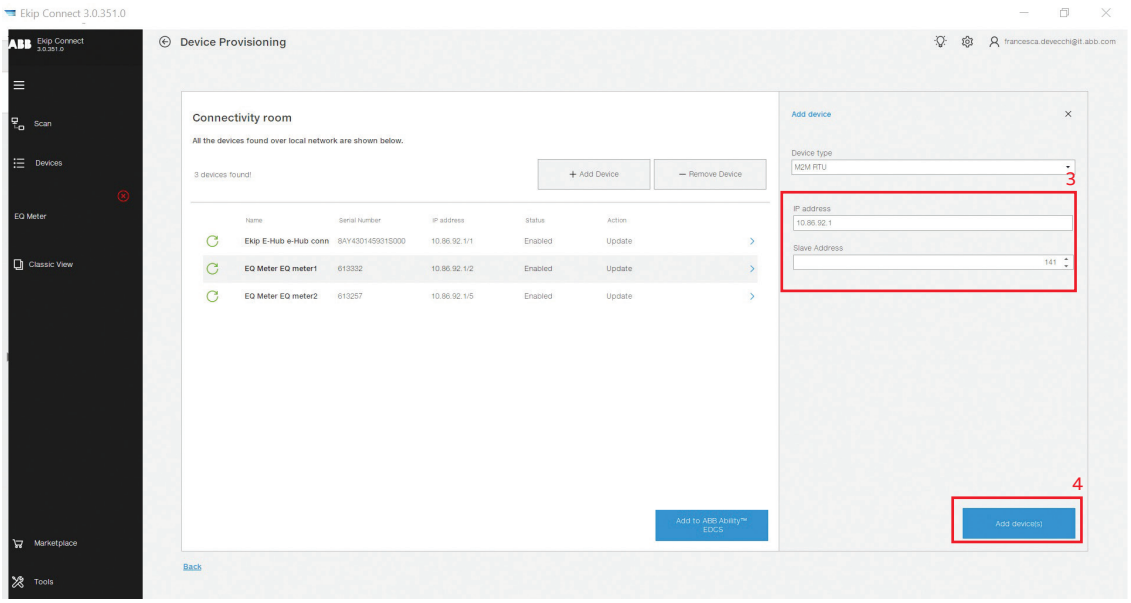


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Image8

5. Give a “Tag Name” to the device and type its “Serial Number” in the dedicated spaces Please ensure “Enable device to send data” is ON. To check the serial number, please follow this procedure:
   1. Press and hold for more than 2 seconds key 5
   2. Press key 3 until “Info menu – enter?” is displayed. Then press key 5 to access the menu.
   3. Press key 3 until “serial number” is displayed.

6. when all devices have been added, either manually or as described in step F; complete the commissioning of the system by clicking on “Add to ABB Ability EDCS”

7. 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.

