STC BACnet IP

EnOcean to BACnet IP gateway/transceiver

Application

Bidirectional gateway for EnOcean-based sensors and actuators as well as controllers and control systems with BACnet IP interface inclusive external receiving antenna (2,5 m), prepared for mounting on DIN rail TS35 (35x7,5 mm) according to EN 60715. To be configured via EasySens airConfig software tool. Details of the communication protocol are available in the software documentation.

Security Advice – Caution

The installation and assembly of electrical equipment should only be performed by authorized personnel.

The product should only be used for the intended application. Unauthorised modifications are prohibited! The product must not be used in relation with any equipment that in case of a failure may threaten, directly or indirectly, human health or life or result in danger to human beings, animals or assets. Ensure all power is disconnected before installing. Do not connect to live/operating equipment.

Please comply with
- Local laws, health & safety regulations, technical standards and regulations
- Condition of the device at the time of installation, to ensure safe installation
- This data sheet and installation manual

Notes on Disposal

As a component of a large-scale fixed installation, Thermokon products are intended to be used permanently as part of a building or a structure at a pre-defined and dedicated location, hence the Waste Electrical and Electronic Act (WEEE) is not applicable. However, most of the products may contain valuable materials that should be recycled and not disposed of as domestic waste. Please note the relevant regulations for local disposal.

Information about EasySens® (radio) / airConfig general usage

Basic information about EasySens® radio and about general usage of our airConfig software, can be downloaded from the following link

http://www.thermokon.de/ftp/info/Information_Radio_airConfig_en.pdf

Technical Data

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Network technology	BACnet IP
Radio technology	EnOcean (IEC 14543-3-10)
Frequency	868 MHz, optional: 902 MHz
Antenna	external transmitting/receiving antenna with magnetic holding
Data transmission	bidirectional, airConfig ready
Receive channels	no limit
Transmit channels	128 (Tx)
Power supply	15..24 V = (±10%) or 24 V ~ (±10%)
Power consumption	typ. 3 W (24 V =) | 5 VA (24 V ~)
Enclosure	ABS, light grey
Protection	IP20 according to EN 60529
Connection electrical	terminal block, max. 1,5 mm²
Ambient condition	0..+50 °C, max. 85% rH non-condensing
Weight	300 g, (without antenna)
Mounting	prepared for mounting on DIN rail TS35 (35x7,5 mm) according to EN 60715
Delivery content	incl. external transmitting/receiving antenna 2,5 m with magnetic holding, software for configuration (freeware via download)
Notes	For network connection use a shielded standard Ethernet cable with shielded RJ45 connectors
	to use the free software airConfig (download) an usb stick, which is able to send and receive EnOcean telegrams, is necessary. We offer such a stick with the package airScan (item No. 566704 for 868 MHz), magnetic antenna plate recommended to improve radio coverage

Mounting

Use standard mounting rails according to DIN EN 60715 The usage of the external antenna supplied with the product is necessary for operating.

The antenna shall be mounted in the centre of a metal steel plate (i.e. galvanized sheet metal) exceeding 180mm x 180mm using the advantage of its magnetic base. Best position for the antenna is keeping a distance of >10 cm from ceiling and walls. The distance to other powerful transmitters (e.g. LTE/ GSM / DECT / wireless LAN / EnOcean senders) should be minimum 0,5 m.

The antenna will be best when mounted vertically, pointing up or downwards. The antenna cable shall be wired in an electric conduit. Pulling with force and bending sharply may cause damages to the sheathing of the antenna cable respectively to the connectors. Minimal radius of the antenna cable is 50 mm.

Connection plan
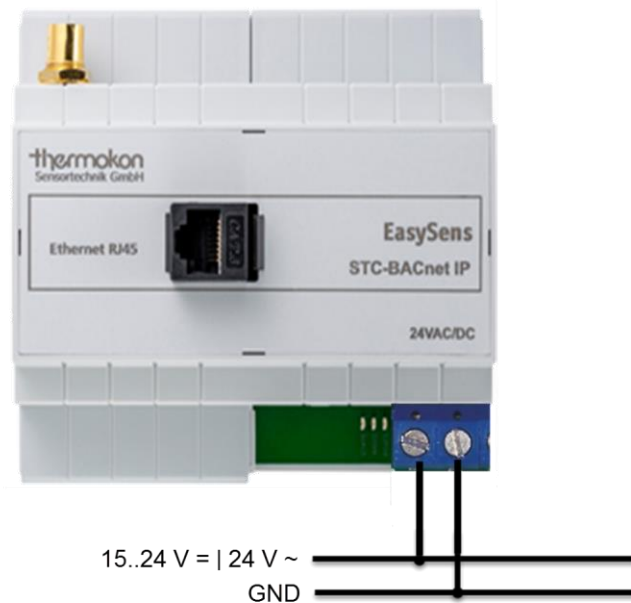
LED

With connected power supply the green POWER LED illuminates permanently. The orange RADIO LED displays the proper operation. While the Gateway is connecting to a network, the orange STATE LED blinks. If the Gateway has successfully connected to network, the STATE LED lights up permanently.

