en

MANUAL

REGIO RUX SERIES

REGIN

THANK YOU FOR CHOOSING REGIN!

Regin provides comprehensive solutions for building automation, including intuitive BMS-solutions, freely programmable and pre-programmed controllers, field devices and more.

Regin's offer, in combination with DEOS and Industrietechnik, empower system integrators, installers, and property owners with a powerful toolbox, setting them in a position to create building automation solutions that save both energy and engineering time. Today, versatile building management, optimized room control, and effective workflows have become the pillars for leading property owners in realizing significant energy savings in properties. Regin shares the clear goal of the group; to make this challenge easier on the way towards a sustainable future.

DISCLAIMER

The information in this manual has been carefully checked and is believed to be correct. Regin makes no warranties about the contents of this manual and users are requested to report errors and discrepancies to Regin, so that corrections may be made in future editions. The information in this document is subject to change without prior notification.

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Rev. A, 2025-12-12

PART OF
REGIN GROUP

Table of Contents

1 Introduction

1.1 About this manual

Special text formats used in the manual:

Note! This box, text, and symbol are used to highlight useful tips and tricks.

Caution! This box, text, and symbol are used to highlight cautions.

Warning! This box, text, and symbol are used to highlight warnings.

This box is used to show formulas and mathematical calculations

```
This box is used to
represent the display
window on the
controller
```

1.2 More information

- ✓ RUX - Product sheet
- ✓ RUX - Instruction
- ✓ RUX - Variable list
- ✓ RUX - Menu structure
- ✓ RCX-BL/RCX-BM - Instruction, (backplates)
- ✓ RUX - Manual (this document)

All the above documents are available for download from Regin's website, www.regincontrols.com.

Note! All settings and configurations of the RUX room units should be done with the Regin:GO app.

2 Information for the end user

2.1 Regio RUX series room units

The Regio RUX series is a range of external room units intended for temperature control via a controller running an application. They can also be used together with Regin's system controllers. The RUX units can be connected to several different products and could, for example, be used to control an air handling unit running a ventilation application.

2.1.1 Applications

The RUX room units have a discrete design and are easy to use, with an intuitive graphical LED matrix front and stylized touch buttons. They can be used to change fan speed, set temperature, extended running, etc.

The Regio RUX series enables temperature adjustments, for example of air handling units. They can be used together with a Regin system controller, where the setup must be done with Regin's tool for controllers. Perform basic controller configuration, or let the person in the room control the room's HVAC behaviour via a connected RUX-..-D room unit. Choose from a large selection of room units that fit your specific needs.

The RUX can easily be integrated with Regio Eedo and Regio Ardo products (version 2.x), and the Corrigo and Exigo product family. The RUX room units have support for Regio Ardo/Eedo functions communicating with room units.

The RUX also works with EXOcompact and EXOclever, using built in template.

In a room, the RUX room unit can measure and detect the following, depending on model:

- ✓ Temperature
- ✓ CO_2 level
- ✓ Relative humidity level
- ✓ Air quality (VOC)
- ✓ Motion of a user

In a room, with the help of a controller, the RUX room unit can control, for example:

- ✓ Temperature by activating heating or cooling
- ✓ If a room should be fully automatically controlled, or set to a manual mode
- ✓ Fan speed
- ✓ The level of fresh airflow

All features are specified under the section *Appendix B Model overview*.

2.1.2 Installation

The RUX room unit should be mounted in a location with good air circulation where it can be expected to give a representative reading. It can be mounted on a appliance box or directly on the wall.

The room transmitters consist of the following parts:

- ✓ Front and PCB assembly
- ✓ Backplate assembly (including terminal)

Note! Backplate assemblies are sold separately

- ✓ Low (for mounting over appliance box), RCX-BL
- ✓ Mid (for on-wall mounting), RCX-BM

2.1.3 Mounting

The modular design with a separate backplate for wiring makes the whole Regio RUX series easy to install and commission. The room units are mounted directly on a wall or over an appliance box (with a backplate).

The RUX room unit consists of the main part (article number RUX-T[H,C,V,P] and the backplate assembly, with terminal. The RCX-B[L,M] are used when mounted over an appliance box, meaning less space for cables needed. The backplate can be changed using the mid-size backplate RCX-BM, to be ordered separately. The RCX-BM is selected when mounting directly on the wall is needed.

For more information, see *Table B-1 Room unit models* in *Appendix B Model overview*.

For detailed installation instructions, see the RUX-..-D. Instruction and the Regio RUX series manual, to be found at www.regincontrols.com. Or, see detailed information in *chapter 4.1 Installation*.

2.2 Communication

2.2.1 RS485

The RUX-..-D models can be connected to a central SCADA-system via RS485 (EXOline, Modbus, or BACnet), and configured for a particular application using the Application tool 2, which can be downloaded free of charge at www.regincontrols.com. For more information, see section *3.2 Application tool 2*.

2.2.2 Bluetooth® Low Energy

Communication is supported for all RUX room units by Bluetooth® (Regin protocol compatible with the Regin:GO app).

The room units can be connected to the Regin:GO app (iOS/Android) and a cloud back end via Bluetooth® Low Energy. For more information, see section *3.1.4 Bluetooth® activation* .

For Regin:GO default access level passwords, see section *3.1.3 Accessing, operation, and settings in the Regin: GO app*.

For more information, see section *3.1 Regin:GO app*.

Caution! If you configure the device exclusively via RS485 using Application tool 2, it is recommended to disable Bluetooth® Low Energy (BLE) during setup. If BLE remains enabled, the device may still be accessed and reconfigured via Regin:GO using the default password. Note that this password can only be changed within the Regin:GO interface.

2.3 Display, LEDs and buttons

2.3.1 User interface description

The user interface consists of three (3) touch sensitive buttons, and a display made up of a matrix of LEDs (25 x 11 pixels), in a plastic casing. The display can be seen through the plastic material, and the buttons can be pressed by touching the icons printed on the front cover.

If no interaction has taken place with the room unit for a while, the display can emit light with full intensity as usual, be dimmed to emit a lower light intensity, or completely be shut off depending on the settings made by the administrator. If you set the display to be dimmed, or to be shut off when inactive, the room unit blends in with the room and is then not likely to disturb the end user. The dimmed mode is preferable for situations where you not want to be distracted by the light emitted by the room unit. Such as, at a hotel, where guests sleep in the room where the room unit is mounted, or in an office, where employees do not want to be distracted by a bright display. It is up to the administrator and the installer of the room unit to configure when the product should be dimmed, or lit.

The LED interface can show the following values:

- ✓ adjusted setpoint (and/or offset of setpoint)
- ✓ current values for sensors
- ✓ adjusted Fan speed (off/low/med/high/Auto)

For more information, see section *Display indications*.

The LED display can also show free text strings for miscellaneous purposes, with adjustable horizontal scroll where the scroll speed is adjustable. Acknowledge possibility to clear text by pressing the **[Menu]** button is also available. For more information, see section *3.4.3 Display Custom text*.

The RUX room unit user interface is shown in *Figure 2-1 RUX room unit model, with display, sensor and buttons*.

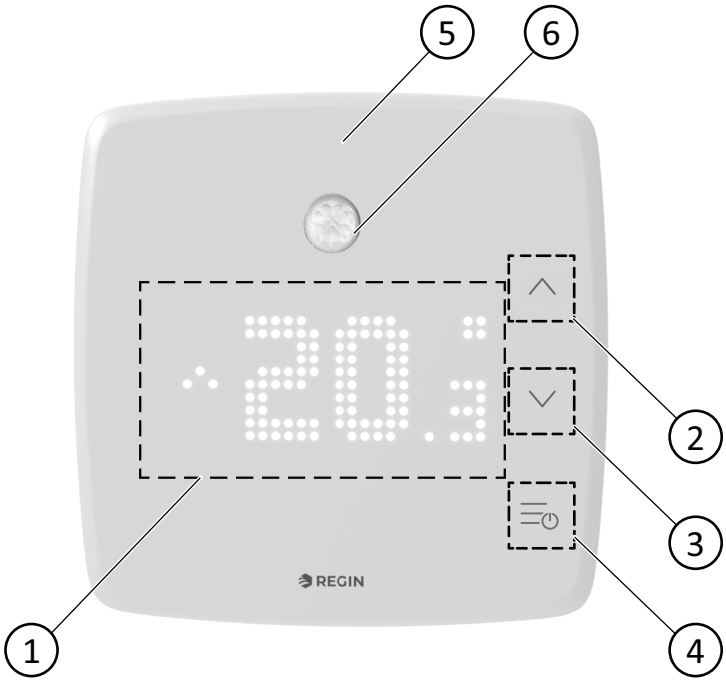


Figure 2-1 RUX room unit model, with display, sensor and buttons

① *LED matrix*
② ***[Down]** arrow button*
③ ***[Up]** arrow button*
④ ***[Menu]** button*
⑤ *RGB LED light*
⑥ *PIR sensor (on selected models)*

Table 2-1 describes the buttons and LED matrix available on RUX room units.

Table 2-1 Button and LED descriptions for RUX room units

Device interfaces	
№	**Description**
1	LED matrix with the current mode or value displayed
2	**[Down]** arrow button ▼. Used for toggling values downwards.
3	**[Up]** arrow button ▲. Used for toggling values upwards.
4	**[Menu]** button ≡. Used for navigation in menu.
5	RGB LED light. Used for Bluetooth® and CO_2 level indications. For more information, see section *2.3.2 RGB LED functions*.

Idle LED display

When no button is pressed, the LED display will return to idle mode after a time-out. After a configurable time delay, the LED display will first dim and then be turned off (by default).

The value shown in idle mode is configurable:

- ✓ Temperature value
- ✓ Actual setpoint + adjustment
- ✓ Heating setpoint
- ✓ Cooling setpoint
- ✓ Average cooling/heating setpoint
- ✓ Setpoint adjustment only
- ✓ CO_2 level
- ✓ Heating setpoint + adjustment
- ✓ Cooling setpoint + adjustment
- ✓ Average setpoint + adjustment
- ✓ Calculated flow in the duct in l/s

2.3.2 RGB LED functions

An RGB LED is present above the LED display. With the LEDs you will be notified if and when the Bluetooth® is activated or not, and when the CO_2 sensor indicates CO_2 levels, if these functions are activated. The RGB LED can be configured to show the CO_2 level in green, yellow and red for low, medium and high CO_2 level respectively. The indication can be off, always active, or active only when the CO_2 value is shown in the display. See *Table 2-2 RGB LED functionality table*.

The RGB LED setting can be configured individually.

Table 2-2 RGB LED functionality table

Colour	Pattern	Description
Blue	Steady	Bluetooth® activated - device connected, or **Identify** pressed.
Blue	Blinking off 5 s, on 500ms	Bluetooth® temporarily activated - no device connected. If Bluetooth® is set to **Always on**, the LED does not blink.
Red	Steady	Indicating CO_2 high level
Yellow	Steady	Indicating CO_2 medium level
Green	Steady	Indicating CO_2 low level

2.4 Navigation - room unit menu

2.4.1 Interface

Organized menu structures enable users to navigate through different configuration options and access various features efficiently, ensuring a logical and user-friendly interface.

Figure 2-2 Room unit model, with display and buttons

Menu button

The **[Menu]** button cycles through all available set *Menu* options. Which options are available depends on the model, the set configuration, and the connected sensors.

Up/Down buttons

In idle mode, the **[Up]/[Down]** buttons will initiate setting of the setpoint adjustment.

The maximum permissible adjustment of the setpoint is configurable (factory setting ± 3 °C). For Corrigo controllers,depending on the control mode of the Corrigo, the up/down buttons will adjust the actual setpoint. In control mode constant supply air control, the supply air setpoint will be adjusted. In room cascade, the room setpoint will be adjusted. If the control mode is extract air cascade, the extract air setpoint will be adjusted

Display indications

When no button is pressed, the LED display will return to idle mode after a time out. After a configurable time delay the display will first be dimmed, then turned off.

The display indications are shown in *Figure 2-3 Indications in the room unit display 1* and *Figure 2-4 Indications in the room unit display 2*.

