STC-DO 902 MHz

Multifunctional transceiver with relay output

thermokon®
HOME OF SENSOR TECHNOLOGY

Datasheet

Subject to technical alteration
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»APPLICATION

AirConfig tool is mandatory for STC-DO!
All settings must be programmed using airConfig.

Multi-functional transceiver with relay output, programmed and commissioned using Thermokon's airConfig software in combination with a USB-transceiver (i.e. from airScan field test tool). The STC-DO can be configured for:

- Radiator-thermostat with 2-point control
- Radiator thermostat with modulating control and PWM output for thermal actuator
- Cooling thermostat with 2-point control
- Cooling thermostat with modulating control and PWM output for thermal actuator
- Heating/Cooling thermostat with change-over and 2-point control
- Heating/Cooling thermostat with change-over and modulating control and PWM output for thermal actuator
- Lighting Controller
- Humidistat (2-point controller for humidity)
- 2-point controller based on various sensor signals (special applications)

This product is intended for use as part of an automation solution for (functional) buildings. It transmits sensor data within a building over short distances unencrypted by radio to suitable receivers. No personal data or location data is transmitted.

The product cannot communicate directly with the Internet and is not intended for applications that use the Internet to forward unprocessed sensor data. Automation stations that forward data via the Internet, e.g. to visualise the building status, must ensure that the data to be forwarded is encrypted as required by law.

»POLLUTION DEGREE

The assessment of the devices depends on the ambient conditions. Possible contamination and moisture influence the possible conductivity rsp. the isolation capacity of the surface. The degree of pollution has an influence on the construction of the component over the creepage distance. The degree of pollution is defined for open unprotected isolation based on the environmental conditions.

The STC-DO switching actuators are designed according to the pollution degree 1.
Extract from DIN EN 60 664-1 (VDE 0110-1), para. 4.6.2
Pollution degree 1: No pollution or only dry, nonconductive pollution occurs. The pollution has no effect.

»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.

CAUTION! Risk of electric shock due to live components within the enclosure, especially devices with mains voltage supply (usually between 90..265 V).

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

The crossed-out wheelie bin symbol indicates that the product or removable batteries must not be disposed of with household or commercial waste. Within the EU, you are legally obliged to dispose of the product separately and appropriately in accordance with the national laws of your country. Alternatively, please contact your supplier or Thermokon Sensortechnik GmbH. Further information can be found at: www.thermokon.com

»PRODUCT TESTING AND CERTIFICATION

Declaration of conformity
The declaration of conformity of the products are available on our website
https://www.thermokon.de/direct/en-gb/categories/stc-do

»INFORMATION ABOUT EASYSENS® (RADIO) / AIRCONFIG GENERAL USAGE

EasySens® - airConfig
Basic information about EasySens® radio and about general usage of our airConfig software, please download from our website.

»OVERVIEW OF THE RADIO TELEGRAMS

EEP
The structure of the data contained in the telegram can be found in the EEP (EnOcean equipment profile) list provided by the EnOcean Alliance. http://www.enocean-alliance.org/eep/

»TECHNICAL DATA

Output switch contact	change-over contact, isolated, load max. 10A
Radio technology	EnOcean (IEC 14543-3-10), transmission power <10 mW
Frequency	902 MHz
Antenna	internal Antenna
Power supply	100..240 V ~
Power consumption	typ. 0,5 VA (100..240 V ~)
Enclosure	ABS, red, flush mounted standard EU box
Protection	IP20 according to EN60529
Connection electrical	Terminal block , max. 1,5 mm²
Ambient condition	-20..+60 °C, max. 85% rH, non-condensing
Weight	55g
Notes	up to 20 sensors can be learned in

