optimus solutions

Product Manual

KNX Automation Switch

OPT-SSxxxx-yyy

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About this document

This document provides detailed technical information on the function, installation and programming of the OPT-SSxxxx-yyy-… device.

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1 Product Desciption

The OPT-SSxxxx-yyy product group defines the family of button switches. This family includes models with up to 8 independent buttons in 3 different sizes. All products come standard with a temperature sensor and thermostat function, and models with displays feature an LCD touch screen at the top. Some models also include air quality and humidity sensors. To enhance the touch effect, a buzzer is equipped. The buttons have two colored status indicators, which can be programmed independently on both sides of the button. It is equipped with many features that can meet the automation needs of a space.

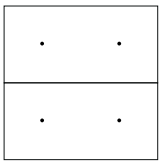
The device is mounted in a standard round box using an adapter piece included in the package. Installation should be carried out by an electrical technician or an expert following the installation diagram. To set up and commission the device, ETS version 5 or higher software is required. The necessary library file can be obtained online or from the website. The device should be commissioned by KNX experts.

1.1 Product Models

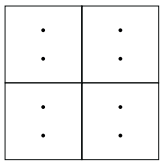
The product code is defined as OPT-SSxxxx-yyy. The part starting with SS and ending with xxx: D, 1, 2, or 3 indicates the button configuration of the product. You can access the color code list from the order codes section.

SSD100 (80x80)
1 Gang 2 Button
with Display

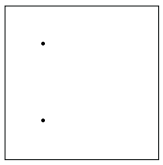
SSD200 (80x80)
2 Gang 4 Button
with Display



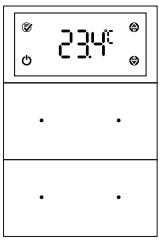
SS1100 (80x80)
2 Gang 4 Button



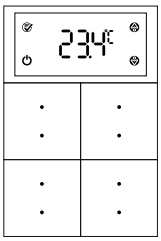
SS2200 (80x80)
4 Gang 8 Button



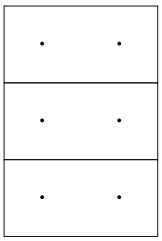
SS3300 (80x80)
1 Gang 2 Button



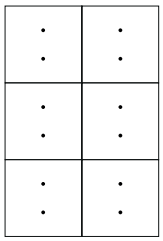
SSD110 (80x120)
2 Gang 4 Button
with Display



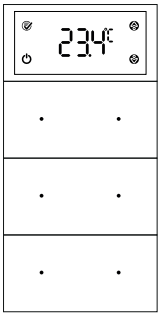
SSD220 (80x120)
4 Gang 8 Button
with Display



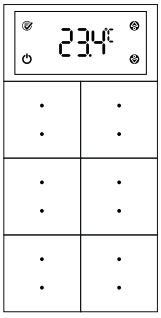
SS1110 (80x120)
3 Gang 6 Button



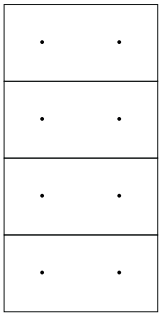
SS2220 (80x120)
6 Gang 12 Button



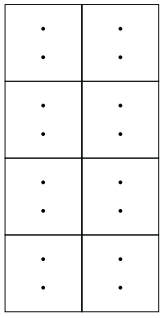
SSD111 (80x160)
3 Gang 6 Button
with Display



SSD222 (80x160)
6 Gang 12 Button
with Display



SS1111 (80x160)
4 Gang 8 Button



SS2222 (80x160)
8 Gang 16 Button

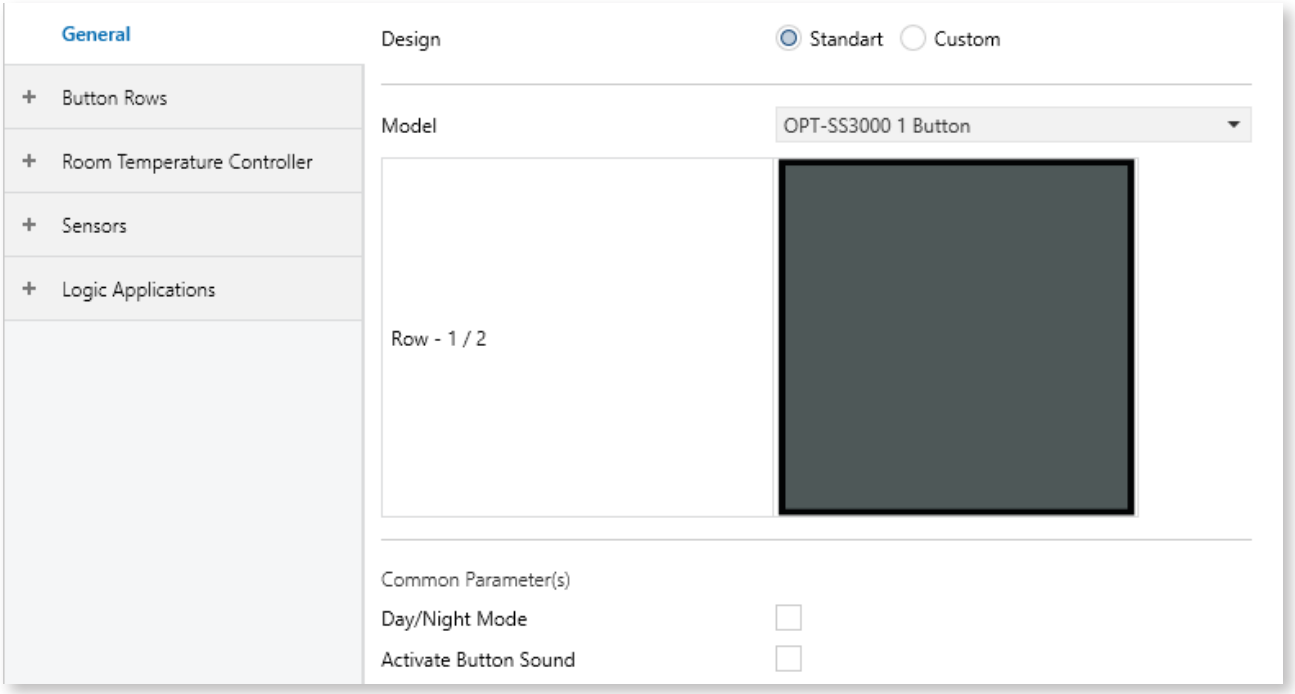
1.2 Product Accessories

The product has no accessories. The mounting adapter for the standard round box is included in the package, and the switch is mounted by fitting into this adapter.

1.3 Technical Specifications

Supply Voltage	21-30VDC
KNX Current Consumption	10 mA
KNX mode	TP-S Mode
Connection	KNX Connection Terminal
Protection Class	IP20 (Interior)
Mounting	Flush mounting (On a standard mounting box)
Temperature Range	Operation -5...+45°C Storage -25...+55°C
Dimensions 80 x 80 80 x 120 80 x 160	(W x H x D) 80 x 80 x 35 mm 80 x 120 x 35 mm 80 x 160 x 35 mm
Weight 80 x 80 80 x 120 80 x 160	Net - Gross 85 g - 122 g 113 g - 160 g 142 g - 200 g
Housing	ABS V2
Certificate	CE

2. Device Parameters



2.1 General

2.1.1 Design

Device includes two design type: Standard and Custom. By selection of Standard, one of the predefined design type can be selected. By selection of Custom, user can customize button layout.

2.1.1.1 Standard

This selection includes predefined button layouts. One of them can be selected and ordered easily.

2.1.1.1.1 Model

Includes Standard model types.

2.1.1.2 Custom

User can customize button layout according to needs.

2.1.1.2.1 Base

In Custom type, physical dimension of the device is selected.

2.1.2 Common Parameters

2.1.2.1 Day / Night Mode

This parameter is used to change brightness of status indicators (LED). By activation of this parameter, brightness of LED indicators are decreased by using Group Object Day/Night Mode.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
1	General	Day \ Night Mode	Input	1bit	1.024	C	-	W	-

Table 1: Day / Night Communication Section Objects

2.1.2.2 Activate Button Sound

This parameter is used to enable/disable buzzer sound to inform button pressing feedback.

2.1.2.3 Control RTC with Row – 2

When this parameter is enabled, the functions of the following four buttons on the thermostat display are also assigned to the buttons on Row–2:

Menu Button – (No: 8)

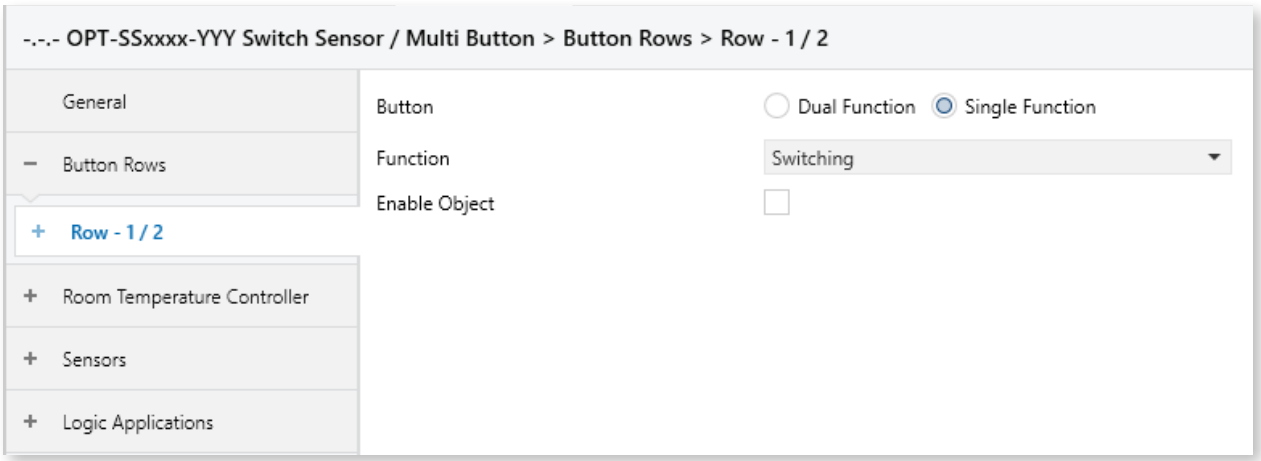
Programmable Button – (No: 6)

Selection Button (▲) – (No: 1)

Selection Button (▼) – (No: 1)

In this case, the buttons on Row–2 and these buttons on the display operate in parallel; the same command is sent regardless of which side is used.
When the parameter is disabled, the Row–2 buttons can be configured independently and used for functions other than the thermostat controls.

2.2 Button Rows



2.2.1 Button

2.2.1.1 Single Function

This parameter is used to use buttons on same row with same function.

2.2.1.2 Dual Function

This parameter is used to use seperated functions for each button.

2.2.2 Enable Object

This parameter is used to enable/disable function of the button by Group Object Enable.

2.2.2.1 Enable With

The "Enable With" object is used to determine the method of using this object. If “OFF Telegram” is selected, the channel becomes Enable when the value “0” is sent to the event object (Enable) of the relevant channel; If “ON Telegram” is selected, the channel is activated by sending “1” value to the same object.

2.2.2.2 Initial Positions

It is the option where the Enabled or Disabled selection is made when the device starts to work.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
x	Row – x	Enable	Input	1bit	1.003	C	-	W	-

Table 2: Enable Communication Object

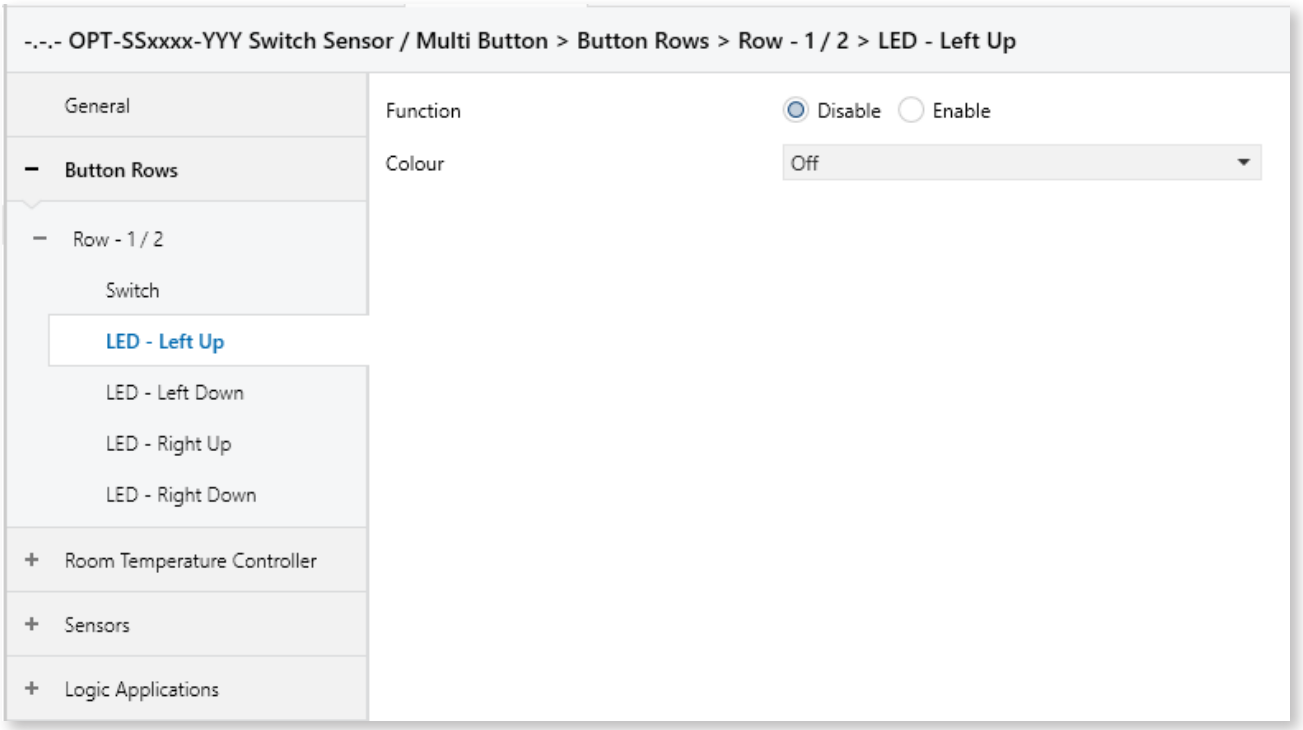
2.2.3 Function

2.2.3.1 LED-X

2.2.3.1.1 Function

You can use this setting to enable or disable LED control. The "Enable" option turns on the LED feature, allowing the LEDs to operate with the selected color and other settings.

2.2.3.1.1.1 Disable

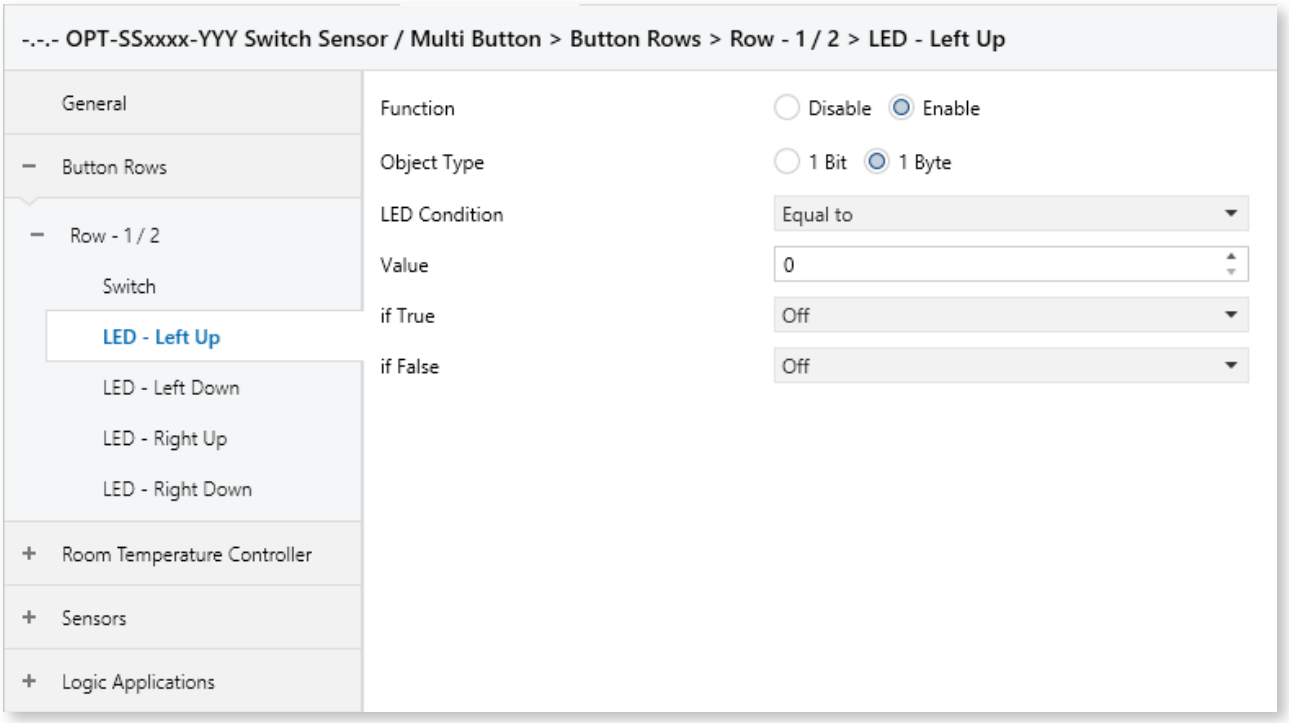


The "Disable" option completely turns off LED control, preventing the LEDs from lighting up based on the current state. In this case, the LEDs will not be Enable, and color settings will be invalid.

2.2.3.1.1.1.1 Colour

You can customize the appearance of the LED by selecting a color here. Available color options include Off, Red, Green, Blue, Yellow, Purple, Turquoise, and White. From the drop-down menu below, you can select the desired LED color to determine how the LED will visually appear.

2.2.3.1.1.2 Enable



The "Enable" option turns on the LED control feature, allowing the LEDs to operate with the selected color and other settings.

2.2.3.1.1.2.1 Object Type

You need to select the object type to determine the operating conditions of the LED. The "1 Bit" option typically provides simple status control using single-bit data, allowing the LED to be controlled in just two states (on/off). The "1 Byte" option uses eight-bit data to offer more information and precision, enabling the LED to be controlled under more complex conditions.

2.2.3.1.1.2.2 LED Condition

You can define the conditions under which the LED will light up. The "Equal" option activates the LED when it equals a specific value. The "Greater" option lights the LED if the value is greater than the specified value. The "Lesser" option activates the LED if the value is less than the specified value. Additionally, the "Between Value 1 and Value 2" option lights the LED when a condition between the two specified values is met. These conditions determine under what circumstances the LED will be Enable.

2.2.3.1.1.2.3 Value

You need to enter the value required for the condition that determines whether the LED will be Enable. This value is the numerical value necessary for the LED to meet a specific condition and is used in conjunction with the chosen LED condition.

2.2.3.1.1.2.4 If True

You can use this setting to determine the color the LED will light up when the condition is met. Options include Off, Red, Green, Blue, Yellow, Purple, Turquoise, and White. When the condition is true, you can select one of these colors for the LED. This setting customizes the visual response of the LED when the condition is met.

2.2.3.1.1.2.5 If False

You can use this setting to determine the color the LED will light up when the condition is not met. Available color options include Off, Red, Green, Blue, Yellow, Purple, Turquoise, and White. When the condition is false, you can select one of these colors for the LED. This setting customizes the visual response of the LED when the condition is not met.

2.2.3.1.1.2.5.1 Brightness

You can use this parameter to adjust the brightness level of the LED. This setting determines the brightness level of the LED.

2.2.3.1.1.2.5.2 Brightness If Night

This parameter is used to adjust the brightness level of the LEDs on the device for night mode. It works in integration with the Day/Night Mode feature. The brightness function selected from the list is performed with the information received from the related object.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
x	Row – x	LED Input	Input	1bit	1.002	C	-	W	-
				1byte	5.010	C	-	W	-

Table 3: LED-X Communication Object

2.2.3.2 Switching

Switching refers to the actions of turning the device on, off, or changing its state. Users can perform various operations by pressing buttons or holding them down.

2.2.3.2.1 Press

Short press is the action triggered when the user briefly presses the button. This is typically used to turn the device on, off, or change its state. When the relevant button is pressed, telegrams selected from the list are sent from the corresponding object. Off Telegram, On Telegram, On-Off Changer. For example, when "On-Off Changer" is selected, each press of the button changes the device's state. The first press sends the "On" telegram, the second press sends the "Off" telegram, and this cycle continues.

2.2.3.2.2 Long Press Detection

Long press detection refers to the actions triggered when the button is held down for an extended period. This allows different telegrams to be sent when pressed for a specific duration. When this parameter is activated, the following parameters are available

2.2.3.2.2.1 Long Press

Refers to the action that occurs when the button is held down for a specific period.

2.2.3.2.2.2 Long Operation Duration

The parameter that determines the duration of the long press. The user can select this time from 250ms to 10s from the list.

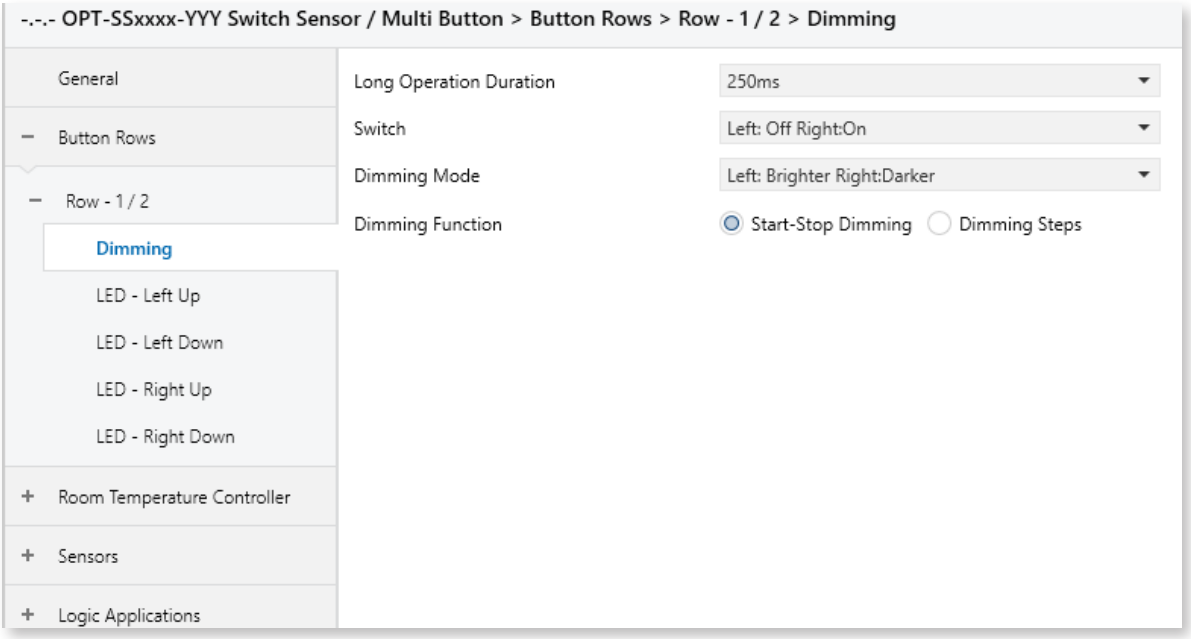
2.2.3.2.2.3 Long Press Communication Object

Refers to the telegrams sent using a specific communication object during a long press operation. This parameter enables distinguishing between long and short press actions using two separate group objects.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
x	Row – x	Switch	Input/Output	1bit	1.001	C	-	W	T
x	Row – x	Long Press	Input/Output	1bit	1.001	C	-	W	T

Table 4: Switching Communication Object

2.2.3.3 Dimming



Dimming is a process used to adjust the light level. Users can increase or decrease the illumination level by pressing the button briefly or holding it down. The dimming process can be customized using various parameters and settings.

2.2.3.3.1 Long Operation Duration

Determines the minimum duration to be detected during a long press operation. When the user holds the button down for this period, the long press operation is triggered. This duration is the minimum time required to start the dimming process. For example, if this time is set to 2 seconds, the dimming process starts when the user holds the button down for at least 2 seconds.

2.2.3.3.2 Switch

Determines the switching telegrams to be sent during the dimming process. When the user presses the button, the specified telegram is transmitted via the data bus. Off Telegram, On Telegram, On-Off Changer. For example, when "On-Off Changer" is selected, each press of the button changes the device's state. The first press sends the "On" telegram, the second press sends the "Off" telegram, and this cycle continues.

2.2.3.3.1.3 Dimming Mode

Determines the mode in which the dimming process will be performed. The user can select these modes to determine how the dimming process will be carried out. When "Brighter" is selected, pressing the button makes the light brighter. When "Darker" is selected, the light becomes darker. In the "Brighter/Darker Changer" option, pressing the button alternates between brightness and darkness.

2.2.3.3.4 Dimming Function

2.2.3.3.4.1 Start Stop Dimming

In this mode, the dimming process starts when the button is pressed and stops when the button is released. As long as the user holds the button down, the light's brightness increases or decreases. The dimming process ends when the button is released.

2.2.3.3.4.2 Dimming Steps

In this mode, the dimming process is carried out in specific steps. Each step changes the light's brightness by a certain percentage. Each press of the button increases or decreases the light according to the selected step percentage.

2.2.3.3.4.2.1 Step Code

Determines the step code to be used during the dimming process. Each step is configured to change the light's brightness by a specific percentage. For example, if a 12.5% step is selected, the light changes by 12.5% during each dimming operation.

2.2.3.3.4.3 Button Mode

Determines how the button will behave during the dimming process. This defines how the dimming process will be carried out when the button is pressed or held down. For example, in long press mode, the dimming process continues while the button is held down and stops when the button is released.

2.2.3.3.4.3.1 Short-Switching Long Dimming

Refers to switching functions during short presses and dimming functions during long presses.

2.2.3.3.4.3.1.1 Cyclical

When this parameter is selected, the dimming step value is periodically repeated as long as the button is held down. In other words, when you hold the button down for a long time, the dimming process continues, and the dimming step value is reapplied at specific intervals during this period. This allows gradual approach or retreat to the desired illumination level.

2.2.3.3.4.3.1.2 Dimming Repetition Duration

Determines how long the steps will be repeated during the dimming process. This duration defines how long each dimming step will last.

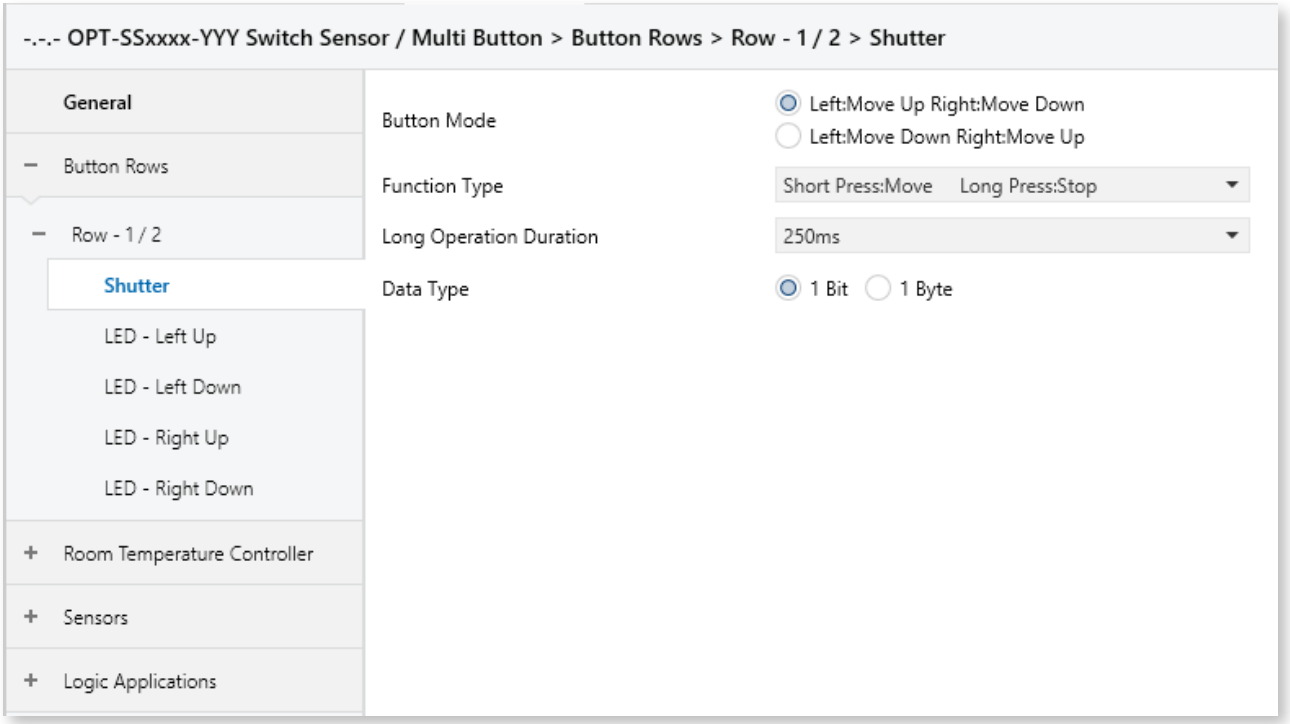
2.2.3.3.4.3.2 Short: Dimming Long Switching

Refers to dimming functions during short presses and switching functions during long presses.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
x	Row – x	Switch	Input/Output	1bit	1.001	C	-	W	T
x	Row – x	Dimming	Output	3bit	3.007	C	-	-	T

Table 5: Dimming Communication Object

2.3.4 Shutter



Shutter control allows for the electronic control of motorized curtains, blinds, or shades. This system enables users to open and close curtains, set them to a specific position, or adjust the amount of light. Shutter control is a common feature in home automation and smart home systems and is typically controlled through various buttons or remote controls.

2.3.4.1. Button Mode

Determines the movement telegrams to be sent during curtain control. When the user presses the button, the specified telegram is transmitted via the data bus. For example, when "Up Telegram" is selected, pressing the button will move the curtain up. In the "Up/Down Changer" option, pressing the button alternates the curtain's movement between up and down.

2.3.4.2. Function Type

This parameter determines how the button will behave for short and long press operations. Different function types allow for sending different telegrams based on the press duration. For example, when "Short Press: Move/Long Press: Stop" is selected, pressing the button briefly moves the curtain, while holding the button down stops the movement. If "Press: Move / Release: Stop" is selected, the curtain starts moving in the specified direction when the button is pressed and stops when the button is released by sending a stop telegram.

2.3.4.3 Long Operation Duration

Determines the minimum duration to be detected during a long press operation. When the user holds the button down for this duration, the long press operation is triggered.

2.3.4.3.1 Data Type

Determines the type of data to be sent. This defines how telegrams are encoded and transmitted.

2.3.4.3.2 Move Down

The data value sent to move the curtain down. This value specifies the signal code used to move the curtain downward.

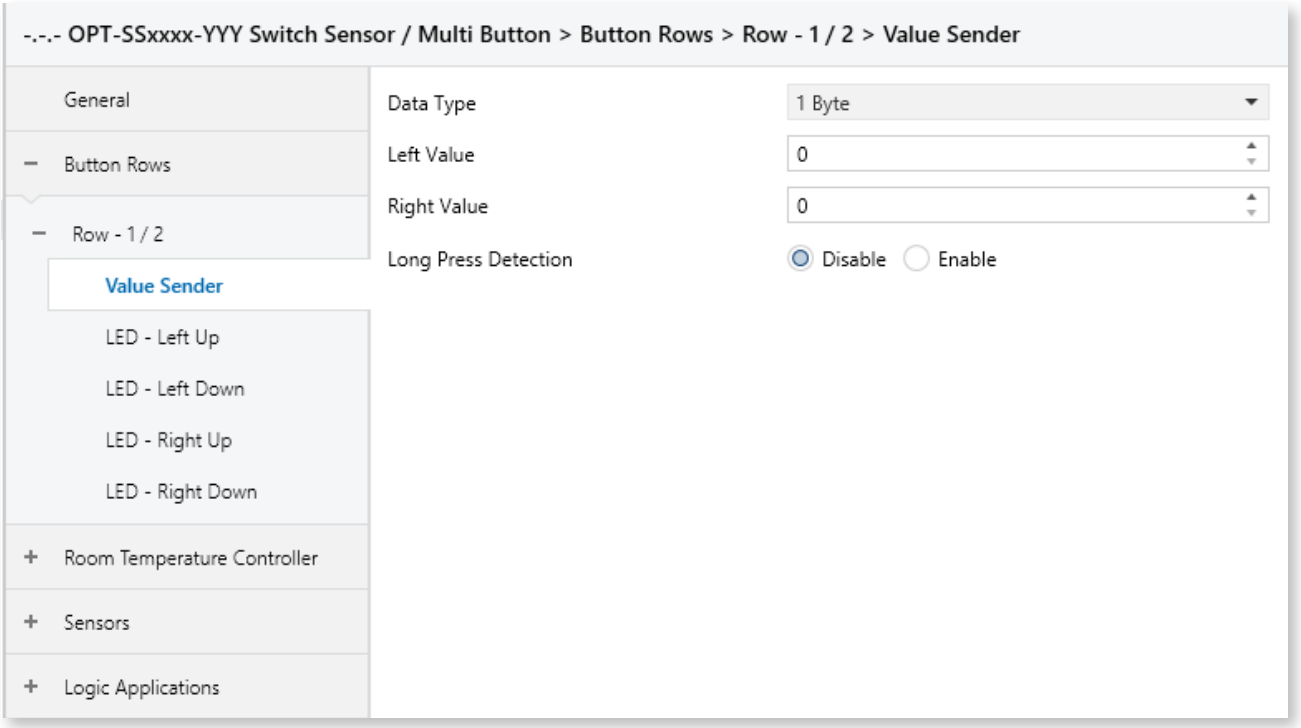
2.3.4.3.3 Move Up

The data value sent to move the curtain up. This value specifies the signal code used to move the curtain upward.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
x	Row – x	Move	Input/Output	1bit	1.008	C	-	W	T
				1byte	5.010	C	-	W	T
x	Row – x	Stop/Step	Input/Output	1bit	1.007	C	-		T

Table 6: Shutter Communication Object

2.3.5 Value Sender



2.3.5.1 Data Type

Determines the data type of the value to be sent. The data type defines the size and format of the data packet.