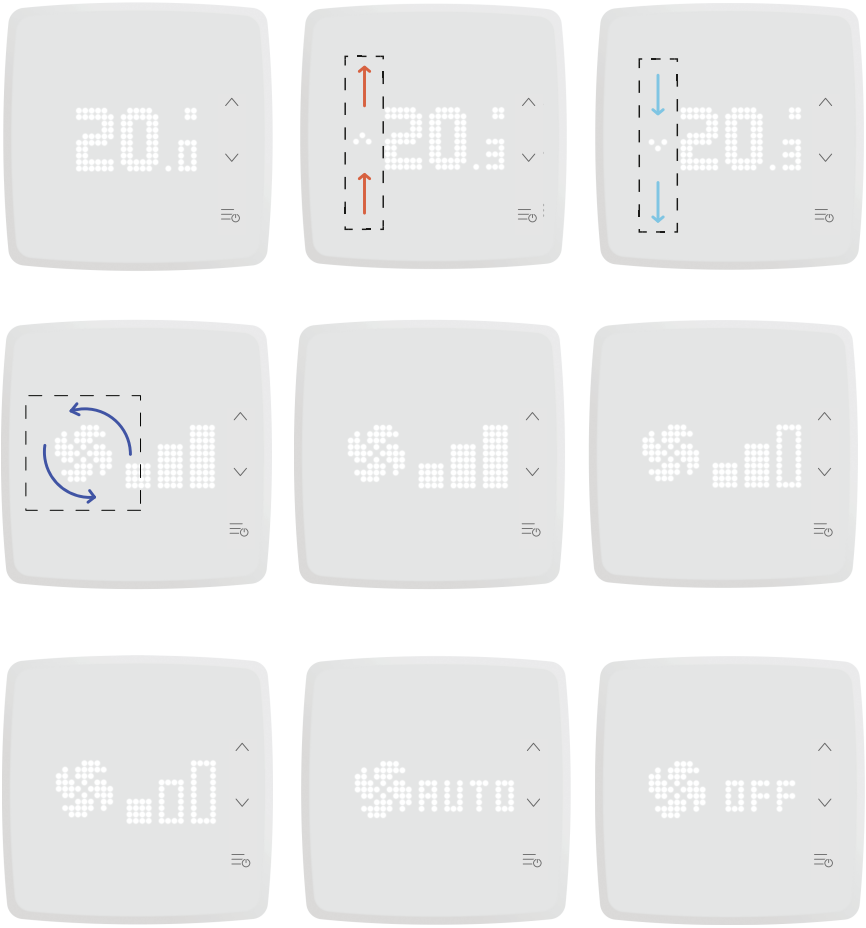


Figure 2-3 Indications in the room unit display 1

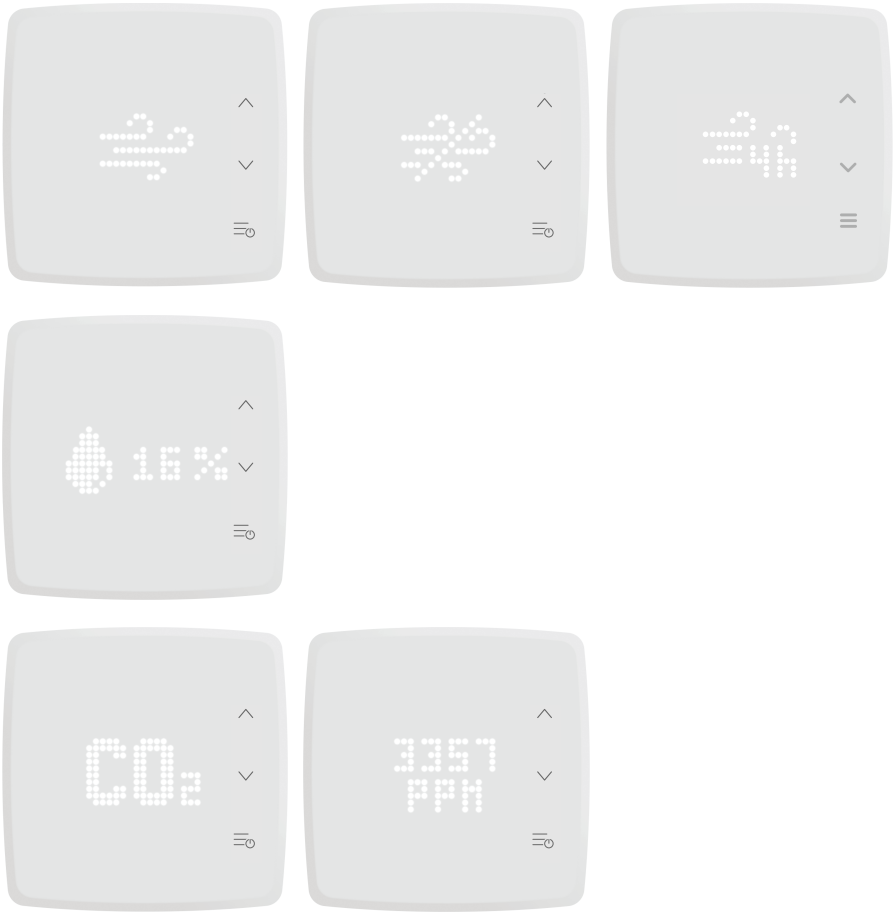


Figure 2-4 Indications in the room unit display 2

Figure 2-5 Indications in the room unit display 3

When setting the setpoint adjustment, the value shown on the display is configurable as follows:

- ✓ Setpoint adjustment
- ✓ Actual setpoint
- ✓ Heating setpoint
- ✓ Cooling setpoint
- ✓ Heating setpoint, Occupied + adjustment
- ✓ Cooling setpoint, Occupied + adjustment
- ✓ Average cooling/heating setpoint

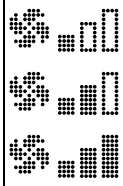
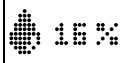
The display and function indications are described in *Table 2-3* and *Table 2-4*.

Table 2-3 Display indication descriptions

Indication	Description
Actual temperature 	When you press the **[Up]** arrow button, the temperature setpoint is increased, and when you press the **[Down]** arrow button, the temperature setpoint is decreased. The increment of each button press is 0.5 °C. The range of the temperature is normally between 18 to 24 °C and can be adjusted only by the administrator of the room unit. For the temperature setting to take effect, the user must wait 10 seconds (s) without pressing any buttons. The display then returns to the current default view. When the user presses one of the arrow buttons, the temperature setpoint is shown and the LED display flashes between the dimmed mode and full intensity mode.
Actual fan speed 	When you press the **[Up]** arrow button, the fan speed setpoint is increased and when you press the **[Down]** arrow button, the fan speed setpoint is decreased. The fan can be set in three (3) levels - 1, 2, and 3. For the fan speed setting to take effect, the user must wait 10 seconds (s) without pressing any buttons. The display then returns to the current default view.

In *Table 2-4* you find descriptions of the functions in the menu and their indications, available when you press the **[Menu]** button.

Table 2-4 Function indication descriptions

Indication	Description
Fan speed 	The fan symbol rotates at different speeds when the user cycles the speeds with the arrow buttons. The fan can rotate with three different speeds, visualized with three bars on the display. The fastest fan speed is reached by pressing the up arrow repeatedly. Pressing the down arrow button repeatedly slows the fan down in increments until it turns the fan to OFF, and the animated fan stops spinning.
Fan Auto 	The fan speed Auto mode simply adjust the fan speed automatically, depending on the need.
Fan Off 	The fan speed is set to Off. The fan is disengaged.
Forced ventilation On 	The setting **Forced ventilation On** lets in fresh air, as it enables a damper to open so that new, fresh air from the duct flows into the room. The benefit of forced ventilation is that even though the fresh air is brought into a room, the current temperature is not changed.
Forced ventilation Off 	The forced ventilation setting is disabled by default (visualized with a breeze of air that is crossed over).
Forced ventilation Timer 	The forced ventilation timer setting is disabled by default. Use **Display and menus** - **Menus** to enable. This feature allows you to set a timer value for how long the Forced ventilation will run (one (1) or four (4) h). Toggle with the arrows to select the timer value.
Relative humidity level 	The relative humidity level of the room is presented as a percentage along with a drop symbol. This is only indoor climate information, and no action can be taken to adjust the levels.
CO_2 level 	The system measures the amount of CO_2 in the room. The value is displayed in the unit parts per million (ppm).
VOC level 	The system measures the VOC level in the room according to a VOC index. See section *3.3.3 VOC*. The VOC level screen switches after a brief delay. This is only indoor climate information, and no action can be taken to adjust the levels.

2.5 Detection sensor - PIR

2.5.1 Range

The detection range of the detection sensor (PIR sensor) is dependent on the difference between the object and the room temperature, and cannot be adjusted.

2.5.2 Detection pattern

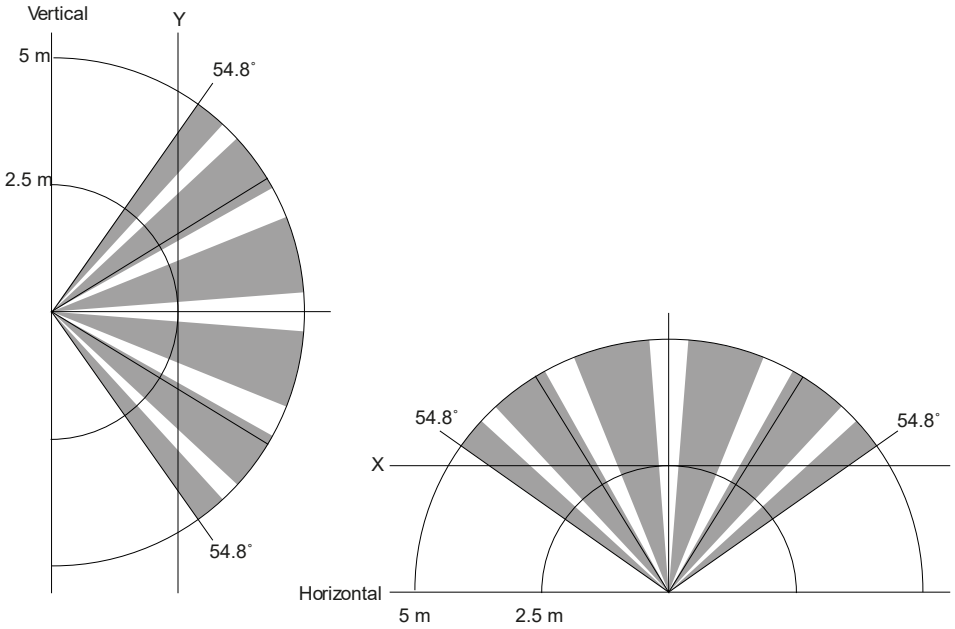


Figure 2-6 Detection pattern range PIR sensor - Vertical and Horizontal

2.6 CO_2 sensor

2.6.1 CO_2 sensor integration and measurement range

CO_2 regulation functionality is available when either an integrated or an external CO_2 sensor is connected. The integrated sensor supports a measurement range of 0 to 2000 ppm.

2.6.2 Automatic self-calibration

The integrated CO_2 sensor includes an automatic self-calibration feature designed to ensure long-term measurement stability. This function records the lowest CO_2 concentration detected each day and performs a weekly evaluation to adjust the baseline, either upward or downward, based on observed trends. The automatic self-calibration feature can be set to On or Off.

For optimal performance, the monitored space must be adequately ventilated and remain unoccupied for a minimum of four (4) hours daily. This calibration method is not recommended for continuously occupied environments such as greenhouses or hospital rooms. See also *3.15 CO_2 sensor calibration*.

Note! If inaccurate readings are suspected, allow a period of 7 to 14 days for the automatic self-calibration process to stabilize and adapt.

2.7 Changing values

Below you find examples of how to change setpoints directly on the room unit. For more information, see section *Display indications* and *Table 2-3 Display indication descriptions*.

2.7.1 Performing a setpoint adjustment

A setpoint adjustment of temperature and fan speed settings can be performed.

To perform a setpoint adjustment:

1. Press the **[Menu]** button until the desired function is shown
2. Press the **[Up]** or **[Down]** button to increase or decrease the setpoint

Note! The new set setpoint is valid instantly and need no confirmation. When you have changed a setpoint, the room unit automatically returns to the previous menu state after 10 seconds.

2.8 Configuration

You use the Regin:GO app and the Application tool 2 as two ways to configure the Regio RUX series room units.

For more information, see sections *3.1 Regin:GO app* and *3.2 Application tool 2*.

Note! When an RUX device is configured and managed by a Regio Ardo/Eedo controller (or Exigo/Corrigo, or an equivalent controller), the device configuration parameters are inherited from the controller, overriding any locally defined settings on the device.

3 Information for the specialist

3.1 Regin:GO app

The Regio RUX series room units are Bluetooth® compatible, and can be connected via the Regin:GO app. The Regin:GO app is available on Android and iOS. It is used for upgrading, configuring, and commissioning one or several Regio RUX series room units. The Regin:GO app can also be used to upgrade the firmware. You can get the Regin:GO app from *App store* (iPhone and iPad) or *Google play* (Android).

3.1.1 Language

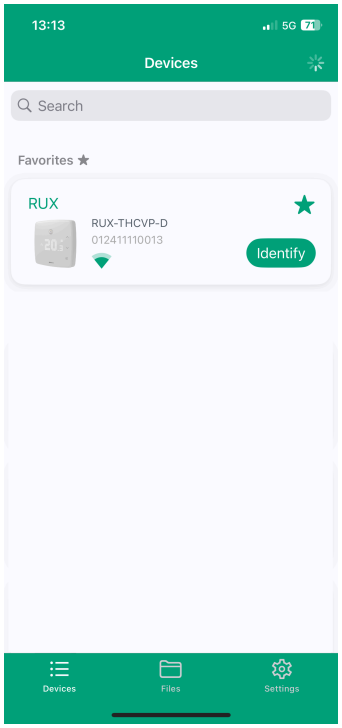
The language setting is inherited from the handheld device settings.

3.1.2 Introduction Regin:GO app

Below you find screenshots and short descriptions of some of the basic functions of the menu pages in the Regin:GO app.

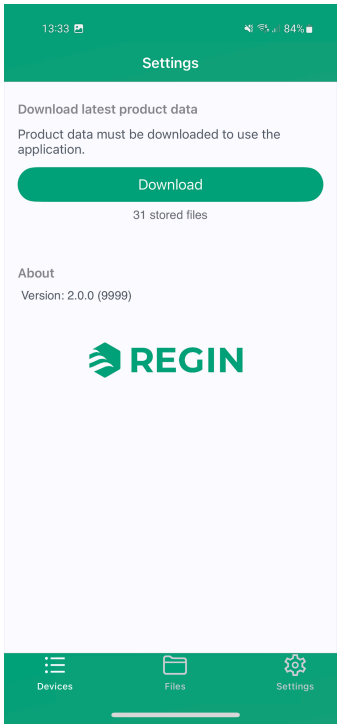
Note! Depending on your configuration, you will have different setting options.

Note! The language setting is inherited from the handheld device.



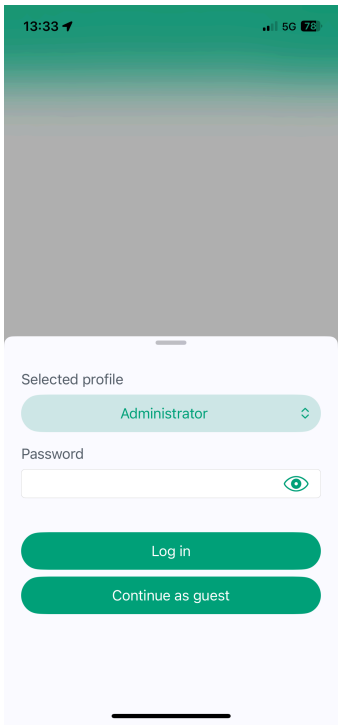
Devices page

This is the first page after the logo page. The *Devices* page lists all units found, with the possibility to identify new units and create favourites in a long list of units. The list presents a unit's name and serial number. When the **Identify** button is tapped in the Regin:GO app, the unit connection symbol is lit in blue for a few seconds and then turns blinking yellow to indicate which unit is selected.



