DOC. N° 2TFP900034A1001 ECN000087106 Rev. A

ABB Ekip E-Hub

Data transmission unit for monitoring and analyzing data of plant

**Manual on use, installation, configuration and maintenance
for the installing technician and user**

Contents

Glossary

Ekip E-Hub	Data transmission unit for monitoring and analyzing data of plant.

Introduction

1 - Contents

Overview

This manual describes the characteristics of Ekip E-Hub, including:

1. Introduction
2. General View
3. Settings
4. Provision
5. Diagnostic
6. Troubleshooting

Recipients

In accordance with standard IEC 60050, this manual is aimed at two user profiles:

- expert persons, in electric environment (IEV 195-04-01): persons with sufficient training and experience to enable them to perceive the risks and avoid the hazards potentially created by electricity
- persons trained in an electrical environment (IEV 195-04-02): persons suitably informed or supervised by electrical technicians to enable them to perceive the risks and avoid the hazards potentially created by electricity

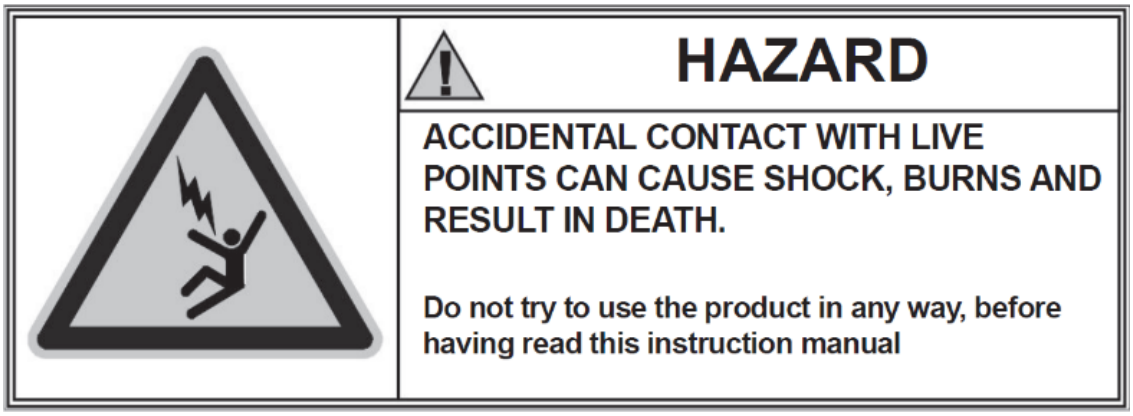
IMPORTANT: in this manual the tasks are specifically indicated that can be performed by trained persons in an electrical environment. All the remaining tasks described in the manual must be performed by trained persons in an electrical environment.
ABB accepts no liability for damage to property or personal injury due to failure to comply with the instructions contained in this document.

Distribution and organization of information

For optimum installation and configuration of Ekip E-Hub in the plant, the following tasks should be performed in sequence, which are available and distributed in the technical product documentation (User Manual and Getting Started):

Number	Task	Document
1	Consult the safety notes	
2	Check operating conditions	
3	Check material received	
4	Installation instructions	1SDH002006A1001-A.pdf
5	Parameters configuration	
6	Provision	
7	Monitoring	

Safety Prescriptions



HARZARD! ELECTRIC SHORK RISK! In the case of persons who are not authorized to work on pants carrying live voltage in accordance with local legislation, in order to avoid any potential electrical risk during assembly, installation, maintenance or removal of the Ekip E-Hub from service, disconnect or lock out all electrical supplies.

WARNING!

- Detailed descriptions of the standard installation, use and maintenance procedures and principles for operating in safety are not included: it is important to note that this document contains safety and caution indications against certain methods (of installation, use and maintenance) that could harm persons, damage devices or make them less safe.
- These warnings and alarms do not encompass all conceivable installation, use and maintenance methods recommended or not recommended by ABB that could be applied and possible consequences and complications of each conceivable method. Neither will ABB investigate all these methods.
- Anybody who used maintenance procedures or devices, recommended by ABB or not has to check thoroughly that neither personal safety nor safety devices are placed in danger by the installation method, use, maintenance or by the instruments used; for further information, explanations or specific problems contact the nearest ABB.
- This manual has been written only for qualified persons and is not to be intended as substitute for a suitable course or experience with the safety procedures for this device.
- For products provided with communication, the purchaser, the installer or the final customer are responsible for applying all the IT security measures to prevent risks arising from the connection to communications networks; these risks comprise amongst other things the use of the product by unauthorized persons, the alterations of its normal operation, access to and modification of information.
- The purchaser, the installer or the final customer and person responsible for ensuring that safety warnings and notices are displayed and also that all the access points and operating devices are safely locked when the switchgear is left unattended.
- All the information contained in this document is based on the latest information available at the moment of publication. We reserve the right to modify the document at any moment without prior notice.

Warnings

WARNING! READ THE FOLLOWING MANUAL CAREFULLY BEFORE INSTALLING OR WORKING ON EKIP E-HUB

- Keep this manual carefully with all the other available documents, including: Getting Started for first installation, electrical diagrams, drawings and any descriptive notes.
- Keep these documents available during the Ekip E-Hub installation, operating and maintenance step to facilitate the following operations.
- Install the unit in compliance with the environmental, electrical and mechanical limits described in the product documentation.
- Ekip E-Hub has been designed to operate with voltage and current values within the rated limits: do not install in systems that work at values exceeding these rated limits.
- Follow the safety procedures set by your company.
- Do not open lids or doors, do not work on devices before disconnecting all circuits and checking that they are disconnected with a measuring instrument.

3 - Cyber security

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.

Customer Sensitive Data Protection

To protect customer sensitive data from divulgence when Ekip E-Hub is decommissioned. It is recommended to remove and erase the external SD card and the TF card.

General View

4 - General

Description

Ekip E-Hub, as an important role of ABB EDCS, is an industrial gateway who can gather data of field devices with Modbus RTU and Modbus TCP/IP. Besides, it can also collect data for consumption of water, gas, etc. by connecting sensors to Ekip E-Hub digital input and analog input modules. All of the collected data can be transmitted to cloud for monitoring or further analysis with privacy agreement.

Ekip E-Hub can be configured with Ekip Connect in an easy way which will only take less than 5 minutes. After the configuration, Ekip E-Hub will work independently to gather data and transmit data securely.

HW Specification

Hardware	***Specification***	
General	Power Supply	9~36VDC
	Size	255.2 mm * 109.3 mm * 49.7 mm
	Operation Temperature	-40°C – 70°C
	Storage Temperature	-40°C – 85°C
	Humidity	5~95% (no condensation)
Control System	CPU	Cortex-A8
	Memory	RAM 256MB
	SD	Standard SD Card
	Power Consumption	24V @5W
Communication	Comm. Protocol	Modbus RTU/TCP
	COM2&com3	RS-485
	Ethernet	LAN1/LAN2
On-board I/O	Analog Input	8 channels with accuracy 1%
	Digital Input	8 channels

Main Features

The main features of Ekip E-Hub are:

Features
Support up to 30 field devices provision to Ekip E-Hub with an interval less than 30s to publish data to cloud.
Easy to configure, automatically detect the field devices including Ekip E-Hub and the devices connected with Ekip E-Hub.
Support 2 isolated Modbus RTU ports
Support 2 separate Ethernet and security policies applied to the device to ensure that Intranet is not exposed to Internet.
8 channels of DI and AI enable users to extend the capability of Ekip E-Hub to adapt to specific user scenarios.
Supported protocols: Modbus RTU, Modbus TCP, HTTPS, TFTP, SNTP, UPNP, DNSMASQ
Gateway functionality: Modbus RTU to Modbus TCP

***NOTE**: The performance could change if a large number of devices are connected to one Ekip E-Hub. It may be better to use more than one Ekip E-Hub when there are multiple ACBs in the system.*

Services & Ports

To support the main functionalities of Ekip E-Hub, the following services and port need to be open:

Port	*Service*	*LAN*	*Functionality*	*Note*
443/TCP	Https	LAN1	Used to communicate with cloud platform.	
69/UDP	TFTP	LAN2	Used to upload data publishing file and data gathering file to device via Ekip Connect 3.	
502/TCP	Modbus/TCP	LAN2	Used for Modbus server to query data from field devices.	
80/TCP	Http/UPNP	LAN1 LAN2	Used to automatically detect devices in Ethernet	
67/UDP	DNSMASQ	LAN2	Used for DHCP server	
53/UDP	DNS	LAN1	Needed for public DNS	
123/UDP	NTP server	LAN1	Needed to use NTP server sync time	

Shopping List

A complete shopping list:

- Ekip E- Hub
- Ekip Connect 3.0.346 and above

5 - Architecture

Architecture Below graphic shows possible architectures of Ekip E-Hub:

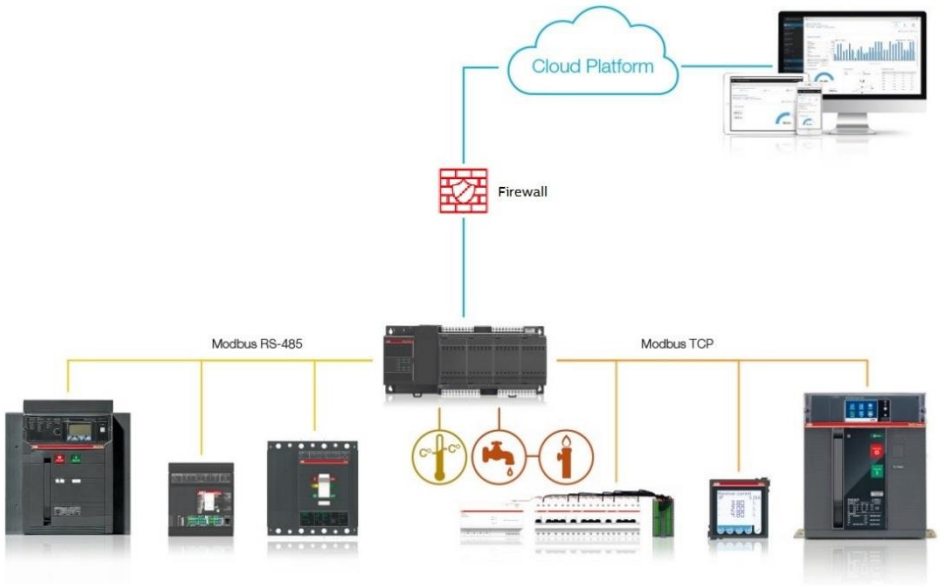


Fig. 1

Topology As an example, the illustration below shows how to wire the system if your field devices of Modbus TCP/IP are in Intranet, which is isolated from Internet.
LAN1 should be connected to Internet.
LAN2 should be connected to Intranet.

