

LOW VOLTAGE

# E-Hub 2.0

## Getting started



- Make existing installations smart without new components
- Meters integration via digital and analog inputs
- Embedded interoperability with third party systems



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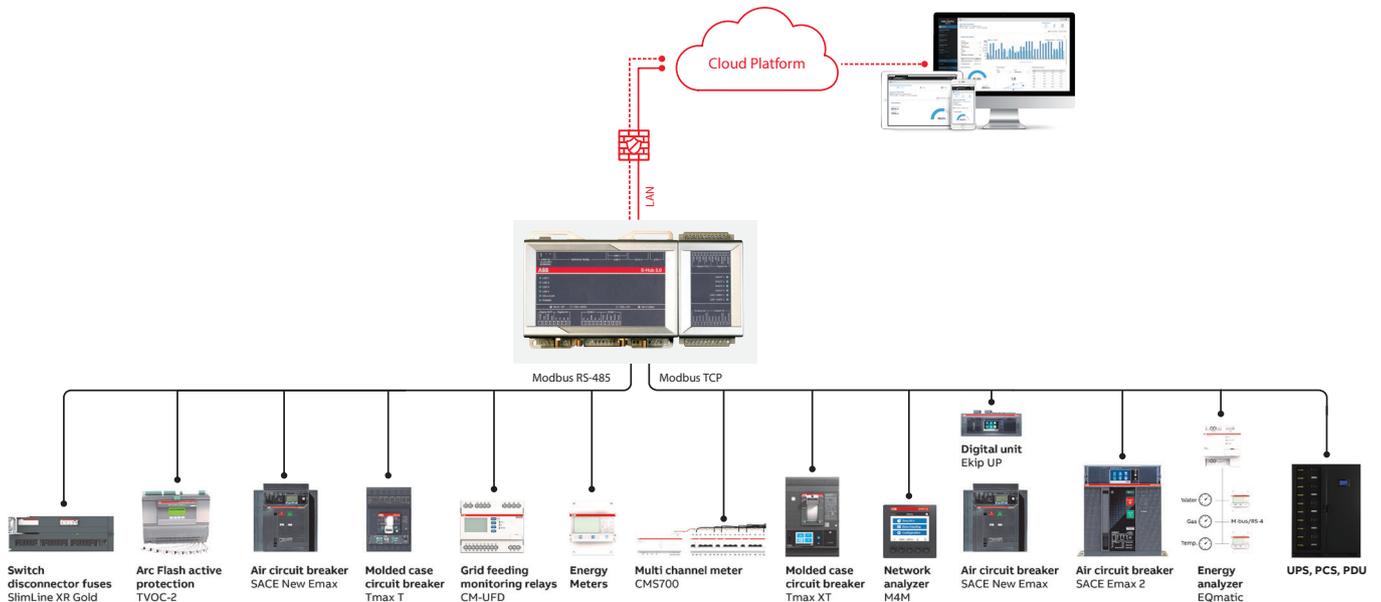
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# E-Hub 2.0

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™ cloud platform. As a result, all the downstream field devices can be monitored from the cloud via ethernet cable, wi-fi or cellular connectivity.

## The Architecture

Below is an example of a typical architecture:



A complete shopping list:

- E- Hub 2.0
- Ekip Connect 3.2.6.0 and above

The device supported list is available [here](#).

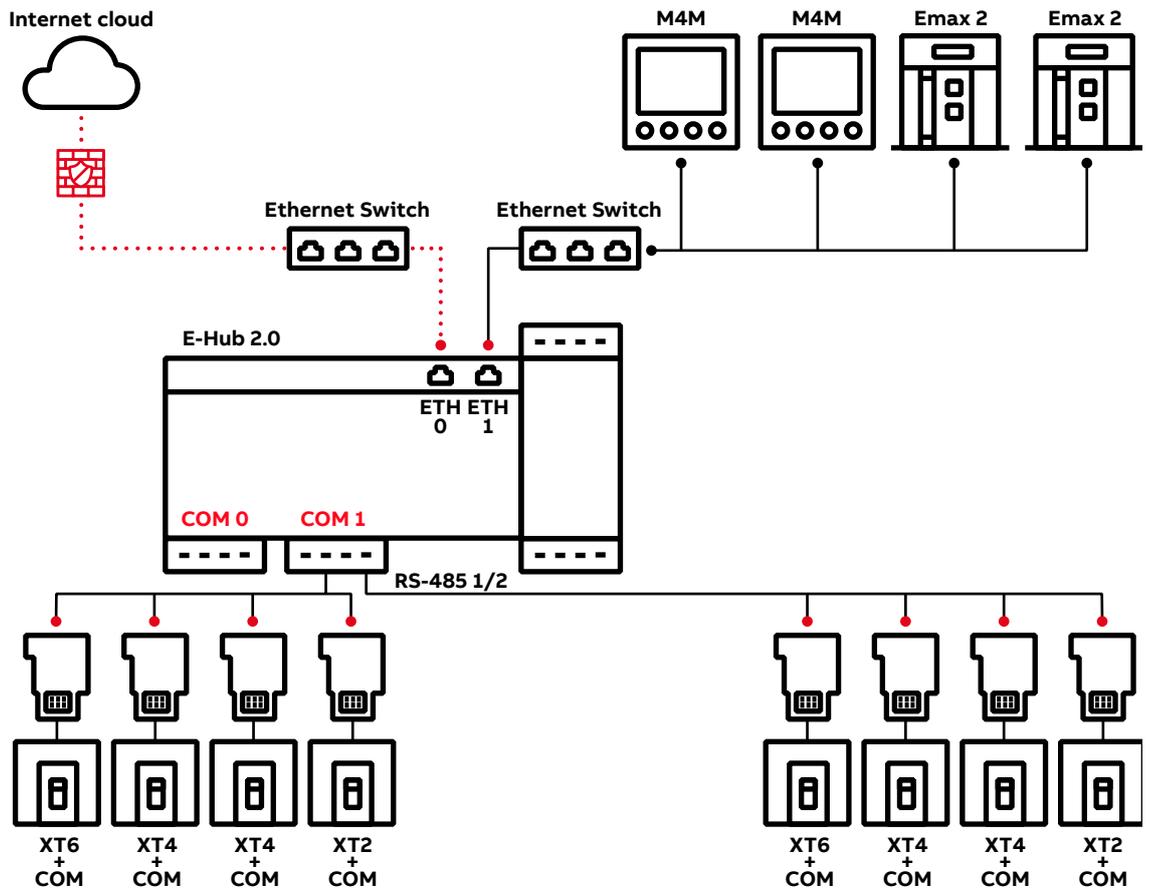
As an example, the illustration below shows how to wire the system with separation of interfaces between field devices and internet connection.

