Deseo RTR KNX

Manual

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1. Introduction

Deseo RTR for KNX is designed to control HVAC in one single room in a very simple and intuitive way.

With one single touch, it is possible to adjust the setpoint, fan speed and temperature modes. Deseo RTR also has an integrated temperature and humidity sensor.

Additional features are the short and long multitouch to turn the lights on and off, using a welcome and a goodbye scene.

The Deseo RTR keypad should be used in combination with the Deseo HVAC front covers.

2. Installation

Use a standard European back box with screws to mount the basalte Deseo RTR. The distance between the screws must be 60mm. The screws must be installed vertically.

Using screws that are too big might hinder the mounting of the Deseo front cover onto the Deseo RTR. When mounted, the Deseo front cover should hide the Deseo RTR completely. If not, the connection to the Deseo front cover might not work properly, which will result in a reduced sensitivity of the switch!

When fixing the screws, do not apply too much force since this will deform the plastic surrounding opening. Doing so might hinder the installation of the Deseo front cover onto the Deseo switch!

The minimal depth required for the Deseo switch KNX is 24mm. Additional depth should be reserved for connecting the device.

The minimum gap between 2 Sentido or Deseo keypads should be at least 4cm (1.6 in).

Connect the 29V of the switch with a DC power supply between 18V and 36V.
Each device has a power consumption of 20mA in standby mode, with a peak of 50mA (1.2 Watt).
Please take into account that the power consumption at start-up can be higher.
Make sure that the power supply is well grounded and correctly dimensioned!
Prefer an over-dimensioned power supply, please reserve 2W for each device.

Make sure that the temperature sensor is on the bottom side of the switch.

Before installing the front cover, shut down the power supply of the switch.
The device can be powered up after the installation of the front cover.

2.1 Touch sensor calibration

The touch sensors need calibration to compensate for environment changes. At start-up, this calibration is performed automatically. Internal drift compensation will track slow variations.

Quick changes in the environment (installation or removal of front cover) will necessitate recalibration. In most cases automatic recalibration is performed without user intervention.

When manual recalibration is required, the user can force this by touching the keypad for 20 seconds. The device will restart, and calibration is performed.

Another option is to use a communication object to trigger the recalibration.

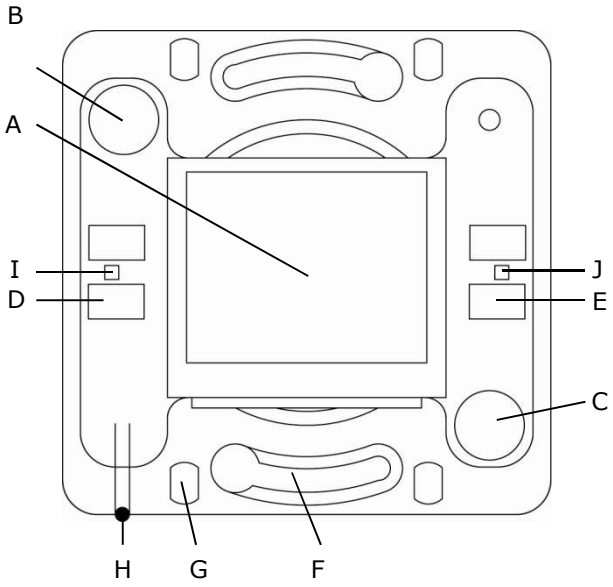
During calibrating, a status bar and the software build number will be shown on the display.

Note: Do not touch the front cover during recalibration because this can lead to insensitive sensors!

2.2 Identifying the parts

2.2.1 Front view of the electronics

A 1.7” OLED-display
B Touch sensor up
C Touch sensor down
D Touch sensor left
E Touch sensor right
F Opening to screw the device into the wall box
G Guide for the Deseo front cover
H Temperature sensor
I Led left
J Led right



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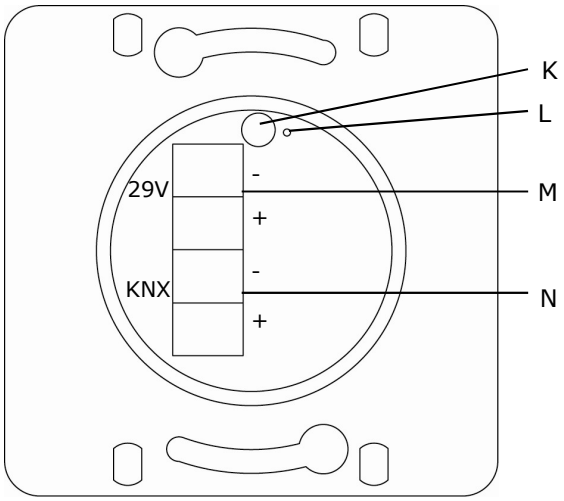
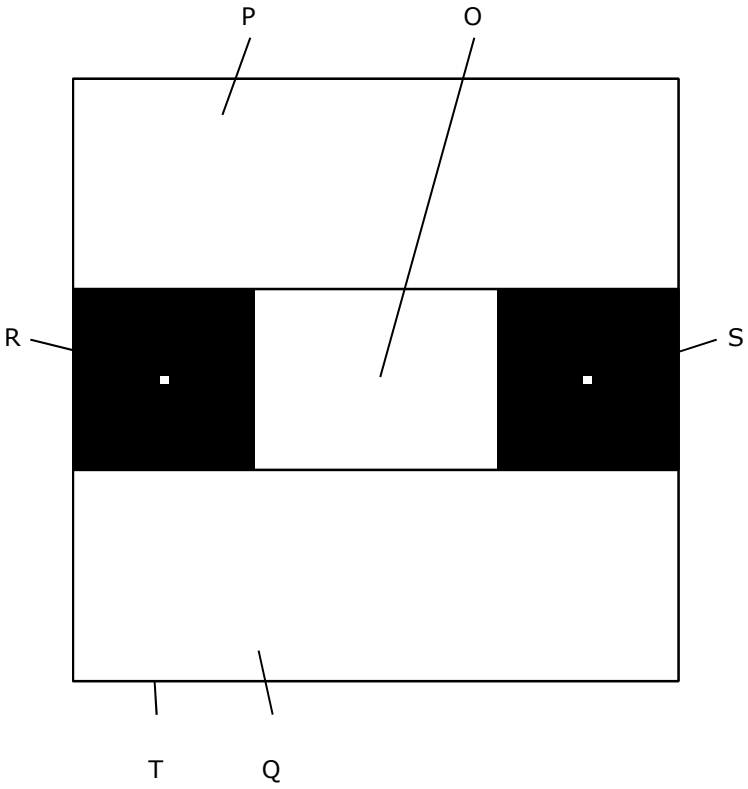
2.2.2 Rear view of the electronics

K Programming button
L Programming led
M External power supply
N KNX connector



2.2.3 Front cover

O Display
P Touch sensor up
Q Touch sensor down
R Touch sensor left
S Touch sensor right
T Opening temperature sensor



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2.3 Programming mode

The programming mode can be activated by keeping the left sensor pressed while pressing 4 times the right sensor. This must be done within 4 seconds.

A screen will be activated asking if you want to activate the programming mode. Pressing up will select 'yes', pressing down will select 'no'.

If you press 'Yes', the Deseo will be in programming mode and this will be indicated on the display.

You can also activate the programming mode by pressing the button on the back of the Deseo.

3. General

3.1 Navigation

Deseo has four touch sensitive fields: up, down, left and right button.

The upper and lower sensor can be used to adjust the comfort setpoint.
The left sensor is used to browse through the fan levels.
The right sensor is used to browse through the thermostat modes.

Touching the upper and lower surface of the device simultaneously will trigger the multitouch event.

Any touch surface can be used to wake the display. After some time, the display will go into standby-mode.

3.2 Start page

The start page is the main entry, shown when the device wakes up. The page can display:

- status of the thermostat
- status of the ventilation
- 1 or 2 info lines

3.2.1 Thermostat status

In the upper right corner, the status of the thermostat is displayed. Using the right button, the user can scroll through following modes (if enabled in ETS).

off – heating – cooling – auto heating and cooling

3.2.2 Ventilation status

In the upper left corner, the status of the ventilation is displayed. Using the left button, the user can scroll through following modes (if enabled in ETS).

off – level 1 – level 2 – level 3 - auto

3.2.3 Info

In ETS, two lines can be set with the following parameters:

Line 1:

- Time
- Temperature
- Text

Line 2:

- Disable
- Temperature
- Date
- Humidity
- 14 byte object

3.2.3.1 Time and date

The device contains an internal clock that can be set with the according communication object 200. The time format can be set either in 12h or 24h notation.

The date can be set in various date formats (dd-mm-yyyy), (mm-dd-yyyy) and (yyyy-mm-dd). This date can be set with a communication object 186.

The date and time can be shared using one date time communication object 202.

Time and date should be updated on a regular base and after each restart of the device with the according communication object. After restarting, the Deseo will show 8:50 02/01/10.

3.2.3.2 Temperature

The device contains an internal temperature sensor and remote PT1000 sensor. If an external sensor is used, the weighting of the internal and external values can be set to calculate the room temperature.

The temperature units (°C or °F) can be configured in ETS.

3.2.3.3 Humidity

The device contains an internal humidity sensor. The humidity can also be displayed using an external bus value.

3.2.3.4 Variable text

The page can display variable text, coming from a 14-byte communication object. When the imported text does not fit on the display, the last characters are discarded.

3.2.3.5 Fixed text

A fixed text line can be added to the start page. The text can be entered in ETS.
A maximum of 14 characters can be displayed. If the text does not fit on the display, the last characters are discarded.

3.3 Setpoint Page

The setpoint page will only be available when the thermostat is in comfort status. In case the Deseo is not in comfort status (= off status) it is possible to activate comfort mode using the thermostat mode button.

In comfort status a symbol for heating or cooling is displayed to indicate the current heating or cooling mode.

When the up or down button is pressed, the setpoint increases/decreases in steps of 0.5°C or 1°F. When the button is pressed and hold, the setpoint changes in steps of 1°C or 2°F.

When the upper limit is reached, the '^' sign on the top of the display disappears and the upper button is disabled. When the lower limit is reached, the 'v' sign on the bottom of the display disappears and the lower button is disabled. The temperature setpoint limits are set in the ETS Configuration menu.

External mode

When the external mode is selected, the thermostat will be controlled by an external logic. Deseo will only send its comfort setpoint (communication object 50: comfort setpoint – output) as set on the display. Every update will trigger an update on the communication object.

By receiving an update on the setpoint (communication object 43: comfort setpoint – input), sent by another device, the Deseo will overwrite the internal setpoint and the screen will be updated, even if the temperature setpoint is beyond the upper or lower limit.

Remark: When a value is sent to the setpoint (input) communication object, the Deseo will not send a new actual setpoint (output) on the bus because this will occur an infinitive loop.

Internal mode

In the internal mode, there are 2 communication objects which reflect the setpoint, comfort setpoint and actual setpoint. The comfort setpoint is the setpoint in the comfort mode. The actual setpoint is the setpoint value depending on the current mode (comfort/standby/economy/protect).

At reception of an update on the input setpoint, sent by another device, the Deseo will overwrite the internal setpoint and the screen will be updated, even if the temperature setpoint is beyond the upper or lower limit.

Remark: When a value is sent to the setpoint (input) communication object, the Deseo will send a new actual setpoint (output) on the bus.

3.4 Screen standby

To reduce power consumption and prolong display life, the display shuts down after a prolonged time of inactivity. This time can be configured with ETS.

The device automatically wakes up when one or more buttons are touched or when the screen wake object is activated (if enabled).

3.5 Multitouch

A multitouch event occurs when the user simultaneously touches the upper and lower surfaces of the device.