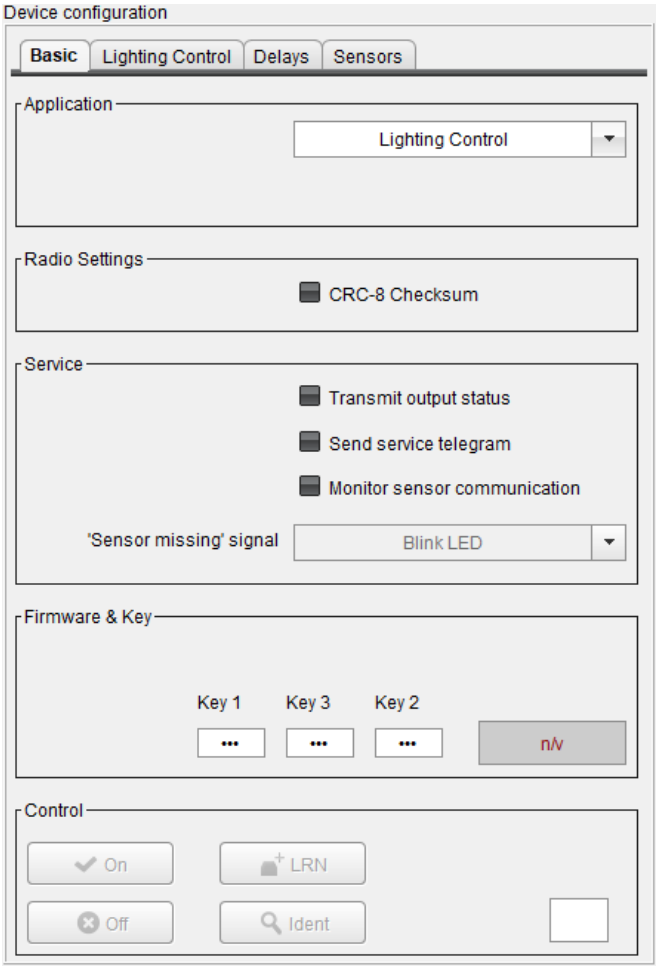
» OVERVIEW OF SUPPORTED RADIO TELEGRAMS

Depending on the configuration of the device, different EEPs are supported. The application is set via the configuration software airConfig.

	Heating	Cooling	Heating and Cooling	Lighting	Humidistat	Special
EEP F6-02-01 .. -03 Rocker Switch, 2 Rocker	•	•	•	•		•
EEP F6-03-01/ -02 Rocker Switch, 4 Rocker	•	•	•	•		•
EEP F6-04-01 Key Card Activated Switch	•	•	•			
EEP D5-00-01 Contacts and Switches	•	•	•			•
EEP F6-10-00 .. -01 Mechanical Handle	•	•	•			•
EEP A5-02-01 .. -1B Temperature Sensors	•	•	•			•
EEP A5-04-01 .. -03 Temperature and Humidity Sensor	•	•	•		•	•
EEP A5-06-01 .. -05 Light Sensor						•
EEP A5-07-01 .. -03 Occupancy Sensor	•	•	•			
EEP A5-08-01 .. -03 Light, Temperature and Occupancy Sensor	•	•	•	•		•
EEP A5-09-02/ -04 Gas Sensor	•	•	•			•
EEP A5-09-08/ -09 Gas Sensor						•
EEP A5-10-01 .. -09 Room Operating Panel	•	•	•			•
EEP A5-10-0A .. -0D Room Operating Panel	•	•	•			•
EEP A5-10-10 .. -14 Room Operating Panel	•	•	•		•	•
EEP A5-10-18/ -19 Room Operating Panel	•	•	•			•
EEP A5-10-1A .. -1D/ -1F Room Operating Panel	•	•				•
EEP A5-10-22/ -23 Room Operating Panel	•	•	•		•	•
EEP A5-20-12 Temperature Controller Input	•	•	•			
EEP A5-30-01/ -02 Digital Input	•	•	•			
EEP A5-14-01/ -03 Multi-Function Sensor	•	•	•			
EEP A5-14-02/ -04/ -06 Multi-Function Sensor	•	•	•			•

Transmitting-EEP (Service)						
EEP A5-11-02 Controller state	•	•	•			
EEP A5-30-02 Relay state				•	•	•

» BASIC CONFIGURATION



» Application

In the 1st tab <**Basic**>, the <**Application**> must be selected using the drop down menu. Depending on the selected application airConfig will offer additional tabs to configure the device.

The airConfig screen can be set to display temperatures in °F or °C. However the radio transmission will be done in °C only, according to the IEC standard 13543-3-10. (airConfig will automatically convert all settings from °F to °C).

» Radio Settings

<CRC-8 Checksum> adds the checksum to the output status telegram sent by the STC-DO. The CRC-8 detects 1-bit transmission errors. This function is compatible with any EnOcean receiver.

» Service

When **<Transmit output status>** is ticked, STC-DO will generate a telegram whenever the output status changes. For heating, cooling or heating/cooling A5-11-02. The other applications use the EEP A5-30-02.

<Send service telegram>: independently of the output state it will generate a telegram every 15 minutes with the A5-11-02 or A5-30-02 EEP.