2.3.5.2 Value

The value according to the Output Data Type will be selected from a dropdown menu or entered manually.

2.3.5.3 Long Press Detection

Refers to actions triggered when the button is held down for an extended period. This allows sending a different telegram when pressed for a specific duration.

2.3.5.3.1 Long Operation Duration

Determines the minimum duration to be detected during a long press operation. For example, if this time is set to 2 seconds, the Value Sender Long Press operation starts when the user holds the button down for at least 2 seconds.

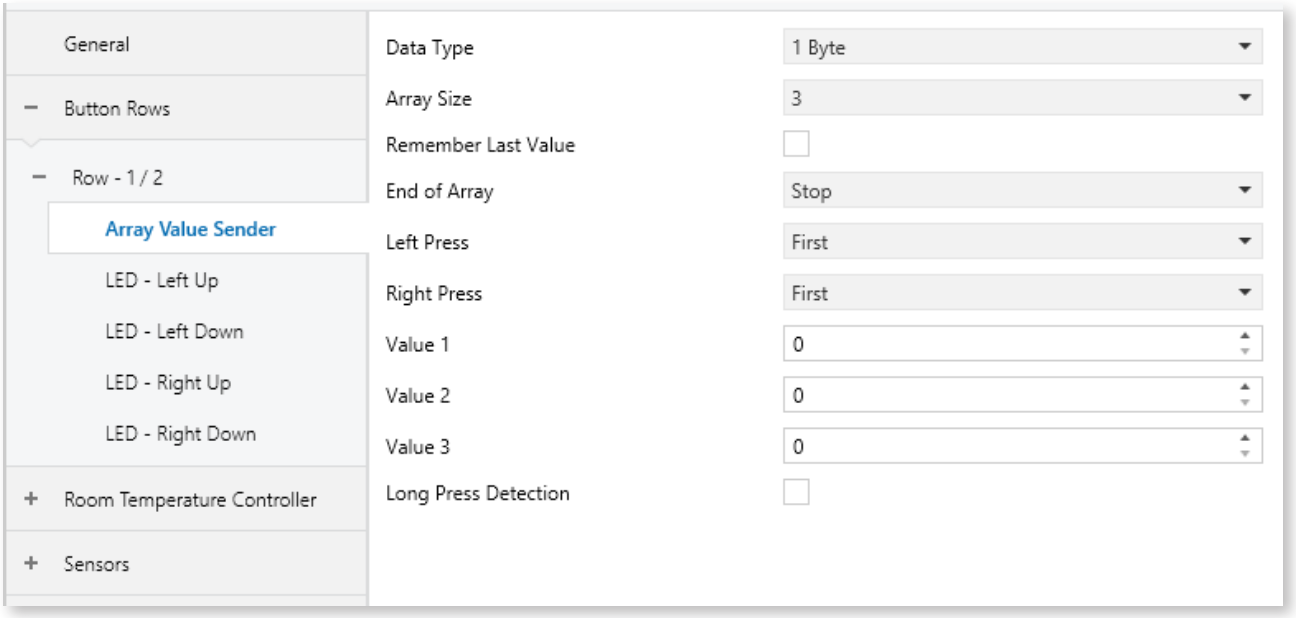
2.3.5.3.2 Long Value

The value to be sent during a long press operation is determined by this parameter.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
x	Row – x	Value	Output	1byte	5.010	C	-	-	T
				2byte	7.001	C	-	-	T
				2byte	9.001	C	-	-	T

Table 7: Value Sender Communication Object

2.3.6 Array Value Sender



The Array Value Sender function refers to sending multiple values in an array format via the data bus. This feature is used to transmit an array of values from various devices or sensors to the control system simultaneously.

2.3.6.1 Data Type

Determines the data type of each element in the array. The data type defines the size and format of each data packet.

2.3.6.2 Array Size

Determines how many elements the array will contain. The user sets the number of values to be sent with this parameter.

2.3.6.3 Remember Last Value

Determines whether to remember the last sent value. This allows the device to recall the last sent value when restarted or in other situations.

2.3.6.4 End of Array

Specifies what to do when the function reaches the last value. If "Stop" is selected, it will stop at the last value. If "Return to Start" is selected, it will restart from value 1.

2.3.6.5 Press

Determines the action during a short press operation. First: Sends the first value. Previous: Sends the previous value. Next: Sends the next value. Last: Sends the last value.

2.3.6.6 Value X

Specifies the specific value of each element in the array. These values are adjusted according to the array size and data type. Values become visible according to the size of the array. For example, if the Size of Array is 4, Value 4 becomes visible.

2.3.6.7 Long Press Detection

Enables or disables long press detection. Long press refers to actions triggered when the button is held down for an extended period. This allows sending a different telegram when pressed for a specific duration.

2.3.6.7.1 Long Operation Duration

Determines the minimum duration to be detected during a long press operation.

2.3.6.7.2 X Long Press

Determines the action to be performed during a long press operation. This option becomes visible if the "Long Press Available" option is checked. These actions are the same as those specified in 2.3.6.5.

2.3.6.7.3 Cycle

When this parameter is selected, the “Long Press” action is periodically repeated as long as the button is held down.

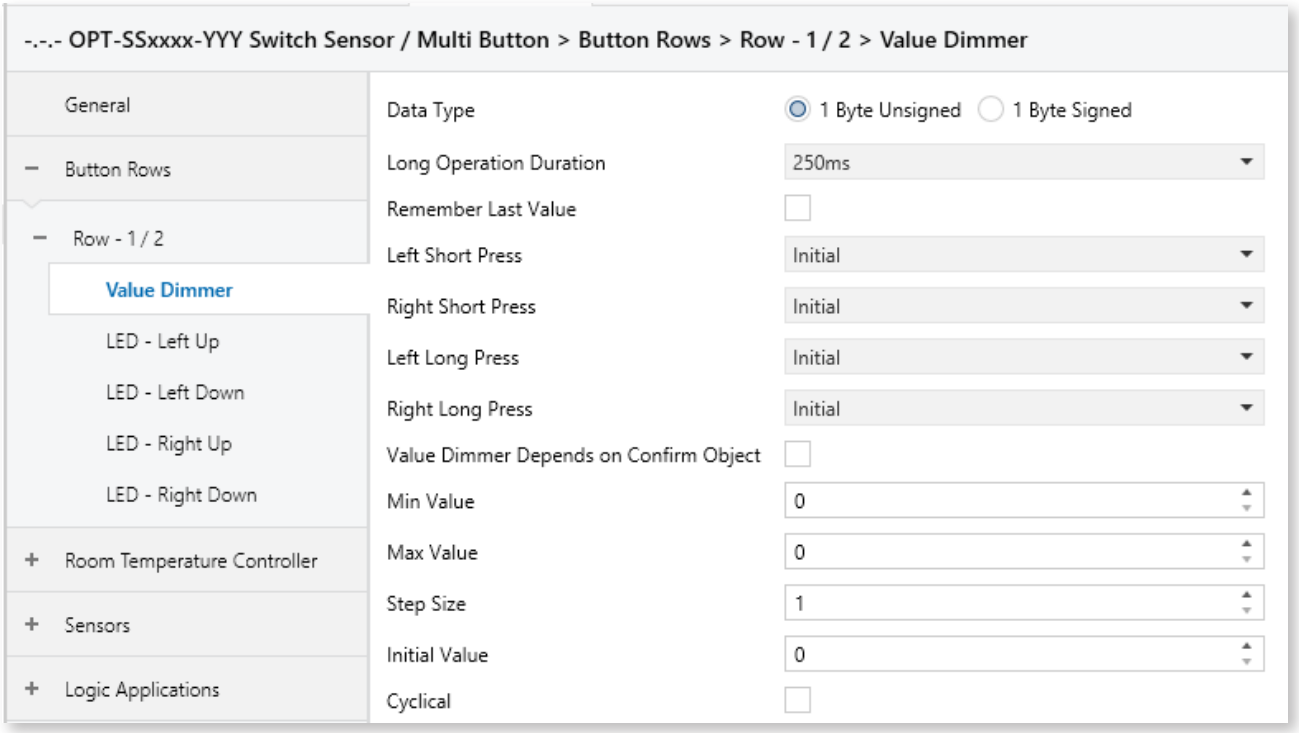
2.3.6.7.3.1 Repetition Duration

Determines how long the button actions will be repeated during a long press operation.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
x	Row – x	Value	Output	1byte	5.010	C	-	-	T
				2byte	7.001	C	-	-	T
				2byte	9.001	C	-	-	T

Table 8: Array Value Sender Communication Object

2.3.7 Value Dimmer



Value Dimmer is a function that allows gradual adjustment of a value within a specific range. This is used for controlling light levels or similar control elements. The user can define how this control operates and the range of values it will change between through specific parameters.

2.3.7.1 Data Type

Defines the data type that the dimmer will use.

2.3.7.2 Long Operation Duration

Determines the minimum duration required for detecting a long press operation.

2.3.7.3 Remember Last Value

Determines whether the dimmer remembers the last sent value. If this parameter is Enable, the dimmer will continue from the last value after a restart or power outage. If Disable, it will start from the initial value.

2.3.7.4 Short Press X

Determines the action to be performed during a short press operation. Options include:

- **Initial:** Sends the initial value defined in the device.
- **Minimum:** Sends the minimum value (e.g., 0%).
- **Step-Down:** Decreases the value by the defined step size with each press.
- **Step-Up:** Increases the value by the defined step size with each press.
- **Maximum:** Sends the maximum value (e.g., 100%).
- **Do Not Send Telegram:** No value is sent when the button is pressed.

2.3.7.5 Long Press X

Determines the action to be performed during a long press operation. These actions are the same as those specified in 2.3.7.4.

2.3.7.6 Value Dimmer Depends on Confirm Object

When this parameter is enabled, the value dimmer operates based on the "Value Dimmer Confirmation Object." The value dimmer occurs with the value received from the relevant communication object. Press actions are executed based on the value from the confirmation object. If no value is received from the confirmation object, the value dimmer function stops.

2.3.7.7 Min Value

Defines the minimum value to which the dimmer can be set.

2.3.7.8 Max Value

Defines the maximum value to which the dimmer can be set.

2.3.7.9 Step Size

Defines how much value the dimmer will increase or decrease in each operation.

2.3.7.10 Initial Value

Defines the initial value sent by the dimmer on the first run.

2.3.7.11 Cyclical

When this parameter is selected, the “Long Press” action is periodically repeated as long as the button is held down.

2.3.7.11.1 Repetetion Duration

Determines how long the button actions will be repeated during a long press operation.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
x	Row – x	Confirm	Input	1byte	5.010	C	-	W	-
				1byte	6.010	C	-	W	-
x	Row – x	Value	Output	1byte	5.010	C	-	-	T
				1byte	6.010	C	-	-	T

Table 9: Value Dimmer Communication Object

2.3.8 Scene

In home automation and building management systems, a scene is a programmed state that allows controlling multiple devices with a single telegram. A scene is created by combining specific settings for devices such as lighting, curtains, and heating-cooling systems. This allows users to control multiple devices simultaneously with a single button press or telegram to create a specific atmosphere or state.

2.3.8.1 X Button Scene Number

Determines the scene number to be called when the respective button is pressed. This scene allows for setting specific lighting, curtain, or other device states as programmed. For example, selecting scene number "1" will activate scene 1 when the respective button is pressed.

2.3.8.2 Scene Record Telegram

Determines whether the scene record telegram will be sent. The scene record telegram is used to save the current state as a scene.

2.3.8.2.1 Push Hold Time

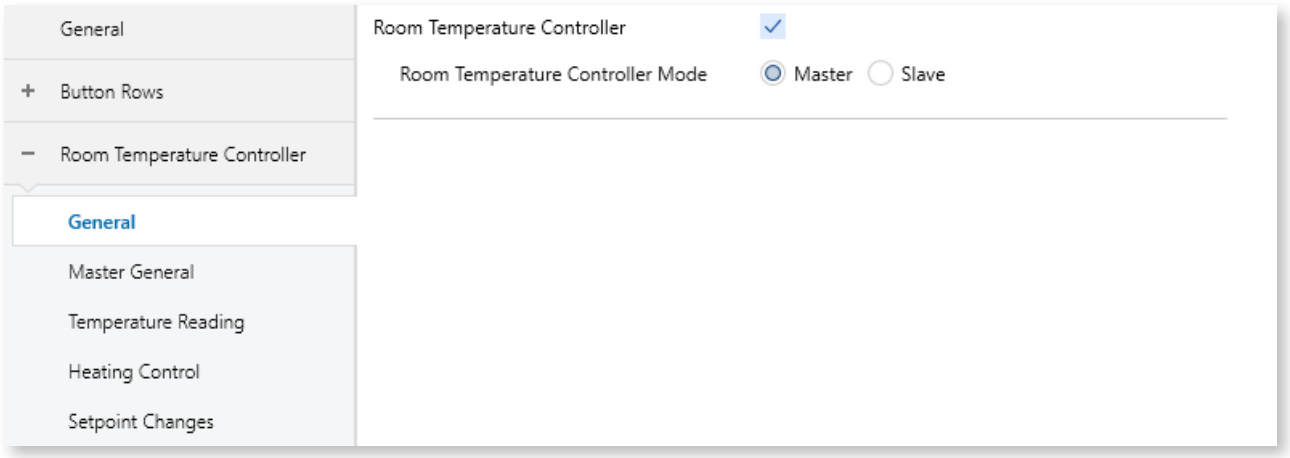
Determines the duration required to send the scene record telegram when the respective button is pressed for a long time. Holding the button during this period will save the scene.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
x	Row – x	Scene	Output	1byte	18.001	C	-	-	T

Table 10: Scene Communication Object

3 Room Temperature Control (RTC)

3.1 General



The Room Temperature general function comes with the OPT-SSxxxx-yyy product. The usage of the function depends on the status of the parameter; if the control box is not activated, the relevant communication objects will not be displayed. The RTC has two modes: master operation and slave operation.

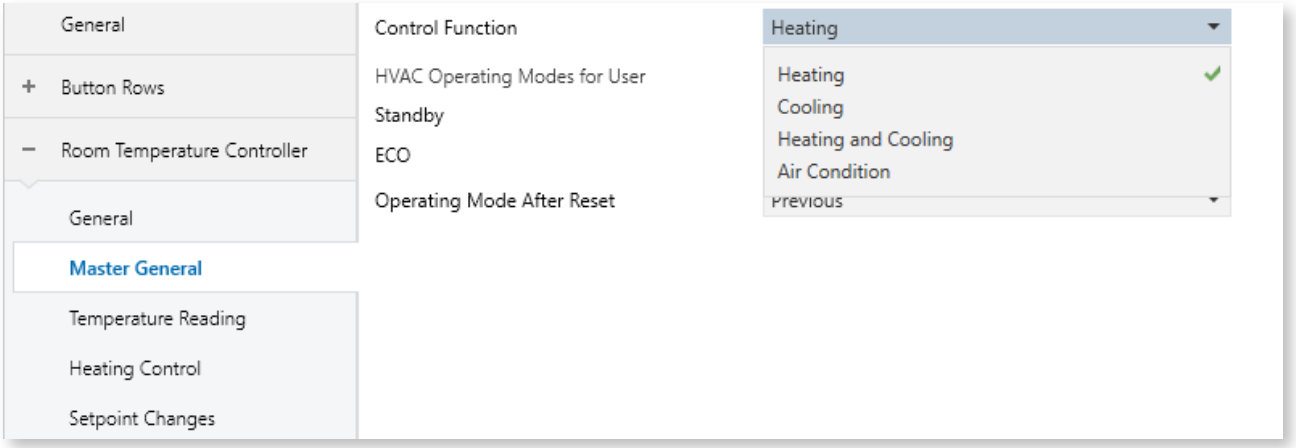
No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
110	RTC-General	HVAC Operating Mode	Bidirectional	1byte	20.102 HVAC Mode	C	R	W	T
111	RTC-General	Comfort Operating Mode Select	Bidirectional	1bit	1.001 switch	C	R	W	T
112	RTC-General	Standby Operating Mode Select	Bidirectional	1bit	1.0011 switch	C	R	W	T
113	RTC-General	ECO Operating Mode Select	Bidirectional	1bit	1.001 switch	C	R	W	T
114	RTC-General	Protection Operating Mode Select	Bidirectional	1bit	1.001 switch	C	R	W	T
115	RTC-General	Forced Operating Mode	Input	1byte	20.102 HVAC Mode	C	-	W	-
116	RTC-General	Presence Detector Input	Input	1bit	1.001 switch	C	-	W	-
117	RTC-General	Window Contact Input	Input	1bit	1.001 switch	C	-	W	-
118	RTC-General	RTC Controller RHCC Status	Output	2bytes	22.101RHCC Status	C	R	-	T
119	RTC-General	Controller HVAC Status	Output	1byte	20.102 HVAC Mode	C	R	-	T

Table 11: RTC-1 Communication Object

3.2 Master General

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
100	RTC-Master	Send Configuration to slave	Output	4bytes	12.001counter pulses	C	R	-	T
101	RTC-Master	Sync Fan Configuration to slave	Bidirectional	1byte	5.010 counter pulses	C	R	W	T
102	RTC-Master	Fan Speed Request	Input	1byte	5.010 counter pulses	C	-	W	
103	RTC-Master	Confirmed Fan Speed Status	Output	1byte	5.010 counter pulses	C	R	-	T
104	RTC-Master	Request HVAC Control Mode AC Master	Input	1byte	20.105 HVAC Control Mode	C	-	W	-
105	RTC-Master	Confirm HVAC Control Mode AC Master	Output	1byte	20.105 HVAC Control Mode	C	R	-	T
106	RTC-Master	Request Fan Auto	Input	1bit	1.001 switch	C	-	W	
107	RTC-Master	Confirm Fan Auto	Output	1bit	1.001 switch	C	R	-	T

Table 12: RTC-2 Communication Object



If it is a model with a screen, it is activated by selecting from the parameters; models without a screen cannot be programmed as slaves. The master mode is used if the RTC is to operate alone or with at least one slave-programmed RTC product. In this mode, the device that makes the control decision is selected as the master, while the information affecting the control decision is provided by the slave-programmed RTC product. Feedback is sent from the master device to the slave device. For master-slave communication established between OPT-SSxxxx-yyy devices, configuration and values are exchanged reciprocally via the relevant communication objects (100-101).

Note
If neither of the master and slave devices is an OPT-SSxxxx-yyy, the master-slave pairing is performed using the RTC master and slave communication objects.

3.2.1 Control Function

This is the section where the regions (heating-cooling-air condition) in which the RTC function can operate are selected. Here, the RTC can be selected as heating, cooling, heating and cooling, or air conditioning controller. This selection is made considering the heating and cooling elements used in the system. Subsequently, value selection parameters are chosen to correctly manage these elements.

3.2.1.1 Heating

Selected for systems with only heating elements. It operates by calculating the difference between the measured room temperature and the set value, then sends the necessary information to the output. Multiple heating elements can be controlled by selecting an additional heating zone.

3.2.1.2 Cooling

Selected for systems with only cooling elements. It operates by calculating the difference between the measured room temperature and the set value, then sends the necessary information to the output. Multiple cooling elements can be controlled by selecting an additional cooling zone.

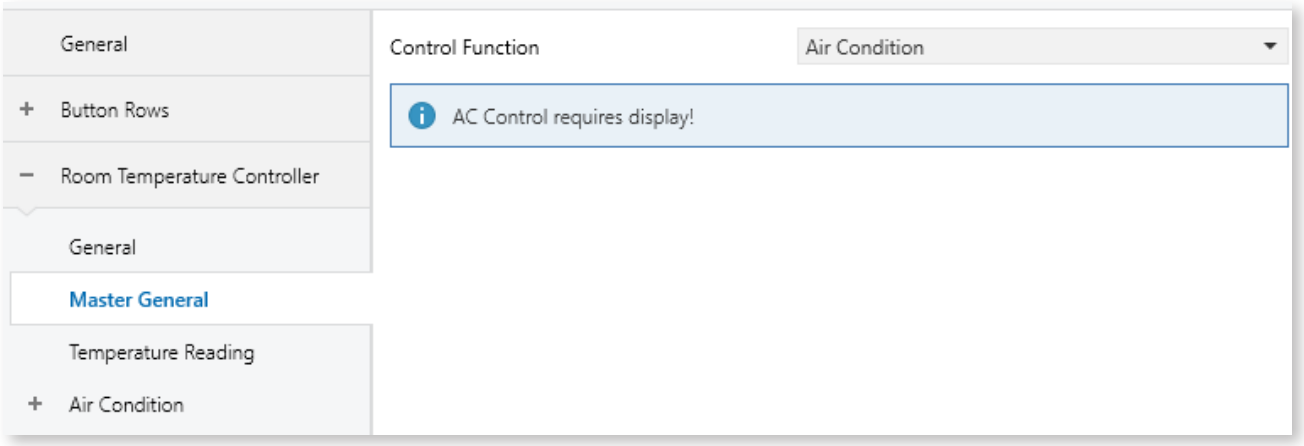
3.2.1.3 Heating and Cooling

Selected for systems with only cooling elements. It operates by calculating the difference between the measured room temperature and the set value, then sends the necessary information to the output. Multiple cooling elements can be controlled by selecting an additional cooling zone.

Note
Selected for systems with both heating and cooling elements. It operates by calculating the difference between the measured room temperature and the set value, then sends the information to either the heating or cooling zone of the RTC based on the need.

The automatic mode is the mode where the RTC function determines which zone it should be in according to the environmental conditions. (See Setpoint changes)

3.2.1.4 Air Condition



For systems with only air conditioning control, the OPT-SSxxxx-yyy RTC function is selected as the air conditioning controller. The air conditioning controller can be programmed and selected as heating only, additional heating, cooling only, additional cooling, heating and cooling, or air conditioning only (RTC air conditioning).

3.2.2 HVAC Operating Modes for User

The RTC can operate in four different modes: Comfort, Standby, Eco/Night, and Protection. Comfort and Protection modes are always accessible by the user. Away and Eco modes are parametric and depend on the status of the control box, determining the operation mode based on information received from the RTC screen or the bus line.

- **Comfort Mod:** This mode operates based on the comfort set temperature of the controlled area.
- **Standby ve Eco/Night Mod:** This mode shifts the comfort set temperature up or down (depending on heating or cooling mode) to save energy. The offset value can be selected from the parameters (See Setpoint changes). The offset is larger for Eco/Night mode, ensuring more economical use.
- **Protection Mod:** This mode means the RTC is off. Outputs remain off until the room temperature reaches a critical level for the controlled area. The RTC operation mode can be changed via the screen or through the bus line.

Note
Refer to the priority table to determine the operation mode, with the priority order from left to right.

Forced mode	Window Contact	Presence Input	Local/Bus	HVAC Status
Auto	No Alarm	Absence	Comfort	Comfort
Auto	No Alarm	Absence	Standby	Standby
Auto	No Alarm	Absence	Eco/Night	Eco/Night
Auto	No Alarm	Absence	Protection	Protection
Auto	No Alarm	Presence	-	Comfort
Auto	Alarm	-	-	Protection
Comfort	-	-	-	Comfort
Standby	-	-	-	Standby
Eco/Night	-	-	-	Eco/Night
Protection	-	-	-	Protection

Table 13: RTC-3 Communication Object

Auto:0, Comfort:1, Standby:2, Eco/Night:3, Protection:4

- **Forced Mode:** The forced mode is the highest priority object in determining the operation mode. If the mode set through this mode is not an automatic mode, the values from other objects in the table are not considered. When switched to automatic mode, the operation mode returns to its previous state.

- **Window Contact:** This is the second highest priority object in the priority table. As long as the window contact value is 0 (closed), the next object in the priority table is considered, and in this case, the window contact does not determine the operation mode. When the window contact value is 1 (open), the system switches to protection mode, a window icon appears on the screen, and values from lower priority objects are not considered.

- **Presence Input:** This is the third highest priority mode in the priority table. It is activated with a 1 (on) signal received by this communication object, the system switches to comfort mode, and values from lower priority objects are not considered. With a 0 (off) signal, the operation mode returns to its previous state; in this case, the next object in the priority table is considered.

- **Local/Bus:** This is the lowest priority in the priority table. Mode selection is made through the screen or values received by the communication object.

Note
When the forced mode is set to auto, data is requested from the window contact and presence input objects.

3.2.2.1 Operating Mode After Reset

When the RTC starts operating, it begins in the operation mode selected in the parameters. If "Previous" is selected, the RTC remembers its last state and starts in that mode.

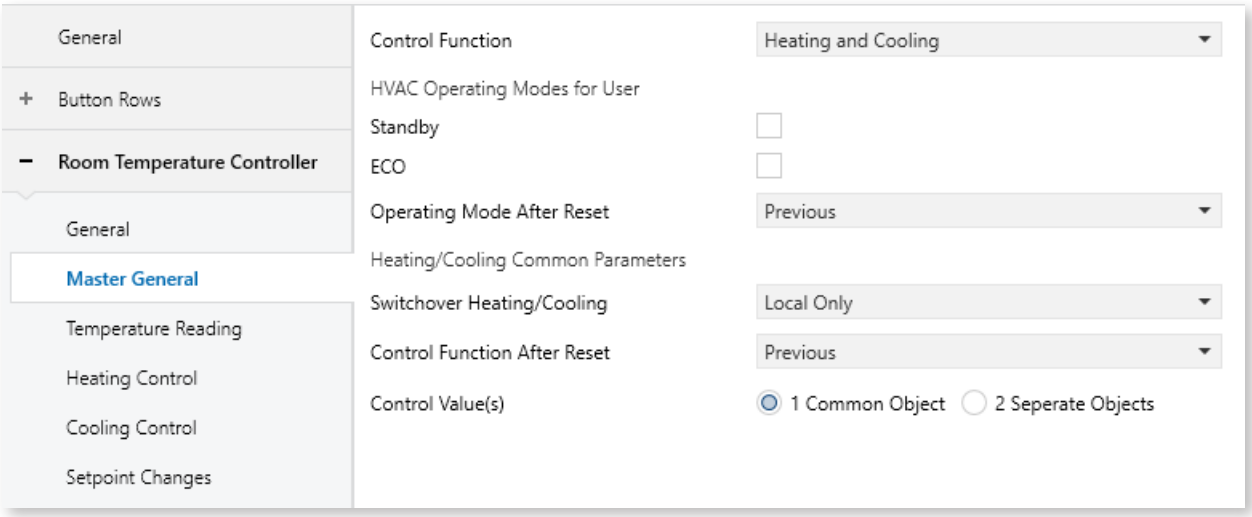
3.2.3 RHCC Feedback

The communication object, according to the RHCC (Room Heating Cooling Control) device status specification, provides the heating/cooling operating mode, active/passive operation, and real temperature measurement error.

3.2.3.1 HVAC Controller Status

The RTC operation mode (comfort, standby, eco/night), operating zone (heating, cooling), and RTC active/passive status are the communication objects it sends.

Bit No	Function	Value
B0	Comfort	0 = false 1 = true
B1	Standby	0 = false 1 = true
B2	Night	0 = false 1 = true
B3	Frost/Heat Prtoection	0 = false 1 = true
B4		
B5	Heat/Cool	0 = cooling 1 =heating
B6	Controller Status	0 = inactive 1 = active
B7		



3.2.4 Heating/Cooling Common Parameters

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
128	RTC- Heating/Cooling	HVAC Control Mode Input	Input	1byte	20.105 HVAC Control Mode	C	-	W	-
129	RTC- Heating/Cooling	HVAC Control Mode Status	Output	1byte	20.105 HVAC Control Mode	C	R	-	T
130	RTC- Heating/Cooling	HVAC Changeover Mode Input	Input	1byte	20.107 Changeover Mode	C	-	W	-
131	RTC- Heating/Cooling	HVAC Changeover Mode Status	Output	1byte	20.107 Changeover Mode	C	R	-	T
132	RTC- Heating/Cooling	Heating Cooling Select	Input	1bit	1.100 Heating / Cooling	C	-	W	-
138	RTC- Heating/Cooling	Heating Cooling Select Status	Output	1bit	1.100 Heating / Cooling	C	R	-	T

Table 14: RTC-4 Communication Object

3.2.4.1 Switchover Heating Cooling

3.2.4.1.1 Local Only

When selected, the heating/cooling mode change can only be made via buttons on the screen. The activated mode is sent to the bus line, but mode changes cannot be made via the bus line.

3.2.4.1.2 Only From Bus

When selected, the heating/cooling mode change can only be made via the bus line. If this option is selected on models with a screen, the mode change menu will not appear on the screen.

3.2.4.1.3 Via Bus and Local

This mode allows for mode changes to be controlled both via the screen and the bus line. In this mode, mode change communication objects can be used, and the mode change menu is available on the screen

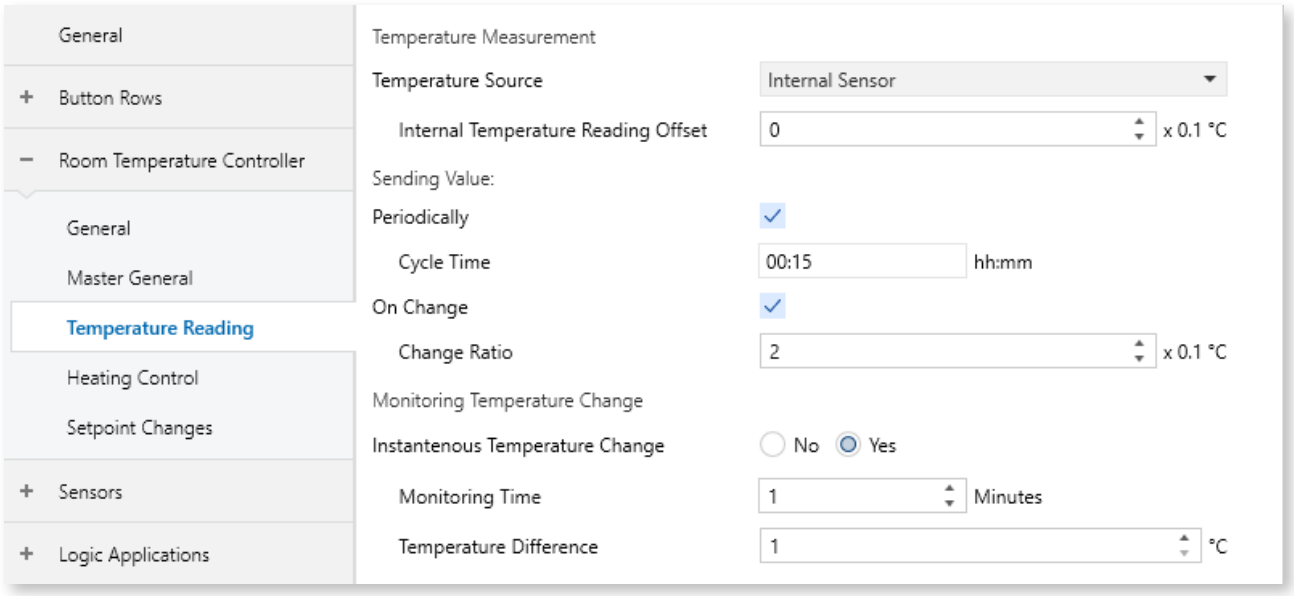
3.2.4.2 Control Function After Reset

- **Previous:** The RTC remembers the control function it was in before the restart and starts in that mode.
- **Heating:** The RTC disregards the control function it was in before the restart and starts in heating mode.
- **Cooling:** The RTC disregards the control function it was in before the restart and starts in cooling mode.
- **Automatic:** The RTC disregards the control function it was in before the restart and starts in automatic mode, comparing the ambient and set temperatures to decide the appropriate mode.