**It is mandatory to use two different networks.**

For internet connectivity you can use:

- ETH0
- Wi-Fi
- 3G/4G

ETH1 must be connected to LAN (field devices)



**Note:**  
Although E-Hub 2.0 has built-in firewall feature to block initiative access from internet and allows only initiative to internet from E-Hub 2.0, it's still recommended to deploy dedicated firewall between E-Hub 2.0 and internet. It is recommended to configure rate limiter either at device level or network level depending on the requirement.

### Disclaimer

It is the sole responsibility of the customer to provide and continuously ensure a secure connection between the product and the customer network or any other network. The customer is required to establish and maintain any appropriate measures (including but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs,

etc.) to protect the product, the network, its system and the interface against any kind of security breach, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB and its affiliates are not liable for damage and/or losses related to such security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information.

## E-Hub 2.0 performance

Each E-Hub 2.0 can connect up to 60 devices (total Modbus TCP/IP and Modbus RS-485). More than 60 devices in total can decrease the performances of the data logging.

- Up to 30 Modbus RS-485 devices can be connected to the RS-485 interface, equally split between the two COM ports,
  - Devices with Modbus address between 2 and 127 must be connected to RS-485 interface COM 0.
  - Devices with Modbus address between 128 and 247 must be connected to RS-485 interface COM 1.
  - Note that a total number of 30 Modbus RS-485 devices ensure an optimal data logging (30sec)
- Up to 30 Modbus TCP/IP devices to ETH1 port.
- Up to 4 channels of analog input supported.
  - Analog Input 1 and 2 (AIN1 and AIN2) are for current input. (4-20mA)
  - Analog input 3 and 4 (AIN3 and AIN4) are for voltage input. (0-36V)
- Up to 7 channels of digital input supported.
  - Pulse meter and O/C contact can be selected for different DI type.

**Note:**

All the AI and DI are set OFF as default.

- Data logging time and data refresh on the web app is 30 seconds. However, performance could decrease if a large number of devices (typically more than 60) are connected to ABB Ability by means of one single E-Hub 2.0.

Also, the type of devices that are connected and the communication protocol used can affect the performance. In order to ensure high data logging performance, it is suggested to use more than one E-Hub 2.0 when more than 30 devices have to be connected via Modbus RS-485.

## Internet data traffic

The estimated data traffic per connected device amounts to 4 GB per year.

## Configuring the system

The system configurations before provisioning consist of four steps: E-Hub 2.0 Configuration, Field Device Configuration, Network configuration and Laptop Configuration.

### E-Hub 2.0 Configuration

- E-Hub 2.0 ETH0 does not need a static IP address, default configuration is DHCP client.
- E-Hub 2.0 Wi-Fi or 3G/4G has to be configured using Ekip Connect 3. Please refer to the Ekip

Connect 3: Provisioning Steps.

- E-Hub 2.0 ETH1 default configuration is DHCP server with the following parameters:
  - Force Static IP Address: ON
  - Static IP address: 192.168.2.1
  - Static Subnet mask: 255.255.255.0
  - DHCP Server IP Range Begin: 192.168.2.100
  - DHCP Server IP Range End: 192.168.2.255
  - Enable DHCP Server: ON

**Note:**

If there is already one DHCP server on the ETH1 network, please be sure to disable the existing DHCP server or disable the option "DHCP enable" for the ETH1 port via Ekip Connect 3 to avoid conflict.

If you connect ETH0 to a network with an existing DHCP server, internet connection should be guaranteed during the provisioning procedure. Contact your network administrator in order to confirm.

For the configuration of the Digital Input and Analog Input of E-Hub 2.0 please refer to the Ekip Connect 3: Provisioning Steps.