If a DHCP server is not found the Gateway provides the default IP address: 192.168.100.100. During this process the state LED blinks.

Configuration via airConfig

To run AirConfig a Windows operated PC or Apple MAC is required. Java and FlashPlayer have to be installed and for communication an EasySens USB transceiver has to be connected (with driver installed), e.g. same as supplied with Thermokon´s field test tool airScan. Alternatively EnOcean's USB300 may also be used. AirConfig does not require any special license.

Software:

EasySens AirConfig commissioning tool is available free of charge for download from the download centre of www.thermokon.de. http://www.thermokon.de/produkte/easysens-empfaenger/tools/airconfig.html#tabs-downloads

Connect the USB stick to one of your computer's USB ports and start airConfig. The driver should be installed automatically from Windows website. In case the driver of the USB transceiver has not been installed properly, this window will appear:

In this case please check in your device manager whether the USB transceiver has been detected properly and the driver is installed. If the driver is missing, you may download the appropriate driver for your system from http://www.ftdichip.com/Drivers/VCP.htm.

If no transceiver could be found, then the software will not start.

In case the computer running airConfig is in the same network as the STC-BACnet IP, you may select **<Connect through TCP/IP>** from the context menu when clicking right onto the device icon.

The airConfig Screen

To configure the device afterwards, start airConfig, make sure, that the USB transceiver has been detected.

Right click on the symbol of the device in the smartCom Driver list and Select **<Query devices>** or press **<F11>**. airConfig will send a query to request the IDs of all devices of that kind within transmission range or connected to the same network as the computer.

Note: To receive and send configuration data to solar powered sensors LEARN button has to be activated to wake-up the sensor.
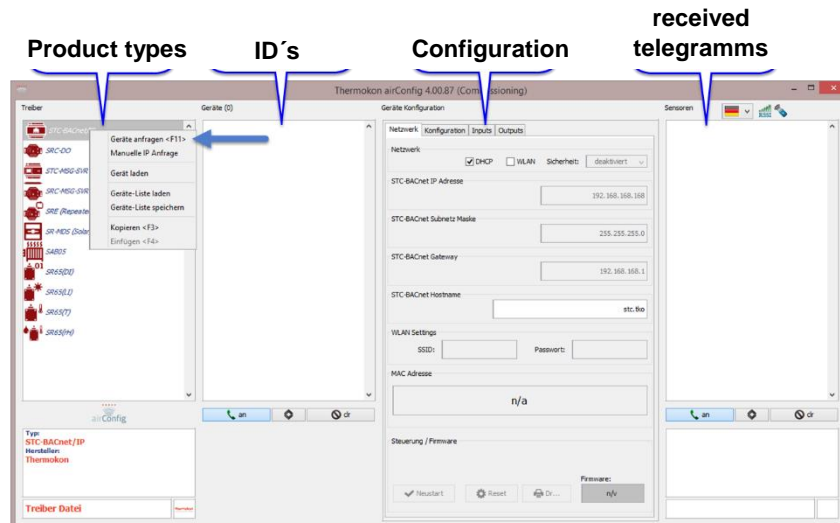
Each device will be listed with its EnOcean ID in the list "Devices" (2nd column).

To configure a particular device click right on the Icon of the device and select **<Request configuration**> or press **<F5>**.

airConfig will prompt for the PIN that protects the device's configuration. Enter the PIN numbers (000…255) and select "Yes" to read the configuration from the device. To work with the default settings, press "No".
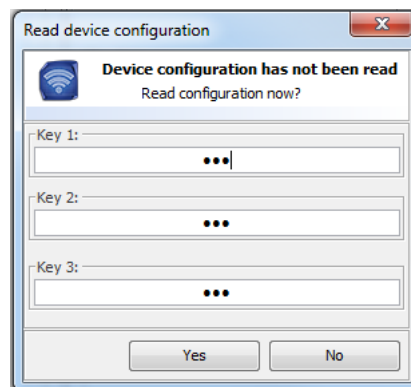
Default PIN key is 000-000-000.