3.2.4.3 Control Value(s)

- **1 Common Object:** If this option is selected, the control value is sent via a common object. The RTC sends the calculated value for heating or cooling mode through the same object. This option is suitable for systems that do not have both heating and cooling modes simultaneously, such as two-pipe heating-cooling systems. In this parameter, the control value cannot be separated for heating and cooling zones; the control type selected for the heating zone applies to the cooling zone as well. Additional zones are not valid; different control types can be used for heating and cooling additional zones.
- **2 seperate Object:** If this option is selected, the control value is sent via two different objects. The RTC selects the object to send based on the heating or cooling mode, and the other object always receives a closed or 0% value. This option is suitable for systems that can perform both heating and cooling simultaneously, such as four-pipe heating-cooling systems. In this parameter, the control value can be selected differently for heating and cooling zones.

3.3 Temperature Reading



No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
122	RTC- Temperature Reading	Internal Temperature	Output	2bytes	9.001 Temperature (°C)	C	R	-	T
123	RTC- Temperature Reading	Actual Temperature Error	Output	1bit	1.005 Alarm	C	-	-	T
124	RTC- Temperature Reading	External Temperature	Input	2bytes	9.001 Temperature (°C)	C	-	W	-
125	RTC- Temperature Reading	Temperature Output	Output	2bytes	9.001 Temperature (°C)	C	R	-	T
126	RTC- Temperature Reading	Fault Temperature Reading	Output	1bit	9.001 Temperature (°C)	C	R	-	T
127	RTC- Temperature Reading	Instantenous Temperature Change	Output	1bit	1.005 Alarm	C	R	-	T

Table 15: RTC-5 Communication Object

3.3.1 Temperature Measurement

3.3.1.1 Temperature Source

The RTC function can use the temperature sensor located in the OPT-SSxxxx-yyy, data from the bus line, or a combination of both sources to obtain the ambient temperature. The source is selected from the parameters.

3.3.1.1.1 Internal Sensor

It designates the sensor inside the OPT-SSxxxx-yyy as the source. The ambient temperature is taken from the sensor and used in output calculations. It can be conditioned from the parameters (offset). In case of a sensor malfunction, the RTC function stops at its last state, and an alarm message is sent to the bus line through the relevant communication object.

3.3.1.1.1.1 Internal Temperature Reading Offset

This adjusts the measured ambient temperature from the sensor by adding or subtracting a value. The entered value is multiplied by '0.1' and added to the measured ambient temperature.

3.3.1.1.2 External Sensor

The temperature information received from the bus line is selected as the source, and output calculations are performed using the obtained value. This value can be conditioned via parameters (offset).

3.3.1.1.2.1 External Temperature Reading Offset

This adjusts the ambient temperature value received from the bus line by adding or subtracting a value. The entered value is multiplied by '0.1' and added to the measured ambient temperature.

3.3.1.1.2.1.1 Monitoring Time

The RTC expects ambient temperature data at certain intervals. This interval is selected from the parameter. If the temperature data is not received within the specified time interval in the parameter, the RTC considers there is an error in reading the ambient temperature, broadcasts an alarm object, and the RTC function stops at its last state.

Note
Selecting a duration of 00:00 indicates that monitoring is not performed. The RTC does not expect periodic data flow

3.3.1.1.2.2 Both of Them

The RTC uses a combination of the OPT-SSxxxx-yyy and bus line data as the source for the ambient temperature. Both sources can be conditioned in the parameters. Data from the bus line can also be requested periodically. If data is not received from the bus line within the desired time period, the RTC function stops at its last state, and an alarm message is sent to the bus line through the relevant communication object.

3.3.1.1.2.2.1 Weight

This determines the ratio of the combined sensor and bus line data. The proportion of data from the sensor is specified as a percentage, and the remaining portion is calculated from the data received from the bus line to obtain the combined ambient temperature data.

Example
Weight %80 - Internal (20°C) - External (25°C) = Weight Temperature = 20 * 0.8 + 25 * 0.2 = 21°C

3.3.2 Sending Value Method

3.3.2.1 Periodically

Determines the frequency at which the ambient temperature data obtained from the selected source is sent to the bus line.

3.3.2.1.1 Cycle Time

The calculated ambient temperature data is sent to the bus line at the specified time intervals.

Note
If the ambient temperature cannot be obtained due to an error, the data is not sent to the bus line periodically.

3.3.2.2 On Change

Sends data to the bus line when the value obtained from the selected source changes by the specified amount.

3.3.2.2.1 Change Ratio

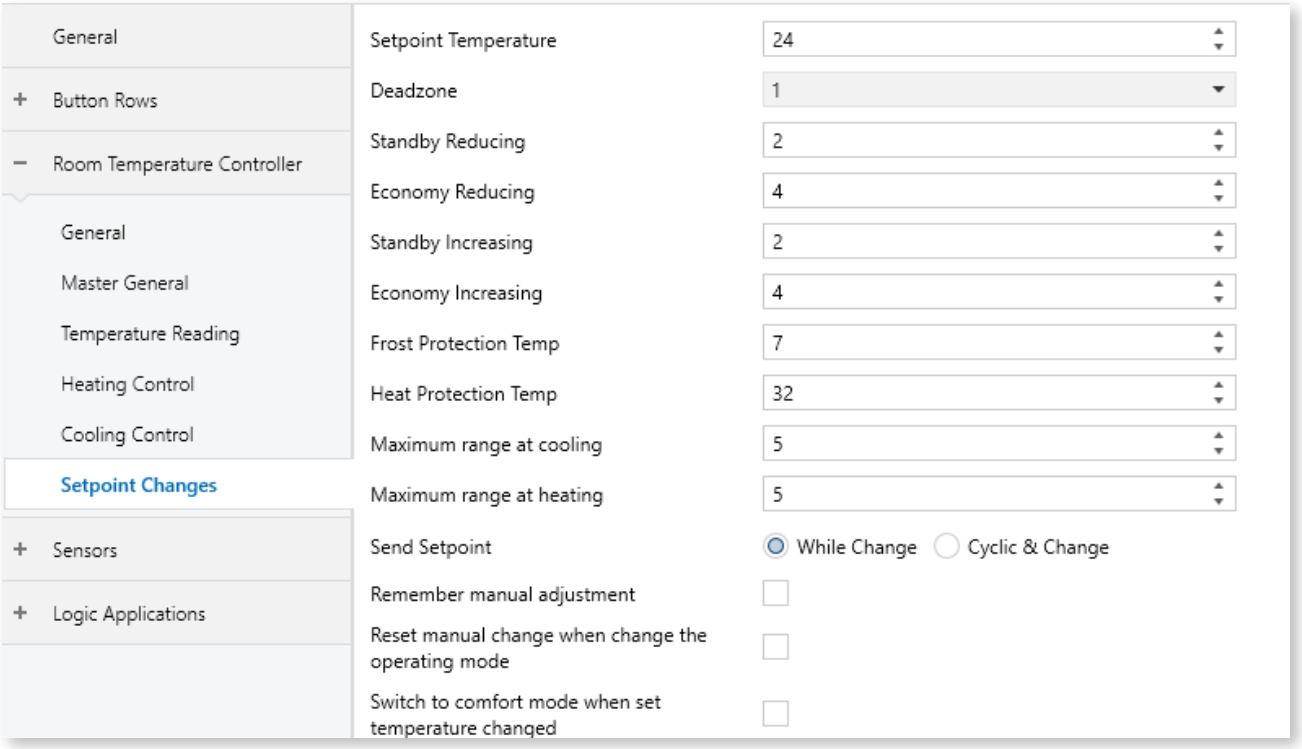
The value specified in the parameter is multiplied by '0.1' to obtain the change ratio. The calculated ambient temperature is compared with the previous value. If the difference is equal to or greater than the value calculated in the parameter, the calculated ambient temperature is sent to the bus line.

3.3.3 Monitoring Temperature Change

3.3.3.1 Instantenous Temperature Change

- **No:** Instantaneous temperature change is not monitored.
- **Yes:** : Instantaneous temperature change is monitored. If a specified or greater temperature change occurs within the defined time, an alarm value is sent to the bus line from the relevant communication object.

3.4 Setpoint Changes



No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
120	RTC- Setpoint	Set Temperature Output	Output	2bytes	9.001 temperature(°C)	C	R	-	T
121	RTC- Setpoint	Set Temperature Request	Output	2bytes	9.001 temperature(°C)	C	-	W	T

Table 16: RTC-6 Communication Object

This section is where the setpoint temperature settings for the RTC are configured. Parameters are used to select the desired dead zone for heating and cooling transitions (if automatic mode is available), define the degrees for increasing and decreasing economy and standby modes, and set the critical setpoint temperatures for freezing and heating protection modes.

3.4.1 Setpoint Temperature

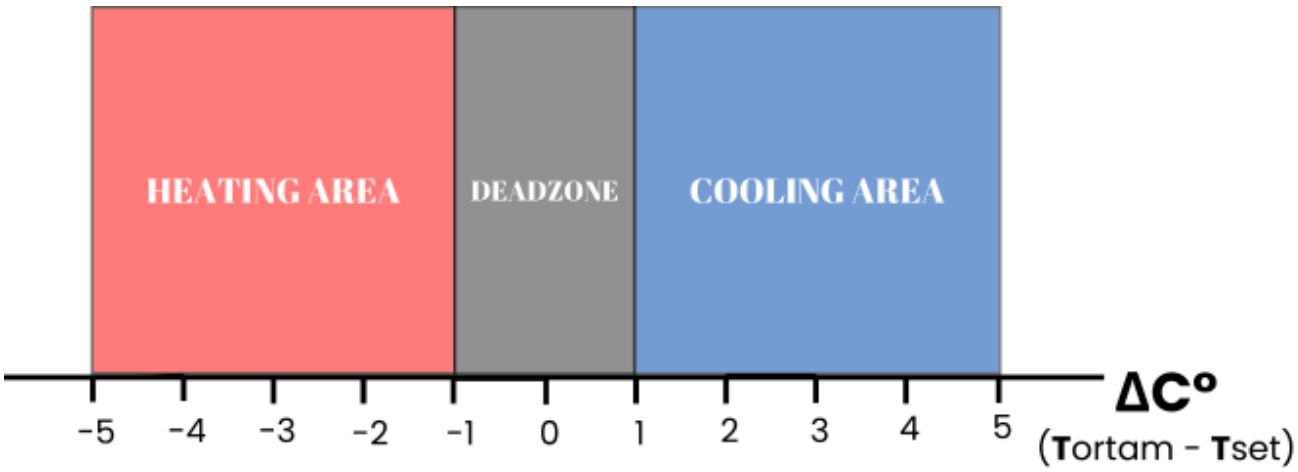
The value to which the OPT-SSxxxx-yyy is initially set is determined via parameters. If the “Remember manual adjustment” parameter is not selected, the device starts with the parameter value. If selected, the last setpoint adjustment will be applied.

3.4.2 Deadzone

Used when heating-cooling transition is in automatic mode. It is the required temperature difference between the setpoint and ambient temperature for mode changes. At the start of the RTC function, if within the dead zone, it does not consider this area and determines the operating range based on the difference between the ambient and set temperatures. The dead zone is considered in temperature difference changes between ambient and set temperatures.

Note
This parameter is only applicable for the heating-cooling selected control function. It does not become Enable if only heating or only cooling is selected.

Example of heating-cooling zone transition with a 1°C dead zone.



3.4.3 Standby Reducing

When the RTC is operating in the heating zone and the standby mode is activated, it specifies the reduction value for the setpoint. Standby mode is indicated on the screen with an icon. If the 'switch to comfort mode when set temperature changed' parameter is not selected, the setpoint value can be changed while in standby mode. While in standby mode, the heating-cooling zone (if in automatic mode) may change. If selected, setpoint changes are not allowed in standby mode; when the setpoint is changed, the RTC will switch to comfort mode.

3.4.4 Economy Reducing

When the RTC is operating in the heating zone and the economy mode is activated, it specifies the reduction value for the setpoint. Economy mode is indicated on the screen with an icon. If the 'switch to comfort mode when set temperature changed' parameter is not selected, the setpoint value can be changed while in economy mode. While in economy mode, the heating-cooling zone (if in automatic mode) may change. If selected, setpoint changes are not allowed in economy mode; when the setpoint is changed, the RTC will switch to comfort mode. (The reduction in setpoint value in economy mode is generally greater than in standby mode.)

3.4.5 Standby Increasing

When the RTC is operating in the cooling zone and the standby mode is activated, it specifies the increase value for the setpoint. Standby mode is indicated on the screen with an icon. If the 'switch to comfort mode when set temperature changed' parameter is not selected, the setpoint value can be changed while in standby mode. While in standby mode, the heating-cooling zone (if in automatic mode) may change. If selected, setpoint changes are not allowed in standby mode; when the setpoint is changed, the RTC will switch to comfort mode.

3.4.6 Economy Increasing

When the RTC is operating in the cooling zone and the economy mode is activated, it specifies the increase value for the setpoint. Economy mode is indicated on the screen with an icon. If the 'switch to comfort mode when set temperature changed' parameter is not selected, the setpoint value can be changed while in economy mode. While in economy mode, the heating-cooling zone (if in automatic mode) may change. If selected, setpoint changes are not allowed in economy mode; when the setpoint is changed, the RTC will switch to comfort mode.

3.4.7 Frost Protection Temp

Specifies the critical threshold for frost protection. While in the heating zone, the RTC does not activate its outputs until the calculated ambient temperature reaches the defined threshold. This mode indicates that the RTC is off but is essential to prevent damage to the controlled area (e.g., damage to objects, freezing of water in pipes, etc.). When the measured ambient temperature reaches the critical threshold, the RTC will heat the environment until it exceeds the threshold.

3.4.8 Heat Protection Temp

Specifies the critical threshold for heat protection. While in the cooling zone, the RTC does not activate its outputs until the calculated ambient temperature reaches the defined threshold. This mode indicates that the RTC is off but is essential to prevent damage to the controlled area. When the measured ambient temperature reaches the critical threshold, the RTC will cool the environment until it drops below the threshold.

3.4.9 Maximum Range at Cooling

Defines the range of setpoint temperatures in the cooling zone. It is the number of steps in both positive and negative directions from the starting setpoint temperature.

Example
Maximum range at cooling: 5°C Setpoint Temperature: 24°C Range at cooling: 19°C...24°C...29°C

3.4.10 Maximum Range at Heating

Defines the range of setpoint temperatures in the heating zone. It is the number of steps in both positive and negative directions from the starting setpoint temperature.

3.4.11 Send Setpoint

The setpoint temperature can be sent to the bus line if required. There are two methods for this:

- **While Change:** Sends the data to the bus line with every change in the setpoint temperature. (The setpoint can be read from the bus line whenever needed.)

- **Cyclic and Change:** Sends the setpoint to the bus line periodically based on the entered window time, regardless of changes. Additionally, if there is a change in the setpoint, it is sent to the bus line immediately, regardless of the time.

3.4.12 Remember Manual Adjustment

When the device is restarted, it remembers the last manually adjusted setpoint temperature and starts with this value. If not selected, it starts with the initial setpoint temperature defined in the parameters.

3.4.13 Reset Manuel Change when Change the Operating Mode

When the operating mode is changed, the setpoint to be referenced is selected. If the parameter is selected, the setpoint will be increased or decreased (depending on the heating-cooling zone) from the initial setpoint when the operating mode is changed. If the parameter is not selected, the setpoint of the new operating mode will be calculated based on the current value.

Example
(Initial setpoint value: 24°C, Current setpoint value: 26°C, Zone: Heating, Standby reducing 2°C.)

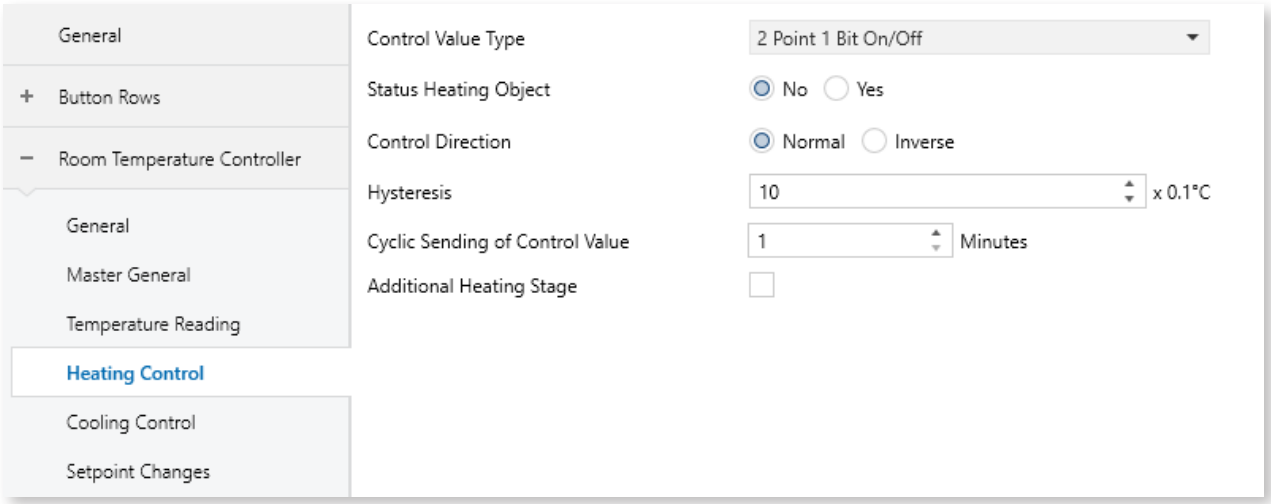
3.4.14 Switch to Comfort Mode when Set Temperature Changed

If selected, when the setpoint temperature changes (either via the screen or bus line), the operating mode will switch to comfort mode if it was in standby or economy mode. It can be switched back to standby or economy mode if desired. In protection mode, the setpoint cannot be changed, so the mode will not switch to comfort. If not selected, changing the setpoint temperature (either via the screen or bus line) does not change the Enable mode; the setpoint temperature changes for standby or economy mode.

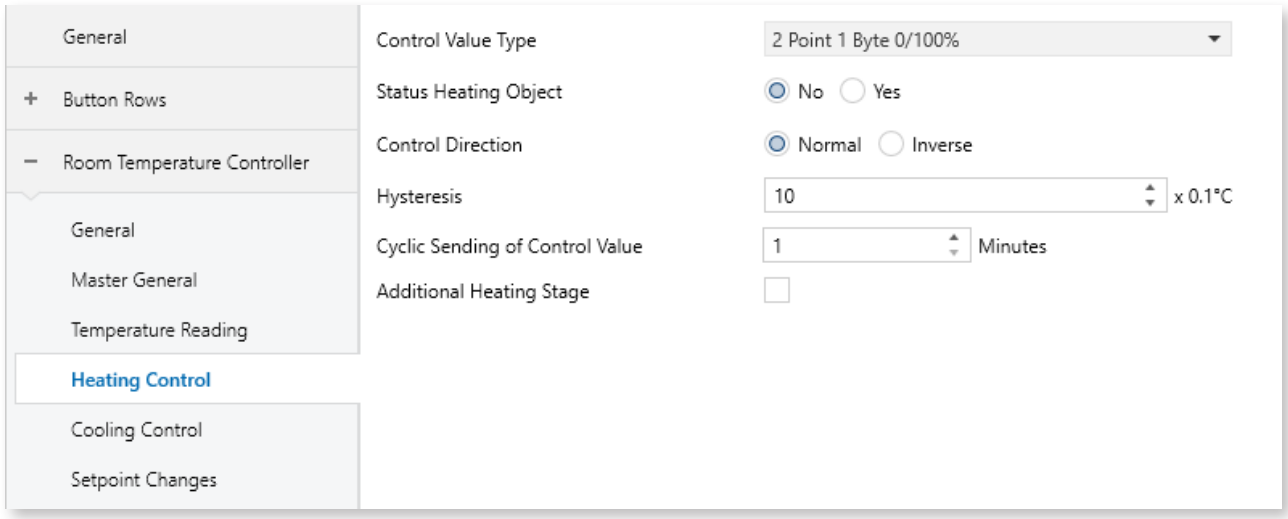
3.5 Control Values

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
133	RTC- Heating/Cooling	Heating Cooling Control Value	Output	1bit/1byte	1.001 switch /5.001 percentage	C	-	-	T
134	RTC- Heating	Heating Control Value	Output	1bit/1byte	1.001 switch /5.001 percentage	C	-	-	T
135	RTC- Heating	Addittional Heating Stage	Output	1bit/1byte	1.001 switch /5.001 percentage	C	-	-	T
136	RTC- Cooling	Cooling Control Value	Output	1bit/1byte	1.001 switch /5.001 percentage	C	-	-	T
137	RTC- Cooling	Addittional Cooling Stage	Output	1bit/1byte	1.001 switch /5.001 percentage	C	-	-	T
139	RTC- Heating	Heating Status	Output	1bit	1.001 switch	C	-	-	T
140	RTC- Cooling	Cooling Status	Output	1bit	1.001 switch	C	-	-	T

Table 17: RTC-7 Communication Object

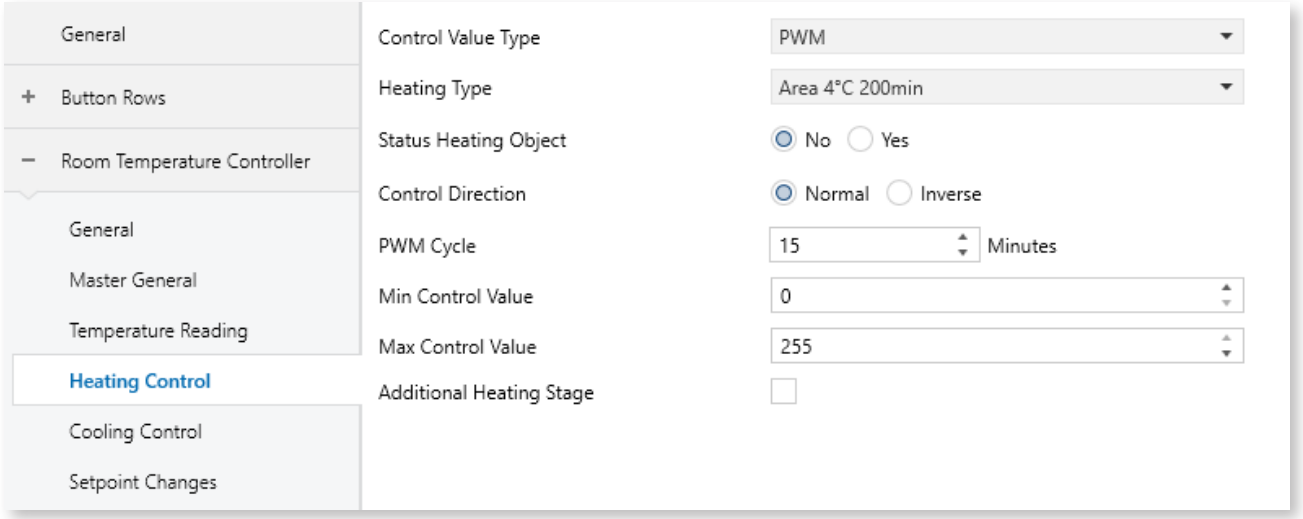


- **2 Point 1 Bit On/Off:** This is the simplest control type. The thermostat turns on when the room temperature drops below a certain level (setpoint temperature minus hysteresis) and turns off when the temperature exceeds a certain level (setpoint temperature plus hysteresis). On and off telegrams are transmitted as 1-bit telegrams.

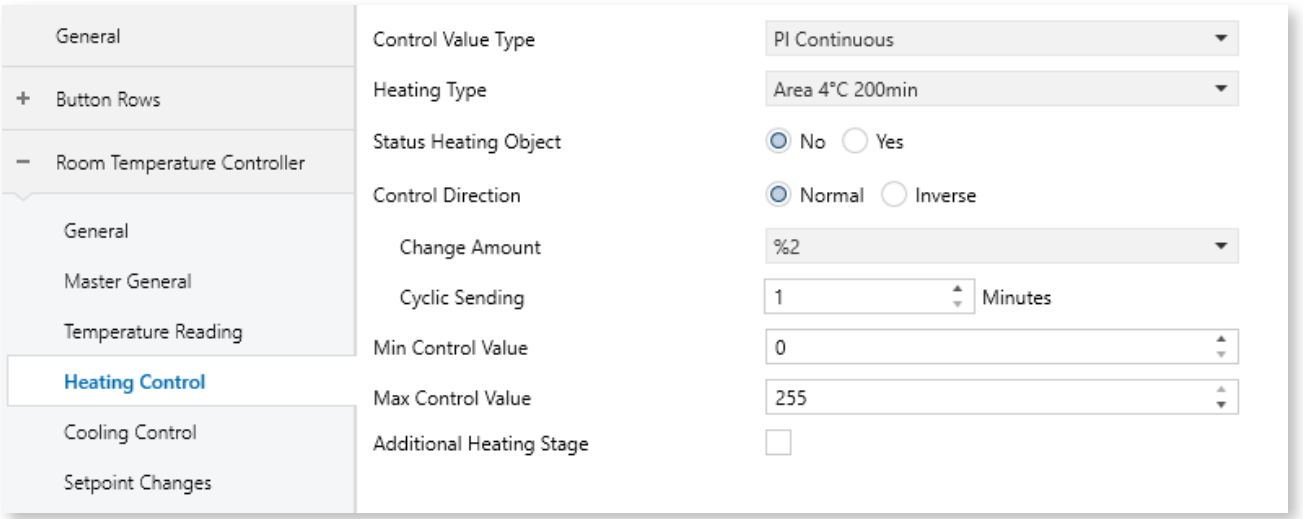


- **2 Point 1 Byte 0/100%:** This is similar to the 2-point control described above. However, in this case, the on and off telegrams are transmitted as 1-byte values (0% / 100%).

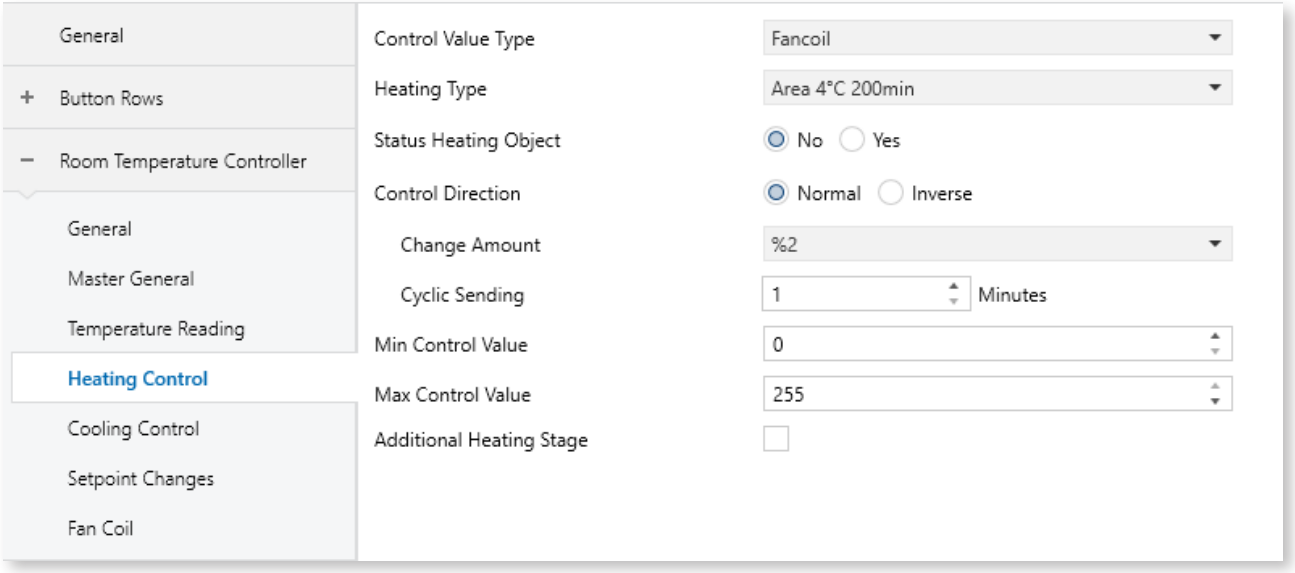
- **PI PWM On/Off:** This is a PI (Proportional-Integral) controller. Here, the output is a 1-bit telegram. The calculated control value is converted into a pulse width modulation (PWM) signal.



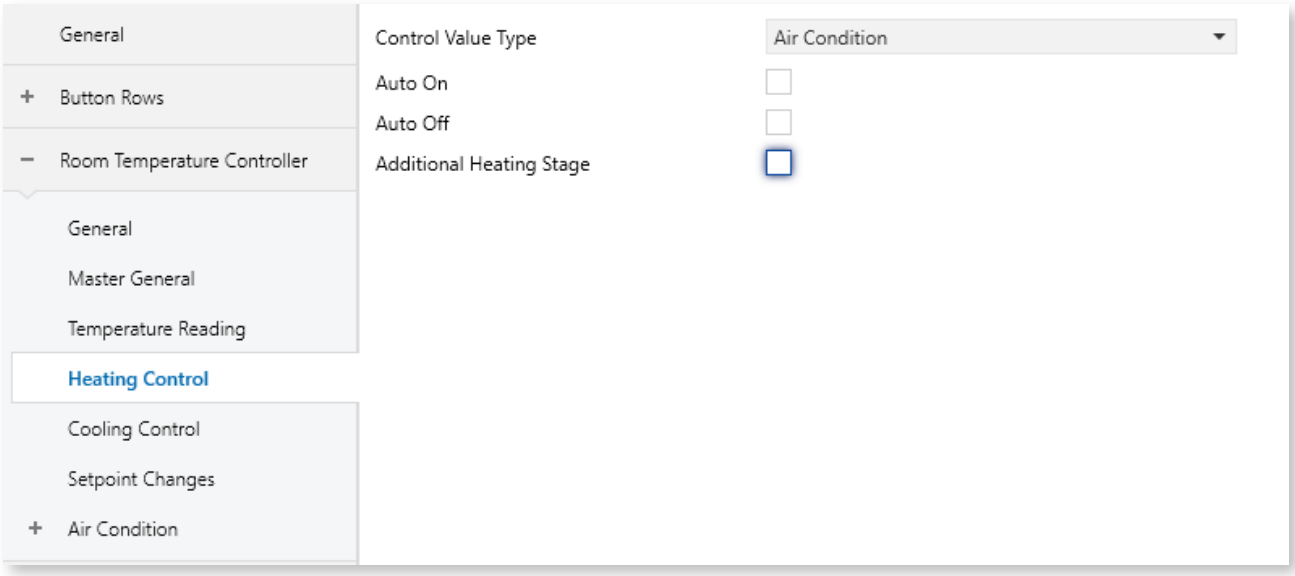
- **PI Continiuous 0-100%:** A PI controller adjusts the output value between 0% and 100% to match the difference between the actual value and the setpoint value, ensuring precise regulation of room temperature. The control value is transmitted to the bus line as a 1-byte value (0% - 100%). To reduce bus line congestion, the control value is only transmitted when there is a certain percentage change from the previously sent value. The control value can also be transmitted cyclically.



- **Fan Coil:** The fan coil controller operates similarly to the PI continuous controller. Additionally, it allows separate activation of the fan in the fan coil unit (e.g., fan speed levels 1-5).



- **Air condition:** Air conditioning control is used to bring the room temperature to a specific setpoint and maintain it at that level. The thermostat sends on or off telegrams to the air conditioner based on the difference between the room temperature and the setpoint temperature. The system adjusts the operating mode (cooling or heating) and fan speed of the air conditioning unit at specific intervals to provide precise temperature control. This control type maximizes comfort while enhancing energy efficiency.



3.5.1 2 Point 1 bit On/Off - 1 byte 0-255

The 2 Point 1 Bit On/Off – 0-255 control type provides a simple and effective control for the RTC (Room Thermostat Controller) based on specific parameters when heating or cooling. This control type sends an output signal by considering the room temperature, hysteresis value, and the setpoint temperature. The system generates and sends an output value when the temperature moves outside the defined temperature range (hysteresis).

- **1 Bit On/Off Parameter:** If the 1-bit on/off parameter is selected, the output is sent as an on or off value through a 1-bit communication object.

- **1 Byte 0-255 Parameter:** If the 1-byte 0-255 parameter is selected, the output is sent as a 0 or 255 value through a 1-byte communication object.

3.5.1.1 Status Heating Object

When the RTC is in heating mode, it operates in sync with the control value. If the control value is positive, it sends a value of 1 (ON) through the corresponding communication object to the bus line. If the control value indicates an inEnable state (e.g., when the setpoint temperature is reached), it sends a value of 0 (OFF) to the bus line.

3.5.1.2 Status Cooling Object

Similarly, when the RTC is in cooling mode, it operates in sync with the control value. If the control value is positive, it sends a value of 1 (ON) through the corresponding communication object to the bus line. If the control value indicates an inEnable state (e.g., when the setpoint temperature is reached), it sends a value of 0 (OFF) to the bus line.