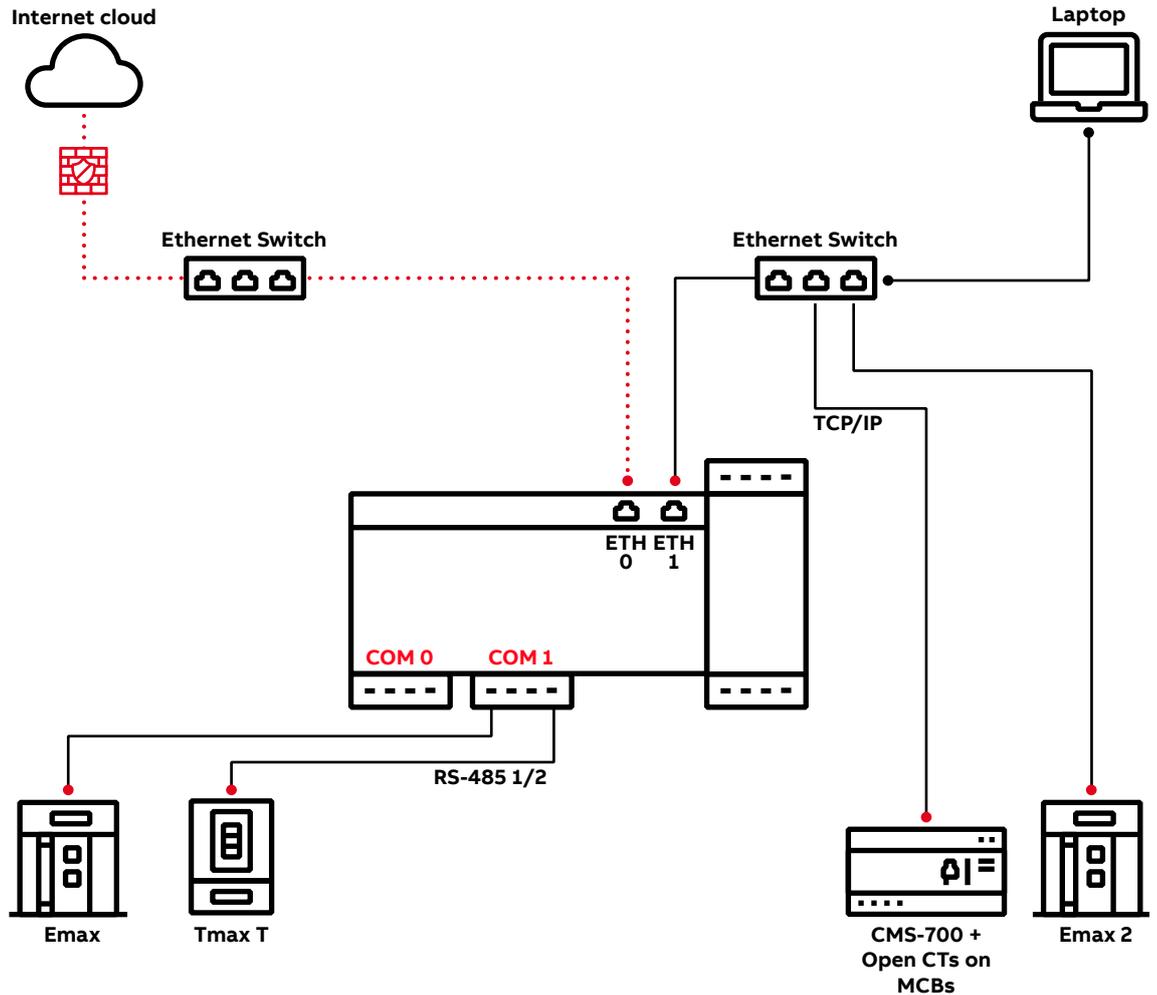
### Field Device Configuration

In case of connection via Modbus TCP, the downstream devices in the TCP network shall be configured with the following parameters:

- Static IP address: ON
- Static IP address: select an address in the 192.168.2.2 ... 192.168.2.99 range
- Subnet mask: 255.255.255.0
- Gateway: 192.168.2.1

### Network configuration

Connect your laptop via ethernet cable to the same ethernet network where the E-Hub 2.0 ETH1 interface and all Modbus TCP field devices are connected;



- E-Hub 2.0 must be provided with internet connection either via ETH0 (site network or dedicated router with SIM card), Wi-Fi or cellular connectivity.
- For internet connectivity, you must ensure that the following destination ports are not forbidden by the firewall, so that these ports could be accessible by E-Hub 2.0:
  - 443/TCP: needed for the upload of the data via HTTPS
  - 53/UDP: needed for public DNS
  - suggested DNS server :
    - 208.67.222.222 OpenDNS
    - 8.8.8.8 Google
    - 1.1.1.1 Cloudflare
  - 123/UDP: if needed to use NTP server synchronization time
- Ekip Connect uses some local ports for data communication with the device:
  - Port 502 TCP, Modbus TCP Communication
  - Port 69 UDP, TFTP Communication

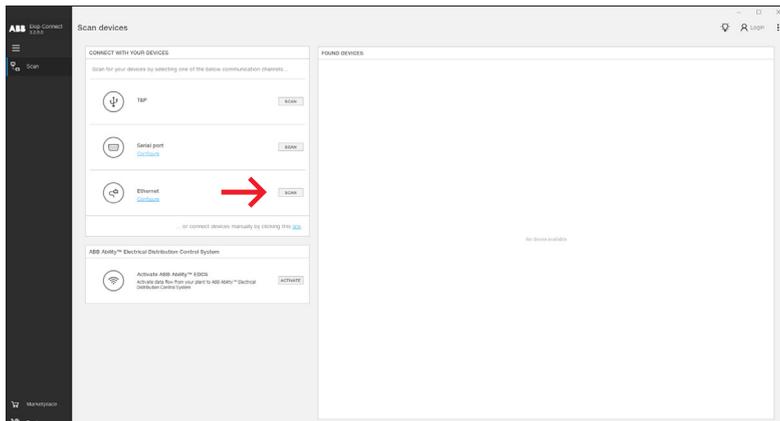
### Laptop Configuration

- Register on MyABB to activate an account.
- The user is not blocked by any firewall, device or software from reaching **prodabbauth.azurewebsites.net** on port 443
- The user is generally able to connect to the internet and reach other internal (if connected to ABB Network) or external internet websites.
- The user has cookies enabled in the browser.

