

RADIO TEMPERATURE SENSOR **RCT-21**

TECHNICAL DATA

Nominal supply voltage:	12 V DC \pm 10%
Radio transmission:	bandwidth ISM (f = 868,50 MHz)
Transmission way:	two-way
Coding:	128-bit key based algorithm
Operating range:***	up to 300 m in open area
Ability to increase range:	yes – through application of retransmitter REP-21
Indication of transmission:	green LED
Basic functionality:	temperature measurement and transfer of information to the EFC-01 controller
Number of measurement channels:	4
Temperature sensor type:	NTC 10k in form of an external probe
Temperature measurement range:	-40 \div +110°C
Temperature probe in the set:	none – requires purchase of Zamel external probe series NTC-XX or NTS-XX
Measurement resolution:	0,1°C
Measurement accuracy:	dependent on the accuracy of the applied NTC sensor (in Zamel NTC probes 1% tolerance thermistors are applied) – this refers to probes NTC-03 and NTS-01
Transmission frequency (TP)*:	a parameter configurable from the controller level in the range 1s to 10h
Measurement hysteresis (hP)**:	a parameter configurable from the controller level in the range 0,3°C to 10°C
Operating temperature range:	-10 \div +55°C
Operating position:	any
Mounting of the casing:	junction box \varnothing 60 mm
Ingress protection rating of the casing:	IP20
Protection class:	III
Dimensions:	47,5 x 47,5 x 20 mm
Weight:	0,020 kg

* interval between successive temperature transmissions to the controller – refers to the situation when temperature changes in particular channels are smaller than set minimum temperature hysteresis. The parameter is global in character – is set for the whole RCT-21 sensor.

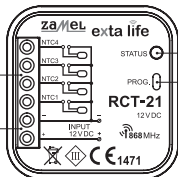
** determines the difference between two consecutive temperatures that causes data transmission to controller. The measurement hysteresis is set individually for each measurement channel.

*** the operating range indicated above refers to open area and ideal conditions without obstacles and without external interference signals. If there are obstacles or sources of strong interference signals, a decrease in the operating range indicated by the manufacturer should be expected, which may in some cases reach up to 90%. This also applies if the sensor is mounted on a metal surface or in a metal switchboard. The following also have a negative impact on the operating range: high-voltage overhead and underground power lines and mobile telecommunication transmitters located in close proximity to the devices.

APPEARANCE

NTC probes terminals

Power supply terminals
12 V DC



Indication of
data transmission

Immediate
transmission of the temperature
value to the EFC-01 controller
/ Reset of the sensor to default
settings

DESCRIPTION

RCT-21 sensor enables measurement of temperature in the EXTA LIFE system using four independent channels. Measured temperature value is sent by radio to the EFC-01 controller and displayed in a mobile application. Through logical functions the sensor can participate in the automation of temperature control processes in home installations. RCT-21 has four independent measurement channels for cooperation with external temperature sensors based on NTC 10k thermistors. Each channel is distinguished by its wide measurement range and resolution of 0,1°C. Two-way communication between the sensor and the controller enables parametrisation of each channel and software update. The sensor is powered by 12VDC \pm 10% voltage. It is designed for installation in \varnothing 60 boxes. RCT-21 is ideal for use in domestic heating installations with coal-fired boilers as a measurement sensor for temperatures at the most important points of the system.

FEATURES

- temperature measurement in the EXTA LIFE system,
- four independent measurement channels,
- parametrisation of each channel,
- cooperation with NTC 10k sensors,
- wide measurement range (-40 °C \div +110 °C),
- high measurement resolution - 0,1 °C,
- power supply 12 V DC \pm 10%,
- compact dimensions (47,5 x 47,5 x 20 mm),
- wide operating range (up to 300 m),
- possibility of signal retransmission.

OPERATING PRINCIPLE

The operating principle of the RCT-21 sensor consists in measurement of temperature in every measurement channel and sending the measured value to the EXTA LIFE controller. The temperature value may be indicated in the application and used in the control processes, for instance through logical functions.