Settings page

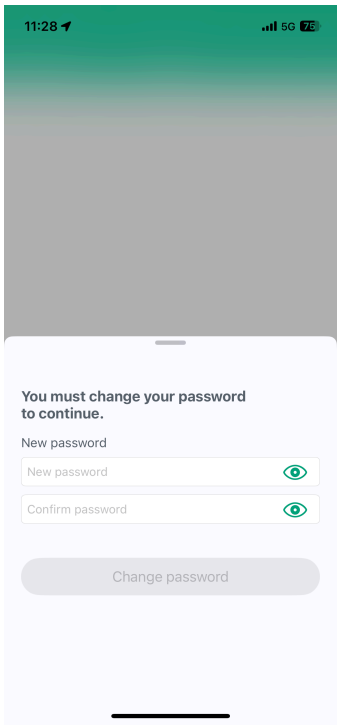
In this page it is possible to download the needed product data files. Tap **[Download]**.



Login pop up window

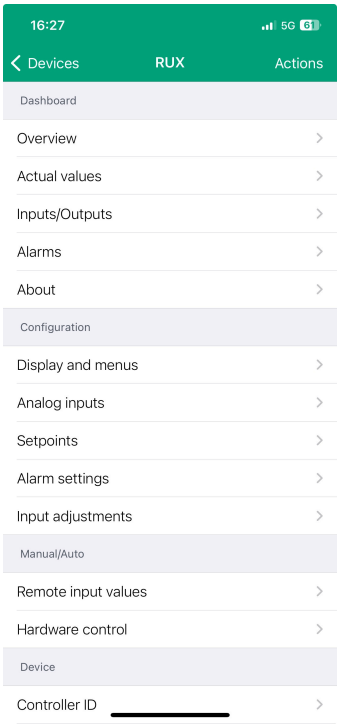
In the *Login* window you can choose the user login type, or to *Continue as guest*.

You need to be logged in as *Administrator* to change the unit name and address, backup and restore settings, as well as doing firmware updates.



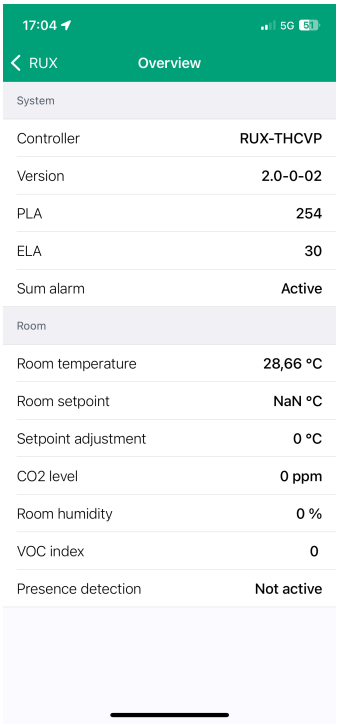
New password pop up window

Upon initial login to a device using an *Administrator* account, the *New password* dialogue prompts the user to create and confirm a new password.



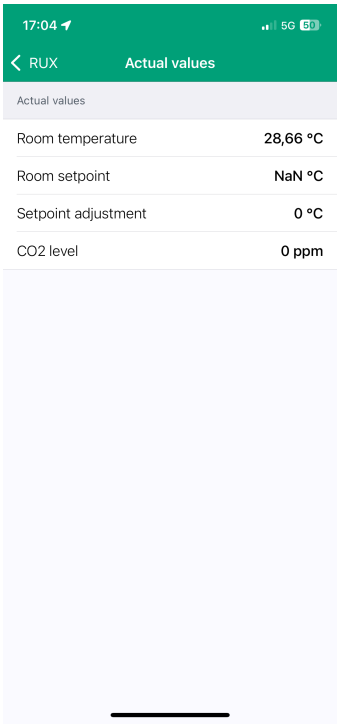
Menu page

This page is a menu page to navigate to other sub-menus, such as *Overview*, *Actula values*, and *Inputs/Outputs* etc.



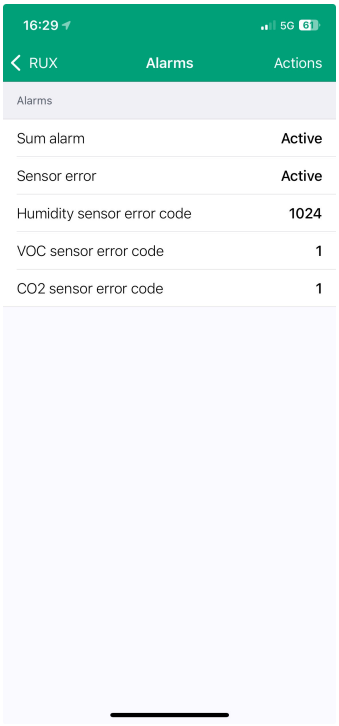
Overview page

This page is an overview page where you can see the actual values of *System* and *Room* settings.



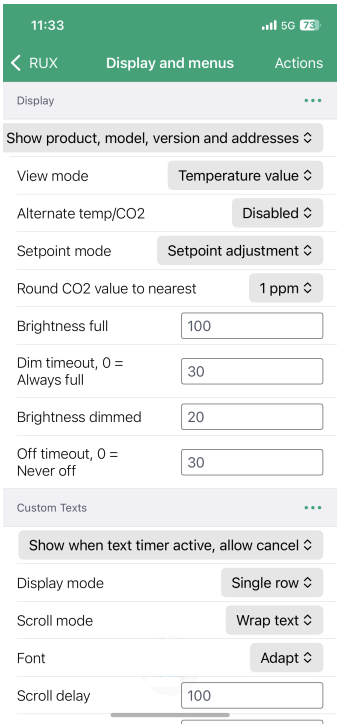
Actual values page

This page is an *Actual values* page where you can see actual values.

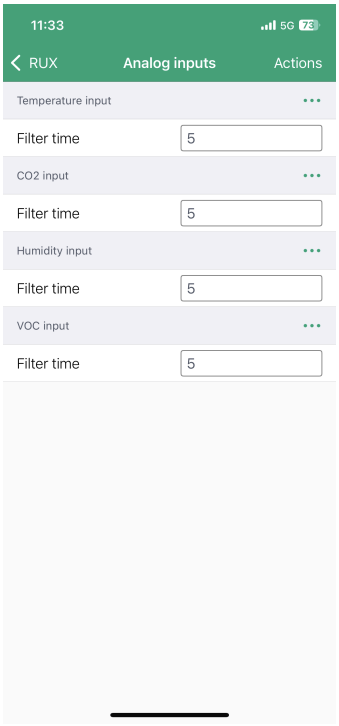


Alarms page

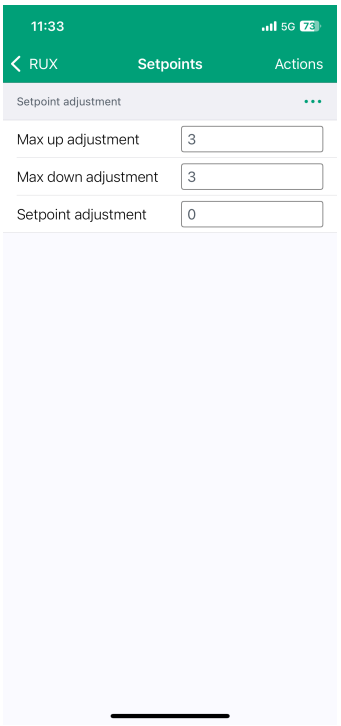
This page is an overview page of all alarms.



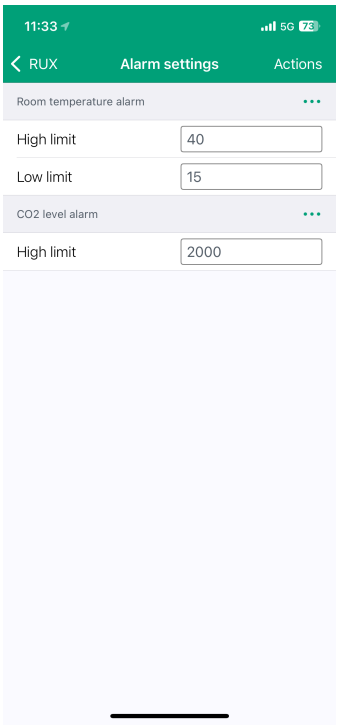
Display and menus page
This page is a settings page to configure the display and menus.



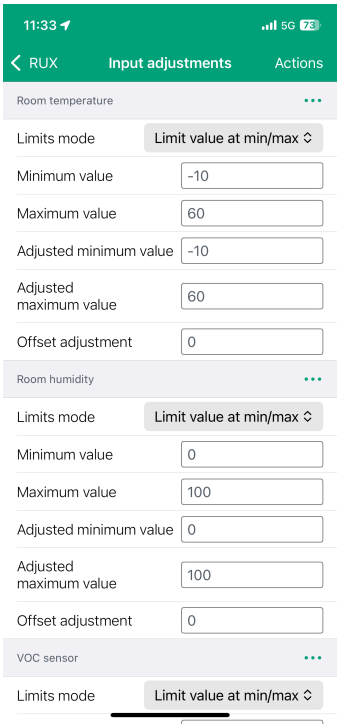
Analog inputs page
This page is a settings page for *Analog input* settings.



Setpoints page
This page is a settings page for *Setpoint adjustments*.

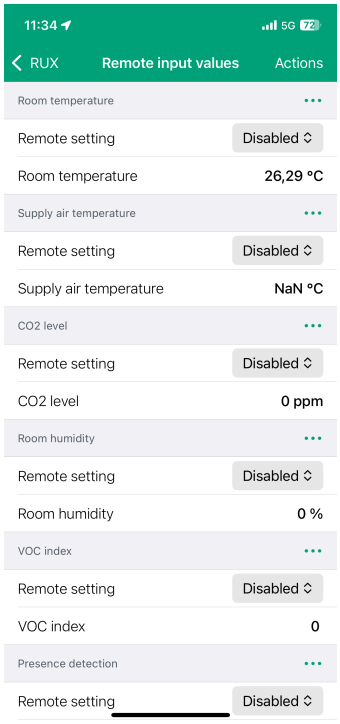


Alarm settings page
This page is a settings page for *Alarm settings*, such as room temperature and CO_2 alarm.



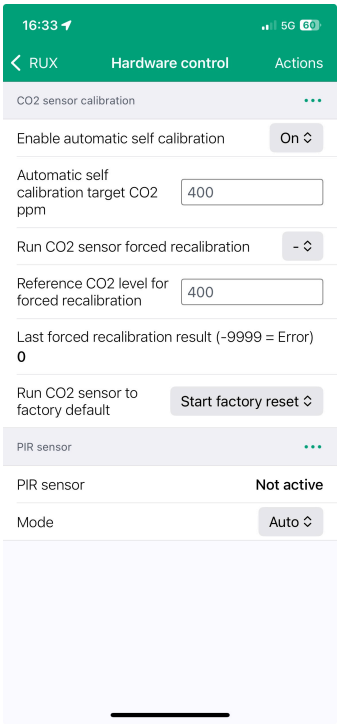
Input adjustments page

This page is a settings page for *Input adjustments*, such as room temperature and humidity adjustments.



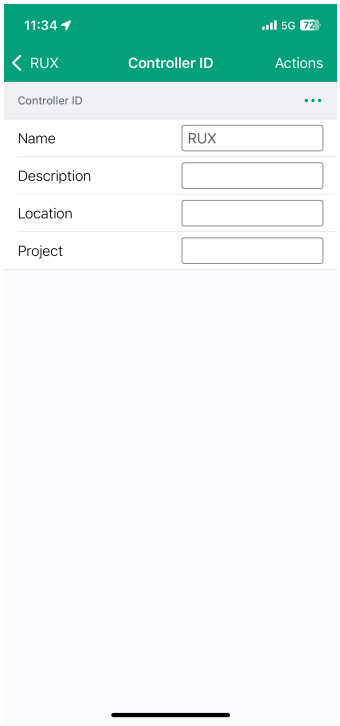
Remote input values page

This page is a settings page for *Remote input values*, such as room temperature and CO_2 level.



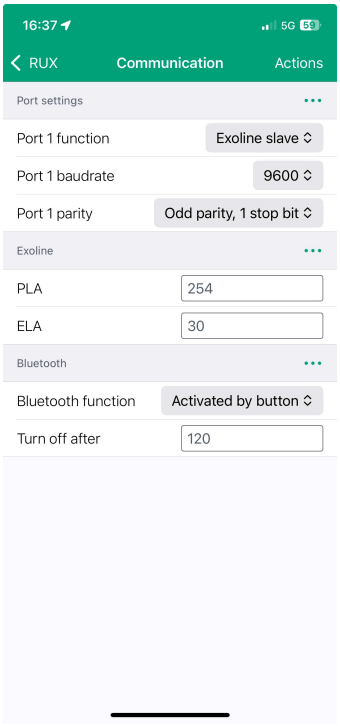
Hardware control page

This page is a settings page to configure hardware settings of the device.

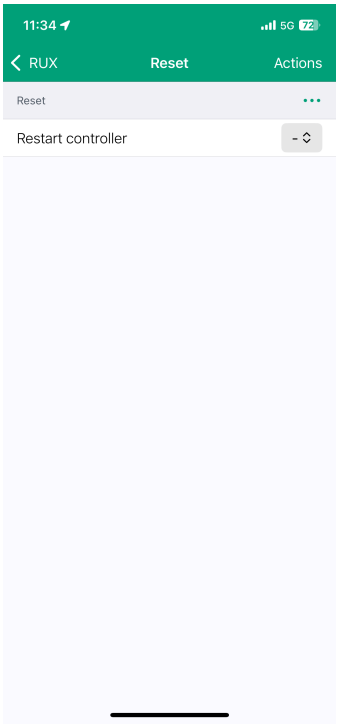


Device ID page

This page is a settings page to configure the properties of the device.



