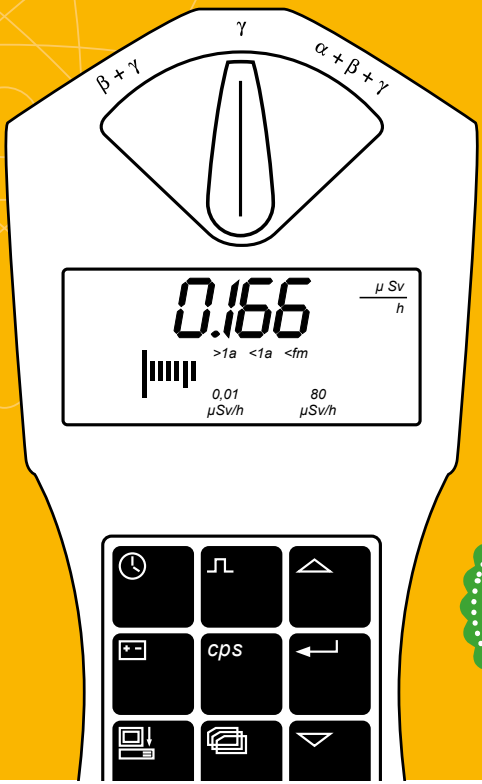
GAMMA-SCOUT®

Measures Radioactivity Easily and Reliably.

RADIATION DETECTOR WITH USB PORT



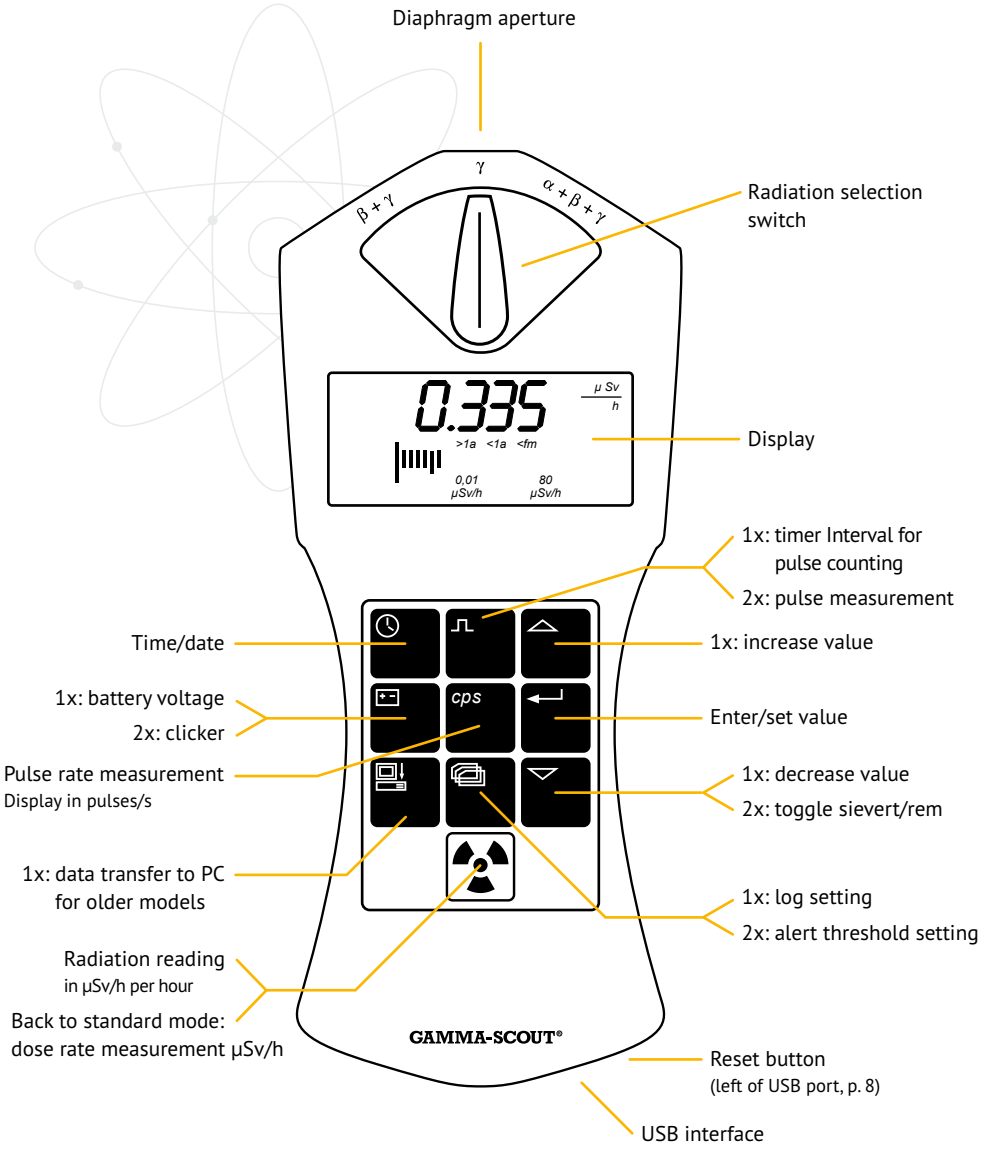
Sustainable & Unique!
Long-lasting battery life!