3.5.1.3 Control Direction

The control direction can be adjusted parametrically. By default, when the control value is Enable, it sends.

- **1 Bit Object:** 1 (ON)
- **1 Byte Object:** 255

This default behavior can be reversed using the parameter settings. In this case:

If the control value is Enable:

- **1 Bit Object:** 0 (OFF)
- **1 Byte Object:** 0

If the control value is inEnable:

- **1 Bit Object:** 1 (ON)
- **1 Byte Object:** 255

This allows for flexibility in how the system communicates the control status based on the Enable or inEnable state.

3.5.1.4 Hysteresis

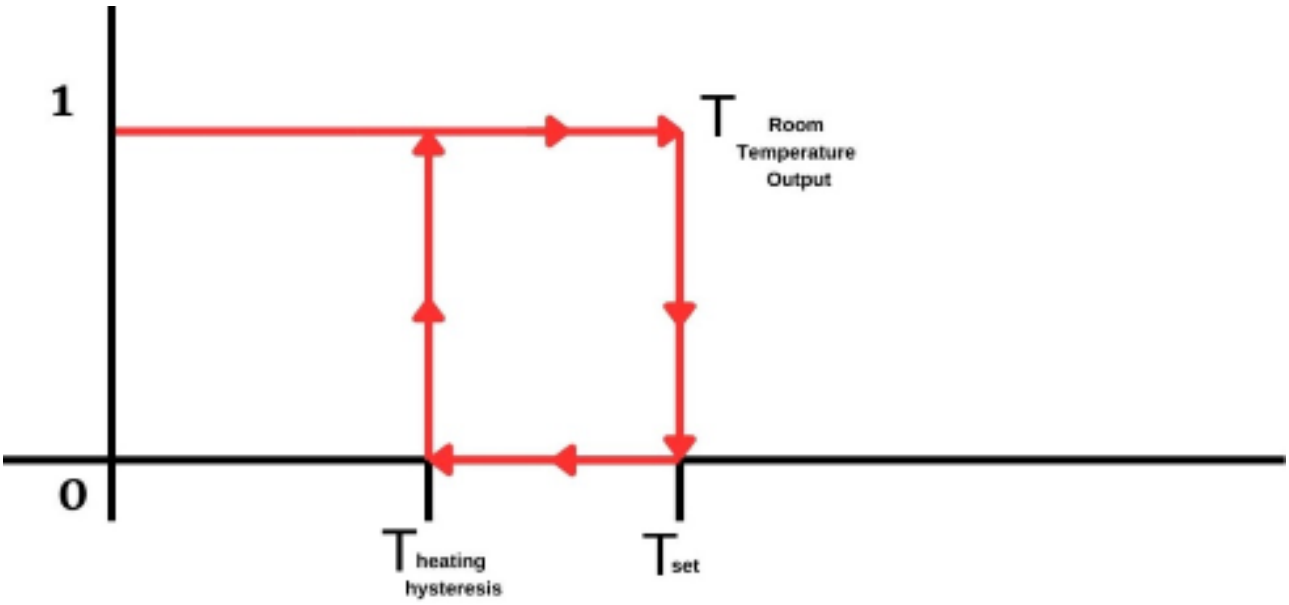
3.5.1.4.1 Heating Control Hysteresis

For Heating Mode:

- **Activation Condition:** The heating output activates when the calculated room temperature is lower than or equal the desired set Temperature.
- **Deactivation Condition:** The output remains Enable until the room temperature reaches the set temperature. Once the set temperature is achieved, the heating output deactivates.
- **Reactivation:** After deactivation, the system will wait until the room temperature drops below the hysteresis threshold to reactivate the heating output.

Example

- **Set Temperature (Theating):** 22°C
- **Hysteresis:** 2°C
- **Heating Output Deactivation:** Room temperature ≥ 22°C
- **Reactivation Threshold:** Room temperature < 20°C (22°C - 2°C)



3.5.1.4.2 Cooling Control Hyseteresis

For Cooling Mode

- **Activation Condition:** The cooling output activates when the calculated room temperature is higher than or equal the desired set Temperature.
- **Deactivation Condition:** The output remains Enable until the room temperature reaches the set temperature. Once the set temperature is achieved, the cooling output deactivates.
- **Reactivation:** After deactivation, the system will wait until the room temperature exceeds the hysteresis threshold to reactivate the cooling output.

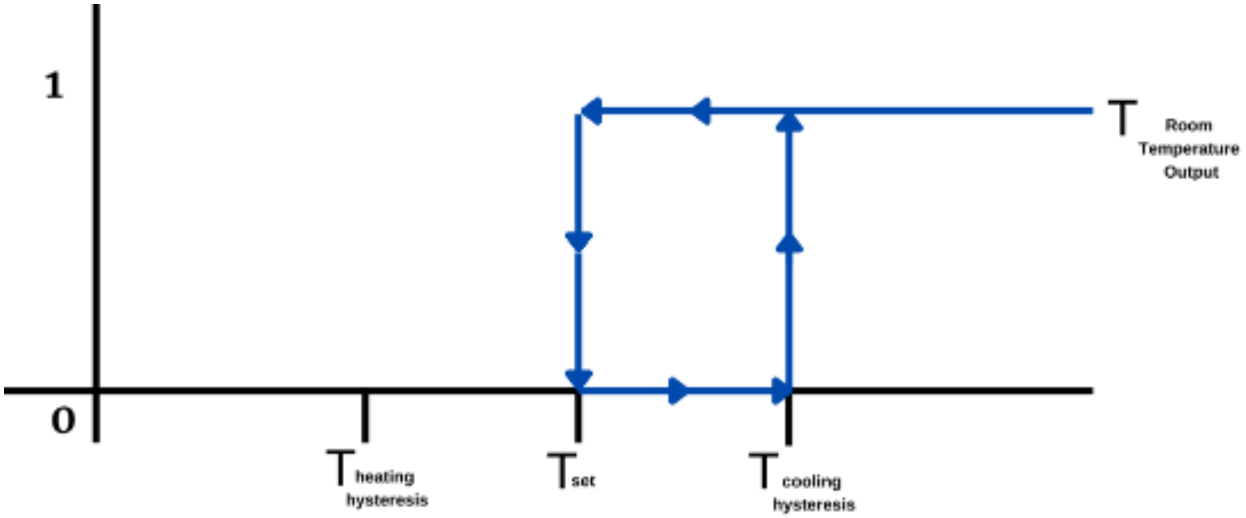
Example

Set Temperature (Tcooling): 22°C

Hysteresis: 2°C

Cooling Output Deactivation: Room temperature ≤ 22°C

Reactivation Threshold: Room temperature > 24°C (22°C + 2°C)



3.5.1.5 Cyclic Sending Control Value

The calculated control value can be sent to the bus line periodically. The interval for sending the control value to the bus line is selected in this area, and the value is sent through a communication object at the specified time interval.

Note
Changes in the control value are sent to the bus line regardless of the parameter settings. If there is a change in the heating/cooling zone, the control value is reset.

3.5.2 Common Parameters For PI Controlled Value Types

Proportional (Oransal) Bileşen: Considers the instantaneous difference between the room temperature and the set temperature. The larger the difference (error), the faster the response rate of the control value. As the difference (error) decreases, the response rate of the control value decreases proportionally.

Integral (Türev) Bileşen: Considers the accumulated error amount over time. The amount of error is tracked proportionally; if the value produced by the PI controller does not reduce the error at the expected rates, the PI control value increases to bring the set point closer.

3.5.2.1 Heating / Cooling Type

The magnitude and speed of the PI control response are parametric, affecting the performance of the heating and cooling elements in the system, user comfort, and energy savings. Pre-set values for the PI controller can be found in the parameters (e.g., Area, Convector, Fan Coil). Alternatively, the PI controller parameters can be freely configured if desired.

- **Area (4°C 200 min):** The PI controller generates a control value to achieve a temperature change of 4°C within 200 minutes. During this period, the PI controller uses both proportional and integral components to adjust the system's response rate and control value to bring the temperature closer to the target. This allows the system to respond more quickly and accurately.

- **Convector (1,5°C 100 min):** The PI controller generates a control value to achieve a temperature change of 1.5°C within 100 minutes..

- **Free Configuration:** Free configuration allows the user to manually set the P and I values. This provides more flexibility and can be adjusted according to the specific requirements of a system or application.

Proportional Gain generates the control signal by multiplying the temperature error (difference) by a specific factor. The error is multiplied by 0.1 to obtain the proportional gain.

$P=Kp \times e(t)$

where KpK_pKp is a constant coefficient. For example, if the temperature error is 2°C and Kp=0.1K_p = 0.1Kp=0.1, the proportional control coefficient would be 0.2.

Integral Gain considers the accumulated error over time. It is determined in minutes, and the control signal is created by multiplying the integral of the error by a specific coefficient.

$I=Ki \times \int_0^t e(\tau)\, d\tau$

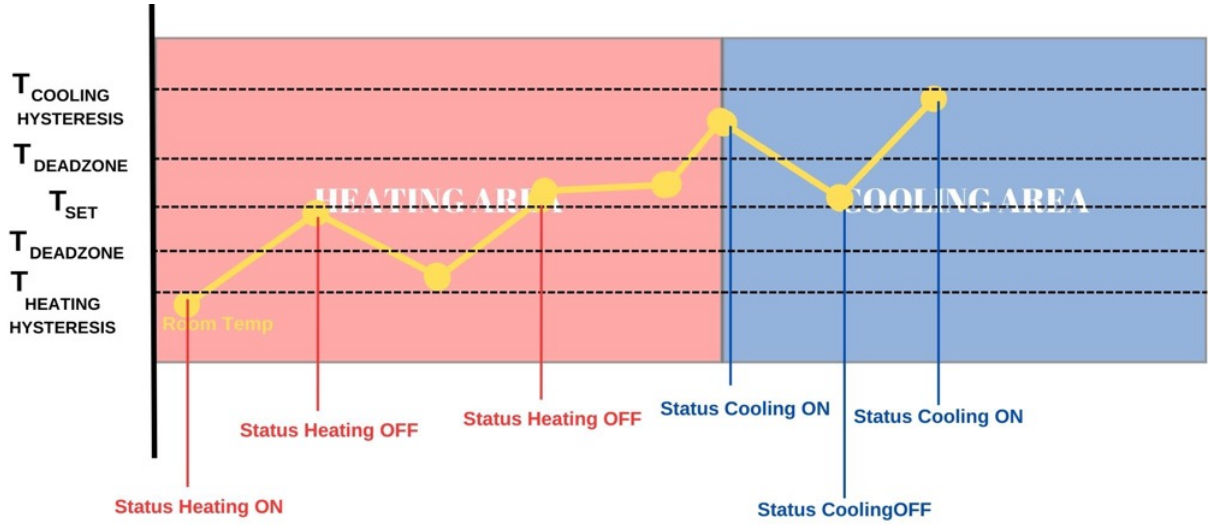
where Ki is a constant coefficient determined in minutes. This coefficient controls the rate at which the error accumulates over time.

3.5.2.2 Status Heating Object / Status Cooling Object

This parameter indicates whether the system is Enablely heating or cooling (based on the current heating or cooling zone).

- **Yes:** If selected, the control value is taken into account. If the control value is positive, the RTC sends a 1-bit (ON) value from the relevant communication object to the bus line. When the control value reaches the setpoint, or when the RTC changes zones or is turned off, the value becomes '0', and a 0 (OFF) is sent to the bus line.

- **No:** If selected, no feedback is sent based on the control value.



PI Control Value Limits

The limits of the PI control value are parameterized. Due to user preferences, performance of heating and cooling elements, and energy saving considerations, the control value can be operated within the desired range. The PI controller scales the value it produces (between 0 and 255) to fit within these limits and manages PWM control accordingly.

- **Minimum Control Value:** This represents the smallest value that the control value can take. If the PI controller aims to set the control value to 0, the minimum value specified in the parameter will be sent to the bus line.

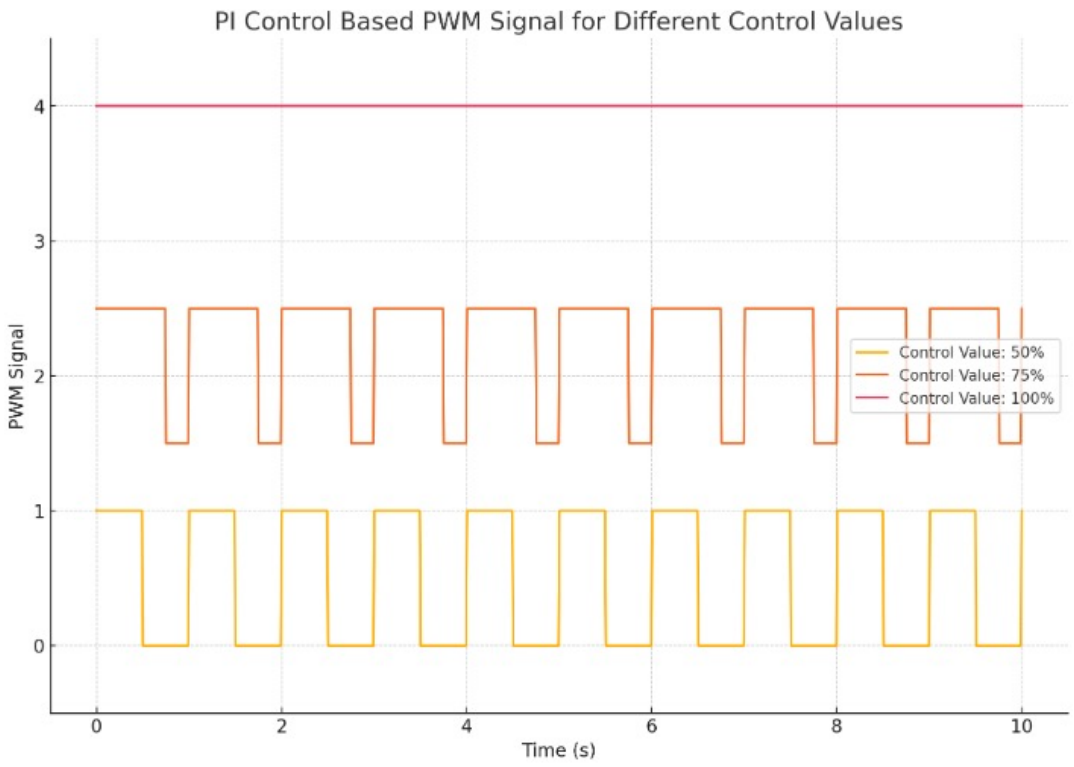
Note
If a value greater than 0 is entered for this parameter, the control value will always be Enable.

- **Maximum Control Value:** Indicates the highest value that the control value can assume. If the PI controller intends to set the control value to 100, the maximum value entered in the parameter will be sent to the bus line.

3.5.2.3 PWM

The PI (Proportional-Integral) PWM (Pulse Width Modulation) control type is used to precisely regulate the room temperature to the setpoint value. This control type converts the control value calculated by the PI controller into a 1-bit (on/off) telegram using the pulse width modulation (PWM) method.

- **PWM (Pulse Width Modulation):** This method allows the device to operate at the desired power level by turning the control signal on and off at specific time intervals. The control value calculated by the PI controller is converted into a pulse width over a defined period. For example, if the calculated value is 30%, the signal will be on for 30% of the time and off for 70% of the time.



3.5.2.4 PWM Cycle

The control value percentage determines the on and off phases within a given PWM cycle when converted to a pulse width modulation (PWM) signal. For example, a control value of 40% represents six minutes of On phase and nine minutes of Off phase in a 15 minute PWM cycle.

3.5.3 PI Continuous / Fancoil

The PI controller adjusts the output value between 0% and 100% to match the difference between the calculated temperature and the setpoint value, ensuring precise regulation of the room temperature to the desired setpoint. The control value is sent to the bus line as a 1-byte value (0% - 100%).

3.5.3.1 Change Amount

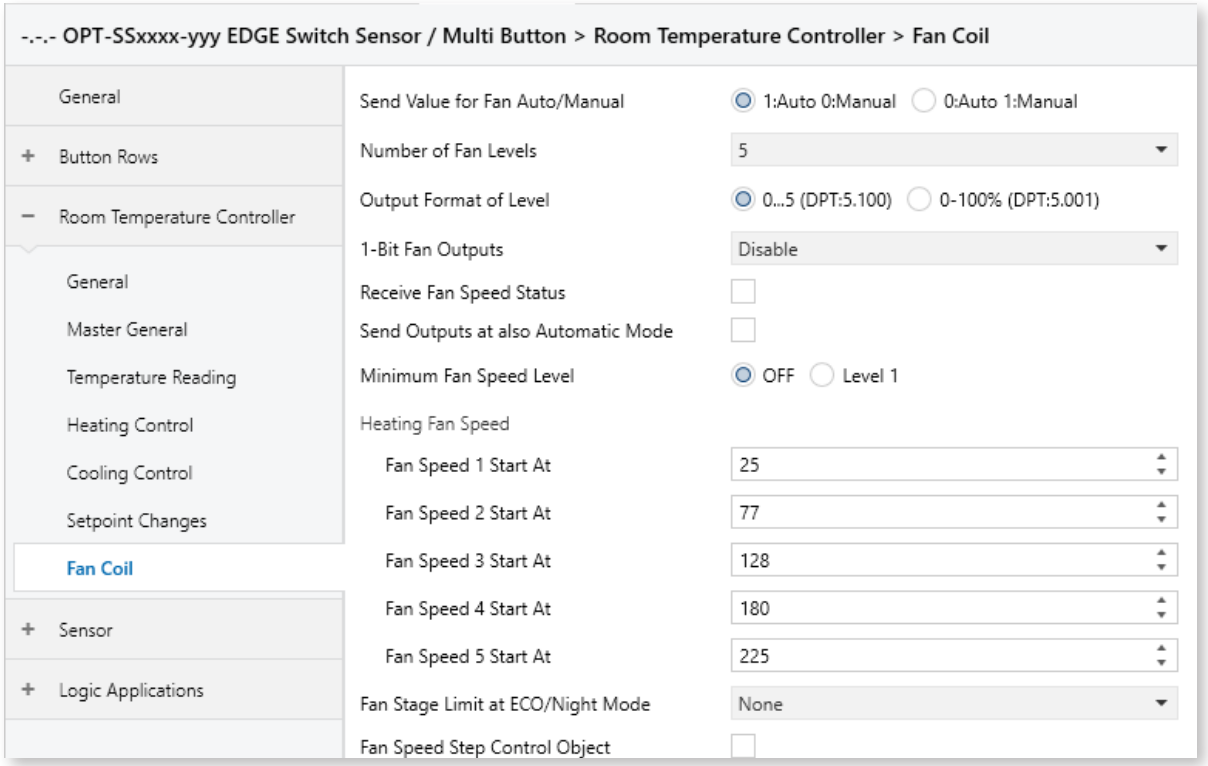
The control value is sent to the bus line based on a specific percentage change from the previously sent value to reduce bus line load, and it is also sent cyclically.

%2-%5-%10: The control value is compared with the previously sent value each time it is calculated. If the amount of change is greater than the percentage specified in the parameter of the maximum control value, this new value is sent to the bus line. If the change is smaller, the value is not sent to the bus line.

Only Cyclic: The control value is sent to the bus line only at the intervals specified in the parameter, regardless of the amount of change.

Note
When there is a change in the heating or cooling zone of the RTC, if the control value is sent from a single object, the value is sent as 0 to this object. If it is sent from two objects, the value 0 is sent to the communication object of the old mode.

3.5.4 Fancoil (Heating / Cooling)



Fan coil units are devices used for heating or cooling a space and typically include a fan and a heat exchanger (coil). In a KNX system, the control of fan coil units can be achieved using a PI (Proportional-Integral) control algorithm to provide more precise and efficient temperature regulation.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
170	RTC- Fan Coil	Fan Speed Auto Control	Bidirectional	1bit	1.001 switch	C	-	W	T
172	RTC- Fan Coil	Fan Speed Auto Control Status	Output	1bit	1.001 switch	C	R	-	T
173	RTC- Fan Coil	Fan Speed Set	Output	1byte	5.100 fan stage (0..255) 5.001 percentage	C	-	-	T
174	RTC- Fan Coil	Fan Speed 1	Output	1bit	1.001 switch	C	-	-	T
175	RTC- Fan Coil	Fan Speed 2	Output	1bit	1.001 switch	C	-	-	T
176	RTC- Fan Coil	Fan Speed 3	Output	1bit	1.001 switch	C	-	-	T
177	RTC- Fan Coil	Fan Speed 4	Output	1bit	1.001 switch	C	-	-	T
178	RTC- Fan Coil	Fan Speed 5	Output	1bit	1.001 switch	C	-	-	T
179	RTC- Fan Coil	Fan Speed Step Control	Input	1bit	1.001 switch	C	-	W	-
180	RTC- Fan Coil	Fan Speed Status	Input	1byte	5.100 fan stage (0..255) 5.001 percentage	C	-	W	-

Table 18: RTC-8 Communication Object

3.5.4.1 Send Value for Fan Auto/Manual

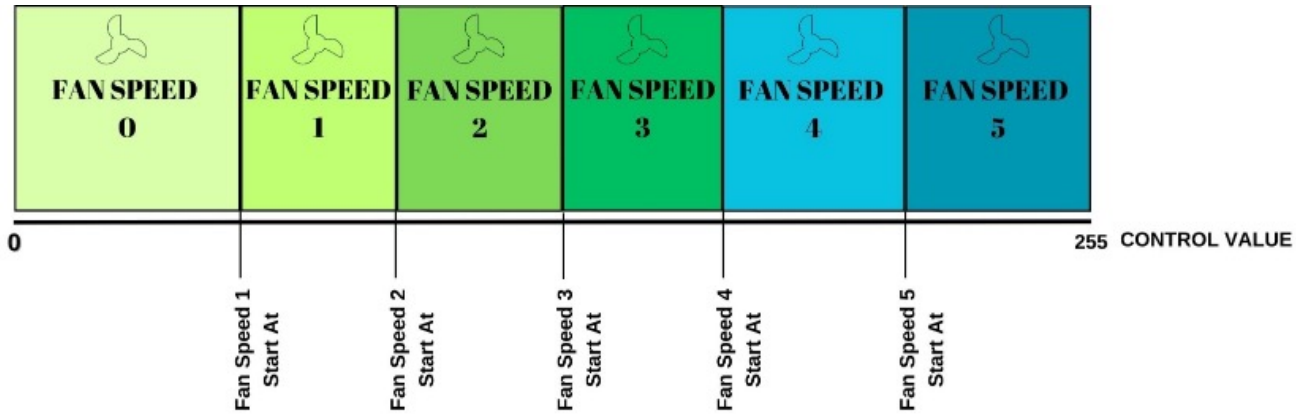
The fan speed of a fan coil unit can be set to either automatic or manual mode. In automatic mode, the fan speed is indicated on the screen with the label 'auto' and adheres to the fan speed thresholds specified in the PI control value parameters. In manual mode, the fan speed is set by the user through the screen or data received from the bus line. In this case, the PI value is disregarded, and the fan will continue to operate at the set speed until it is switched back to automatic mode. The selection between automatic/manual fan modes is made using 1-bit data with values for On or Off, and this choice is parameterized..

- **1:Auto 0: Manual:** If selected, the RTC fan speed will switch to automatic mode with value 1 (ON) and to manual mode with value 0 (OFF).

- **0:Auto 1: Manual:** If selected, the RTC fan speed will switch to automatic mode with value 0 (OFF) and to manual mode with value 1 (ON).

3.5.4.2 Number of Fan Level

This parameter specifies the number of fan levels in the fan coil unit used in the system. You can choose from 2, 3, or 5 levels. Threshold values are set for the selected levels. The fan level that corresponds to the range of the control value produced by the PI controller is sent to the bus line (if the fan is in automatic mode).



If the minimum fan speed level 1 is selected, the fan stage cannot be 0

3.5.4.3 Output Format of Level

5.4.3. Output Format of Level
The output format of the fan level, whether calculated or manually sent, is parameterized and can vary depending on the data type. The data type for the fan level is selected from this parameter:

- **0..5 (DPT:5.100):** If selected, the fan level is sent to the bus line in 1 byte DPT5.100 (fan stage) data type.
- **0..100% (DPT 5.010):** If selected, the fan level is sent to the bus line in 1 byte DPT5.010 (percentage) data type according to KNX standard values.

Fan Stage	DPT 5.100 Value
Fan Speed 0	0
Fan Speed 1	1
Fan Speed 2	2

Fan Stage	DPT 5.100 Value
Fan Speed 0	0
Fan Speed 1	1
Fan Speed 2	2
Fan Speed 3	3

Fan Stage	DPT 5.100 Value
Fan Speed 0	0
Fan Speed 1	1
Fan Speed 2	2
Fan Speed 3	3
Fan Speed 4	4
Fan Speed 5	5

Fan Stage	DPT 5.010 Value
Fan Speed 0	0
Fan Speed 1	128
Fan Speed 2	255

Fan Stage	DPT 5.010 Value
Fan Speed 0	0
Fan Speed 1	85
Fan Speed 2	170
Fan Speed 3	255

Fan Stage	DPT 5.010 Value
Fan Speed 0	0
Fan Speed 1	51
Fan Speed 2	102
Fan Speed 3	153
Fan Speed 4	204
Fan Speed 5	255

3.5.4.4 1 Bit Fan Outputs

The fan level is sent separately to the bus line as 1-bit data communication objects, depending on the parameter setting. If selected, the RTC sends the fan level information as 1 (ON) for Enable and 0 (OFF) for inEnable via the 1-bit communication object. There are two methods for sending this data, depending on the choice for the fan coil unit:

- **Disabled:** The fan level is not sent via 1-bit communication objects..
- **1 of Stages:** If selected, only the Enable fan stage sends the ON information, while inEnable stages send OFF information.

Example
In a 3-stage fan coil system, if stage 2 is Enable, stages 1 and 3 will send OFF values, while stage 2 will send ON (if there is a change).

- **All of stages:** If selected, the Enable stage and all lower stages send ON information, while higher stages send OFF values to the bus line (if there is a change).

Example
In a 5-stage fan coil unit, if stage 3 is Enable, stages 1, 2, and 3 will send ON information, while stages 4 and 5 will send OFF information

3.5.4.5 Recieve Fan Speed Status

If this parameter is selected, the fan speed feedback communication object will be used. In manual mode, the fan speed sent is dependent on the feedback value received and this value is considered correct. If a value different from what was sent by the RTC is received from the feedback object, the RTC will display the fan speed based on the received value.

If this parameter is not selected, the relevant communication object will not be visible, and the fan speed will operate without feedback. The RTC will not receive information about the operation of the fan speed it has sent and will only be responsible for sending the value.

Note
This parameter can be used in cases where the fan speed is not sent to the bus line in automatic mode; therefore, if this parameter is selected, the 'send output at also Automatic Mode' parameter will be disabled.

3.5.4.6 Send Output at Also Automatic Mode

The RTC can send the fan speed to the bus line while in automatic mode or only report that it is in automatic mode. This option is parametric.

- **Selected:** The fan speed within the range of the PI controller will be sent to the bus line in the data type chosen in the parameter.
- **Not Selected:** The RTC will not send fan speed data to the bus line while in automatic mode, only informing that it is in automatic mode.

3.5.4.7 Minimum Fan Speed Level

The minimum fan speed level can be selected as either 1 or 0. If the minimum fan speed level is set to 1, the 0-speed fan option will not be available in the manual mode fan menu. In automatic mode, and if a value is being sent to the bus line, the fan speed is defined as 1 until the 'fan speed start at 2' threshold is reached.

3.5.4.8 Fan Stage Limit at ECO/Night Mode

When the RTC is set to ECO operation mode, it can limit the fan stages to provide energy savings and comfort. This option is parametric, and the fan stages can be limited according to the fan coil unit's allowed stages.

- **None:** Fan stages are not limited.
- **0-1-2-3-4:** The fan stages can be limited according to the number of stages in the fan coil unit. (For a 5-stage fan coil unit, the stages can be limited to 0-1-2-3-4; for a 3-stage unit, to 0-1-2; for a 2-stage unit, to 0-1). If the fan stage in ECO/Night mode is limited and the PI controller calculates a value above this limit, the highest allowed fan stage will be sent to the bus line. If a lower stage is calculated, this value will be sent to the bus line. In manual mode, the fan stage menu can be selected up to the limited value.

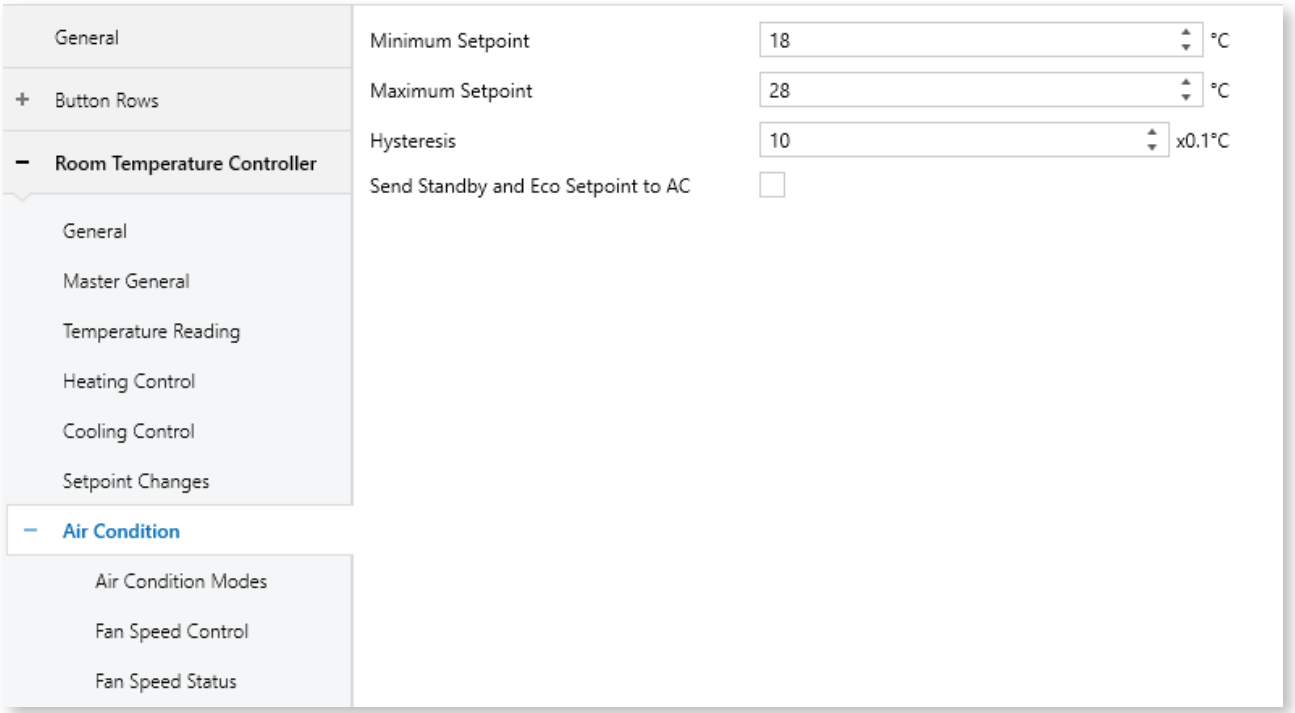
Note
If the Minimum Fan Speed Level parameter is set to "1," the limit cannot be 0.

3.5.4.9 Fan Speed Step Control Object

The fan speed change can be managed via a single communication object with a 1-bit data length. If this parameter is selected, the corresponding communication object becomes visible. The object will increase the fan speed stage upon receiving ON information and decrease it upon receiving OFF information. (In a 3-stage system, if the 2nd stage is Enable, ON information will switch to the 3rd stage, and OFF information will switch to the 1st stage.)