**Note:** while devices provisioning process is running into ABB Ability, be sure your firewall is disabled.

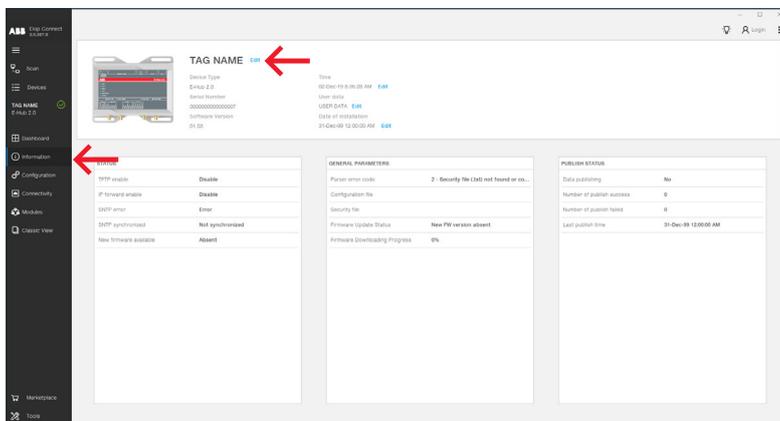
# Ekip Connect 3

## Provisioning Steps



### E-Hub 2.0 Connect

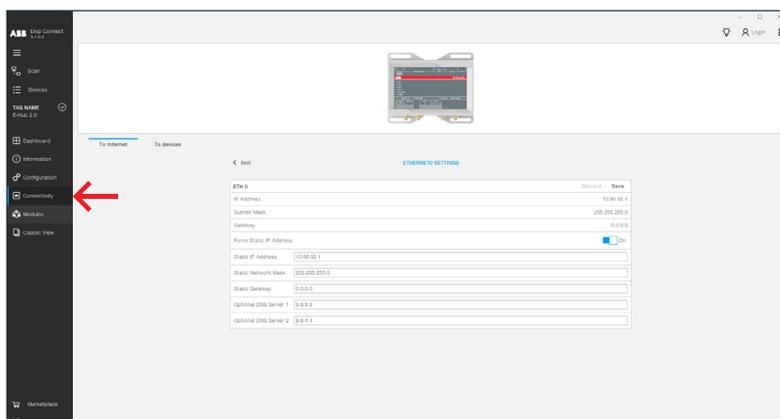
Configure the Ethernet option in the "Scan" section and press "SCAN" as shown by pointer to discover E-Hub 2.0.



### Edit Tag Name

Click the "Information" section and edit device tag name as shown by the pointer.

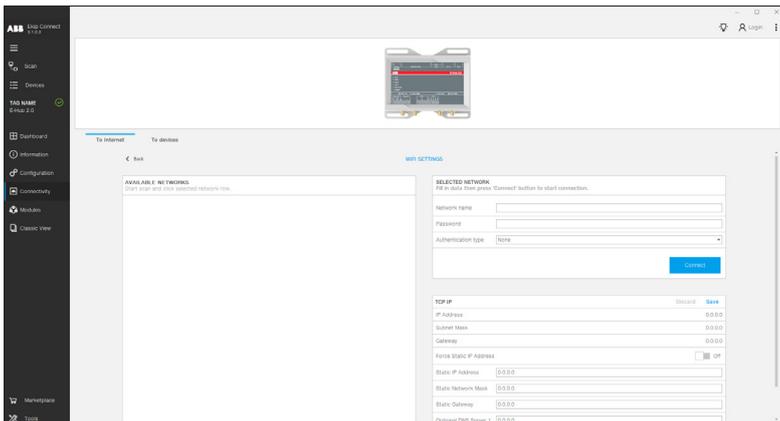
Click save after edit the device tag name.



### E-Hub 2.0 Communication – To Internet – ETH0

Follow the next instructions if you want to connect the E-Hub 2.0 to internet through the ETH0. Be sure that the E-Hub 2.0 ETH0 port is connected to internet via an ethernet cable.

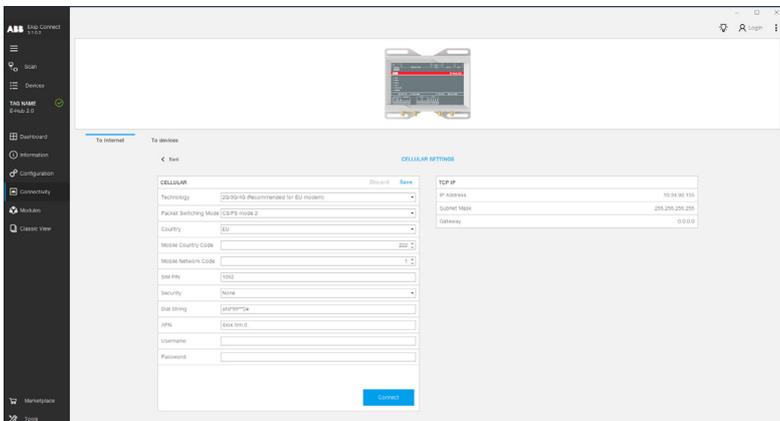
Click the "Connectivity" tab then select "To Internet" and click on the "Ethernet 0" tile. Configure the parameters according to the network where ETH0 is connected, for example you can force a static IP address.



**E-Hub 2.0 Communication – To Internet – Wi-Fi**

Follow the next instructions if you want to connect the E-Hub 2.0 to internet through the Wi-Fi network. Be sure that the E-Hub 2.0 ETH0 port is not connected to any network via an ethernet cable.

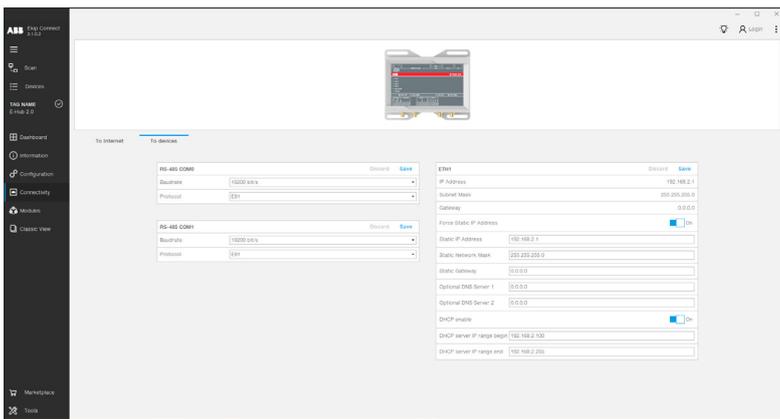
Click the “Connectivity” tab then select “To Internet” and click on the “Wi-Fi” tile. Click on “Start Scan” and wait until your Wi-Fi network is discovered, then click on it and fill in all the parameters in the “SELECTED NETWORK” box and then click “Connect”. Device will reboot. If needed you can edit the TCP/IP parameters according to the Wi-Fi network, for example you can force a static IP address.



**E-Hub 2.0 Communication – To Internet – Cellular**

Follow the next instructions if you want to connect the E-Hub 2.0 to internet through the Cellular (3G/4G) network. Be sure that the E-Hub 2.0 ETH0 port is not connected to any network via an ethernet cable.