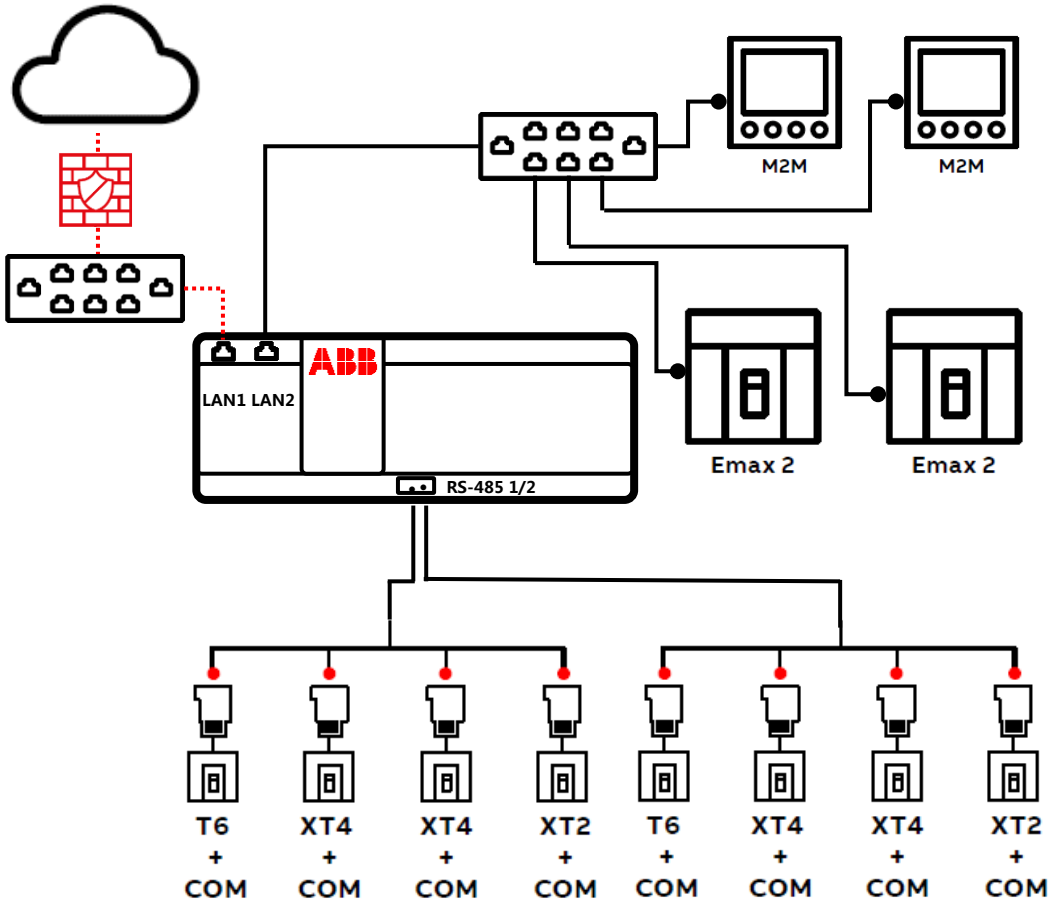


Fig. 2

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

6 - Connect Ekip E-Hub

Warnings

Do not incorrectly configure the software, as this can lead to inaccurate data results.

Connect Ekip E-Hub

- Please use **Ekip Connect 3** to connect Ekip E-Hub
- **Configure** ethernet settings

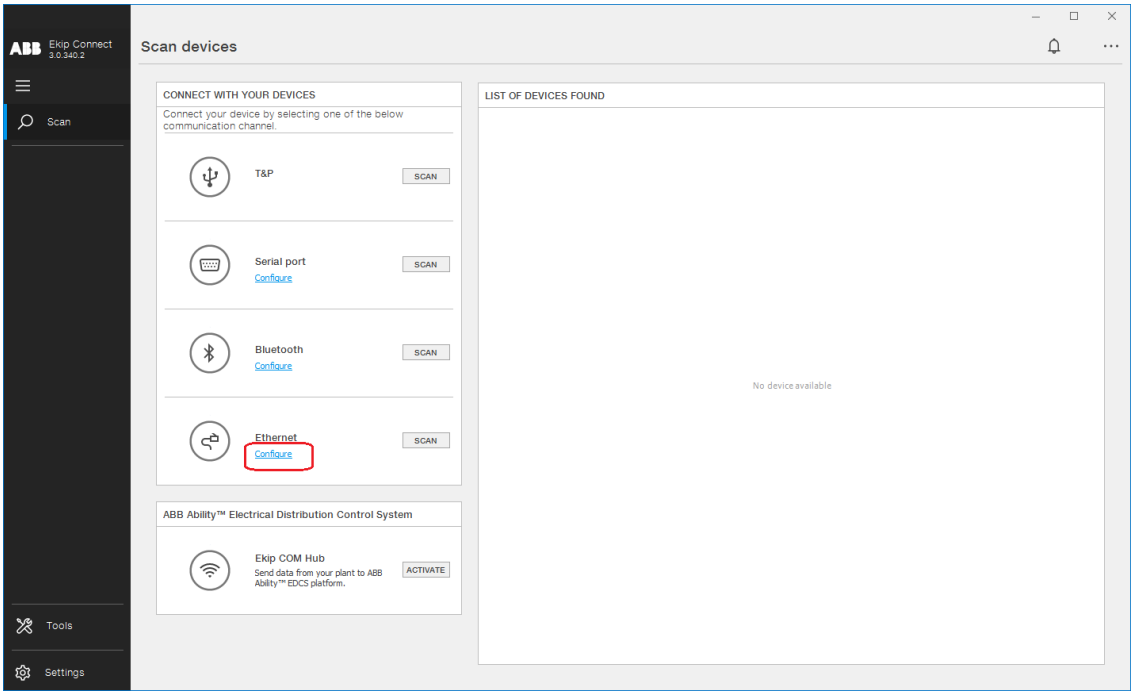


Fig. 3

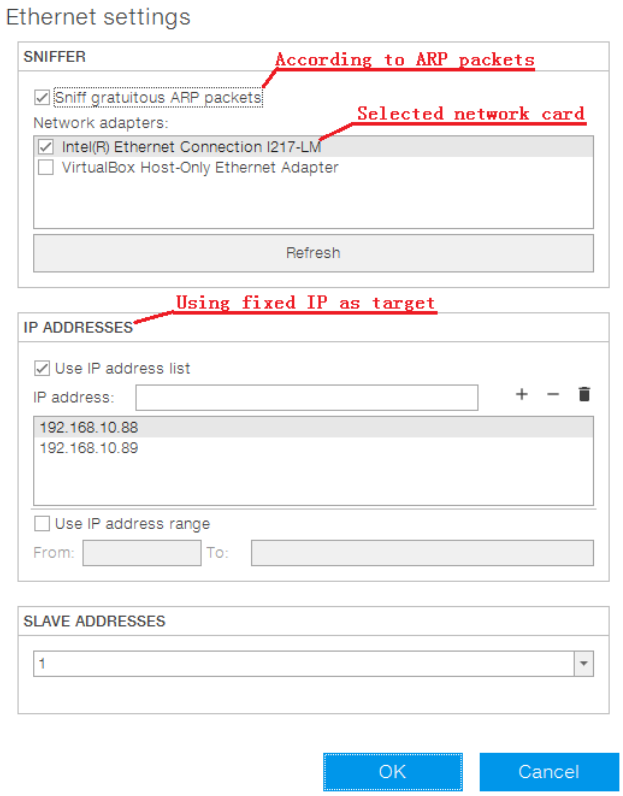


Fig. 4

- **Scan** and **connect** Ekip E-Hub

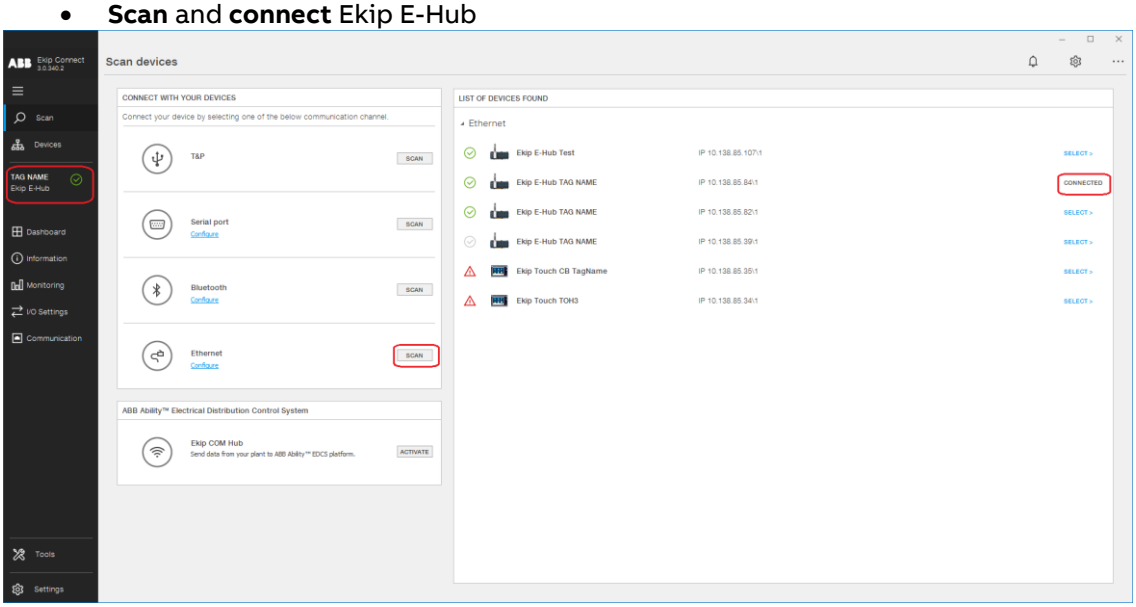


Fig. 5

Basic setting

Click **Information** to enter the page of configure. Configure device's name, time and date of installation according to the actual situation.

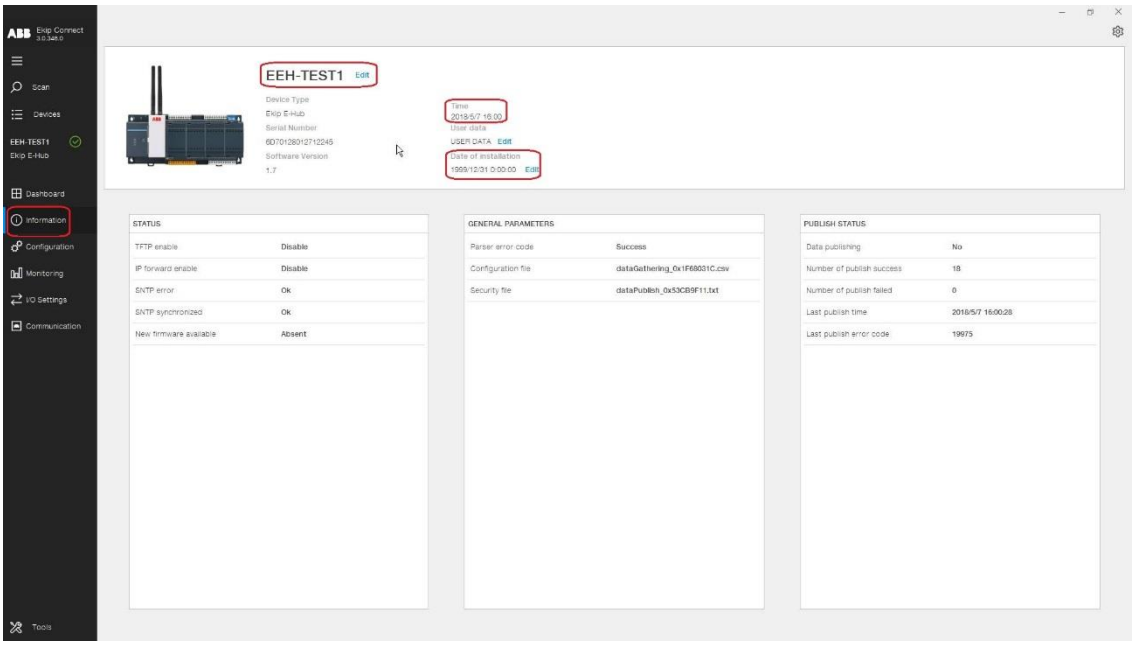


Fig. 6

Time zone Settings

The **Time zone Settings** allows users to set time zone and SNTP for time synchronism.