A product of GAMMA-SCOUT GmbH & Co. KG
www.gamma-scout.com

TÜV FCC-15
Complies with the standards of the US agency

CONTROL PANEL

GAMMA-SCOUT© is a user-friendly device. This diagram provides a quick overview of its features.



*For ONLINE model only

1x: = press once / 2x: = press twice

CONTENTS

SUMMARY 4
Introduction to GAMMA-SCOUT® functions and features (all models) 4
Declaration of Conformity, technical notes 5
User Manual 5

α, β & γ RADIATION 6
Optional exclusion of α and β radiation 6

OPERATING MODES 7
Display current radiation levels 7
Calculate average over past day (12:00 pm to 11:59 pm) 7
What is a microsievert? 7

LIMITS 8
Normal radiation exposure values and limits 8
GAMMA-SCOUT® operating ranges 8
Working with radiation, legal limits 8

PULSE COUNTING 9

PULSE RATE MEASUREMENT 10
Displaying the pulse rate 10

DATE AND TIME 11
Display and set date and time 11

BATTERY, RECHARGEABLE BATTERY AND OPERATION 12
Battery type 12
Display battery voltage 12
Display software version 12
Changing the battery 12

SET CLICKER 13

w/ALERT-ALARM THRESHOLD 14
Exceeding dose rate alert threshold (w/ALERT version) 14
User-defined dose rate threshold alert 14
Automatic alert level (w/ALERT Version) 14

DOSE MEASUREMENT 15
Displaying and resetting the dose meter 15

LOG SETTINGS, CLEARING MEMORY 16

DATA ANALYSIS TOOLBOX SOFTWARE FOR WINDOWS 17
System requirements 17
Installing the software and drivers 17
Uninstalling GAMMA-SCOUT Toolbox 5 19
Data read-out 20
Clearing the memory 21
Software update 21

DATA ANALYSIS IN WINDOWS 22
Data read-out before firmware version 6.0 22
Troubleshooting the USB connection 22

GRAPHIC TOOL FOR GAMMA-SCOUT® ONLINE 23
Show bar chart and display options 23

GAMMA-SCOUT® ONLINE MODEL / REALTIME FOR WINDOWS 25

DATA READOUT FOR GAMMA-SCOUT READER® FOR MAC 27
System Requirements 27
Installing the software 27
Using the software 27
Transferring the log data 27
Set date and time 28
Software update 29

GAMMA-SCOUT REALTIME® FOR MAC 30
Using the software 30
Set limits and colors 30

TECHNICAL DATA, CALIBRATION, SUPPORT, RESET 32

TERMS AND CONDITIONS, SAFETY REGULATIONS 34

INDEX 36

NOTIZEN / NOTES 37

SUMMARY

INTRODUCTION TO GAMMA-SCOUT® FUNCTIONS AND FEATURES (ALL MODELS)

Measures α radiation: Thanks to high-quality end window counter tube, GAMMA-SCOUT® measures α radiation as well as β and γ rays.

