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Radiation Detector



USER MANUAL

The developer continuously improves the firmware. Please use the latest version of the manual

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Quick Start

Radiacode Zero is a portable wide-range radiation detector and dosimeter for real-time radiation assessment. The device measures gamma and X-ray dose rate, accumulates dose, automatically logs measurements, and warns of radiation hazards.



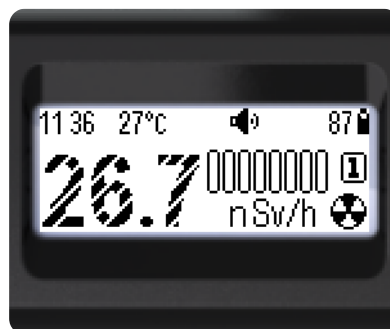
Step 1: Unpacking and charging

Unpack the device, check that it is intact and complete. Connect the USB Type-C cable to a charger (5 V, 0.5 A or more) or a computer USB port. Wait for a full charge — the blue indicator goes out.

If the device has been brought in from the cold, leave it in its packaging at room temperature for two hours before opening. Otherwise, moisture condensation may cause a malfunction.

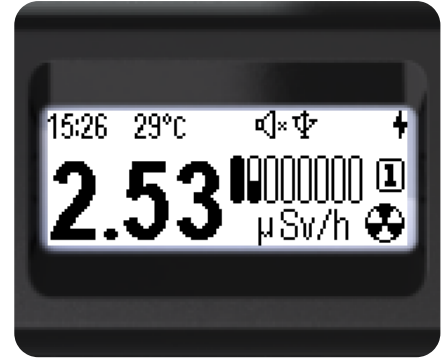
Step 2: Turning on

Press and hold the round button (at least 3 seconds). The device starts in Monitor mode and begins estimating the dose rate.



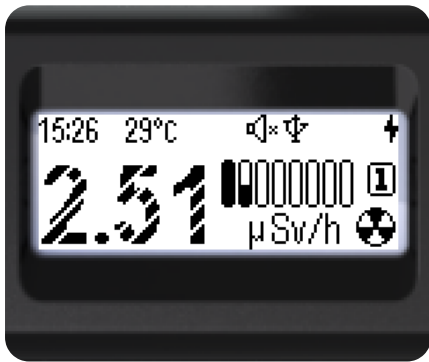


- Press and hold the round button until the device turns on (at least 3 seconds).
- When turned on, the device is in Monitor mode.
- If enabled, the “turning on” sound plays, the device vibrates and the display backlight turns on.

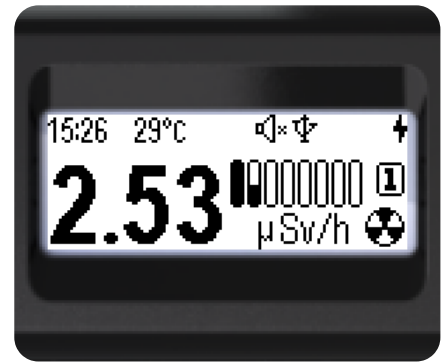


Step 3: Reading the values

The screen shows the current dose rate estimate. While not enough data has been accumulated, the result is low-confidence and is shown with hatched digits.



- Low-confidence values are shown with digits hatched with light diagonal stripes.
- When the value is valid, the digits are fully filled in.



Step 4: Connecting to a smartphone

Install the RadiaCode app from [Google Play](https://play.google.com/store/apps/details?id=com.radiacode), the [App Store](https://apps.apple.com/ru/app/radiacode/id1444444444) or the RadiaCode website: www.radiacode.com/downloads. Connect the device via Bluetooth for extended features: Google and OSM maps with GPS coordinates, charts, history, and external database storage.

Pairing is done from the app: turn on Bluetooth on the device and select it in the list of devices. No codes are required.

Additionally recommended:

- Set the current time (Settings → Time)
- Select the menu language (Settings → Language)
- Set up the screen: backlight and orientation
- Set up the signals: sound, vibration, light
- Update the device firmware

Safety

Important warnings

Keep the device out of the reach of children and pets.

Do not disassemble the device. Have the device repaired only at certified service centres.

Operating a faulty device is unsafe. If a fault is found, contact the manufacturer's service centre.

Handling rules

Temperature. Avoid exposure below -20°C or above $+45^{\circ}\text{C}$. Extreme temperatures reduce battery capacity, shorten its life, and may degrade detector performance.

Moisture. Despite IP64 protection, avoid getting the device wet. Water ingress voids the manufacturer's warranty. If water gets on the device, wipe it with a dry cloth.

Condensation. If the device has been brought in from the cold, leave it in its packaging at room temperature for two hours before opening. Otherwise, moisture condensation may cause a malfunction.

Handling. Do not grip the device tightly; press the buttons gently. Handle with care — the display can crack or get scratched.

Shocks. Drops, external impacts and rough handling may cause serious damage to the device electronics.

Electromagnetic interference. Avoid strong electromagnetic fields and electrostatic discharge. Electronic and household devices, cordless phones, and routers may interfere with the device operation.

Dust. Do not use or store the device in contaminated or dusty environments.

Heat. Avoid contact with hot objects and open flames. The battery may ignite if overheated.

Charging. Use only USB chargers rated at 5 V and at least 0.5 A, or a computer USB port. Do not use faulty chargers. Connect the USB cable carefully. Damage caused by improper charging is not covered by the manufacturer's warranty.

Firmware update. Do not disconnect the device during a firmware update — interrupting the process may cause a malfunction that can only be fixed by the manufacturer's service centre.

Radioactive contamination. Avoid contaminating the device with radioactive materials. When working in potentially contaminated areas, place the device in a sealed bag.

About the device

What Radiacode Zero can do

Radiacode Zero is a compact radiation detector and dosimeter based on a plastic tissue-equivalent scintillator with a silicon photomultiplier (SiPM) and temperature compensation. Thanks to adaptive data processing, the device provides a fast response to changes in the radiation background and high reliability at high doses of ionizing radiation. The device is suitable for fieldwork, inspection of various objects and materials, and continuous environmental monitoring.



With Radiacode Zero you always have:

- Area survey and inspection of various objects and materials
- Continuous radiation monitoring
- Automatic data logging to device memory; time-stamped database
- Accumulated dose monitoring
- Radiation source search
- Alarms for radiation hazards and changes in the radiation environment
- Standalone operation or paired with a smartphone/computer
- Wired and wireless data transfer; processing in apps for iOS, Android, macOS and Windows

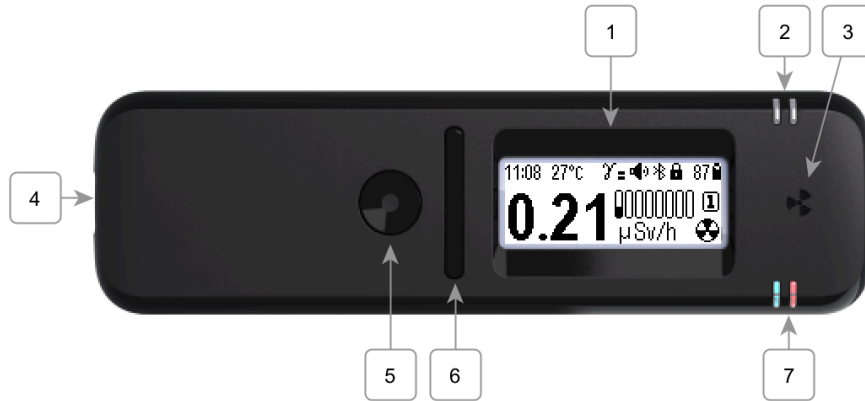
Device features:

- Fast response thanks to the plastic scintillator with SiPM and adaptive data processing
- Continuous estimation of the detector count rate, dose rate and accumulated dose. Estimation and data accumulation do not depend on the selected display mode
- Wide measurement range thanks to two operating ranges and a tissue-equivalent scintillator
- IP64 — dust and splash protection
- Long standalone operation (up to 200 hours)
- 6 independent alarm thresholds (2 each for count rate, dose rate, and dose)
- Non-volatile memory for approximately 1000 hours of observations; transfer via USB and Bluetooth; external database storage

- GPS coordinate tagging and display on Google and OSM maps (with a smartphone)
- Apps for Windows, macOS, Android, and iOS
- Ongoing development; firmware updates
- Energy-efficient graphic display with backlight; adaptive screen orientation
- Sound, light and vibration indication, duplicated on a smartphone

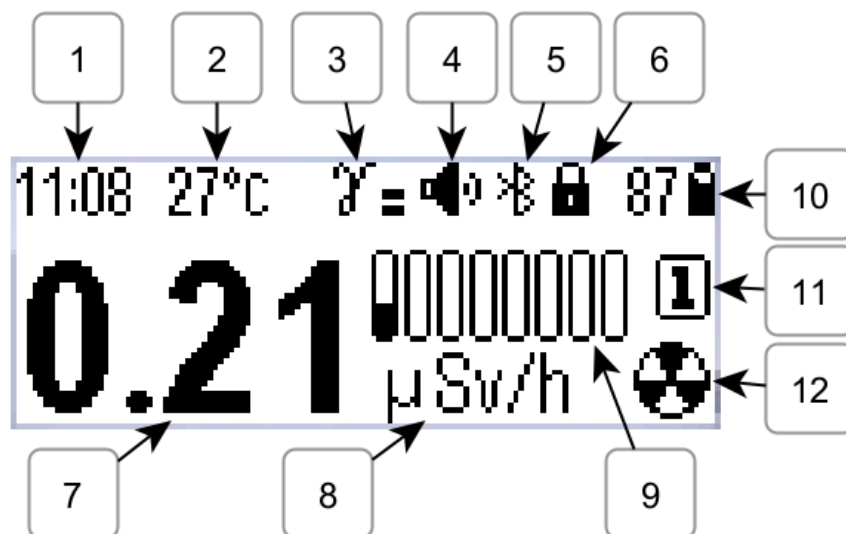
Design elements

Design elements, controls and indicators of Radiacode Zero:



1. LCD display
2. Ambient light sensor
3. Location of the radiation sensor, digital thermometer, and orientation sensor
4. USB Type-C port for charging and data exchange
5. Power and confirmation button
6. Swing buttons (up and down)
7. Light indication: charging (blue); photon registration (green — normal, red — alarm threshold exceeded)

Main mode display indicators



1. Current time
2. Radiation sensor temperature
3. Alarm sign and level
4. Sound indication status
5. External device connection status (Bluetooth, USB)
6. Lock icon
7. Current dose rate / count rate estimate
8. Dose rate / count rate units
9. Graphical dose rate indicator
10. Battery level and charging status
11. Operating range indicator (1 – pulse mode, 2 – current mode)
12. Display mode icon

Technical specifications

Parameter	Value
Dosimetric quantity	H*(10) — ambient dose equivalent rate
Units	Sv, rem, cps, cpm
Detector	Plastic scintillator 14×14×14 mm with SiPM (temperature compensated)
Alarm signalling	Sound, vibration, light
Alarm thresholds	6 (2 each for cps, dose rate, dose)
Type of radiation	Photons (gamma, X-ray)
Energy range (dose measurement)	100 keV–3.0 MeV
Energy range (indication)*	30 keV–3.0 MeV
Count rate range (Cs-137)	0–144 M cps
Dose rate range	0.1 µSv/h–9000 mSv/h
Dose rate error	±20%
Accumulated dose	0–100 Sv, error ±20%
Sensitivity Cs-137 (662 keV)	16 cps/(µSv/h)
Sensitivity Co-60 (1250 keV)	8 cps/(µSv/h)
Display update period	0.5 s

Memory	≈1000 hours (non-volatile)
Continuous operation time	Up to 200 hours
Battery	Li-Pol 3.7 V, 1500 mAh
Charging: voltage / max current / time	5 V / 750 mA / ≈4 h
Max USB consumption	800 mA
Protection	IP64 (dust and splashes)
Operating temperature	-20...+45 °C
Max humidity	85%
Wireless interface	BLE 5.2
Wired interface	USB 2.0+, Type-C
Display	Monochrome LCD 128×48, 34×13 mm, FSTN, transfective, positive
Dimensions (W×H×D)	127×34×21 mm
Weight	76 g

** In the 30–100 keV range the device registers radiation, but dose rate readings may deviate from the actual values due to the detector's energy response. In other words, the device will detect the presence of radiation but will measure it with a larger error than in the main range of 100 keV–3.0 MeV.*

System requirements

Computer: Windows 8/10/11, 2 GB RAM or more, 1 GB free disk space, USB port, 1024×768 display or better.

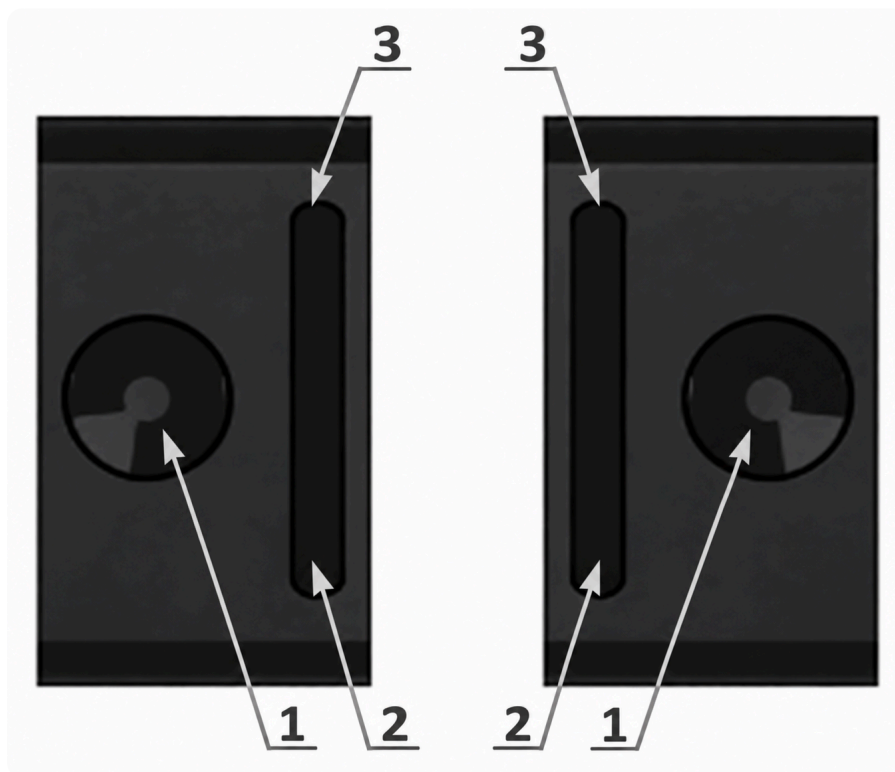
Android: version 6.0 or higher.

iOS/macOS: iOS 17.0+ / macOS 14.0+ (Mac with Apple Silicon).

Controls and display

Buttons

The device has an intuitive menu system and is controlled by three buttons. Sound and vibration indication also help in operating the device. Which swing button is “up” and which is “down” depends on the screen orientation.



The device in the left and right hand:

1. Power and confirmation button, round.
2. “Down” swing button.
3. “Up” swing button.

Two types of button presses: short and long (at least 3 seconds).

Long press on the round button [1]: turn on, unlock/lock the swing buttons, confirm viewing of the alarm list, confirm in some settings screens.

Short press on the round button: open the menu, return from the menu, confirm a selection, cycle through options, turn off alarm signals.

The swing buttons lock automatically after 5, 10, 15, 30 s, 2 or 5 min of inactivity, together with the screen backlight turning off. The status bar then shows the icon . This time is set in the backlight settings with the [Duration] parameter. To unlock — long-press the round button; the backlight turns on again. Exception — [Auto] mode: in bright light the backlight stays off, but the buttons are unlocked. To lock again — long-press the round button.

Short press on the swing buttons [2, 3]: move between menu items, set values, additional functions in the display modes.

Long press on the swing buttons [2, 3] depends on the context. In menus — fast scrolling. In display modes, long press on the “up” swing button turns the sound indication on/off.

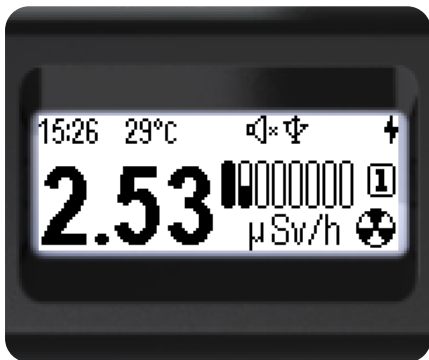
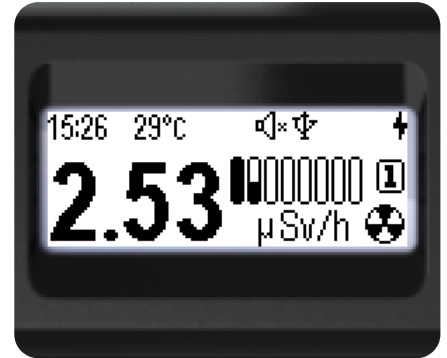
When navigating any menu level, the selected item is highlighted in negative — light on dark.

Every button press is accompanied by a short sound and vibration (if enabled). Button press sound and vibration can be disabled.

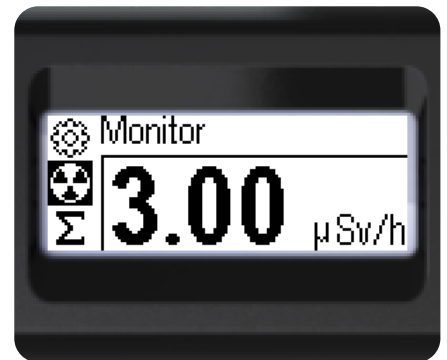
Turning on and off



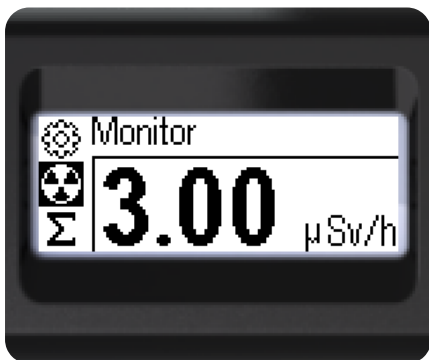
- Press and hold the round button until the device turns on (at least 3 seconds).
- When turned on, the device is in Monitor mode.
- If enabled, the “turning on” sound plays, the device vibrates and the display backlight turns on.



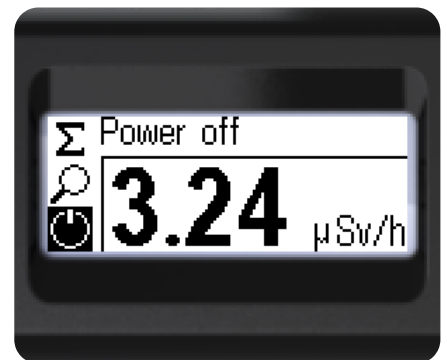
- To turn off, short-press the round button — the menu appears.
- The lock icon means the swing buttons are locked. To unlock, hold the round button (at least 3 seconds).



Lock icon:  — swing buttons are locked.



- Using the swing buttons, navigate to the [Power off] icon.
- Short-press the round button to turn the device off.
- If enabled, the “turning off” sound plays. The screen goes dark.



