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COMMISSIONING GUIDELINE

# Provisioning and visualization in ABB Ability EDCS of CMS-700

## Getting started



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**In order to carry out the provisioning of CMS-700 in ABB Ability™ EDCS, please follow the procedure as described below. The first part of the provisioning is to be performed on the CMS-700 webserver, the second part via EPiC (Electrification Product intuitive Configurator) wizard, the free software for ABB Ability EDCS provisioning.**

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# Provisioning and visualization in ABB Ability™ EDCS of CMS-700

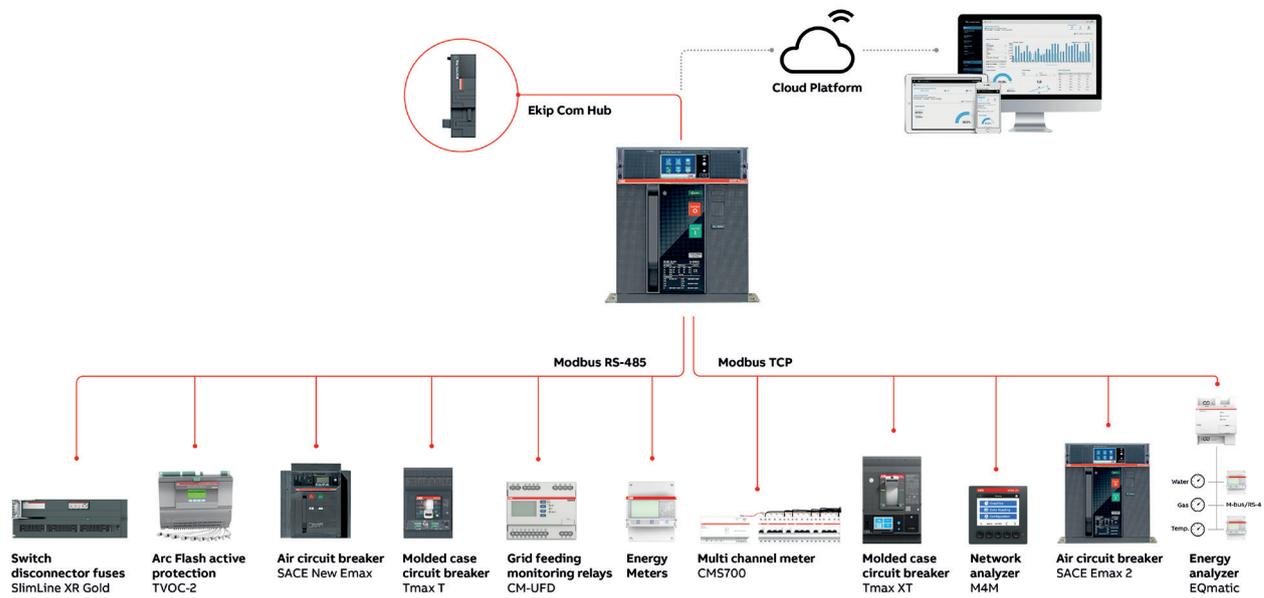
## Architectures scenario

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

## Embedded Solution

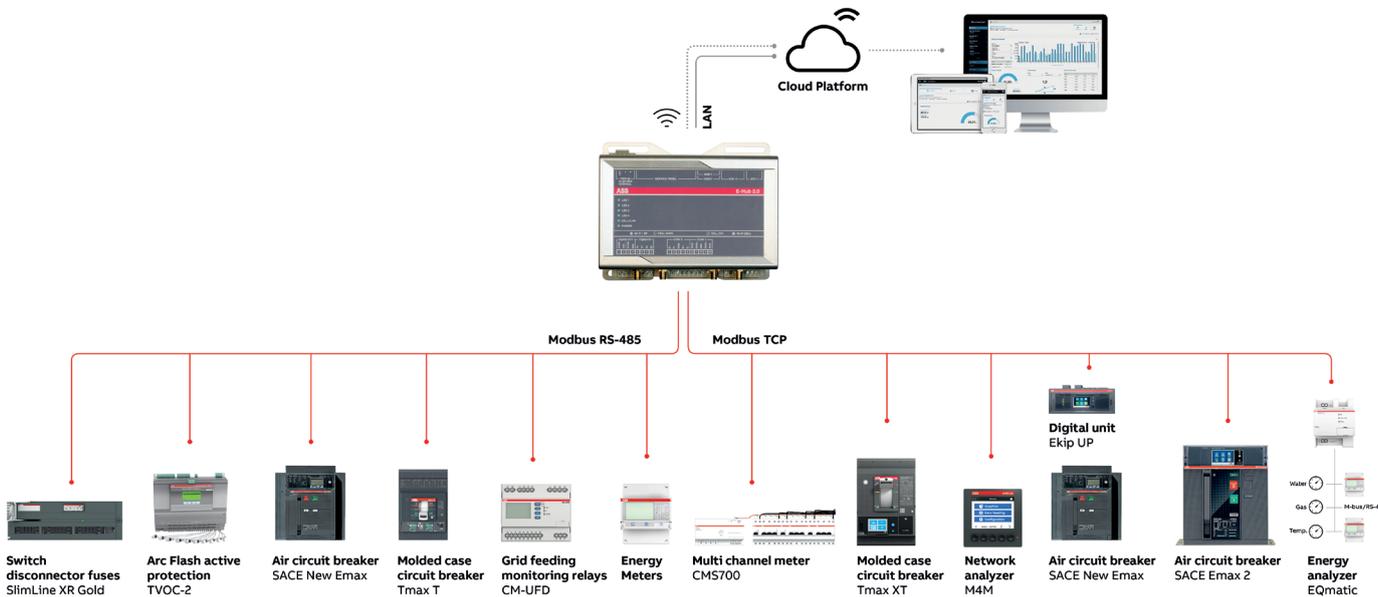
Emax 2 equipped with the new Ekip Com Hub establishes the cloud connection for the whole switchboard.