Easy reading: In measuring mode (button) the display shows the current radiation reading every 2 sec. The display also temporarily shows the average measurement over the past day (00:00 to 23:59 hrs).

Large measurement range: GAMMA-SCOUT® is calibrated to measure reliably across a wide range: (0.1 to 1000 µSv/h). The range of the sensor is much larger. However, the device is calibrated with the specified precision.

Tested calibration: Every GAMMA-SCOUT® radiation meter is subjected to a final test. This is monitored by a state university for applied technology. The readings from the tested devices must lie within a confidence interval of 5% against a master device, which in turn is calibrated against reference Cs 137 emitter and the ODL.

Dose rate and dose: GAMMA-SCOUT® also works as a dosimeter (cumulative radiation dose over time).

Flexible display:
The dose rate can be displayed in sievert or rem.

Energy-saving continuous operation:
GAMMA-SCOUT® monitors radiation day and night and logs the data for later read-out. It is neither necessary nor possible to switch it off. Due to sophisticated, patented electronics, the battery lasts for years. When the GAMMA-SCOUT® is connected to a PC, the device is powered via the USB port. This protects and charges the battery. Optimal operation conditions are at environmental radiation levels. If the device is exposed to higher radiation levels (e.g. in a lab) or if the clicker is continuously activated, this places greater demand on batteries. The battery icon appears when the battery voltage falls below 2.7 V. The battery should then be replaced.

Data storage: The GAMMA-SCOUT® saves the number of pulses detected in various user-defined time intervals (up to 32,000 readings). For continuous monitoring, the interval for storing environmental radiation values is set to 2h. This permits the storage of seven years of recording activity. For details see p. 16.

Data readout: Measurement data can be read out on a Windows or MAC OS X operating system (see GAMMA-SCOUT TOOLBOX 5 and GAMMA-SCOUT READER®). Interface documentation is provided in the appendix.

GAMMA-SCOUT® w/ALERT (BASIC FUNCTIONS PLUS ALERT AND CLICKER)

Alarm thresholds: This model features an acoustic alert when radiation level exceeds a user programmed threshold.

Clicker: The GAMMA-SCOUT® w/ALERT features an acoustic alert when a user-defined radiation level is exceeded or when a user-defined dose is reached. A warning triangle appears in the display. For details see p. 14.

GAMMA-SCOUT® ONLINE / REALTIME (INCLUDES ALL FUNCTIONS OF THE ALERT MODEL)

ONLINE / REALTIME function: The GAMMA-SCOUT® can transmit the detected pulses as well as the dose and the dose rate simultaneously to a connected PC at

regular intervals. The software can also generate graphs of the data.

GAMMA-SCOUT® RECHARGEABLE (INCLUDES ALL FUNCTIONS OF THE ALERT MODEL)

Always enough energy: Instead of a conventional battery, this model uses a rechargeable battery that is charged via the supplied power supply or the USB port of a PC. This allows measurements over extended periods at very high radiation levels or with a permanently activated clicker.

CAUTION: To avoid deep discharging, we recommend charging the rechargeable battery at least once every three months. With a full charge, the battery voltage is approx. 4.0 V. If the voltage drops below 3.6 V, it is advisable to charge the battery using the cable and power supply (included with the device).

DECLARATION OF CONFORMITY, TECHNICAL NOTES

The CE Declaration of Conformity is available from the manufacturer and also complies with Part 15 of the FCC Rules.

USER MANUAL

The current version is available as a PDF file on our website (Support » User manual) at:

www.gamma-scout.com

To avoid paper waste and conserve resources, we plan to discontinue the print version in the future.

THE READOUT SOFTWARE CONSISTS OF:

GAMMA-SCOUT® TOOLBOX VERSION 5

» For Windows PC operating systems (Windows 8./8.1, 10 and 11; 32 and 64 bit versions)

» Available in German and English versions

» Installation instructions starting on p. 18

GAMMA-SCOUT READER® FOR MAC OS X AND GAMMA-SCOUT REALTIME®

» For MAC users with OS X 10.11 and higher with USB-A connection

» For German and English language environments

» Installation guide starting on p. 27

» GAMMA-SCOUT REALTIME® can be used only with a GAMMA-SCOUT ONLINE model. See p. 30 ff

WASTE DISPOSAL

The disposal agreement as required under packaging regulations was signed with Susa Solutions GmbH.