3.5.1 Short multitouch

Typically, the multitouch is used to switch on and off the lights when a person enters or leaves the room.

The installer can set text fields which are displayed shortly when multitouch occurs.

The multitouch logic can also be triggered by a communication object (communication object 15).

To control the multitouch, the device has to know the feedback of the lights.
For this, there are 8 communication objects (communication objects 16-23) to couple the feedback of the lights controlled by the multitouch.
When one or more feedback objects are active (1), the multitouch will send the "off" command.
When all feedback objects are inactive (0), the multitouch will send the "on" command.

Room status

The room status (communication object 14) will send the status of the room using the 8 feedback objects.

3.5.2 Long multitouch

This function is only available when the short multitouch is activated.
After a long press event the Deseo can send a 1 bit, scene or byte number. This function is intended to, for example, turn all the lights off in the entire house.

4. Thermostat

The internal room temperature controller can control the temperature of 1 room. The device supports 6 operating options:

- Heating
- Cooling
- Heating and cooling
- Basic and additional heating
- Basic and additional cooling
- Basic and additional heating and cooling

When both heating and cooling are enabled, it is possible to choose between only manual or manual and auto switchover.

In automatic mode, the selection between heating or cooling is automatically set by the controller, based upon the parameter "comfort setpoint".
A neutral zone can be set in the automatic control. Heating mode is activated if the temperature falls below: comfort setpoint – neutral zone upper band.

Cooling mode is activated if the temperature rises above: comfort setpoint + neutral zone lower band.

This upper and lower band can be set between 0.5 and 3°C or 1 and 6°F.

Boost mode

Boost mode is a function that will boost the system when the room is to cold or to warm.

When this parameter is enabled, boost mode will start when the calculated PI control value exceeds 100%. The mode will stay active (PI = 100%) until the setpoint is reached. Once the setpoint is reached, the PI will be reset.

Note: this will only work in combination with PI or P control.

Floor protection

It is possible to limit the temperature of the floor using a PT1000 sensor directly connected to the Deseo.

In the temperature section, assign the PT1000 sensor as a floor temperature sensor.

When heating is enabled, the maximum floor temperature can be set. Once the temperature exceeds this value, the heating system will receive a time out specified in the parameters.

4.1 Modes

When manually controlling the Deseo thermostat. The user can cycle through the different modes:

off – heating – cooling – auto heating and cooling

When selecting heating, cooling or auto. The Deseo will automatically go to the comfort mode.

The off status is a collection of all thermostat modes different from comfort mode. When changing the setpoint, the user will always be asked to activate comfort mode (if not already active).

When manually selecting the off status on the Deseo. One of the following actions will be performed, depending on the ETS parameter in Configuration menu "Mode after manual off".

- Switch to standby mode
- Switch to protect
- Switch off thermostat

4.1.1 Simple mode

When using the thermostat in single mode setup, there will only be a comfort mode. The comfort setpoint can be adjusted to satisfy a comfortable room temperature.

4.1.2 Multi mode

This mode can be activated by disabling simple mode. Now the Deseo can work in 4 modes. Each mode has a setpoint assigned to it.

- Comfort: To be activated when people are present in the room. The temperature is set to a comfortable value.
- Standby and Economy: To be activated when the room is not in use. The temperature is set to a lower setpoint value which allows energy saving.
- Building protection: When a window is opened, normal operation is suspended. The temperature is kept between critical values, preventing freezing and/or overheating.

Remark: "Protection" is a mode that will automatically be activated when a window is opened (if enabled).

Switching between the modes will be possible through communication objects. For each mode there is a 1-bit communication object. The mode is also available through a 1-byte communication object, where the value represents the mode:

1: Comfort
2: Standby
3: Economy
4: Building protection

Any input on the communication objects (input) overwrites the current mode setting.

When a 0 to 1 transition is received on a 1-bit object, or an appropriate value on the 1-byte object, the mode state is overwritten.

4.1.3 Setpoint

4.1.3.1 Comfort

On the Deseo only the comfort setpoint can be adjusted.

When auto and manual mode is enabled, the same setpoint will apply to Heating and to Cooling.

When only manual mode is enabled, there will be 2 different setpoints one for heating and one for cooling.

4.1.3.2 single mode

When using the thermostat in single mode setup, there will be no standby and economy setpoints. Only the comfort and protect setpoints will be available in the parameters.

The thermostat can switch between comfort and protect using the on/off object.

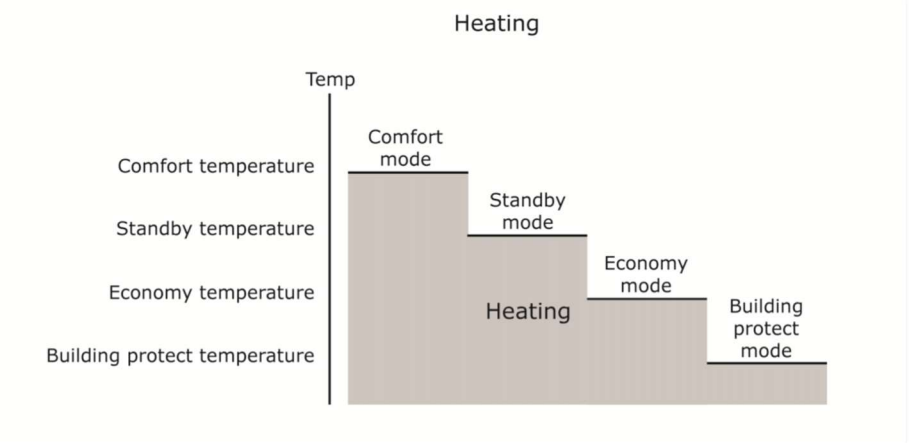
4.1.3.3 Multi mode

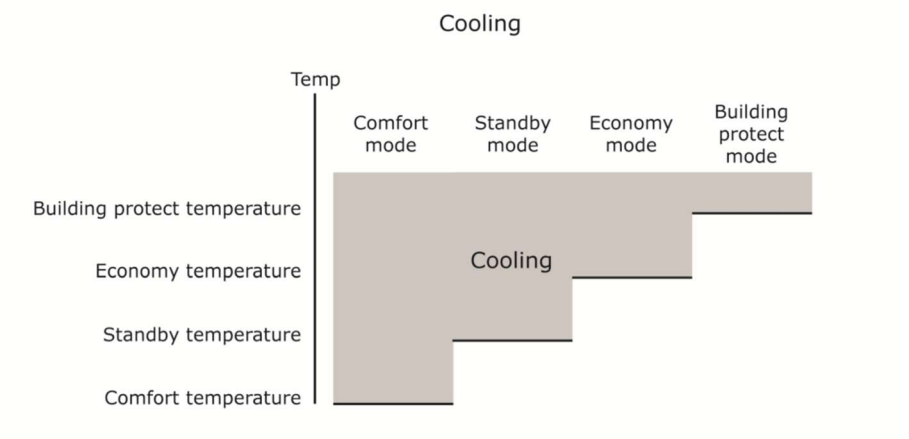
In this mode, the standby and economy mode will be available. Switching between the modes will be possible using the one-byte object or using the four binary objects.

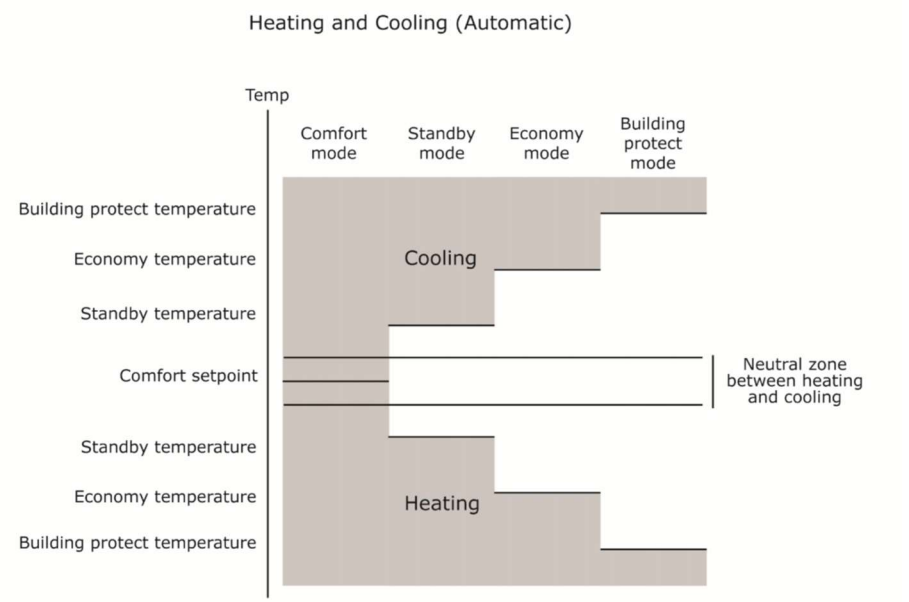
Two alternatives are available in the multi mode thermostat: absolute setpoints and relative setpoints.

4.1.3.4 Relative setpoints

The setpoint for “standby” and “economy” mode are derived from the “comfort” setpoint. This deviation, called an offset, for “standby” and “economy” can be set into the parameters of ETS. This deviation is kept constant against the changes to the comfort setpoint.







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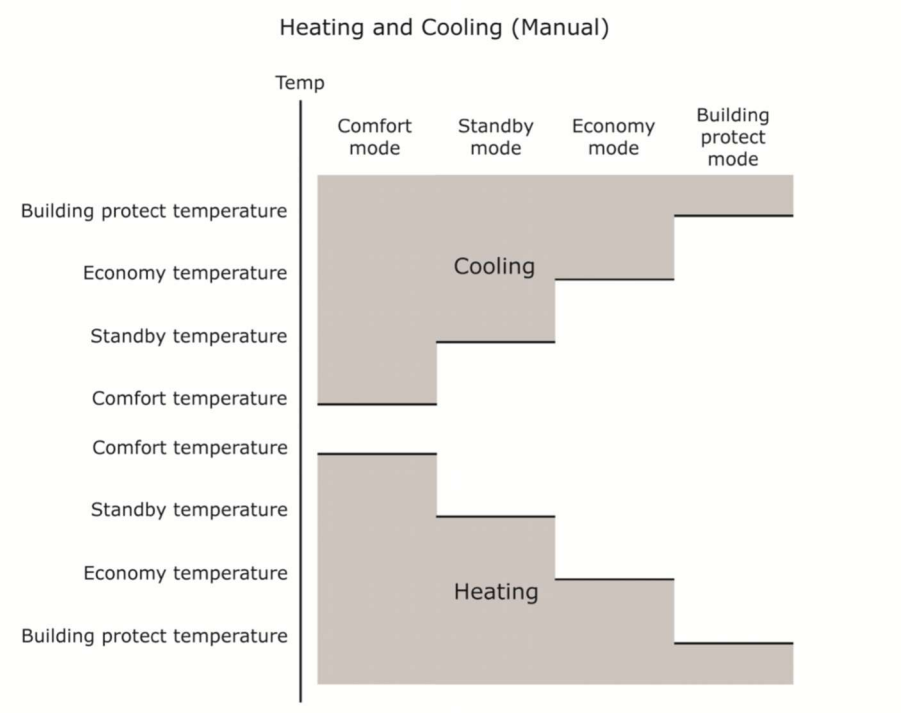

4.1.3.5 Absolute setpoints

All setpoints can be controlled individually in absolute terms.

In case the setpoint received of the current mode differs from the previous one, the new setpoint value will be returned through the status object (unless the current special mode is Protection).

4.1.3.6 Temporary comfort setpoint

It is possible to activate a temporary setpoint, after a mode change, the setpoint will reset to te basic setpoint.

If this parameter is enabled in ETS, the setpoint controlled on the Deseo will be the temporary setpoint.