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



**External Solution**

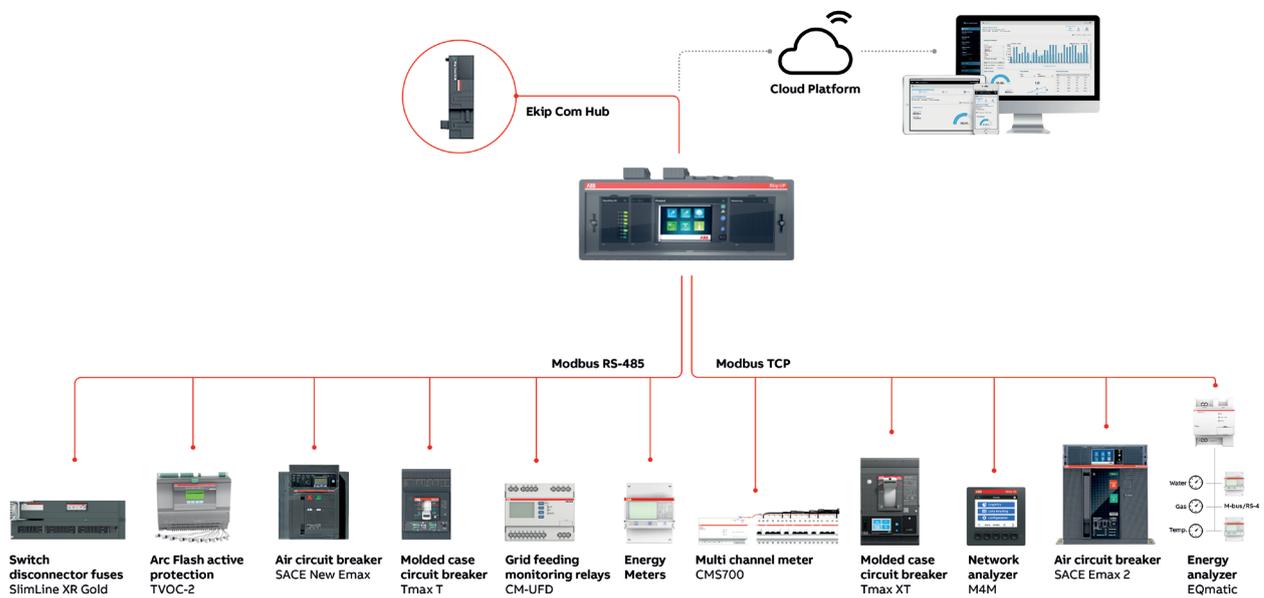
E-Hub 2.0 is an independent IoT gateway which can gather data from field devices as well as consumption of water, gas, etc. and connect to the system to ABB Ability™ Electrical Distribution Control System, the cloud platform. As a result, all the downstream field devices can be monitored from the cloud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



# Provisioning and visualization in ABB Ability™ EDCS of CMS-700

## 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 during the provisioning:

- User manual of CMS-700 available at this [link](#) (2CCC481011M0201)
- 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).

## Initial commissioning of CMS-700 in the webserver

**Tip:** in case multiple CMS-700 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, CMS-700 can be maintained in operations and it is possible to switch on and start provisioning the next CMS-700.