Temperature sensors (NTC 10k) cooperating with the RCT-21 device enable temperature measurement in the range from -40 to +110°C

The RCT-21 sensor performs continuous temperature measurement. If a current measurement result in a given channel (T_n'') differs from the previous value (T_n') by a hysteresis value set for this channel (h_p), then the result of the measurement is immediately sent to the controller. Otherwise the transmission does not take place. The sensor always sends information on current temperature from four measurement channels.

$T_n'' - T_n' > h_p$ – transfer of temperature value to the controller

$T_n'' - T_n' \leq h_p$ – lack of transfer of temperature to the controller

where:

n – number of the measurement channel

If for a longer period of time the temperature changes (for each channel) are smaller than the set minimum hysteresis value, the temperature values are sent to the controller only every TP time set for a given sensor.

Example:

$h_1 = 0,5^\circ\text{C}$ – hysteresis for channel 1

$h_2 = 0,8^\circ\text{C}$ – hysteresis for channel 2

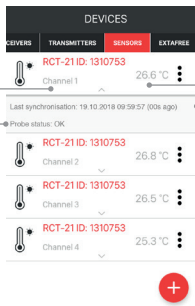
$h_3 = 1,0^\circ\text{C}$ – hysteresis for channel 3

$h_4 = 1,2^\circ\text{C}$ – hysteresis for channel 4

TP time = 10 minutes.

- If the temperature changes are smaller than $0,5^\circ\text{C}$, then the information about the temperature is sent to the controller only every fixed TP time (in this case every 10 min).
- Hysteresis h_p is programmed individually for each measurement channel in the range $0,3$ to 10°C
- TP time is programmed for the whole RCT-21 sensor in the range from 1s to 10h.
- By pressing the PROG button on the sensor, the measured temperature values are sent immediately to the controller, regardless of the measurement hysteresis.

- In the mobile application, the information about the current temperature value is downloaded automatically after entering the Sensors tab or the defined card/category or after refreshing one of these screens.
- Status information is sent for the sensor to indicate when the last information from the sensor to the controller was sent and how much time has elapsed since the last synchronization.



Channel number

Current temperature value

Measurement probe status:

Feedback on the last synchronization

- ok
- short-circuit / break

- If for time $t > 24h$ the controller does not receive information from a given sensor RCT-21, it interprets it as communication problems - the sensor is then marked in the application by a greyed out name.


In the mobile application two alarm situations are signalled for each measurement channel of the RCT-21 device, that is:

- short-circuit of the measurement sensor,
- break in the measurement sensor (probe circuit break).

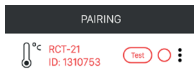
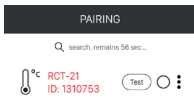
ADDING A SENSOR TO THE EXTA LIFE SYSTEM

Adding the RCT-21 sensor to the system requires connecting the EFC-01 controller and installing the exta life application on a mobile device.

In order to pair the sensor with the controller:

1. Launch the EXTA LIFE application.
2. Enter the „Devices”screen.
3. Select the „Sensors”tab.
4. Enter the search screen by pressing the „+” button .
5. Within less than 60 s the sensors in controller’s range will automatically be displayed on the list of devices ready to be paired with the controller.

- The search process for the sensors can be stopped by pressing the button „Stop” ②.
- After the search end mark the RCT-21 sensors you want to add to the EFC-01 controller and press the „Pair” button.
- Following the above actions the sensor is visible in the system (as 4 channels) and indicates the temperature registered during the pairing process ③. Each channel of the RCT-21 sensor may be given an individual name, assigned an icon and used further in the mobile application (assigning to users, categories, logical functions etc.) ④.
- The temperature value is updated each time after entering the Sensors screen or after refreshing it (dragging the screen down).
- If there is no communication with the sensor, its name is greyed out (no temperature feedback for time $t > 24h$).
- After pairing with one controller a sensor is not visible to other controllers.