- Click **Configuration** to enter the page of configure.
- Click **SNTP** subtab and select the appropriate **Time zone** in the drop-down list. Input a valid SNTP server address, then switch on **SNTP client enable**, Ekip E-Hub will sync time with SNTP server.

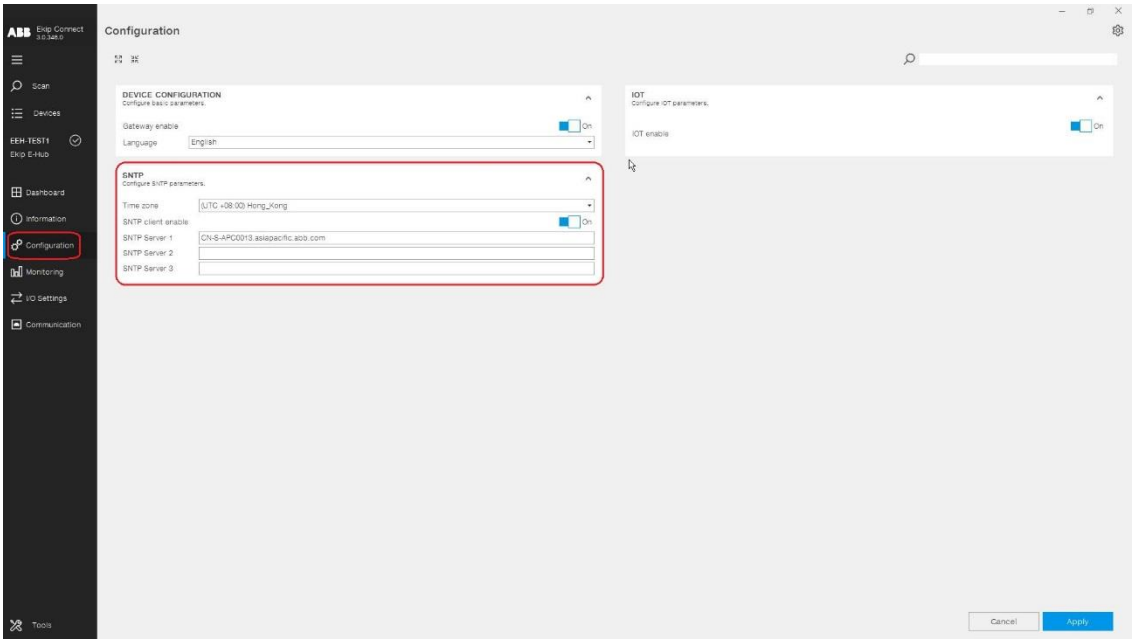


Fig. 7

Gateway enable

The **Gateway enable setting** allows user to access Ekip E-Hub's RTU devices.

- Click **Configuration** to enter the page of configure.
- Click **Device configuration** and switch on/off to enable/disable access RTU devices.
- Click "**Apply"** and **reboot** the Ekip E-Hub to make setting validated.

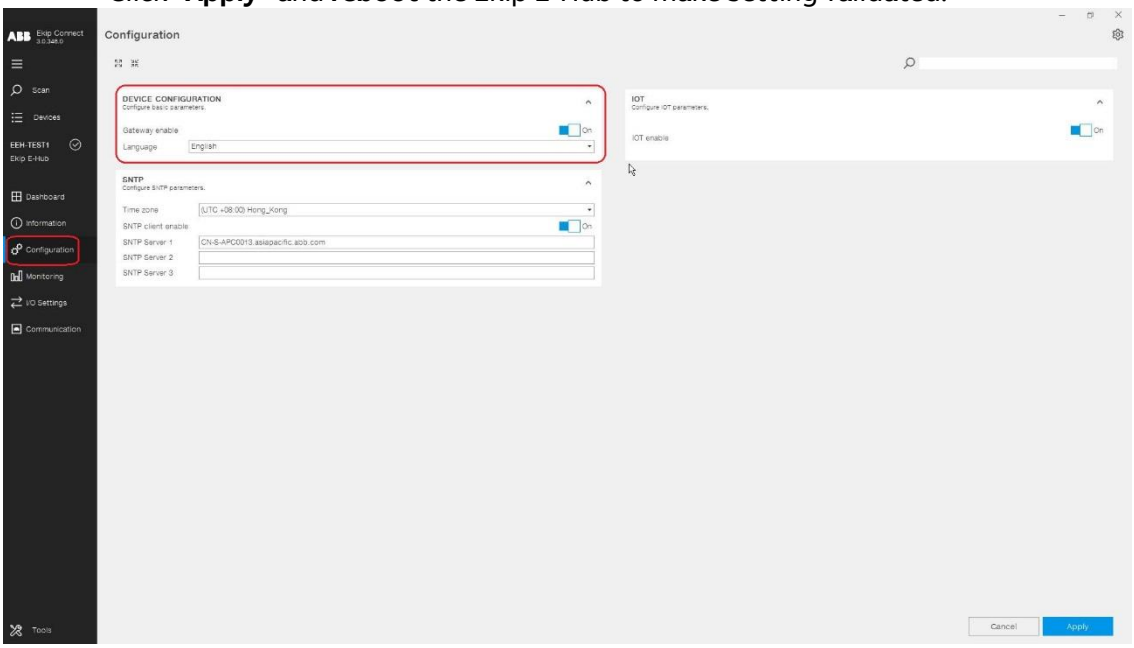


Fig. 8

Language

The Ekip E-Hub only supports the **English** currently.

Ports Settings

The **Ports Settings** will set the serial port parameters.

- Click **Communication** > **Parameters**

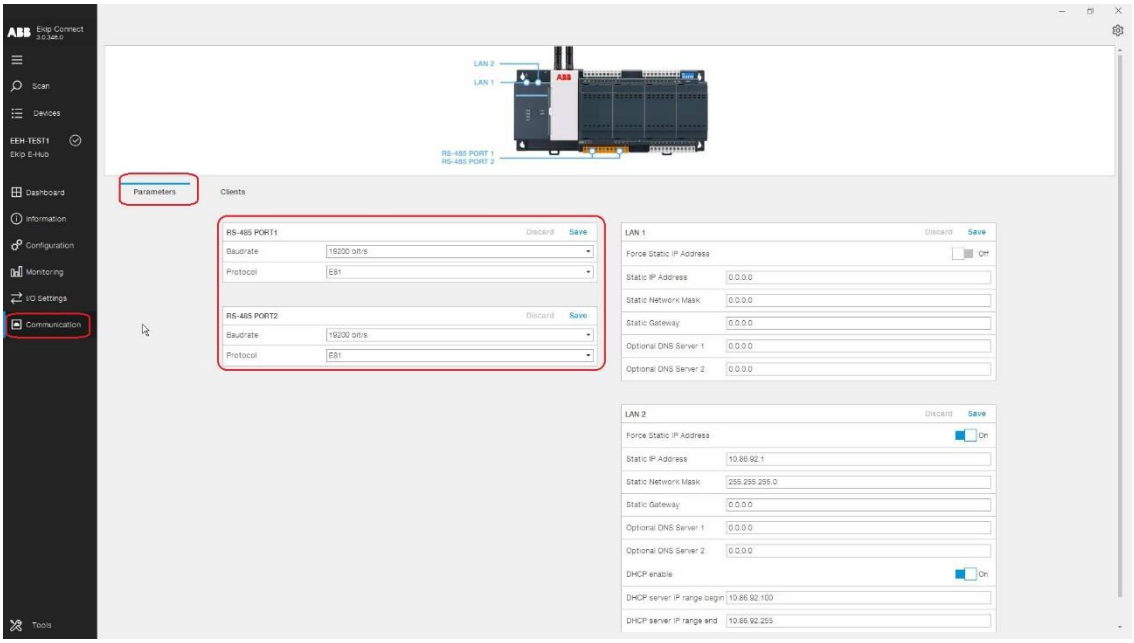


Fig. 9

Parameters

Parameters	Description	Default
Baud rate	RS-485 Port baud rate: 9600 bit/s 19200 bit/s 38400 bit/s	19200 bit/s
Protocol	E81: Even parity, 8 data bits, 1 stop bit O81: Odd parity, 8 data bits, 1 stop bit N82: None parity, 8 data bits, 2 stop bit N81: None parity, 8 data bits, 1 stop bit	E81

- Click **Save** the configuration.
- Reboot the EEH will make the configuration valid.

Network Settings

- Click **Communication > Parameters**

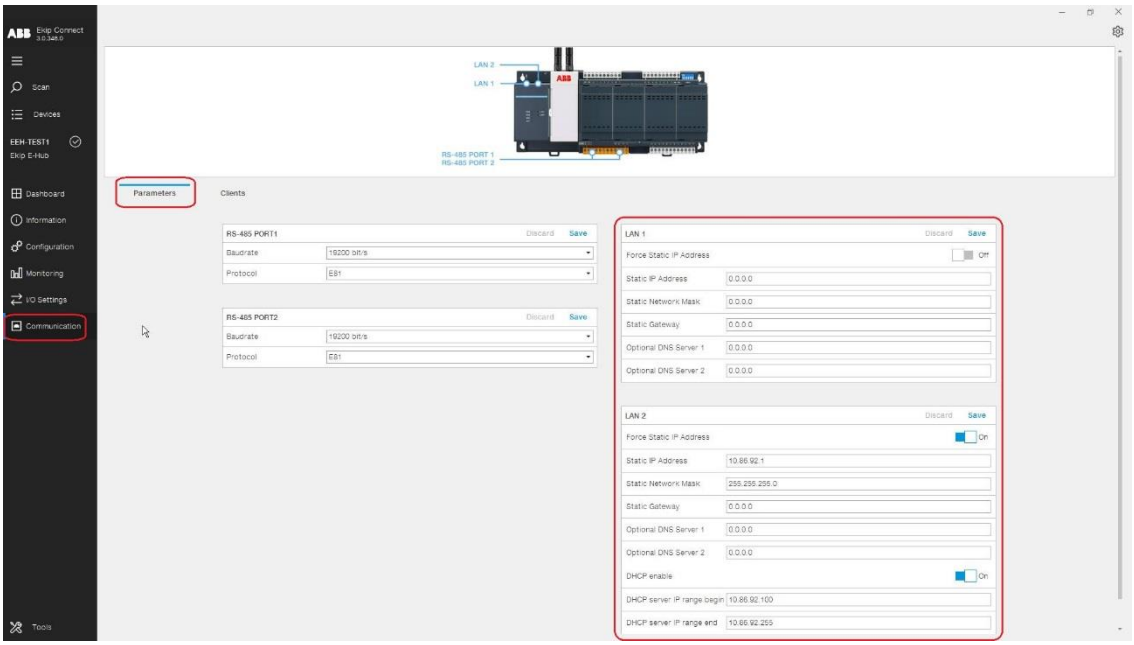


Fig. 10

Parameters

Parameters	Description	Default
Force Static IP Address	Switch on/off to use static IP address. To make the **Static** setting available, please enable the **Force Static IP Address**.	Off for LAN1 On for LAN2
Static IP Address	IP address on LAN port	0.0.0.0 for LAN1 10.86.92.1 for LAN2
Static Network mask	Subnet mask for LAN port	255.255.255.0
Static Gateway	Default gateway IP address	0.0.0.0
Optional DNS Server 1	DNS Server IP. Keep default value for LAN2	0.0.0.0
Optional DNS Server 2	DNS Server IP. Keep default value for LAN2	0.0.0.0
DHCP enable	Enable/Disable DHCP server for LAN2	On
DHCP server IP range begin	IP range begin that DHCP server dynamic distributing	10.86.92.100
DHCP server IP range end	IP range end that DHCP server dynamic distributing	10.86.92.255

- The custom should be careful if wants to change the LAN2 IP address. Make sure the input static IP address and the DHCP server IP range are correct and in the same LAN before save the configuration.
- Click **Save** the configuration.