REVOCATION CLAUSE

For the revocation clause in accordance with the Distance Marketing Act, see Terms and Conditions starting on p. 35.

α, β & γ RADIATION

Your GAMMA-SCOUT® is equipped with a Geiger-Müller tube that can detect not only gamma radiation, but also alpha and beta radiation.

OPTIONAL EXCLUSION OF α AND β RADIATION

You can use the radiation selection switch to restrict the detected radiation types (to a large extent):

» To detect only gamma rays, select the center position (γ): With this selection, an aluminum plate provides highly effective shielding of the counter tube window against alpha and beta radiation.

» Turn the selection switch to the left (β + γ) for detection of gamma and beta rays while excluding alpha rays: Now the end window of the counter tube is shielded against alpha rays by aluminum foil.

» Turn the switch to the right (Symbol α + β + γ) to measure all three radiation types: The counter tube is now open to all three types of radiation.

To measure environmental radiation, you should have the radiation selection switch in the middle position. α and β radiation have short ranges or just a few centimeters or meters and are therefore encountered only in the immediate vicinity of the radiation sources.

This is why it is not advisable to keep the radiation selection switch open at all times. This position also risks damage to the counter tube window from a sharp object such as a pencil. p. 7

OPERATING MODES

The GAMMA-SCOUT® is able to measure radiation in different operating modes: Along with the standard operating mode (dose rate measurement), pulse and pulse rates can be recorded.

DISPLAY CURRENT RADIATION LEVELS

Pressing the ☢ button puts the GAMMA-SCOUT® into standard operating mode, which displays the dose rate. In this mode, the current radiation level is displayed in µSv/h (microsieverts per hour – see yellow box below) in numerical form and as a bar chart. Please note that for smaller levels of radiation, the bar chart appears as a single line. To visualize the volume of detected radiation, symbols below the bar chart indicate the radiation level (>1a (more than 1 year), <1m (less than 1 month) etc.)

To toggle between µSv/h and µRem/h units, press the ▽ button in "Measure radiation" mode.

CALCULATE AVERAGE OVER PAST DAY (12:00 PM TO 11:59 PM)

In the standard operating mode (Dose measurement), pressing the ☢ button displays the average radiation over the last day for a few seconds. (00:00 – 23:59 h). The H̄ symbol will blink. Note that the average over the last day is not available until a new day begins after first starting the device or the last reset.

WHAT IS A MICROSIEVERT?

Three important types of radiation from radioactive sources known in physics (α, β, and γ radiation) not only differ considerably in their physical characteristics, but also in their effects on humans. To make them comparable in their effects on humans, a value has been created which defines the biological effects of radiation. It is referred to as the equivalent dose and its unit of measurement is the sievert. The older unit was the rem. 1 rem = 0.01 Sievert (Sv). The count of radiation pulses is used to convert the components of an exposure to a mixture of radiation types into a common measure of the biological effects. The basis is Cs-137. The conversion into the equivalent dose refers to gamma quanta from the Cs 137 radionuclide with a quantum energy of 662 keV. For physical reasons, the conversion applies various factors depending on the quantity of pulses per unit of time. The precise definition is available at **www.fs-ev.org** or **www.bfs.de.**

LIMITS

NORMAL RADIATION EXPOSURE VALUES AND LIMITS

Under EU law, two legal limits are defined for individuals with occupational exposure to radioactive sources:

» max. dose of 6 mSv per year = 3 µSv/h (based on 2000 working hours), Category B

» max. dose of 20 mSv per year = 10 µSv/h (based on 2000 working hours), Category A

(There is also an "exclusion zone" from 3 mSv/h)

The natural radiation dose in Germany ranges from 0.05 to 0.18 µSv/h, depending on local conditions. For further details see the Federal Office for Radiation Protection at www.bfs.de or www.odlinfo.bfs.de.