Example:
Basic comfort setpoint is 23°C on a cold day the temporary setpoint is manually increased on te Deseo to 25°C. After a mode change to off status back to comfort, the setpoint is reset to 23°C (basic setpoint).

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4.2 Temperature control method

4.2.1 2-point control method

This is a very simple controller method, suitable for slow responding cooling and heating systems. It addresses the actuator with 1 bit output variable. No proportional value is calculated.

This type of method results is a significant temperature fluctuation.

For heating:
When the temperature rises above the setpoint + upper hysteresis, the actuator is deactivated.
When the temperature falls below setpoint – lower hysteresis, the actuator is activated.
The upper and lower hysteresis can be set between 0.5 and 6°C.

For cooling:
When the temperature falls below the setpoint – lower hysteresis, the actuator is deactivated.
When the temperature rises above setpoint + upper hysteresis, the actuator is activated.
The upper and lower hysteresis can be set between 0.5 and 6°C.

The output of the 2-point control is send out every 20 minutes, even if the output value is not changed. This to prevent the heating actuator from going into safety mode.

4.2.2 PI control

PI control is a feedback control method that combines proportional and integral actions.

The proportional action provides smooth control without overshoot or oscillation. This action's output is proportional to the temperature deviation. When the temperature deviation is equal to the proportional band, the output is 100%.

The integral action's output is proportional to the time over which the deviation occurred. This action output reaches the same level as the proportional action after a specified time: the reset time.

The integral action automatically corrects offset, created by the proportional action.
To avoid windup, the I-action is limited.

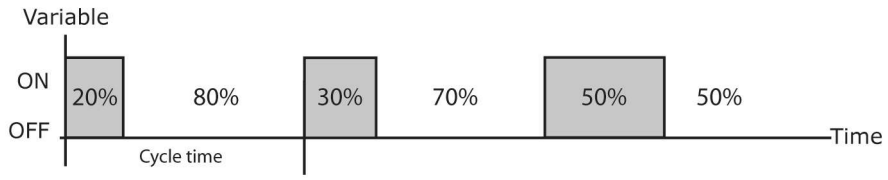
The proportional band and reset time are adjustable in ETS. In case of a PI controller, the controller output type can be set to PWM or Continuous.

4.2.3 PWM

A PWM output uses a single 1 bit output. By adjusting the pulse / pause ratio, averaged over time, it behaves like a proportional output.

Output values smaller than 10% are discarded and values exceeding 90% result in pulse / pause ratio of 100%.
In this regard, please keep in mind that the valve needs a certain time to open or close.
The time to open or close the valve should be at least 10% of the cycle time.

The PWM period (duration of 1 pulse + 1 pause) can be parameterized.



When the PWM output is 0%, only the falling edge is sent every cycle.
When the PWM output is 100%, only the rising edge is sent every cycle.

4.2.4 Continuous

A continuous output uses a 1-byte unsigned output and directly reflects the proportional output of the PI controller. The output value is updated every 3 minutes or when the value is changed by more than 5%.

4.2.5 P control

P control is a feedback control method that only uses proportional actions.

The proportional action provides a control without considering the time. This action's output is proportional to the temperature deviation. When the temperature deviation is equal to the proportional band, the output is 100%.

In case of a P controller, the controller output type can be set to PWM or Continuous.

4.3 Additional Cooling / Heating

The Deseo RTR can control a secondary heat / cool source, to ensure a more comfortable indoor climate.

To configure the additional heating / cooling function, it is necessary to define an offset towards the basic level.

Additional heating

When the room temperature is lower than the setpoint – offset. The additional heating will come into operation.

Additional cooling

When the room temperature is higher than the setpoint + offset. The additional cooling will come into operation.

5. Ventilation

The Deseo can control 3 fan levels .

External mode

When the external mode is selected, the fan will be controlled by an external logic. Deseo will only send the fan mode (communication object 106: fan mode – output) as set on the display. Every update will trigger an update on the communication object.

By receiving an update (communication object 100: fan mode – input), sent by another device, the Deseo display will be updated, even if the mode is not enabled in the ETS parameters.

Remark: When a value is sent to the fan mode (input) communication object, the Deseo will not update fan mode (output) on the bus because this will occur an infinitive loop.

Internal mode

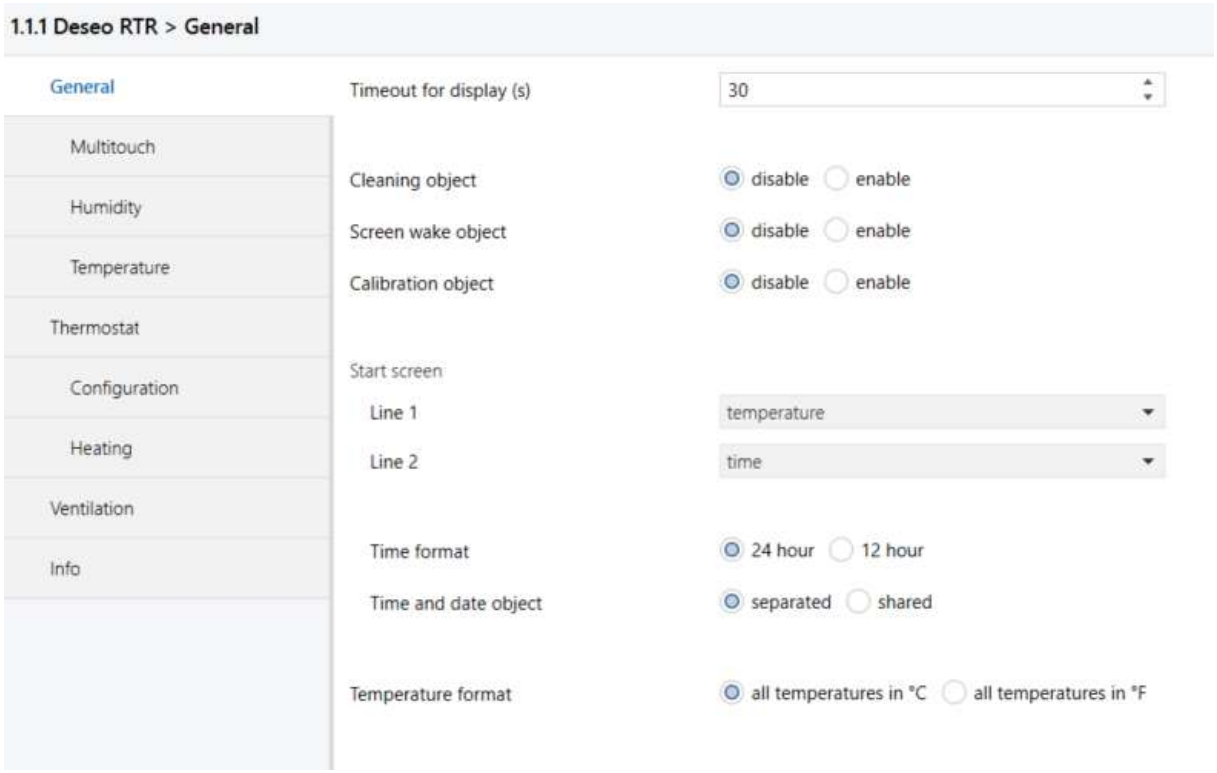
In the internal mode, the Deseo can directly control 3 fan levels using 1 bit objects. The 1 bit objects can be connected to control switching relays.

At reception of an update on the input, sent by another device, the Deseo will adopt to the mode and the screen will be updated, even if the mode is not enabled in the ETS parameters.

Remark: When a value is sent to the fan mode (input) communication object, the Deseo will send an updated fan mode (output) on the bus.

6. Configuration of parameters

6.1 General



Parameter	Description
Timeout for display to switch off in sec	This parameter sets the time that the display will remain active after the last use. Settings: range: 10 – 120 seconds (default: 30 seconds)
Cleaning object	This parameter allows to enable/disable the touch sensors with a communication object as long as the object is 1. Settings: disable (default) dnable Communication object: 1: cleaning – as long as object is 1 (input)

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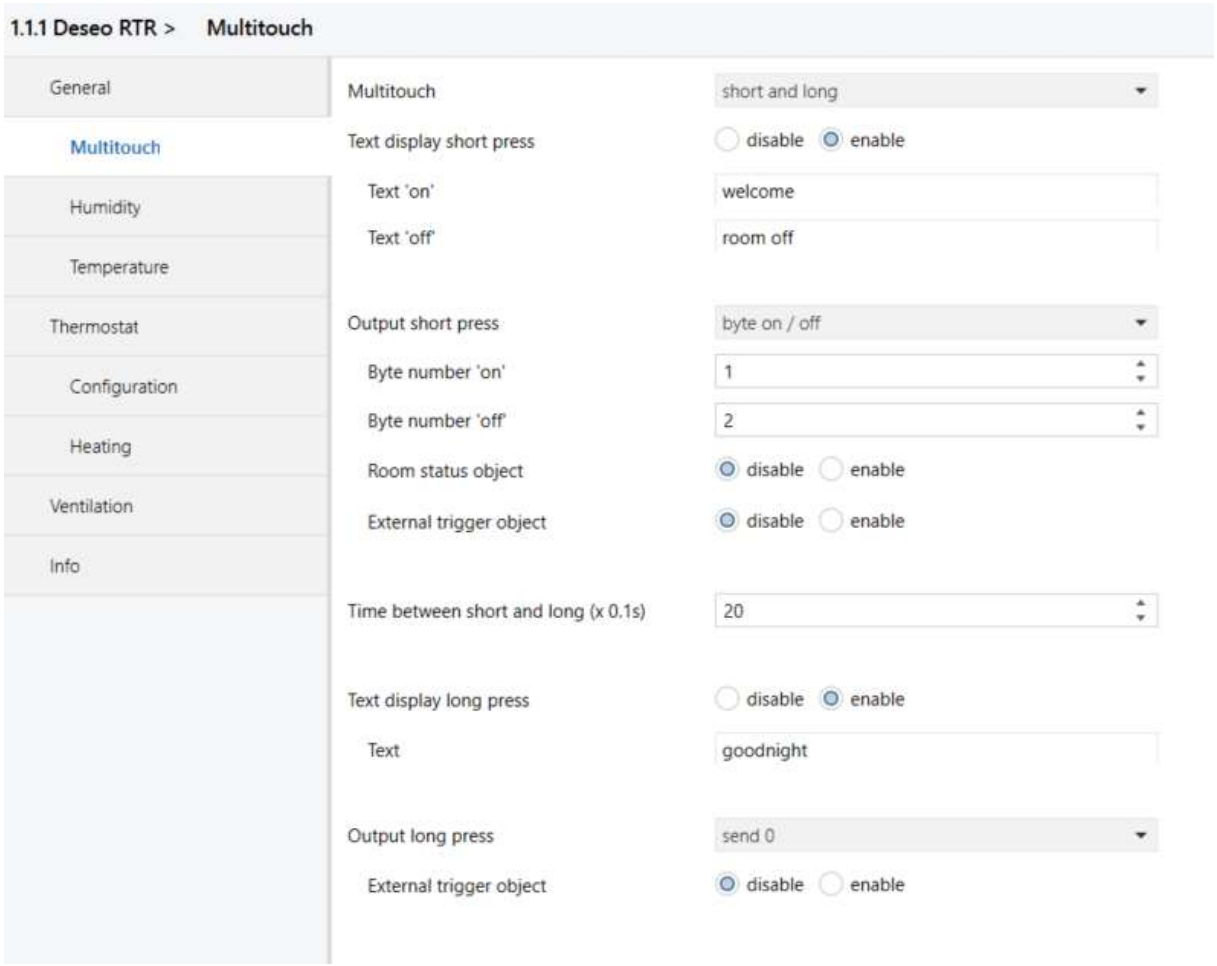
Screen wake object	This parameter allows waking the screen with an external communication object on a rising edge. Settings: disable (default) dnable Communication object: 2: screen wake – on rising edge (input) Behaviour: The display becomes active when 0 to 1 transition is received on the according communication object. This is a similar behaviour of touching a touch sensor when the device is into standby.
Calibration object	This parameter allows calibrating the device with an external communication object on a rising edge. Settings: disable (default) enable Communication object: 3: calibration – on rising edge (input) Behaviour: The touch sensors of the device start to calibrate on a rising edge of the communication object. While calibrating, the display shows the status of the calibration process and the software build number into the device.
Start screen: Line 1	This parameter allows to define the start screen text of the first line. Settings: time temperature (default) text Communication objects: 200: time – time (input) 201: date – date (input) 202: date & time – byte (input)
Start screen: Line 2	This parameter allows to define the start screen text of the first line. Settings: disable (default) time date humidity 14 byte object Communication objects: 4: start screen – text (input) 200: time – time (input) 201: date – date (input) 202: date & time – byte (input)