Power-off icon: 

Indication: sound, vibration, light

Radiacode Zero has built-in sound and vibration sources to acknowledge button presses and to indicate events and alarms. Light indication is provided for monitoring from a distance. For visual monitoring, the main states are shown as icons on the display.

Sound can accompany:

- Turning the device on and off
- Button press
- Bluetooth connection established
- Photon registration
- Alarm threshold exceeded
- Low battery charge
- Response to the "Find the device" request

Vibration can accompany:

- Turning the device on and off
- Button press
- Alarm threshold exceeded
- Response to the "Find the device" request

Light indication:

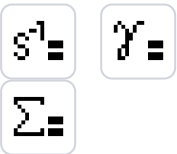
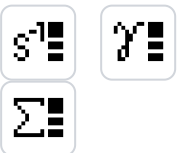
- Battery charging — blue, steady
- Photon registration under normal conditions — green, flash
- Photon registration during an alarm — red, flash

Signals can be turned on/off by groups:

- All sounds
- Button press sound
- Photon registration sound
- All vibration types
- Light indication

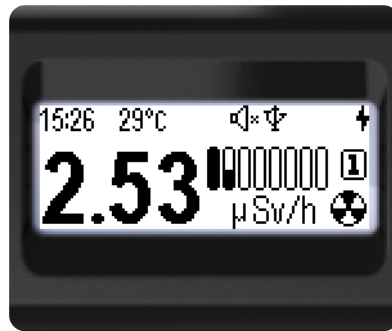
Summary table of events and signals:

Event / state	Screen	Sound	Vibration	Light
Turning on	—	+	+	—
Turning off	—	+	—	—

Establishing a connection	 	+	–	–
Loss of connection	–	+	–	–
Low battery charge		+	+	–
Charging		–	–	blue — continuous
Find the device	–	+	+	–
Button press	–	+	+	–
Photon registration	–	+	–	green, red — flashes
Alarm 1		+	+	–
Alarm 2		+	+	–
Over-range		+	+	–
Temperature alarm		+	–	–

Sound, light and vibration complement the information on the display and provide a response when buttons are pressed.

Display



Display: monochrome graphic LCD, 128×48 pixels, 34×13 mm, FSTN, transfective, positive

The display has a backlight for use in the dark. Automatic ambient light detection ([Auto] mode): the backlight turns on only when a button is pressed; in bright light (for example, in the sun) it does not turn on. The backlight has 10 brightness levels. Screen orientation: [Auto] / [Right] / [Left]. Brightness and orientation are set in the [Settings] menu.

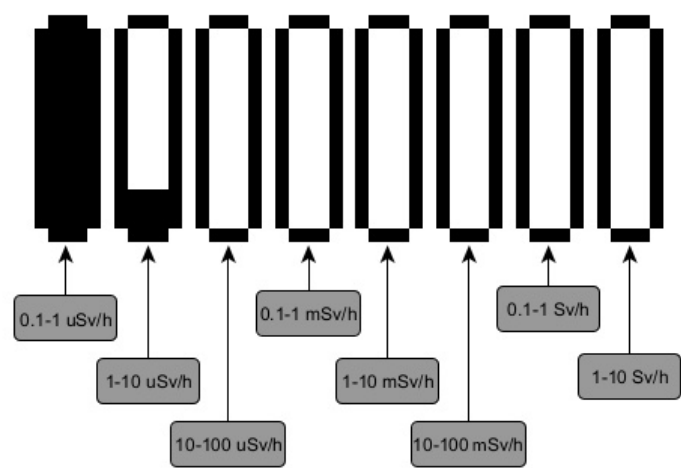
The display shows: the device status, numerical and graphical display of the measured quantities, the control menu and the settings menu.

Measurement results are shown in several display modes: Monitor mode (dose rate estimate), Dose mode (accumulated dose), Search mode (real-time data visualization). In these modes the status bar is at the top of the display; its content depends on the selected display mode. The icons used are described in detail in section "Icons and symbols".

Icons and symbols

Logarithmic indicator

In all display modes except settings, a logarithmic indicator is shown. Each vertical bar represents a value (dose rate, dose, count rate) on a logarithmic scale. Adjacent bars differ by a factor of 10:



Status bar icons

Icon	Description
	100–90% charge, running on battery
	Less than 90% charge
	Less than 80% charge
	Less than 70% charge

	Less than 60% charge
	Less than 50% charge
	Less than 40% charge
	Less than 30% charge
	Less than 20% charge
	Less than 10% charge — charge the battery
	Charging in progress
	Fully charged, powered externally
	Swing buttons locked
	USB connection established
	Bluetooth connection established
	All sounds off

	Sounds on
	Count Rate Alarm 1
	Count Rate Alarm 2
	Count Rate over-range
	Dose Rate Alarm 1
	Dose Rate Alarm 2
	Dose Rate over-range
	Dose Alarm 1
	Dose Alarm 2
	Dose over-range
	Low temperature threshold crossed — Overcooling
	High temperature threshold crossed — Overheating

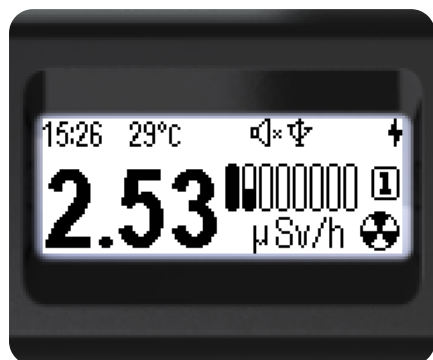
	Range 1 (pulse mode) icon
	Range 2 (current mode) icon

Note: on Radiacode Zero, the battery charge percentage is displayed next to the graphical battery icon.

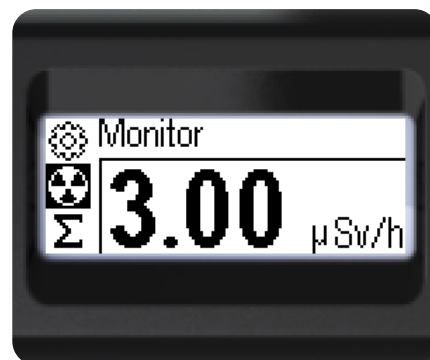
Menu item icons

Icon	Item	Description
	Settings	Device settings menu
	Monitor	Current dose rate or count rate display
	Dose	Accumulated photon radiation dose (gamma and X-ray)
	Search	Search mode — count rate displayed as a graph
	Power off	Turning off
	Device info	Serial number and firmware version

Menu navigation



- Briefly press the round button to enter the menu.
- At the top — the name of the current menu item (e.g. “Monitor”).
- Menu item icons are arranged vertically.
- The active item is highlighted in negative — light on dark.



Six items are available at the main menu level. Three are visible at a time; scroll with the swing buttons for the rest. The menu is cyclic at all levels.

Cyclic order when pressing the “down” button:



To select an item — short-press the swing buttons. To confirm — short-press the round button.

To exit submenus, use [< Back] or [<< Menu quit].

Display modes

Modes overview

Radiacode Zero operates in a single mode — continuous data collection, accumulation, and analysis. At any time, one of the following display modes is available:

-  Monitor — dose rate and count rate estimation
-  Dose — accumulated dose estimation
-  Search — operational search for radiation sources

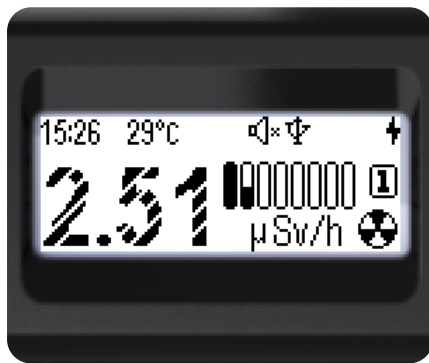
While operating, the device tracks all alarm threshold exceedances, informing the user of radiation hazards or changes in the environment.

Monitor

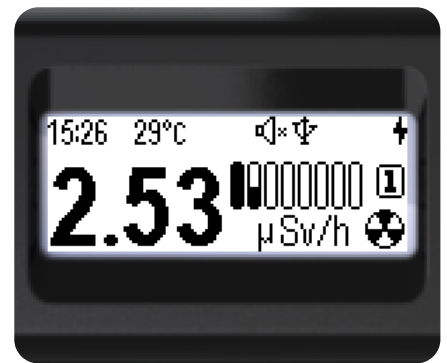
On startup, the device operates in this mode. All incoming data is accumulated and analysed. When a change in the radiation environment is detected, the device starts a new accumulation interval. When no changes are detected, it continues averaging to increase the confidence of the estimate.

Displayed values are considered valid if:

- their random error does not exceed 30% for the dose rate and 50% for the count rate
- the device sensor temperature is below +45 °C

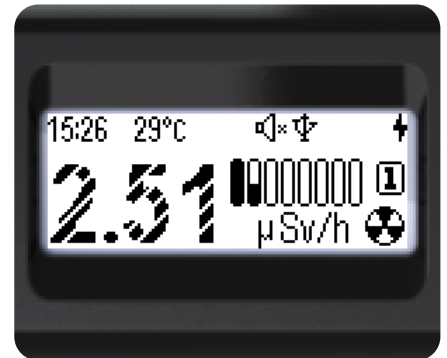


- Low-confidence values are shown with digits hatched with light diagonal stripes.
- Valid values are shown with fully filled digits.