1. Connect the laptop to the same Ethernet network of the CMS-700, i.e. to same ethernet switch.

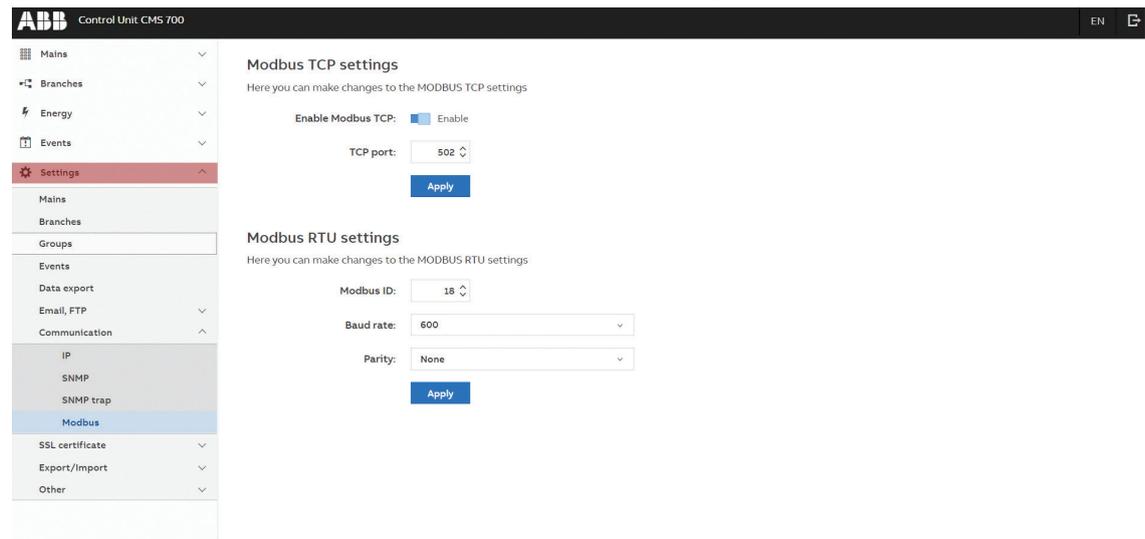
**Tip:** Wired connection of the PC is preferred due to more stable connection.

2. Set your laptop to static access with default factory settings. The procedure explaining how to set static IP address is explained in “Initial Commissioning” chapter of the user manual.
  - a. Static IP address to assign= 192.168.1.100 (address close to the default one for CMS-700, which is 192.169.1.200). Please make sure the IP address in the assigned LAN is not used twice. If it is used twice, select another IP address.
  - 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.
3. Access to CMS-700 web user interface (default IP: 192.168.1.200:8000) as described in “Initial Commissioning” and “Web User Interface Overview” chapters of the user manual
4. In the webUI, configure the mains, branches, groups of CMS-700, including the configuration of sensors connected to the control unit (see specific sections in chapter “WEB UI – Settings”)
5. In the webUI, update the FW of the control unit to the latest one available on ABB website (see section “Settings – Other / FW update”)  
**Tip:** integration in ABB Ability EDCS is ensured from FW version 1.31 on.

The screenshot displays the ABB Control Unit CMS 700 web interface. On the left, a navigation menu is visible with categories: Mains, Branches, Energy, Events, Settings (highlighted), and Other. Under Settings, there are sub-items: Mains, Branches, Groups, Events, Data export, Email, FTP, Communication, SSL certificate, Export/Import, and Other. The main content area is titled "Settings - Firmware Update" and shows the current firmware version as 1.32C0-271-g26a1692 and the serial number as 111.222.333. It provides instructions for updating the firmware: 1. Download the latest version from a link; 2. Drag and drop the file into the designated area or click to locate it on the PC; 3. Press the "Update now" button. A large empty box with a cloud upload icon and the text "Drag and drop a file here or click" is provided for file upload. An "Update now" button is located at the bottom right of the interface.

# Provisioning and visualization in ABB Ability™ EDCS of CMS-700

6. In the webUI, modify the Modbus settings of CMS-700 (see section “Settings – Communication / Modbus”), as follows: check “Enable Modbus TCP” and set TCP Port: 502



7. In the webUI, set the static IP address dedicated to the CMS-700 unit. Modify IP settings as described in section “Settings – Communication / IP”

**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.

**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

8. For advanced users: In case a dynamic IP address is required on the CMS-700, once the dynamic DHCP is set and connected to the network, connect to the very network with (filter bootp) and identify through the MAC address which IP address has been assigned to the CMS-700

## 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:
  - a. Procedure for Ekip Com Hub is described in "Ekip Com Hub Getting started" document.
  - b. Procedure for Ekip E-Hub is described in "Ekip E-Hub Getting started" document.