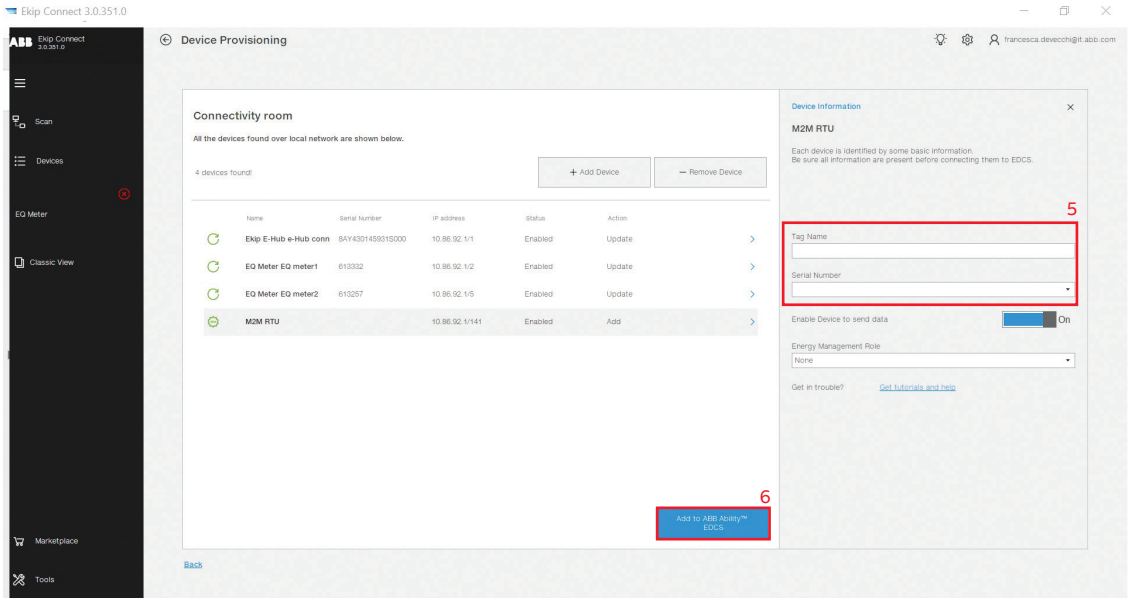


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Image9

# M2M 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 (M2M RS485) > information. Two tabs are available:

- General Parameters
- 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 M2M can be downloaded:

- Avg, max and min currents (phase and neutral 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
- Active, reactive and apparent total energy.

All these measurements can be included in the report only if those measurements are actually available from the selected M2M. 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 M2M with all required functionalities, please refer to the catalogue available at this link (9AKK106930A8017).

## Widgets where M2M can be displayed

Widgets and measurements described below will be visualized only if those measurements are actually available from the selected M2M. In case some measurements are not supported by the device, it will not be possible to visualize them. In order to select the correct M2M with all required functionalities, please refer to the catalogue available at this link (9AKK106930A8017).


Image10

**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.
In order to add a widget

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 M2M connected.