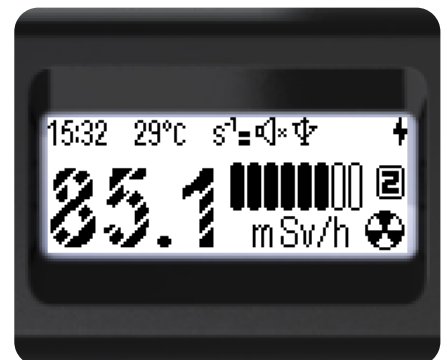


Two operating ranges:

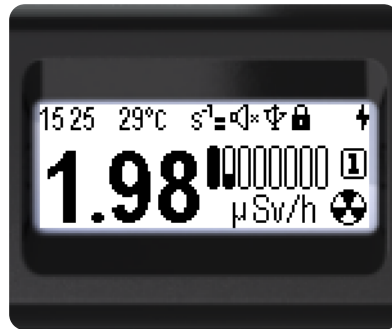
Pulse mode (1): from 0.1 μSv/h to 1 mSv/h. Data comes from the scintillator by registering individual flashes, which allows estimating low radiation levels and searching for sources. Energy response compensation uses a predefined calibration function programmed at the factory. Clicks and count rate are available — the device clicks on each registered photon and shows cps values.



Current mode (2): 1 mSv/h to 9 Sv/h. A different mechanism is used for real-time dose rate estimation based on an integral value. Clicks and detector count rate remain available, but the click tone is different in this mode. This mode is required for operation in high radiation fields.



Monitor mode screen:



Status bar (top, left to right):

15:25 29°C s¹ □ * Ψ □ ⚡

- Current time: hours, minutes
- Radiation sensor temperature
- Threshold exceedance sign for dose rate, dose, count rate or temperature
- Sound indication status
- Bluetooth or USB connection status
- Lock icon
- Battery status

Bottom of the screen: dose rate or count rate estimate, logarithmic indicator, range number

( / ), units (Sv/h, rem/h or cps, cpm), current mode icon ( Monitor).

Units can be selected via the menu: Sv/h or rem/h for dose rate display; cps or cpm for count rate display.

The radiation intensity type (dose rate or count rate) can be selected via the menu or switched quickly using the device buttons.

Hotkeys:

- Short ▲ — toggle dose rate ↔ count rate (pulse mode only)
- Long ▲ — sound indication on/off
- Short ▼ — turn clicks on/off (pulse mode only and only when sound is on)

When alarm thresholds are exceeded — pulsing icons appear:

Dose rate:

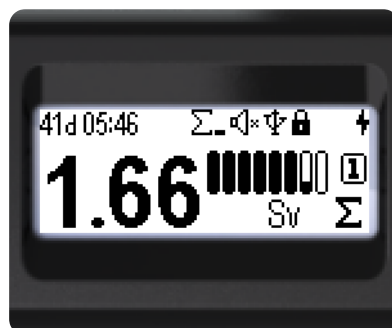
“Alarm 1” —  ; “Alarm 2” —  ; “Out of scale” — 

Count rate:

“Alarm 1” —  ; “Alarm 2” —  ; “Out of scale” — 

Dose

The mode shows the accumulated dose.



Status bar:

41d 05:46 Σ- 🔊 🔒 🔋

- Time since dose accumulation started: days, hours, minutes
- Alarms; sound; connection; lock; battery

Bottom of the screen: dose value; logarithmic indicator, range number, units (Sv or rem), mode icon.

Hotkeys:

- Long ▼ — reset (zero) the accumulated dose
- Long ▲ — sound indication on/off

When a dose alarm threshold is exceeded:

“Alarm 1” — ; “Alarm 2” — ; “Out of scale” —

Search

The mode shows the count rate as a search graph — for an operational search for a source or an area with an elevated radiation level.



Status bar:

1/2s 24.0 cps 🔔 🔌 🔒 🔋

- Averaging time per bar: 1/2, 1, 2, 4 seconds
- Current count rate value; units (cps or cpm)
- Alarms; sound; connection; lock; battery

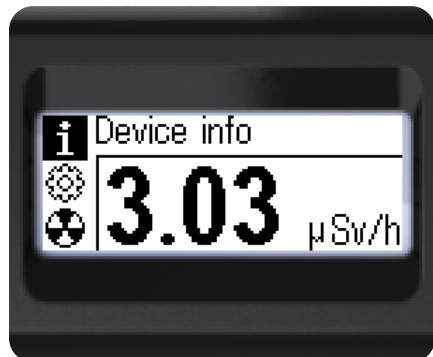
Bottom of the screen: logarithmic count rate indicator, search graph, range, mode icon.

Hotkeys:

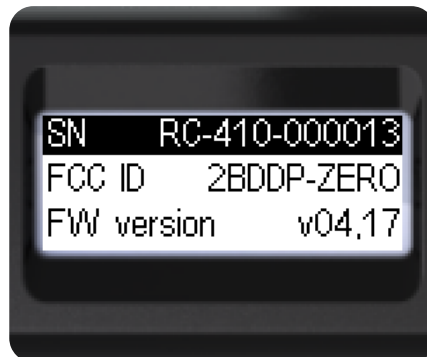
- Short ▲ — decrease averaging time
- Short ▼ — increase averaging time
- Long ▼ — clear screen, start new search session
- Long ▲ — sound indication on/off

Device info

Brief information: model, serial number, firmware version, bootloader version.



- Device model and serial number.
- Firmware version.
- Bootloader version.



Alarm system

How alarms work

Alarm sources are divided into two groups:

- Main — the current count rate, the current dose rate, the accumulated dose
- Additional — the current radiation sensor temperature

The device constantly compares the current values of the measured quantities with the corresponding thresholds. Depending on the direction in which a threshold is crossed, either an Alarm Event or an Alarm Clear Event is generated. Any Alarm Event switches the device from the Normal State to the Alarm State. After Alarm Clear Events have cleared all alarms, the device returns to the Normal State.

Main alarms

All main alarm sources have three alarm thresholds.

If the current count rate, dose rate, or dose value crosses any threshold from below, an Alarm Event is triggered: first threshold — Alarm 1; second threshold — Alarm 2; upper scale limit — Over-range.

The first and second level thresholds are set in the settings for each source separately and can be changed at your discretion. The third threshold is the upper limit of the measured quantity's scale and cannot be changed via the menu.

Each main alarm source defines one of 4 states:

- Normal — value below the first threshold (no alarm)
- Alarm 1 — value above the first threshold but not above the second
- Alarm 2 — value above the second threshold but not above the third
- Out of scale — value above the third threshold, beyond the scale

Additional alarms

The radiation sensor temperature is an additional alarm source with two thresholds — upper and lower.

If the temperature rises above the upper threshold or falls below the lower threshold, a temperature Alarm Event occurs.

The temperature thresholds correspond to the operating temperature limits given in the technical specifications. These values are fixed and cannot be changed via the menu.

The temperature defines one of 3 states:

- Normal — value above the lower threshold and below the upper one (no alarm)
- Overcooling — value below the lower threshold
- Overheating — value above the upper threshold

Alarm Signals

Each Alarm Event has Alarm Signals: a sound signal and a vibration signal. They can be turned on and off in the settings independently — for each level of any source. Stop the signal with a short press on the round button; it sounds again at the next Alarm Event.

The Alarm State is indicated by:

- Red LED flashes (Range 1 only)
- Alarm icons in the display status bar
- Line of unacknowledged alarms
- Dialog box with alarm icons

Icon	Description
	Count Rate Alarm 1
	Count Rate Alarm 2
	Count Rate over-range
	Dose Rate Alarm 1
	Dose Rate Alarm 2
	Dose Rate over-range
	Dose Alarm 1

	Dose Alarm 2
	Dose over-range
	Overcooling alarm
	Overheating alarm

Light signals can be turned on/off in the settings (Range 1 only).

Device behaviour on an Alarm Event

For Alarm Events whose sound and vibration signals are disabled in the device settings, the current Alarm State is shown by the corresponding icons in the display status bar.

For Alarm Events whose sound and/or vibration signals are enabled, the alarm signalling turns on: the device vibrates and emits the alarm sound. A short press on the round button turns the signalling off. After an alarm signal, the device waits for the user to explicitly acknowledge it (turning the signalling off with a short press is not an acknowledgement). The alarm is acknowledged only with a long press on the round button. The display then shows the line of maximum recorded alarm levels, either in the status bar:



or as a dialog box:



After the alarms are acknowledged, the previous screen is restored. The current active Alarm States of all sources are shown in the normal status bar by the corresponding icons, alternating.

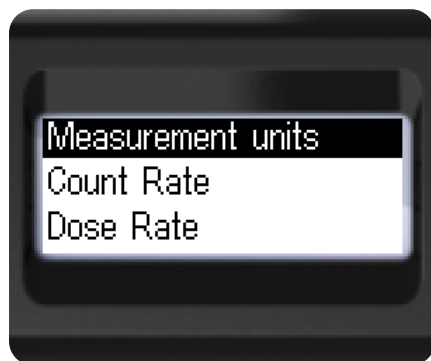
When the level of an acknowledged alarm decreases, only its icon in the status bar changes.

When an acknowledged alarm returns to Normal, its icon disappears from the status bar. Note that an accumulated dose alarm ends only when the dose is reset or its threshold is changed.

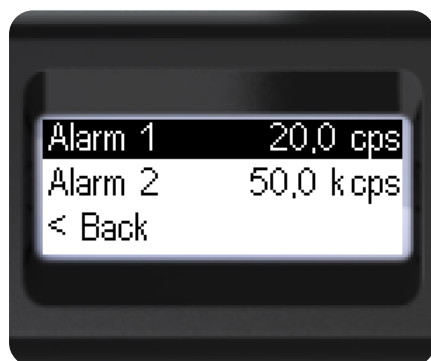
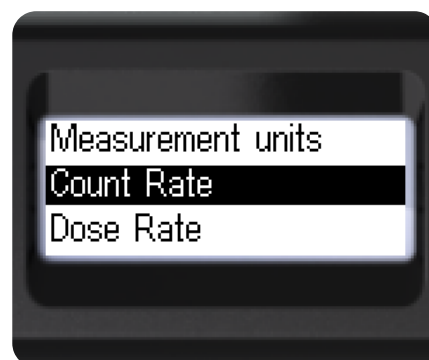
Setting alarm thresholds

For each of the three quantities (count rate, dose rate, accumulated dose) two alarm thresholds can be set. The procedure is the same.