Temperature format	This parameter allows changing the temperature format. All parameters and communication objects will transform to the selected format. <u>Settings:</u> all temperature in °C (default) all temperature in °F

6.1.1 Multitouch

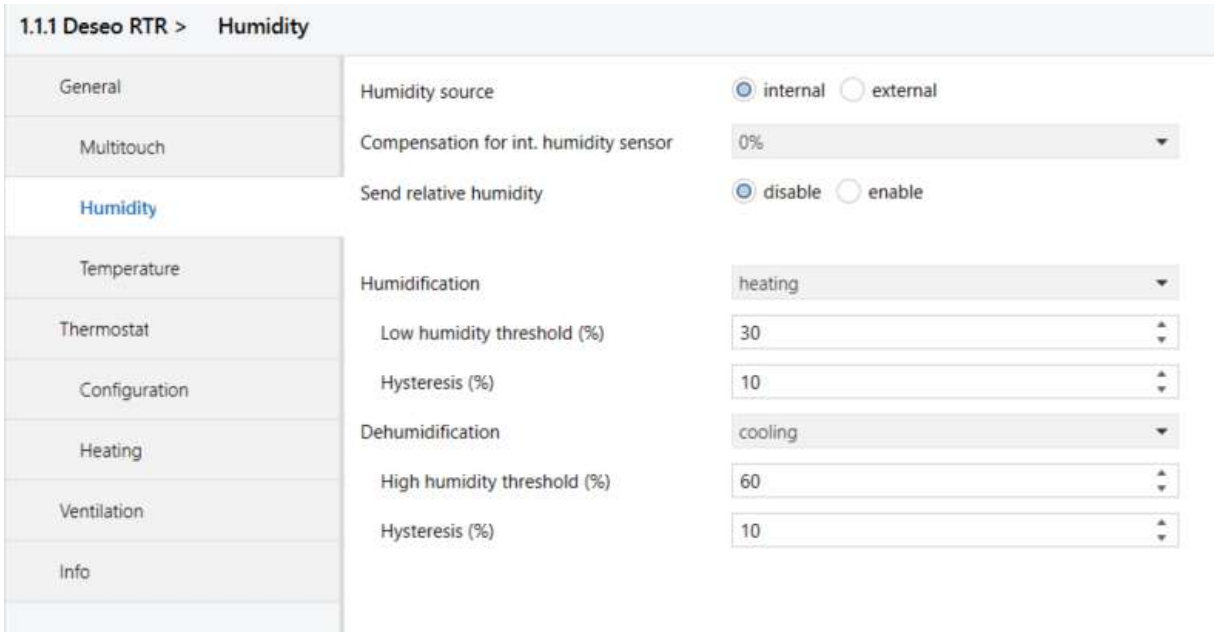


Parameter	Description
Multitouch	This parameter enables or disables the multitouch functions. To achieve a toggle function, the status of the light circuits in the room can be fed back to the status feedback objects. Settings: disable short only (default) short and long Communication objects: 16-23: multitouch – status feedback n (input) Behaviour: When one or more feedback objects are active, the multitouch will send the "off" command. When all feedback objects are inactive, the multitouch will send the "on" command.
Text display short press	This parameter enables the use of text when using the short multitouch. Settings: enable (default) disable
Text 'on'	This parameter sets the displayed text for the 'on' command of the multitouch (default: welcome). Max 14 characters.
Text 'off'	This parameter sets the displayed text for the 'off' command of the multitouch (default: room off). Max 14 characters.
Output short press	This parameter defines the "on" and "off" command of the multitouch short press. Settings: send 0 send 1 1 bit on / off (default) byte on / off scene on / scene off scene on / all off Communication objects: 10: multitouch – off (output) 10: multitouch – on (output) 10: multitouch – on/off (output) 11: multitouch – scene (output) 12: multitouch – byte (output) 13: multitouch – all off (output)
Byte number 'on'	This parameter defines the byte number for byte on. Settings: Value between 0 and 255
Byte number 'off'	This parameter defines the byte number for byte off. Settings: Value between 0 and 255

Scene number 'on'	This parameter defines the scene number for scene on. Settings: Value between 1 and 64
Scene number 'off'	This parameter defines the scene number for scene off. Settings: Value between 1 and 64
Room status object	This parameter defines the status of the room. Settings: disable (default) enable Communication object: 14: multitouch – room status (output) Behaviour: The room status object is set to 1 if one or more multitouch feedback objects is high. And set to zero when all feedback objects are low.
External trigger object (short)	This parameter enables or disables the external trigger object. Settings: disable (default) enable Communication object: 15: multitouch - external trigger short (input) Behaviour: This function makes it possible to trigger the multitouch short command from an external device, for example from a Sentido. The rising edge of the communication object triggers the multitouch command.
Time between short and long (x 0.1s)	This parameter defines the time between short and long press. Settings: Value between 5 and 50
Text display long press	This parameter enables the use of text when using the long multitouch. Settings: enable (default) disable
Text 'on'	This parameter sets the displayed text for the 'on' command of the multitouch (default: goodnight). Max 14 characters.
Text 'off'	This parameter sets the displayed text for the 'off' command of the multitouch (default: good morning). Max 14 characters.

Output long press	This parameter defines the "on" and "off" command of the multitouch long press. Settings: send 0 (default) send 1 toggle bit byte scene Communication objects: 24: multitouch – long off (output) 24: multitouch – long on (output) 24: multitouch – long on/off (output) 25: multitouch – long scene (output) 26: multitouch – long byte (output)
Byte number 'long'	This parameter defines the byte number. Settings: Value between 0 and 255
scene number 'long'	This parameter defines the scene number Settings: Value between 1 and 64
External trigger object (long)	This parameter enables or disables the external trigger object. Settings: disable (default) enable Communication object: 27: multitouch - external trigger long (input) Behaviour: This function makes it possible to trigger the multitouch long command from an external device, for example from a Sentido. The rising edge of the communication object triggers the multitouch command.

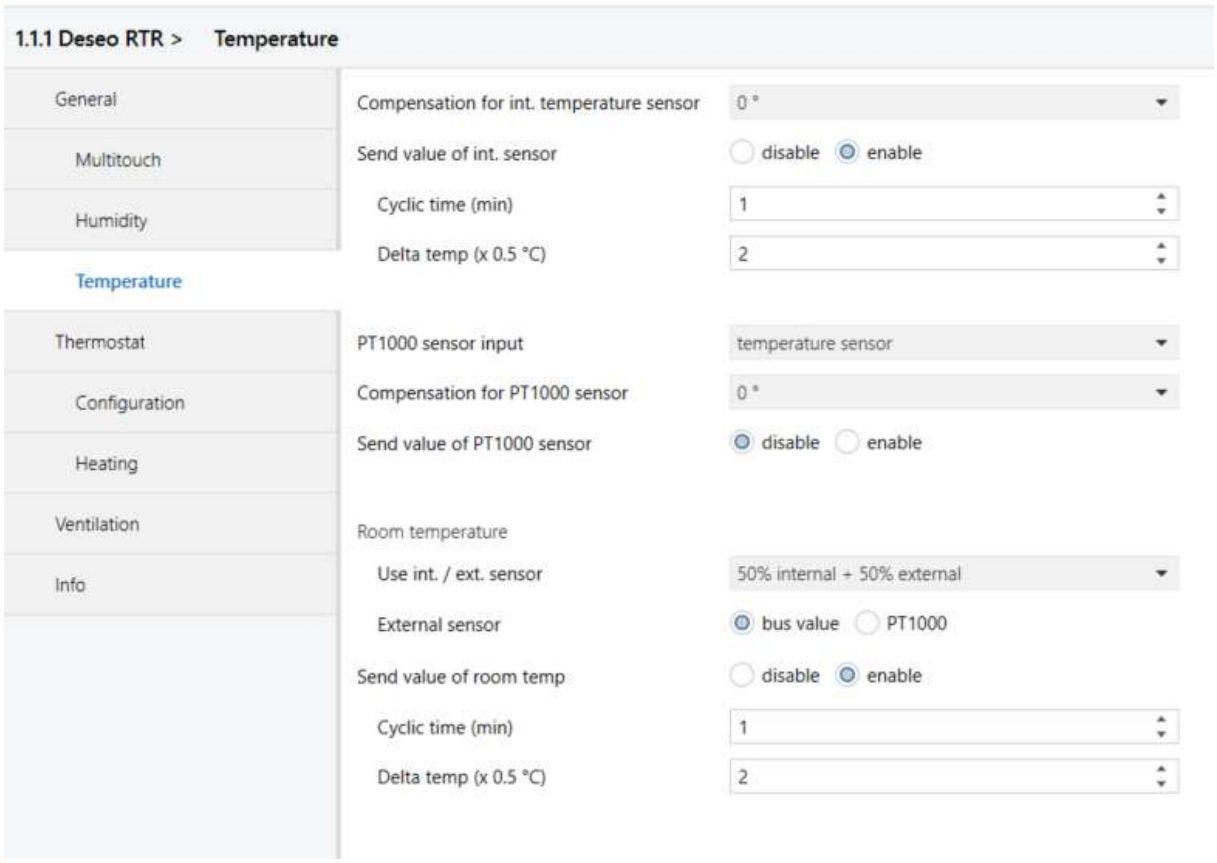
6.1.2 Humidity



Parameter	Description
Humidity source	This parameter defines if the humidity measurement is external or internal. Settings: internal (default) external
Compensation for int. humidity sensor	This parameter is used to compensate the internal humidity sensor with a fixed offset. Settings: From -20% to +20% with steps of 1% Behaviour: The humidity shown on the device or send on the bus, is the compensated value.
Send relative humidity	This parameter defines if the relative humidity is send on the bus. Settings: disable enable Communication objects: 34: humidity – humidity value (output) 37: humidity – external value (output)
Humidification	This parameter enables the humidification when the selected mode is active. Settings: disabled (default) heating cooling heating and cooling Communication object:

	35: humidity – humidification (output) Behaviour: When parameter heating is selected, the humidification will not be set when cooling mode is active.
Low humidity threshold (%)	This parameter defines the low humidity threshold for the humidification. When the relative humidity is below the threshold the humidification will start. Settings: Value between 20% and 80%
Hysteresis (%)	This parameter defines the hysteresis for the humidification process. Settings: Value between 0% and 20%
Dehumidification	This parameter enables the dehumidification when the selected mode is active. Settings: disabled (default) heating cooling heating and Cooling Communication object: 36: humidity - dehumidification (output) Behaviour: When parameter cooling is selected, the dehumidification will not be set when heating mode is active.
High humidity threshold (%)	This parameter defines the high humidity threshold for the dehumidification. When the relative humidity is above the threshold the dehumidification will start. Settings; Value between 20% and 80%
Hysteresis (%)	This parameter defines the hysteresis for the humidification process. Settings: Value between 0% and 20%