Note
When the fan speed is at the maximum value, ON information will not change the stage, and similarly

3.5.5 Air Condition



No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
141	RTC–AirCondition	Climate On-Off	Output	1 bit	1.001 Switch	C	-	-	T
143	RTC–AirCondition	Climate Setpoint	Output	2 bytes	9.001 temperature(°C)	C	-	-	T
146	RTC–AirCondition	Climate Heat Cool Select	Output	1 bit	1.001 Switch	C	-	-	T
148	RTC–AirCondition	HVAC Conrol Mode Output	Output	1 byte	20.105 HVAC Control Mode	C	-	-	T
149	RTC–AirCondition	HVAC Conrol Mode Status	Input	1 byte	20.105 HVAC Control Mode	C	-	W	T
155	RTC–AirCondition	Fan Speed Value	Output	1 byte	5.001 Percentage	C	-	-	T
156	RTC–AirCondition	Fan Speed Step Control	Input	1 bit	1.001 Switch	C	-	W	-
157	RTC–AirCondition	Fan Speed Auto	Output	1 bit	1.001 Switch	C	-	-	T
158	RTC–AirCondition	Fan Speed 1	Output	1 bit	1.001 Switch	C	-	-	T
159	RTC–AirCondition	Fan Speed 2	Output	1 bit	1.001 Switch	C	-	-	T
160	RTC–AirCondition	Fan Speed 3	Output	1 bit	1.001 Switch	C	-	-	T
161	RTC–AirCondition	Fan Speed 4	Output	1 bit	1.001 Switch	C	-	-	T
162	RTC–AirCondition	Fan Speed 5	Output	1 bit	1.001 Switch	C	-		T
163	RTC–AirCondition	Fan Speed Status	Input	1 byte	5.001 Percentage	C	-	W	-
164	RTC–AirCondition	Fan Speed Auto Status	Input	1 bit	1.001 Switch	C	-	W	-
165	RTC–AirCondition	Fan Speed 1 Status	Input	1 bit	1.001 Switch	C	-	W	-
166	RTC–AirCondition	Fan Speed 2 Status	Input	1 bit	1.001 Switch	C	-	W	-
167	RTC–AirCondition	Fan Speed 3 Status	Input	1 bit	1.001 Switch	C	-	W	-
168	RTC–AirCondition	Fan Speed 4 Status	Input	1 bit	1.001 Switch	C	-	W	-
169	RTC–AirCondition	Fan Speed 5 Status	Input	1 bit	1.001 Switch	C	-	W	-

Table 19: RTC-9 Communication Object

The OPT-SSxxxx-yyy can be used as a climate controller, and this option should be selected based on the system's conditions. Options include: climate control for heating only, cooling only, heating and cooling, additional heating zone climate, or additional cooling zone climate. The RTC communicates with the climate system through the climate interface, functioning similarly to a climate thermostat. In this case, it can send the setpoint temperature, provide room temperature, set the fan speed, determine the fan's automatic or manual mode, and offer 5 operating modes (auto, heat, cool, dry, fan).

Note
If the climate system is the sole heating-cooling element in the environment, the RTC can only be selected as a climate controller (see Master General). In this case, the RTC operation mode cannot be used.

3.5.5.1 Auto On/Off

The RTC can send automatic on, automatic off, or both automatic on and off telegrams to the climate system in the selected area. This option is parameterizable.

- **Auto On:** In automatic on mode, the RTC sends an ON telegram to the climate system based on the calculated room temperature, setpoint, and hysteresis values.

- **Auto OFF:** In automatic off mode, the RTC sends an OFF telegram to the climate system based on the calculated room temperature, setpoint, and hysteresis values.

3.5.5.1.1 Default Setpoint Temperature

When the RTC is selected solely as a climate controller, the initial setpoint temperature to be sent to the climate system is defined. The specified value is sent to the bus line upon change, and if desired, information can be sent to the bus line at specific intervals by entering a time period.

3.5.5.1.2 Minimum/Maximum Setpoint

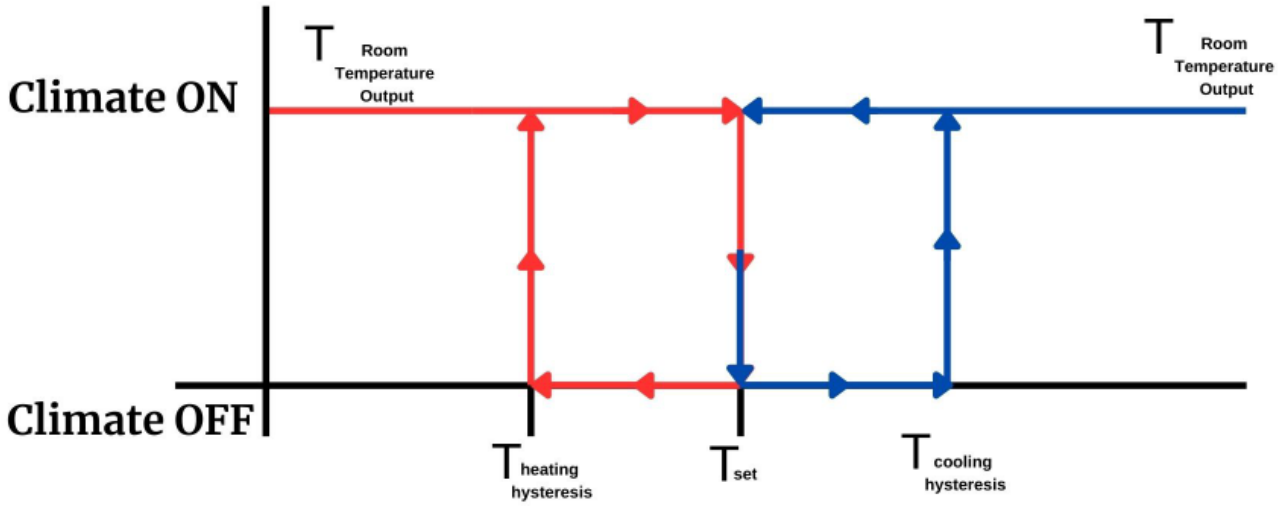
If the climate system and RTC control multiple heating elements, different setpoint ranges can be specified. If the setpoint temperature determined by the RTC exceeds the defined limits for the climate system, the maximum setpoint temperature is sent to the climate system through the relevant communication object. If it is below the limit, the minimum setpoint value is sent to the bus line through the same communication object..

Note
The setpoint range should be defined according to the climate product.

3.5.5.1.3 Hysteresis

If the climate system is programmed for automatic on, automatic off, or both automatic on and off, the hysteresis value is specified here.

Example
In a system where both auto on and auto off are selected, the RTC will continue to operate the climate system until the setpoint temperature is reached. Once the setpoint is reached, the climate system will turn off. When in the heating mode, the RTC allows the room temperature to drop by the specified hysteresis amount before reactivating the climate system. In the cooling mode, the RTC allows the room temperature to rise by the specified hysteresis amount before reactivating the climate system.



Note
If automatic modes are selected, the climate system can be manually turned on and off. However, when the RTC enters the opening and closing regions, it will control the climate system.

3.5.5.1.4 Send Stanby and Eco Setpoint to AC

The RTC adjusts the setpoint temperature according to the operating mode. Whether this adjustment is sent to the climate system is parametric.

- **Seçilirse:** The RTC-calculated setpoint temperature for the climate system is sent via the communication object to the bus line according to the operating mode. If the setpoint is within the climate set limits, it is sent directly; otherwise, the minimum or maximum value is sent.

- **Seçilmez ise:** The RTC sends the comfort setpoint temperature to the climate system. Setpoints calculated in economy or standby modes are not sent to the climate system. If setpoint changes are possible in these modes, they affect the comfort mode setpoint, and this value is sent to the climate system.

Note
This parameter is Enable if selected from the climate heating or cooling menu. If there is only one climate system for both heating and cooling, the RTC operation mode will not change.

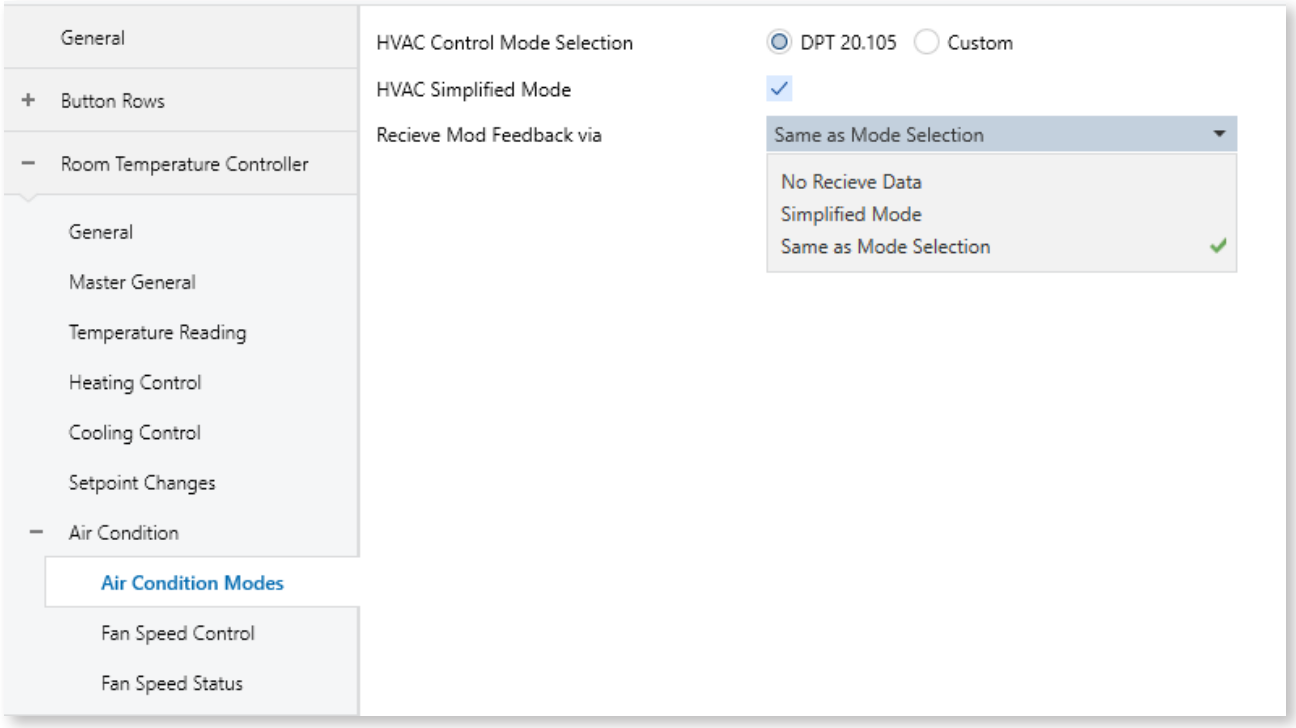
If the Standby and Eco Setpoint to AC parameter is selected, the setpoint and the calculated set temperatures in the eco/night mode are sent to the air conditioner through the relevant communication object.

3.5.5.2 Air Condition Modes

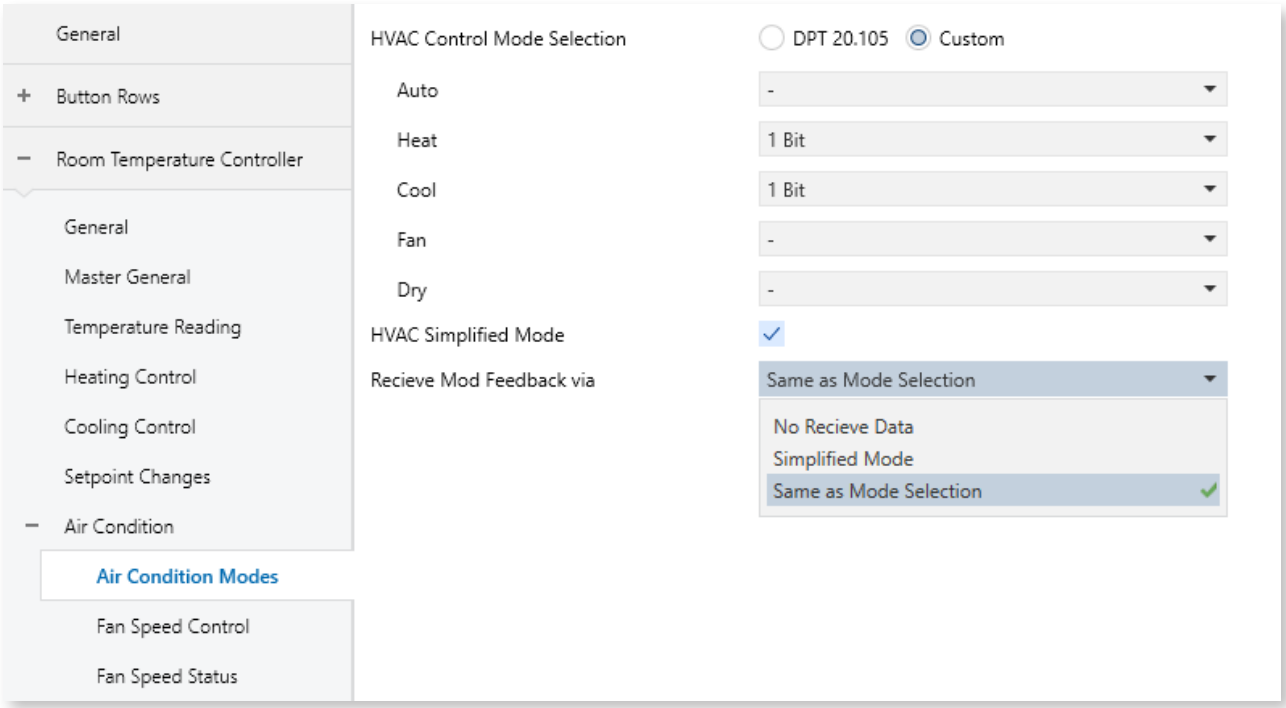
3.5.5.2.1 HVAC Control Mode Selection

The RTC supports five air conditioning modes. It can send these mode details to the bus system and receive them from the bus system to display on the screen. The values for these modes that it will receive and send are parameterizable. Desired values can be configured or KNX-defined values can be sent and received via the corresponding communication objects.

- **DPT20.105:** If selected, all supported modes will be sent and received using KNX-defined 1-byte fixed data.



- **Custom 1bit:** If selected, the air conditioning control modes can be sent and received as 1-bit data. When this parameter is chosen, 1-bit transmission communication objects for each selected mode will be visible in the RTC. An ON value sent from these objects indicates that the mode is Enable.



- **Custom 1byte: :** If selected, air conditioning control modes can be sent as 1-byte data. For the selected modes, 1-byte communication objects will be visible for sending. The parameter includes an input for the value to be sent to the bus system when the mode is Enable. The entered value will be sent as 1-byte data to the bus system when the mode is Enable.

Mode	Data	Data Type
Auto	0	20.105 HVAC Control Mode
Heat	1	20.105 HVAC Control Mode
Cool	3	20.105 HVAC Control Mode
Fan Only	9	20.105 HVAC Control Mode
Dry	14	20.105 HVAC Control Mode

3.5.5.2.2 HVAC Simplified Mode

If only heating and cooling modes are used in the air conditioning system, the simplified mode can be utilized. If this parameter is selected, a 1-bit communication object will be visible. When RTC is set to heating mode, it will send an ON value via this object. When in cooling mode, it will send an OFF value.

3.5.5.2.3 Recieve Mod Feedback via

The source from which the air conditioning mode feedback is received is parameterized. Feedback may not be received, or it can be received via simplified mode, or the sent values can be used for feedback.

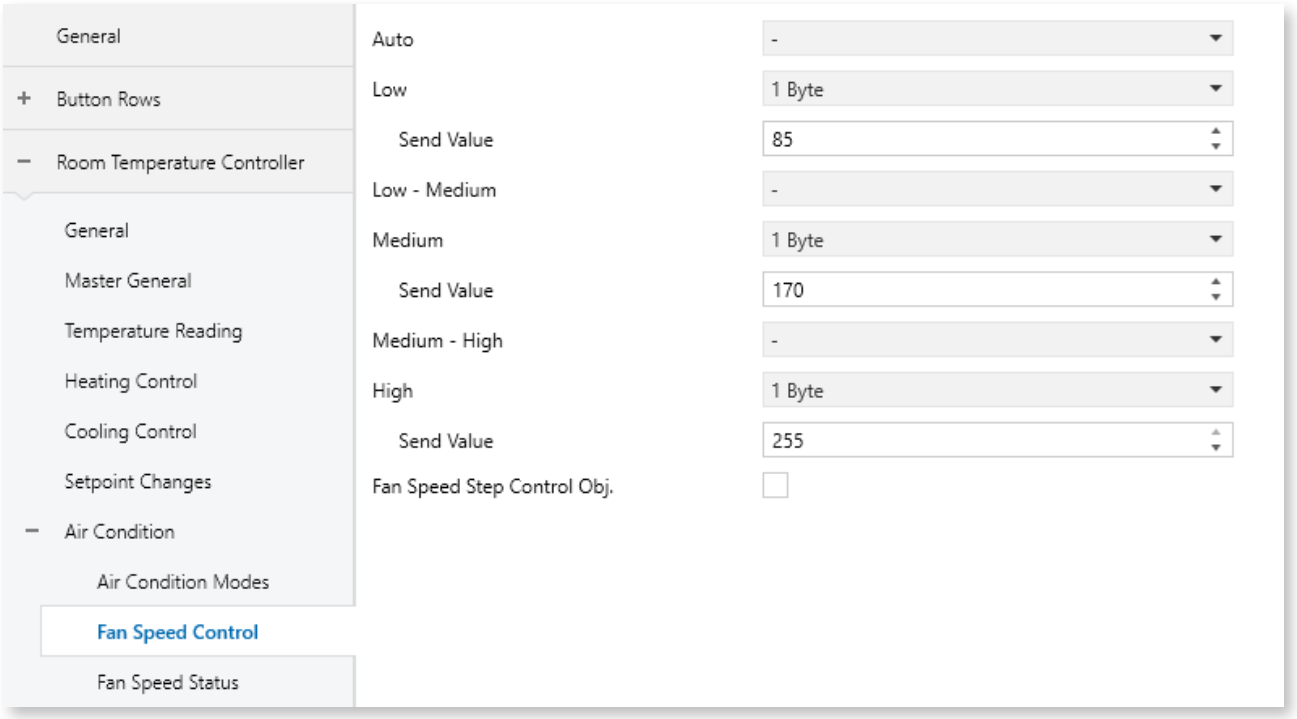
- **No Receive Data:** RTC does not receive air conditioning mode feedback, and the communication object for feedback will not be visible.

- **Simplified Mode:** RTC receives air conditioning mode feedback through a 1-bit communication object in simplified mode. If selected, the communication object will be visible, and an ON value from this object indicates heating, while an OFF value indicates cooling.

Note
If simplified mode is not Enable but is selected as the feedback source, simplified mode will be automatically activated.

- **Same as Mode Selection:** RTC considers the values and data types it sends to the air conditioner as feedback as well. If the air conditioning mode DPT 20.105 is selected, feedback will be received from the corresponding communication object with the same values. If Custom is selected, communication objects for feedback will appear with the data type set for sending value methods. Feedback values from these objects will determine the RTC mode.

3.5.5.3 Fan Speed Control



3.5.5.3.1 Fan Stages

RTC can send up to 5 fan stages to the air conditioner. If the air conditioner has an automatic fan stage, the automatic mode can also be sent. The data type and value of each fan stage can be customized. Fan stages can be set as 'Auto, Low, Low-Medium, Medium, Medium-High, High,' and each stage's data type and value can be changed.

- **None :** The stage is not selectable in the fan stage menu and does not appear on the screen.
- **1 bit :** Sends fan stage information via a 1-bit communication object. An ON value indicates the stage is Enable.
- **1byte:** When selected, the required value for the Enable stage is prompted. The value is sent to the bus line via a 1-byte communication object..
- **Both:** Sends fan stage information using both 1-bit and 1-byte communication objects. A value for the 1-byte data type is defined.

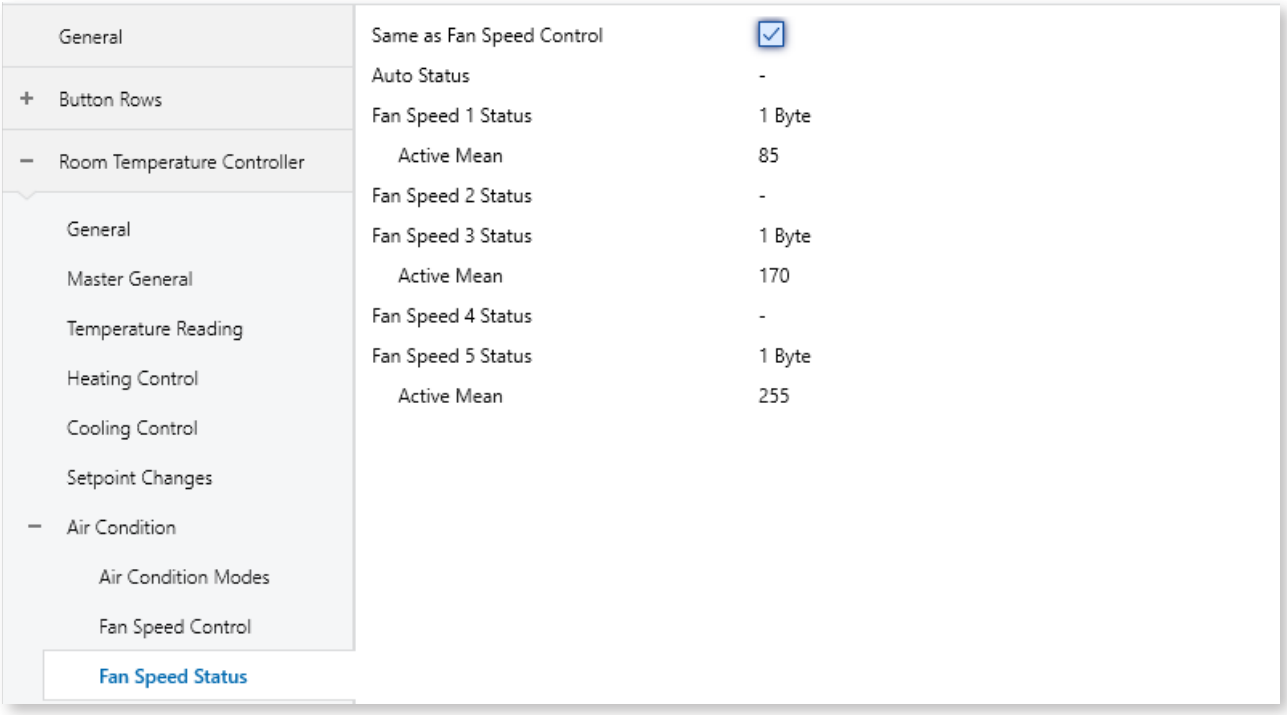
3.5.5.3.2 Fan Speed Step Control Object

Fan speed changes can be managed via a single 1-bit communication object. If this parameter is selected, the communication object becomes visible. This object allows for fan speed adjustment as follows:

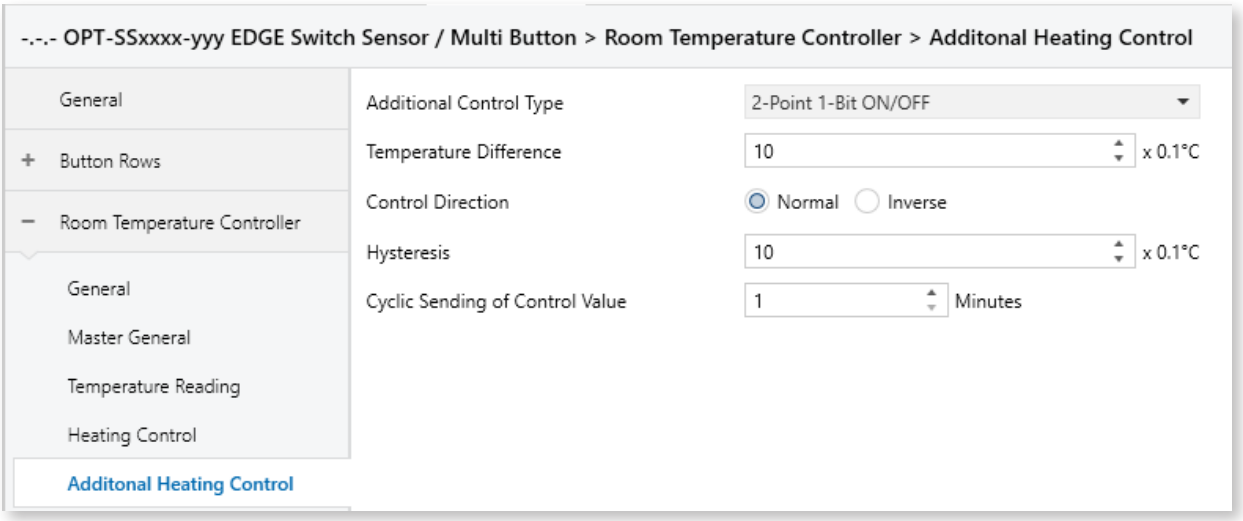
- **ON:** Increases the fan speed stage.
- **OFF:** Decreases the fan speed stage.

3.5.5.3.3 Fan Speed Status

The fan speed feedback from the air conditioner can be customized and is parameter-driven. The feedback can be received in any desired data length and format. Additionally, the RTC can synchronize its fan speed feedback with the values sent to the air conditioner. This parameter is used when fan speed values are sent and received as feedback.



3.6 Additional Heating/Cooling Stages



RTC can manage additional heating or cooling stages in environments where a primary heating or cooling element is either inadequate or requires rapid response. These additional stages are configured through the parameters of the extra zone.

3.6.1 Additional Control Types

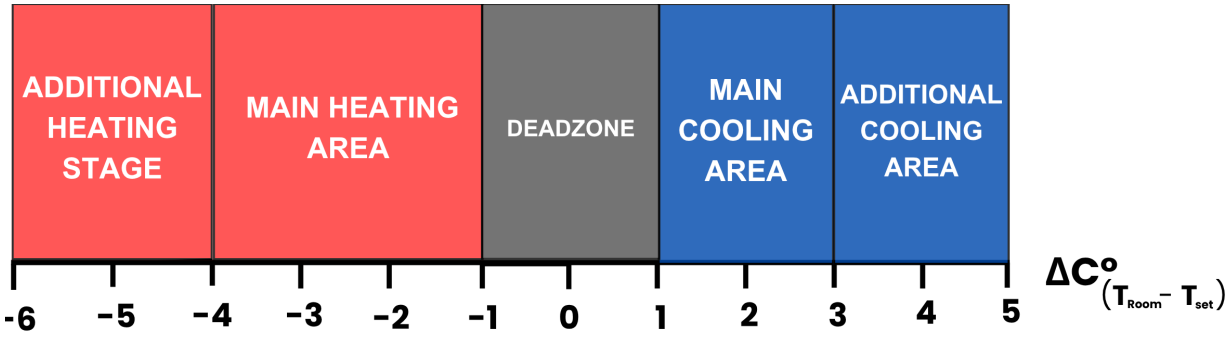
All control types that RTC can manage are selected based on the type of secondary heating or cooling element. The control value is derived from the temperature difference from the setpoint.

- **2 Noktalı 1 Bit, Kapalı/Açık:** The simplest control type. The thermostat turns on when the room temperature falls below a set point minus hysteresis and turns off when it rises above the set point plus hysteresis. Telegrams are transmitted as 1-bit values.
- **2 Noktalı 1 Byte, 0/100%:** Similar to the 2-Point On/Off control but uses 1-byte values (0% / 100%) for telegrams.
- **PI Sürekli, 0-100%:** The PI controller adjusts the output between 0% and 100% to match the difference between the actual value and the setpoint, finely regulating the room temperature. The control value is sent as a 1-byte value (0% - 100%). For efficiency, the control value is only sent if there is a certain percentage change from the last sent value and can be sent cyclically.
- **PI PWM, Kapalı/Açık:** A PI controller where the output is a 1-bit telegram. The calculated control value is converted into a pulse width modulation (PWM) signal.
- **Fan Coil:** Works like a PI continuous controller but additionally allows separate control of the fan within the fan coil unit (e.g., fan speed levels from 1 to 5).
- **Air Conditioner:** Air conditioner control is used to bring the room temperature to a specified setpoint and maintain it at that level. The thermostat determines the difference between the room temperature and the setpoint, and sends on/off telegrams to the air conditioner accordingly. The system adjusts the air conditioner's operating mode (cooling or heating) and fan speed at specific intervals to ensure precise temperature control. This control type enhances energy efficiency while maximizing comfort levels.

Note
For fan coil and air conditioning control types, the same control type cannot be selected for both the main and additional zones. In other words, if the main zone is set to fan coil, the additional zone cannot be set to fan coil. Similarly, if the main zone is set to air conditioning, the additional zone cannot be set to air conditioning.

3.6.2 Temperature Differance

The activation of the additional zone is determined by the difference between the setpoint of the main zone and the additional zone, and this is parameterizable.

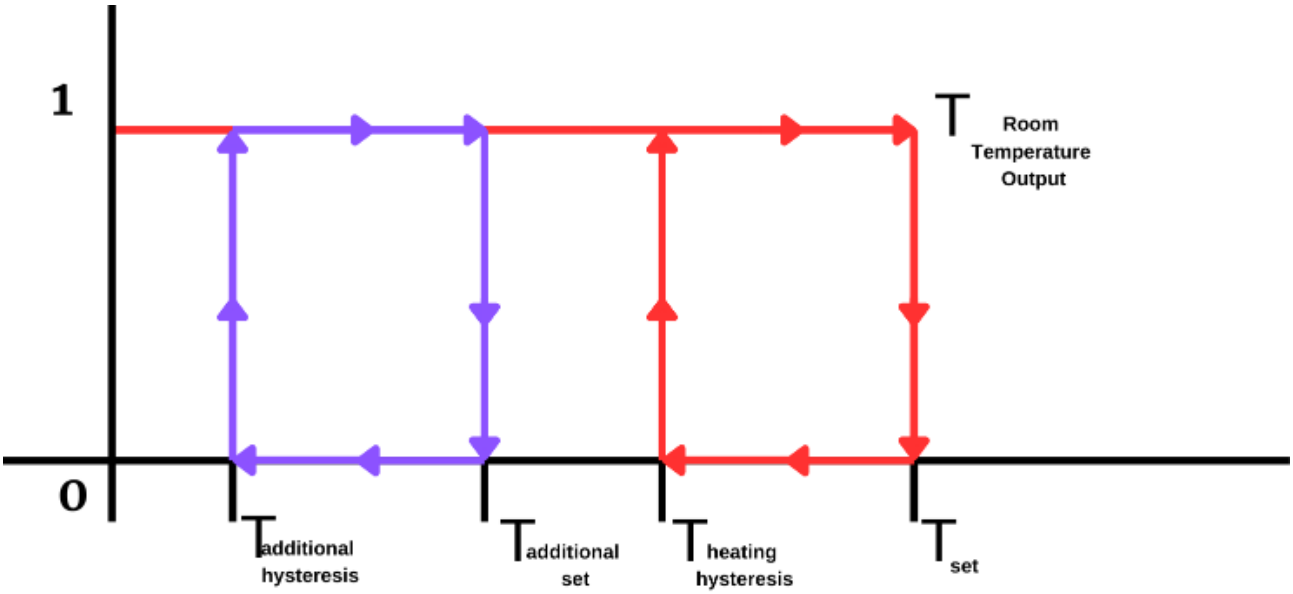


Note
If the additional zone setpoint temperature difference is set to 0, the main zone and the additional zone will activate together.