Count rate — alarm levels



- Navigate to [Count Rate]. Enter the submenu.

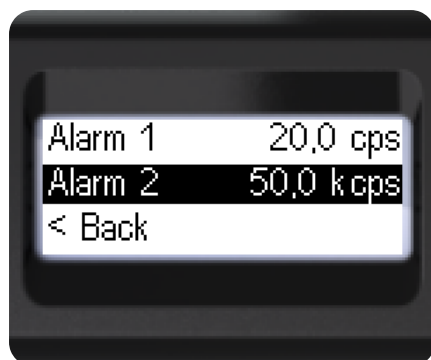


- Enter [Alarm 1]. Select a digit, change its value. Set all digits.



- Select [Enter] or [Esc]. Long-press to confirm.

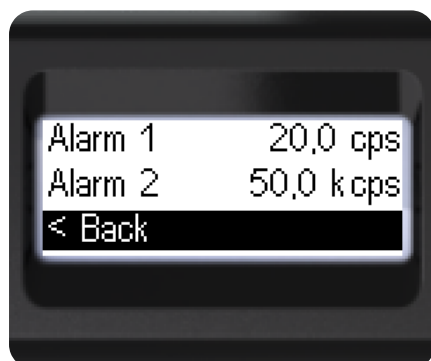




- Navigate to [Alarm 2]. Same procedure.



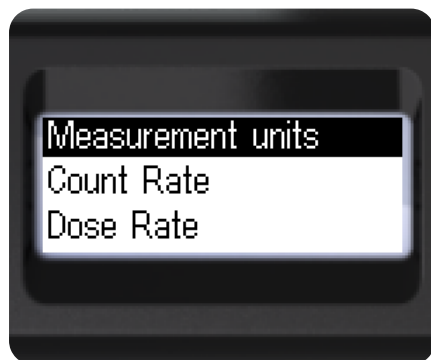
- [Enter] or [Esc]. Long-press to confirm.



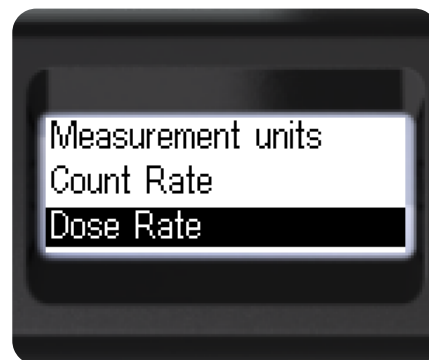
- To go back: [< Back] or [<< Menu quit].

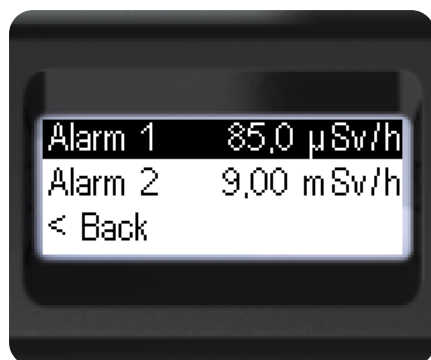


Dose rate — alarm levels



- Navigate to [Dose Rate]. Enter the submenu.

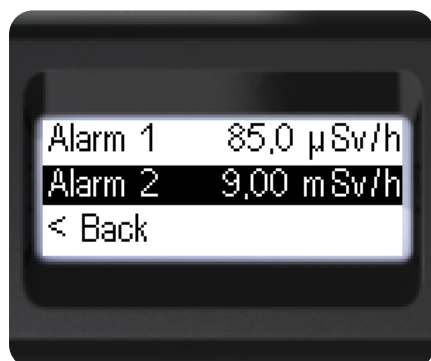




- Enter [Alarm 1]. Select a digit, change its value.



- [Enter] or [Esc]. Long-press to confirm.

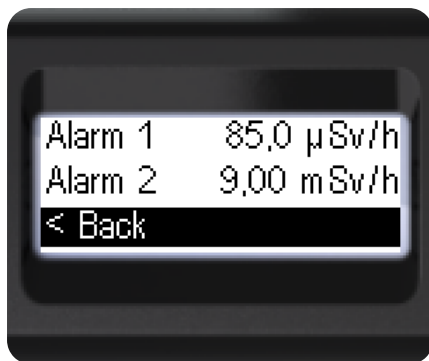


- Navigate to [Alarm 2]. Set values.



- [Enter] or [Esc]. Long-press to confirm.

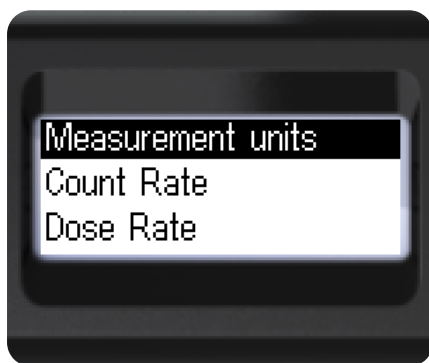




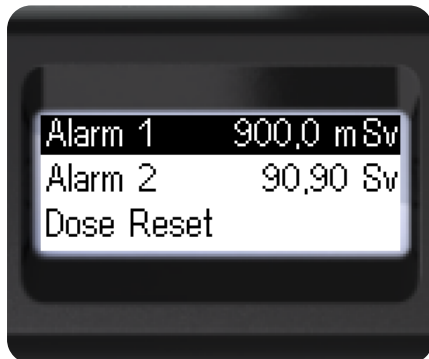
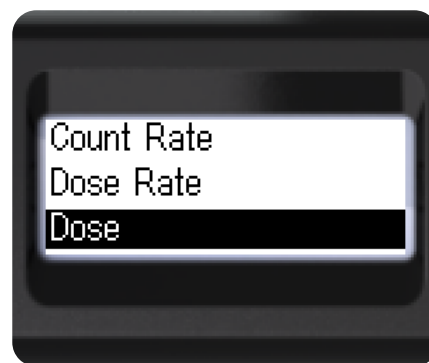
- To go back: [< Back] or [<< Menu quit].



Dose — alarm levels



- Navigate to [Dose]. Enter the submenu.

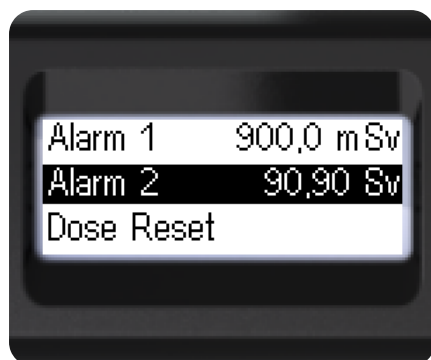


- Enter [Alarm 1]. Select a digit, change its value.



- [Enter] or [Esc]. Long-press to confirm.

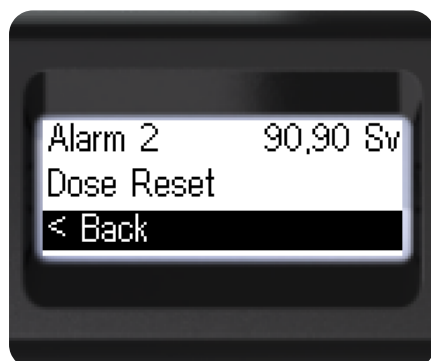




- Navigate to [Alarm 2]. Set values.



- [Enter] or [Esc]. Long-press to confirm.



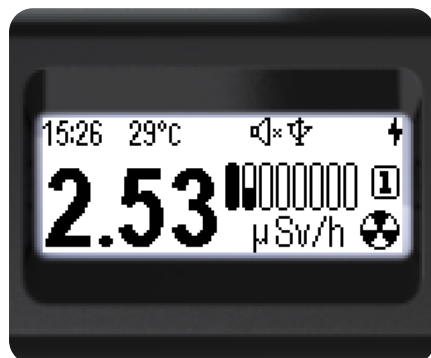
- To go back: [< Back] or [<< Menu quit].



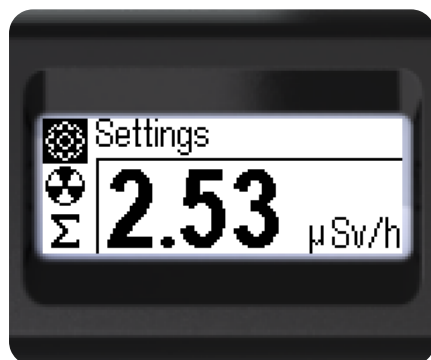
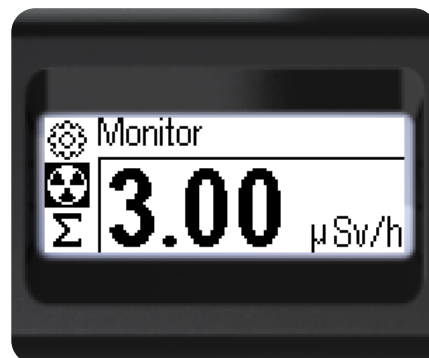
Settings

Settings menu

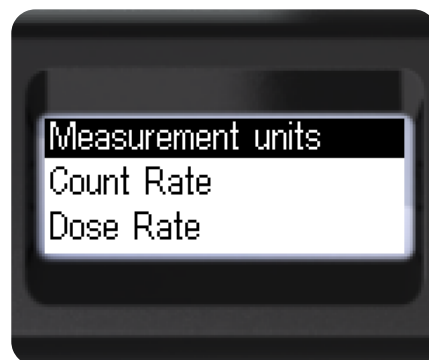
All settings are accessible via the menu: round button →  Settings.



