Technical Document

Smart Sensor Gateway
Installation Manual
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1 General

Smart Sensor Gateway is used to upload the Smart Sensor data automatically to the Smart Sensor Portal. Gateway needs to be configured for internet access before it can start reading the Smart Sensors. Following internet connections are supported:

- PoE (Power over Ethernet) network
- LAN/Ethernet network together with PoE injector
- WIFI network
- Mobile network with specific USB dongle
- USB port at the bottom of the Gateway can be used as a power supply for devices like a USB WIFI modem

Sales package includes:

- X1000 Bluetooth router, wall and pole mounting kits and a quick guide

Figure 1 Content of the Sales Package
2 Installation

2.1 Prerequisites for Installation

Internet connection:
- Gateway cannot operate in networks with VPN (Virtual Private Network)
- In case there is a firewall used, TCP and UDP ports 5246 and 5247 need to be opened for communication with abb.cassia.pro (13.126.172.231)
- Mobile network needs to have adequate signal strength. In most demanding locations an extension USB cable or external antenna might be needed for USB modem/dongle.

Power supply:
- In case PoE network is not available, a PoE injector (power supply) is needed

Ethernet cable:
- 1 ethernet cable is needed when PoE, WIFI or mobile network is used
- 2 ethernet cables when LAN/ethernet network is used

Computer:
- Computer with WIFI adapter is needed for Gateway configuration. Tablet computer or mobile phone can also be used.

2G/3G USB dongle
- In case a mobile network is used, a specific USB dongle is needed. Gateway has built in drivers for Huawei MS2131i-8 and the Gateway currently supports the use of this specific dongle.
- SIM card with sufficient data plan
- Gateway also supports the use of a USB powered WIFI modems such as e.g. Huawei E8372. WIFI connection is used between the Gateway and the modem.

Mounting:
- Flat head screwdriver for pole mounting
- Phillips head screwdriver and a drill (if needed) for wall mounting
- Mounting is not mandatory, but it is recommended to secure the Gateway somehow to its intended place
2.2 Recommended Location

Height:
- Recommended height for the Gateway is 3-30 meters from ground level. Lower levels are also acceptable but they might have weaker Bluetooth signal levels due to obstacles.

Orientation:
- Gateway has the best reception to the direction where the Cassia logo is shown on its side. If the Gateway has troubles connecting to a specific Smart Sensor, it is recommended to rotate the Gateway to point directly to that direction.

2.3 Gateway Configuration

When the Gateway is powered on, the blue LED at the bottom of the Gateway turns ON. After bootup the Gateway will turn on the configuration WIFI hotspot. The bootup takes about 30-60 seconds.

Configuration WIFI hotspot has SSID “cassia-XXXXXX”, where XXXXXX is the last 6 digits of the Gateway’s MAC address. MAC address can be found from the bottom of the Gateway. Password for this WIFI hotspot is the same as the SSID.

Connect to this WIFI hotspot with the device used for configuration (computer, phone or tablet) and open the web browser. Type 192.168.40.1 to the web browser’s address field and press enter. Cassia configuration page will open. During the first login the default password needs to be changed. Default credentials are:

- Login: admin
- Password: admin

![Cassia Login Page](image)
Once logged in, the Status Page is shown. This page shows current operation mode and connection status of the Gateway. AC Online Time shows how long the Gateway has been connected to the AC (Access Controller) server. If no time is shown it means that the Gateway does not have a connection to the AC server. AC server connection is needed for the Smart Sensor data transfer.

![Status Page](image)

Figure 3 Status Page

Basic Page is where the configuration is done. Following values are common for all network configurations (PoE, LAN, WIFI, Mobile):

- **Router Mode**: Gateway is getting commands and sending data via access controller (AC). This needs to be selected as “AC Managed Router” (default).
- **Tx Power**: In some countries Tx power needs to be adjustable. Default value is 20.
- **AC Address**: Type here the access controller address abb.cassia.pro
- **AC-Router Comm. Ports**: Ports 5246, 5247 are used (default)
- **Remote Assistance**: ON (default)
Connection Priority is where a priority connection method is selected in case there are several in use. Select the priority according to connection in use:

- Wired for PoE and LAN connections
- Wireless for WIFI connection
- 3G/4G for mobile USB dongle connection
2.4 **PoE Connection**

If a PoE (Power Over Ethernet) network is available, the Gateway can be configured to use it without any additional power supply.

*Figure 5 PoE Network Configuration*

From the Gateway Basic Page select:
- Connection Priority: Wired
- IP Allocation: DHCP or Static (in case the IP allocation is given)

Press Apply at the bottom of the screen.
2.5 **LAN/Ethernet Cable Connection**

If a LAN/Ethernet network is available, the Gateway can be configured to use it. Additional PoE injector (power supply) is needed.

From the Gateway Basic Page select:
- Connection Priority: Wired
- IP Allocation: DHCP or Static (in case the IP allocation is given)

Press Apply at the bottom of the screen.
2.6 WIFI Connection

Gateway can be configured to use an existing WIFI network. Additional PoE injector (power supply) is needed.

![Figure 7 WIFI Network Configuration](image)

From the Gateway Basic Page select:
- Connection Priority: Wireless
- Enter the SSID (name) of the WIFI network
- Enter the WIFI network password
- Change the Wireless operation mode from Hotspot to Client
- IP Allocation: DHCP or Static (in case the IP allocation is given)

Press Apply at the bottom of the screen.