Communication page
This page is a settings page for changing the *Communication* settings.



Reset page
This page is a reset page to reset the device. Restart device, Reset application settings, Factory reset.

3.1.3 Accessing, operation, and settings in the Regin:GO app

To access and enable operations and settings in the Regin:GO app, a valid password is required. See the list of access rights below.

Access rights

Administrator - password: Admin

- ✓ Update firmware
- ✓ Reset to default values
- ✓ Save and import local configuration
- ✓ Change password
- ✓ Read and write all values that are possible to change, including all settings and configurations

Note! You will be prompted to change the default password after the first *Admin* login. See section *Password handling*.

Guest - password: N/A

- ✓ Read values decided by Regin:GO app.

Activating an identification notification in the Regin:GO app

If the device has Bluetooth® Low Energy support and Bluetooth® Low Energy is turned on, it is possible to activate an identification notification in the Regin:GO app.

To activate the identification notification:

1. Perform a short press (<1.5 seconds (s)) to activate the identification notification
2. Search for a device in the app
3. The device, with an active notification, will show on the top of the list with a blinking frame around it

Password handling

Upon initial login to a device with administrative privileges, the system will prompt the user to update their password. It is recommended to select a strong and unique password. The updated credentials will be temporarily cached within the application for a duration of 8 hours, and will be auto-filled during this period. See section *3.1.2 Introduction Regin:GO app*.

Connecting to a RUX room unit, with the Regin:GO app

To connect to a RUX room unit with the Regin:GO app:

1. Make sure Bluetooth® Low Energy is On in the device. Press the **[Menu]** button of the device for five (5) seconds (press the lower right corner, if no **[Menu]** button). A blue LED indication is presented at On.
2. Open the Regin:GO app on your mobile device
3. In the **Search** field, in the **Devices** page (opens per default), type a room unit serial number or wait until the Regin:GO app populates the room unit by automatic detection
4. Tap the **Controller** area on the desired identified room unit to connect
5. In the **Log In** dialogue, tap the **Selected profile** list and select the desired profile type. Then tap and type the corresponding password in the **Password** field.
   For more information, see section *Password handling*.
6. Tap the **[Login as...]** button
7. The Regin:GO app is now connecting to the device

You can now navigate the menu in the Regin:GO app to view values or make configuration changes. For more information, see sections *3.1 Regin:GO app* or *3.5 Regin:GO - Menu structure*.

3.1.4 Bluetooth® activation

There are two settings that control the activation of Bluetooth®. The configuration of the Bluetooth® functions and the turn off after an activation, as described in section *Bluetooth® function* and *Turn off after activation*.

Bluetooth® function

In *Table 3-1 Bluetooth® functions* the four (4) different activation functions are described, with the corresponding activation procedure.

Table 3-1 Bluetooth® functions

Function	Description
Off	Bluetooth® is disabled. Only serial line communication is possible.
Always On	Bluetooth® is always activated. LED indication is off.
On after start up	Bluetooth® is activated after power on for a configurable time. LED indication is On.
Activated by button (default)	Bluetooth® is activated by pressing the **[Menu]** button of the room unit for five (5) seconds (the lower right corner, if no **[Menu]** button). LED indication is On.

When Bluetooth® is temporarily activated (valid for the functions O*n after startup* or *Activated by button*), it is indicated with a blue LED flash every five (5) seconds. The Bluetooth® is activated for two (2) minutes per default.

Turn off after activation

Turn off after activation is only applicable for the Bluetooth® function options O*n after startup* and *Activated by button*, meaning the time in seconds that Bluetooth® should be activated. The permissible range for the setting value lies between 10 and 3600 seconds (default 600 s).

3.2 Application tool 2

The Application tool 2 is a PC-based configuration software tool. It is used for upgrading, configuring, and commissioning one or several Regio RUX series controllers.

Warning! Always disconnect the control unit from the power supply before connecting or disconnecting any connectors on the control unit.

3.2.1 Open Application tool 2

The Application tool 2 opens a dialogue at startup where you can create an offline project, open an existing project, or connect to a RUX controller via an RS485 serial connection.

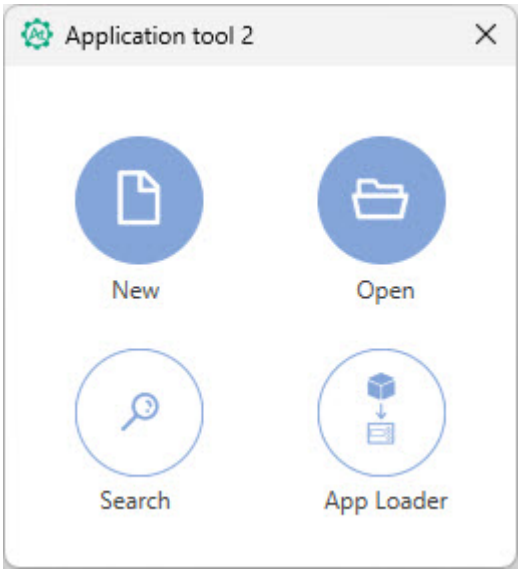


Figure 3-1 Application tool 2 start dialogue

To create and open a new offline project, click the **[New]** button.

To open an already existing project, click the **[Open]** button.

To search and connect to a controller, click the **[Search]** button.

The *App Loader* function can be used when you just want to upload the application to the controller. It is then not possible to configure the settings in the controller. Just send the application to the controller. Click the **[App Loader]** button, and upload the application to the controller.

Serial search

The **Search** window can also be opened by pressing **[F7]** on your keyboard, or from the **Tools** menu, via **Search**. Select **Search** serial and choose the serial port to be used.

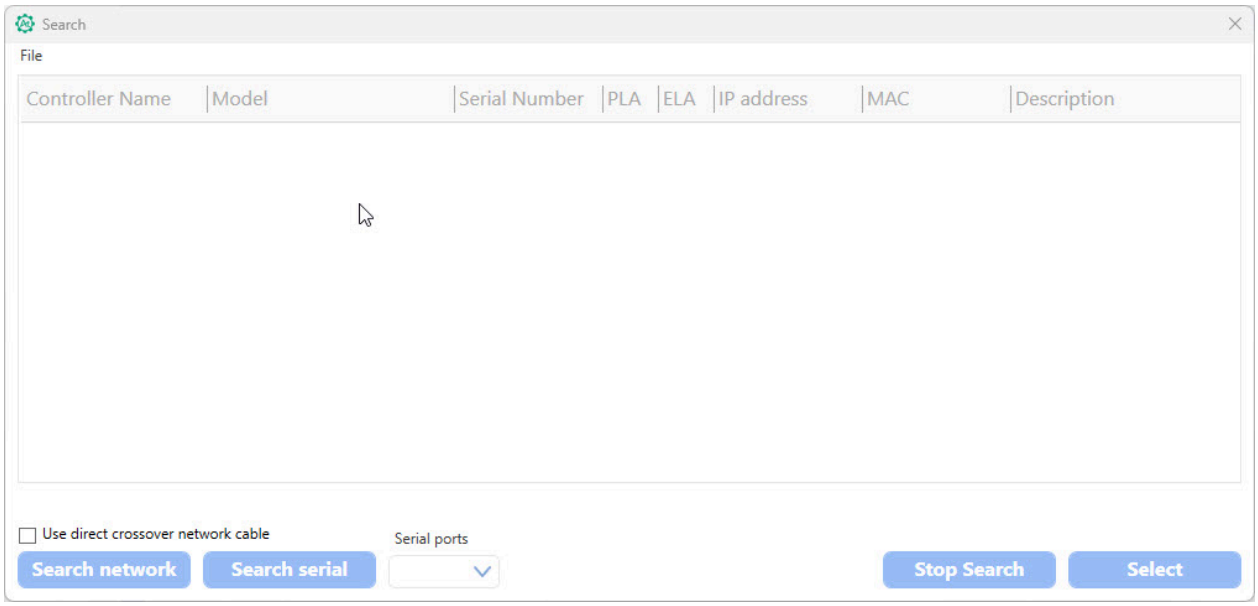


Figure 3-2 The Application tool 2 Search window

3.3 Function overview

3.3.1 Presence detection

The presence detection is based on two selectable inputs, the PIR sensor and/or the CO_2 sensor.

The calculated presence can be read in variable *RC_Presence*.

There are also settings for delays of setting and removing presence, these delays is set in minutes in the following variables: *RC_PresenceDelayOn* and *RC_PresenceDelayOff*.

PIR sensor input

The PIR sensor input can be overridden by the *RC_DIPresenceRemote* variable by setting the *RC_DIPresenceRemoteSelect* to **1**. The currently used value can be read in variable *RC_Presence*.

The current PIR sensor value is always available in *IoDiIn_4_value*.

CO_2 Presence detection

The CO_2 sensor can be used to detect presence, it uses the *RC_PresenceCO2Limit* and *RC_PresenceCO2Hyst* variables to check for presence, and the result can be read in *RC_CO2Presence* as long as the *RC_PresenceCO2Enable* is set to **1**.

3.3.2 CO_2 settings

There are some special settings connected to the CO_2 measurements. See section *Table 3-2 CO_2 variables* and *3.15 CO_2 sensor calibration*.

Table 3-2 CO_2 variables

Variable	Description
RC_CO2SetIndication	0 = Off 1 = VALUEDISPLAY: Show colour indication on CO_2 level when the CO_2 value is displayed. 2 = ALWAYS: Always show colour indication of CO_2 level.
RC_CO2LevelYellow	CO_2 limit when you change from Green to Yellow indication
RC_CO2LevelRed	CO_2 limit when you change from Yellow to Red indication
RC_CO2Indicator	Currently calculated CO_2 indication colour. 0 = OFF 1 = Green 2 = Yellow 3 = Red
RC_CO2Level	The current measured CO_2 value
RC_CO2LevelRounded	Rounded version of the CO_2 value, based on the *RC_CO2Step* variable
RC_CO2Step	This is the smallest allowed step change in *RC_CO2LevelRounded* value, as an example set this to 20 and you will only get CO_2 values like 420, 440, 460 and so on.
RC_CO2FilterTime	Filter time constant for the CO_2 value.

3.3.3 VOC

VOC's (Volatile Organic Compounds) are measured using specialized devices known as VOC monitors or VOC detectors. VOC detectors are designed to quantify the concentration of VOC's in the air, for RUX room units expressed in a index number, VOC Index. This index is relative, and does not measure the actual level of VOC's (tVOC).

VOC air pollutants can be breath, cosmetics, and other body odours from people, as well as different gases and fumes from furniture, paint, plastic, or gases from cleaning or cooking activities, or similar.

Examples of air pollutants and sources can be:

Exhalation

- ✓ breath gases (sulphur gases)
- ✓ CO_2 (carbon dioxide)

Harmful gases

- ✓ from paint and gluing compounds (acetone)
- ✓ from furniture, mattresses, or building products (toluene)

Other gases

- ✓ from alcohol, cleaning compounds, perfume (ethanol)

Odours

- ✓ from rotten food, farts (hydrogen sulphide, volatile sulfuric compounds)
- ✓ from pet pee (ammonia, amines)

Smoke

- ✓ from cigarettes (benzene, nitrosamine)

The VOC Index is a valuable tool for monitoring indoor air quality, specifically related to VOC's.

The VOC Index describes the current VOC status in a room relative to the sensor's recent history. Think of it like a human nose: When we enter a room, our nose uses the air composition outside as a baseline and alerts us if it detects higher or lower levels of VOC's indoors.

The VOC algorithm processes the raw signal from the sensor. It calculates an average value over the past 24 hours and assigns it a baseline VOC Index of 100. The VOC Index then maps measured values to a range from 0 to 500. This means that in a start-up phase of a sensor, or when a sudden big change in air quality, such as re-painting of a room or similar, will leave the VOC Index with a higher average value for some time before it will be stabilized.

The VOC algorithm initializes in two phases:

- ✓ 0…1.5 h: fast adaptation to the environment. Signal always initializes in level "typical". From the beginning, sensor-to-sensor-variation is excellent and fast VOC events are shown.
- ✓ >1.5 h: final, slow adaptation. Even very slow changes in chemical air pollution are now visualized for best user experience.

When the VOC sensor indicates poor air quality, individuals may be advised to take precautionary measures to reduce exposure to pollutants. VOC monitoring is crucial in various settings, including indoor environments (homes, offices, schools) to assess indoor air quality, industrial facilities to monitor emissions and comply with regulations, and environmental monitoring to understand outdoor air quality and potential health impacts on communities. Regular monitoring and control of VOC levels help ensure a safe and healthy environment for both humans and ecosystems.