**Tip:** during first commissioning of the web-server, 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").

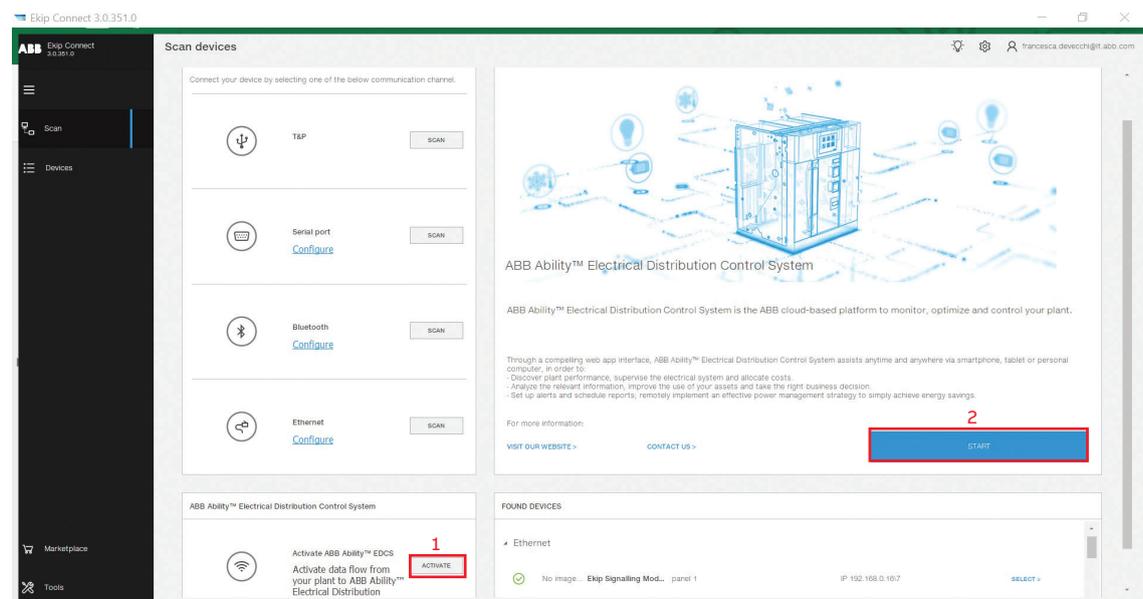


Image 1

- 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".

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

# Provisioning and visualization in ABB Ability™ EDCS of CMS-700

E. When the “Discover configuration” page is reached, EPiC scans the ethernet network, looking for devices to provision. With “Manual discovery”, it is possible to insert specific IP 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 7 in the first part.

**TIP:** Manual discovery is recommended, to make sure the device is recognized by the wizard tool.

Here the steps to follow to scan for devices:

1. Click on “Manual discovery settings”
2. In the section “IP addresses”, insert the IP address of CMS-700 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” as in 2a), or input IP address range (“Use IP address range” as in 2b).
3. Then press “OK” and “Start Discovery”.