**NOTE!** Once the Apply button is pressed the Gateway WIFI adapter stops sharing the WIFI hotspot and changes the connection to configured WIFI network. In case the DHCP is used, the Gateway has now a new IP address. This IP address is needed to reconnect to the Gateway e.g. to check the Status Page or scan the devices within the Gateway’s range. Local IT department can find out the Gateway’s IP address by accessing the WIFI router device list or by performing the network scan for IP addresses. In case a static IP is used, the address is known.

Connect your computer, tablet or mobile phone to the same WIFI network as the Gateway is connected. Open a web browser and type the new IP address to the address field and press enter. Access to Gateway configuration pages is established again.

**NOTE!** If there was an error in SSID, password or IP address configurations, you cannot access the Gateway anymore. In this case the Gateway isn’t shown in router device list or in network scans. Press the reset button at the bottom of the Gateway for 10 seconds to reset the Gateway to factory default values.
2.7 **USB Mobile Dongle Connection**

Mobile network can be used with a specific USB dongle. Additional PoE injector (power supply), Huawei MS2131i-8 USB dongle and a SIM card are needed.

![Diagram of Smart Sensors and Gateway](image)

**Figure 8: Mobile Network Configuration**

Gateway works with Huawei MS2131i-8 USB dongle. PIN query needs to be disabled from the SIM card.

Insert the USB dongle with SIM card to USB port at the bottom of the Gateway.

From the Gateway Basic Page select:

- Connection Priority: 3G/4G
- USB Dongle Type: select Huawei MS2131
- Type the access point name (APN) which the SIM carrier is using. Usually it is "internet" but some carriers might use a different access point.
- Type the username and password for the APN if needed. Usually these are not needed.

Press Apply at the bottom of the screen.

Reboot the Gateway by removing the power supply for a few seconds and then reconnecting it.

**NOTE!** With a USB dongle the Gateway needs to be in place where there is a sufficient network signal available. In case of a weak signal strength an extension USB cable or additional external antenna for USB dongle might be needed.

If a WIFI modem (e.g. Huawei E8372) is used, then insert the modem to USB port at the bottom of the Gateway and follow the 2.6 WIFI Connection section instructions.
2.8 **Firewall Configuration**

In case there is a firewall in the network which the Gateway is using, specific ports need to be opened.

- Firewall needs to have both TCP and UDP port 5246, 5247 opened
- Firewall should allow communication between the Gateway and abb.cassia.pro (13.126.172.231)

![Firewall Configuration Diagram](image)
3 Scanning Bluetooth Devices

Correct Gateway placement can be checked by scanning the Bluetooth devices within the Gateway’s range. Gateway location or orientation needs to be changed if all desired Smart Sensors are not visible for the Gateway or if the Smart Sensor is showing weak signal level.

To enable the scanning, the router mode needs to be changed. This is done in the Basic Page. Change the mode from “AC Managed Router” to “Standalone Router”. Gateway will automatically reboot and is operational again within 30 to 60 seconds.

In computer, tablet or mobile phone, open the following web page while having an internet access:

http://www.bluetooth.tech/debugger/

![Cassia Bluetooth Debug Tool](image)

Figure 10 Cassia Bluetooth Debug Tool

Once the debug tool is loaded, connect the device used for configuration (computer, tablet or mobile phone) to the WIFI network generated by the Gateway. If the Gateway is connected to WIFI, then connect the configuration device to the same WIFI network as the Gateway is connected.

Type in the Gateway’s MAC and IP addresses to the fields Router MAC and Router IP. Press Start Scan.
Debug Tool now starts to list all Bluetooth devices within its range. For all scanned devices the tool is showing the MAC address and RSSI value. Sometimes the name is not available, but it is listed if known.

RSSI value can be roughly categorized to the following groups:
- RSSI value between 0 and -70 is OK
- RSSI value between -70 and -80 is weak, sensor can be read time to time
- RSSI value -80 or less is poor, most probably the sensor cannot be read

If the desired Smart Sensors are showing RSSI values of -70 or less, it is recommended to adjust the Gateway's location or orientation.

**NOTE!** Remember to change the router mode to AC Managed Router mode. If the mode is not changed the Gateway is not establishing a connection to AC server and the data is not read form the Smart Sensors.
4 Troubleshooting

Forgetting the login credentials or making a mistake while configuring the WIFI network SSID or password:
- Press the reset button for 10 seconds while the Gateway is powered on. This will reset all Gateway settings to factory default values. Reset button is located at the bottom of the Gateway.

Gateway does not generate the WIFI hotspot for setup:
- Check the power supply and that the blue LED is ON at the bottom of the Gateway
- If the Gateway is configured to use a WIFI network, it does not generate a WIFI hotspot
- Try to reset the Gateway by pressing the reset button for 10 seconds while the Gateway is powered on. Reset button is located at the bottom of the Gateway.

Gateway does not connect to AC server:
- Check the internet access
- In case a USB dongle is used, check the model is supported by the Gateway and that the dongle has established a connection to a mobile network
- Check that the used network does not use VPN
- Check the used network firewall settings

Gateway is not reading the Smart Sensor data:
- Check that the Smart Sensors are within the Gateway's range
- During the first use it can take up to few hours to get the first readings to the Smart Sensor Portal
- Check from the Status Page if it shows the Online Time. If not, please check the internet connection.

For more support, please contact Smart Sensor support:
support.smartsensor@abb.com