The area "Device configuration" is based on the type of device, which should be configured. Here all settings could be changed to configure the device or devices.

To finalize configuration choose **<Send configuration>** from the context menu **(F6).** For sensors it is necessary to press LEARN button to store the configuration at the device. A restart is only required with changed network settings.

- **Network**   **IP configuration**
- FDR   BACnet foreign device registration (only Virtuoso mode)
- **Configuration**   **EnOcean gateway settings**
- **Inputs**   **BACnet inputs (sensor signals received)**
- **Outputs**   **Bacnet outputs (signals generated by the gateway)**

Network:

activate DHCP

(WLAN is currently not supported)

Network settings

WLAN settings

(currently not supported)

MAC Address

Changes of the network settings have to be followed by a restart of the gateway to apply the new network setting.

The STC-BACnet IP can receive its IP only during start-up. To allow slower devices to be ready the STC-BACnet IP has implemented a delay in restart of approximately. 90 seconds to allow slow DHCP devices to start their services. As soon as both yellow LED will light up, the gateway is online again.

In case you observe a longer delay the STC-BACnet IP may download an update from the Server. This may take up to 5 minutes before the gateway starts automatically. The new version of the firmware will be displayed on the lower right corner of the Network tab.

Configuration:

The Configuration tab also indicates the EnOcean settings as well as the BACnet address and the buffer size (ADPU length).

TCM informations

Location (editable)

BACnet ID

Update firmware and XML file

During the update process the gateway is not available for a few minutes.

FDR (only EEP-Virtuoso):

FDR is used for foreign device registration, it´s a special BACnet service to route data between networks. With this a sensor in one network can communicate with devices in another network.

BBMD settings

CPU settings

"on demand" =

Processor clocks depending on usage.

Inputs: EnOcean -> BACnet

The Inputs section shows the EnOcean devices that will be converted into BACnet data points. To generate data points the gateway needs to know the sensor's EEP as this defines what data point will be created. Therefore only EnOcean sensors which have been recognized can be assigned. Sensors with icons indicate the type of message only (i.e. 4BS, VLD, MSC) cannot be assigned and will be highlighted in red to indicate the problem.

If the EEP of a particular sensor is already known, the EEP can be set manually by clicking right on the sensor's icon and selecting the EEP from the "change type" dialogue.

To assign a sensor to the BACnet IP gateway simply drag and drop the sensor's icon from the EnOcean Sensor list on the right into the Inputs window.

The BACnet IP gateway automatically will generate data points for the sensors in the order shown in the inputs window. The BACnet address of the first data point for each sensor is shown in brackets after the configuration has been transferred to the BACnet IP gateway.

A restart of the device is not required, unless the IP settings has been changed. "Auto" indicates a sensor that has been newly assigned but w/o transferring and reading back the configuration from the STC-BACnet IP gateway.
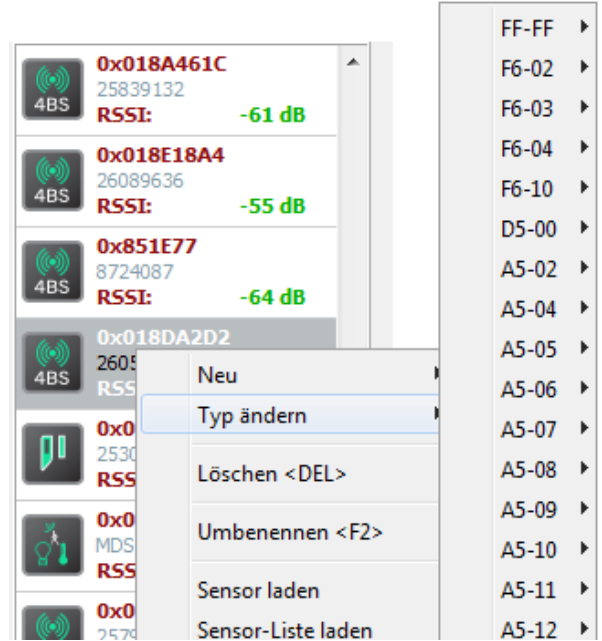
Outputs BACnet → ENOcean:

Outputs define EnOcean telegrams that will be generated by the BACnet IP gateway from BACnet data points. Select the EEP from the drop-down list and press the "Add"-button to generate the icon and EnOcean device in the Outputs list. 1000 data points are reserved for each EEP. A maximum of 128 EEPs can be generated. Optionally the manufacturer ID can be specified, which will be included in the Learn-in message. A restart of the device is not required, unless the IP settings has been changed.
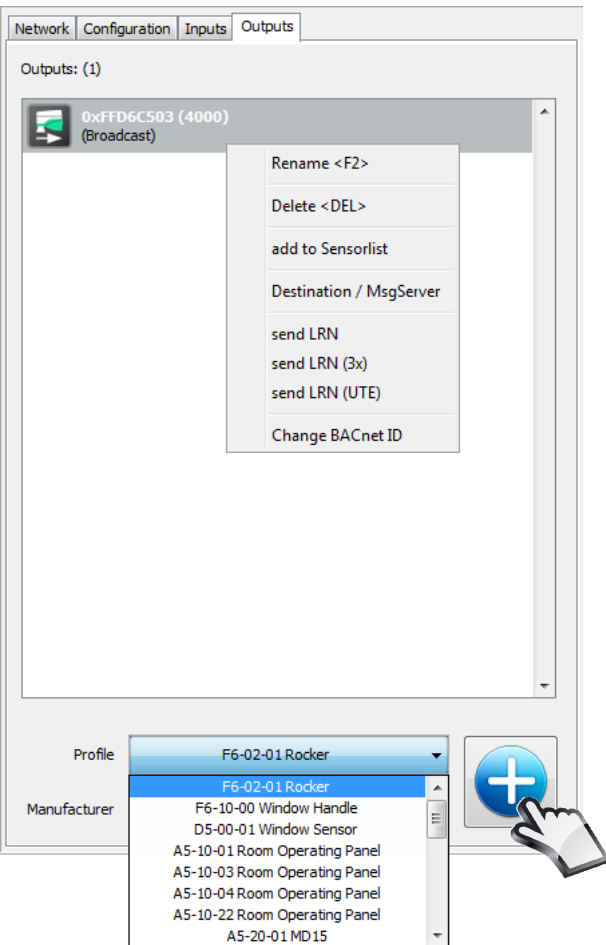
Click right on a particular sensor icon to open the context menu and select **<send LRN>** to send a Learn-in message to the device that is to be paired with this message.

<send LRN (3x)> transmits the teach-in telegram 3x with random pauses in between. Do not use this for devices that delete the ID when receiving a LRN telegram the 2nd time.

For devices supporting the universal teach-in message (UTE) **<send LRN (UTE)>** should be used.

In case the output signal will be assigned to another device supporting airConfig the signal's ID can be added to the sensor list on the right directly without having to physically send a Learn-in telegram, alternatively by using the "add to sensor list" by dragging the icon into the sensor list.

Each output telegram can be addressed to a certain EnOcean-ID using the destination dialogue.

When selecting EEP-A5-20-1 SAB05/MD15 the BACnet IP gateway can be the Message Server for a wireless valve actuator SAB05. To activate the message server for a particular output signal simply select the SAB's EnOcean-ID from the **<Destination / MsgServer>** dialogue.

**MSG-Server – bidirectional Teach In SAB05:**
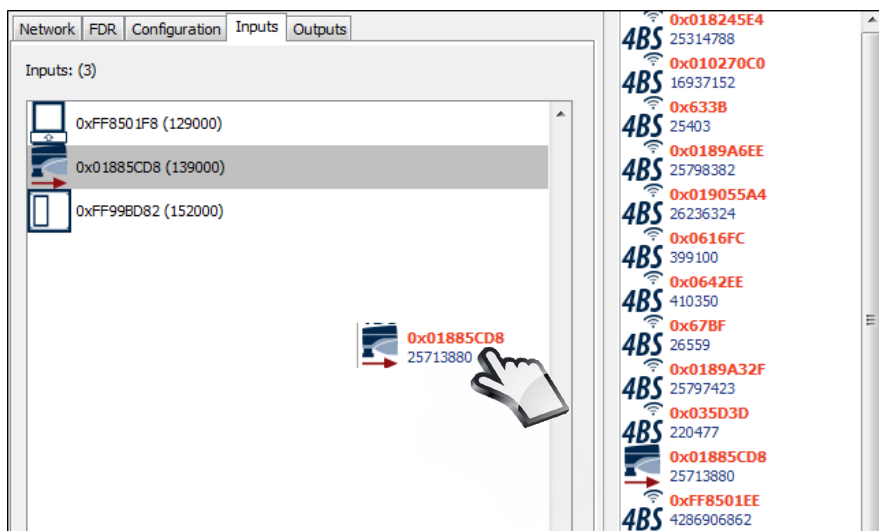
The teach-in of an valve actuator works in both directions. The SAB does need to learn the ID of the Message Server and the STC-BACnet IP needs to know the SAB'S ID. Therefore the SAB will show up in the inputs section as well as in the outputs. It's status telegram will show up in the inputs, the new position telegram will be sent from the outputs.