6.1.3 Temperature

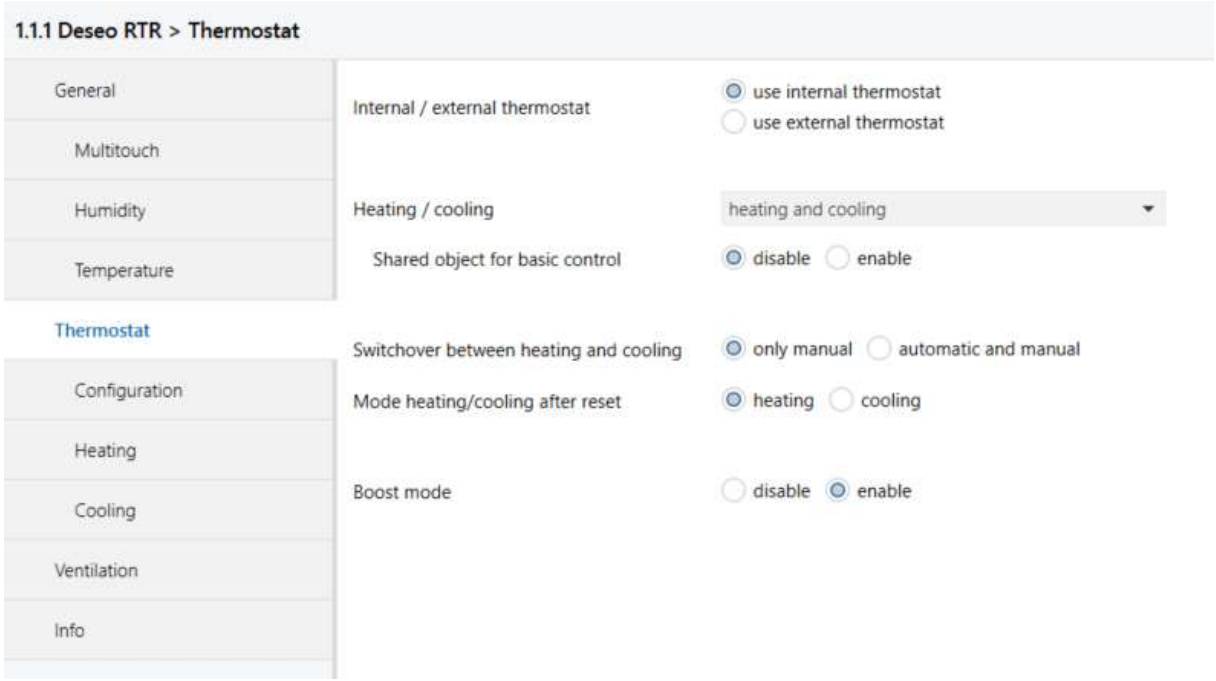


Parameter	Description
Compensation for int. temperature sensor	This parameter makes it possible to compensate the measured temperature. Settings: Value between -10°C to +10°C with steps of 0.5°C or -20°F to +20°F with steps of 1°F. Behaviour: The temperature shown on the display or send on the bus, is the compensated temperature.
Send internal temperature value (°C)(°F)	With this parameter, it is possible to send the temperature on the bus. Settings: enable (default) disable Communication objects: 30: temperature – internal temperature (output) *Remark:* *Please consider a delay of about 20 minutes until you have the correct value.* *After 20 minutes you can compare the measured value with a measurement in the room with a digital temperature sensor to get the compensation value.*

Cyclic time (min)	This parameter sets the interval for sending the internal temperature on the bus (0 = inactive). Settings: Value between 0 and 255
Delta temp (x 0.5 °C) (x 1 °F)	This parameter sets the delta temperature for when the internal temperature will be reported on the bus (0 = inactive). Settings: Value between 0 and 255
PT1000 sensor input	This enables the use of a PT1000 sensor input. The PT1000 can be used as a temperature sensor or as a floor temperature sensor. Settings: disable (default) temperature sensor floor temperature Behaviour: When using the PT1000 as a floor temperature sensor. Settings for floor protection can be set under Thermostat tab.
Compensation for PT1000 sensor	This parameter defines the compensation value for the PT1000 sensor. Settings: Value between -10°C and + 10°C with steps of 0.5°C or -20°F to +20°F with steps of 1°F.
Send value of PT1000 sensor	This parameter defines if the temperature value of the PT1000 is send on the bus (0 = inactive). Settings: disable (default) enable Communication object: 32: temperature – PT1000 sensor (output)

Use int./ ext. temperature sensor	With this parameter it is possible to set the way of measuring the temperature. The device can use the internal temperature sensor or an external temperature (value from the bus or PT1000). It is also possible to combine the internal and external temperature sensor. (This can be used e.g. to measure the average temperature of the Deseo and another device) Settings: internal sensor (default) 80% internal sensor + 20% external sensor 60% internal sensor + 40% external sensor 50% internal sensor + 50% external sensor 40% internal sensor + 60% external sensor 20% internal sensor + 80% external sensor external sensor Behaviour: When a combined value is used, the value is send to the room temperature (output) Communication objects: 30: temperature – internal temperature (output) 31: temperature – external temperature (input) 33: temperature – room temperature (output)
External sensor	This parameter defines which external sensor is used. Behaviour: PT1000 will only be available when set as a temperature sensor. Settings: bus value (default) PT1000
Send value of room temp	This parameter defines if the room temperature is send on the bus. Settings: enable (default) disable Communication object: 33: temperature – room temperature (output)
Cyclic time (min)	This parameter sets the interval for sending the room temperature on the bus (0 = inactive). Settings: Value between 0 and 255
Delta temp (x 0.5 °C)(x 1 °F)	This parameter sets the delta temperature for when the room temperature will be reported on the bus (0 = inactive). Settings: Value between 0 and 255

6.2 Thermostat

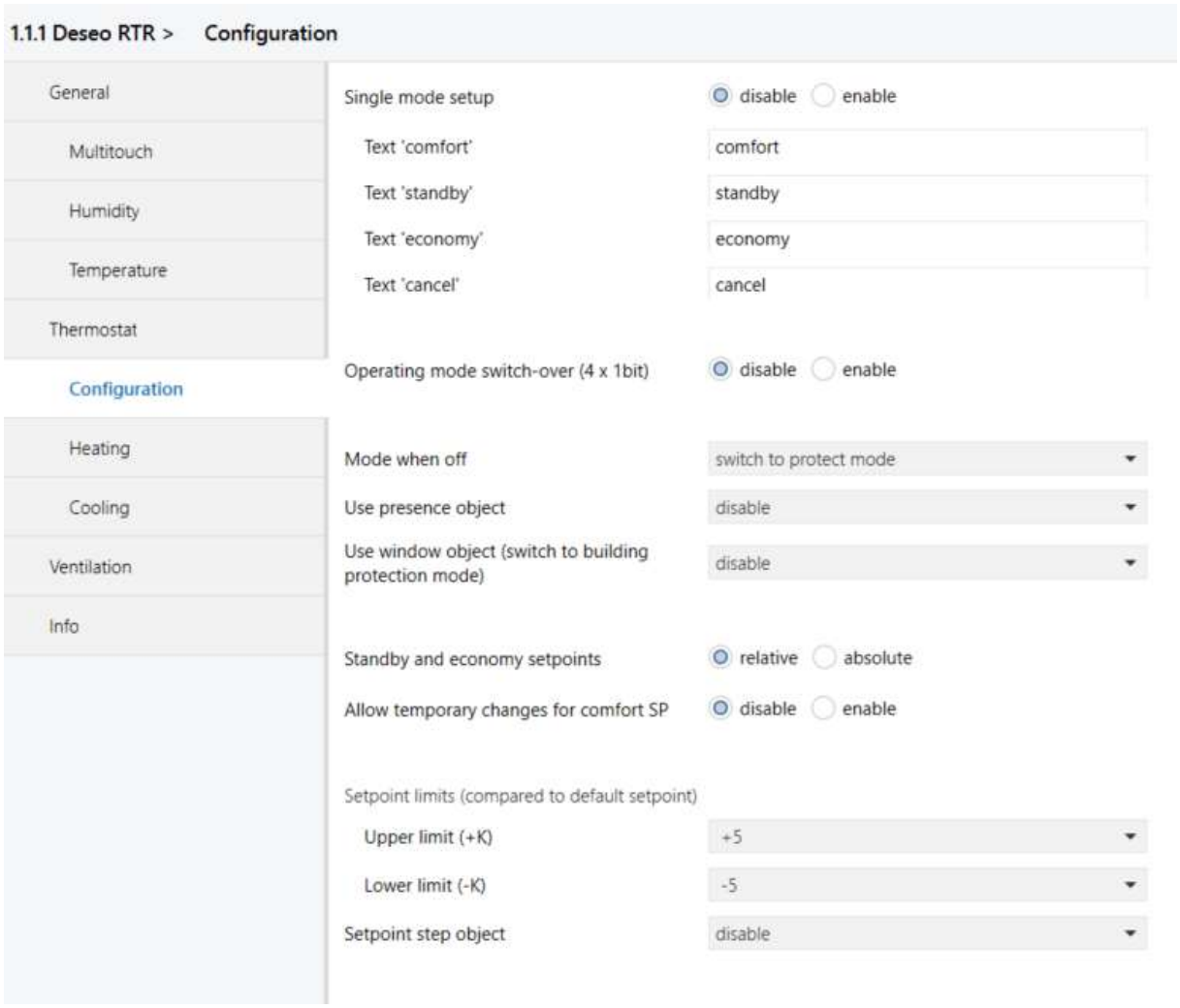


Parameter	Description
Internal / external thermostat	This parameter sets the type of logic to control the thermostat (internal or external logic). Settings: use internal thermostat use external thermostat
Heating / cooling	This parameter sets the type of the thermostat. Settings: heating cooling heating and cooling basic and additional heating basic and additional cooling basic and additional heating and cooling

Shared object for basic control	This parameter defines if the output of the heating and cooling commands are send to shared or separate group objects. Settings: disable (default) enable Communication object: 92: thermostat – heating and cooling 2 point (output) 93: thermostat – heating and cooling PWM (output) 94: thermostat – heating and cooling continuous (output) 95: thermostat – additional heating and cooling 2 point (output) 96: thermostat – additional heating and cooling (output) 97: thermostat – additional heating and cooling continuous Behaviour: When using shared objects, the control types for heating and cooling should be the same type. Combination like 2-point (heating) and continuous (cooling) are not possible. **When outputs are not from the same type, no communication object will be available.**
Switchover between heating and cooling	This parameter defines the switchover between heating and cooling. In only manual there will be no automatic mode. Settings: only manual (default) automatic and manual Communication objects: 69: thermostat – changeover mode (input) 70: thermostat – changeover mode (output)
Neutral zone upper band (+K)	This parameter sets the upper neutral band for heating/cooling. Settings: Value between +0.5 and +3 (°C) or +1 and +6 (°F).
Neutral zone lower band (-K)	This parameter sets the lower neutral band for heating/cooling. Settings: Value between -0.5 and -3 (°C) or -1 and -6 (°F). Behaviour: A small neutral zone can cause undesirable changeover between heating and cooling. Make sure to use a save neutral zone.
Block object additional stage	The parameter defines if there is an object to block the additional stage. Settings: disable (default) enable Behaviour: When the additional stage is blocked, the output will be forced to zero as long as the blocking object is high. Communication objects: 98: thermostat – deactivate additional heating (input) 99: thermostat – deactivate additional cooling (input)