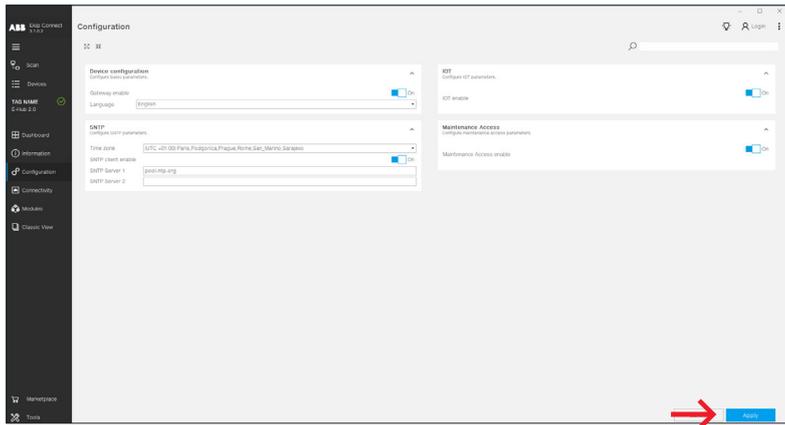
Click the “Connectivity” tab then select “To Internet” and click on the “Cellular (3G/4G)” tile. Fill in all the parameters in the “CELLULAR” box and then click “Connect”. Device will reboot.



**E-Hub 2.0 Communication – To devices**

Follow the next instructions to configure the connectivity to field devices.

Click the “Connectivity” tab then select “To devices”. In the boxes “RS-485 COM 0” and “RS-485 COM 1” you can configure the connectivity with Modbus 485 devices. In the box “ETH1” you can configure the parameters according to the network where ETH1 port is connected, for example you can force a static IP address and disable/enable the DHCP server.



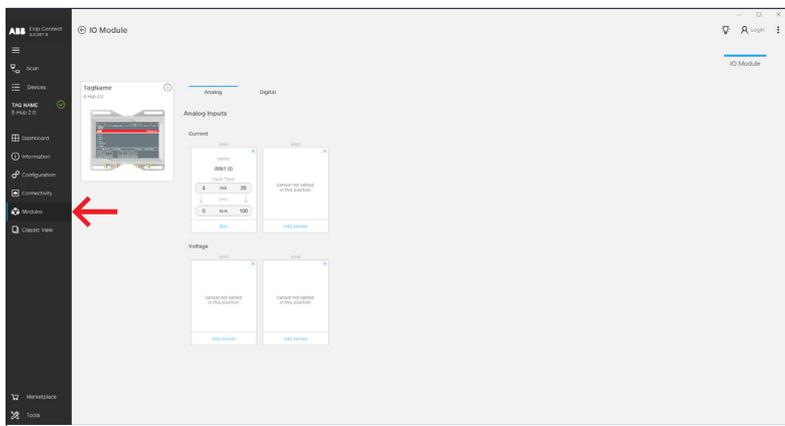
### E-Hub 2.0 Configuration

Click the "Configuration" section and in the "SNTP" box you can configure the SNTP server and enable/disable the SNTP synchronization.

In the "Maintenance Access" box you can enable/disable the maintenance access that can be use by ABB technicians to help you in case of issues with the device.

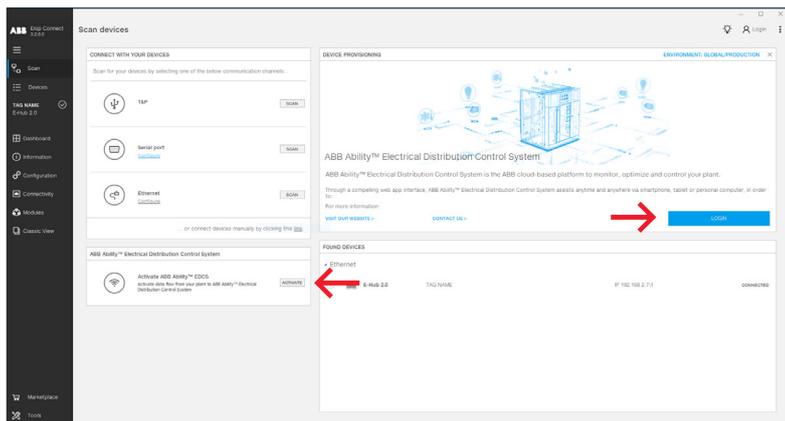
Click apply and continue.

**Before provisioning, please be sure that the system time is correct**



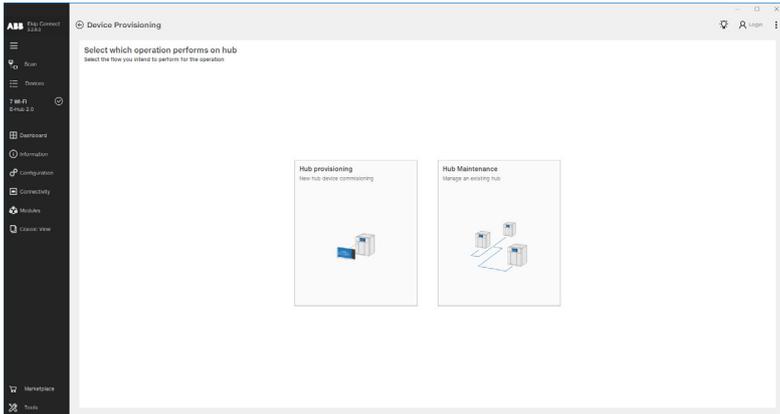
### E-Hub 2.0 I/O Settings

Click the "Modules" section and the then "IO Module" tile to configure the Digital Input and the Analog Input of E-Hub 2.0.