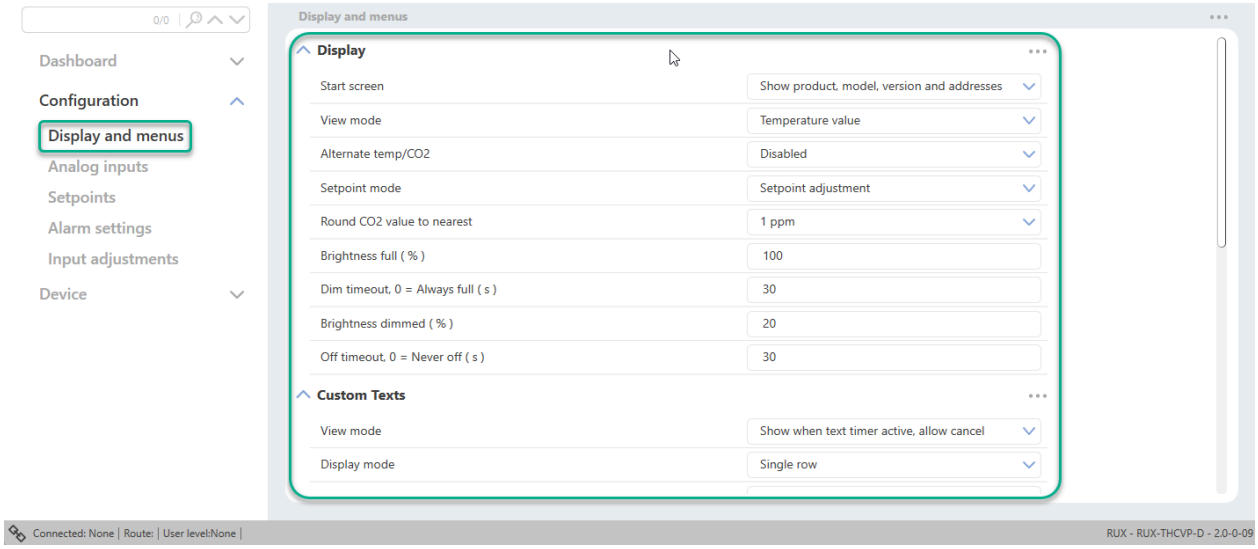
The VOC sensor used in RUX room unit is a MOX (Metal Oxide technology) based gas sensor for indoor air quality measurement.

Interpreting the VOC Index

A VOC Index above 100 indicates more VOC's than the average (for example, due to cooking, cleaning, or other events). A VOC Index below 100 suggests fewer VOC's than average (for example, fresh air from an open window). The VOC Index adapts its gain based on past 24-hour events, allowing consistent quantification on the same limited scale.

You can use the VOC index to trigger a higher amount of fresh air. Such as, by activating the *VOC Control* function with a setpoint for VOC index.

3.4 Display and menus



3.4.1 Display settings

Table 3-3 Display settings list describes the LED brightness and time-out variables. You set the properties under **Display** in the **Display and menus** page in Regin:GO.

Table 3-3 Display settings list

Configuration setting	Description
Start screen	Setting for what values are shown at start-up. The selectable values are: **No startup screen** **Show product** **Show product and model** **Show product, model and version** **Show product, model, version, and addresses**
View mode	Setting for what values are shown as default. The selectable values are: **Temperature value** **Actual setpoint** **Heating setpoint** **Cooling setpoint** **Average cooling/heating setpoint** **Setpoint adjustment only** **CO2 level** **Heating setpoint + adjustment** **Cooling setpoint + adjustment** **Average setpoint + adjustment** For more information, see *Table 3-4 Display View modes*.
Alternate temp/CO2	You can set the display to alternate between showing the temperature value and the CO_2 level value.
Setpoint mode	Setting of the setpoint: **Setpoint adjustment** (default) **Actual setpoint** **Heating setpoint** **Cooling setpoint** **Heating setpoint Occupied + adjustment** **Cooling setpoint Occupied + adjustment** **Average cooling/heating setpoint**
Round CO2 value nearest	1, 50, 100 ppm.

Table 3-3 Display settings list (continued)

Configuration setting	Description
Brightness full (%)	Setting of the brightness (in %) 0-100 (default value = 100)
Dim timeout (s)	Setting of time (in seconds) Free value, 0 = Always full (s), (default value = 30)
Brightness dimmed	Setting of the dimmed brightness (in %) 0-100, (default value = 20)
Off timeout, 0 = never off (s)	Setting of the LED brightness timeout (in seconds) Free value, 0 = never off (s), (default value = 30)

Table 3-4 Display View modes

Mode setting	Description
Actual setpoint	Actual setpoint value shown on the display.
Heating setpoint	Actual heating setpoint value shown on the display.
Cooling setpoint	Actual cooling setpoint value shown on the display.
Average cooling/ heating setpoint	When setting the setpoint adjustment, the value shown on the display is configurable with **[Up]**-arrow button or **[Down]** arrow button.
Setpoint offset only	When setting the setpoint adjustment, the value shown on the display is configurable with **[Up]**-arrow button or **[Down]** arrow button.
CO2 level	Actual CO_2 level value shown on the display.
Heating setpoint + offset	When setting the setpoint adjustment, the value shown on the display is configurable with **[Up]**-arrow button or **[Down]** arrow button.
Cooling setpoint + offset	When setting the setpoint adjustment, the value shown on the display is configurable with **[Up]**-arrow button or **[Down]** arrow button.
Average setpoint + offset	When setting the setpoint adjustment, the value shown on the display is configurable with **[Up]**-arrow button or **[Down]** arrow button.

3.4.2 LED indication

In the Regin:GO app you can set the RGB *Led indication* configuration for the CO_2 level.

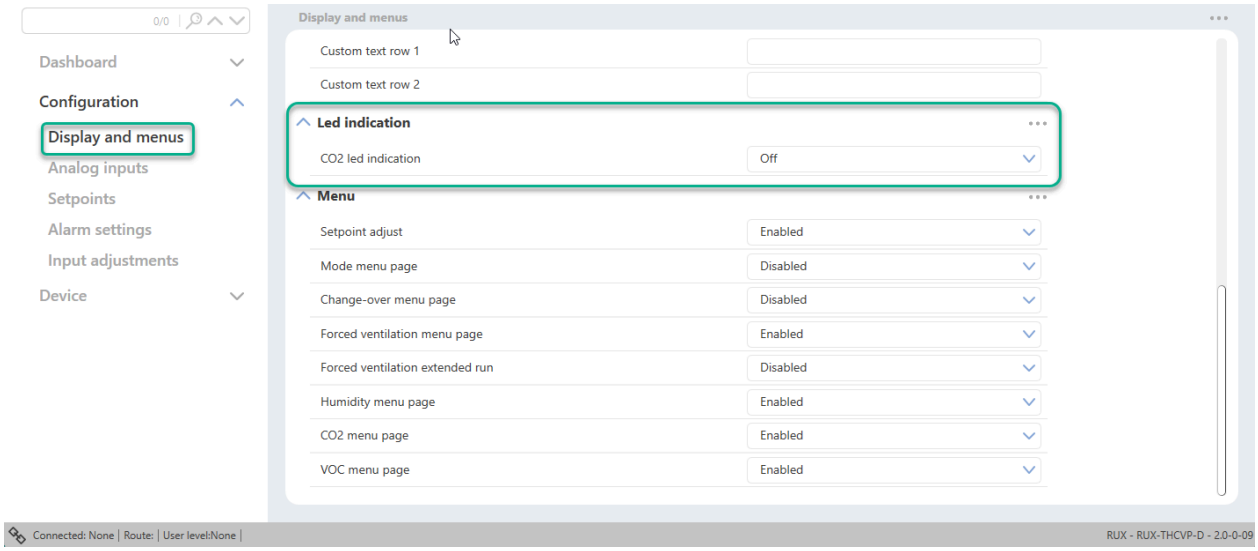


Figure 3-3 Led indication configuration settings in Application tool 2

Table 3-5 Led indication settings

Setting	Description
CO2 led indication	Set Off/On for *CO_2 led indication* function, (default - Off) Off, On when CO2 value is displayed, Always on

3.4.3 Display Custom text

You can configure custom text variables to show your own custom text in the display. The below character map is implemented in the device. See *Figure 3-4 Display character map, 5 px, 7 px and 10 px*.

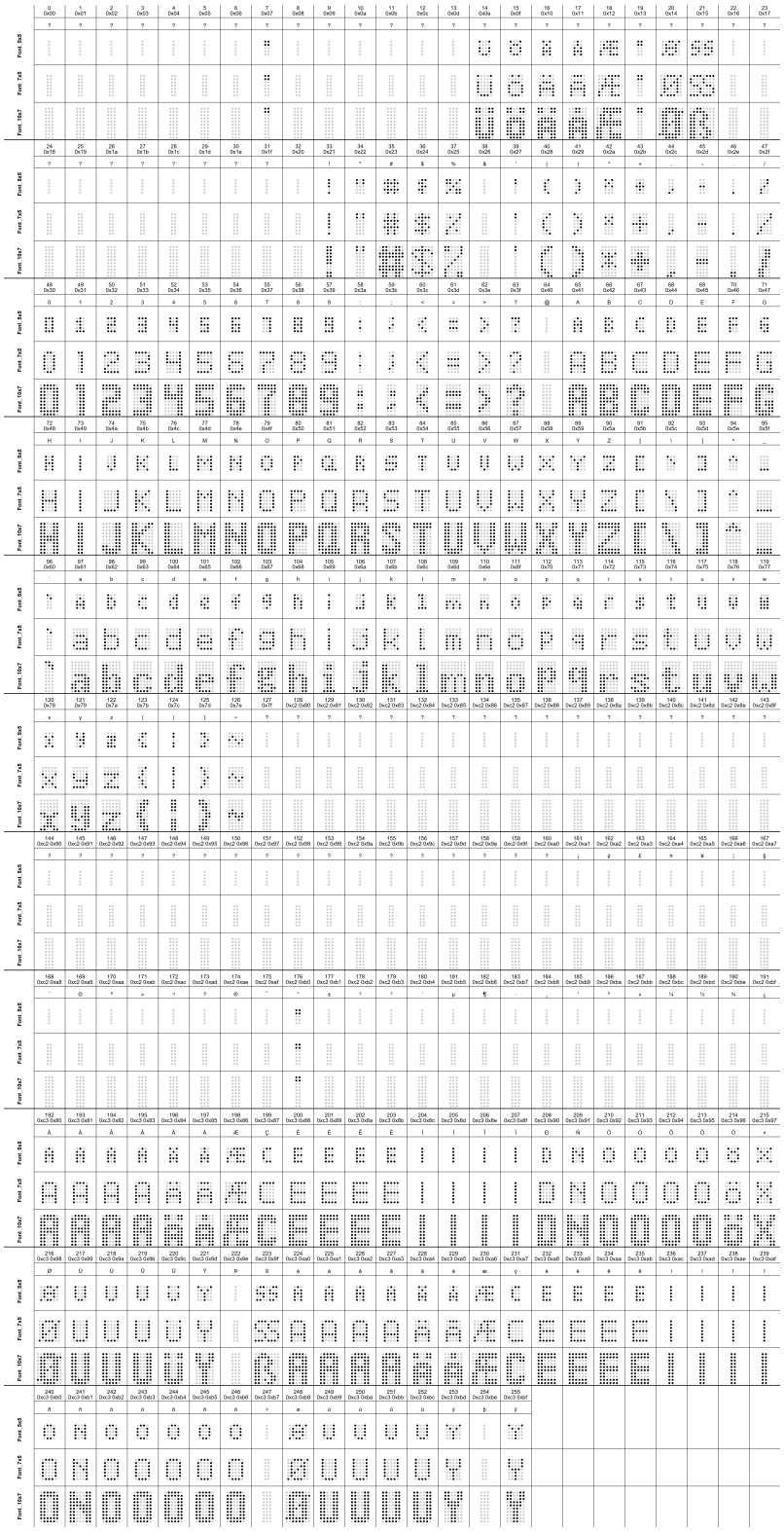


Figure 3-4 Display character map, 5 px, 7 px and 10 px

You can set the texts in the display by configure variables. The text string can be up to 64 characters in length. You can also set the visibility time and text scroll parameters, if needed. See *Table 3-6 Display setting values*.

The font used in dual row mode is always 5 px. However, the font size can also be set to a 7 px high or a 10 px high font, for single row.

Table 3-6 Display setting values

Setting values	Variable name	Description
View mode	*rt_text_visability*	When to show the custom text: 0 = *ACTIVETIME_ALLOW_CANCEL*: Show when remaining time is > 0. Show as menu item if a button has been pressed until remaining time is 0. 1 = *ACTIVETIME*, Force display until remaining time is 0. 2 = *AS_MENU*, Show as a menu item as long as text is not empty.
Display mode	*rt_text_mode*	How to show the custom string in the display: 0 = *SINGLEROW*: Show only one row of text. 1 = *DUALROW*: Show two rows of text.
Scroll mode	*rt_text_display_scroll_mode*	When to show the custom text: 0 = *SCROLL_WRAP*: Scroll text, if needed. Wrap from end to beginning. 1 = *SCROLL_BOUNCE*, Bounce text in the end positions, if needed 2 = *SCROLL_WRAP_SYNC*, Bounce text in the end positions, if needed. Sync row 1 and 2 3 = *SCROLL_BOUNCE_SYNC*, Bounce text in the end positions, if needed. Sync row 1 and 2
Font	*rt_text_font*	The font to use in single row mode (dual row mode is always 5px): 0 = *AUTO*: Adapt font to fit on screen, use as large as possible, if it does not fit, use scrolling and smallest font 1 = 5px, 5px high font. 2 = 7px, 7px high font. 2 = 10px, 10px high font
Scroll delay (ms)	*rt_text_display_scroll_speed*	Time in milliseconds (ms) between scrolling one pixel. Decrease value to scroll faster.
Custom text timer value (s)	*rt_text_timeleft*	Time in seconds to show the custom text in the display This variable will count down to 0. Set to any value to enable the custom text for that time.
Custom text row 1	*rt_text_row_1*	String to show on in the display when the text timer is active. This is string is used as the top row in dual row mode and as the main string in single row mode. The string can be up to 64 characters (if special characters are used it might be less due to the UTF8 encoding).
Custom text row 2	*rt_text_row_2*	String to show as the second row in dual row mode. The string can be up to 64 characters (if special characters are used it might be less due to the UTF8 encoding).

Special characters

There are some special character sequences that can be used to insert measurement values from the device into the custom text. See *Table 3-7 Special characters*.

Table 3-7 Special characters

Special string	Description
@00#	Current room temperature
@01#	Current room humidity
@02#	Current room CO_2 level
@03#	Current room VOC index
@06#	Device name

Menu

In the Regin:GO app you can set the *Display and menus* page to enable Menu options. See section *Menu options*.