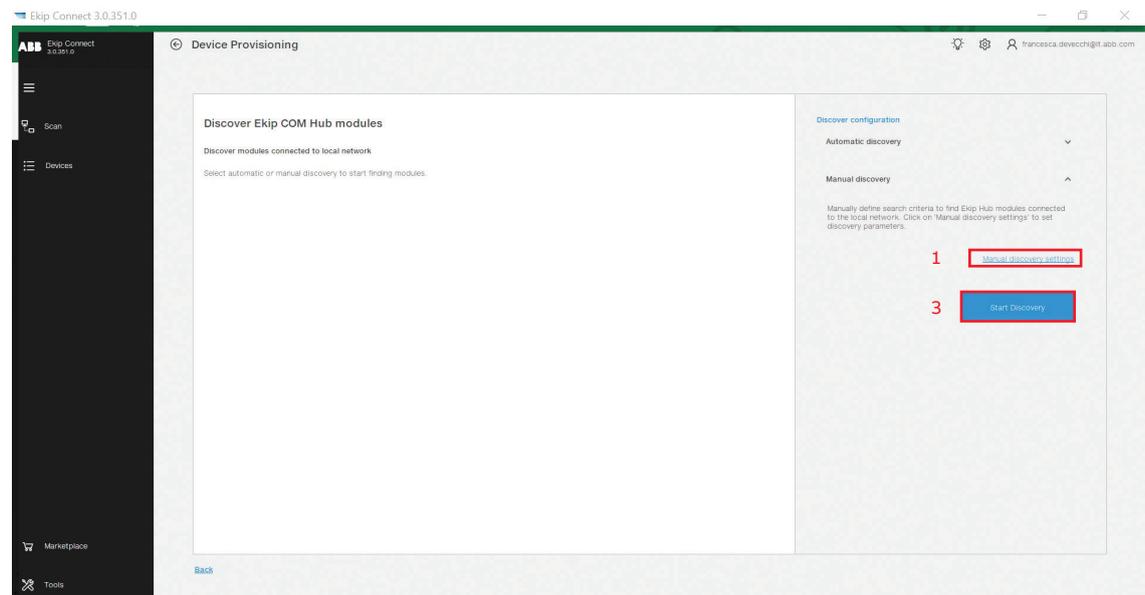


Image2

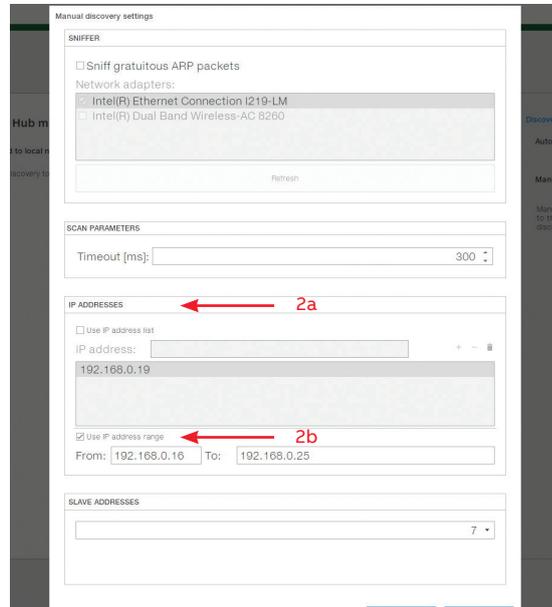


Image3

F. Once the CMS-700 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)

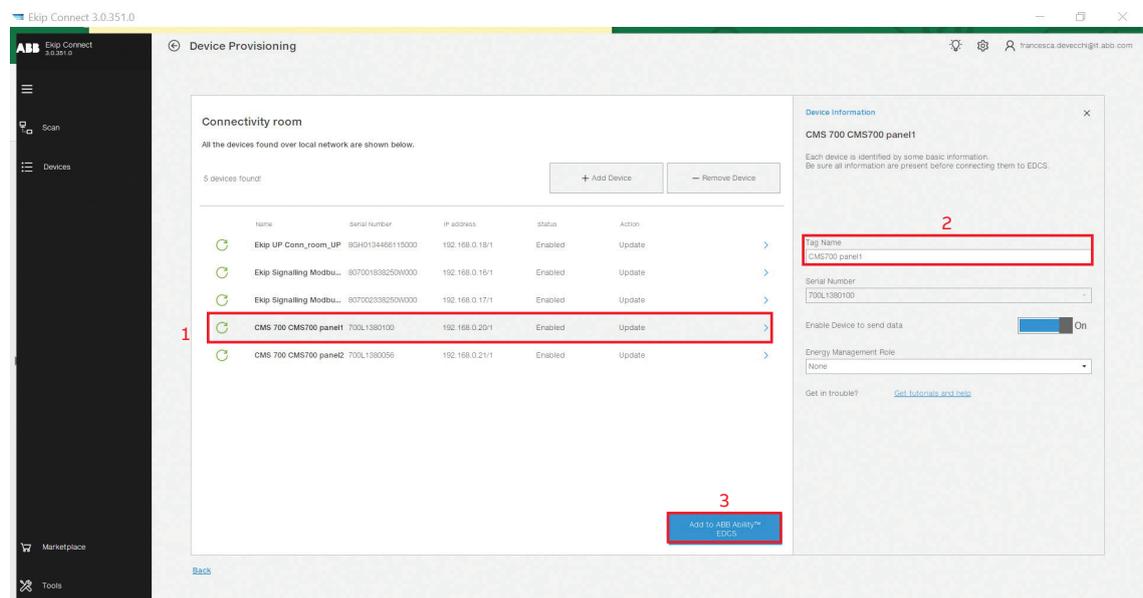


Image4

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.

## CMS-700 visualization in ABB Ability™ EDCS

### Information and settings

#### • Information

Information of the device are available on ABB Ability EDCS webapp once the device is connected. Go to Monitor > devices > select device (CMS700) > information. Two tabs are available:

- General Parameters
- Electronics

#### • Setting CMS sensors' tag name

It is possible to add a tag name to each of the 96 sensors of CMS-700.

Once on the ABB Ability EDCS webapp, go to "Monitor" > "devices" > select device (CMS700) > "settings": tag name of each sensor connected to the CMS-700 can be changed. After changing tag names as needed, click on "Apply" or "Save".