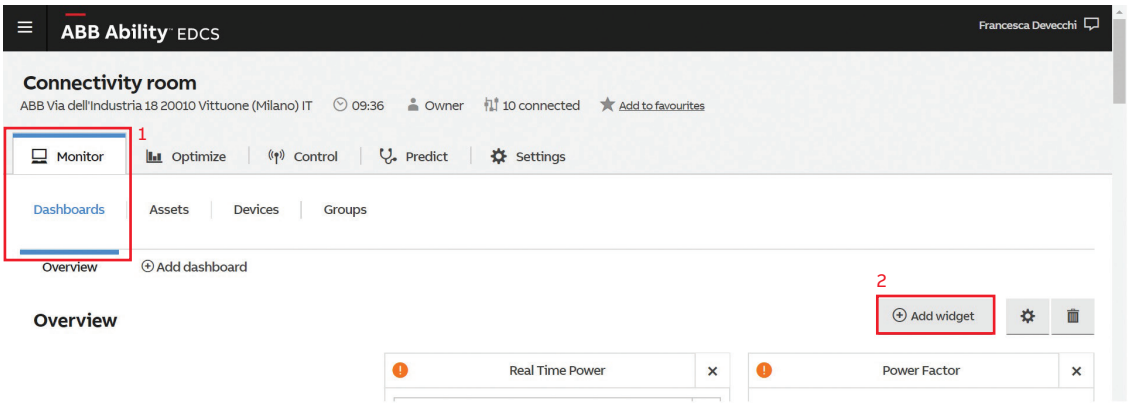


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Image11

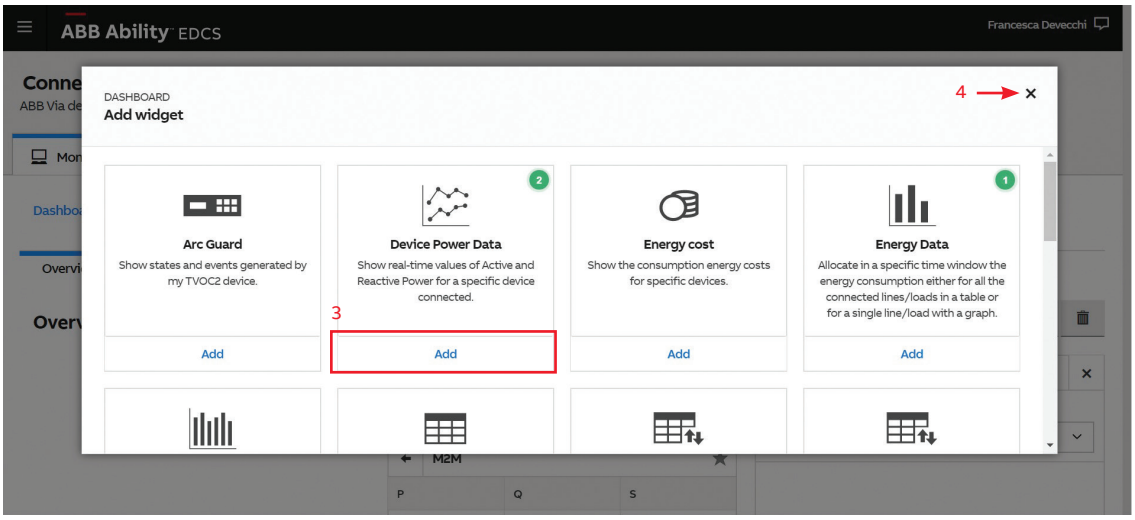


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Image12

# M2M 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.

In case only one M2M 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.

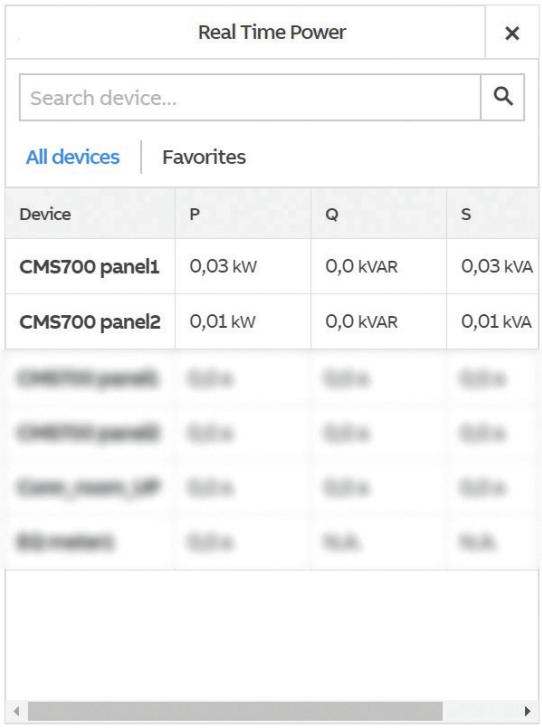


Image13


Image14

**C. Real Time Currents widget**

The widget “Real Time Currents” monitors real-time data of the currents 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.

In case only one M2M shall be visualized, select the device in the drop-down list of available devices in the widget. Measured currents are displayed in a graph.