Menu options

In *Table 3-8 Menu page settings* you find descriptions of the available configuration settings in the *Display and menus - Menu* page, where you can choose what functions to enable when you press the **[Menu]** button.

In the *Menu* section you can choose from menus with three setting states:

- ✓ *Enabled*, to enable the actual menu being displayed in the device (with configuration options for some functions)
- ✓ *Disabled*, to disable the actual menu
- ✓ *Read only*, to enable the actual menu with no configuration options (read only)

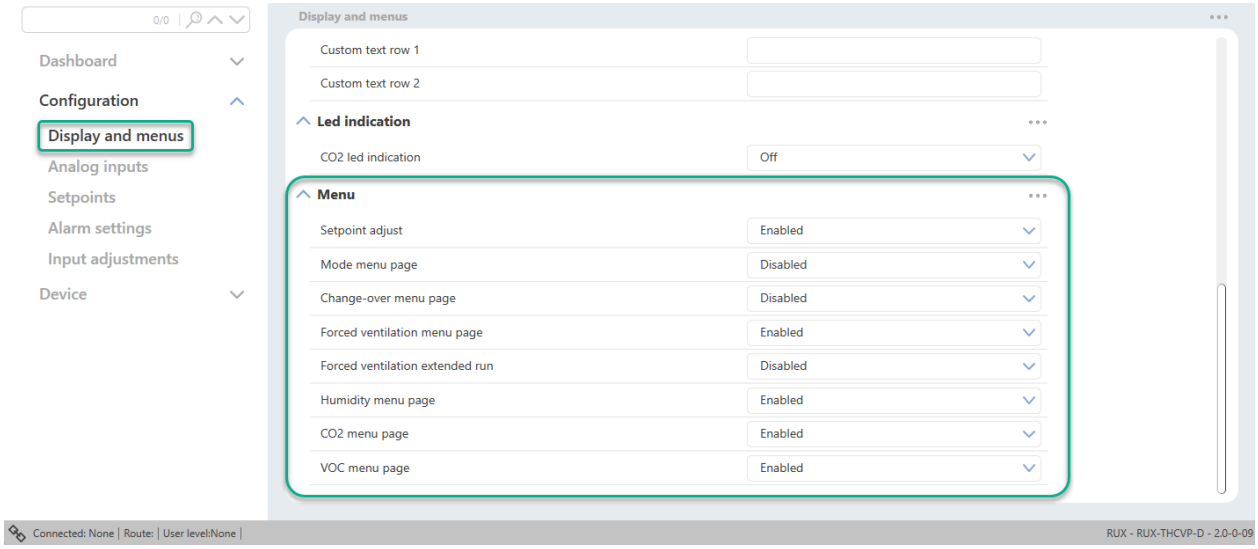


Figure 3-5 Menu options settings

Table 3-8 Menu page settings

Configuration setting	Description
Setpoint adjust	When enabled this makes it possible to adjust setpoints. Enabled (default), Disabled, Read only
Mode menu page	Text field. Write text for menu title. Default value MODE. Enabled, Disabled (default), Read only
Change-over menu page	When enabled the mode controller state *Off* is present and can be selected in the device display. Enabled, Disabled (default), Read only
Forced ventilation menu page	When enabled the mode controller state *Unoccupied* is present and can be selected in the device display. Enabled (default), Disabled, Read only
Forced ventilation extended run	When enabled the mode controller state *Standby* is present and can be selected in the device display. Enabled, Disabled (default), Read only
Humidity menu page	When enabled the mode controller state *Occupied* is present and can be selected in the device display. Enabled (default), Disabled, Read only
CO2 menu page	When enabled the mode controller state *Forced ventilation* is present and can be selected in the device display. Enabled (default), Disabled, Read only
VOC menu page	Text field. Write text for mode *Off*. Enabled (default), Disabled, Read only

3.5 Regin:GO - Menu structure

The Regin:GO menu structure for the Regio RUX series application can be found in the RUX - Menu Structure document, available at www.regincontrols.com.

3.6 Main display settings menu

When pressing the **[Up]** or **[Down]** button in the main view, a settings menu is displayed. There are two modes that can be used. Either the *Offset adjustment* mode, or the *Temperature setting* mode. See *Table 3-9*.

Table 3-9 Main display variables

Variable name	Description
RC_TemperatureCO2	0 = Show only temperature in the main view 1 = Alternate temperature and CO_2 in the main view
RC_ RuxControllerMode	0 = OFF 1 = HEATING: Show up-arrow indicating heating 2 = COOLING: Show down-arrow indicating cooling

3.7 Setpoints

When pressing **[Up]** or **[Down]** button in the main view, a *Settings* menu is displayed. There are two modes that can be used. Either the *Offset adjustment* mode or the *Temperature setting* mode. See *Table 3-10 Setpoint adjustment variables*.

3.7.1 Setpoint adjustment - variables

The following variables can be used to set mode, setpoints and setpoint adjustments. See *Table 3-10*.

Table 3-10 Setpoint adjustment variables

Configuration setting	Variable name	Description
Setpoint mode	*RC_ DisplaySetpointMode*	Select between showing the offset or the temperature setting: **Setpoint adjustment** (default) **Actual setpoint** **Heating setpoint** **Cooling setpoint** **Heating setpoint Occupied + adjustment** **Cooling setpoint Occupied + adjustment** **Average cooling/heating setpoint**
Max up adjustment (C°)	*RC_RoomSetpointOffsetMaxPos*	The maximum allowed adjustment in degrees, on the positive side. Max: 0, Min: 19; 3 (default)
Max down adjustment (C°)	*RC_RoomSetpointOffsetMaxNeg*	The maximum allowed adjustment in degrees, on the negative side. Max: 20000, Min: -10000; -10 (default)
Setpoint adjustment (C°)	*RC_ RoomSetpointOffset*	The currently selected offset. Can also be written from the device. Max: 19, Min: -19; 0 (default)

3.8 Sensor values via communication

The following variables can be used to get the measurements from the internal sensors in the RUX room unit. See *Table 3-11*.

Table 3-11 Sensor measurement retrieval variables

Variable name	Description
RC_RoomTemp	The measured room temperature. (°C)
RC_Humidity	The measured room humidity. Relative humidity, % RH (%)
RC_CO2Level	CO_2 level. (ppm)
RC_VOC	VOC (value between 0 and 500, where 100 is the last 24 hour average)
RC_Presence	Detected presence in the room. See section *2.5 Detection sensor - PIR*.

3.9 Filtering

3.9.1 Sensor measurement filtering

The following variables can be used to get the measurement filtering for the internal sensors in the RUX room unit. See *Table 3-12*.

Table 3-12 Sensor measurement filtering variables

Variable name	Description
RC_TempFilterTime	Filter time constant for the temperature value.
RC_CO2FilterTime	Filter time constant for the CO_2 value.
RC_VOCFilterTime	Filter time constant for the VOC value.
RC_RHFilterTime	Filter time constant for the humidity value.

3.10 Measured value override

There are variables that can be used to override the measured values. When overridden the REG_INP_* variables will show the overridden values, and will be visible on the display. See *Table 3-13*.

Table 3-13 Measured value override variables

Variable name	Description	Measured value
RC_RoomTempRemote	Value to use for room temperature	AI5_VALUE
RC_RoomTempRemoteSelect	Set to 1 to enable override value	
RC_HumidityRemote	Value to use for room humidity	AI6_VALUE
RC_HumidityRemoteSelect	Set to 1 to enable override value	
RC_CO2LevelRemote	Value to use for room CO_2	AI8_VALUE
RC_CO2LevelRemoteSelect	Set to 1 to enable override value	
RC_VOCRemote	Value to use for room VOC	AI7_VALUE
RC_VOCRemoteSelect	Set to 1 to enable override value	

3.11 Presence detection

The presence detection is based on two (2) selectable inputs. The PIR sensor and/or the CO_2 sensor.

The calculated presence can be read in the variable *RC_Presence*.

There are also settings for delays of setting and removing presence. These delays are set in minutes (min) in the following variables: *RC_PresenceDelayOn* and *RC_PresenceDelayOff*.

3.11.1 PIR sensor input

The PIR sensor input can be overridden with the *RC_DIPresenceRemote* variable, if the variable *RC_DIPresenceRemoteSelect* is set to one (1).

The currently used value can be read in variable *RC_DIPresence*.

The current PIR sensor value is always available in variable *IoDiIn_4_value*.

3.11.2 CO_2 presence detection

The CO_2 sensor can be used to detect presence. It uses the *RC_PresenceCO2Limit* and *RC_PresenceCO2Hyst* variables to check for presence. The result can be read in variable *RC_CO2Presence*, as long as the *RC_PresenceCO2Enable* is set to one (1).

3.12 Forced ventilation menu

The state of the *Forced ventilation* toggle can be read out of the *RC_ControllerStateSetBypass* variable. You can also change the state of this variable to change the displayed state.

3.13 Fan speed menu

The current *Fan speed* setting can be read out or changed in the variable *RC_FanSelect*, with the definitions in *Table 3-14*.

Table 3-14 Variable REG_FANSELECT values

Value	Name	Description
0	OFF	Fan is turned off
1	Speed1	Low speed
2	Speed2	Mid speed
3	Speed3	High speed
4	AUTO	Fan speed is automatically controlled

3.14 Input adjustment

For room temperature, room humidity, VOC sensor, and CO_2 sensor you can set value limits, min. and max. values (with adjustment values, and offset adjustment values. See *Table 3-15 Room temperature variables*, *Table 3-16 Room humidity variables*, *Table 3-17 VOC sensor variables*, and *Table 3-18 CO2 sensor variables*.

3.14.1 Room temperature - variables

Below you find the input adjustment variables for the room temperature sensor. See *Table 3-15*.

Table 3-15 Room temperature variables

Configuration setting	Variable name	Description
Limits mode	*loAnaIn_5_limit*	Setting of limit value: **Limit value at max/min** (default) **Set error if outside limits**
Minimum values	*loAnaIn_5_min_in*	Setting of min. value: Max: 20000, Min: -10000; -10 (default)
Maximum values	*loAnaIn_5_max_in*	Setting of max. value: Max: 20000, Min: -10000; 60 (default)
Adjusted minimum value	*loAnaIn_5_min_out*	Setting of adjusted min. value: Max: 20000, Min: -10000; -10 (default)
Adjusted maximum value	*loAnaIn_5_min_out*	Setting of adjusted max. value: Max: 20000, Min: -10000; 60 (default)
Offset adjustment	*loAnaIn_5_offset*	Setting of offset adjustment value: Max: 1000, Min: -1000; 0 (default)

3.14.2 Room humidity - variables

Below you find the input adjustment variables for the room humidity sensor. See *Table 3-16*.

Table 3-16 Room humidity variables

Configuration setting	Variable name	Description
Limits mode	*loAnaIn_6_limit*	Setting of limit value: **Limit value at max/min** (default) **Set error if outside limits**
Minimum values	*loAnaIn_6_min_in*	Setting of min. value: Max: 20000, Min: -10000;, -10 (default)
Maximum values	*loAnaIn_6_max_in*	Setting of max. value: Max: 20000, Min: -10000; 60 (default)
Adjusted minimum value	*loAnaIn_6_min_out*	Setting of adjusted min. value: Max: 20000, Min: -10000; -10 (default)
Adjusted maximum value	*loAnaIn_6_min_out*	Setting of adjusted max. value: Max: 20000, Min: -10000; 60 (default)
Offset adjustment	*loAnaIn_6_offset*	Setting of offset adjustment value: Max: 1000, Min: -1000; 0 (default)

3.14.3 VOC sensor - variables

Below you find the input adjustment variables for the VOC sensor. See *Table 3-17*.

Table 3-17 VOC sensor variables

Configuration setting	Variable name	Description
Limits mode	*IoAnaIn_7_limit*	Setting of limit value: **Limit value at max/min** (default) **Set error if outside limits**
Minimum values	*IoAnaIn_7_min_in*	Setting of min. value: Max: 20000, Min: -10000; -10 (default)
Maximum values	*IoAnaIn_7_max_in*	Setting of max. value: Max: 20000, Min: -10000; 60 (default)
Adjusted minimum value	*IoAnaIn_7_min_out*	Setting of adjusted min. value: Max: 20000, Min: -10000; -10 (default)
Adjusted maximum value	*IoAnaIn_7_min_out*	Setting of adjusted max. value: Max: 20000, Min: -10000; 60 (default)
Offset adjustment	*IoAnaIn_7_offset*	Setting of offset adjustment value: Max: 1000, Min: -1000; 0 (default)

3.14.4 CO_2 sensor - variables

Below you find the input adjustment variables for the CO_2 sensor. See *Table 3-18*.

Table 3-18 CO2 sensor variables

Configuration setting	Variable name	Description
Limits mode	*IoAnaIn_8_limit*	Setting of limit value: **Limit value at max/min** (default) **Set error if outside limits**
Minimum values	*IoAnaIn_8_min_in*	Setting of min. value: Max: 20000, Min: -10000; -10 (default)
Maximum values	*IoAnaIn_8_max_in*	Setting of max. value: Max: 20000, Min: -10000; 60 (default)
Adjusted minimum value	*IoAnaIn_8_min_out*	Setting of adjusted min. value: Max: 20000, Min: -10000; -10 (default)
Adjusted maximum value	*IoAnaIn_8_min_out*	Setting of adjusted max. value: Max: 20000, Min: -10000; 60 (default)
Offset adjustment	*IoAnaIn_8_offset*	Setting of offset adjustment value: Max: 1000, Min: -1000; 0 (default)

3.15 CO_2 sensor calibration

The Automatic Sensor Calibration (ASC) algorithm ensures long-term measurement stability without requiring manual recalibration. It analyses historical sensor data and assumes exposure to a known minimum CO_2 concentration at least once during each calibration cycle. By default, the algorithm presumes the sensor is exposed to outdoor air with a CO_2 concentration of 400 ppm for a minimum of three (3) minutes every seven (7) days. You find the CO_2 sensor calibration in Regin:GO. See *Table 3-19*.