To teach in a SAB valve actuator press the SAB's LEARN-button first. SAB will show up in the sensor list (icon with an arrow pointing from valve (the left) to the right. Drag this icon into the STC-BACnet's input window.
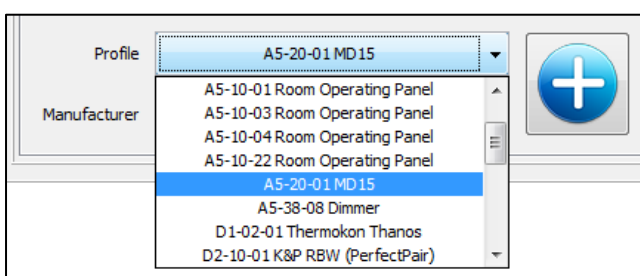
Select the tab "outputs" and select a SAB type telegram (A5-20-01 MD15) from the drop-down list and add it to the output list.

Right click on the SAB-output's icon, select **<Destination / MsgServer>** and choose the ID of the desired SAB, the MSG-Server function shall be activated for. This must be the same ID that has been dragged into the Inputs section in Step 1.
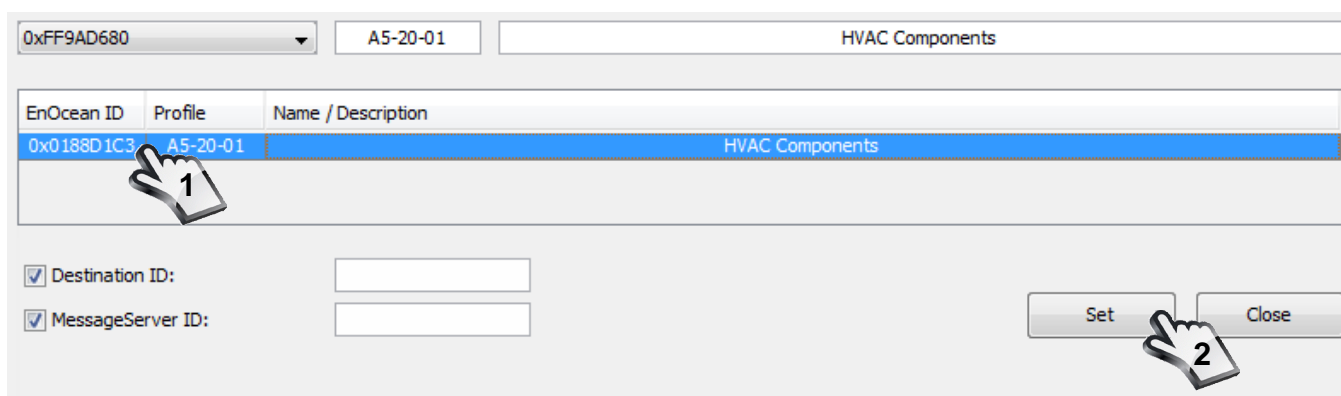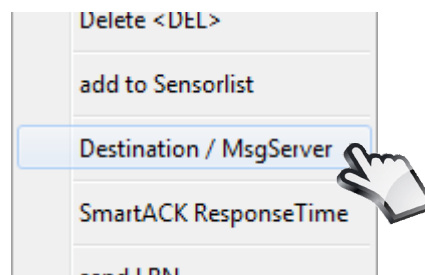
The Message Server does forward data to a particular SAB only, which is done by using addressed telegrams. The address must be set by selecting Destination and the ID of the SAB valve actuator.

Finish the configuration by transferring it to the STC-BACnet. Click right onto the BACnet symbol and choose **<Send configuration>**. If the configuration process is completely finished, end the session with **<End LEARN mode>**.

Finally the STC-BACnet IP and the SAB05 need to exchange their LRN messages. Load the configuration of the STC-BACnet IP (clicking right onto the STC-BACnet IP symbol -> **<Request configuration>**).

Select the SAB05/MSG-Server symbol in the Outputs Tab and select **<send LRN>**. Press the SAB05's LRN button which will confirm the teach-in acoustically with 2 friendly beeps and blinking twice with its green LED.

BACnet data points follow the sensor definition in the EEPs, which are assumed to be known in detail. Data points will be generated automatically in the order of being dragged into the inputs tab or the order of their generation in the output tab.