***NOTE**: Please always remember the input LAN2 static IP address before save the changes.*

Show Clients

The **Show Clients** will show the clients that communicate with Ekip E-Hub.

- Click **Communication** > **Clients**

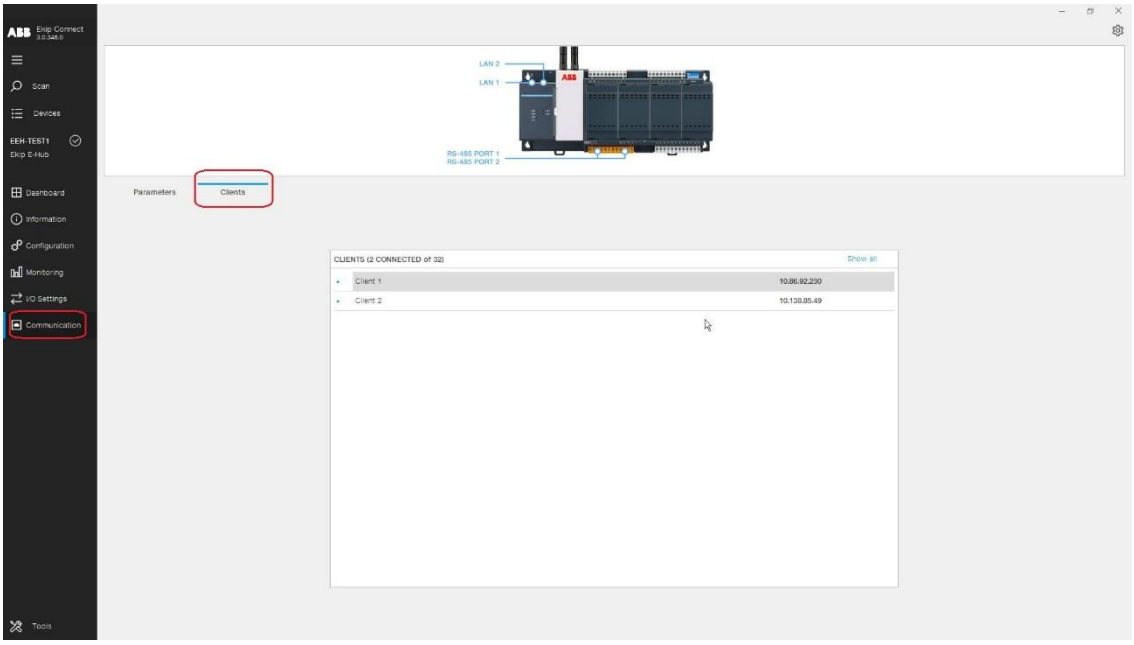


Fig. 11

Dial Settings

Ekip E-Hub has a six bits DIP-switch on board, 1 to 6 are arranged in order from left to right. Currently Ekip E-Hub only use the sixth bit function that enable or disable TFTP. When the sixth bit is on top, Ekip E-Hub will enable TFTP, and provisioning operation can be carried out. Ekip E-Hub software will auto disable TFTP 30 minutes later, but the sixth bit is still in its original position. Therefore, toggle the sixth bit to bottom and toggle it to top in advance of carrying out provisioning.

Fig. 12

---

9 - AI/DI Settings

AI Wiring

Ekip E-hub equips with 8 AI channels with differential wring type. Wire AI as shown in the picture.

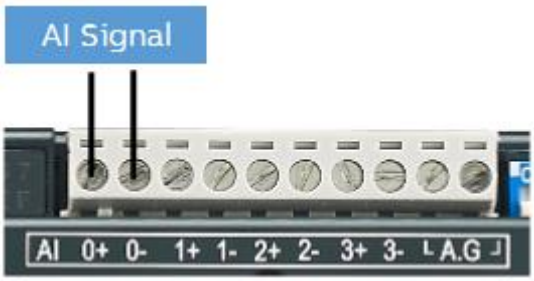


Fig. 13

DI Wiring

Ekip E-hub equips with 8 DI channels.
As shown in the picture, the pin “COM” is for positive voltage wiring and provides a pull-high voltage to the unwired pins. Normally you can leave it empty, and consider wiring while the field interference is significant.

Fig. 14

AI setting

Click **IO setting** to enter I/O setting page, then select **Analog** tab to configure AI channels.
Channel 0…3 for current analog input and 4…7 for voltage analog input.
Click **Add sensor** to enable the setting channel if there is no sensor set at this position.
Click **Edit** to do the AI channel configuration.

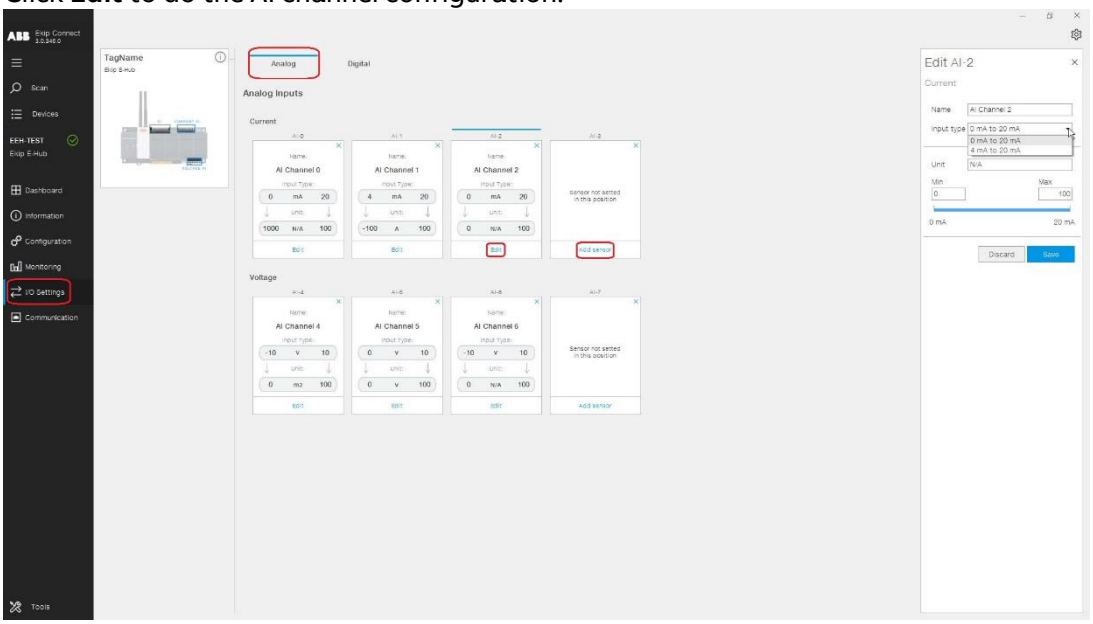


Fig. 15

Parameters

Parameters	Description	Default
Name	AI channel name	AI Channel No.
Input type	AI input types for this channel. Current AI: 0 mA to 20 mA and 4 mA to 20 mA Voltage AI: -10 V to +10 V 0 V to +10 V -2.5 V to +2.5 V 0 V to +2.5 V	Current AI: 0 mA to 20 mA Voltage AI: -10 V to +10 V
Unit	Unit for the measurement	N/A
Min	Minimum value for the measurement, corresponding to the lower bound of input type.	0
Max	Maximum value for the measurement, corresponding to the upper bound of input type.	100

***NOTE**: Please configure the AI channels according to the real environment. The AI channels data will be upload to the cloud after finishing the provision process*

DI setting Click **IO setting** to enter I/O setting page, then select **Digital** tab to configure DI channels.

Powering and Insulation

Parameters	Description
Channel	8 Channels
Input type	Sink (Wet Contact)/Counter
Wet Contact Input	Logic 0: 0 ~ 5 VDC Logic 1: 11 ~ 30 VDC
Rated Voltage	12/ 24 VDC
Rated Input Current	＞ 5mA@ 12VDC ＞ 10mA@ 24VDC
Over Voltage Protection	+40VDC
Isolation Voltage	2000VDC

DI could be configured as Pulse meter or Open/Close contact.
Pulse meter: measuring value will be increased one weight at each pulse
Open/Close contact: digital value 0 and 1 will be transferred into meaningful words set in **status 0** and **status 1**.

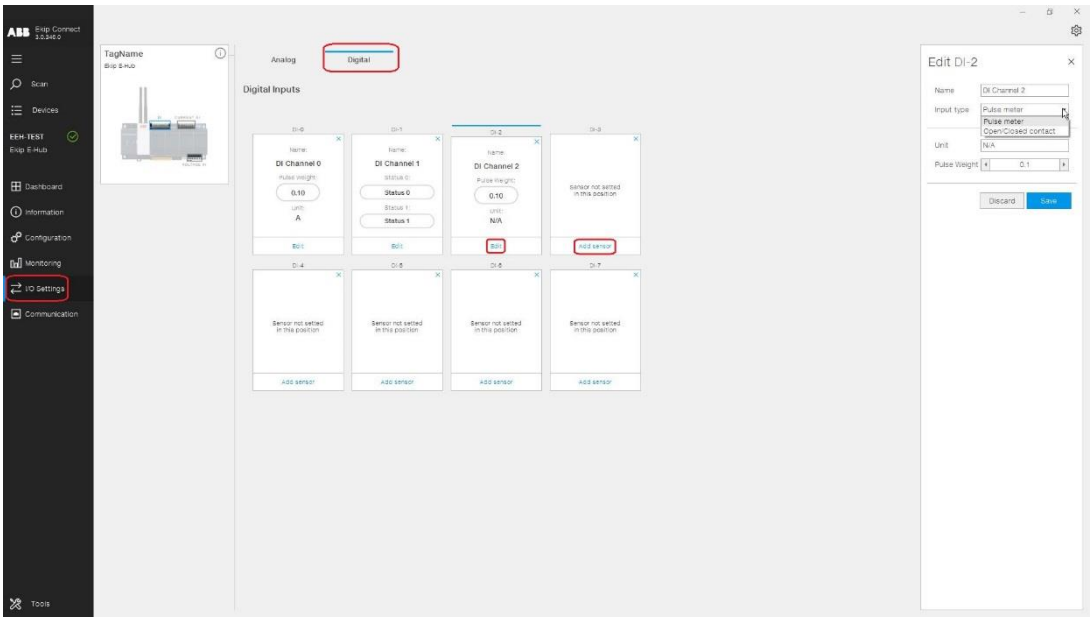


Fig. 16

Parameters

Parameters	Description	Default
Name	DI channel name	DI Channel No.
Input type	DI input types for this channel: Pulse meter Open/Close contact	Pulse meter
Unit	Unit for the measurement	N/A
Pulse weight	Increment for Pulse meter.	0.1
Status 0	For Open/Close contact type: Meaning of status 0	Status 0
Status 1	For Open/Close contact type: Meaning of status 1	Status 1

***NOTE**: Please configure the DI channels according to the real environment. The DI channels' data will be upload to the cloud after finishing the provision process. If there is type changing in the DI channel, please do a re-provisioning process to make the changes valid.*

Provision

10 - Pre-provision

Description Provision with Ekip Connect 3 could help to get the plant configuration and publish the measurements.