If **<Monitor sensor communication>** is ticked, STC-DO will indicate a missing telegram either by a blinking LED or by switching the relay on and off periodically if telegram has been not been received for more than 90 minutes.

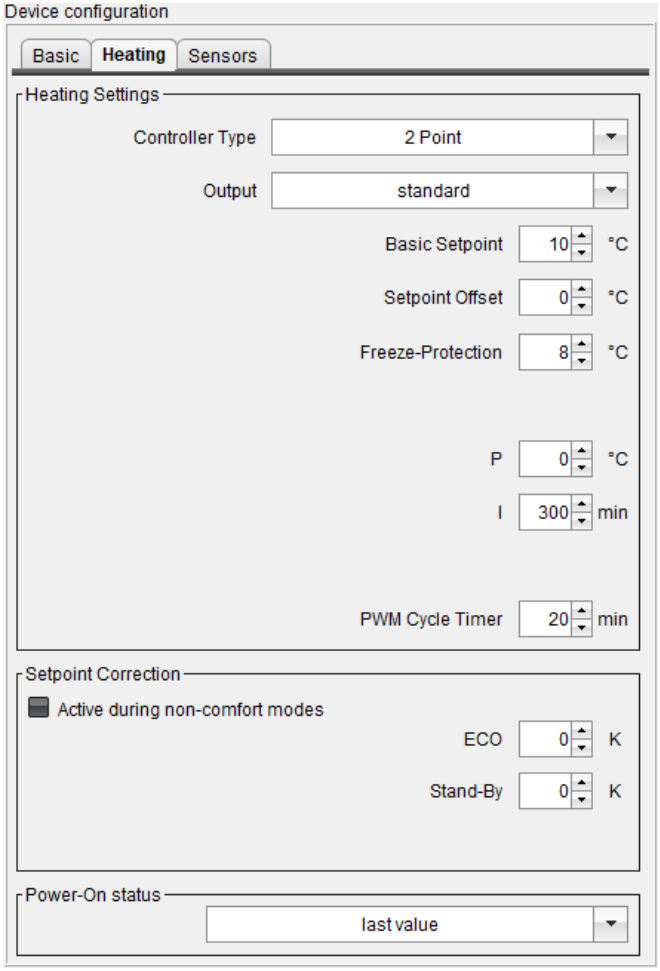
» Firmware & Key

Key 1-2-3 allows the user to input a 3x8 Bit - PIN Code (000….255) to secure the configuration. Default PIN is 000-000-000

In case of a lost PIN code the device´s configuration is secured and can not be reset or modified and should be replaced with a new unit if changes are required.

LRN generates the LRN-Telegram to learn in the output status telegram into a gateway, i.e. to process the output status using in the BMS.

» APPLICATIONS, “HEATING”, “COOLING” AND “HEATING & COOLING”



» Heating Settings

<Controller Type> can be set to 2-point control or proportional control (PI-loop) with PWM for thermal actuators.

The output can also be inverted.

<Basic Set point> defines the centre position of a dial type setpoint adjuster

<Setpoint Offset> is the range by which the user can shift the setpoint up or down.

<Freeze-Protection> is the threshold to automatically turn on “heating” mode independently of the set point, for frost protection of pipes.

Controller’s PI-loop is characterized by parameter **P** (proportional band) and **I** (Integration time)

The PI loop‘s output will be converted to a **PWM** (pulse width modulation) signal based upon a cycle time representing the control variable of 100%. Controlled by occupancy sensors the Set point can be lowered to **ECO** or **Stand-by** mode

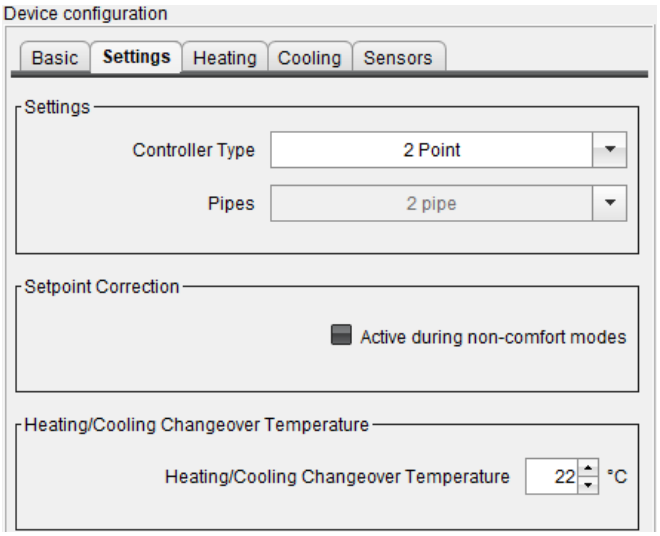
» Setpoint Correction

With a switch, keycard switch or occupancy sensor the mode can be switch from **Standby** to Comfort and vice versa. The SRxx-MS’ sliding switch (EEP: A5-10-06) or the SR65-DI (EEP: A5-30-02) can also switched to **ECO** mode.