- Briefly press the round button to enter the menu.

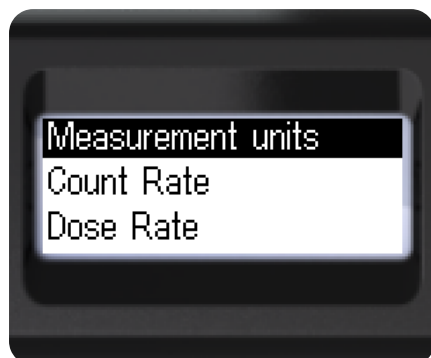


- Navigate to [Settings]. Confirm.

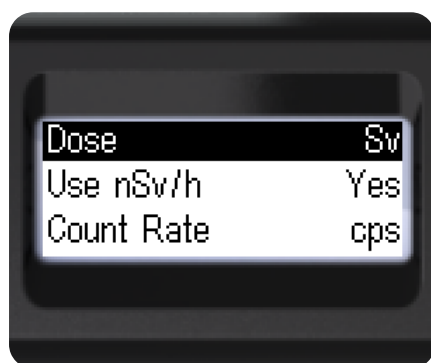
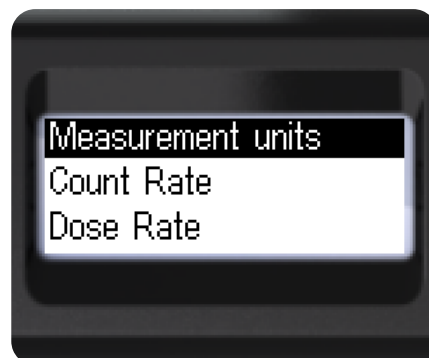


Use the swing buttons to navigate to the desired item. Exit via [< Back] or [<< Menu quit].

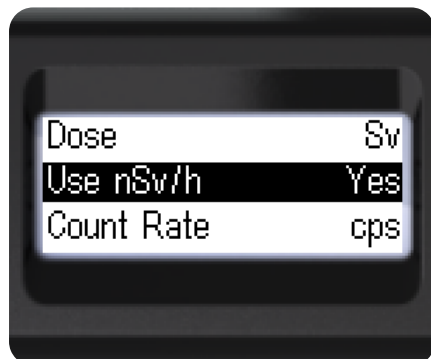
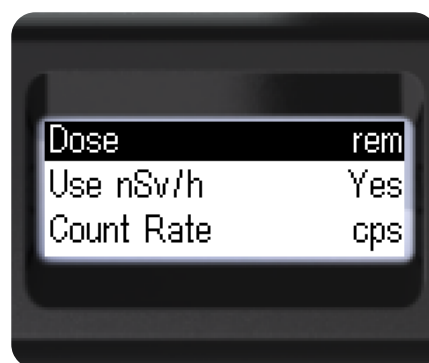
Selecting units of measurement



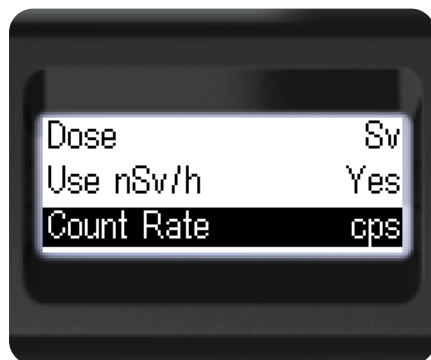
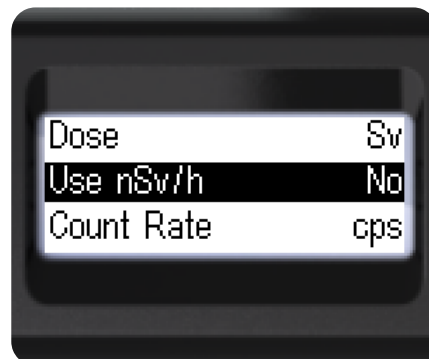
- Navigate to [Measurement units]. Enter the submenu.



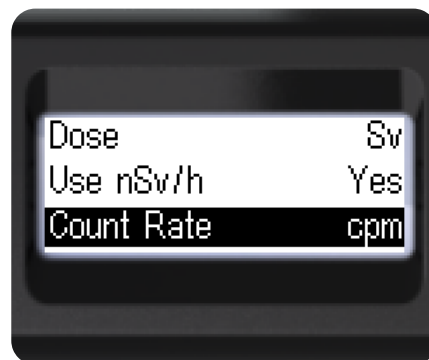
- Select dose rate units: Sv — sievert or rem. Move focus to [Use nSv/h].

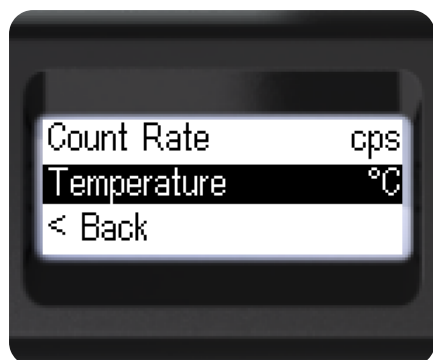


- Choose whether to use nSv/h when Sv is selected: [Yes] or [No]. Move focus to [Count Rate].

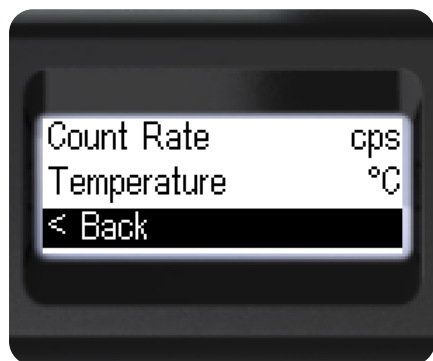
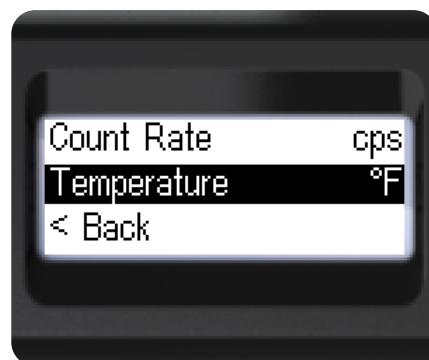


- Select count rate units: cps — counts per second or cpm — counts per minute.





- Select temperature units: °C — Celsius or °F — Fahrenheit.

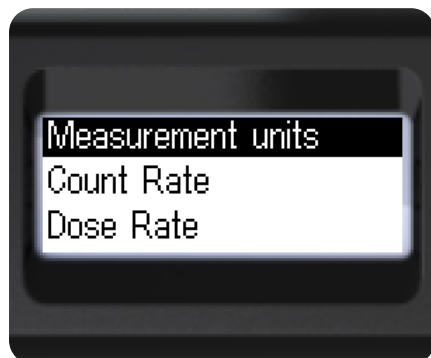


- To go back: [< Back] or [<< Menu quit].

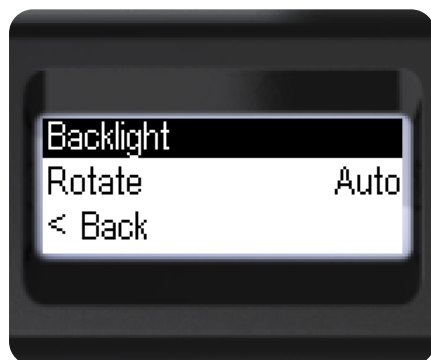
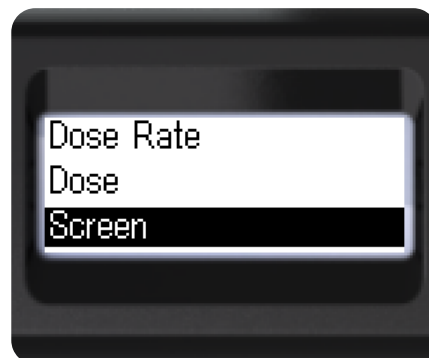


Screen settings

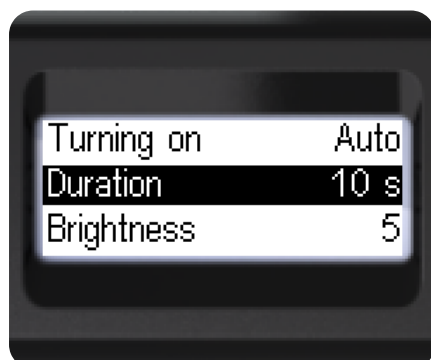
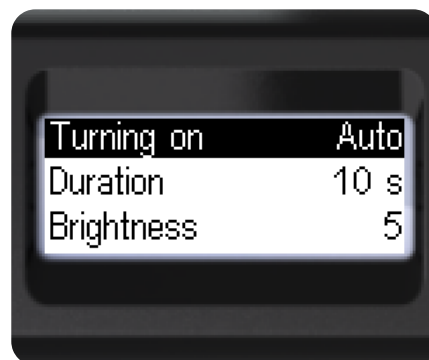
Backlight brightness: 0–9 (default 5). Lower levels reduce battery consumption. [Duration]: 5, 10, 15, 30 s and 2, 5 min. [Turning on]: [Auto] / [By button] / [Never]. [Rotate]: [Auto] / [Right] / [Left].