Preparation

The following procedure is preparation for system provisioning:

Ekip E-Hub Configuration:
Ekip E-Hub LAN1 does not need a static IP address, default configuration is DHCP client
Ekip E-Hub LAN2 default configuration is DHCP server with the following parameters: ➢ Force Static IP Address: ON ➢ Static IP address: 10.86.92.1 ➢ Static Subnet mask: 255.255.255.0 ➢ DHCP Server IP Range Begin: 10.86.92.100 ➢ DHCP Server IP Range End: 10.86.92.255 ➢ Enable DHCP Server: ON

***NOTE**: If there is already one DHCP server in your Intranet, please be sure to disable the existing DHCP server or disable the option "Enable DHCP Server of Ekip E-Hub" via Ekip Connect 3 in order to avoid conflict. If you connect LAN2 to an existing DHCP server, internet connection should be guaranteed during the commissioning procedure. Contact your network administrator in order to confir m.*

***NOTE**: For the configuration of the Digital Input and Analog Input of Ekip E-Hub please refer to the **Settings -> AI/DI Settings** section*

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 10.86.92.2 … 10.86.92.99 range ➢ Subnet mask: 255.255.255.0 ➢ Gateway: 10.86.92.1

Network Configuration:
Ekip E- Hub must be provided with internet connection either via site network or dedicated router with SIM card.
For internet connectivity, you must ensure that the following ports are open: ➢ 443/TCP: needed for the upload of the data via HTTPS ➢ 53/UDP: needed for public DNS ➢ 123/UDP: if connecting to public NTP server or ABB SNTP server
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 https://stsint.abb.com on port 443 The User will also need access on port 443 to the application or service he is accessing
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.

Topology for Provision

Connect your laptop via Ethernet cable to the same Ethernet network where the Ekip E-Hub LAN2 is connected:

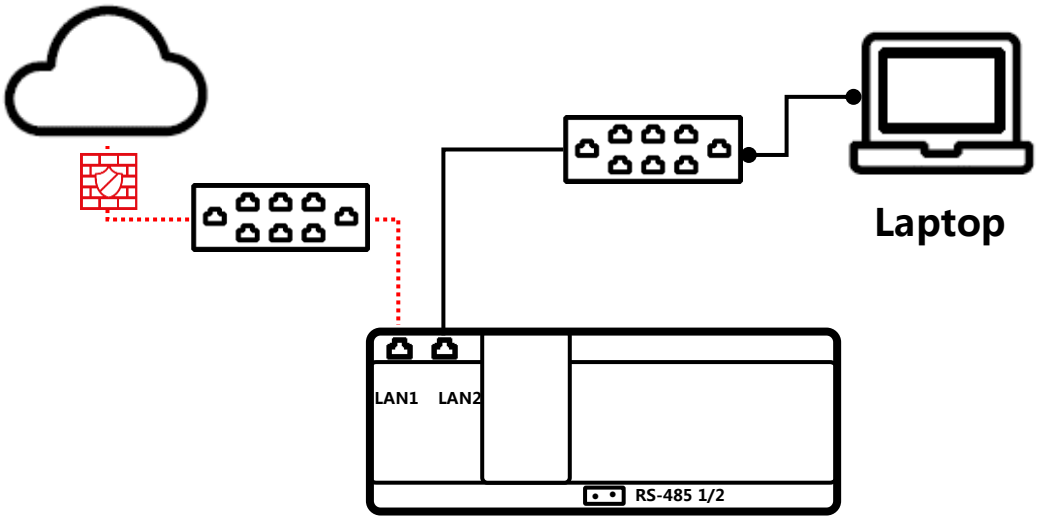


Fig. 17

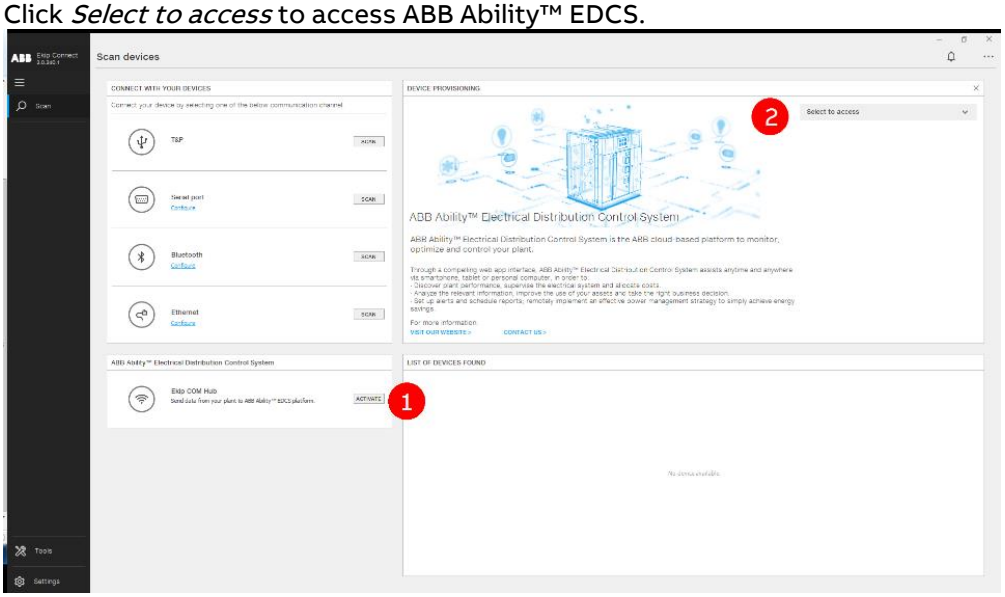
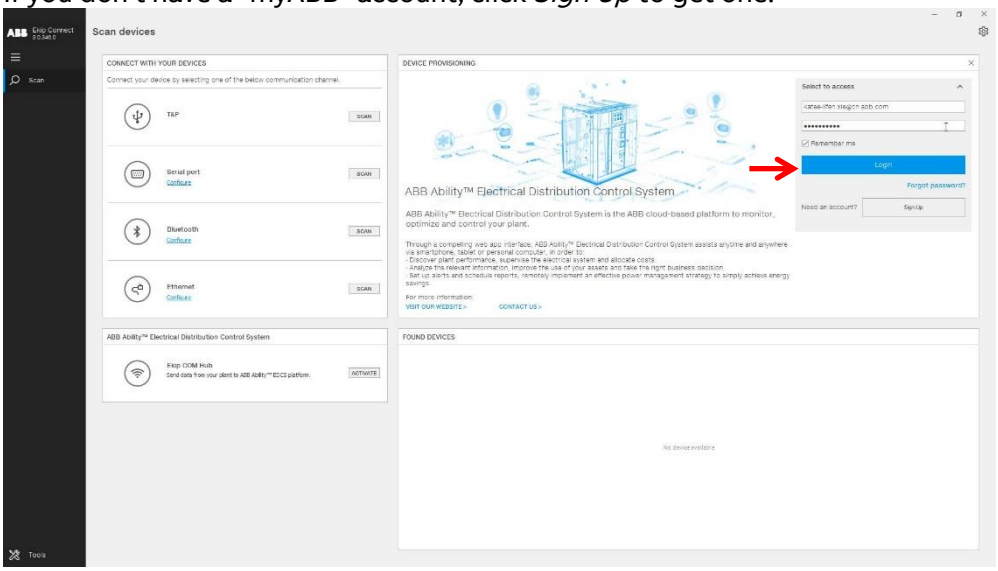
***NOTE**: Before provisioning, please synchronize the time of Ekip E-Hub manually or by switching on SNTP in Ekip Connect 3.*
For SNTP, you should choose accessible servers available in your region.

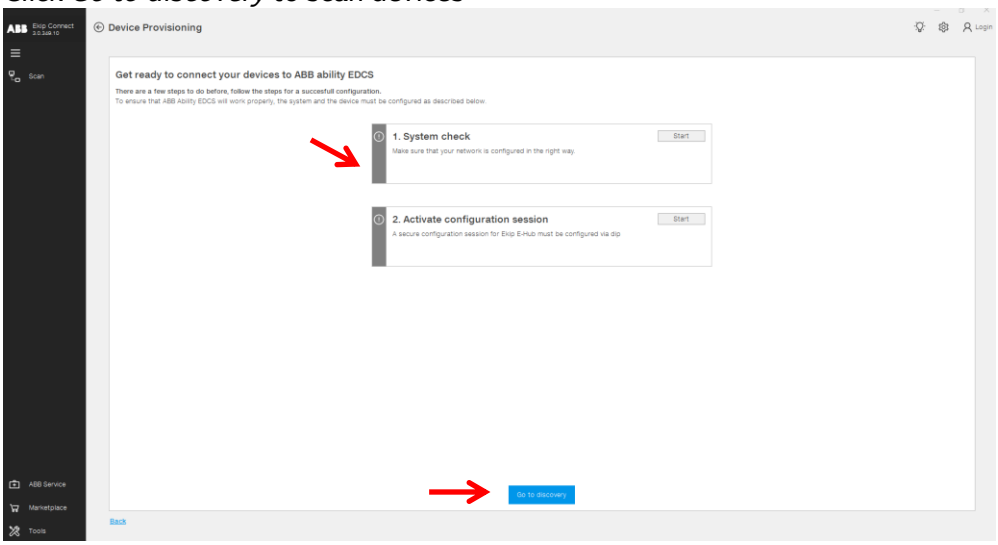
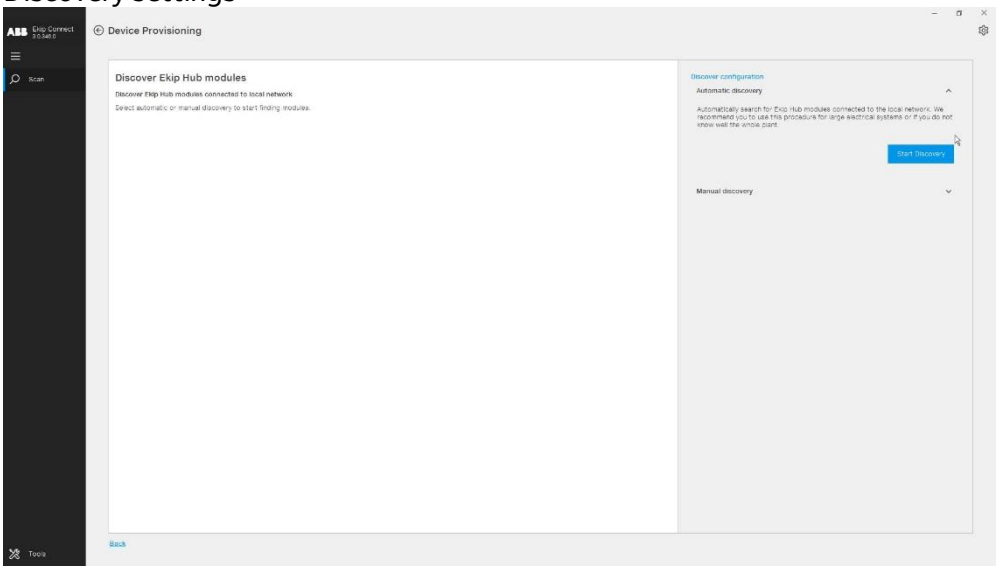
***NOTE**: Performing a second commissioning on an Ekip E-Hub module already provisioned to an ABB Ability EDCS plant, will allow only for updating the plant's devices configuration (e.g. when you need to add a new device to the EDCS' plant).*