Floor protection	This parameter enables or disables the floor protection. Settings: disable (default) enable Communication object: 77: temperature – floor protection (output) Behaviour: The floor protection is available when the PT1000 sensor is set as floor temperature parameter in the Temperature tab. The floor protection (output) will be high as long as the heating stage is timed out.
Max temperature (°C)(°F)	This parameter sets the max floor temperature. Exceeding this value will activate the floor protection. Settings: Value between 20 and 60 (°C) or 68 and 140 (°F).
Timeout (min)	This parameter sets the time after which the floor protection will be deactivated. Settings: Value between 0 and 60 min.
Boost mode	This parameter enables boost mode. Behaviour: The Boost mode will only work in combination with PI or P control. Settings: disable (default) enable

6.2.1.1 Thermostat configuration



Parameter	Description
Single mode setup	This parameter defines if the single mode setup is used. When disabled the traditional KNX multi-mode will be used. Settings: disable (default) enable Communication objects: 59: thermostat – mode (input) 64: thermostat – mode (output)

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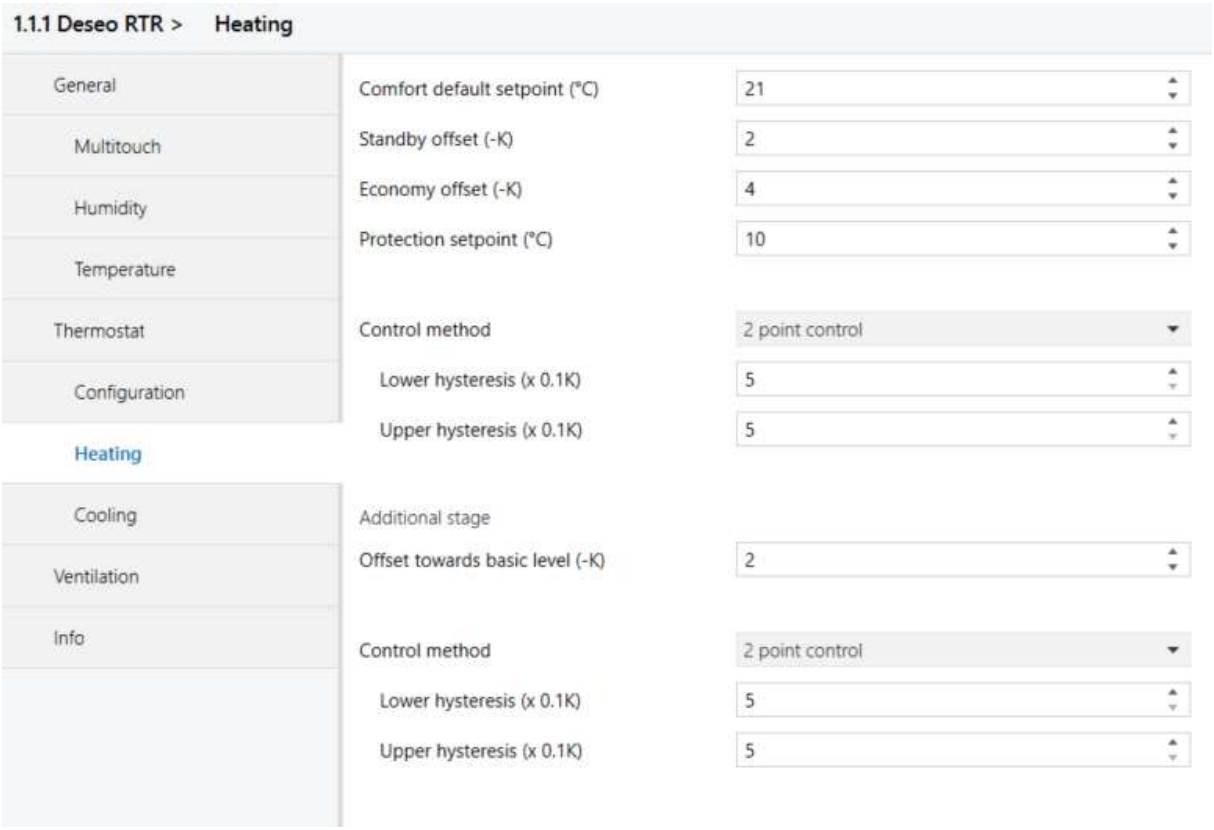
Operating mode switch-over (4 x 1bit)	This parameter enables the use of 4 separate 1 bit communication objects to control the different modes. Settings: disable (default) enable Communication objects: 60: thermostat – mode – comfort (input) 61: thermostat – mode – standby (input) 62: thermostat – mode – economy (input) 63: thermostat – mode – protected (input) 65: thermostat – mode – comfort (output) 66: thermostat – mode – standby (output) 67: thermostat – mode – economy (output) 68: thermostat – mode – protected (output)
Mode when off	This parameter defines which mode the Deseo will adopt when the off status is selected on the Deseo using the right button. Settings: switch to standby mode switch to protect mode (default) switch off thermostat
Use presence object	This parameter enables the use of the presence object to switch between modes. Settings: disable (default) switch between comfort and standby switch between comfort and economy Behaviour: When the presence (input) is high, the Deseo jumps to comfort mode. When object is low, Deseo jumps to the mode selected in parameters. Communication object: 55: thermostat – presence (input)
Use window object	This parameter enables the use of the window object to switch to protection mode. Settings: disable (default) open = 1 open = 0 Behaviour: When the window open (input) is high, the Deseo is forced to protect mode. Communication object: 56: thermostat – window open (input)

Standby and economy setpoints	This parameter defines of the standby and economy setpoints are relative or absolute. Settings: relative (default) absolute Communication objects: 45: thermostat – standby heat setpoint (input) 46: thermostat – standby cool setpoint (input) 47: thermostat – economy heat setpoint (input) 48: thermostat – economy cool setpoint (input)
Setpoint for active operation mode	This parameter enables the use of a single setpoint for the active operation mode. Settings: disable (default) enable Behaviour: When sending a setpoint to object 49, being in standby heating mode. The standby heating setpoint will be updated. Being in a different mode, a different setpoint will be updated. Communication object: 49: thermostat – active operating mode setpoint (input)
Allow temporary changes for comfort SP	This parameter defines if temporary changes can be made to the comfort setpoint. After a mode change, the setpoint will reset to the basic setpoint. Settings: disable (default) enable Communication objects: 42: thermostat – temporary comfort setpoint (input) 43: thermostat – basic setpoint (input) 43: thermostat – basic heat setpoint (input) 44: thermostat – basic cool setpoint (input)
Setpoint limits (compared to default setpoint)	This parameter defines the setpoint limits compared to the default comfort setpoint. Default setpoint can is set in the Heating or Cooling tab. Settings: Upper limit (+K) value between +1 and +10 (°C) or +2 and +20 (°F). Lower limit (-K) value between -1 and -10 (°C) or -2 and -20 (°F).

Setpoint step object	This parameter defines the value of the comfort setpoint shift. Settings: disable (default) 0.5°, 1°, 2°, 3°, 4°, 5° Behaviour: Sending a '1' will shift the comfort SP upwards. Sending a '0' will shift the comfort SP downwards. In case the current mode is not comfort, the Deseo will jump to comfort mode after sending '0' or '1'. Communication object: 41: thermostat – setpoint step (input)

6.2.1.2 Heating

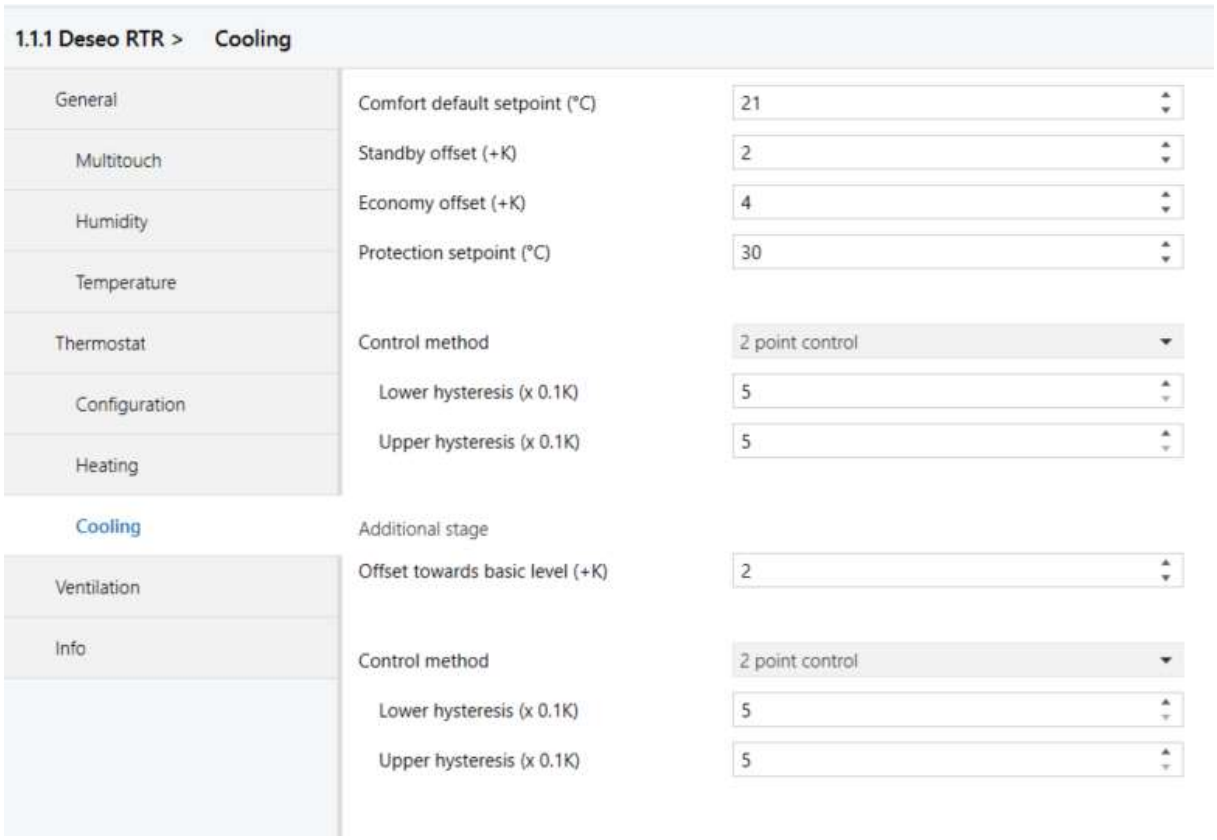


Parameter	Description
Comfort default setpoint	This parameter sets the default comfort setpoint. Settings: Value between 7 and 40 (°C) or 45 and 105 (°F)
Standby offset	This parameter sets the offset for the standby setpoint towards the comfort setpoint. Settings: Value between 1 and 6 (°C) or 2 and 16 (°F)

Economy offset	This parameter sets the offset for the economy setpoint towards the comfort setpoint. Settings: Value between 1 and 6 (°C) or 2 and 16 (°F)
Protection setpoint	This parameter sets the offset for the building protect setpoint towards the comfort setpoint into degrees Kelvin. Settings: Value between 7 and 40 (°C) or 45 and 105 (°F)
Control method	This parameter sets the type of control method for the heating. Settings: 2 point control PI control P control Communication objects: 80: thermostat – heating 2 point (output)
Lower Hysteresis (x 0.1 K)	This parameter sets the hysteresis value into degrees Kelvin. Settings: Value between 0.5 and 6 (°C) or 1 and 12 (°F)
Upper Hysteresis (x 0.1 K)	This parameter sets the hysteresis value into degrees Kelvin. Settings: Value between 0.5 and 6 (°C) or 1 and 12 (°F)
Control type	This parameter sets the type of control system for the heating system in case of PI or P control is selected. Settings: continuous (1 byte) PWM (1 bit) Communication objects: 81: thermostat – heating pwm (output) 82: thermostat – heating continuous (output)
PWM cycle time (min)	This parameter sets the time for the PWM cycle into minutes. Settings: Value between 2 and 40 min
Control parameters	This parameter sets the type for the heating system. Settings: customized parameters warm water (5K – 150min) floor heating (5K – 240min) electric heating (4K – 100min) fan coil unit (4K – 90min) A/C split (4K – 90min)