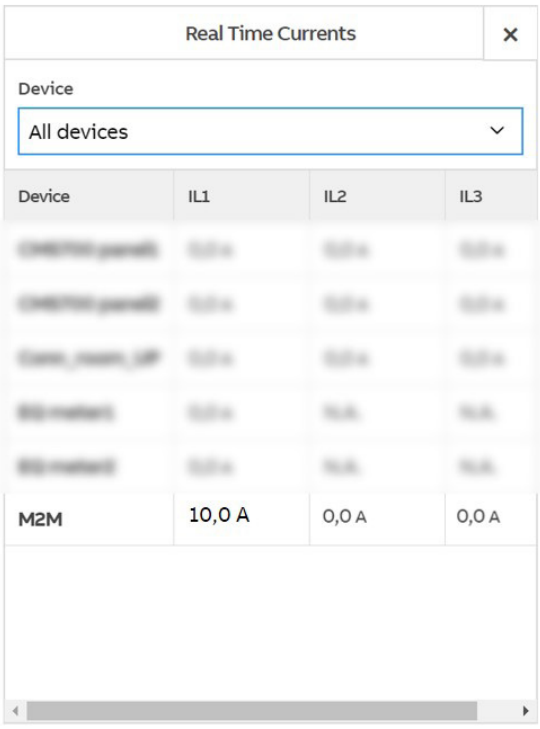


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Image15

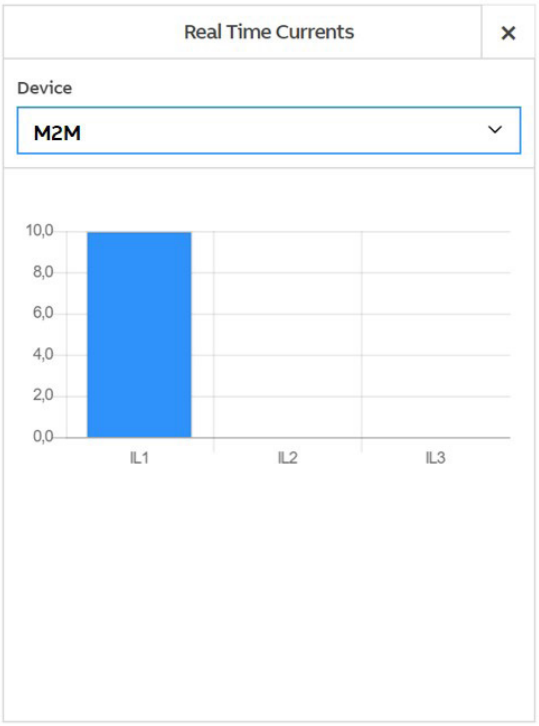


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Image16

# M2M 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, for each connected device.

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

In case only one M2M shall be visualized, select the device in the drop-down list of available devices in the widget. Measured voltages are displayed in a graph.