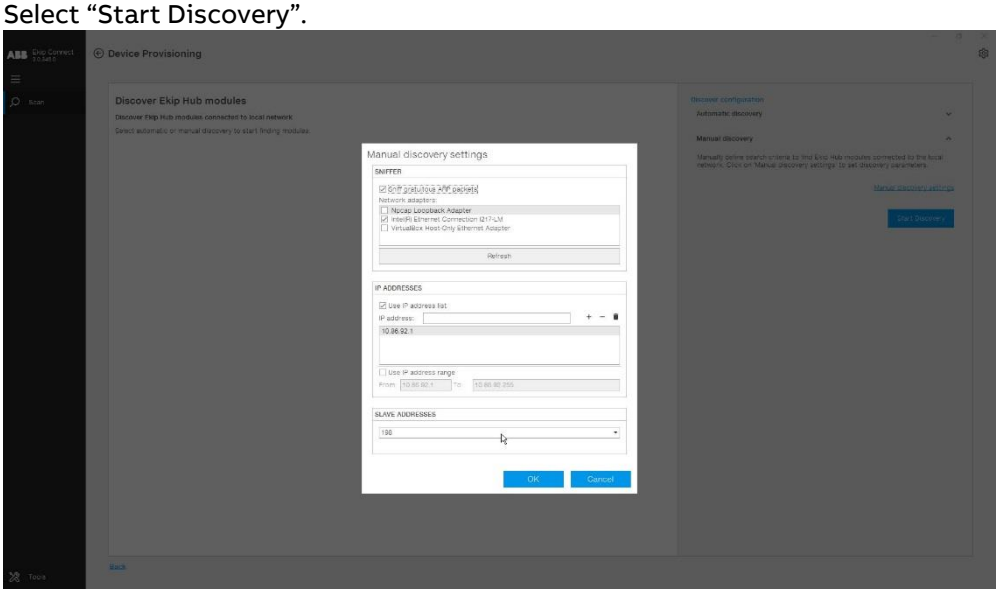
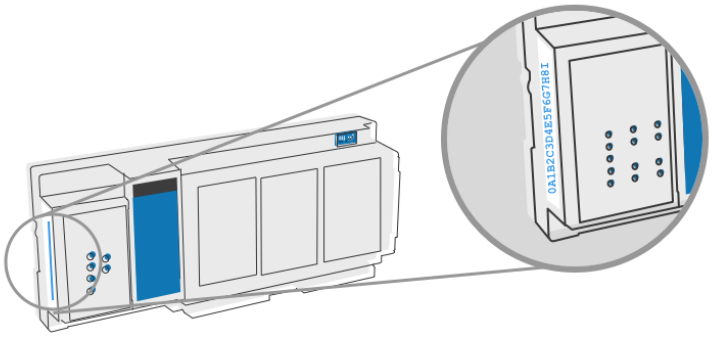
***NOTE**: In order to create a new plant you will need to delete all the devices and Ekip E-Hub connected to the specific plant directly from the ABB Ability EDCS webapp (Select the plant, then Devices > Delete device). This will remove the association of the devices and the Ekip E-Hub from a plant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

11 -Provision with Ekip Connect 3

Provision

Step	Description
1	**Initial activities** ❶In order to simplify the identification of devices for Ekip Connect during provisioning, it is strongly suggested that each device in the system is provided with a Tag Name. ❷Verify that Ekip E-Hub is functioning correctly and that it has obtained an IP address from the connected network. ❸Update Ekip Connect 3 to the latest version. ❹Enable TFTP upload setting by dip-switch
2	Go to the Ekip Connect 3 home page. Click *Activate* and Click *Select to access* to access ABB Ability™ EDCS.  **Fig. 18**
3	Insert the “myABB” credentials, then click *Login* and *Start*. If you don’t have a “myABB” account, click *Sign Up* to get one.  **Fig. 19**

4	In order to ensure that ABB Ability EDCS will work properly, it is suggested to follow these two steps to check whether the system and the device is configured in the right way - System check - Activate configuration session Click *Go to discovery* to scan devices  **Fig. 20**
5	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”  **Fig. 21**

6	Tick on the ‘Sniff gratuitous ARP packets’ box. Digit in the device IP address of Ekip E-Hub Module, and click on plus symbol. Digit for each device connected via Modbus TCP the device IP address and click on plus symbol “**+**”. Otherwise, input the IP address range in which those devices will be scanned. 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”.  **Fig. 22**
7	Once the Ekip E-Hub module has been found, digit the 16 character password code that you can find printed on the left side of the device and press “Let me in”.  **Fig. 23**

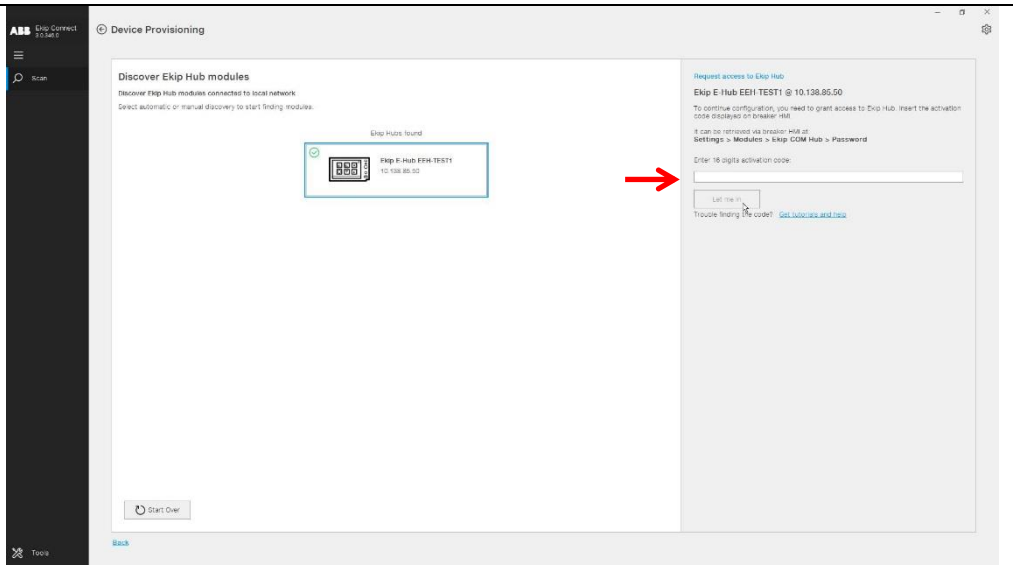


Fig. 24

8

Now it will be able to see all the devices connected with the Ekip E-Hub.
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™ EDCS
- Note: at least one Main or Generator device must be set inside a plant

Once all the settings on each device have been completed. Click on Add to ABB Ability™ EDCS.

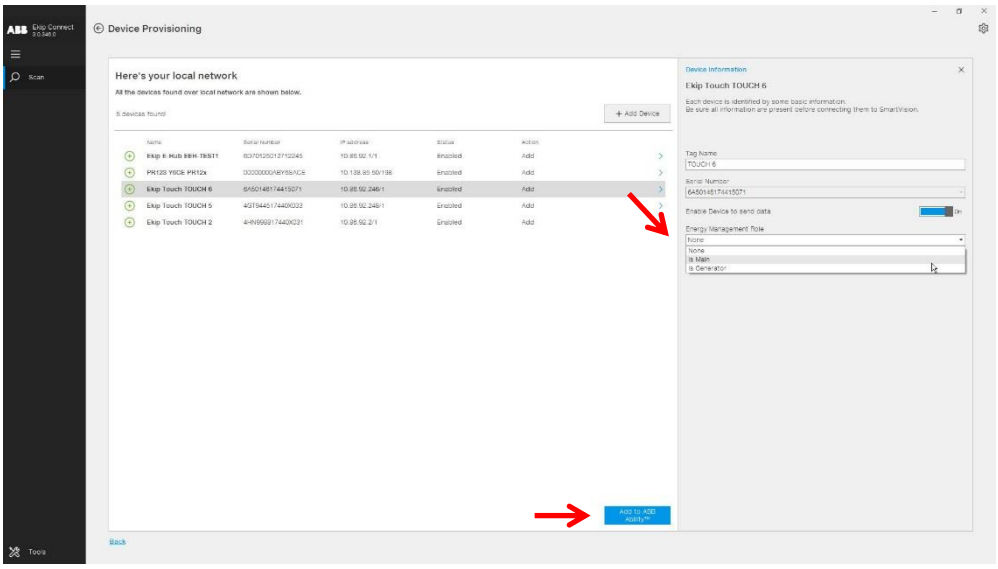


Fig. 25

NOTE: Make sure that **TFTP** is enabled now. Please refer to the Dial Settings on how to enable TFTP.