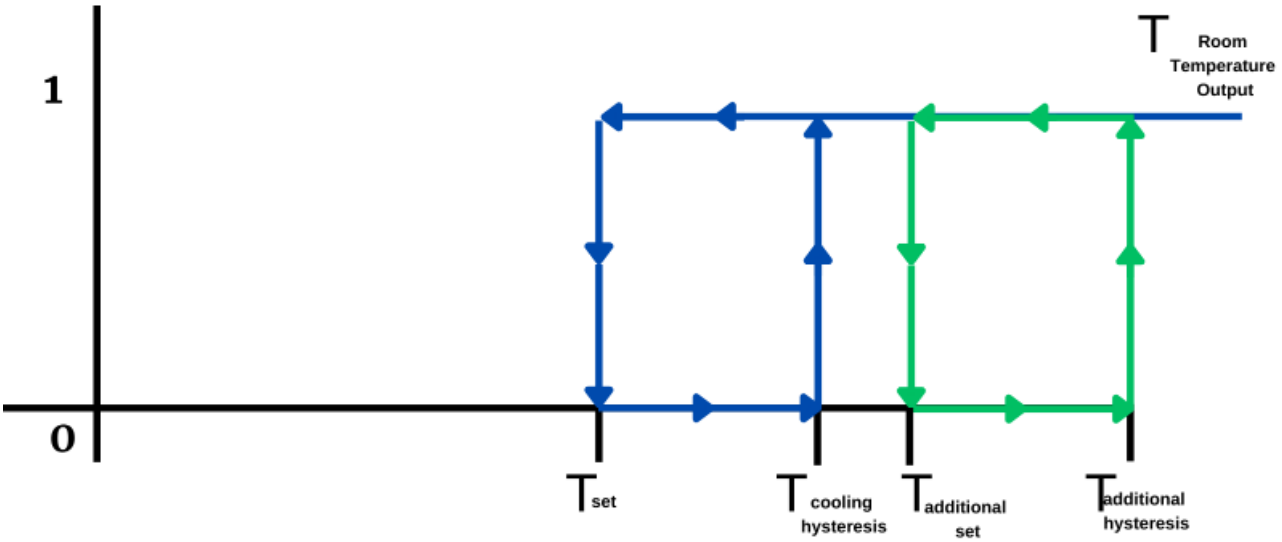
3.6.3 Additional Stage Hysteresiz

When the required temperature difference for activating the additional zone is met, the RTC will activate the additional zone. The additional zone will be controlled until the temperature difference specified in the parameters is resolved and then deactivated. Afterward, it remains in the standby position for the hysteresis value, and the additional zone will reactivate after an increase or decrease (depending on the heating or cooling zone) equal to the hysteresis value

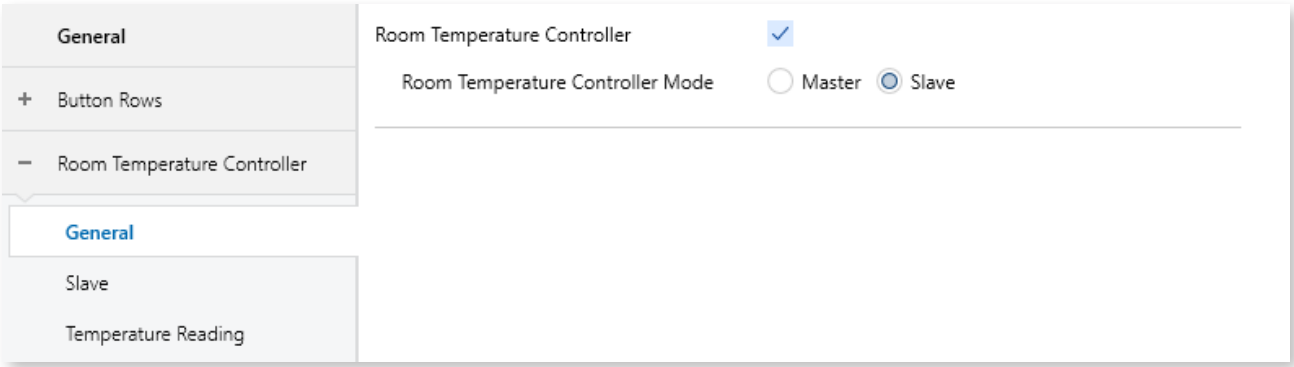
Hysteresis Operation for Additional Heating Zone



Hysteresis Operation for Additional Cooling Zone



3.7 SLAVE



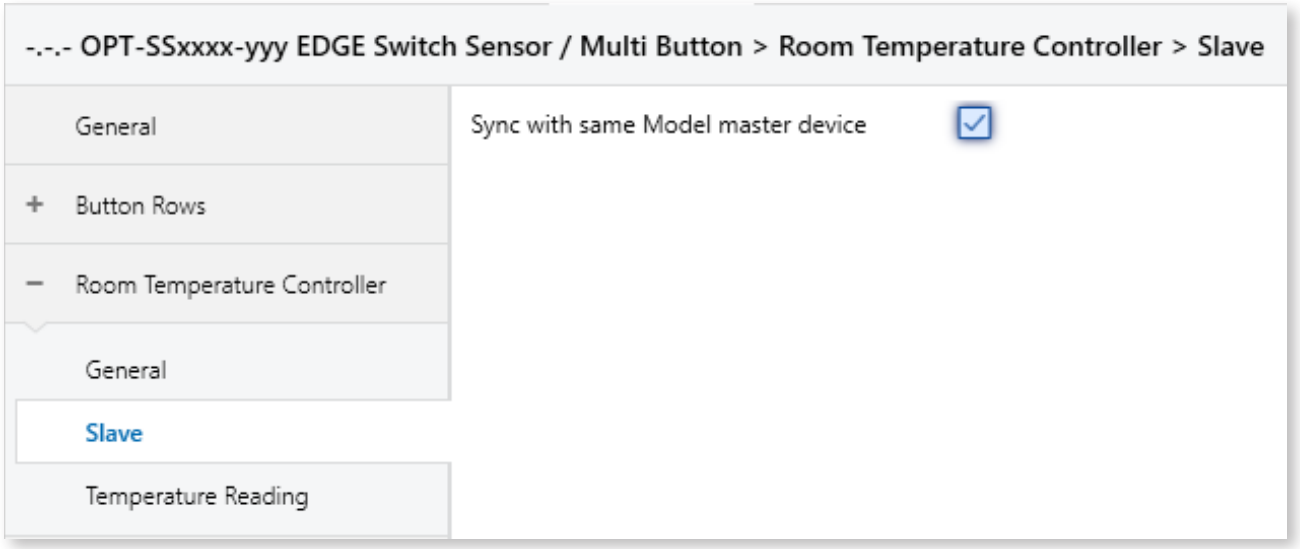
No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
100	RTC-Slave	Get Configuration from master	Output	4 bytes	12.001 counter pulse	C	-	-	T
101	RTC-Slave	Sync Fan Configuration from master	Bidirectional	1byte	5.010 counter pulse	C	-	W	-
110	RTC-Slave	HVAC Operating Mode	Input	1byte	20.102 HVAC Mode	C	-	W	-
111	RTC-Slave	HVAC Operating Mode Status	Input	1byte	20.102 HVAC Mode	C	-	W	-
115	RTC-Slave	Forced Operating Mode	Input	1byte	20.102 HVAC Mode	C	-	W	-
116	RTC-Slave	Presence Detector Input	Input	1 bit	1.001 Switch	C	-	W	-
117	RTC-Slave	Windows Contact Input	Input	1 bit	1.001 Switch	C	-	W	-
120	RTC-Slave	Set Temperature Input	Input	2 bytes	9.001 temperature	C	-	W	-
121	RTC-Slave	Set Temperature Confirm	Output	2 bytes	9.001 temperature	C	-	-	T
122	RTC-Temperature Reading	Internal Temperature	Output	2 bytes	9.001 temperature	C	R	-	T
123	RTC-Temperature Reading	Actual Temperature Error	Output	1 bit	1.005 alarm	C	-	-	T
124	RTC-Temperature Reading	External Temperature	Input	2 bytes	9.001 temperature	C	-	-	-
125	RTC-Temperature Reading	Temperature Output	Output	2 bytes	9.001 temperature	C	R	-	T
126	RTC-Temperature Reading	Fault Temperature Reading	Output	1 bit	1.005 alarm	C	R	-	T
127	RTC-Temperature Reading	Instantenous Temperature Change	Output	1 bit	1.005 alarm	C	R	-	T
130	RTC-Slave	HVAC Changeover Mode Select	Input	1byte	20.107 Changeover Mode 20.105 HVAC Control Mode	C	-	W	-
131	RTC-Slave	HVAC Changeover Mode Status	Output	1byte	20.107 Changeover Mode 20.105 HVAC Control Mode	C	-	-	T
132	RTC-Slave	Heating Cooling Select	Input	1 bit	1.100 cooling/heating	C	-	W	-
138	RTC-Slave	Heating/Cooling Select Status	Output	1 bit	1.100 cooling/heating	C	-	-	T
170	RTC-Slave	Fan Speed Auto Control	Output	1 bit	1.001 Switch	C	-	-	T
172	RTC-Slave	Fan Auto / Manual Status	Input	1 bit	1.001 Switch	C	-	W	-
173	RTC-Slave	Request Fan Speed Set	Output	1byte	5.001 Percentage	C	-	-	T
174	RTC-Slave	Confirmed Fan Speed Set	Input	1byte	5.001 Percentage	C	-	W	-

Table 20: RTC-10 Communication Object

If the same environment is to be controlled by multiple thermostats, the RTC can be programmed as a slave to a master device. In this case, the RTC can send and receive the following information to and from the master device: setpoint, operating mode, working area (heating, cooling), ambient temperature, window contact, occupancy information, fan stages, and fan auto/manual mode.

Note
The OPT-SSxxxx-yyy model without a screen cannot be programmed as a slave.

3.7.1 Synchronise to OPT-SSxxxx-yyy



When both master and slave devices are of the 'OPT-SSxxxx-yyy', the configurations from the master device can be transferred to the slave device through the relevant com objects
This ensures optimal communication between the master and slave devices.

Group Object 100
Packet 0 Configuration

Bit Nr	Properties	Bit Count	Description	
1	AutoSelectable	1	Automatic mode selectable	Function Menu
2	HeatSelectable	1	Heat mode selectable	
3	CoolSelectable	1	Cool mode selectable	
4	FanSelectable	1	Fan mode selectable	
5	DrySelectable	1	Dry mode selectable	
6	FunctionSelected	6	Number of selected function	
7	FunctionSelected			
8	FunctionSelected			
9	FunctionSelected			
10	FunctionSelected			
11	FunctionSelected			
12	HeatingSelected	1	Auto with Heat	
13	CoolingSelected	1	Auto with Cool	
14	ComfortSelectable	1	Comfort selectable	HVAC Menu
15	StandbySelectable	1	Standby selectable	
16	EconomySelectable	1	Economy selectable	
17	BuildProtetictionSelectable	1	BuildProtection selectable	
18	ShowAllFanStage	1	For air conditioning, it is used to open all fan stages and switch between the Enable ones	FAN Menu
19	FanAutoSelectable	1	FanAuto selectable	
20	OffSelectable	1	FanOff selectable	
21	Fan1Selectable	1	Fan1 selectable	
22	Fan2Selectable	1	Fan2 selectable	
23	Fan3Selectable	1	Fan3 selectable	
24	Fan4Selectable	1	Fan4 selectable	
25	Fan5Selectable	1	Fan5 selectable	
26	Reserved	5	Reserved area	
27	Reserved			
28	Reserved			
29	Reserved			
30	Reserved			
31	PacketID	1	For this packet, the PacketID is 0	
32	Sign	1	For this packet, the SignID is 1	

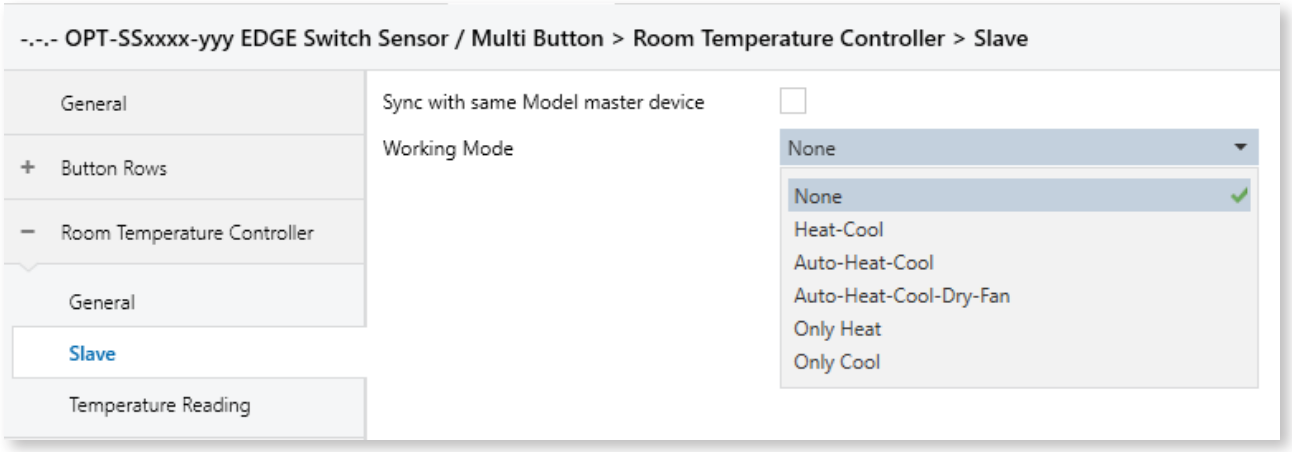
Note
When a group object is read, it initially returns a value of 0. After 500 ms, it sends packet1 and packet2 from the same object on the bus. If there are any changes in the packet values, only the updated packet values are sent on the bus.

Group Object 101

Value	Object Function	Description
0	FanOff	Fan Stage 0
1	Fan1	Fan Stage 1
2	Fan2	Fan Stage 2
3	Fan3	Fan Stage 3
4	Fan4	Fan Stage 4
5	Fan5	Fan Stage 5
6	FanNone	Fan menu closed, only for slave
10	FanAutoOff	Fan Stage Automatic 0
11	FanAuto1	Fan Stage Automatic 1
12	FanAuto2	Fan Stage Automatic 2
13	FanAuto3	Fan Stage Automatic 3
14	FanAuto4	Fan Stage Automatic 4
15	FanAuto5	Fan Stage Automatic 5
16	FanAuto	Fan Stage only auto

Table 21: RTC-11 Communication Object

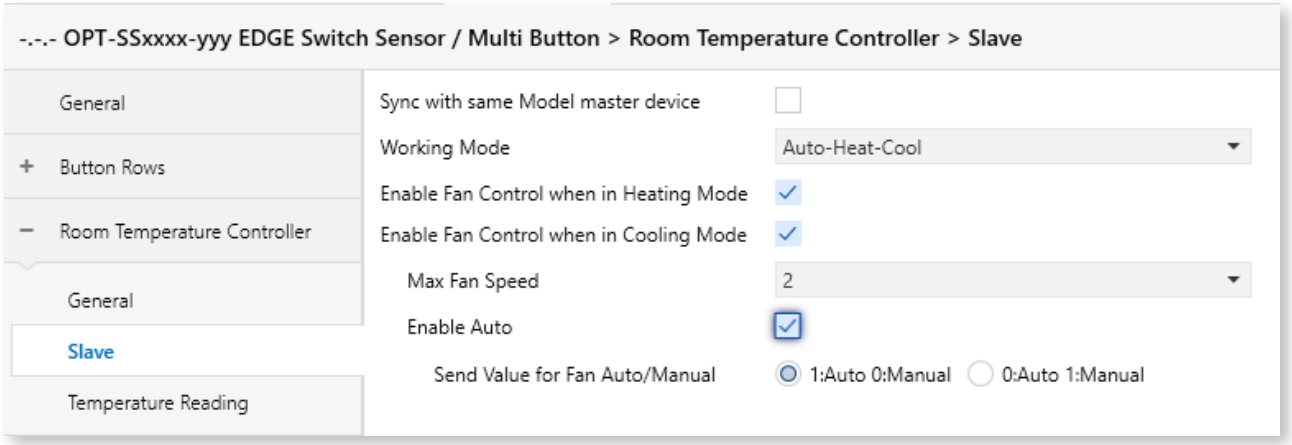
3.7.2 Heating/Cooling Switchover



In slave mode, the RTC can send and receive the heating/cooling zone information to and from the bus. If the RTC master supports automatic heating/cooling zone switching, the options for automatic, heating, or cooling can be selected here. If the master device does not support automatic mode, the heating/cooling option is selected. If the master device controls the air conditioning and additional modes are used, the options for heating, cooling, fan, and dry modes can be selected here. This selection affects the relevant communication objects and display menus.

Note
In slave mode, the RTC always sends the heating/cooling region to the bus as a 1-bit data length.

3.7.3 Enable Fancoil When in Heating Mode



The RTC can operate the ventilation (fancoil, air conditioning) system when in heating mode. The fan configuration can be synchronized with the master device using these parameters.

3.7.4 Enable Fancoil When in Cooling Mode

The RTC can operate the ventilation (fancoil, air conditioning) system when in cooling mode. The fan configuration can be synchronized with the master device using these parameters.

3.7.5 Max Fan Speed

Determines the fan stage of the controlled ventilation system. The fan stage specified here will be selectable on the display.

3.7.6 Enable Auto

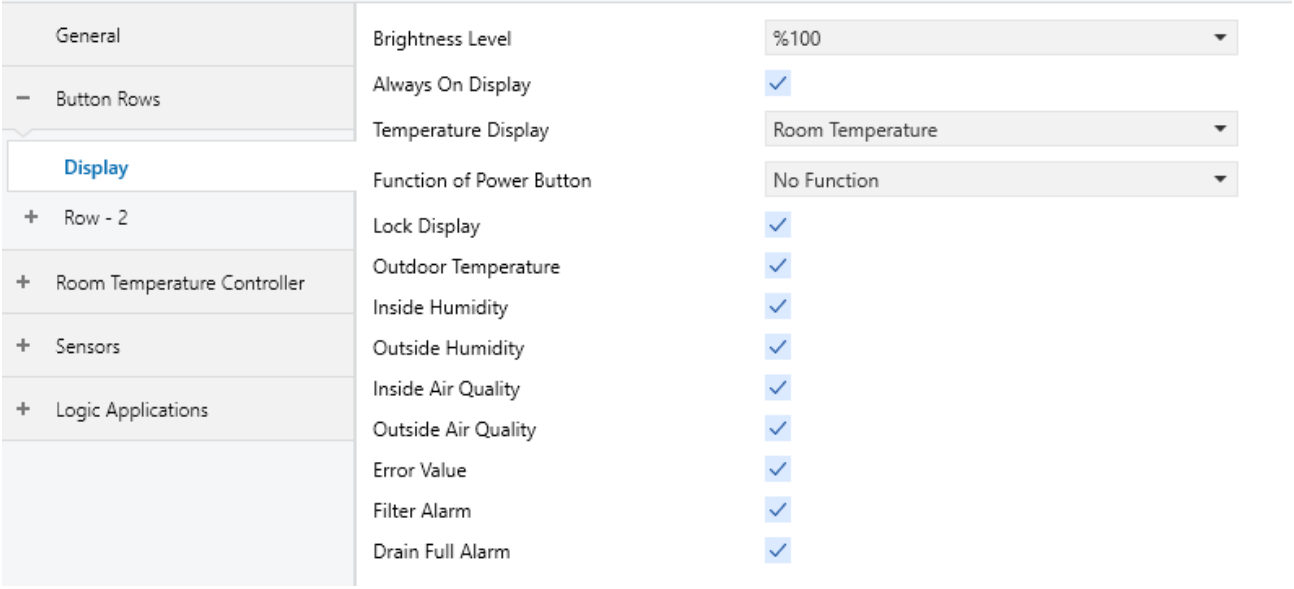
Determines the automatic mode feature for the fan stages. If the master device supports automatic fan control, this option is selected, and the value for the automatic fan stage sent and received is then chosen.

- **1: Auto, 0: Manual:** The automatic mode is sent with a value of 1 (ON) in 1-bit data format, and the same information is received as feedback.
- **0: Auto, 1: Manual:** The automatic mode is sent with a value of 0 (OFF) in 1-bit data format, and the same information is received as feedback.

3.7.7 Temperature Reading

Note
Same as RTC Master temperature reading function. (See 3.3 Temperature Reading)

3.8 Display



No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
10	Display	Lock Display	Bidirectional	1 bit	1.009 open/close	C	R	W	-
11	Display	Display Unit 0: Celcius 1: Fahrenheit	Bidirectional	1 bit	1.001 switch	C	R	W	-
12	Display	Error	Input	1 bit	1.005 alarm	C	-	W	-
13	Display	Error Code	Input	2 bytes	7.001 counter pulse	C	-	W	-
14	Display	Filter Alarm	Input	1 bit	1.005 alarm	C	-	W	-
15	Display	Filter Reset=1	Bidirectional	1 bit	1.005 alarm	C	-	W	T
16	Display	Drain Full Alarm	Input	1 bit	1.005 alarm	C	-	W	-
17	Display	Toggle Button Status	Input	1 bit	1.009 open/close	C	-	W	-
18	Display	Toggle Button Status	Output	1 bit	1.009 open/close	C	-	-	T
20	Display	Room Temperature	Input	2 bytes	9.001 temperature	C	-	W	-
21	Display	Set Temperature	Input	2 bytes	9.001 temperature	C	-	W	-
22	Display	Outside Temperature	Input	2 bytes	9.001 temperature	C	-	W	-
23	Display	Inside Humidity	Input	2 bytes	9.007 humidity	C	-	W	-
24	Display	Outside Humidity	Input	2 bytes	9.007 humidity	C	-	W	-
25	Display	Inside Air Quality	Input	2 bytes	9.008 parts/million (ppm)	C	-	W	-
26	Display	Outside Air Quality	Input	2 bytes	9.008 parts/million (ppm)	C	-	W	-

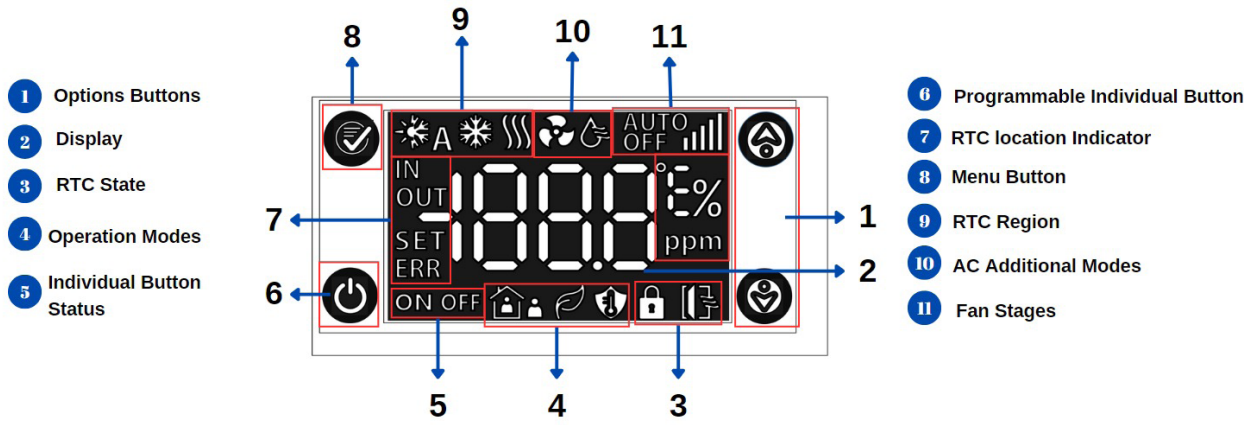
Table 22: RTC-12 Communication Object

3.8.1 Brightness Level

This is where the brightness level of the screen is set. The screen brightness is as bright as the percentage value selected here. 100% is the brightest, while 25% is the dimmest.

3.8.2 Always on Display

This parameter determines whether the screen remains on. If selected, the screen remains on at the set brightness level. If not selected, a timeout is defined for the screen. After the defined period, the screen turns off and will turn on again with the next touch. When the screen turns on, the timer starts again, and the screen will turn off after the timeout period



The display can cyclically show either the set temperature, the calculated room temperature, or both pieces of information. This selection is parameterized. The set temperature can be changed using the selection buttons without the need to enter any menu. When the RTC menu button is pressed, the display shows the following menus in sequence if configured from parameters or if they can be controlled: "Fan Menu,""Operation Mode Menu,""RTC Operating Area," "Air Conditioning Additional Modes," and "RTC Additional Indicators" (including external temperature, internal humidity, external humidity, indoor air quality, outdoor air quality, error, error value, filter alarm, filter alarm reset, drainage full alarm).

The RTC screen includes a programmable button (6), and the button feedback (5) can be monitored on the screen.

The RTC operating area (9) is displayed on the screen. When determining the area, four icons can light up: Heating only (heating icon lights up alone), Cooling only (snowflake icon lights up alone), Automatic mode in the heating area (both automatic and heating icons light up), and Automatic mode in the cooling area (both automatic and snowflake icons light up).

Menus that are not controlled, permitted, or unavailable will not appear on the screen and will be skipped.

3.8.3 Temperature Display

The temperature to be displayed on the screen is selected. The options are set temperature, room temperature, or both. If both are selected, they will appear on the screen for a specified duration before switching between each other. The set point shows the set value configured in the RTC parameters. When the "Set Temperature" communication object (number 21) is inEnable, it displays the value. When the RTC function is Enable, the RTC's set value is shown.

3.8.4 Function of Power Button

The lower-left part of the screen can function as a customizable button, allowing for switching between comfort and protection operation modes, or it can be deactivated. This option is parameterized.

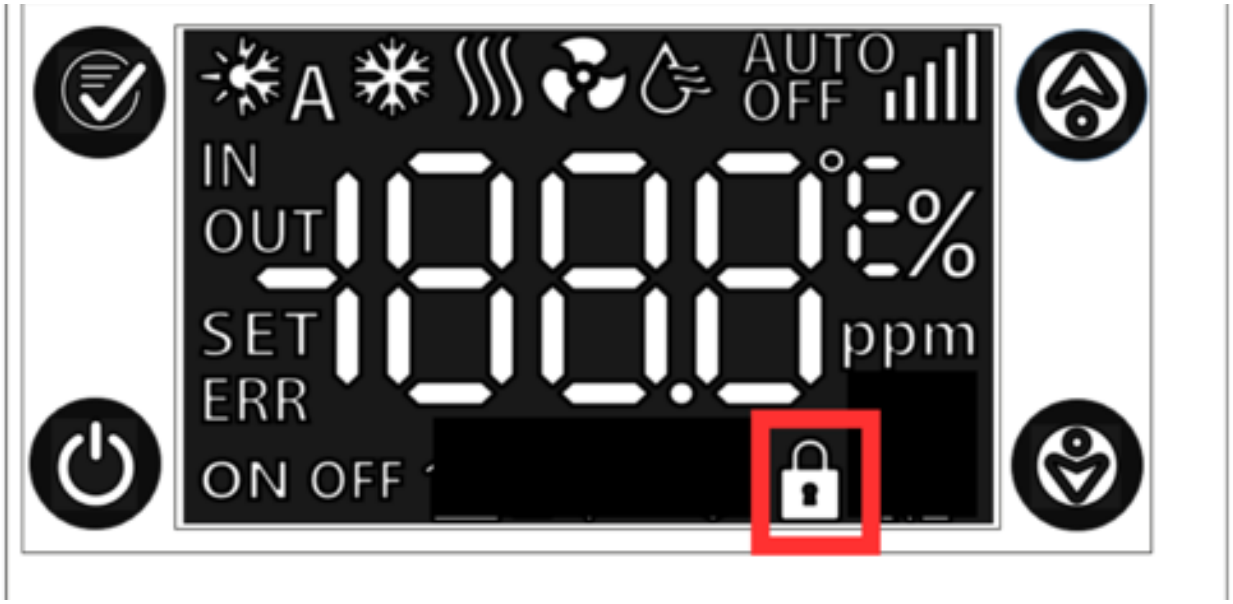
- **No Function:** The button is deactivated; the icon and communication object are not visible.
- **Comfort/Protection Mode Selection:** Switches between comfort and protection modes. Each press changes the mode.

Note
This parameter is valid when the RTC function is Enable. When the RTC function is inEnable, the button is non-functional due to the absence of an operation mode.

- **Individual Toggle Button:** Can be programmed as an individual button. In this parameter, a communication object for sending and receiving a 1-bit data value becomes visible. The on-off icons on the screen change according to the feedback object.

3.8.5 Lock Display

Disables control of the screen. With a value of 0 (OFF) received by the relevant communication object, the screen becomes non-controllable. With a value of 1 (ON), the screen can be controlled again. When the screen is locked, a lock icon appears on the display.



3.8.6 Outdoor Temperature

Dış mekân sıcaklık bilgisinin ekranda görüntülenip görüntülenmeyeceğini belirler. Bu seçenek işaretlendiğinde, dış mekân sıcaklığı ekranda gösterilir. Ekranda "Out" ibaresi yanar ve değer celcius C° cinsinden gösterilir.

3.8.7 Inside Humidity

Determines whether the indoor humidity level is displayed on the screen. When this option is checked, the indoor humidity level is shown on the screen. The "In" label lights up and the value is displayed as a percentage (%).

3.8.8 Outside Humidity

Determines whether the outdoor humidity level is displayed on the screen. When this option is checked, the outdoor humidity level is shown on the screen. The "Out" label lights up and the value is displayed as a percentage (%).

3.8.9 Inside Air Quality

Determines whether the indoor air quality is displayed on the screen. When this option is checked, the indoor air quality is shown on the screen. The "In" label lights up and the value is displayed in parts per million (ppm).

3.8.10 Outside Air Quality

Determines whether the outdoor air quality is displayed on the screen. When this option is checked, the outdoor air quality is shown on the screen. The "Out" label lights up and the value is displayed in parts per million (ppm).

3.8.11 Error Value

When this option is checked, the error status is displayed in the screen menus. If the error code information is available, the "Err" icon blinks with the code on the screen; if not available, only the "Err" icon blinks.

3.8.11.1 Error Code

Displays the error code on the screen. Error codes up to the decimal value "1999" can be displayed.

3.8.12 Filter Alarm

Displays an alarm message on the screen when the filter needs to be cleaned or replaced. When this option is checked, the filter alarm is activated. When the alarm occurs, the "fil" label lights up and the "Err" icon blinks in the screen menus.

3.8.12.1 Filter Reset

A communication object used to reset the filter alarm. When the filter alarm is triggered, a button to reset the filter is located at the bottom left of the screen. Long pressing this button sends a 1 (ON) value with a 1-bit data length to the bus line to reset the filter.

3.8.13 Drain Full Alarm

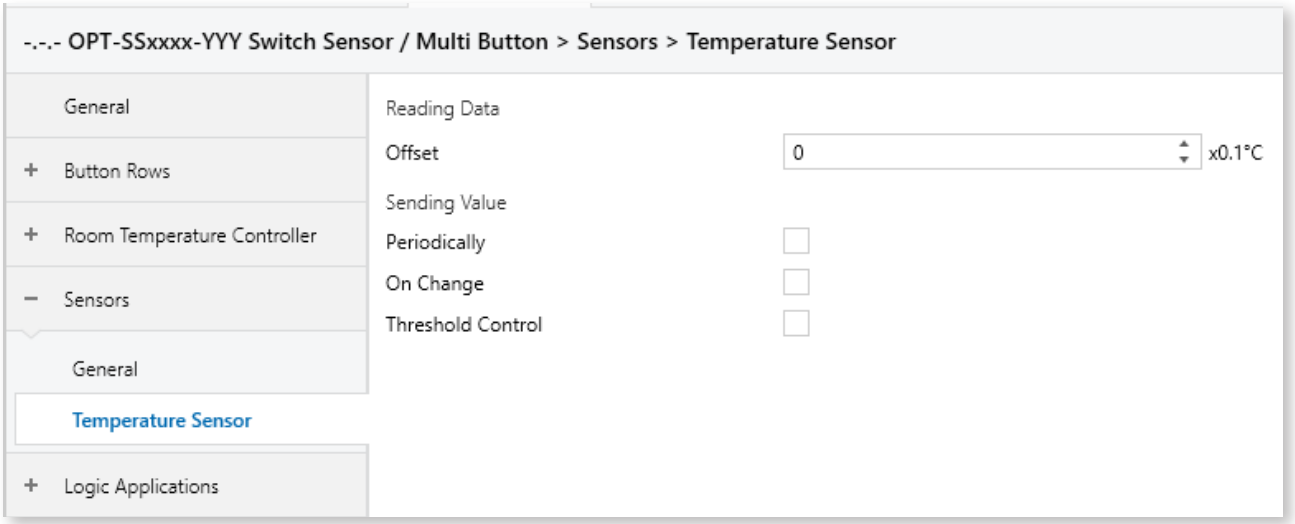
Displays an alarm message on the screen when the drainage tank is full. When this option is checked, the drain full alarm is monitored. When the alarm occurs, the "Ful" label lights up and the "Err" icon blinks in the screen menus.

3.8.14 Display Unit

0: Celsius 1: Fahrenheit
Determines the unit of temperature displayed on the screen. A value of 1 (ON) displays the temperature in Fahrenheit, while a value of 0 (OFF) displays it in Celsius. Temperature values are displayed in Celsius when the RTC is restarted.

4 Sensors

4.1 Temperature Detection



The sensor measures the temperature level of the environment with the help of the integrated temperature sensor. This measurement is used in both the temperature detection process and RTC applications. The purpose of the temperature detection application is to continuously monitor the temperature value of the environment and transmit it to the KNX line with the specified parameters. If desired, the relevant telegrams are transmitted to the KNX BUS line in cases where the temperature is below or above the specified threshold values.

4.1.1 Ofset

The value measured by the internal temperature sensor of the device may differ from the actual ambient temperature due to the sensor being located at a higher point. This value can be adjusted by comparing it with portable thermometers. The adjustment range is between -12.8 °C and +12.7 °C, with steps from -128 to +128 (x0.1). The default value is 0 °C.

4.1.2 Sending Value Method

There are two methods that can be used to send the temperature level to the KNX line. In cases where both methods are not specified, the current temperature information is answered from the same communication object based on the "Read" requests received by the communication object.