» Power-ON status

Restarting after a power failure STC-DO will start with a pre-defined status (ON or OFF) or will restart with the last status before the power failure. Once the room sensor’s telegram is received again, the control loop will be updated back to the last program setting.

» APPLICATIONS HEATING & COOLING” WITH CHANGE-OVER



» Settings

The application heating & cooling supports 2-pipe configuration with change over sensor (i.e. SR65 VFG) only.

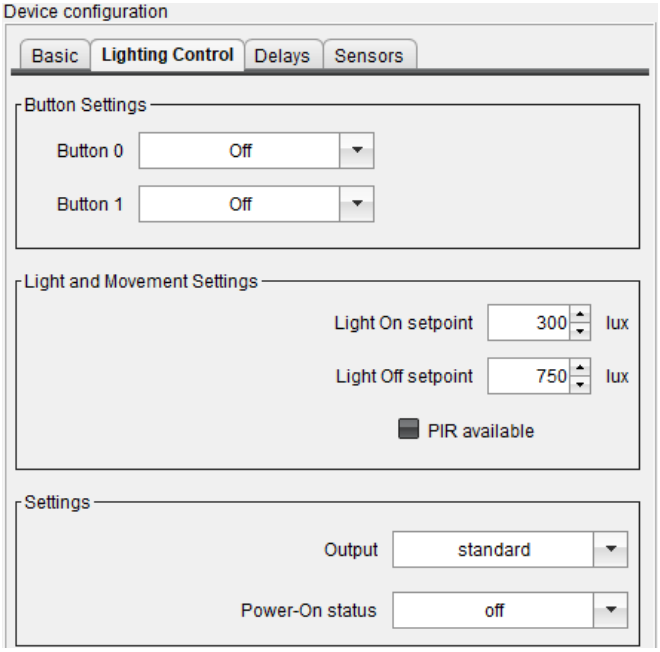
» Setpoint Correction

Set point offset will usually be used in Comfort mode only, however by ticking **<Active during non-comfort modes>** the set point offset will be always used.

» Heating/Cooling Changeover Temperature

If the pipe temperature sensed by the SR65 VFG exceeds the threshold “Heating“ mode will be activated. If the pipe temperature is lower “Cooling“ mode will be activated.

» LIGHTING APPLICATIONS



Any side of a rocker can be configured to work as ON, OFF, Switch (Toggle), Switch (Pulse), push button pressed or push button released.

OFF Switches the relay (permanently) Off.

ON switches the relay (permanently) On.

Switch (Toggle) realizes a 1-button operation: ON-OFF-ON-…

Switch / Impulse activates the relay for 5 s.

Push button **Pressed** activates the relay as long as the switch's rocker is pressed. (dead man's switch)

Push button **Released** activates the relay until the switch's rocker is pressed.

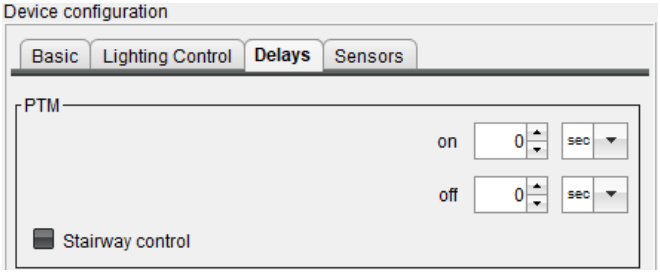
If an SR-MDS is assigned, the relay can be controlled by the brightness sensed by the SR-MDS. If the brightness is below the **Set point** the relay will be turned on. If the brightness exceeds Set point the relay will be turned off. This can be activated by ticking box **PIR available**.

The output can be optionally inverted if required.

The relay's status is indicated by the LED, which is lit while the relay is ON.

Restarting after a power failure STC-DO will start with a pre-defined status (ON or OFF) or restart with the last status/operation before the power failure.