9

Select an existing plant or create a new plant and click *Publish.*

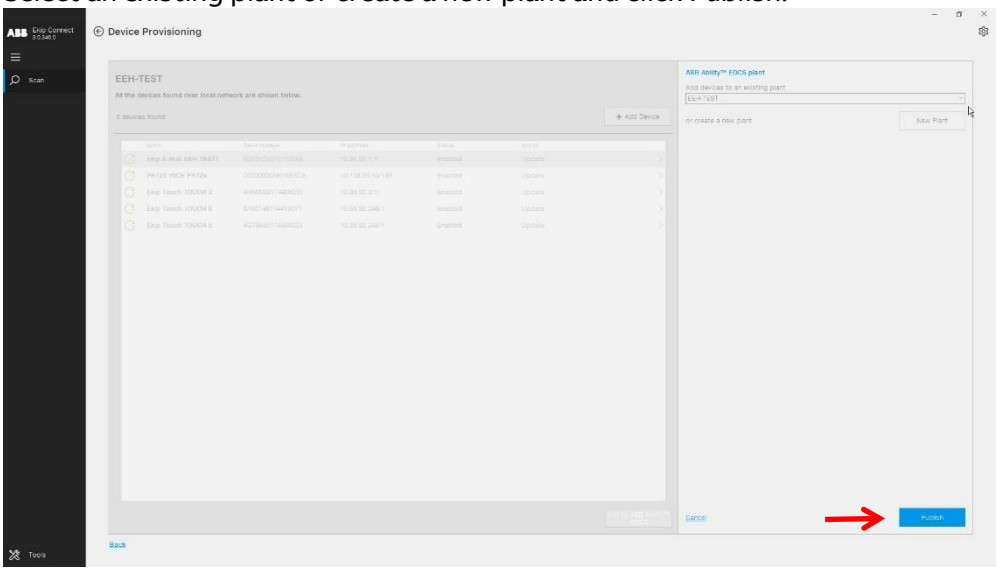


Fig. 26

10

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

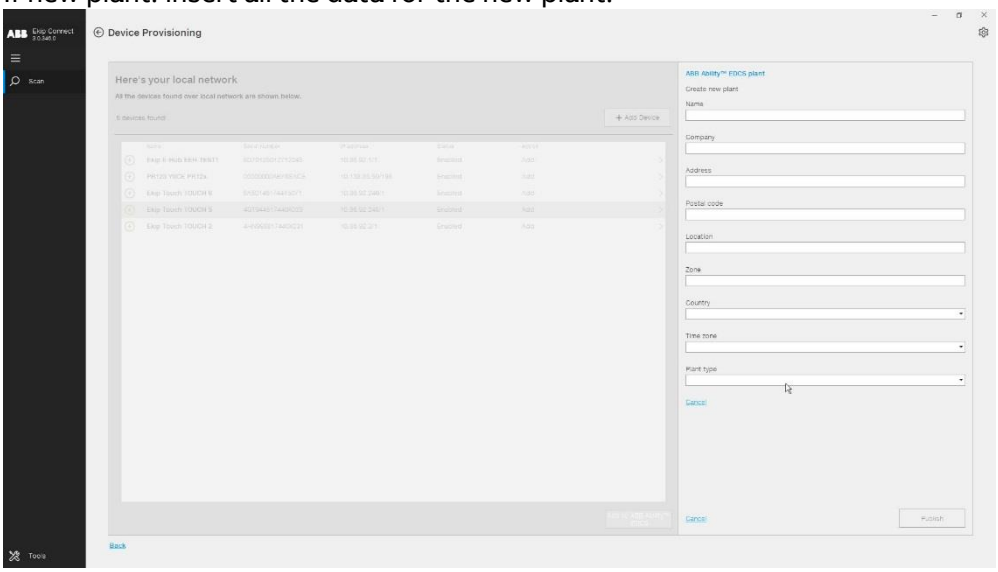
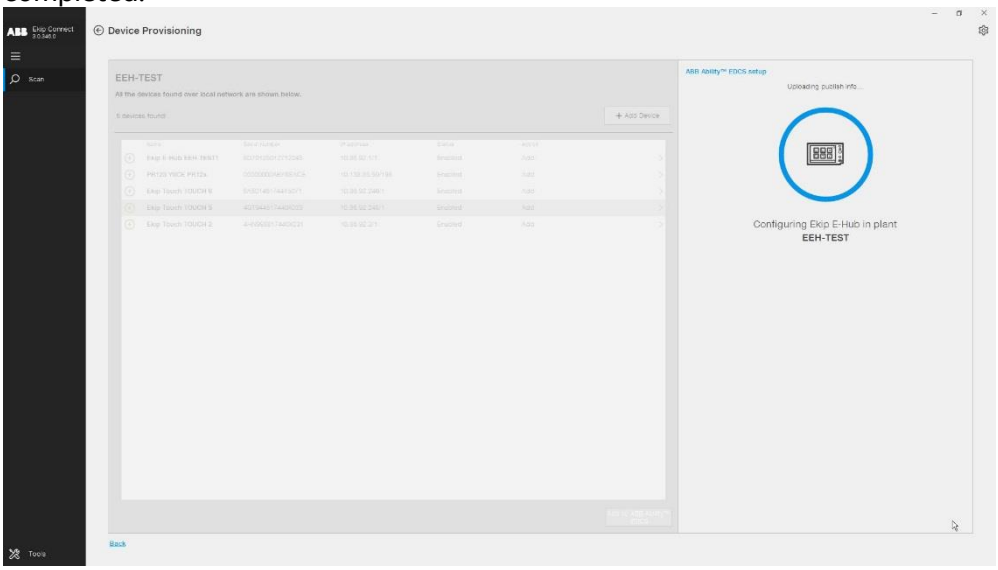
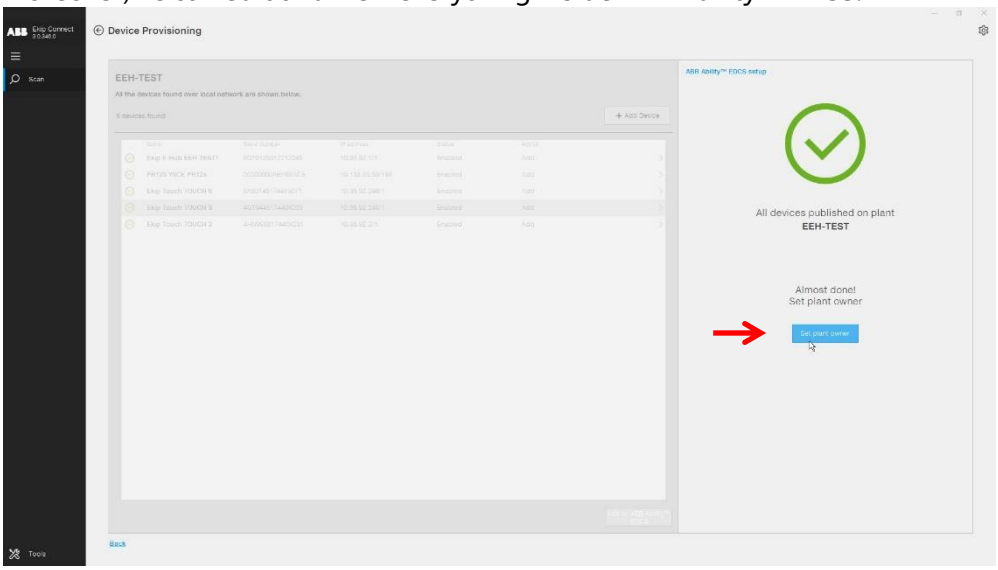


Fig. 27

NOTE: Do not input the special character (like #,@,>,etc..) to name the plant's name, it may lead to create the plant error.
All the items are required to input during create the plant, do not leave any item blank.

11	The Publishing of the plant is now completed. A green stripe will appear at the top as soon as the configuration has been completed.  **Fig. 28**
12	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™ EDCS.  **Fig. 29**

13

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

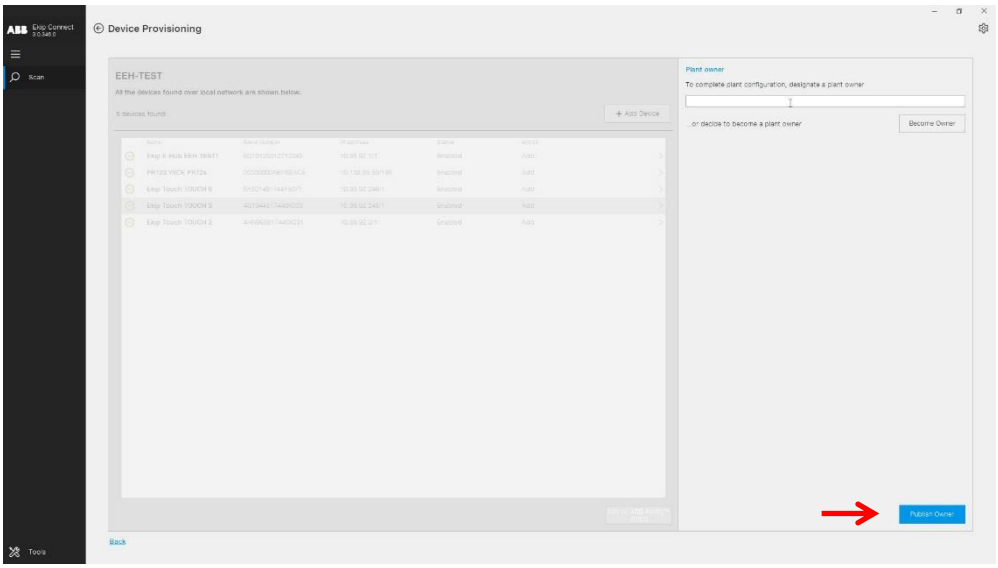


Fig. 30

14

Click “Ok” to agree the “Terms of service”.