The numbers in brackets indicate the starting index of each data point. Each sensor or device starts at a multiple of 1000. Outputs will be found from 1.000..128.000, inputs start at 129.000.

MSG-Server – bidirectional Teach In thanos
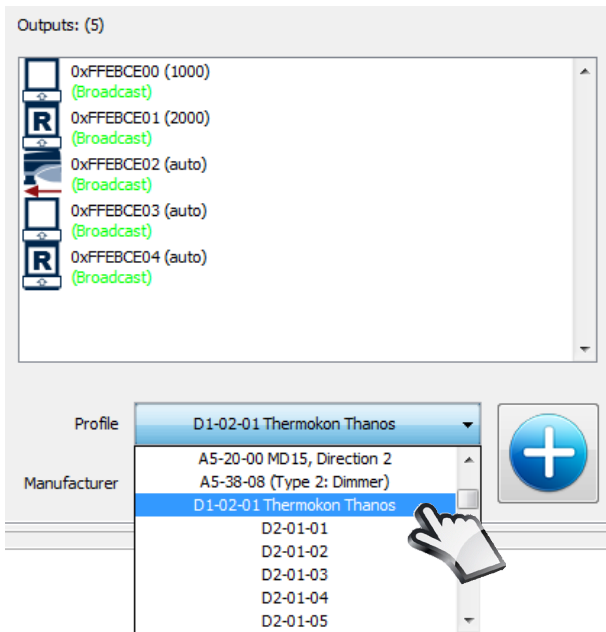
thanos does require a bidirectional teach-in as well to receive data from thanos but to change settings in thanos as well. Select thanos in the output section and add it to the outputs. You will see that 2 icons will be created, one for requesting data and one for sending commands to thanos.

Right Click on the STC-BACnet IP icon and send the configuration to the gateway.
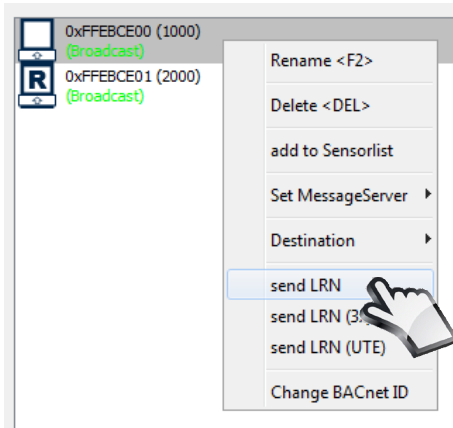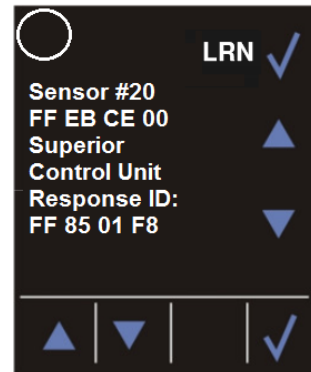
To finalise the teach-in process enter thanos' configuration menu by pressing the 2 buttons in opposite corners (i.e. lower left and upper right) for a few seconds. Browse to the menu to reach the teach-in of sensor #20 (Superior Control Unit):

Press LRN to set thanos into LRN mode. To send a LRN telegram from STC-BACnet IP right click on the thanos output icon (the one w/o the R (equest)) and select **<send LRN>**.

Thanos immediately will answer with its ID, which will be shown in thanos display and will be added to the sensors list of airConfig.