» ON / OFF DELAY | STAIRS CONTROL

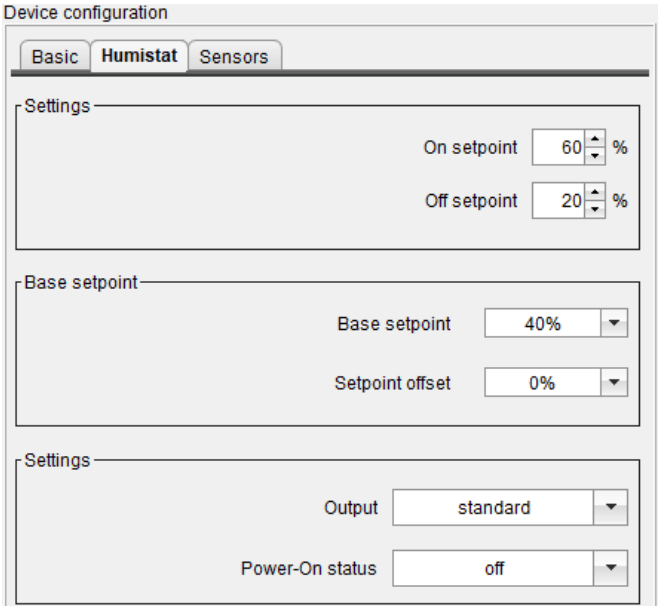


» PTM

For a learned-in switch (PTM), an on / off delay can be set.

If the **<stairway control>** is switched on, the relay is switched off for 10 seconds before the follow up time expires and then switched on again for the last 30 seconds.

»APPLICATION “HUMIDISTAT”



» Settings

Humidistat application is a 2-point control of the relative humidity using a rH-sensor (EEPs: A5-04-01 or A5-10-10/11/12)

If a sensor without a set point dial is used (SR04 rH) the fixed **Settings** will be used: If the rH sensed exceeds the **ON set point**, the relay will be turned on. Once the rH value drops below the **OFF set point** the relay will be turned off.

» Base setpoint

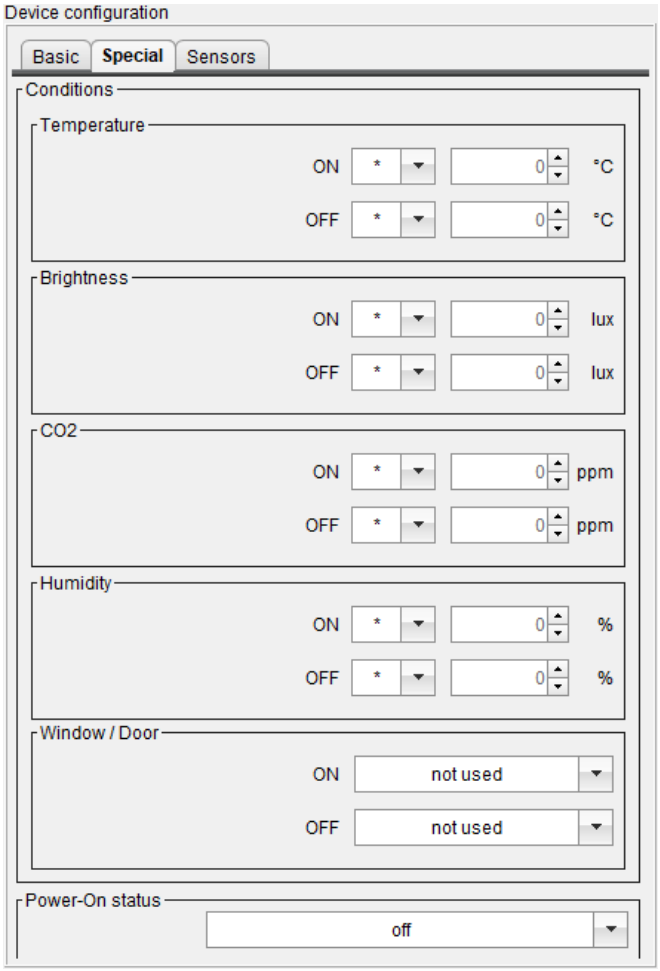
When using a sensor with a set point, i.e. SR04P rH the threshold will be calculated from the **base set point** plus the set point dial’s position received from the sensor. The parameter **On Setpoint‘**, and **Off Setpoint** will not be used in this case. If the rH sensed exceeds the sum of **Base set point** plus **set point shift** received from the sensor, the relay will be turned on. Once the rH value drops below the threshold the relay will be turned off.

» Settings

The output can be optionally inverted. The relay’s status is indicated by the LED, which is illuminated while the relay is ON.