GAMMA-SCOUT® OPERATING RANGES

GAMMA-SCOUT® is intended for monitoring purposes under normal working and environmental conditions (continuous monitoring with logging function).

Due to the calibration of the university radiation source, used for calibration purposes, the device display is calibrated only up to a level of 1000 µSv/h. However, the device displays readings up to the limit of the counter tube (20,000 to 40,000 µSv/h). If this occurs, the display shows "Overflow" with an alarm symbol ⚠. Figures above the measurement limits are marked (*) in the data table.

Reset the alarm symbol ⚠ by pressing the standard button ☢ twice.

WORKING WITH RADIATION, LEGAL LIMITS

Please take all necessary precautions in working with radioactivity and observe the provisions of the German Radiation Protection Ordinance (StrlSchV). Additional information on this topic can be found, among other sources, in the publications of the commission established by the Radiation Protection Commission established by the federal government at: **www.fs-ev.org** or **www.bfs.de.**

PULSE COUNTING

The GAMMA-SCOUT® can also be used as a pulse counter. This mode displays the number of pulses detected.

SWITCH PULSE COUNT ON AND OFF

» Press ⎍ to switch the GAMMA-SCOUT® to "pulse count" mode. The display now shows the pulse symbol. Counting has not yet begun. Pressing the ⎍ button a second time causes the counting process to begin without specifying the measurement period.

» Alternatively, you can set a measurement time by pressing the ↵ button:

- To specify the time in seconds, press the ↵ button once.
- To specify the time in minutes, press the ↵ button twice.
- To specify the time in hours, press the ↵ button three times.

» Now set the exact measurement time using the △ and ▽ buttons.

» Start the measurement by pressing the ⎍ button again. The pulse icon blinks in the display during the measurement time.

» If a measuring time is set, the pulse icon blinks until the end of the measuring time and then becomes steady again. The display now shows the number of pulses counted during the set time.

» You can stop the measurement:

- by pressing the ⎍ button again. The measurement is now displayed.
- by selecting a different operating mode. Then the measurement is no longer displayed.

PULSE RATE MEASUREMENT

PLEASE NOTE: The device calculates the rate of ionizations per second detected in the counter tube. This is not identical to the activity of the isotope, which is defined in becquerels (Bq).

DISPLAYING THE PULSE RATE

In the "Pulse rate measurement" mode, the pulses detected in the counter tube are continuously measured and converted to a pulse rate. This is indicated in counts per second.

» Press the cps button to switch to the pulse rate measurement mode. The # icon will now blink as long as the measurement continues. When the measurement ends, the # icon stops blinking.

The pulse rate measurement indicates the average number of pulses per second. Because the radiation intensity can fluctuate rapidly, this average number will naturally become more precise as the measurement period increases.

GAMMA-SCOUT® provides you with a first result within a few seconds. Then it automatically extends the measuring time to a maximum of 65536 seconds in order to reach as precise an average figure as possible. For example, 16384 pulses after 65536 seconds = 0.25 pulses / second.

Alternatively, users can set a constant measurement period. To do this, press the ↵ button once after starting the pulse rate measurement. This displays the current measurement time, which can be set progressively using the △ and ▽ buttons. Then press ↵ to start the measurement. To distinguish the operating mode, the time symbol blinks to indicate the automatic increase of the measurement interval.

DATE AND TIME

DISPLAYING TIME AND DATE

» Press the ⏲ button to view the time. The display shows the set time and the ⏲ icon. Press the ⏲ button a second time to view the date. The display shows the set date and the 📅 icon.

SETTING THE TIME

» First, display the time by pressing the ⏲ button. Now press the ↵ button to set the hours. The two digits for the hours will blink. Use the △ and ▽ buttons to set the hour. Press the ↵ button to confirm your selection and move on to set the minutes.

» Now press the ↵ button a second time to set the minutes. The two digits for the minutes will blink. Use the △ and ▽ buttons to set the minutes. Press the ↵ button to confirm your selection and move on to set the seconds.