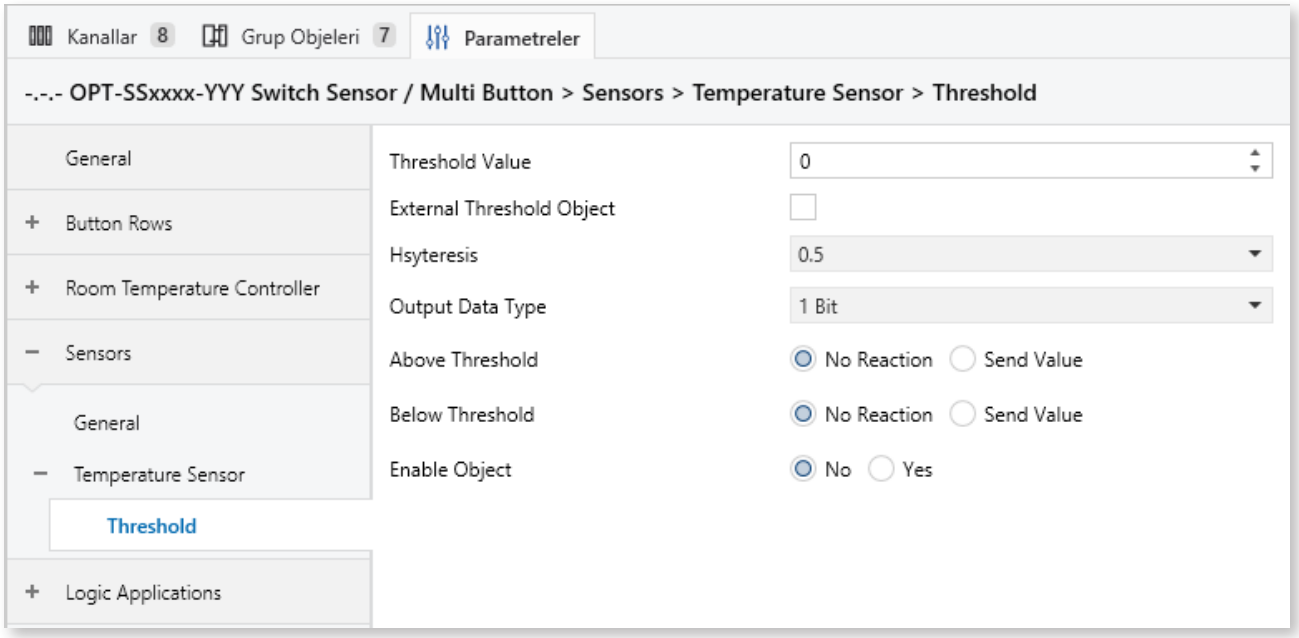
4.1.2.1 Periodically

The measured temperature value is transmitted to the data bus by repeating it for a period of time parametrically determined by the user (between 2-255 minutes). The default value is 2 minutes.

4.1.2.2 Change Amount

When the temperature value changes by more than the amount parametrically determined by the user (between 1 and 50 degrees), the current temperature value is transmitted to the data bus. The default value is 1°C.

4.1.3 Threshold



It is used to determine a threshold for the measured temperature values and to take action when this threshold is exceeded or dropped below. The appropriate option is selected from the "Disable" or "Enable" options. When activated, the options below it open.

4.1.3.1 Threshold Value

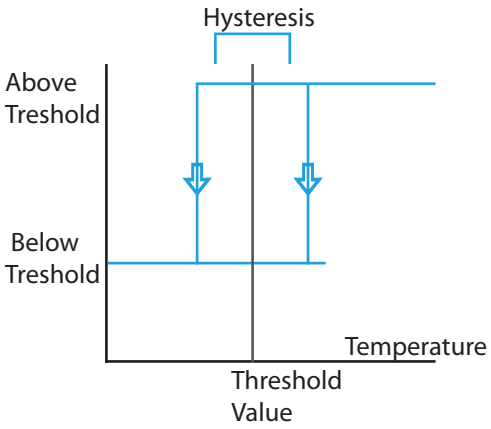
The threshold value we want to measure is determined at this point. The default value is 23 °C.

4.1.3.2 External Threshold Object

When activated, the temperature threshold value should be able to be changed with the “Temperature Threshold Value” object and the relevant com object from the KNX line.

4.1.3.3 Hysteresis

This is the area where the total tolerance around the specified threshold value is determined. A value between 0.5 °C and 10 °C can be selected. In order for the threshold exceeding process to occur, the hysteresis around the threshold value must also be exceeded. For example, if the threshold is selected as 23 °C and the hysteresis is selected as 1 °C, the threshold processes will occur when the measured temperature falls below 22 °C or rises above 24 °C.



4.1.3.4 Output Data Type

The data type that the decision resulting from the threshold process will be sent to the data path is selected. The appropriate one is selected from the “1-bit”, “1-byte”, “1-bytePercentage”, “Hvac”, “Scenario” or “2-byte Temperature” mode options.

4.1.3.5 Above Threshold

The action to be taken when the room temperature exceeds the tolerable threshold value is selected. When “No Action” is selected, no telegram is sent. When “Send Value” is activated, the “Threshold Status” is transmitted to the data bus.

4.1.3.6 Below Threshold

The action to be taken when the room temperature falls below the tolerable threshold value is selected. When “No Action” is selected, the telegram is not sent. When “Send Value” is activated, the “Threshold Status” is transmitted to the data bus.

4.1.3.7 Enable Object

It is used to make the Constant Light Level Control completely Enable or completely inEnable. “Disable” or “Enable” can be selected. The default value is “Disable”. When Enable is selected, the options below it and the “Temperature Control Activity” object open.

4.1.3.8 Enable Value

“OFF Telegram” indicates that it will be activated with a 1-bit 0 (zero) telegram; “ON Telegram” indicates that it will be activated with a 1-bit 1 (one) telegram. The default value is “ON Telegram”.

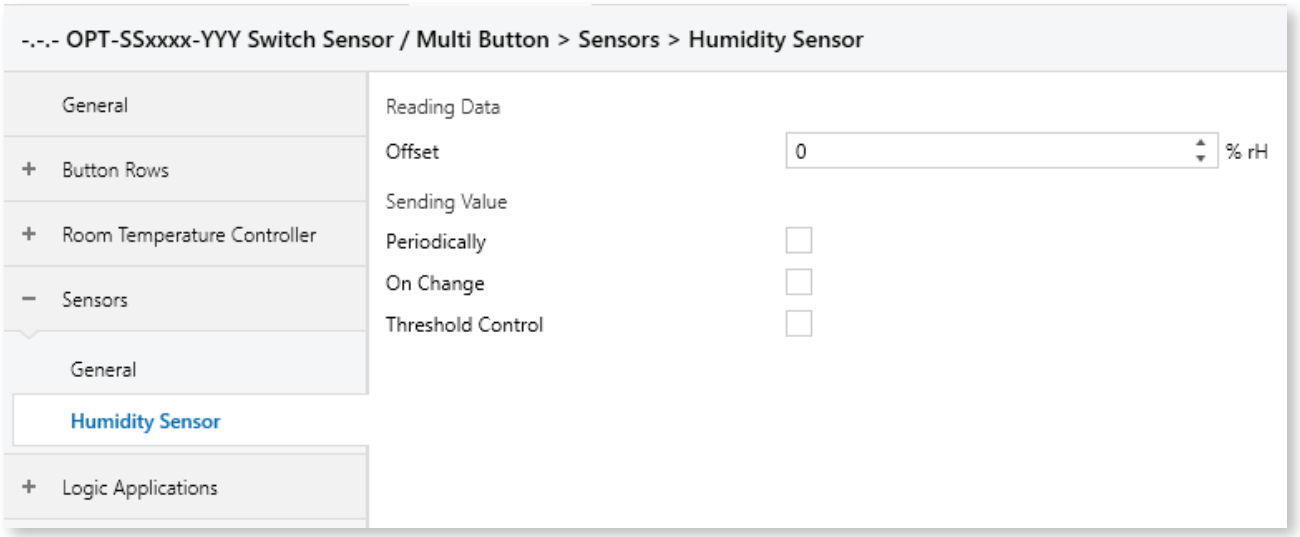
4.1.3.9 Initial Positions

It shows the initial status of the device. If “Enabled” is selected, the device will work directly at startup, otherwise, “Temperature Detection” will not work immediately after the device starts.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
230	Temperature	Enable Input	Input	1-bit	1.003 Enable	C	-	W	-
231	Temperature	Value Output	Output	2 byte	9.001 Temperature	C	R	-	T
232	Temperature	Treshold Value	Output	2 byte	9.001 Temperature	C	R	-	T
			Input/Output	2 byte	9.001 Temperature	C	R	W	T
233	Temperature	Treshold Status	Output	1-bit	1.001 Switch	C	-	-	T
				1-byte	5.010 UCount	C	-	-	T
				1-byte	5.001 Percentage	C	-	-	T
				1-byte	17.001 Scene Nr	C	-	-	T
				2-byte	20.102 HVAC Mode	C	-	-	T
				2-byte	9.001 Temperature	C	-	-	T

Table 23: Temperature Communication Section Objects

4.2 Humidity Detection



It is used to transfer the data line of the relative humidity measurement made by the internal humidity sensor of the device.

4.2.1 Ofset

The value measured by the internal humidity sensor may differ from the perceived humidity due to its location. An external humidity meter can be used to compensate. The conversion can be between -50 and +50. The default value is 0%.

4.2.2 Sending Value

There are two methods that can be used to send humidity information to the KNX line. In cases where neither method is specified, the current humidity information is answered from the same communication object based on the “Read” requests coming to the communication object. (Response).

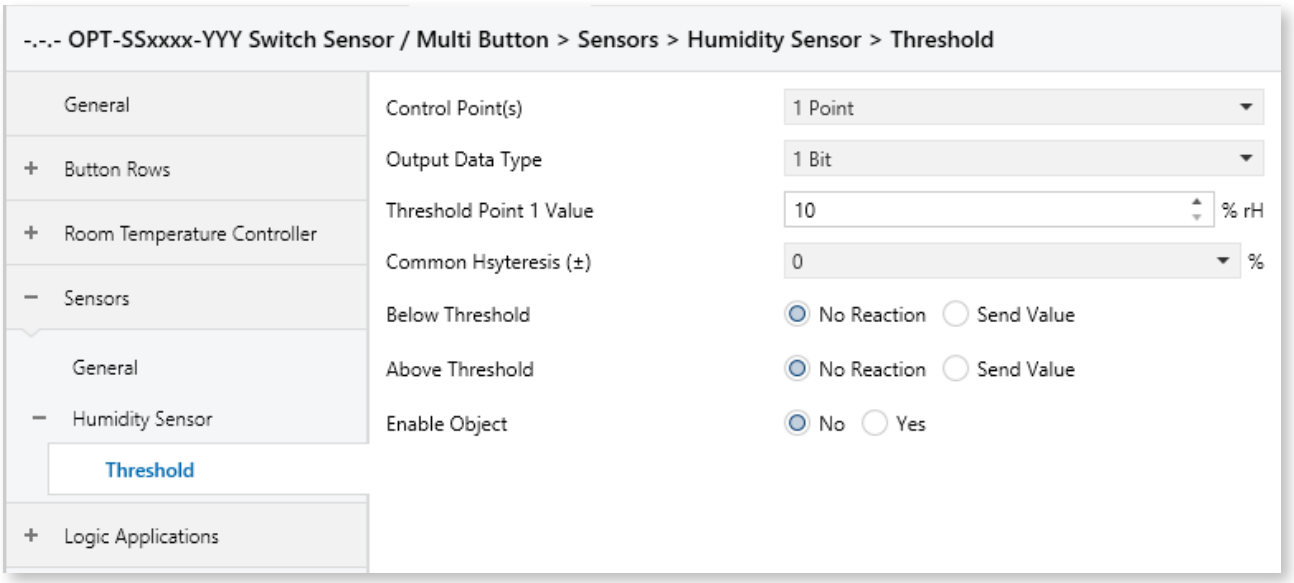
4.2.2.1 Periodically

It determines the sending frequency of the measured humidity value to the data line via the "Humidity Value" object. The sending frequency can be determined between 2 and 255 minutes. The default value is 2 minutes.

4.2.2.2 Change Amount

When the humidity value changes more than the amount parametrically determined by the user (between 1% and 100%), the current humidity value is transmitted to the data bus. The default value is 1.

4.2.3 Threshold



It is used to determine a threshold for the measured humidity value and to take action when this threshold is exceeded or dropped below. The appropriate option is selected from the "Disable" or "Enable" options. When activated, the options below it open.

4.2.3.1 Hysteresis

It is the area where the total tolerance around the specified threshold value is determined. A value between 0% and 10% can be selected. Threshold activation is one-sided and negative. For example, if we select our threshold value as 50% and hysteresis as 10%, when the humidity value is 50%, the activation will be activated directly above the threshold, and when it drops to 45%, the activation will be activated below the threshold.

4.2.3.2 Output Data Type

The data type that the decision resulting from the threshold process will be sent to the data path is selected. The appropriate one is selected from the “1-bit”, “1-byte”, “1-bytePercentage”, “Hvac”, “Scenario” or “2-byte Temperature” mode options.

4.2.3.3 Enable Object

It is used to make the threshold control of the Humidity Detection application completely Enable or completely inEnable. “Disable” or “Enable” can be selected. The default value is “Disable”. When Enable is selected, the options below it and the “Activation Input” object open.

4.2.3.4 Enable Value

"OFF Telegram" indicates that it will be activated with a 1-bit 0 (zero) telegram; "ON Telegram" indicates that it will be activated with a 1-bit 1 (one) telegram. The default value is "ON Telegram".

4.2.3.5 Initial Positions

It shows the initial status of the device. If "Enabled" is selected, the device will work directly at startup, otherwise, "Humidity Threshold" will not work immediately after the device starts.

4.2.3.6 Control Point

It ensures that the humidity information is checked with 1, 2 and 3 different control points and the appropriate data resulting from this control is transmitted to the relevant Com object.

4.2.3.6.1 Control Point 1

4.2.3.6.1.1 Threshold Value Point 1

When control point 1 is activated, threshold control is performed by entering a value between 10-90 into this parameter.

4.2.3.6.1.2 Below Threshold

The action to be taken when the current humidity value falls below the tolerable threshold value is selected. When "No Action" is selected, the telegram is not sent. When "Send Value" is activated, the values entered in the "1-bit", "1-byte", "1-byte Percentage", "HVAC", "Scenario" or "2-Byte Temperature" parameters are transmitted to the "Threshold Status" data path.

4.2.3.6.1.3 Above Threshold

The action to be taken when the current humidity value exceeds the tolerable threshold value is selected. When "No Action" is selected, no telegram is sent. When "Send Value" is activated, the values entered in the "1-bit", "1-byte", "1-byte Percentage", "HVAC", "Scenario" or "2-Byte Temperature" parameters are transmitted to the "Threshold Status" data path.

4.2.3.6.2 Control Pointı 2

4.2.3.6.2.1 Threshold Value Point 2

In this parameter, which appears when control point 2 is activated, how much additional value will be written over threshold point 1 as a percentage is entered. Threshold control is performed by entering one of the values of 10%, 20%, 30%, 40%, 50%, or 60%. For example, if the value of threshold point 1 is 40% and the value entered in this parameter is 20%, threshold point 2 is defined as 60%.

4.2.3.6.2.2 Between Point 1 and Point 2

If the current Humidity value is between the tolerant threshold value 1 and the tolerant threshold value 2, the action to be taken is selected. When "No Action" is selected, the telegram is not sent. When "Send Value" is activated, the values entered in the "1-bit", "1-byte", "1-byte Percentage", "Hvac", "Scenario" or "2-Byte Temperature" parameters are transmitted to the "Threshold Status" data path.

4.2.3.6.2.3 Above Threshold 2

The action to be taken when the current humidity value exceeds the tolerant threshold 2 is selected. When "No Action" is selected, no telegram is sent. When "Send Value" is activated, the values entered in the "1-bit", "1-byte", "1-byte Percentage", "HVAC", "Scenario" or "2-Byte Temperature" parameters are transmitted to the "Threshold Status" data path.

4.2.3.6.3 Control Point 3

4.2.3.6.3.1 Threshold Point 3

In this parameter, which appears when control point 3 is activated, how much additional value will be written above threshold point 2 as a percentage is entered. Threshold control is performed by entering one of the values of 10%, 20%, 30%, 40%, 50%, or 60%. For example, if the value of threshold point 2 is 60% and the value entered in this parameter is 20%, threshold point 3 is defined as 80%.

4.2.3.6.3.2 Between Point 2 and Point 3

If the current Humidity value is between the tolerant threshold value of 2 and the tolerant threshold value of 3, the action to be taken is selected. When "No Action" is selected, the telegram is not sent. When "Send Value" is activated, the values entered in the "1-bit", "1-byte", "1-byte Percentage", "HVAC", "Scenario" or "2-Byte Temperature" parameters are transmitted to the "Threshold Status" data path.

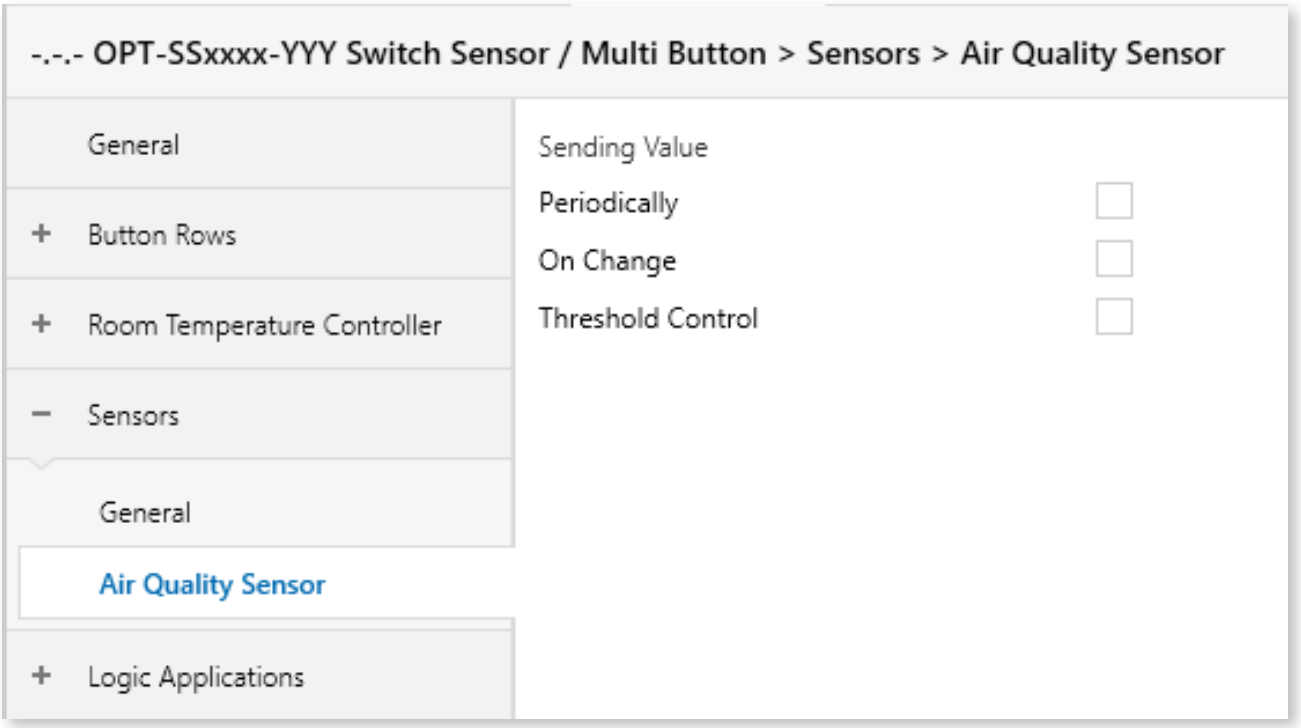
4.2.3.6.3.3 Above Threshold 3

The action to be taken when the current humidity value exceeds the tolerant threshold 3 is selected. When "No Action" is selected, no telegram is sent. When "Send Value" is activated, the values entered in the "1-bit", "1-byte", "1-byte Percentage", "HVAC", "Scenario" or "2-Byte Temperature" parameters are transmitted to the "Threshold Status" data path.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
250	Humidity	Enable Input	Input	1-bit	1.003 Enable	C	-	W	-
251	Humidity	Sensor Output	Output	2-byte	9.007 Humidity	C	R	-	T
252	Humidity	Treshold Status	Output	1-bit	1.001 Switch	C	-	-	T
				1-byte	5.010 UCount	C	-	-	T
				1-byte	5.001 Percentage	C	-	-	T
				1-byte	17.001 Scene Nr	C	-	-	T
				2-byte	20.102 HVAC Mode	C	-	-	T
				2-byte	9.001 Temperature	C	-	-	T

Table 24: Humidity Communication Section Objects

4.3 Air Quality Detection



To ensure the data line transfer of the relative air quality measurement made by the device's internal air quality sensor used for the purpose.

4.3.1 Sending Value

There are two methods that can be used to send air quality information to the KNX line. In cases where both methods are not specified, the current Air quality information is responded to from the same communication object based on the "Read" requests received by the communication object.

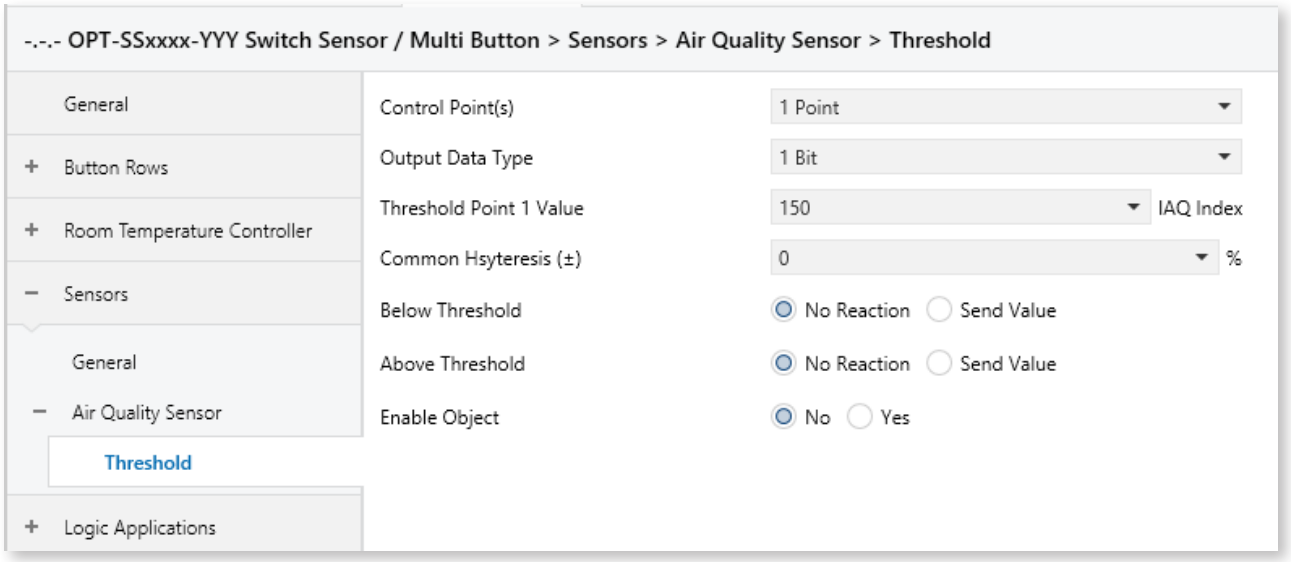
4.3.1.1 Periodically

It determines the sending frequency of the measured air quality value to the data line via the “Air Quality” object. The sending frequency can be specified between 2 and 255 minutes. The default value is 2 minutes.

4.3.1.2 Change Amount

When the air quality value changes more than the amount parametrically determined by the user (between 50ppm and 500ppm), the current air quality value is transmitted to the data bus. The default value is 100.

4.3.2 Threshold



It is used to determine a threshold for the measured Air Quality value and to take action when this threshold is exceeded or dropped below. The appropriate option is selected from the "Disable" or "Enable" options. When it is activated, the options below will open.

4.3.2.1 Hysteresis

This is the area where the total tolerance around the specified threshold value is determined. A value between 0% and 10% can be selected. In order for the threshold exceeding process to occur, the hysteresis around the threshold value must also be exceeded. It will work as one-way negative like the hysteresis of the humidity application.

4.3.2.2 Output Data Type

The data type that the decision resulting from the threshold process will be sent to the data path is selected. The appropriate one is selected from the “1-bit”, “1-byte”, “1-bytePercentage”, “Hvac”, “Scenario” or “2-byte Temperature” mode options.

4.3.2.3 Enable Object

It is used to make the Constant Light Level Control completely Enable or completely in Enable. “Disable” or “Enable” can be selected. The default value is “Disable”. When Enable is selected, the options below it and the Air Quality Control Activity “Enable” or “Disable” object opens.

4.3.2.4 Enable Value

"OFF Telegram" indicates that it will be activated with a 1-bit 0 (zero) telegram; "ON Telegram" indicates that it will be activated with a 1-bit 1 (one) telegram. The default value is "ON Telegram".

4.3.2.5 Initial Positions

It shows the initial status of the device. If "Enabled" is selected, the device will work directly at startup, otherwise, "Air Quality" will not work immediately after the device starts.

4.3.2.6 Control Point

It ensures that air quality information is checked with 1, 2 and 3 different control points and the appropriate data resulting from this control is transmitted to the relevant "Com Object".

4.3.2.6.1 Control Point 1

4.3.2.6.1.1 Threshold Value Point 1

When control point 1 is activated, threshold control is performed by entering a value between 100-2000 for this parameter.

4.3.2.6.1.2 Below Threshold

The action to be taken when the current air quality value falls below the tolerable threshold value is selected. When "No Action" is selected, no telegram is sent. When "Send Value" is activated, the values entered in the "1-bit", "1-byte", "1-byte Percentage", "HVAC", "Scenario" or "2-Byte Temperature" parameters are transmitted to the "Threshold Status" data path.

4.3.2.6.1.3 Above Threshold

The action to be taken when the current air quality value exceeds the tolerable threshold value is selected. When "No Action" is selected, no telegram is sent. When "Send Value" is activated, the values entered in the "1-bit", "1-byte", "1-byte Percentage", "HVAC", "Scenario" or "2-Byte Temperature" parameters are transmitted to the "Threshold Status" data path.

4.3.2.6.2 Control Point 2

4.3.2.6.2.1 Threshold Value Point 2

In this parameter, which appears when control point 2 is activated, how much additional value will be written over threshold point 1 is entered. Threshold control is made by entering one of the values between 100-2000. For example, if the value of threshold point 1 is 1000ppm and the value entered in this parameter is 500, threshold point 2 is defined as 1500ppm.

4.3.2.6.2.2 Between Point 1 and Point 2

If the current air quality value is between the tolerant threshold value 1 and the tolerant threshold value 2, the action to be taken is selected. When "No Action" is selected, the telegram is not sent. When "Send Value" is activated, the values entered in the "1-bit", "1-byte", "1-byte Percentage", "Hvac", "Scenario" or "2-Byte Temperature" parameters are transmitted to the "Threshold Status" data path.

4.3.2.6.2.3 Above Threshold 2

The action to be taken when the current air quality value exceeds the tolerant threshold 2 value is selected. When "No Action" is selected, the telegram is not sent. When "Send Value" is activated, the values entered in the "1-bit", "1-byte", "1-byte Percentage", "HVAC", "Scenario" or "2-Byte Temperature" parameters are transmitted to the "Threshold Status" data path.

4.3.2.6.3 Control Point 3

4.3.2.6.3.1 Threshold Point 3

When control point 3 is activated, this parameter enters how much additional value will be written on threshold point 2. Threshold control is performed by entering one of the values between 100-2000. For example, if the value of threshold point 2 is 1500ppm and the value entered in this parameter is 300, threshold point 3 is defined as 1800ppm.

4.3.2.6.3.2 Between Point 2 and Point 3

If the current air quality value is between the tolerant threshold value 2 and the tolerant threshold value 3, the action to be taken is selected. When "No Action" is selected, the telegram is not sent. When "Send Value" is activated, the values entered in the "1-bit", "1-byte", "1-byte Percentage", "HVAC", "Scenario" or "2-Byte Temperature" parameters are transmitted to the "Threshold Status" data path.

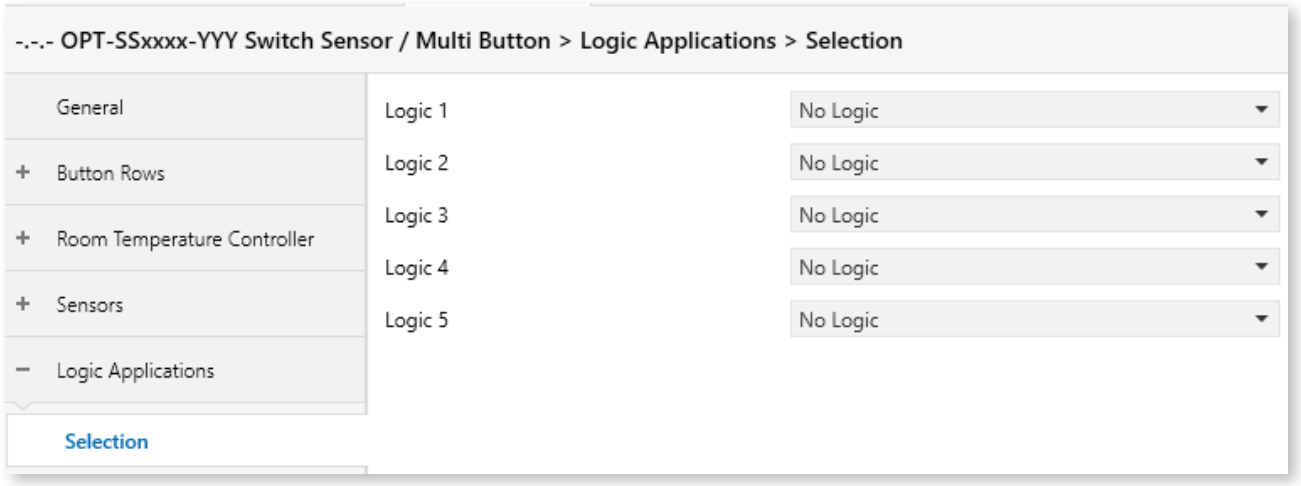
4.3.2.6.3.3 Above Threshold 3

The action to be taken when the current air quality value exceeds the tolerant threshold 3 is selected. When "No Action" is selected, no telegram is sent. When "Send Value" is activated, the values entered in the "1-bit", "1-byte", "1-byte Percentage", "HVAC", "Scenario" or "2-Byte Temperature" parameters are transmitted to the "Threshold Status" data path.

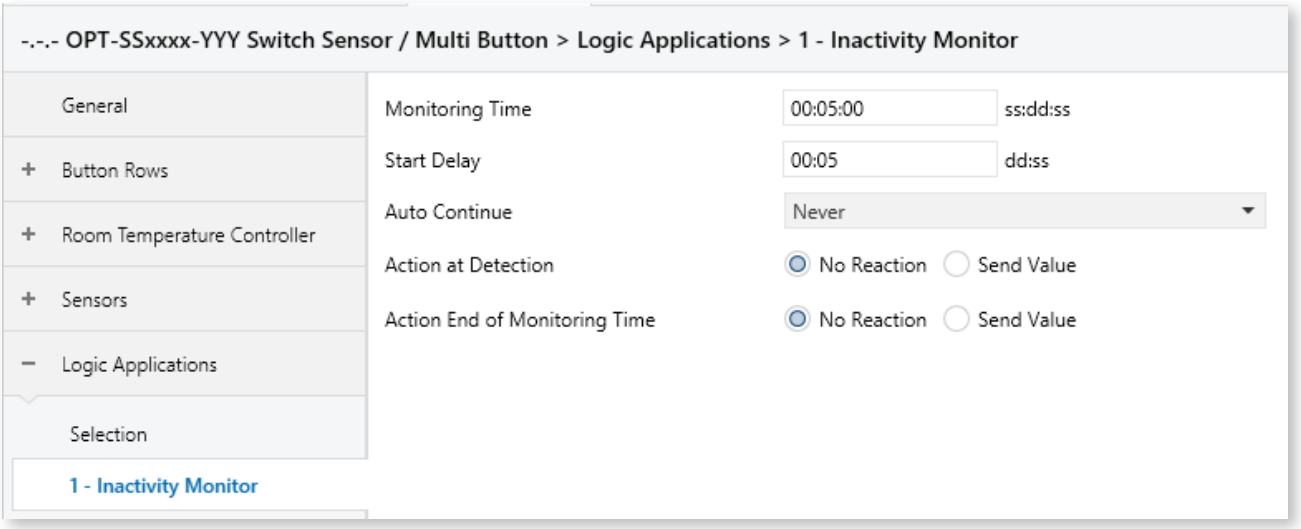
No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
271	Air Quality	Enable Input	Input	1-bit	1.003 Enable	C	-	W	-
272	Air Quality	Sensor Output (VOC Index)	Output	2-byte	7.001 Pulses	C	R	-	T
273	Air Quality	Sensor Output (ppm)	Output	2 byte	9.008 Air Quality	C	R	-	T
273	Air Quality	Threshold Status	Output	1-bit	1.001 Switch	C	-	-	T
				1-byte	5.010 UCount	C	-	-	T
				1-byte	5.001 Percentage	C	-	-	T
				1-byte	17.001 Scene Nr	C	-	-	T
				2-byte	20.102 HVAC Mode	C	-	-	T
				2-byte	9.001 Temperature	C	-	-	T

Table 25: Air Quality Communication Section Objects

5 Logic Applications



5.1 Inactivity Monitor



This application is used to monitor the activity level of a space over a specified period. If no movement is detected during this time, it sends an inactivity signal. It can be used for monitoring hotel rooms or for security purposes to track activity in a specific area.

5.1.1 Monitoring Time

Defines the duration for monitoring movement. If no movement information is received from the movement information object during this period, the system will consider it as inactivity. The observation duration can be set through the "Observation Function Start" object. It can be set between 10 and 65536 seconds, with a default value of 300 seconds.