Restarting after a power failure STC-DO will start with a pre-defined status (ON or OFF) or restart with the last status before the power failure.

»APPLICATIONS: SPECIAL



» Conditions

Custom programmable applications using 2-point control based on temperature, brightness, CO2, relative humidity or window status. Custom programs can be selected: “more – less – equals“ can be selected in combination with a threshold to turn on or off the relay. To delete a threshold „*“ must be chosen. If multiple condition are defined the last condition processed will control the relay.

I.e.: Condition CO_2 ON > 1200ppm and Humidity OFF > 70%. Sensor-data received: 1400ppm and 73%rh. The first condition (CO_2 ON > 1200ppm) is correct and the 2nd condition (Humidity OFF > 70%.) is also correct. The Humidity condition will be processed after the CO2 condition and the relay will stay off.

» Power-ON status

Restarting after a power failure, STC-DO will start with a pre-defined status (ON or OFF) or restart with the last status before the power failure.

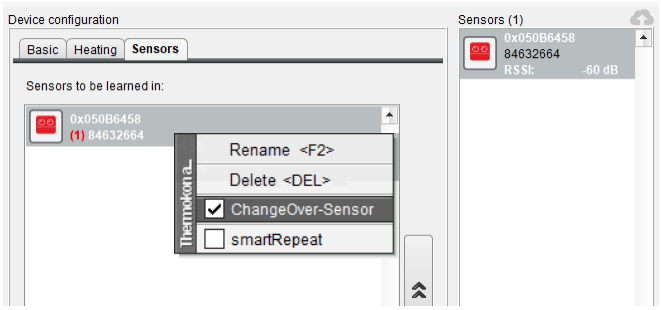
Example: Windows/Door

When the window is opened, the relay switches on.

ON **[open]**

OFF **[closed]**

»LEARN-IN OF SENSORS



Sensors and devices, within range, are listed on the right side of airConfig. To learn in a specific sensor simply drag and drop the (activated) symbol into the sensors input tab of the STC-DO. The Sensor‘s (EEP) type must be known to be assigned correctly through activation of the sensor or switch. The sensor type is coded in the EEP, which is included in the sensor’s LRN telegram.

Right-clicking on the symbol of the SR65-VFG temperature sensor offers the option to declare this as the change-over sensor, which airConfig indicates by red arrows in a circle.

»SUPERIOR CONTROLLER PROFILE A5-20-12 FOR HEATING / COOLING / VENTILATION

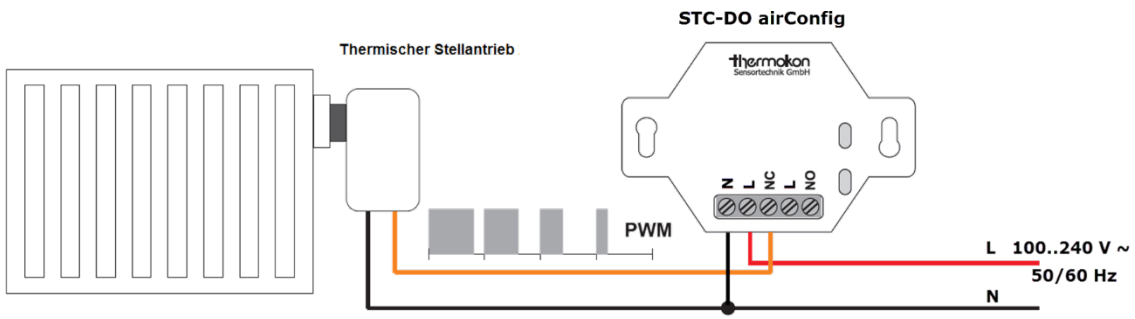
The local control loop can be overwritten by the BMS using the superior controller profile EEP A5-20-12. The BMS through a bidirectional gateway such as the LON, Modbus or BACnet gateway will be taught in as shown above. It Because of the special EEP it will override and priority control compared to the local control loop.

To return the control to the local loop the BMS must set back all changes to the default value (send 00-FF-80-08$_{hex}$ (DB3..DB0)). STC-DO will monitor the superior Controller profile telegrams, same as any other sensor signal. If a signal is not received for more than 90 minutes the control will be shifted back to the local control loop and replacing the previously received data from the BMS.

Send Configuration

Finally to transfer the configuration made through “airConfig”, right-click on the STC-DO’s symbol and select the context menu „send configuration“

»ELECTRICAL CONNECTION



»DIMENSIONS (INCH)