Image5

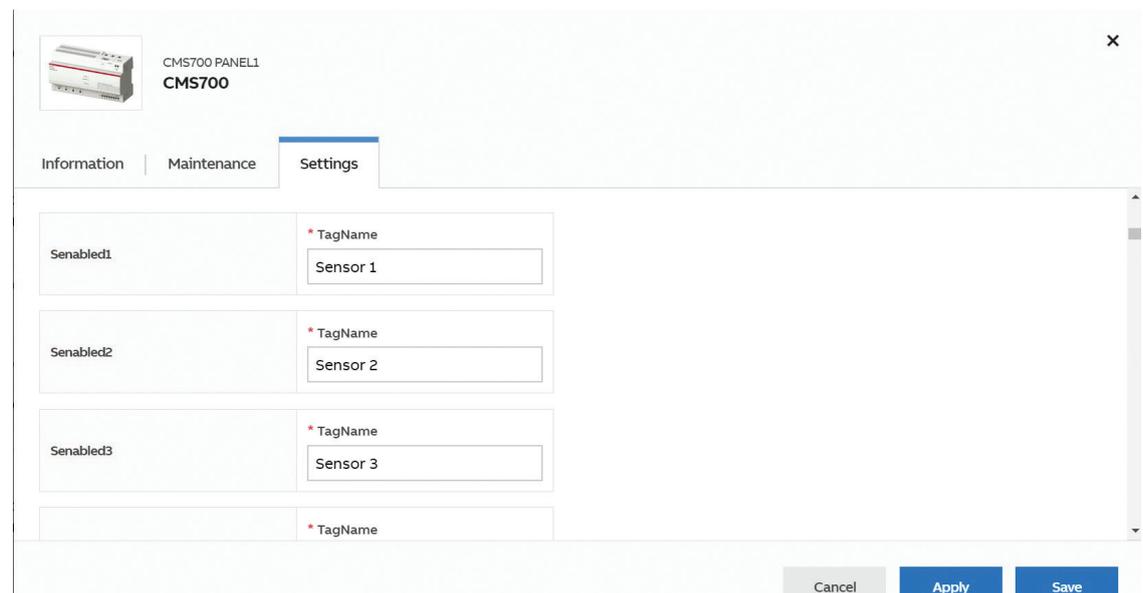


Image5

## 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”. Report generation can be guaranteed for a maximum of 32 sensors connected to a CMS-700. If more than 32 sensors are connected, downloading and scheduling of reports can only be carried out for the first 32 sensors. On the other hand, monitoring of sensors data on the dashboard can be done for all the sensors connected (even if more than 32).

In order to download sensors data, in the “Report type” please select one of the following:

- “Active energy” for active energy data
- “Active power” for active power data
- “Phase Currents” for phase currents data

In all other “Report types”, the following measurements for each CMS-700 can be downloaded:

- Avg, max and min currents (phase currents)
- Avg, max and min voltages (phase-neutral voltages)
- Avg, max and min active, reactive and apparent power, total and per phase
- Avg, max and min THD
- Active, reactive and apparent total energy

## Widgets where CMS-700 can be displayed

### 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”

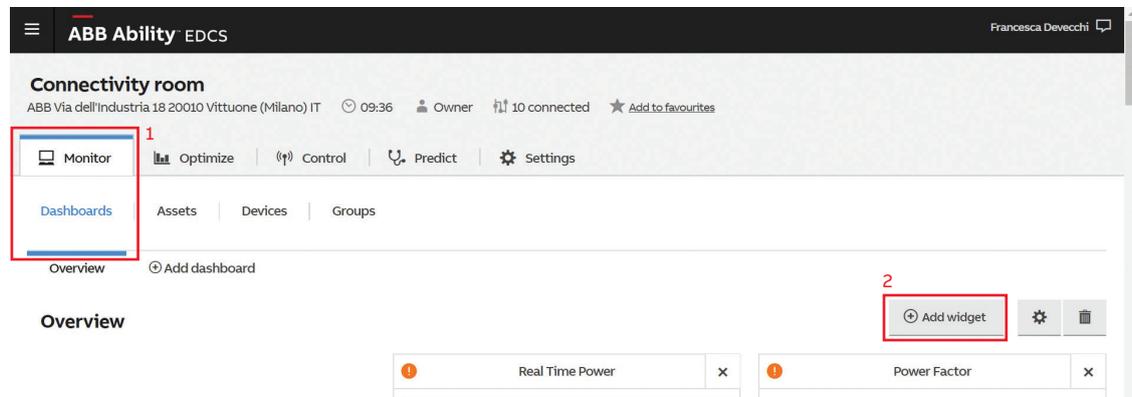


Image7

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 CMS-700 connected.