Table 3-19 CO_2 sensor calibration settings

Setting values	Variable	Description
Enable automatic self calibration	*SCD40_ASC_enable*	Activates or deactivates the automatic calibration function for the CO_2 sensor. 0 = Off 1 = On (default)
Automatic self calibration baseline [ppm]	*SCD40_ASC_target*	Defines the baseline CO_2 concentration (in ppm) used by the ASC algorithm as the expected minimum background level during each calibration cycle. This value represents the lower bound to which the sensor is assumed to be regularly exposed. Value 300 to 1200 (ppm), 400 (default)
Run CO2 sensor forced recalibration	*SCD40_FRC_enable*	Forced Recalibration (FRC) allows the sensor to be manually calibrated using a known reference CO_2 concentration. This method is recommended when ASC is not sufficient or when immediate correction is required. Before initiating FRC, ensure the sensor is placed in an environment with a stable and homogeneous CO_2 concentration for at least three (3) minutes. Set this parameter to 1 to begin a manual recalibration of the CO_2 sensor. The value will automatically reset to 0 upon completion. 0 = Off (default) 1 = Run calibration
Reference CO2 level for forced recalibration [ppm]	*SCD40_FRC_target*	Specifies the CO_2 concentration (in ppm) to be used as the reference value during forced recalibration. This should reflect the actual CO_2 level at the sensor's location during calibration. Value 300 to 1200 (ppm), 400 (default)
Last forced recalibration offset (-9999 = Error)	*SCD40_FRC_result*	Displays the correction value applied during the most recent FRC operation (in ppm). A value of -9999 indicates that the calibration attempt failed. Value = 0 (default) Value = -9999 (calibration attempt failed)
Start factory reset	*SCD40_factory_reset*	Set this parameter to 1 to reset the CO_2 sensor to its original factory configuration. The value will revert to 0 once the reset is complete. This command erases all user-defined settings and clears the history of both ASC and FRC algorithms. 0 = Off (default) 1 = Reset to factory default

3.16 Communication

3.16.1 Networks, interfaces and protocols - Factory default

In *Table 3-20 Networks and interfaces, factory default status* and *Table 3-21 Protocols, factory default status* you find the supported network interfaces and protocols, including the factory default settings.

Table 3-20 Networks and interfaces, factory default status

Network/Interface	Status from factory default	Description
RS485	ON	Serial interface with differential signal levels, allowing for reliable data exchange between devices, sensors, and actuator over a bus with multiple other devices. Connection for SCADA configurations.
Bluetooth® Low Energy	Activated by button	The Bluetooth® Low Energy interface is a wireless interface used to temporarily connect to the device from a mobile phone, or tablet. The interface is used with the Regin:GO app for installation, configuration and maintenance of the device.

Caution! If you configure the device exclusively via RS485 using Application tool 2, it is recommended to disable Bluetooth® Low Energy (BLE) during setup. If BLE remains enabled, the device may still be accessed and reconfigured via Regin:GO using the default password. Note that this password can only be changed within the Regin:GO interface.

Table 3-21 Protocols, factory default status

Protocol	Status from factory default	Used in interface	Description
EXOline	ON	RS485	Regin specific protocol. EXOline is used for communication and reliable, real-time data exchange between devices, sensors, and other field devices within Regin's EXO system and SCADA. Here used for device configuration, system maintainance, communication with other devices, SCADA etc. The difference compared to Modbus and BACnet, is that EXOline allows more configuration and is used by Regin's own configuration tools.
Modbus	OFF	RS485	Modbus standardized protocol. Used for communication with other devices and/or SCADA systems.
BACnet	OFF	RS485	BACnet standardized protocol. Used for communication with other devices and/or SCADA systems.

3.16.2 Communication settings

In the **Device - Communication** page, you can set port settings, the Modbus address, and the Bluetooth® function settings.

The port 1 settings can be altered between the EXOline, Modbus, BACnet communication protocols, or be disabled.

For EXOline, you can set the PLA and ELA addresses (in Regin:GO) [1].

For the Modbus protocol, the Modbus address can be set here. And for BACnet the properties can be set. You can also change the Bluetooth® connection settings, for how and when the connection is made.

Communication fail settings can also be set from this page. For more information, see *Table 3-22 Communication settings*.

Table 3-22 Communication settings

Setting values	Variable name	Description
Port 1 function	*RC_Port1Mode*	Setting of the port 1 function: **Disabled** **EXOline slave** (default) **Modbus slave** **EXOline/Modbus slave** **BACnet**
Port 1 baudrate	*RC_Port1Baud*	Setting of the port 1 baudrate: **9600** (default) **19200** **38400** **76800**
Port 1 parity	*RC_Port1Format*	Parity bit settings: **No parity, 1 stop bit** **Odd parity, 1 stop bit** (default) **Even parity, 1 stop bit** **No parity, 2 stop bits** **Odd parity, 2 stop bits** **Even parity, 2 stop bits**
Modbus address	*QServices.ModbusUnitID*	The same setting as ELA (default)
BACnet MSTP address	*QServices.BACnetMstpMAC_Port_1*	Setting of the BACnet MSTP address. Default set to a number between 64 and 127 (default).
MSTP max master address	*QServices.BACnetMstpMax-MasterAddr_Port_1*	Setting of the MSTP max master address. (default = 127)
BACnet device ID	*QServices.BACnetDeviceID*	Setting of the BACnet Device ID. Set to the last 6 digits of the serial number (default).
BACnet device object name	*QServices. BACnetDeviceObjectName*	Setting of the BACnet device object name. Device name with the serial number appended to the end, “RUX012509111234” (default).
Password	*QServices.BACnetPassword*	Setting of a BACnet password. Need to be set by user (default).
Bluetooth® function	*BleButtonMode*	Setting on when the Bluetooth® function is activated or inactivated: **Off** **Always on** **On after startup** **Activated by button** (default)
Turn off after (s)	*BleButtonTimeout*	Setting of when the Bluetooth® connection is turned off. 120 = (default)
Timeout (s)	*RC_OfflineTimeout*	Setting of an offline timeout threshold. 10 = (default)
Status	RC_Offline	Status description of the current communication status.

3.17 Update software

3.17.1 Updating the device software in Regin:GO

When there is a software update available for the device, you will be prompted to update the software. You can also manually update the device software in Regin:GO whenever you need through the **Action** menu, if you are connected to the device.

1. In the Regin:GO menu, tap the **[Actions]** button.
2. In the dropdown menu, tap **[Update software]**.
3. In the **Update software** page, tap **[Available software]**.
4. Select the desired software version.
5. Tap the **[Update software]** button.
6. In the **Update software** dialog, choose **[Save settings]**, **[Continue with update]**, or **[Cancel]**.

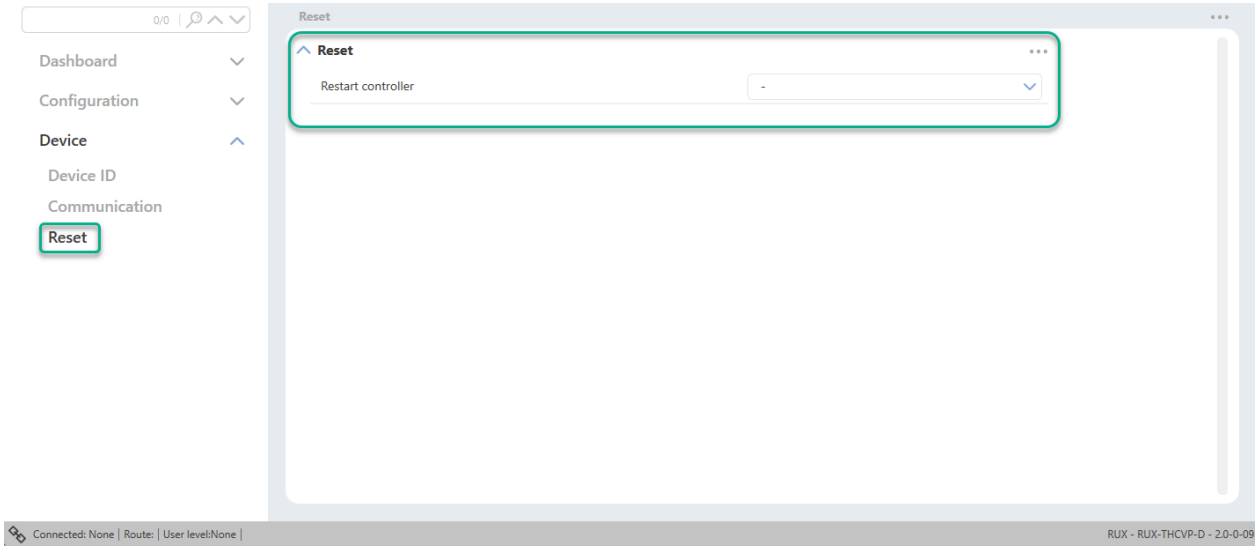
Note! Regin recommend to save your settings before a software update. The update can cause the settings to be reset to default, and then you can use the saved file to restore your settings.

7. To continue with device software update, tap **[Continue with update]**. You will be prompted with the update process progression.

Note! Do not leave the **Update software** page during the update process.

8. When the software update is finished, in the **Update software** dialog, tap **[Return to device]** list.

3.18 Reset



In the **Device - Reset** page, you can set the variable *product_reset* to **Restart device**, **Reset application settings**, or **Factory reset**, in order to initiate a restart instantly. For more information, see *Table 3-23 Reset types*.

Table 3-23 Reset types

Reset type	Description
Restart device	Restart the device. Similar to a power cycle.
Reset application settings	Restart the device and set all parameters to the default factory state, except some communication settings such as: ELA, PLA, Modbus address, serial port settings (baud rate, mode, parity, time-outs) and BACnet configuration (Device ID, Device object name, password, MSTP MAC, timeouts)
Factory reset	Restart the device and set all parameters to the default factory state.

3.19 Factory reset

You can reset the device to factory settings with use of the touch buttons. To reset the device with the touch buttons, follow the below procedure within the first 60 seconds after starting the device:

1. Make sure that the device has been turned off
2. Start the device
3. Press and hold on the upper right part of the device (keep active during the full sequence), within the first 60 seconds after starting the device
4. Press and hold the lower right part of the device (**[Menu]** button) for approximately 10 seconds. During this time the indication will be green, when done it will change to red.
5. Release the lower right part of the device (**[Menu]** button)
6. Press (and release) the lower right part of the device (**[Menu]** button) three (3) times in 10 seconds
7. The LED flashes in green for a short time to confirm a successful factory reset, and the device restarts with default settings

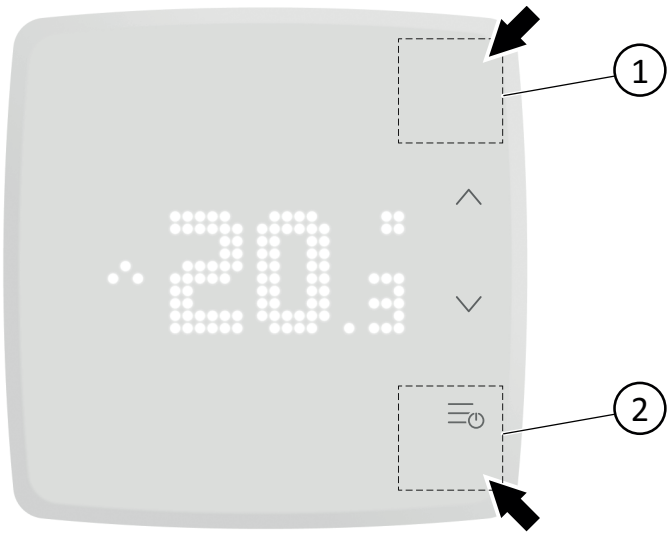


Figure 3-6 Factory reset press areas

① *Upper right part of the device*

② *Lower right part of the device, **[Menu]** button*

If you have not succeeded in pressing the lower right part of the device (2)(**[Menu]** button) three (3) times during ten (10) seconds in step 6., or you release the upper right part of the device (1), the reset operation is interrupted and the LED returns to what it showed before. Start with step 3. anew, if you still want to make a factory reset.

4 Information for the installer

4.1 Installation

4.1.1 Installation preparations

The RUX-... room unit should be mounted in a location with good air circulation, where it can be expected to give a representative reading. It may be mounted on a wall box or directly on the wall.

See the RUX-... Instruction, to be found at www.regincontrols.com.

4.1.2 Mounting

Caution! If the device is mounted over electrical installation pipes, it is important that the airflow is obstructed. If there is a risk for this, you need to plug the pipe.

1. With surface-mounted cabling, break out suitable holes from the marks in the plastic
2. Find a location that has a temperature representative for the room. A suitable location is approximately 1.6 m above floor level in a place with unobstructed air circulation
3. Select suitable holes and mount the backplate onto the wall or a connection box with fastening screws, so that the arrows on the backplate point upwards
   The backplate has several fixing hole combinations

Note! Do not tighten the fastening screws too hard

4. Place the terminal in the sliding slots on the backplate
5. Connect the cables needed to the terminal, according to the terminal list

For more information, see the RUX-... Instruction, to be found at www.regincontrols.com.

4.1.3 Removing cover

To remove the front cover:

1. Depress the locking tongue in the lower part of the casing using a 3 mm flat-blade screwdriver
2. Press and twist the screwdriver and at the same time pull the bottom part of the front outwards
3. When the bottom end of the front is free from the bottom part of the casing, slide the cover towards the top of the casing to free the hooks holding the upper edge of the front cover.

4.1.4 Installation

Based on the used room unit the product can be installed with one of two options:

1. The room unit can be connected to the same supply voltage as the room unit. Communication then takes place via EXOline and is connected to the serial ports (RS485), A and B.
2. The unit can also be connected via an EDSP-K3 cable to the display port.