No device for this category

①

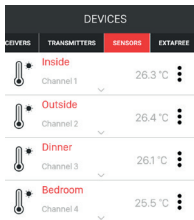
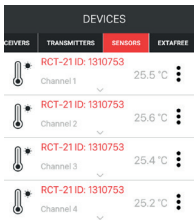
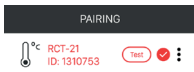


②

STOP

③

PAIRING



④

PAIRING

⑤



⑥

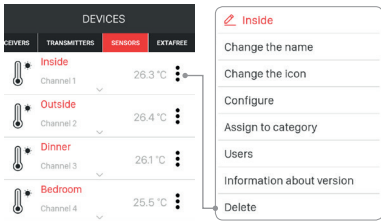


REMOVING A SENSOR FROM THE EXTA LIFE SYSTEM

In order to remove a sensor from the controller:

1. Launch the EXTA LIFE application.
2. Enter the „Devices”screen.
3. Select the „Sensors”tab.
4. Choose the „remove”option from the sensor’s context menu. After confirmation the sensor is removed from the system.

ATTENTION: Each time the whole RCT-21 sensor is removed from the application. It is not possible to remove a single channel.



RESET OF THE RCT-21 SENSOR TO DEFAULT SETTINGS

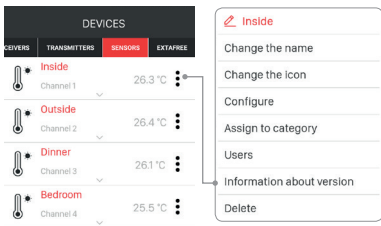
In order to restore the RCT-21 sensor to the default settings, press the PROG. button for about 5 seconds. After this time the STATUS LED will blink green. Release the PROG button then and wait for about 5 seconds until the device is ready to work again.

ATTENTION: After the reset, the default values of hysteresis hP and TP time are restored. The device is also unpaired (removed) from the EFC-01 controller.

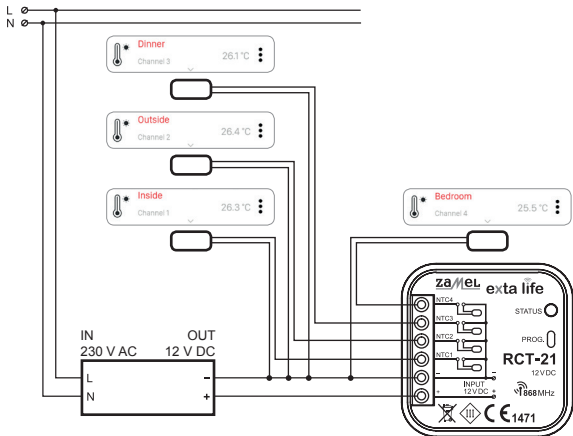
REMOTE SOFTWARE UPDATE

- The RCT-21 sensor has a built-in bootloader, which allows you to remotely change software from the EXTA LIFE application level. Updating is possible only in the case of sensors paired with the controller and can be implemented only by a user with administrator privileges. In order to update it is necessary to download the latest software from the extalife.com website and transfer it to the SD card in the controller - in order to do so, read the "Updating the software in EXTA LIFE receivers and sensors" manual. LIFE". This manual is available for download from extalife.pl.
- The current software version of the RCT-21 sensor is shown in the "Information on the version" screen. After pressing the "Update" button, the information is sent to the controller, which enters the sensor into the software update mode. The latest software from the controller level is sent to the sensor. During the update, the sensor and the controller are switched to the service frequency and no control is possible. If the update is successful, the information about it is sent from the receiver level to the controller and indicated in the mobile application.
- If for some reason the sensor update fails, then from the controller side it is marked as a sensor with update error. The sensor loses its original functionality (this is indicated by continuous blinking of the green STATUS diode). Then, if the option "Information on the version" is selected again from the application level for such a sensor, it is possible to repeat the update process.

ATTENTION: If an update error occurs, the sensor must not be removed from the controller.



CONNECTION



ADDING THE SENSOR TO REP-21 RETRANSMITTER

1. Press briefly (1s) the PROG. button on the retransmitter - the STATUS diode will turn blue.
2. After the diode turns blue, within <5 seconds briefly press the PROG button on the sensor to be added to the retransmitter.
3. The STATUS diode on the na retransmitter will blink orange and then will go out – this means that the sensor is correctly assigned.
4. After this procedure, the STATUS LED on the retransmitter lights up blue when the PROG button on the sensor is pressed - this means that the signal from the sensor is retransmitted.