# CMS-700 visualization in ABB Ability™ EDCS

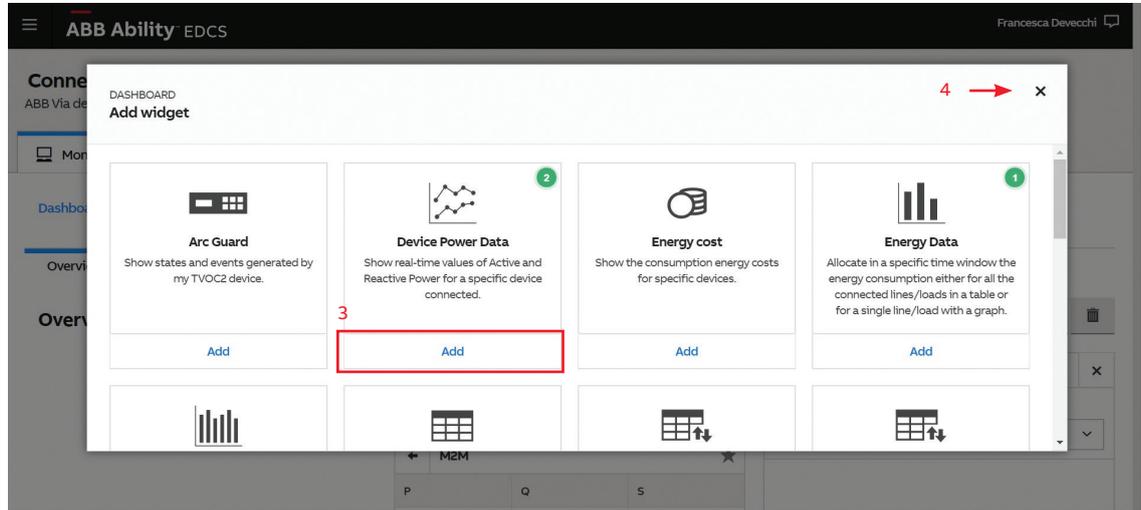


Image8

## B. Real Time Power 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 CMS-700 shall be visualized, select the device in the drop-down list of available devices in the widget. Active Power measured by each sensor is displayed. “N.A.” appears in case sensor is not assigned.

Real Time Power			
Search device...			
All devices   Favorites			
Device	P	Q	S
CMS700 panel1	0,03 kW	0,0 kVAR	0,03 kVA
CMS700 panel2	0,01 kW	0,0 kVAR	0,01 kVA
CMS700 panel3	N.A.	N.A.	N.A.
CMS700 panel4	N.A.	N.A.	N.A.
CMS700 panel5	N.A.	N.A.	N.A.
CMS700 panel6	N.A.	N.A.	N.A.

Image9

Real Time Power	
Search device...	
CMS700 panel1	
Device	P
Sensor 1	0,0 kW
Sensor 2	0,0 kW
Sensor 3	0,05 kW
Sensor 4	0,04 kW
Sensor 5	N.A.
Sensor 6	N.A.
Sensor 7	N.A.
Sensor 8	N.A.
Sensor 9	N.A.

Image10

### C. Real Time Currents widget

The widget "Real Time Currents" monitors real-time data of the currents for each connected device. It is also possible to add the widget "Group Real Time Currents" to show devices according to the defined groups.

In case the group "*Name of the plant - Plant*" is selected, measured currents from all devices in the plant (measuring current) are listed in a table.

Group Real Time Currents			
Connectivity room - Plant			
Device	IL1	IL2	IL3
CMS700 panel1	0,0 A	0,0 A	0,0 A
CMS700 panel2	0,0 A	0,0 A	0,0 A
Conn_room_UP	0,0 A	0,0 A	0,0 A
EQ meter1	0,0 A	N.A.	N.A.
EQ meter2	0,0 A	N.A.	N.A.
M2M	N.A.	N.A.	N.A.

Image11

In case only one CMS-700 shall be visualized, select the device by clicking on the name of the desired CMS-700 in the table. Real Time Current measured by each sensor is displayed. "N.A." appears in case sensor is not assigned.

Group Real Time Currents	
Search group...	
← CMS700 panel1	
Device	I
Sensor 1	0,0 A
Sensor 2	0,0 A
Sensor 3	0,23 A
Sensor 4	0,17 A
Sensor 5	N.A.
Sensor 6	N.A.
Sensor 7	N.A.
Sensor 8	N.A.
Sensor 9	N.A.

Image12

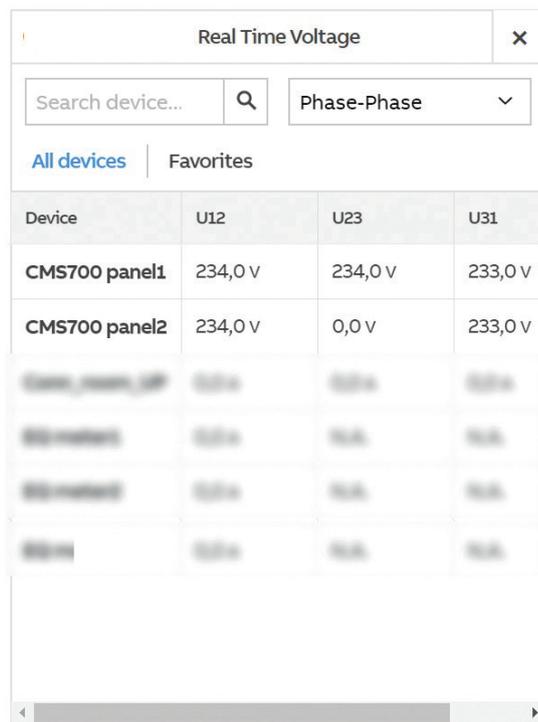
## CMS-700 visualization in ABB Ability™ EDCS

### 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 CMS-700 shall be visualized, select the device by clicking on the name of the desired CMS-700 in the table and select the voltage type. Measured voltages are displayed in a graph.