Drag the thanos icon from the sensor list into the inputs window to create BACnet data points for the data sent by thanos via radio.
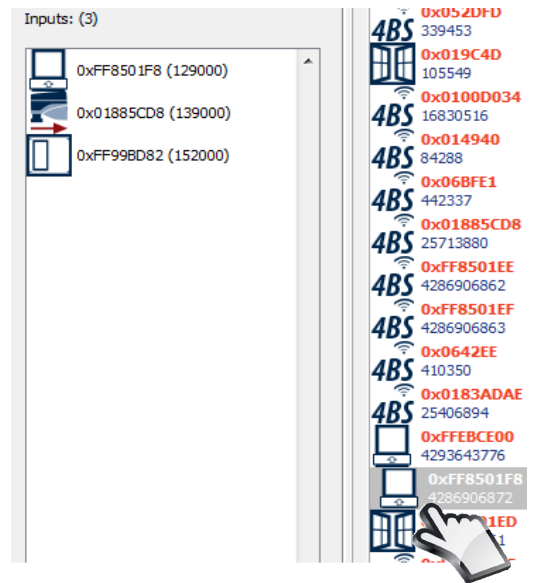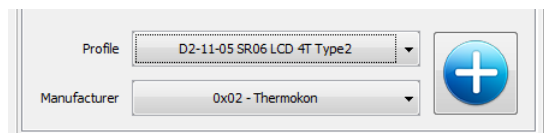
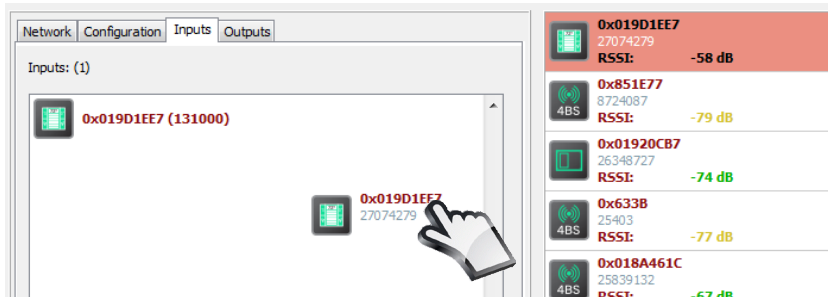## SmartACK – bidirectional Teach In SR06LCD

The learn-in process is carried out in both directions.

Activate SmartACK via airConfig:

or with the configuration software.

For the learn-in process press shortly the LRN-button. The EasySens room operating panel will be displayed in the sensorlist. Drag this symbol in the inputs.

Select the appropriate profile on the „Outputs" tab. Add the profile to the "outputs" using the blue plus symbol.

The output channel only sends data to specific participants, using addressed telegramms. A click with the right mouse button on the output datapoint opens the context menu. Select the **<Destination / MsgServer>** entry from the menu and activate the desired destination address. This should be the same address, which has been drawn in the input channel.
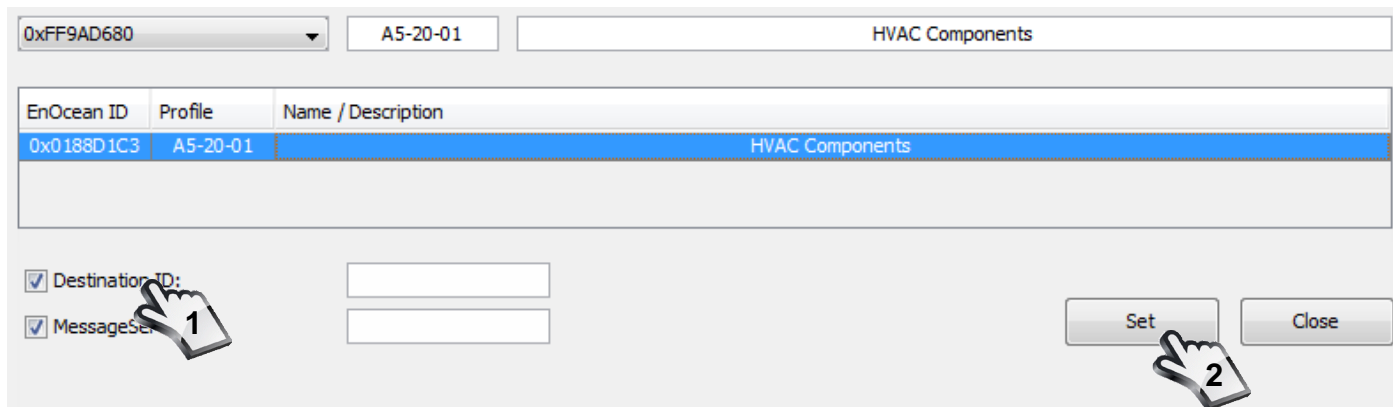
Send the new configuration to the BACnet IP Gateway. A click with the right mouse button on the device symbol opens the context menu. Select the **<Send configuration>** entry. A restart of the device is not required. When the configuration process is completed, the configuration session has to be closed with the **<End LEARN mode>** entry.

A click with the right mouse button on the output datapoint opens the context menu. Select the **<SmartACK Response Time>** entry from the menu and activate the desired destination address.