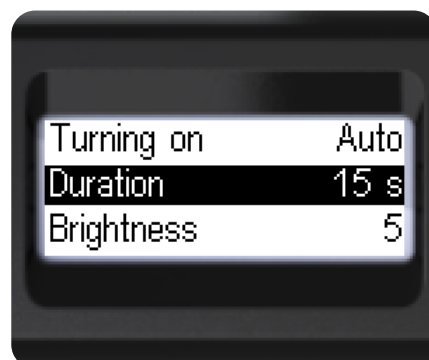
- Navigate to [Screen]. Enter the submenu.

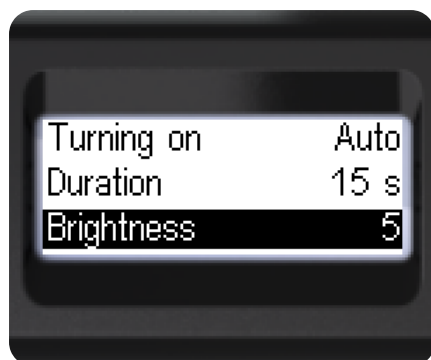


- Enter [Backlight]. Select mode: [Auto], [Never] or [By button].



- Select duration: 5, 10, 15, 30 s or 2, 5 min.

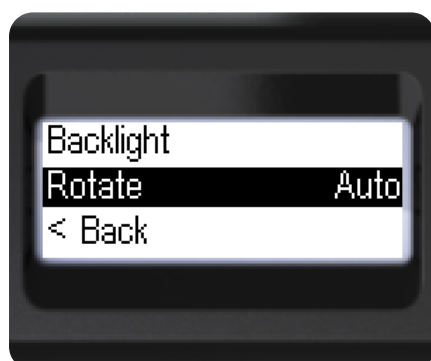




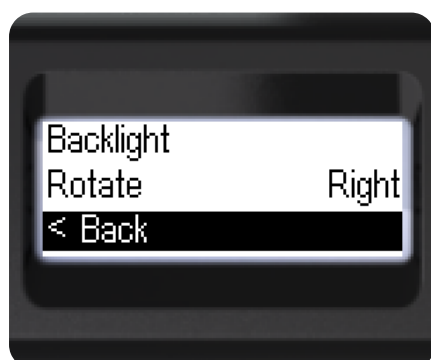
- Select backlight brightness from 0 to 9.



- [< Back] to go back.



- Navigate to [Rotate]. Select: [Auto], [Right] or [Left].



- [< Back] to go back.

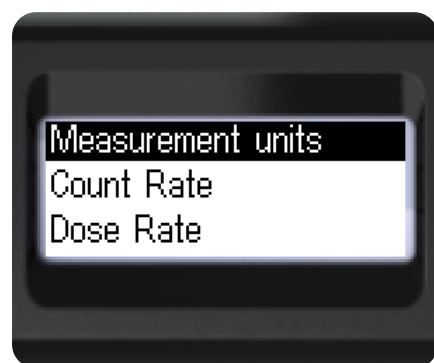


- To go back: [< Back] or [<< Menu quit].

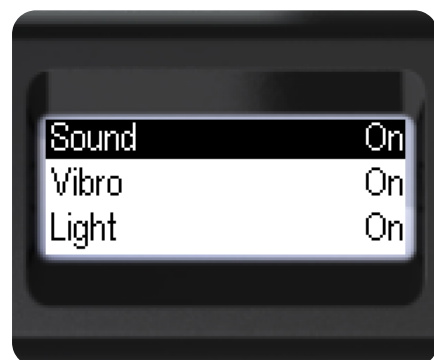
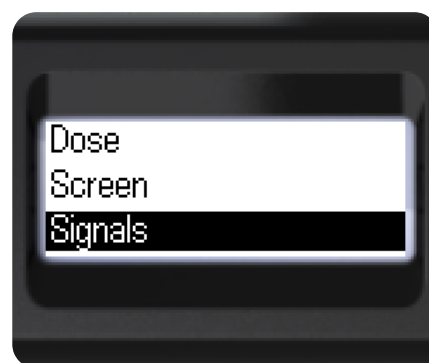


Signals — sound, vibration, light

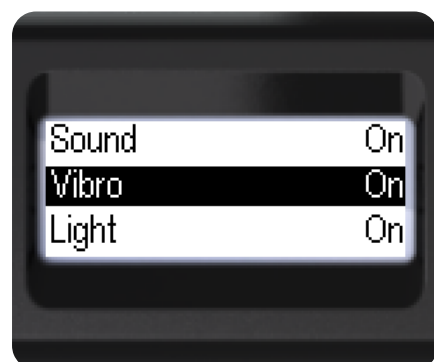
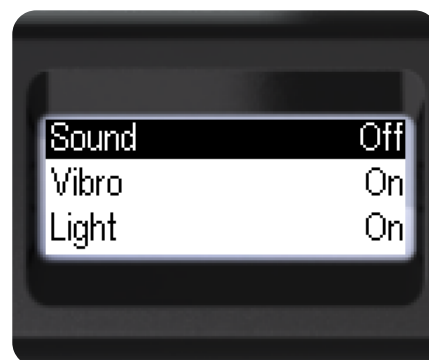
Combined interface: display, buttons, sound emitter, LEDs, vibration motor. Individual settings are available for alarm sounds, button response, and clicks.



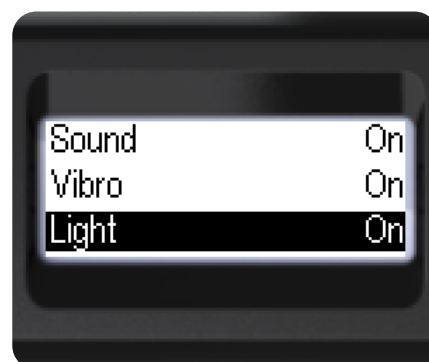
- Navigate to [Signals]. Enter the submenu.



- [Sound]: [On] — all enabled sounds, or [Off] — only search and out-of-scale signals remain.



- [Vibro] and [Light]: [On] or [Off].

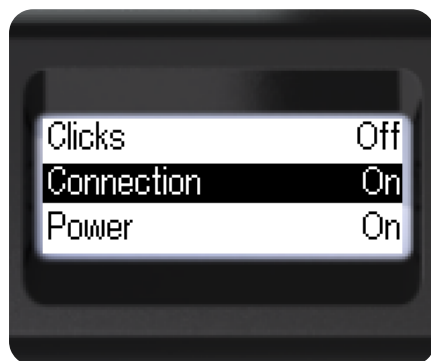
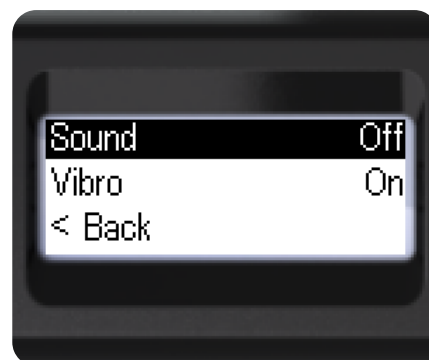


- [Clicks] — gamma and X-ray photon registration clicks. [On] or [Off].

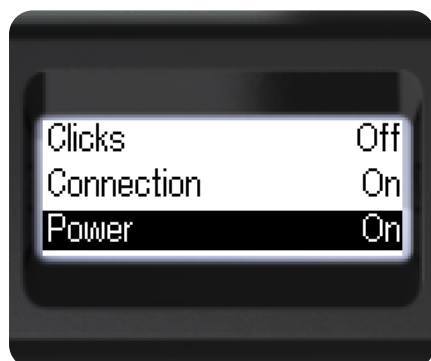




- [Buttons]: [Sound] or [Vibro] – select the response type.



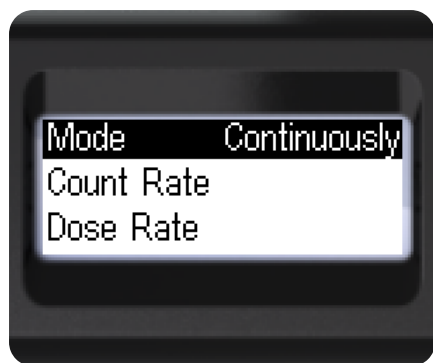
- [Connection] – connect/disconnect signal. [On] or [Off].



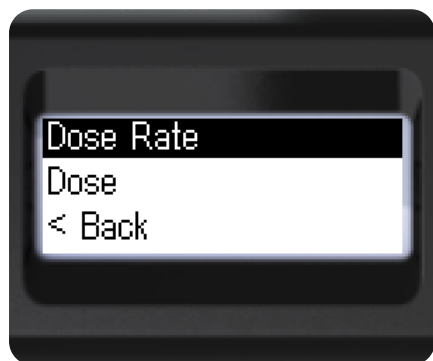
- [Power] – turning on/off sound. [On] or [Off].



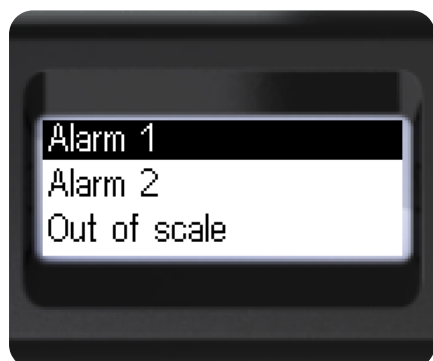
- To configure alarm signals: [Alarms]. Confirm.



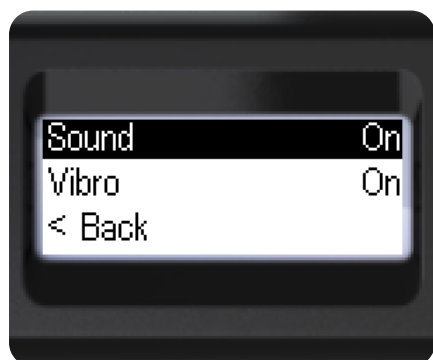
- Indication mode: [One-shot] or [Continuously].