4.1.5 Wiring

All units that share the same transformer and communication loop must use the same transformer-pole for G (terminal 1) and G0 (terminal 2). On the communication loop, the A-terminal (terminal 3) should only be connected to another A-terminal, and the B-terminal (terminal 4) to another B-terminal. Otherwise, the communication will not work.

The communication cable must be a screened twisted pair cable. The shield must be connected to G0 on one (and only one) transmitter in each separate power supply loop with 24 V AC. If the length of the loop exceeds 300 m, a repeater is required. See *Figure 4-1 Wiring example - communication cable*.

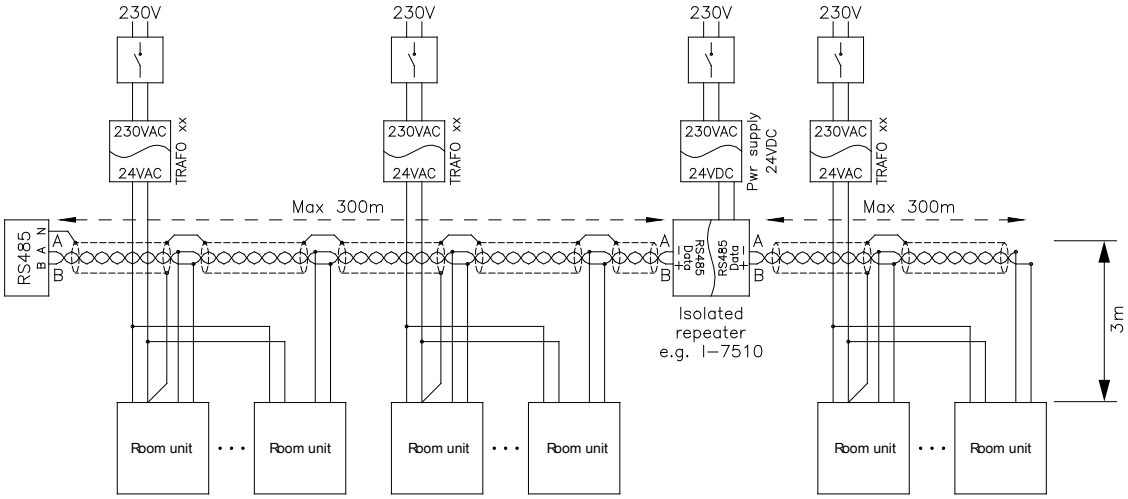


Figure 4-1 Wiring example - communication cable

Caution! In installations with wires entering the device from the side, the wires must be firmly attached to the surrounding wall to relieve the wires from strain and twisting, as there are no internal strain relief.

EDSP-K3 cable

The unit can also be connected via an EDSP-K3 cable to the display port.

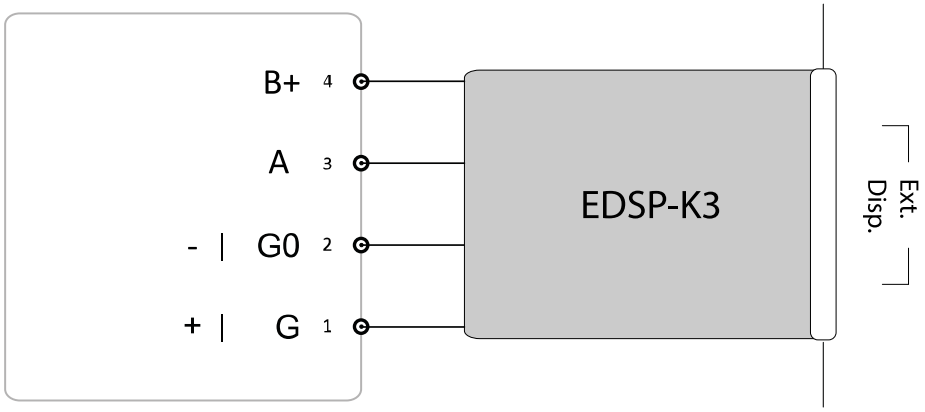


Figure 4-2 Wiring with an EDSP-K3 cable

Table 4-1 EDSP-K3 cable wiring

Terminal N and designator	EDSP-K3 wire color	Description
1 G	Black	24 V AC supply voltage input
2 G0	White	24 V AC voltage reference
3 A-	Yellow	Output signal to controller
4 B+	Brown	Input signal to controller

4.1.6 Wiring - RUX-..-D

Perform the connections according to the electrical wiring diagram.

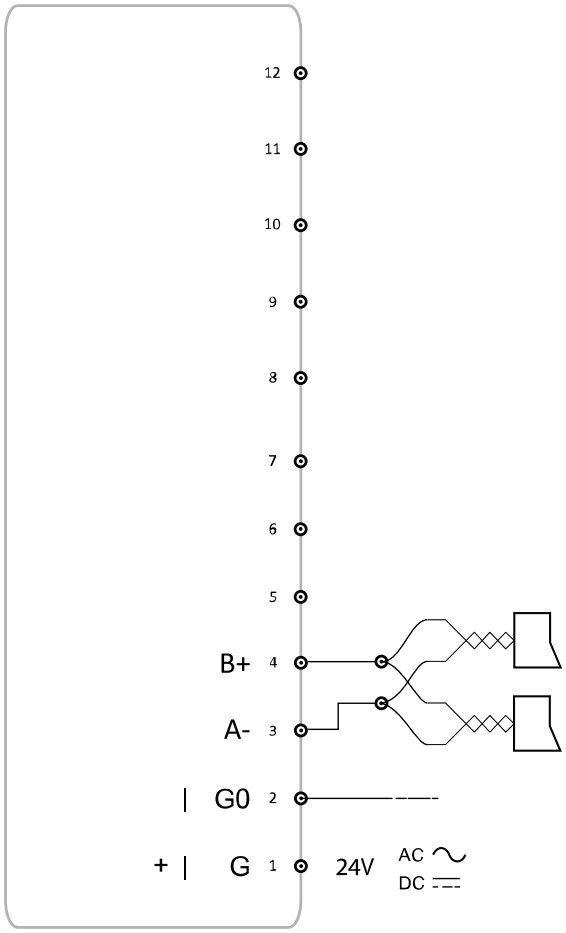


Figure 4-3 RUX-..-D wiring diagram

4.1.7 Using labels

On the back of the electronics cassette, there is a set of labels which make it easier to install a large number of RUX room units. By using the labels as carriers of information for the installation engineer, much time will be saved and you can keep wiring errors at a minimum.

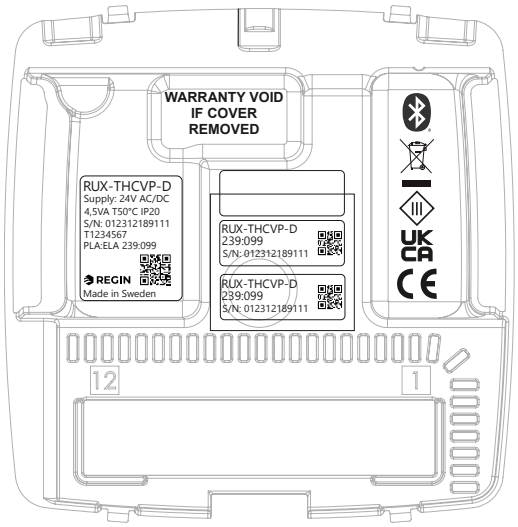


Figure 4-4 Labels on the back of the room unit (example label illustrated, may vary)

The three-piece label can be split and the two (2) smaller label parts to the right can be fastened to the installation drawing and the backplate of the room unit. The labels carry information on the communication address etc., and have QR codes and a note area where you can enter a reference number to the connection diagram.

4.1.8 Troubleshooting

It is possible to detach the terminal from the backplate when troubleshooting, and perform measurements on the terminal while the room unit is connected.

5 Conformity

Hereby, Regin declares that the radio equipment type Regio RUX series is in compliance with Directive 2014/53/EU.

Regio RUX series complies with EN IEC 60730-1, as a class A control.

This radio equipment device is approved for use in all countries within the European union.

CE

This product carries the CE-mark. More information is available at www.regincontrols.com.

Appendix A Technical data

A.1 General data

Supply voltage	24 V AC (50 - 60 Hz) or DC (tolerance: 18…28 VAC, 18..30 VDC)
Display	25 x 11 pixels
Power consumption	2.5 VA
Ambient temperature	0...50 °C
Ambient humidity	Max. 90 % RH
Storage temperature	-20…+70 °C
Terminal blocks	Pluggable screw terminal, for cable cross-section <= 2.1 mm^2
Protection class	IP30
Measuring range, temperature	0…50 °C
Temperature accuracy	±0.5°C at 15…30 °C
Humidity sensor accuracy	2,5 %RH @ 25°C full range
CO_2 sensor	0…2000 ppm Update frequency: 5 s
CO_2 sensor accuracy	±50 ppm + 5% (measured value,MV) @400-2000 ppm
PIR sensor, detection range	Detection angle 110°, distance 5 m at 8 °C temp. difference between object and room temp. = up to 7 m at 4 °C temp. difference between object and room temp. = up to 5 m (Target conditions: movement 1.9 m/s, object size approx. 700x250 mm) **Note!** Depending on the temperature difference between the target and the surroundings, detection range will change.
VOC sensor	VOC Index, range 0-500 (100 = 24 h average)
Mounting	Room/Wall
Weight	115 g
Dimensions	Low (RCX-BL) backplate assembly: 94.6 x 94.6 x 21 mm Medium (RCX-BM) backplate assembly: 94.6 x 94.6 x 31 mm

A.2 Communication

RS485	For EXOline (with automatic detection), Modbus (with automatic detection), or BACnet.
Communication cable length, maximum	1200 m, with repeater
Bluetooth® Low Energy	Bluetooth® communication.
Modbus RTU	8 bits, 1 or 2 stop bits. Odd, even or no parity.
Communication speed	9600, 19200, 38400, or 76800 bps (for all protocols)

A.3 Material

Cover	Polycarbonate (PC) (signal white) Acrylonitrile Butadiene Styrene (ABS) (jet black)
PCB Cover	Polycarbonate (PC)
Backplate assembly, incl. terminal	Polycarbonate (PC) (signal white) Acrylonitrile Butadiene Styrene (ABS) (jet black)
Colour, cover	RAL9003 (signal white) or RAL9005 (jet black)
Colour, backplate assembly	RAL9003 (signal white) or RAL9005 (jet black)

Appendix B Model overview

Table B-1 Room unit models

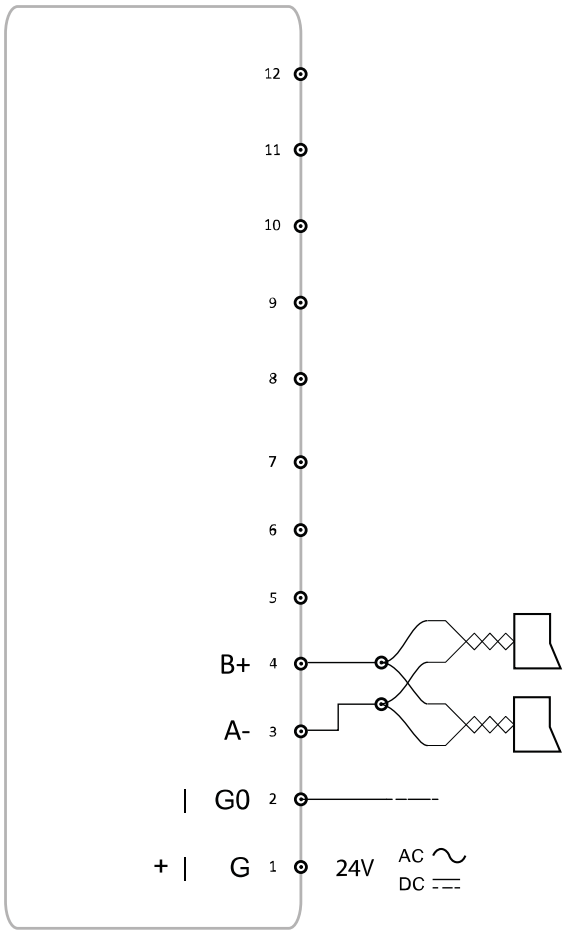
Article	Communi-cation	Display	Buttons	Tempera-ture sensor	Humidity sensor	CO_2 sensor	VOC sensor	PIR sensor
RUX-T-D	✓	✓	✓	✓				
RUX-TC-D	✓	✓	✓	✓		✓		
RUX-TH-D	✓	✓	✓	✓	✓			
RUX-THCVP-D	✓	✓	✓	✓	✓	✓	✓	✓
RUX-TC-D-BLACK	✓	✓	✓	✓		✓		
RUX-THCVP-D-BLACK	✓	✓	✓	✓	✓	✓	✓	✓

Table B-2 Backplate assembly models

Article	Description
RCX-BL	Backplate Low (signal white)
RCX-BM	Backplate Medium (signal white)
RCX-BL-BLACK	Backplate Low (jet black)
RCX-BM-BLACK	Backplate Medium (jet black)

Note! The backplate assemblies are sold separately.

Appendix C Terminal list



C.1 Wiring - Terminal list

See section *4.1.5 Wiring*.

Terminal	I/O
1	Power supply G +24 VAC
2	Power supply G0 –24 VAC
3	Communication A–
4	Communication B+

Appendix D Licenses

D.1 Cube MX

D.2 FreeRTOS

The FreeRTOS kernel is released under the MIT open source license, the text of which is provided below.

This license covers the FreeRTOS kernel source files, which are located in the /FreeRTOS/Source directory of the official FreeRTOS kernel download. It also covers most of the source files in the demo application projects, which are located in the /FreeRTOS/Demo directory of the official FreeRTOS download. The demo projects may also include third party software that is not part of FreeRTOS and is licensed separately to FreeRTOS. Examples of third party software includes header files provided by chip or tools vendors, linker scripts, peripheral drivers, etc. All the software in subdirectories of the /FreeRTOS directory is either open source or distributed with permission, and is free for use. For the avoidance of doubt, refer to the comments at the top of each source file.

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D.4 JSMN

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