Proportional band	This parameter sets the band in which the output is proportional to the deviation between the actual temperature and the setpoint value. Settings: Value between 1 and 12 K
Integral time (min)	This parameter sets the time required to obtain the same output variable as for the proportional action when using only an integral action. Settings: Value between 5 and 240 min
Offset toward basic level	This parameter sets the offset for the additional heating towards the basic level. Settings: Value between 0 and 10 (°C) or 0 and 20 (°F)
Control method	This parameter sets the type of control method for the additional heating. Settings: 2-point control PI control P control
Lower Hysteresis	This parameter sets the hysteresis value. Settings: Value between 0.5 and 6 (°C) or 1 and 12 (°F)
Upper Hysteresis	This parameter sets the hysteresis value into degrees Kelvin. Settings: Value between 0.5 and 6 (°C) or 1 and 12 (°F)
Control parameters	This parameter sets the type for the additional heating system. Settings: customized parameters warm water (5K – 150min) floor heating (5K – 240min) electric heating (4K – 100min) fan coil unit (4K – 90min) A/C split (4K – 90min)
Proportional band	This parameter sets the band in which the output is proportional to the deviation between the actual temperature and the setpoint value. Settings: Value between 1 and 12 K
Integral time	This parameter sets the time required to obtain the same output variable as for the proportional action when using only an integral action. Settings: Value between 5 and 240 min

6.2.1.3 Cooling

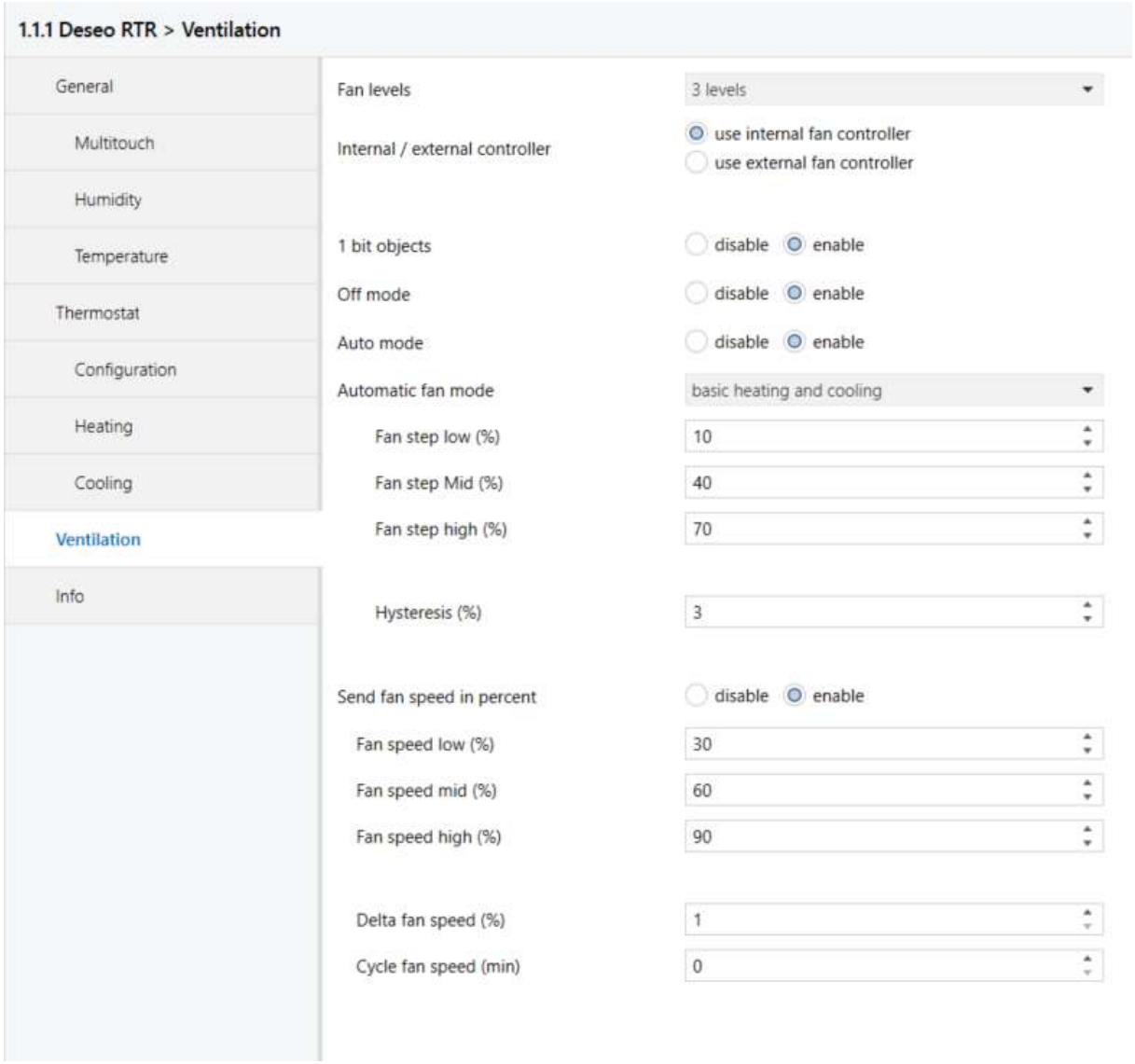


Parameter	Description
Comfort default setpoint	This parameter sets the default comfort setpoint. Settings: Value between 7 and 40 (°C) or 45 and 105 (°F)
Standby offset	This parameter sets the offset for the standby setpoint towards the comfort setpoint into degrees Kelvin. Settings: Value between 1 and 6 (°C) and 2 and 12 (°F)
Economy offset	This parameter sets the offset for the economy setpoint towards the comfort setpoint into degrees Kelvin. Settings: Value between 1 and 6 (°C) and 2 and 12 (°F)
Protection setpoint	This parameter sets the offset for the building protect setpoint towards the comfort setpoint into degrees Kelvin. Settings: Value between 7 and 40 (°C) or 45 and 105 (°F)
Control method	This parameter sets the type of control method for the cooling. Settings: 2-point control PI control P control

	Communication objects: 80: thermostat – cooling 2 point (output)
Lower Hysteresis	This parameter sets the hysteresis value. Settings: Value between 0.5 and 6 (°C) or 1 and 12 (°F)
Upper Hysteresis	This parameter sets the hysteresis value. Settings: Value between 0.5 and 6 (°C) or 1 and 12 (°F)
Control type	This parameter sets the type of control system for the cooling system. Settings: Continuous (1 byte) PWM (1 bit) Communication objects: 81: thermostat – cooling pwm (output) 82: thermostat – cooling continuous (output)
PWM cycle time	This parameter sets the time for the PWM cycle into minutes. Settings: Value between 2 and 40 min.
Control parameters	This parameter sets the type for the cooling system. Settings: Customized parameters Cooling ceiling (5 K – 240min) Fain coil unit (4 K – 90min) Split unit (4 K – 90min)
Proportional band (x0.1 K)	This parameter sets the band in which the output is proportional to the deviation between the actual temperature and the setpoint value. Settings: Value between 10 and 120
Integral time (min)	This parameter sets the time required to obtain the same output variable as for the proportional action when using only an integral action. Settings: Value between 5 and 240
Offset toward basic level (+K)	This parameters sets the offset for the additional cooling towards the basic level. Settings: Value between 0 and 10
Control method	This parameter sets the type of control method for the additional cooling. Settings: 2 point control

	PI control P control
Lower Hysteresis (x 0.1 K)	This parameter sets the hysteresis value into degrees Kelvin. Settings: Value between 5 and 60
Upper Hysteresis (x 0.1 K)	This parameter sets the hysteresis value into degrees Kelvin. Settings: Value between 5 and 60
Control parameters	This parameter sets the type for the additional cooling system. Settings: Customized parameters Cooling ceiling (5 K – 240min) Fain coil unit (4 K – 90min) Split unit (4 K – 90min)
Proportional band (x0.1 K)	This parameter sets the band in which the output is proportional to the deviation between the actual temperature and the setpoint value. Settings: Value between 10 and 120
Integral time (min)	This parameter sets the time required to obtain the same output variable as for the proportional action when using only an integral action. Settings: Value between 5 and 240

6.3 Ventilation



Parameter	Description
Fan levels	This parameter sets the amount of fan levels used. Settings: Disable 3 levels (default) 2 levels 1 level Communication objects: 100: ventilation – fan speed (input) 106: ventilation – fan speed (output)
Internal / external controller	This parameters defines if the Ventilation in controlled internally or externally. Settings: Use internal fan controller Use external fan controller (default)

1 bit objects	This parameters defines if the fan levels are controlled by a one byte object (disable) or 1-3 one bit objects. Settings: Disable (default) Enable Communication objects: 102: ventilation – mode high (input) 103: ventilation – mode mid (input) 104: ventilation – mode low (input) 108: ventilation – mode high (output) 109: ventilation – mode mid (output) 110: ventilation – mode low (output) Behaviour: When the parameter is enabled the fan levels will be send over 1-3 one bit objects. When the parameters is disabled the fan levels will be send over one 1 byte object.
Off mode	This parameter defines if the off mode can be selected on the Deseo. Settings: Enable (default) Disable Communication object: 105: ventilation – mode off (input) 111: ventilation – mode off (output)
Auto mode	This parameters defines if the auto mode can be selected on the Deseo. Settings: Disable (default) Enable Communication objects: 101: ventilation – mode auto (input) 107: ventilation – mode auto (output)
Fan step (%)	These parameters define when the fan should switch between levels. Settings: Fan step low (%) Fan step mid (%) Fan step high (%)
Hysteresis	This parameter defines the hysteresis for the level switch over. Settings: Value in %

Send fan speed in percent	The parameter defines if the fan speed will be send on the bus in percent. Settings: Disable (default) Enable Communication object: 112: ventilation – fan speed percent (output)
Fan speed (%)	This parameter defines which percentage should be send on the bus in relation to the active fan speed level. Settings: Fan speed low (%) Fan speed mid (%) Fan speed high (%)

6.4

6.4 Info

This page gives some more information about the application file that is used.

Text	**Description**
Deseo RTR app	This is the version of the application In this case: v1.3
ETS application build	This is the build number of the application In this case: 180903
Product code	The product code for the Deseo KNX In this case: 310-02
http://www.basalte.be	The website from basalte

7. Appendix:

7.1 Characters main menu font

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï	Ñ	Ò	Ó	Ô	Õ	Ö	Ù	Ú	Û	Ü
à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï	ñ	ò	ó	ô	õ	ö	ù	ú	û	ü
Ø	ø	Ý	ý	ÿ	ß																				
0	1	2	3	4	5	6	7	8	9																
`	-	/	:	.	?																				