- Select a channel, e.g. [Dose Rate]. Confirm.

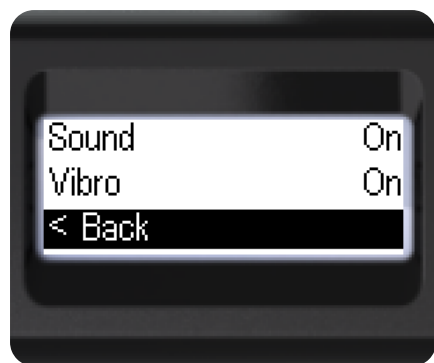


- Select level: [Alarm 1] or [Alarm 2]. Confirm.



- [Sound] or [Vibro]: [On] or [Off].

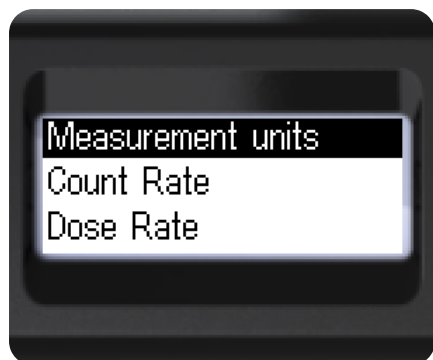




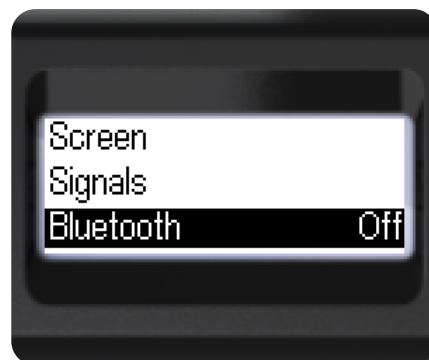
- To go back: [< Back] or [<< Menu quit].



Bluetooth



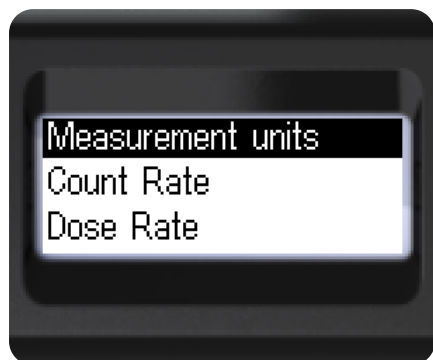
- Navigate to [Bluetooth].
Select [On] or [Off].



- To go back: [< Back] or
[<< Menu quit].



Selecting the menu language



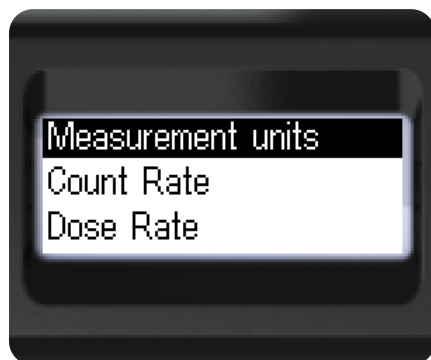
- Move focus to [Language]. Select your preferred interface language.



- To go back: [< Back] or [<< Menu quit].



Reset to factory settings



- Navigate to [Factory settings]. Confirm.



- Select [Yes] or [No].



- Long-press to confirm. If [Yes] — reset and return.

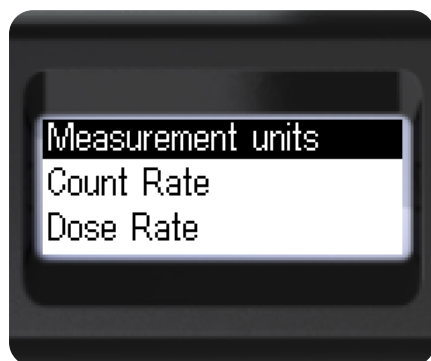


- To go back: [< Back] or [<< Menu quit].

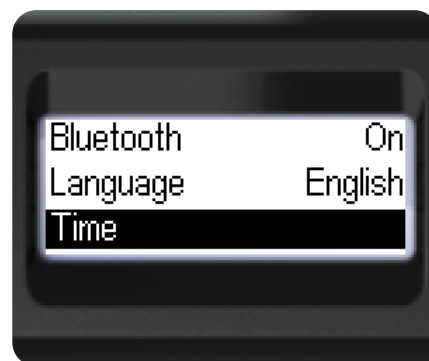


Setting the time

When connected to a smartphone or computer, the time is set automatically. Manual setting via the menu:



- Navigate to [Time]. Confirm.



- Select an input field. Change the value with the swing buttons. Hold for fast change.



- [Enter] or [Esc]. Long-press to confirm.



- To go back: [< Back] or [<< Menu quit].



Connecting to a smartphone and computer

Smartphone

Install the RadiaCode app: Android — [Google Play](https://play.google.com/store/apps/details?id=com.radiacode) or the RadiaCode website at www.radiacode.com/downloads (APK); iOS — [App Store](https://apps.apple.com/gb/app/radiacode/id1443812220).

Bluetooth connection: enable Bluetooth on the device (Settings → Bluetooth → On) and select the device in the app.

USB OTG connection (Android only): connect the device using a cable and adapter, then grant the app access.

A detailed description of the app interface is built into the app.

With external power connected, the device is accessible via Bluetooth or USB whether it is on or off. This allows turning the device on/off remotely.

When connected to a smartphone or PC, accumulated data is transferred to the external device, and new incoming data is sent directly without being saved in the device internal memory.

PC (Windows)

Install the RadiaCode program from the RadiaCode website. Connect the device with a USB Type-C cable. The program lets you view data, control the device and transfer the measurement log. Detailed help is built into the program.

With external power connected, the device is accessible via USB whether or not it is powered on. This allows remote turning on/off.

Maintenance

Battery charging

Connect the USB cable to the connector at the end of the device ([4] in the general view in section “Design elements”) and to a charger (5 V, ≥ 0.5 A) or a computer USB port. Leave the device connected until charging is complete.

Blue indicator [7] — charging. The screen shows the charging icon .

When complete, the blue indicator goes out and the icon changes to external power .

The battery can be recharged or charging interrupted at any level.

Check the charge level by the battery icons ; the percentage shown next to them updates in real time.

If the battery indicator  is empty — connect the device to a charger

To ensure proper charging conditions and a long battery service life, charging is blocked when the device temperature is above +40 °C or below 0 °C.

For charging, use only USB chargers rated at 5 V and at least 0.5 A, or a computer USB port. Connecting to an unsuitable power source can damage the device. Damage caused by improper charging is not covered by the manufacturer's warranty.

If the battery is fully discharged, the device may not respond to turning on. Charge the battery first. If the battery does not charge, connect the charging cable, then disconnect and reconnect it. The device will then be ready for operation.

Firmware update

The device is constantly improved; the firmware is updated regularly. Current version — in the “Device info” menu.

iOS over Bluetooth:

- Download and install the RadiaCode app from the [App Store](#)
- Launch the app and grant it Bluetooth access
- In the Devices list, select your device and connect to it
- Once connected, open Control Center — the button is in the upper-right corner of the screen
- If a firmware update is available, the Update button in the Firmware section becomes active. Tap it to start the update
- During the update, a red LED will glow on the device
- Wait for the process to finish. Do not close the app or turn off the device until the update is complete

Android over Bluetooth:

- Install RadiaCode from [Google Play](#)
- Launch → menu (the three-horizontal-line button in the upper left) → “Devices”
- Select the Bluetooth connection interface and confirm by pressing [OK]
- After connecting, confirm the update. A red LED will glow during the update process

Android over USB OTG:

- Connect the device to the smartphone using a cable and adapter
- Allow the RadiaCode app to use the connected device
- Launch → menu → “Devices” → USB interface → [OK]
- Confirm the update and wait for it to finish

PC (Windows):

- Download and install RadiaCode from www.radiacode.com/downloads
- Connect the device, turned on, via USB Type-C directly to a computer port
- If an update is available — confirm; wait for it to finish

Do not turn off the device or break the connection (USB or Bluetooth) until the process is complete! Interrupting the firmware update may cause device failure. To restore operation, contact the service centre.

Troubleshooting

Typical faults	Possible causes	Solutions
Does not turn on from the battery	Battery discharged	Charge the battery
Works only with external power	Battery faulty	Contact customer support
Vibrates, icon on screen: 	Battery discharged	Charge the battery
Charge below 100% after disconnect	Not fully charged	Wait until the blue LED goes out
Charge below 85% after 15 min	Battery capacity degradation	Contact customer support
Not charging (no LED)	Temperature above +40 °C or below 0 °C	Ensure proper temperature
Not charging	Deep discharge	Reconnect the cable. Do not allow full discharge
Continuous vibration + blue LED	In bootloader mode	Contact customer support
Monitor shows 0.00 cps	Device malfunction	Contact customer support
"Instrument not calibrated"	Missing calibration data	Contact customer support
Shuts off without notification	Static electricity	Protect from electrostatic discharge
"Hardware error [1XX]"	Non-volatile memory error	Restart; if recurring — contact customer support

"Hardware error [2XX]"	Bluetooth module error	Restart; if recurring — contact customer support
"Hardware error [3XX]"	Accelerometer error	Restart; if recurring — contact customer support
"Hardware error [4XX]"	Optical sensor error	Restart; if recurring — contact customer support
"Hardware error [5XX]"	Thermometer error	Restart; if recurring — contact customer support
"Hardware error [6XX]"	Settings saving error	Restart; if recurring — contact customer support
"Hardware error [7XX]"	Charger error	Restart; if recurring — contact customer support

In case of a malfunction, contact the manufacturer's customer support. For any other issues, please report them to the support team.