The screenshot shows the 'Real Time Voltage' widget with the 'Phase-Phase' voltage type selected. The table lists two CMS-700 panels and several other devices. The voltage values for the CMS-700 panels are 234,0 V for U12 and U23, and 233,0 V for U31.

Device	U12	U23	U31
CMS700 panel1	234,0 V	234,0 V	233,0 V
CMS700 panel2	234,0 V	0,0 V	233,0 V
...	...	...	...

Image13

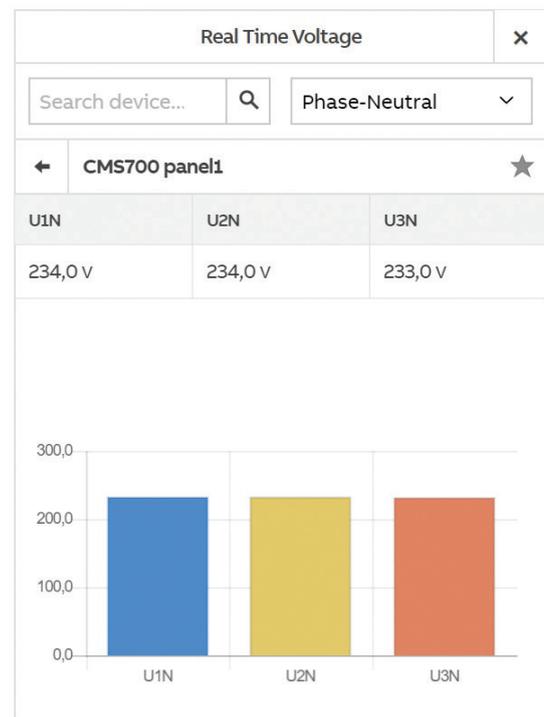


Image14

**E. Device Power Data widget**

The widget “Device Power Data” shows in a graph real-time values of Active, Reactive and Apparent 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.

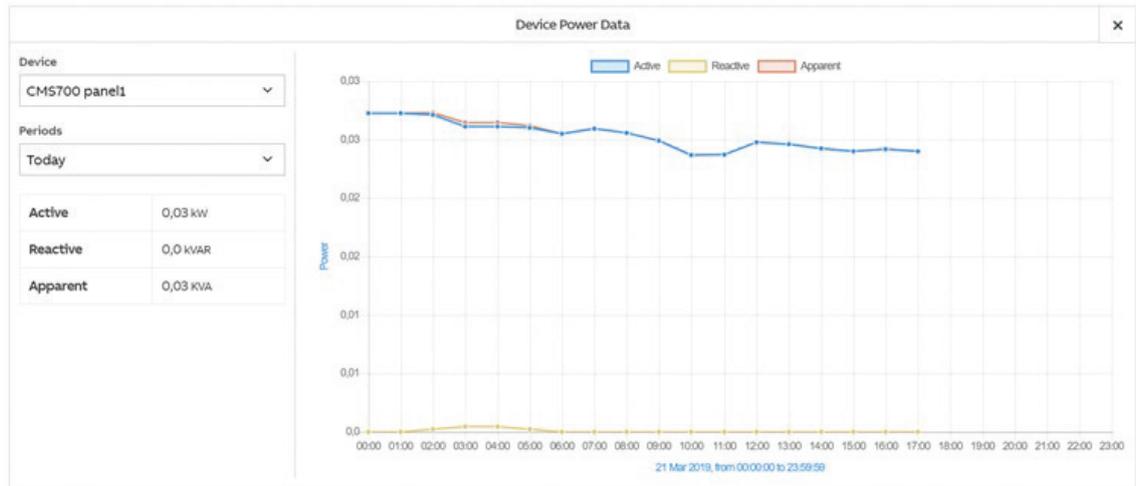


Image15

**F. Power 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 CMS-700, it displays in a table THD of voltage and current for each phase.

Power Quality			
Device		Parameter	
CMS700 panel1		THD	
THD	L1	L2	L3
<b>Voltage</b>	N.A.	N.A.	N.A.
<b>Current</b>	0,0 %	0,0 %	0,0 %

Image16