The waiting period between data and reclaim telegram is defined with the response time. SR06 LCD has a fixed response time of 200 ms.
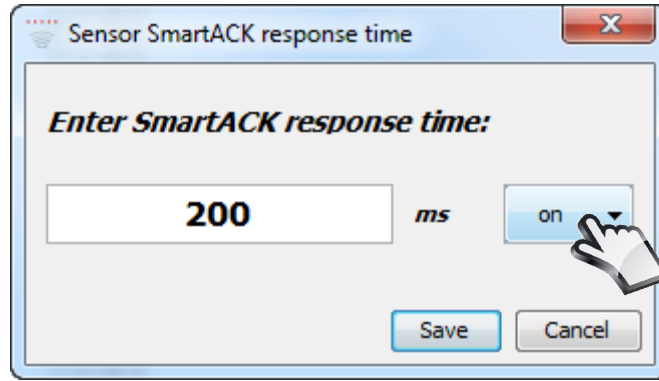
Sensor SmartACK response time

Enter SmartACK response time:

| 200 | **ms** | on ▾ |

Save   Cancel

Send the new configuration to the BACnet IP Gateway. A click with the right mouse button on the device symbol opens the context menu. Select the **<Send configuration>** entry. A restart of the device is not required. When the configuration process is completed, the configuration session has to be closed with the **<End LEARN mode>** entry.
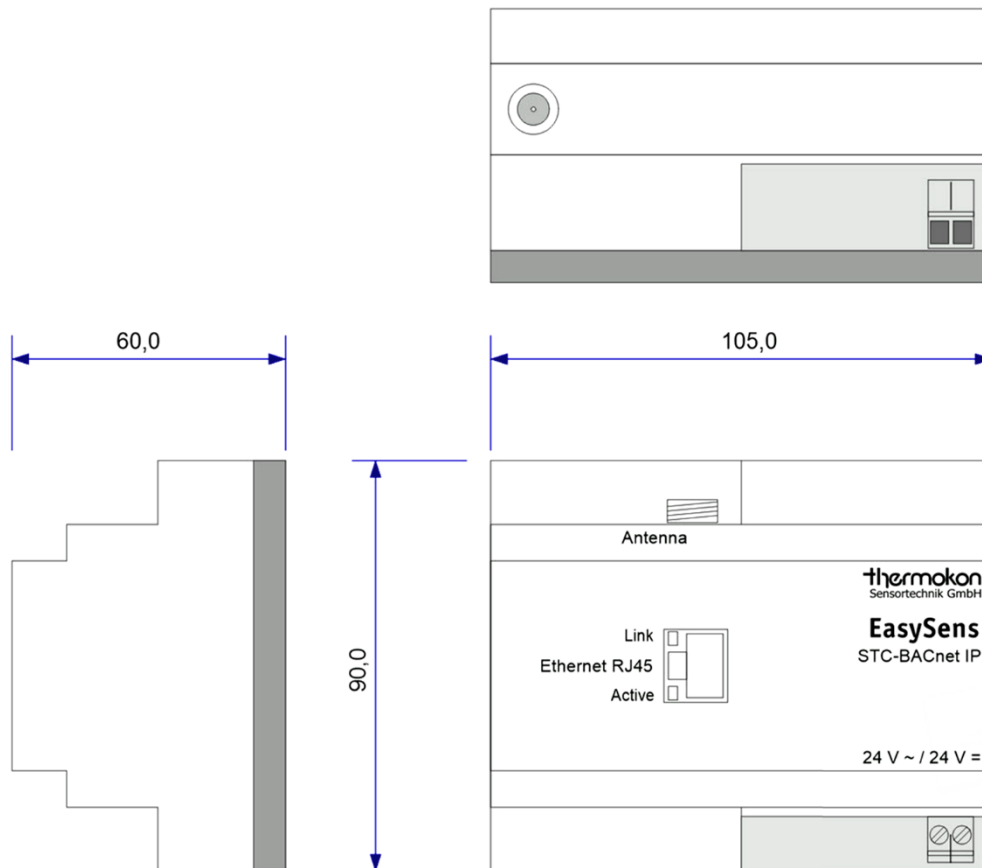
SmartACK:

For more information about the function, please download from the following link.

http://www.thermokon.de/download-archive/Kataloge_Preise_Infos/Allg.%20Dokumente/Informationen/SmartACK-Info_en.pdf

Dimensions (mm)

60,0   105,0   90,0

Antenna

thermokon
Sensortechnik GmbH

EasySens
STC-BACnet IP

Link
Ethernet RJ45
Active

24 V ~ / 24 V =

Accessories (optional)

Antenna extension 10 m	Item No. 257206
Antenna extension 20 m	Item No. 257213
Magnetic antenna holder form L, 180x180 mm	Item No. 255097
EnOcean USB transceiver for airConfig/airScan (incl. license)	Item No. 566704