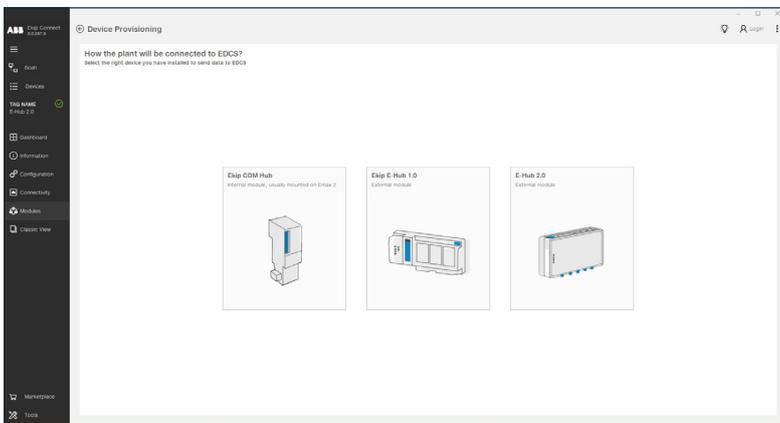


### E-Hub 2.0 Provisioning

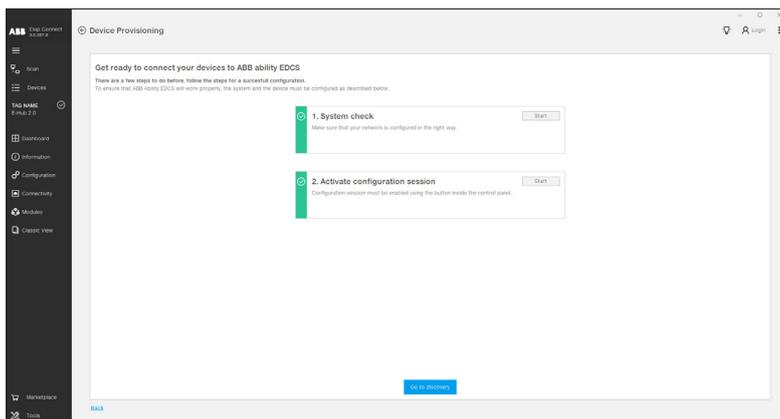
Click the "Scan" section, press the "ACTIVATE" button and then press the blue "LOGIN" button to login with your credentials.



Select the tile "Hub provisioning".



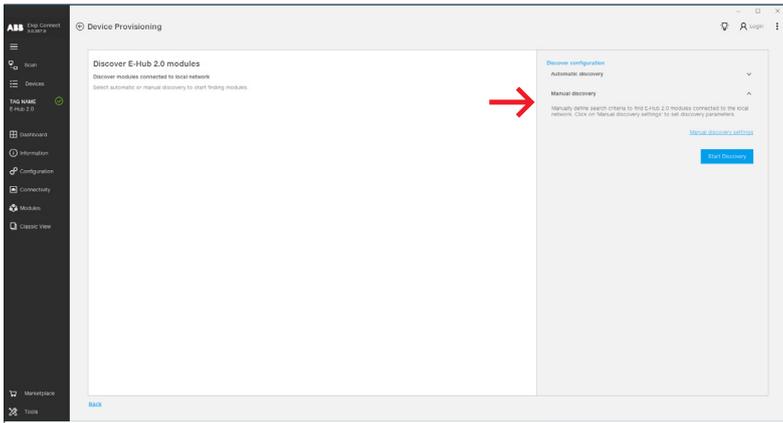
Select the tile "E-Hub 2.0" to start the configuration of the unit.



**In order to ensure that ABB Ability will work properly, it is mandatory to follow these two steps to check whether the system and the device are configured in the right way**

- System check
- Activate configuration session

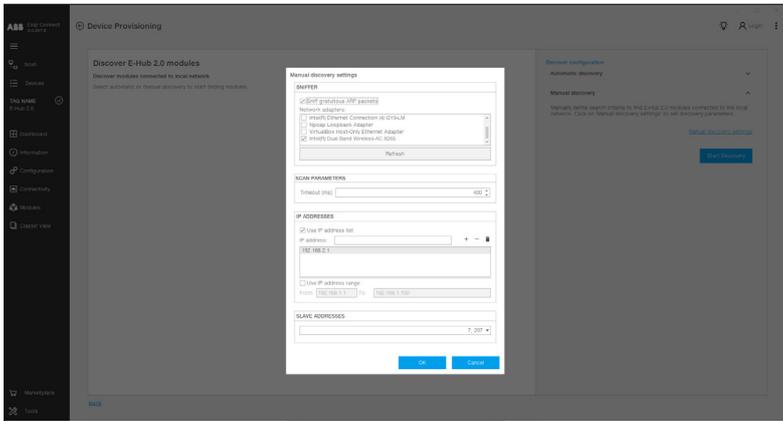
Click "Go to discovery".



With Automatic discovery, Ekip Connect will scan the whole Modbus network looking for devices to provision.

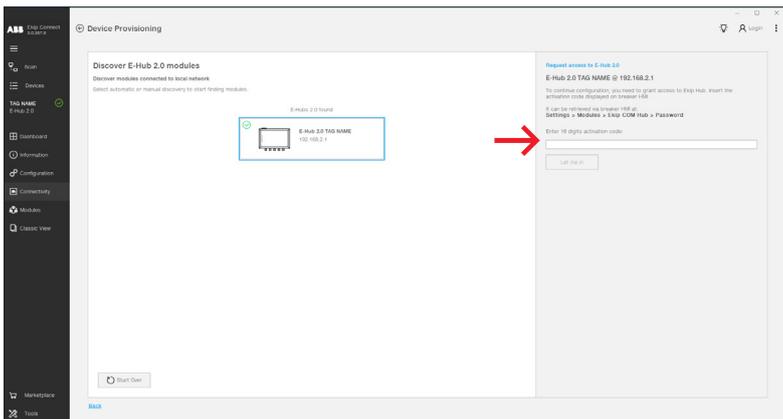
With Manual discovery, it is possible either to provide the list of specific Modbus RTU or IP addresses or to narrow the scan to a particular range of addresses.