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7.2 List with communication objects

Com object	Name	Function	i/o	Data length	Date type	Flags
1	cleaning	as long as object is 1	i	1 Bit	[1.1] Switch	-WC---
2	screen wake	on rising edge	i	1 Bit	[1.1] Switch	-WC---
3	calibration	on rising edge	i	1 Bit	[1.1] Switch	-WC---
4	start screen	text	i	14 Bytes	[16.0] String_ASCII	-WC-U-
10	multitouch	on/off	o	1 Bit	[1.1] Switch	--CT--
10	multitouch	on	o	1 Bit	[1.1] Switch	--CT--
10	multitouch	off	o	1 Bit	[1.1] Switch	--CT--
11	multitouch	scene	o	1 Byte	[18.1] SceneControl	--CT--
12	multitouch	byte	o	1 Byte	[5.10] Value	--CT--
13	multitouch	all off	o	1 Bit	[1.1] Switch	--CT--
14	multitouch	room status	o	1 Bit	[1.1] Switch	R-CT--
15	multitouch	external trigger short	i	1 Bit	[1.1] Switch	-WC---
16	multitouch	status feedback 1	i	1 Bit	[1.1] Switch	-WC-U-
17	multitouch	status feedback 2	i	1 Bit	[1.1] Switch	-WC-U-
18	multitouch	status feedback 3	i	1 Bit	[1.1] Switch	-WC-U-
19	multitouch	status feedback 4	i	1 Bit	[1.1] Switch	-WC-U-
20	multitouch	status feedback 5	i	1 Bit	[1.1] Switch	-WC-U-
21	multitouch	status feedback 6	i	1 Bit	[1.1] Switch	-WC-U-
22	multitouch	status feedback 7	i	1 Bit	[1.1] Switch	-WC-U-
23	multitouch	status feedback 8	i	1 Bit	[1.1] Switch	-WC-U-
24	multitouch	long on/off	o	1 Bit	[1.1] Switch	--CT--
24	multitouch	long on	o	1 Bit	[1.1] Switch	--CT--
24	multitouch	long off	o	1 Bit	[1.1] Switch	--CT--
25	multitouch	long scene	o	1 Byte	[18.1] SceneControl	--CT--
26	multitouch	long byte	o	1 Byte	[5.10] Value	--CT--
27	multitouch	external trigger long	i	1 Bit	[1.1] Switch	-WC---
30	temperature	internal temperature	o	2 Bytes	[9.1] Value_Temp	R-CT--
30	temperature	internal temperature	o	2 Bytes	[9.27] Value_Temp_F	R-CT--
31	temperature	external temperature	i	2 Bytes	[9.1] Value_Temp	-WC-U-
31	temperature	external temperature	i	2 Bytes	[9.27] Value_Temp_F	-WC-U-
32	temperature	PT1000 sensor	o	2 Bytes	[9.1] Value_Temp	R-CT--
32	temperature	PT1000 sensor	o	2 Bytes	[9.27] Value_Temp_F	R-CT--
33	temperature	room temperature	o	2 Bytes	[9.1] Value_Temp	R-CT--
33	temperature	room temperature	o	2 Bytes	[9.27] Value_Temp_F	R-CT--
34	humidity	humidity value	o	2 Bytes	[9.7] Value_Humidity	R-CT--
35	humidity	humidification	o	1 Bit	[1.1] Switch	R-CT--
36	humidity	dehumidification	o	1 Bit	[1.1] Switch	R-CT--
37	humidity	external value	i	2 Bytes	[9.7] Value_Humidity	-WC-U-
39	thermostat	comfort setpoint	i	2 Bytes	[9.1] Value_Temp	-WC-U-
39	thermostat	comfort setpoint	i	2 Bytes	[9.27] Value_Temp_F	-WC-U-
41	thermostat	setpoint step	i	1 Bit	[1.1] Switch	-WC---

42	thermostat	temporary comfort setpoint	i	2 Bytes	[9.1] Value_Temp	-WC-U-
42	thermostat	temporary comfort setpoint	i	2 Bytes	[9.27] Value_Temp_F	-WC-U-
43	thermostat	comfort heat setpoint	i	2 Bytes	[9.1] Value_Temp	-WC-U-
43	thermostat	comfort heat setpoint	i	2 Bytes	[9.27] Value_Temp_F	-WC-U-
43	thermostat	comfort setpoint	i	2 Bytes	[9.1] Value_Temp	-WC-U-
43	thermostat	comfort setpoint	i	2 Bytes	[9.27] Value_Temp_F	-WC-U-
43	thermostat	basic setpoint	i	2 Bytes	[9.1] Value_Temp	-WC-U-
43	thermostat	basic setpoint	i	2 Bytes	[9.27] Value_Temp_F	-WC-U-
43	thermostat	basic heat setpoint	i	2 Bytes	[9.1] Value_Temp	-WC-U-
43	thermostat	basic heat setpoint	i	2 Bytes	[9.27] Value_Temp_F	-WC-U-
44	thermostat	comfort cool setpoint	i	2 Bytes	[9.1] Value_Temp	-WC-U-
44	thermostat	comfort cool setpoint	i	2 Bytes	[9.27] Value_Temp_F	-WC-U-
44	thermostat	basic cool setpoint	i	2 Bytes	[9.1] Value_Temp	-WC-U-
44	thermostat	basic cool setpoint	i	2 Bytes	[9.27] Value_Temp_F	-WC-U-
44	thermostat	comfort setpoint	i	2 Bytes	[9.1] Value_Temp	-WC-U-
44	thermostat	comfort setpoint	i	2 Bytes	[9.27] Value_Temp_F	-WC-U-
45	thermostat	standby heat setpoint	i	2 Bytes	[9.1] Value_Temp	-WC-U-
45	thermostat	standby heat setpoint	i	2 Bytes	[9.27] Value_Temp_F	-WC-U-
46	thermostat	standby cool setpoint	i	2 Bytes	[9.1] Value_Temp	-WC-U-
46	thermostat	standby cool setpoint	i	2 Bytes	[9.27] Value_Temp_F	-WC-U-
47	thermostat	economy heat setpoint	i	2 Bytes	[9.1] Value_Temp	-WC-U-
47	thermostat	economy heat setpoint	i	2 Bytes	[9.27] Value_Temp_F	-WC-U-
48	thermostat	economy cool setpoint	i	2 Bytes	[9.1] Value_Temp	-WC-U-
48	thermostat	economy cool setpoint	i	2 Bytes	[9.27] Value_Temp_F	-WC-U-
49	thermostat	active operating mode sp	i	2 Bytes	[9.1] Value_Temp	-WC-U-
49	thermostat	active operating mode sp	i	2 Bytes	[9.27] Value_Temp_F	-WC-U-
50	thermostat	comfort setpoint	o	2 Bytes	[9.1] Value_Temp	R-CT--
50	thermostat	comfort setpoint	o	2 Bytes	[9.27] Value_Temp_F	R-CT--
51	thermostat	actual setpoint	o	2 Bytes	[9.1] Value_Temp	R-CT--
51	thermostat	actual setpoint	o	2 Bytes	[9.27] Value_Temp_F	R-CT--
55	thermostat	presence	i	1 Bit	[1.1] Switch	-WC-U-
56	thermostat	window open	i	1 Bit	[1.19] Window_Door	-WC-U-
57	thermostat	on/off	i	1 Bit	[1.1] Switch	-WC-U-
58	thermostat	on/off	o	1 Bit	[1.1] Switch	R-CT--
59	thermostat	mode	i	1 Byte	[20.102] HVACMode	-WC-U-
60	thermostat	mode - comfort	i	1 Bit	[1.1] Switch	-WC-U-
61	thermostat	mode - standby	i	1 Bit	[1.1] Switch	-WC-U-
62	thermostat	mode - economy	i	1 Bit	[1.1] Switch	-WC-U-
63	thermostat	mode - protected	i	1 Bit	[1.1] Switch	-WC-U-
64	thermostat	mode	o	1 Byte	[20.102] HVACMode	R-CT--
65	thermostat	mode - comfort	o	1 Bit	[1.1] Switch	--CT--
66	thermostat	mode - standby	o	1 Bit	[1.1] Switch	--CT--
67	thermostat	mode - economy	o	1 Bit	[1.1] Switch	--CT--
68	thermostat	mode - protected	o	1 Bit	[1.1] Switch	--CT--

69	thermostat	changeover mode	i	1 Byte	[20.107] ChangeoverMode	-WC-U-
70	thermostat	changeover mode	o	1 Byte	[20.107] ChangeoverMode	R-CT--
71	thermostat	cooling/heating	i	1 Bit	[1.100] Heat_Cool	-WC-U-
72	thermostat	cooling/heating	o	1 Bit	[1.100] Heat_Cool	R-CT--
73	thermostat	heating active	i	1 Bit	[1.1] Switch	-WC-U-
74	thermostat	heating active	o	1 Bit	[1.1] Switch	--CT--
75	thermostat	cooling active	i	1 Bit	[1.1] Switch	-WC-U-
76	thermostat	cooling active	o	1 Bit	[1.1] Switch	--CT--
77	temperature	floor protection	o	1 Bit	[1.1] Switch	--CT--
80	thermostat	heating 2 point	o	1 Bit	[1.1] Switch	--CT--
81	thermostat	heating pwm	o	1 Bit	[1.1] Switch	--CT--
82	thermostat	heating continuous	o	1 Byte	[5.1] Scaling	--CT--
83	thermostat	add heating 2 point	o	1 Bit	[1.1] Switch	--CT--
84	thermostat	add heating pwm	o	1 Bit	[1.1] Switch	--CT--
85	thermostat	add heating continuous	o	1 Byte	[5.1] Scaling	--CT--
86	thermostat	cooling 2 point	o	1 Bit	[1.1] Switch	--CT--
87	thermostat	cooling pwm	o	1 Bit	[1.1] Switch	--CT--
88	thermostat	cooling continuous	o	1 Byte	[5.1] Scaling	--CT--
89	thermostat	add cooling 2 point	o	1 Bit	[1.1] Switch	--CT--
90	thermostat	add cooling pwm	o	1 Bit	[1.1] Switch	--CT--
91	thermostat	add cooling continuous	o	1 Byte	[5.1] Scaling	--CT--
92	thermostat	heating and cooling 2 point	o	1 Bit	[1.1] Switch	--CT--
93	thermostat	heating and cooling pwm	o	1 Bit	[1.1] Switch	--CT--
94	thermostat	heating and cooling continous	o	1 Byte	[5.1] Scaling	--CT--
95	thermostat	add heating and cooling 2 point	o	1 Bit	[1.1] Switch	--CT--
96	thermostat	add heating and cooling pwm	o	1 Bit	[1.1] Switch	--CT--
97	thermostat	add heating and cooling continious	o	1 Byte	[5.1] Scaling	--CT--
98	thermostat	deactivate add heating	i	1 Bit	[1.1] Switch	-WC-U-
99	thermostat	deactivate add cooling	i	1 Bit	[1.1] Switch	-WC-U-
100	ventilation	fan mode	i	1 Byte	[5.10] Value	-WC-U-
101	ventilation	mode auto	i	1 Bit	[1.1] Switch	-WC-U-
102	ventilation	mode high	i	1 Bit	[1.1] Switch	-WC-U-
103	ventilation	mode mid	i	1 Bit	[1.1] Switch	-WC-U-
104	ventilation	mode low	i	1 Bit	[1.1] Switch	-WC-U-
105	ventilation	mode off	i	1 Bit	[1.1] Switch	-WC-U-
106	ventilation	fan mode	o	1 Byte	[5.10] Value	R-CT--
107	ventilation	mode auto	o	1 Bit	[1.1] Switch	--CT--
108	ventilation	mode high	o	1 Bit	[1.1] Switch	--CT--
109	ventilation	mode mid	o	1 Bit	[1.1] Switch	--CT--
110	ventilation	mode low	o	1 Bit	[1.1] Switch	--CT--
111	ventilation	mode off	o	1 Bit	[1.1] Switch	--CT--
112	ventilation	fan speed percent	o	1 Byte	[5.1] Scaling	--CT--

200	time	time	i	3 Bytes	[10.1] TimeOfDay	-WC-U-
201	date	date	i	3 Bytes	[11.1] Date	-WC-U-
202	date & time	date & time	i	8 Bytes	[19.1] DateTime	-WC-U-