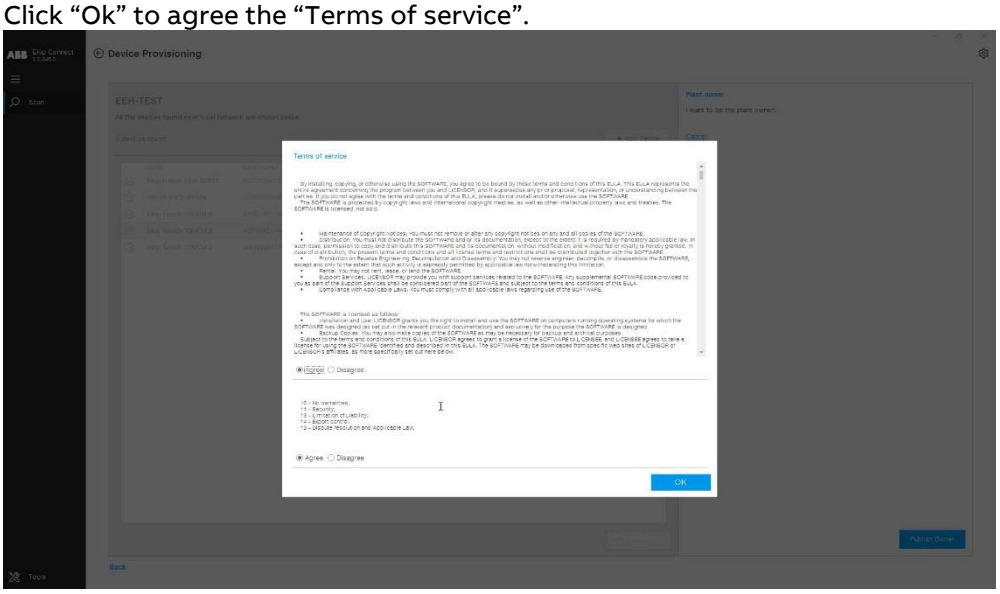
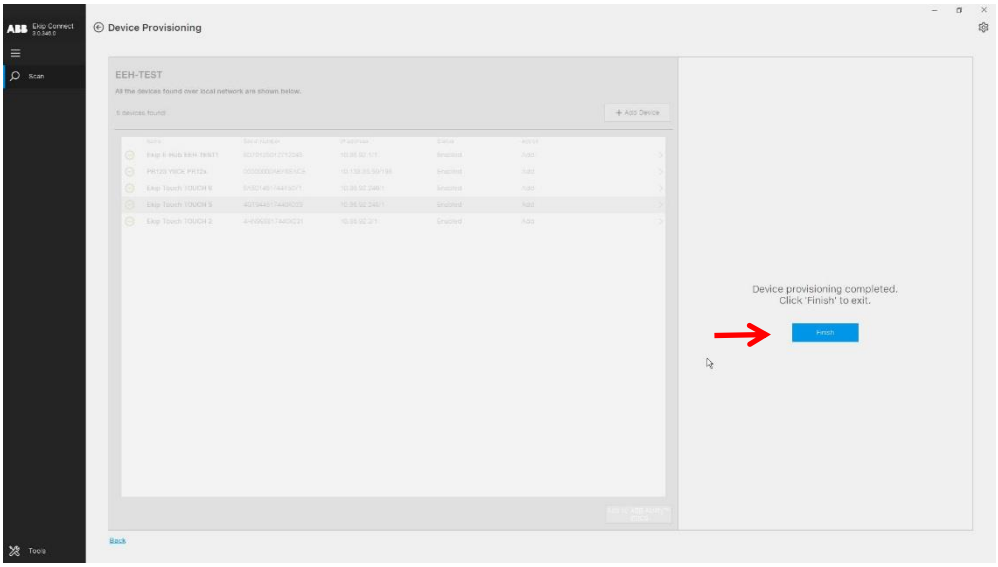
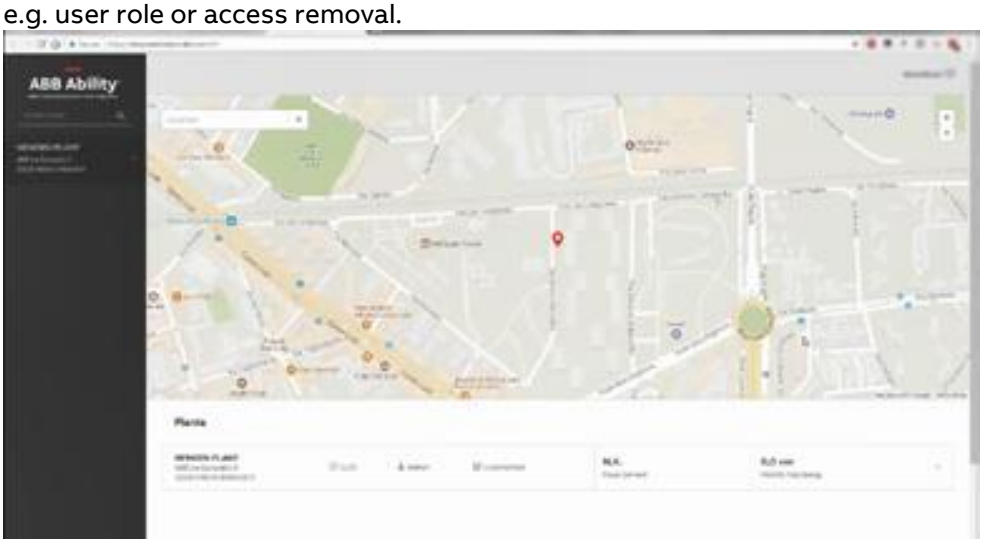


Fig. 31

15	Click “Finish”.  **Fig. 32**
16	Ekip Connect will automatically open the predefined internet browser and access the ABB Ability™ EDCS page. From the home page, you can manage all the plants to 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.  **Fig. 33**

Exceptions

Exception	Possible reason	Suggestion
Cannot discover Ekip E-Hub	1. Network connection error 2. Ekip Connect 3 and Ekip E-Hub LAN2 were not in the same LAN 3. Ekip E-Hub LAN2 IP was not in scan range	1. Enable DHCP 2. Connect Ekip Connect 3 and Ekip E-Hub LAN2 in the same LAN 3. Check Ekip Connect 3 scan setting
Cannot discover devices connected to Ekip E-Hub	1. RS485 (+, -) wiring error for serial device 2. Gateway disabled 3. TCP devices not in the same LAN 4. Devices address was not in scan range	1. RS485 (+, -) wiring correctly 2. Enable gateway in Ekip Connect 3 setting 3. Connect TCP devices in the same LAN 4. Check Ekip Connect 3 scan setting
Publish error	1. TFTP disable 2. LAN1 Network is invalid	1. Enable TFTP by dip switch 2. Connect LAN1 to an internet network

12 - LED status

Fig. 34

System LED

LED	Color	Function Description
Power	Green	Light on, device powered
Run	Green	Unused
Error	Red	Light on, Ekip E-Hub fatal error
Low	Red	Light on, battery lower than 5V
Prog	Green	Light on, Ekip E-Hub is upgrading

Ethernet LED

LED	Color	Function Description
Act1	Green	Blinking, LAN1 is sending data to Ethernet
Link1	Orange	Light on, LAN1 is connected with Ethernet
Act2	Green	Blinking, LAN2 is sending data to Ethernet
Link2	Orange	Light on, LAN2 is connected with Ethernet

Serial Communication LED

LED	Color	Function Description
TX1	Orange	Unused
RX1	Green	Unused
TX2	Orange	Blinking, COM2 is sending data
RX2	Green	Blinking, COM2 is receiving data
TX3	Orange	Blinking, COM3 is sending data
RX3	Green	Blinking, COM3 is receiving data

Digital I/O Indicator LED

LED	Color	Function Description
DI0	Green	Light on, the channel is activated by input signal
DI1	Green	
DI2	Green	
DI3	Green	
DI4	Green	
DI5	Green	
DI6	Green	
DI7	Green	
DI8	Green	
DO0	Green	Unused
DO1	Green	Unused
DO2	Green	Unused
DO3	Green	Unused

13 - Metering device troubleshooting

Digital input troubleshooting

This table describes how to solve issues with digital inputs.

Issue	Possible Solution
No pulse is received. The digital input LED is not flashing	Check that the LED is working. Bridge the input terminals between the terminal and the 12/24 VDC power supply to confirm that LED can be lit up.
	Check that the meter is connected to the digital input channel and the power supply. Refer to the **Installation instructions**.
	Check that the meter or contact is operating.
No pulse is received. The digital input LED is flashing	Check the digital input channel to which the pulse meter or O/C contact is connected.

Analog input troubleshooting

This table describes how to solve issues with analog inputs.

Issue	Possible Solution
No analog value can be read	Check the analog output sensor is connected to the proper terminals. Refer to the **Installation instructions**.
	In the Ekip Connect 3 I/O setting page, check that the analog input channel is set to the correct type of the sensor. AI0-AI3 are current input channels: 0-20mA, or 4-20mA. AI4-AI7 are voltage input channels:-10v-+10v,or 0v-+10v, or -2.5v-+2.5v, or 0v-+2.5v
	Check that the DIP switch SW5. AI0-AI3 should be set to on: Current type. AI4-AI7 should be set to off: Voltage type.

IMPORTANT: The tasks are specifically indicated that can be performed by trained persons in an electrical environment. Please follow the *Safety* items in section 2.
ABB accepts no liability for damage to property or personal injury due to failure to comply with the instructions contained in this document.

14 - Modbus device troubleshooting

Modbus TCP device troubleshooting

This table describes how to solve issues with Modbus TCP device.

Issue	Possible Solution
No Modbus TCP device can be discovered in Ekip Connect 3	Check that following IP address are in the same LAN: ● Ekip E-Hub LAN2's IP address ● PC's IP address which run the Ekip Connect 3 ● Modbus TCP devices' IP address
	Check that the Modbus TCP device IP is inputted correctly in Ekip Connect 3 manual discovery settings.
Ethernet LED is not blinking	Check that the Ethernet cable is connected.

Modbus RTU device troubleshooting

This table describes how to solve issues with Modbus RTU device.

Issue	Possible Solution
No Modbus RTU device can be discovered on the Ekip E-Hub RS-485 ports	Check that **Gateway** function is enabled. Changes of device configuration will be validated after Ekip E-Hub reboot.
	Check Ekip E-Hub communication interface defaulted setting, RS-485 interface1 and interface 2 **Baud rate are 19200 bit/s, physical protocol are E81.**
	Check the wiring integrity and that the RX/TX are wired to correct terminals.
Some Modbus RTU devices cannot be discovered	Check that the slave address is inputted correctly in Ekip Connect 3 manual setting.
	Check that the missing device is wired to correct RS-485 port: Modbus RS-485 devices with slave address between 2 and 127 must be connected to RS-485 interface 1. Modbus RS-485 devices with slave address between 128 and 247 must be connected to RS-485 interface 2.
	Check that two devices do not have the same slave address.
	Check that the wiring of the missing devices is correct.
	Check that the setting to the missing device consistent with the Ekip E-Hub communication setting (**Baud rate, physical protocol).**

IMPORTANT: The tasks are specifically indicated that can be performed by trained persons in an electrical environment. Please follow the *Safety* items in section 2.
ABB accepts no liability for damage to property or personal injury due to failure to comply with the instructions contained in this document.

15 - Ekip E-Hub troubleshooting

Ekip E-Hub troubleshooting

This table describes how to solve issues with Ekip E-Hub.

Issue	Possible Solution
Ekip E-Hub time incorrect	Check that **Time Zone** is selected correctly.
	Configure the **SNTP** parameter. Input a valid SNTP server and enable the SNTP client.
SNTP do not work	Check that the input server address is correct, try to ping the server address.
Ekip E-Hub Error LED is red on	Check that the external SD-card is inserted. Reboot the Ekip E-Hub.

Provisioning troubleshooting

This table describes how to solve issues with provisioning in Ekip Connect 3.

Issue	Possible Solution
Ekip E-Hub API device response error	Check that the entered 16 digital password is correct.
Download data publish file error	Check that TFTP is enabled.
	Check that the laptop firewall is off.
Data publish exception	Check that Ekip E-Hub LAN1 network is working.

Data publishing troubleshooting

This table describes how to solve issues with data publishing to cloud.

Issue	Possible Solution
Many data publish failed	Check that the Ethernet cable is connected to Ekip E-Hub LAN1.
	Check that the External network proxy server is working.
No publish success	Check that the Ekip E-Hub LAN1 is working.
	Check that Ekip E-Hub provisioning has succeeded. Configuration file and security file are uploaded success. Re-provisioning or reboot the Ekip E-Hub.
	Check that SD card is inserted. Reboot the Ekip E-Hub.

ABB Ability™ EDCS plant troubleshooting

This table describes how to solve issues with ABB Ability™ EDCS plant.

Issue	Possible Solution
The connected device is not added to ABB Ability™ EDCS plant	Check the actions during provisioning. Try re-provisioning all the interested devices to the Ekip E-Hub.
	Check that the connected device is not on other plants.
Missing data due to network issue	Check that mobile terminal network is working. Refresh the ABB Ability™ EDCS plant.
Data displayed might be past	Check that the device in the plant does not disconnect from Ekip E-Hub. Verify the wiring of connected device.

Firmware upgrade troubleshooting

This table describes how to solve issues with firmware upgrade.

Issue	Possible Solution
Firmware is not upgraded	Check that the external network in Ekip E-Hub LAN1 is working. New firmware package can be download.

	Check that Ekip E-Hub power supply is ok during firmware upgrading.

Reviews

Review	ECN	Description