The Manual discovery is recommended: in the new Page select “Manual Discovery settings”



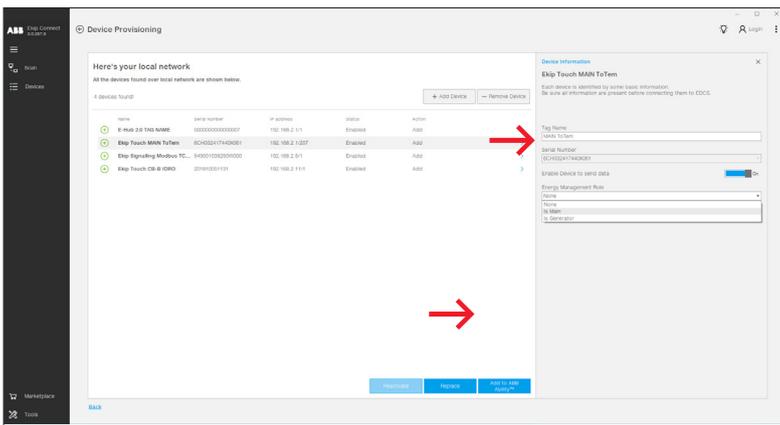
Tick on the "Sniff gratuitous ARP packets" box. Digit in the device IP address of E-Hub 2.0, and click on plus symbol. Digit for each device connected via Modbus TCP the device static IP address and click on plus symbol. Otherwise, input the IP address range where to scan those devices. In the slave address drop-down menu, it is possible to select the addresses of the slaves connected with Modbus RTU communication protocol.

Then press “OK”  
Select “Start Discovery”.



Once the E-Hub 2.0 module has been found, digit the 16 character password code that you can find printed on the left side of the devices and press “Let me in”.

## Automatically discovered devices

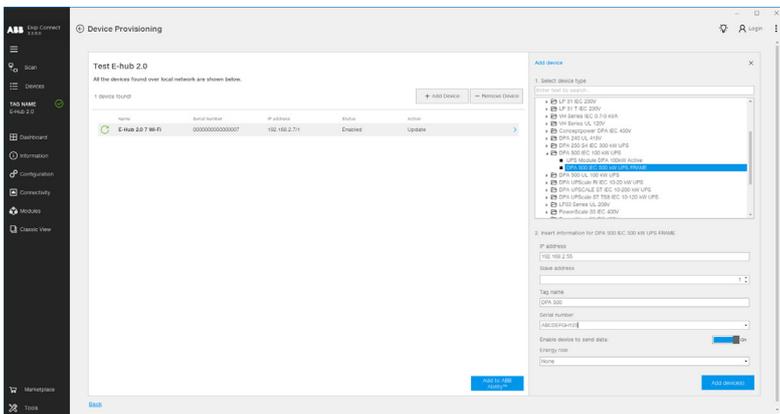


Now you will be able to see all the devices connected to the E-Hub 2.0.

For each device, you can set:

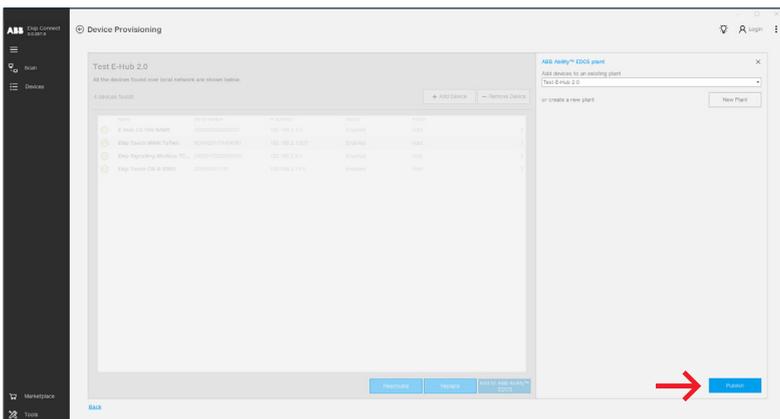
- Tag Name, if not already present
- Set it to be on one of the main feed lines (e.g. an incomer breaker)
- Set it to be on a generator line (e.g. diesel generator, PV system, turbine...)
- If it has to send data to the ABB Ability™
- **Note:** at least one Main or Generator device must be set inside a plant.

## Manually added devices



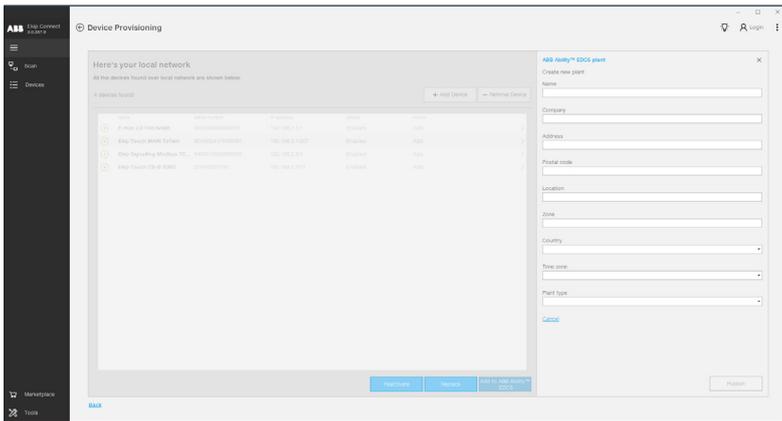
Devices that doesn't support automatic discovery can be added by clicking on

"Add device". Select the device and provide the information."

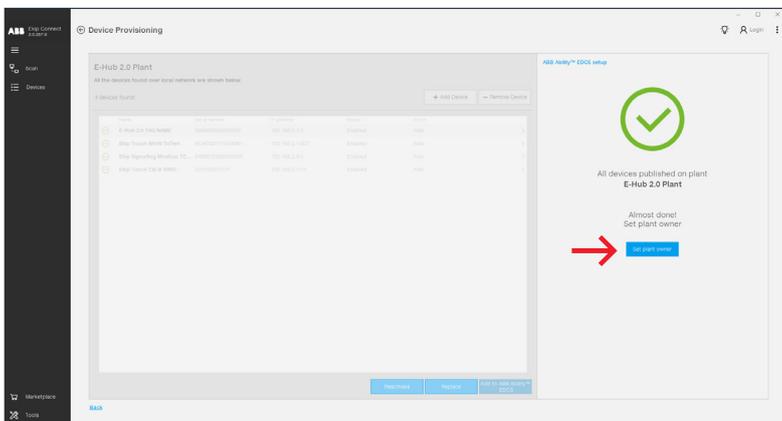


Once all the settings on each device have been completed. Click on "Add to ABB Ability™". You can add the devices to an existing plant or to a new one.