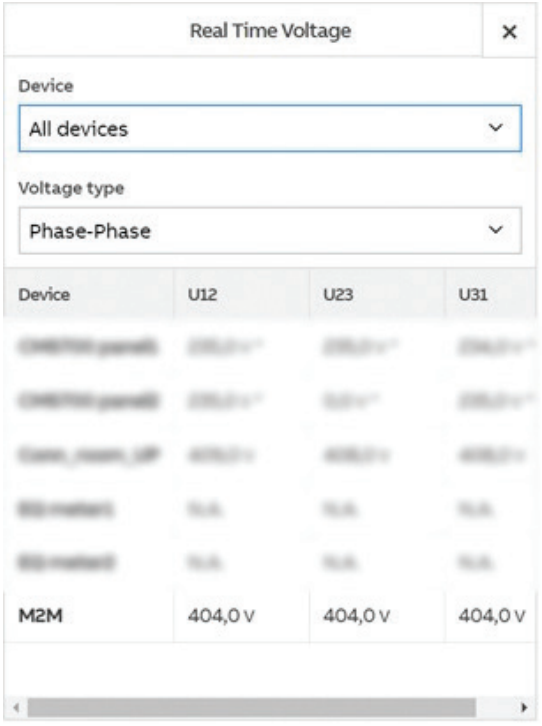


Image17


Image18

**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.

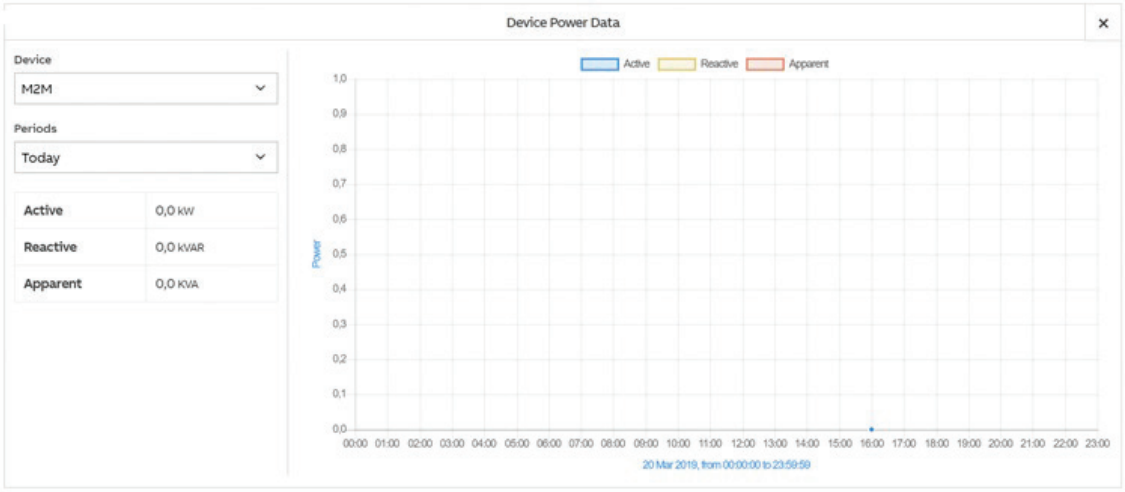


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Image19

# M2M visualization in ABB Ability™ EDCS

**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.

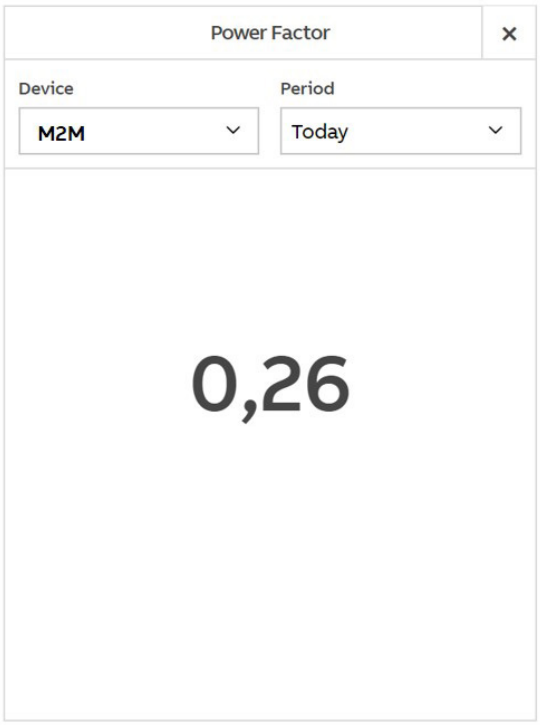


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Image20

**G. Power Quality widget**

Power quality can also be monitored by the dedicated widget “Power Quality”.
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.
For M2M, it displays in a table THD of voltage and current for each phase.

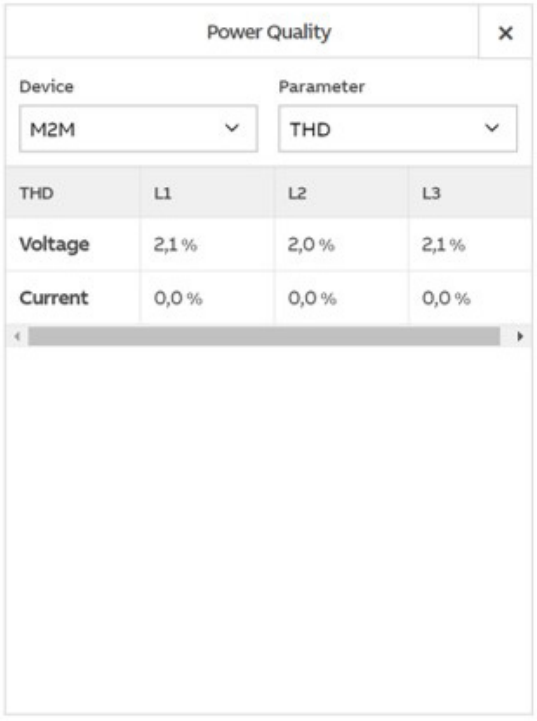


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Image21

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