5.1.2. Start Delay

Used to set an initial delay before the device begins detection. It can be set between 0 and 255 seconds, with a default value of 5 seconds.

5.1.3 Auto Continue

The observation function typically works as a single observation. After the delay, if no movement is detected during the observation period, the system will stop the function and send a "Stop" telegram from the Start/Stop object. If the list is selected twice, the system will automatically resend the "Start" telegram from the Start/Stop object if no movement is detected during the first observation and will activate the second observation period without delay. It will produce an output based on the condition during the second observation period and send a "Stop" telegram from the Start/Stop object.

5.1.4 Output Data Type

Determines the type of data that will be produced as a result of the observation. Options include "1-bit," "1-byte Counter Pulses," "1-Byte Percentage," "Scenario," "HVAC," or "2-Byte Temperature."

5.1.5 Action at Detection

Determines whether any action will be taken upon movement detection. "Send Telegram" means no telegram will be sent. "Send Value" will send the value defined below.

5.1.6 Action End of Monitoring Time

Determines what action will be taken if no movement is detected at the end of the monitoring period. If no action is to be taken, select "Send Telegram." If a value is to be sent, select "Send Value."

5.1.7 Send Value

Defines the value to be sent when "Send Value" is selected. The value must be entered according to the selected "Output Type."

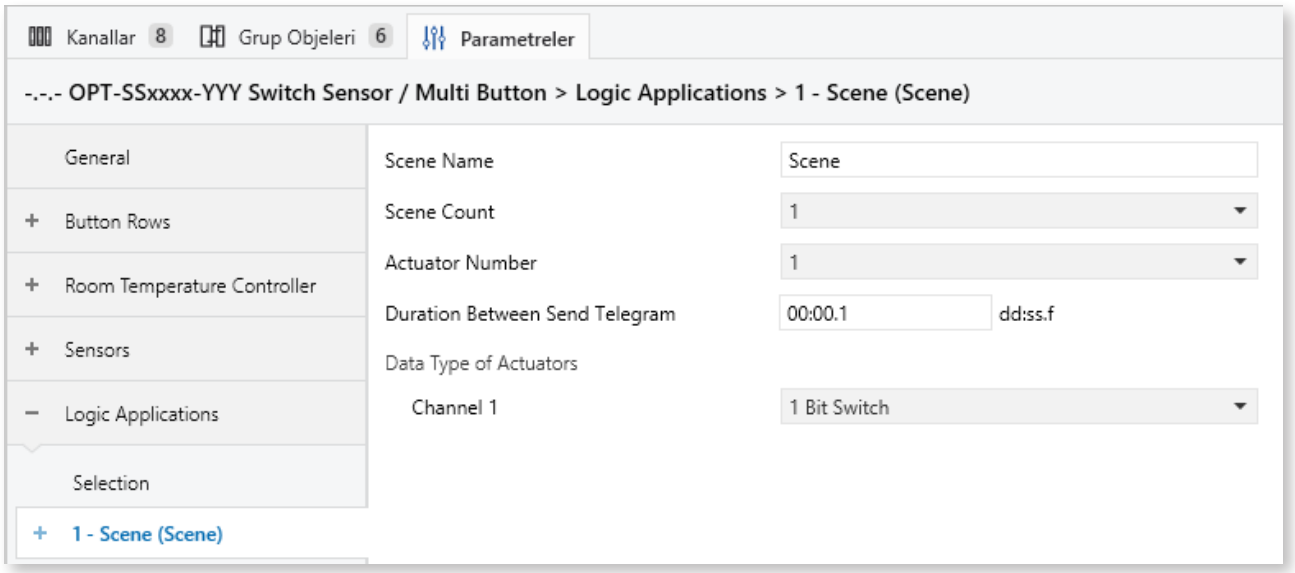
No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
x	LA- x I Inactivity Monitor	Start/Stop Monitoring	Input	1-bit	1.010 Start/Stop	C	R	W	T
x	LA- x I Inactivity Monitor	Movement Input	Input	1-bit	1.001 Switch	C	R	-	T
x	LA- x I Inactivity Monitor	Action at Detection	Output	1-bit	1.001 Switch	C	-	-	T
				1-byte	5.010 UCount	C	-	-	T
				1-byte	5.001 Percentage	C	-	-	T
				1-byte	17.001 Scene Nr	C	-	-	T
				2-byte	20.102 HVAC Mode	C	-	-	T
				2-byte	9.001 Temperature	C	-	-	T
x	LA- x I Inactivity Monitor	Action End of Monitoring Time	Output	1-bit	1.001 Switch	C	-	-	T
				1-byte	5.010 UCount	C	-	-	T
				1-byte	5.001 Percentage	C	-	-	T
				1-byte	17.001 Scene Nr	C	-	-	T
				2-byte	20.102 HVAC Mode	C	-	-	T
				2-byte	9.001 Temperature	C	-	-	T

Table 26: Logic Applications - Inactivity Monitor Communication Section Objects

5.2 Scene Controller

A scene controller is an application that sends predefined values to n outputs, which can be of different data types. There can be one or more scenes for the same output group. Users may be granted the ability to save new values to the scenes if desired.

5.2.1 General Parameters



5.2.1.1 Scene Name

This field allows you to specify the name of the scene, making it easier to identify and distinguish between different scenes. For example, you might name a scene "Meeting Mode" or "Evening Lighting."

5.2.1.2 Scene Count

This parameter allows you to choose a value between 1 and 8, determining how many different scenes can be defined on the module.

5.2.1.3 Actuator Number

You can select a value between 1 and 8. This specifies how many actuators (devices controlled by the scene, such as lights or blinds) will be used in each scene.

5.2.1.4 Duration Between Send Telegram

Values such as 0.1 s, 0.2 s, up to 10.0 s can be entered. This sets the delay time between sending telegrams to each actuator when a scene is triggered. For instance, setting a delay of 0.5 seconds means telegrams will be sent to each actuator every half second.

5.2.1.5 Data Type Actuators

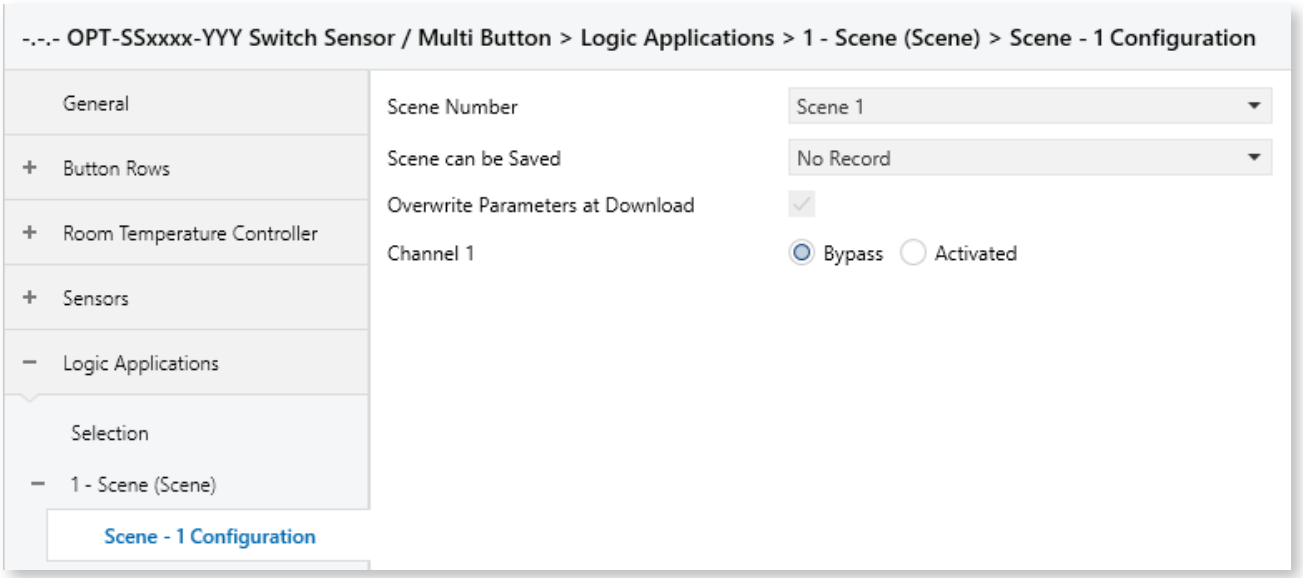
The data type for each channel is selected based on the type of device or function. For example

- **1-bit Switch:** Used for on/off functions, such as turning lights on or off.
- **1-byte Percentage:** Used for dimmers to set the brightness level as a percentage..

5.2.2 Scene X Configuration

5.2.2.1 Scene Number

Select a value between 1 and 64 to identify and organize scenes. This number helps in managing the order and selection of scenes.



5.2.2.2 Scene can be Saved

Choose from "Save," "Save Last Values," or "Send Read Telegrams."

- **Save:** The scene can only be recalled.
- **Save Last Values:** The most recent values received by "Status" communication objects are stored in memory.
- **Send Read Telegrams:** Responses to Read telegrams sent at 500ms intervals are recorded as current values.

5.2.2.3 Overwrite Parameters at Download

When selected, this option ensures that existing parameters are overwritten when new scene settings are uploaded, facilitating updates to scene configurations.

5.2.2.4 Channel x

Each channel has two options:

5.2.2.4.1 Activated

When checked, this option makes the channel Enable when the scene is triggered.

5.2.2.4.1.1 Send Value

Specifies the value to be sent for each channel. This value is determined based on the actuator's data type and is sent when the scene is activated. For example, it could adjust the brightness of a light or set the position of a blind.

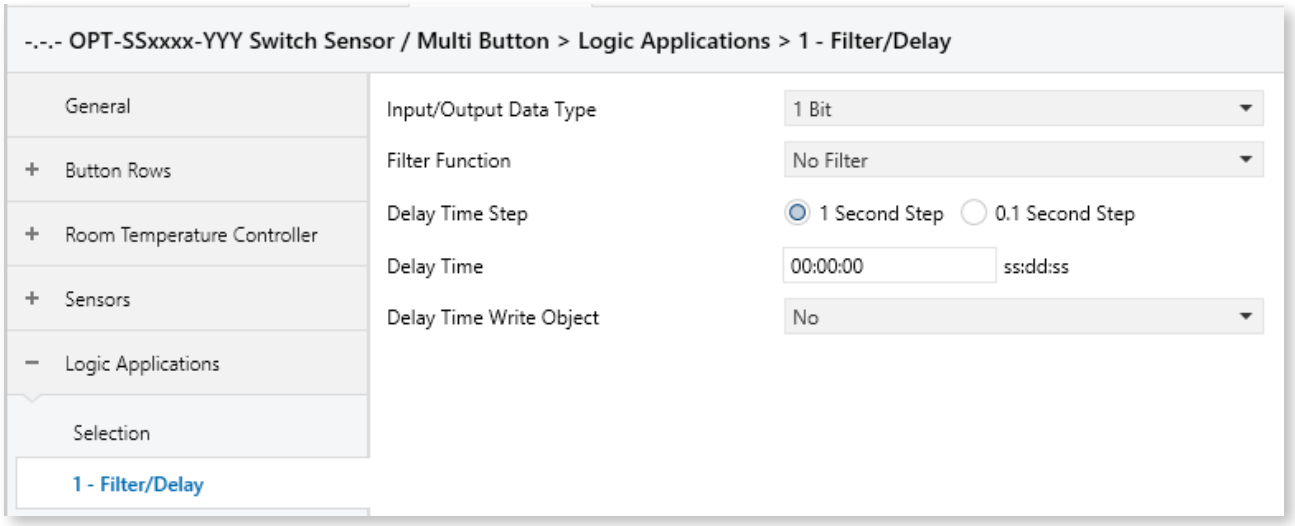
5.2.2.4.2 Bypass

When checked, this option skips the channel when the scene is triggered, meaning it will not participate in the scene's actions.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T	U
x	LA- x I Scene	Light Scene Number	Input	1-bit	18.001 Scene C.	C	-	W	-	-
	LA- x I Scene	Channel -x Output	Output	1-bit	1.001 Switch	C	-	-	T	-
				1-bit	1.008 Up/Down	C	-	-	T	-
				1-byte	5.010 UCount	C	-	-	T	-
				1-byte	5.001 Percentage	C	-	-	T	-
				2-byte	9.001 Temperature	C	-	-	T	-
	LA- x I Scene	Channel -x Status	Output	1-bit	1.001 Switch	C	-	W	-	U
				1-bit	1.008 Up/Down	C	-	W	-	U
				1-byte	5.010 UCount	C	-	W	-	U
				1-byte	5.001 Percentage	C	-	W	-	U
				2-byte	9.001 Temperature	C	-	W	-	U

Table 27: Logic Applications - Scene Communication Section Objects

5.3 Filter/Delay



This function processes the input data based on specified criteria and sends it to the data bus after a defined delay if the criteria are met (either parametrically or through the data bus).

5.3.1 Input/Output Data Type

This parameter determines the type of data for both input and output. Different data types ensure compatibility with various applications and devices.

5.3.2 Delay Time Step

The delay time can be set in increments of 1 second or 0.1 seconds.

5.3.3 Delay Time

You can manually enter the delay time. A value between 1 and 6000 seconds can be specified. This time determines how long the device will wait to respond after a triggering event.

5.3.4 Delay Time Write Object

This parameter activates the delay time object and specifies the data type.

5.3.5 Filter Function

Selects the filtering function:

5.3.5.1 No Filter

No filter is applied; all data is sent directly.

5.3.5.2 Delay accepted value, others are sent directly

Values that meet the specified criteria are delayed, while other data is sent immediately.

5.3.5.3 Delay accepted value, others aren't sent

Values that meet the specified criteria are delayed, while other data is not sent.

5.3.5.4 Send accepted value directly, others are delayed

Values that meet the specified criteria are sent immediately, while other data is delayed.

5.3.5.5 Do not send accepted value, others are delayed

Values that meet the specified criteria are not sent, while other data is delayed.

5.3.6. Filter Criteria

Defines the filtering criteria:

5.3.6.1. Equal

Checks if the value is equal to the specified criteria.

5.3.6.2. Greater Than

Checks if the value is greater than the specified criteria.

5.3.6.3. Less Than

Checks if the value is less than the specified criteria.

5.3.6.4 Greater or Equal

Checks if the value is greater than or equal to the specified criteria.

5.3.6.5 Less or Equal

Checks if the value is less than or equal to the specified criteria.

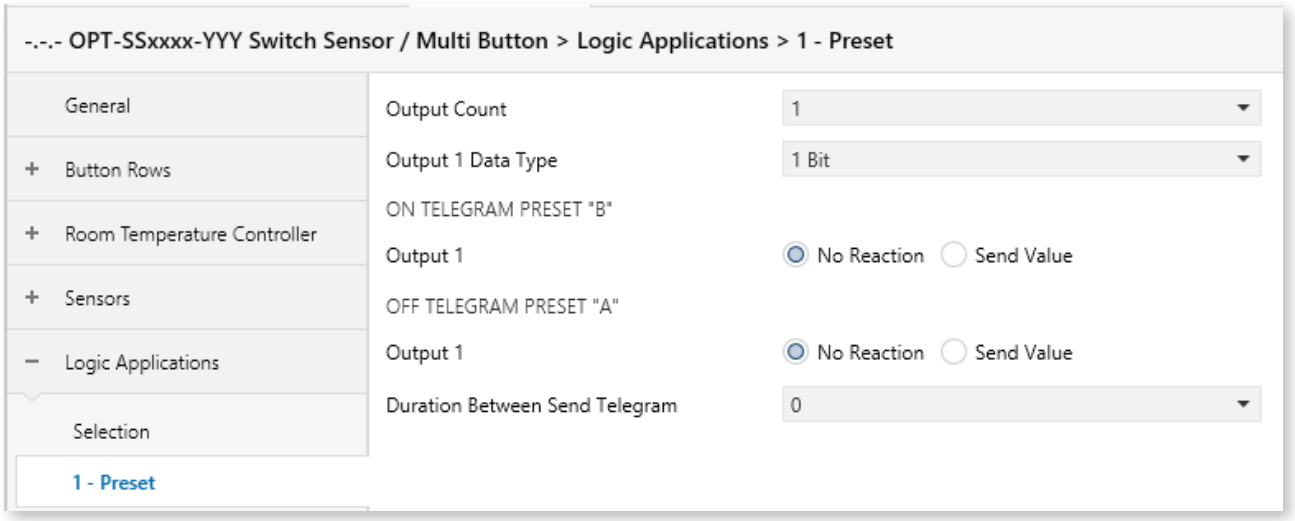
5.3.7. Criteria Value

You can manually enter the criteria value. This value is determined according to the selected data type. For example, for a 1-bit Switch, it could be 0 or 1; for 1-byte, it could be a value in the range of 0-255.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
x	LA – x I Filter/Delay	Input	Input	1-bit	1.001 Switch	C	-	W	-
				1-byte	5.010 Counter P.	C	-	W	-
				1-byte	5.001 Percentage	C	-	W	-
				1-byte	6.010 Counter P.	C	-	W	-
				1-byte	7.001 Pulses	C	-	W	-
				2-byte	8.001 Pulses	C	-	W	-
				2-byte	9.001 Temperature	C	-	W	-
				4-byte	12.001 Pulses	C	-	W	-
				4-byte	13.001 Counter P.	C	-	W	-
				4-byte	4-byte Float Value	C	-	W	-
				2-byte	9.001 Temperature	C	-	-	T
x	LA – x I Filter/Delay	Output	Output	1-bit	1.001 Switch	C	-	-	T
				1-byte	5.010 Counter P.	C	-	-	T
				1-byte	5.001 Percentage	C	-	-	T
				1-byte	6.010 Counter P.	C	-	-	T
				1-byte	7.001 Pulses	C	-	-	T
				2-byte	8.001 Pulses	C	-	-	T
				2-byte	9.001 Temperature	C	-	-	T
				4-byte	12.001 Pulses	C	-	-	T
				4-byte	13.001 Counter P.	C	-	-	T
				4-byte	4-byte Float Value	C	-	-	T
				2-byte	9.001 Temperature	C	-	-	T
x	LA – x I Filter/Delay	Delay Time	Input / Output	2-byte	7.004 Time 100ms	C	R	W	T
				2-byte	7.005 Time s	C	R	W	T

Table 28: Logic Applications - Filter Delay Communication Section Objects

5.4. Preset



A function that allows a device to operate with a set of predefined settings or configurations. These settings define how the device should behave under certain conditions. Presets enable the device to automatically apply these pre-defined settings when a specific state or trigger event occurs.

5.4.1. Output Count

The number of outputs can be selected between 1 and 4.

5.4.2 On Telegram Preset

Determines what the outputs will do when an "On" telegram is received from the input group object.

5.4.2.1 Output x

Specifies the value to be sent for output "x." Options include 1-bit, 1-byte, 2-byte Unsigned, 2-byte Signed, 2-byte Float.

5.4.3 Off Telegram Preset

Determines what the outputs will do when an "Off" telegram is received from the input group object.

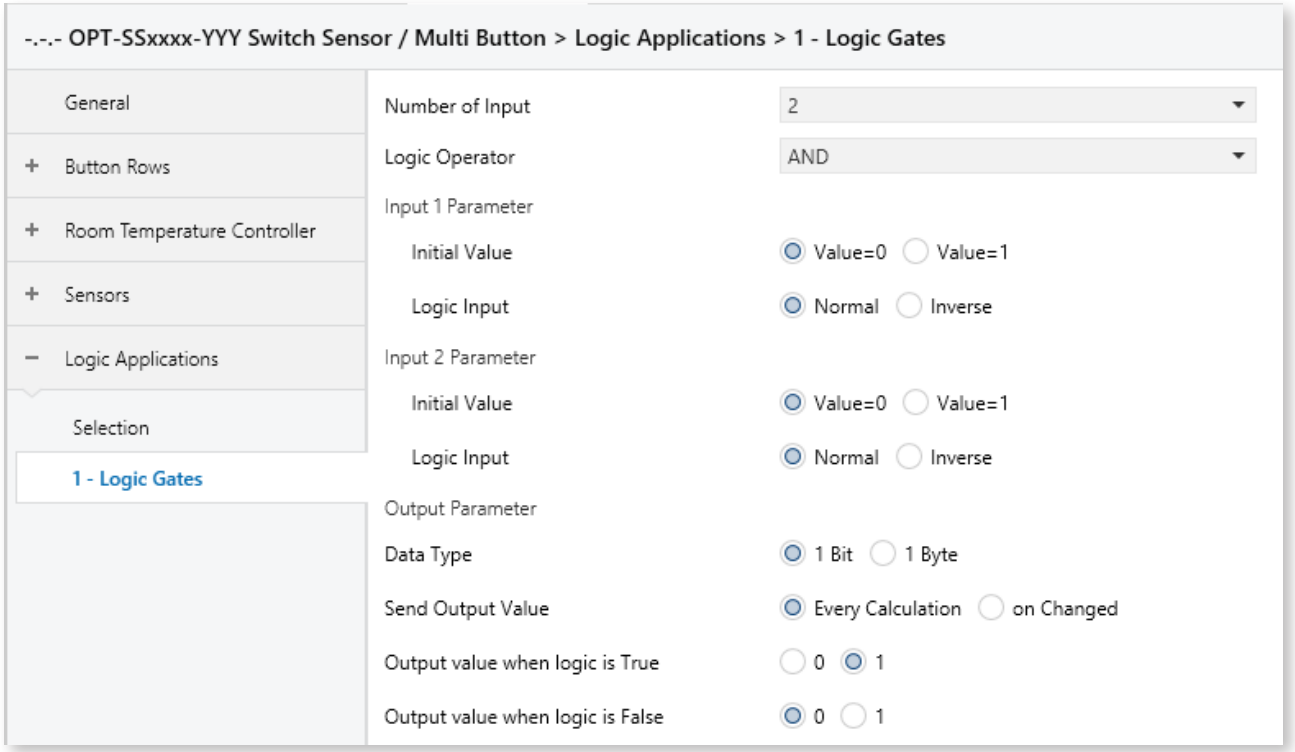
5.4.3.1 Output x

Specifies the value to be sent for output "x." Options include 1-bit, 1-byte, 2-byte Unsigned, 2-byte Signed, 2-byte Float.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
x	LA- x I Preset	Call Preset	Input	1-bit	1.022 Scene	C	-	W	-
x	LA- x I Preset	Output - x	Output	1-bit	1.001 Switch	C	-	-	T
				1-byte	5.010 UCount	C	-	-	T
				2-byte	7.001 Pulses	C	-	-	T
				2-byte	8.001 Pulses	C	-	-	T
				2-byte	9.001 Temperature	C	-	-	T

Table 29: Logic Applications - Preset Communication Section Objects

5.5 Logic Gates



An application that produces results based on standard logical functions of one or more inputs.

5.5.1 Number of Inputs

Determines the number of input signals connected to the logic gate. The type of logic gate used is determined based on the number of inputs (e.g., NOT Gate for 1 input, AND, OR, etc., for 2 or more inputs).

5.5.2 Logic Operator

Defines the operation of the logic gate. For example, the AND operator results in true if all inputs are true, while the OR operator results in true if any input is true. When multiple inputs are selected, for instance, in a 3-input logic gate, the result of the logic operation on input 1 and input 2 is processed through another gate with input 3, and this result defines the "Output" value.

5.5.3 Input x Parameters

5.5.3.1 Data Type

Determines the data type of the input signal. The 1-bit data type is used for simple on/off signals, while the 1-byte data type is used for broader value ranges.

5.5.3.2 Logic Input

Specifies whether the input signal should be processed normally (directly) or inverted (inverse). In normal mode, the signal is processed as is; in inverted mode, the signal is processed in its inverted form.

5.5.3.3 Initial Value

Defines the initial value of the input signal. This is the value the input will take when the device is first powered on or reset.

5.5.4 Output Parameters

5.5.4.1 Data Type

Specifies the data type of the output signal. The 1-bit data type is used for simple on/off signals, while the 1-byte data type is used for broader value ranges.

5.5.4.2 Send Output Value

Determines when the output value will be sent. In the "After Change" option, the output value is sent only when it changes. In the "Each Calculation" option, the output value is sent after each calculation.

5.5.4.3 Output Value

When Logic is true: Specifies the value of the output when the logic condition is true. For the 1-bit data type, values of 1 (On) or 0 (Off) are chosen. For the 1-byte data type, a value between 0-255 can be entered.

5.5.4.4 Output Value

When Logic is false: Specifies the value of the output when the logic condition is false. For the 1-bit data type, values of 1 (On) or 0 (Off) are chosen. For the 1-byte data type, a value between 0-255 can be entered.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
x	LA- x I Logic Gate	Input - x	Input	1-bit	1.001 Switch	C	-	W	-
x	LA- x I Logic Gate	Output	Output	1-bit	1.001 Switch	C	-	-	T
				1-byte	5.010 UCount	C	-	-	T

Table 30: Logic Applications - Logic Gate Communication Section Objects

5.6 Gate

The GATE logic function evaluates input signals according to specific rules to generate the output signal. This function is used for logical operations and signal management. GATE functions provide flexible control by working with different data types.

5.6.1 Input/Output Data Type

Selects the data type to be used in the GATE logic function. This data type determines how the input and output signals are processed.

5.6.2 Enable Object Value

Sets the value of the object used to enable or disable the GATE function.

5.6.2.1 Normal

The GATE function operates under normal conditions.

5.6.2.2 Inverted

The GATE function operates under inverted (reverse) conditions.

5.6.3 Initial Value Of Enable Object

Determines whether the GATE function is Enable or Disable initially.

5.6.3.1 Enabled

The GATE function is Enable initially.

5.6.3.2 Blocked

The GATE function is inEnable (Disable) initially.

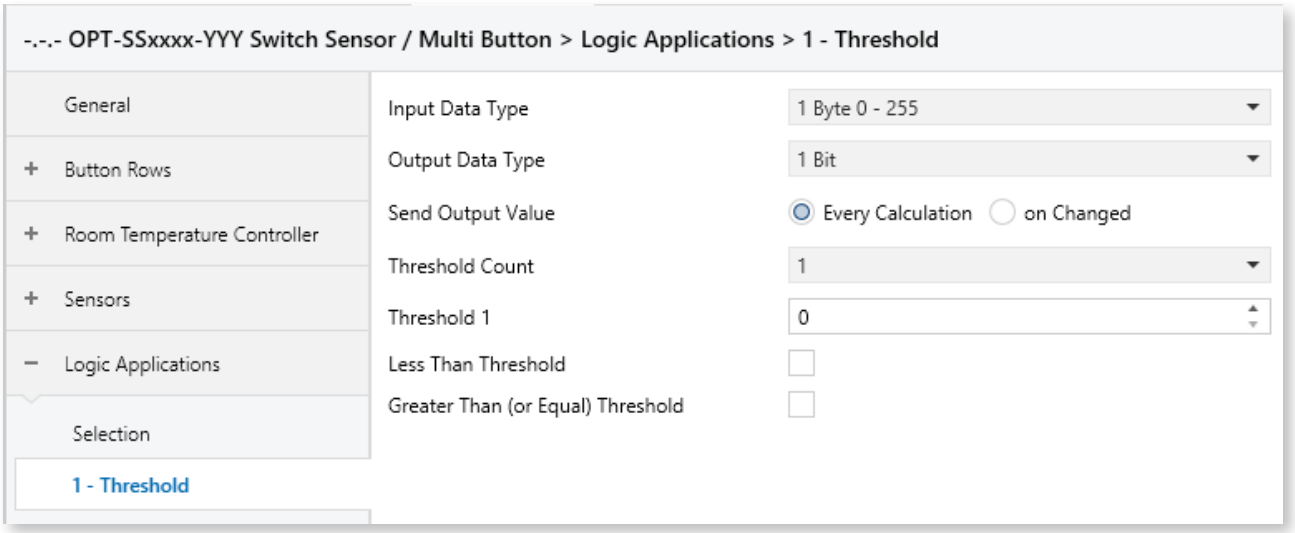
5.6.4 Send Last Value When Gate Enabled

When the GATE function is activated, this option helps in sending the last value of the related input.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
x	LA – x I Gate	Input	Input	1-bit	1.001 Switch	C	-	W	-
				3-bit	3-bit Controlled	C	-	W	-
				1-byte	5.010 Counter P.	C	-	W	-
				1-byte	5.001 Percentage	C	-	W	-
				1-byte	6.010 Counter P.	C	-	W	-
				2-byte	8.001 Pulses	C	-	W	-
				2-byte	9.001 Temperature	C	-	W	-
x	LA – x I Gate	Output	Output	1-bit	1.001 Switch	C	-	-	T
				3-bit	3-bit Controlled	C	-	-	T
				1-byte	5.010 Counter P.	C	-	-	T
				1-byte	5.001 Percentage	C	-	-	T
				1-byte	6.010 Counter P.	C	-	-	T
				2-byte	8.001 Pulses	C	-	-	T
				2-byte	9.001 Temperature	C	-	-	T
x	LA – x I Gate	Control Input	Input	1-bit	1.003 Enable	C	-	W	-

Table 31: Logic Applications - Gate Communication Section Objects

5.7 Threshold



5.7.1 Input Data Type

The Threshold Control feature evaluates input data against specified threshold values and sends the output data based on certain rules. This feature can be configured flexibly with different data types and numbers of thresholds.

5.7.2 Output Data Type

Determines the type of output data.

5.7.3 Send Output Value

Determines when the output data will be sent.

5.7.3.1 on Changed

Sends data only when there is a change.

5.7.3.2 Every Calculation

Sends data after each calculation.

5.7.4 Threshold Count

Determines the number of thresholds to be used.

5.7.5 If Number of Thresholds is 1

5.7.5.1 Threshold

Enter a threshold value based on the input data type.

5.7.5.2 Less Than Threshold

If this box is checked, a specific action is taken when the input value is below the threshold value.

5.7.5.2.1 Send Value

Enter a value based on the output data type.

5.7.5.3 Greater Than (or Equal) Threshold

If this box is checked, a specific action is taken when the input value is above the threshold value.

5.7.5.3.1 Send Value

Enter a value based on the output data type.

5.7.6 If Number of Thresholds is 2

5.7.6.1 Threshold 1

Enter a threshold value based on the input data type.

5.7.6.2 Less Than Threshold 1

If this box is checked, a specific action is taken when the input value is below Threshold 1.

5.7.6.2.1 Send Value

Enter a value based on the output data type.

5.7.6.3 Threshold 2

Enter a threshold value based on the input data type.

5.7.6.4 Greater Than (or Equal) Threshold 1 and Less than Threshold 2

If this box is checked, a specific action is taken when the input value is between Threshold 1 and Threshold 2.

5.7.6.4.1 Send Value

Enter a value based on the output data type.

5.7.6.5 Greater Than (or Equal) Threshold 2

If this box is checked, a specific action is taken when the input value is above Threshold 2.

5.7.6.5.1 Send Value

Enter a value based on the output data type.

5.7.7 If Number of Thresholds is 3

5.7.7.1 Threshold 1

Enter a threshold value based on the input data type.

5.7.7.2 Input Below Threshold 1

If this box is checked, a specific action is taken when the input value is below Threshold 1.

5.7.7.2.1 Send Value

Enter a value based on the output data type.

5.7.7.3 Threshold 2

Enter a threshold value based on the input data type.

5.7.7.4 Greater Than (or Equal) Threshold 1 and Less than Threshold 2

If this box is checked, a specific action is taken when the input value is between Threshold 1 and Threshold 2.

5.7.7.4.1 Send Value

Enter a value based on the output data type.

5.7.7.5 Threshold 3

Enter a threshold value based on the input data type.

5.7.7.6 Greater Than (or Equal) Threshold 2 and Less than Threshold 3

If this box is checked, a specific action is taken when the input value is between Threshold 2 and Threshold 3.

5.7.7.6.1 Send Value Enter a value based on the output data type

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5.7.7.7 Greater Than (or Equal) Threshold 3

If this box is checked, a specific action is taken when the input value is above Threshold 3.

5.7.7.7.1 Send Value

Enter a value based on the output data type.

No	Name	Object Function	Direction	Length	Data Type	C	R	W	T
x	LA – x I Threshold	Input	Input	1-byte	5.010 Counter P.	C	-	W	-
				1-byte	5.001 Percentage	C	-	W	-
				1-byte	6.010 Counter P.	C	-	W	-
				2-byte	7.001 Pulses	C	-	W	-
				2-byte	8.001 Pulses	C	-	W	-
				2-byte	9.001 Temperature	C	-	W	-
				4-byte	12.001 Pulses	C	-	W	-
				4-byte	13.001 Counter P.	C	-	W	-
				4-byte	4-byte Float Value	C	-	W	-
x	LA – x I Threshold	Output	Output	1-bit	1.001 Switch	C	-	-	T
				1-byte	5.010 Counter P.	C	-	-	T
				1-byte	5.001 Percentage	C	-	-	T
				1-byte	6.010 Counter P.	C	-	-	T

Table 32: Logic Applications - Threshold Communication Section Objects

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OPTIMUS SOLUTIONS TEKNOLOJİ
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