Add to an existing plant: select the desired plant from the menu then click "Publish".

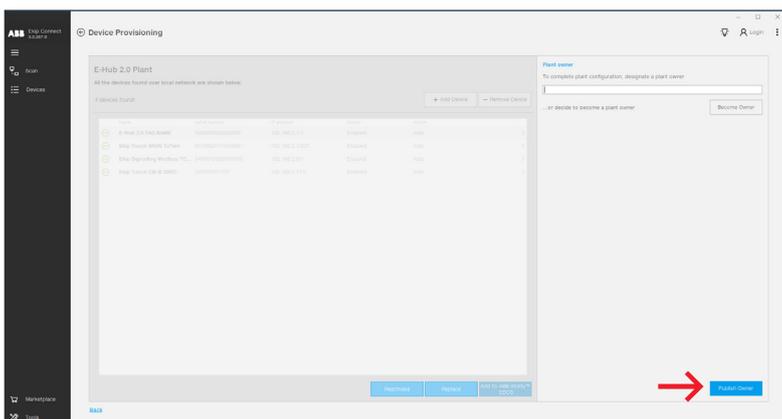


New plant: insert all the data for the new plant.



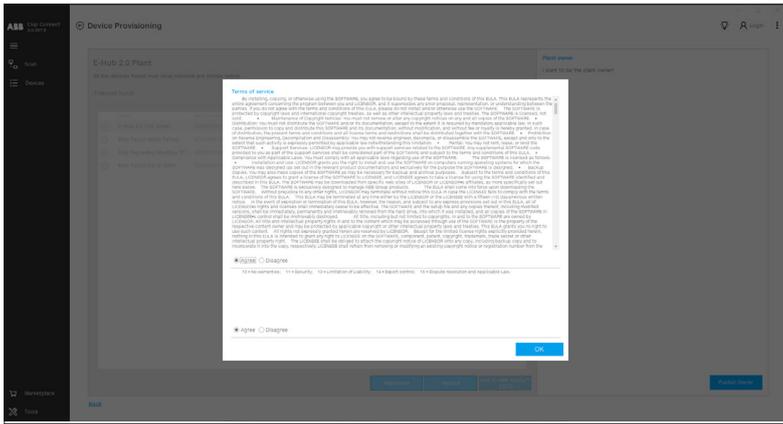
Now you have to set the plant owner.

The plant owner is the one who accepts the EULA and renews the license. Moreover, he can edit and view everything inside ABB Ability™.

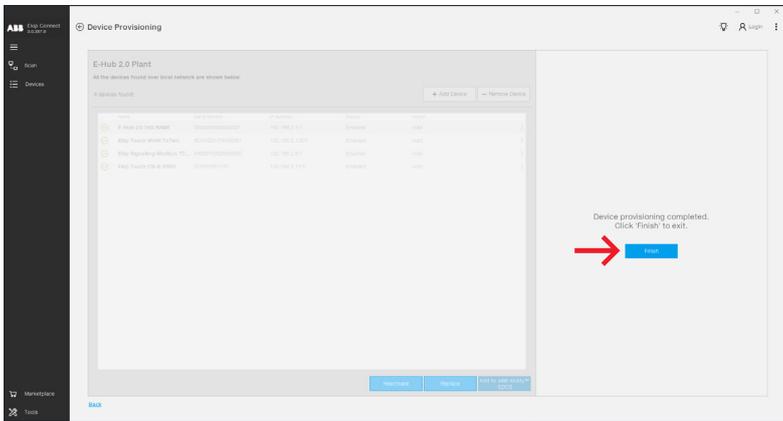


If you are the owner of the plant, please select “Become Owner”, otherwise insert the email address of the person who will be the owner.

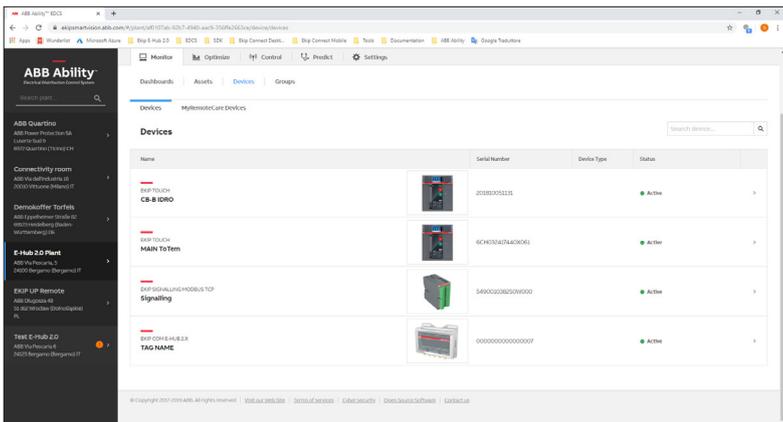
Then click “Publish Owner”



Click "Ok" to agree to the terms of service.



Click "Finish".



Ekip Connect will automatically open the default internet browser and access the ABB Ability™ page.

From the home page, you can access all the functions and the plants for which you have access. From each plant it is possible to browse to Settings, then Profiles section. In Profiles section, it is possible to manage the users' access to the selected plant, e.g. user role or access removal

**Note:**

Performing a second provisioning on an E-Hub 2.0 module already provisioned to an ABB Ability plant, is allowed only for updating the plant's devices configuration (e.g. when you need to add a new device to the plant).

In order to create a new plant you will need to delete all the devices and E-Hub 2.0 connected to the specific plant directly from the ABB Ability webapp (Select the plant, then Devices > Delete device). This will remove the association of the devices and the E-Hub 2.0 from a plant and make them available for a provisioning on a new plant.

During the first 15 minutes after completing the provisioning, you could not be able to see any data on the ABB Ability™ webapp. This is a normal situation as security checks are occurring between the module and the platform.

If you still cannot visualize the provisioned devices afterwards, this could be due to communication issues between field network and cloud platform, i.e. the UDP 53 port is not open.



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