» Press the ↵ button a third time if you wish to set the seconds. The two digits for the minutes will appear on the display next to the flashing digits for the seconds. Use the △ and ▽ buttons to set the seconds. Press the ↵ button to confirm your selection and exit the time setting function.

SETTING THE DATE

» Press the ⏲ button to view the date. Now follow the same steps as above under "Setting the time". You can exit the time and date setting procedure at any time by pressing the ⏲ button. When setting the date (when the year is displayed), exit by pressing the ↵ button a fourth time.

DISPLAY AND SET DATE AND TIME

The GAMMA-SCOUT® has an integrated quartz clock (push button display). The time and date are required for accurate logging of measured radiation. A function in the data read-out program permits the synchronization of the GAMMA-SCOUT® date and time with the clock on your PC or MAC system. Select "Set any time" to choose your desired date and time (e.g. for different time zones) on the GAMMA-SCOUT®.

BATTERY, RECHARGEABLE BATTERY AND OPERATION

BATTERY TYPE

GAMMA-SCOUT® is powered by a 2.7–3.7 V lithium thionyl chloride cell. The device will continue functioning until the cell voltage is down to 2.8 V. When the voltage drops below this value, the battery icon will appear. The data will be retained even following a total loss of voltage. The RECHARGEABLE model has a rechargeable battery that can be recharged via USB (or the power supply unit included with delivery - see p. 5.)

DISPLAY BATTERY VOLTAGE

Press the ⊟ button to display the remaining battery voltage. The display shows the remaining voltage available minus the load drawn by the built-in electronics.

DISPLAY SOFTWARE VERSION

When the battery voltage is displayed, press the ↵ button to briefly display the firmware version. In rechargeable devices, the letter 'a' is also displayed.

CHANGING THE BATTERY

The battery is permanently attached to the circuit board (because of our extremely low currents of approximately 10 microamperes, plug-in batteries would constantly lead to current interruptions due to oxidation on the contacts). Should the user want to solder in a new battery, the initial settings can be restored by pressing the reset button. For details see p. 33. However:

PLEASE NOTE: Opening the GAMMA-SCOUT® will void the warranty.

For older devices with no USB interface, the device can be reset by pressing the pins. See our FAQs.

RECHARGEABLE DEVICES

For customers using the GAMMA-SCOUT® over extended periods at exposures of more than 10 µSv/h, we built the RECHARGEABLE model.

To meet the higher power requirements, it is equipped with a rechargeable battery. Charging starts automatically when the GAMMA-SCOUT® is connected to the computer via a USB port (or with the power supply unit included). While charging, the display shows a "C" followed by an "F" for "Full" after approximately two hours. When the F appears, the charge level is sufficient.

Optimal operation conditions are at environmental radiation levels. If the device is exposed to higher radiation levels (e.g. in a lab) or if the clicker is continuously activated, this places greater demand on batteries, which can reduce the lifetime of the cell. An internal charging circuit prevents overcharging. The charge status is displayed by pressing the ⊟ button.

A full charge is reached at approx. 4.0 V.

CAUTION: To avoid deep discharging, we recommend charging the rechargeable battery at least once every three months.

SET CLICKER

At the request of our customers, we have installed an acoustic signal (clicker) into the Alert, Online and Rechargeable models. It can be switched on and off as needed. The standard model does not contain a clicker.

CLICKER (NOT IN STANDARD MODEL)

A double click of the ⇦ button causes the word "On" to appear. Press the ↵ button to start the clicker. The display now shows a speaker icon. If the clicker was already on, the Display will show "Off". Press the ↵ button to switch off the clicker. The speaker icon will disappear.

When the clicker is on, the GAMMA-SCOUT® emits a tone with each pulse. With increasing radiation levels, the stream of clicks becomes a cascade and then a steady tone. The tone uses 500 times as much power as the device under normal measurement operations in regular environmental conditions. We have therefore designed the tone to switch off automatically after 10 minutes in this state. In rechargeable devices and when operating with a PC connection, the clicker does not switch off automatically. If the clicker option is used once per day, the power consumption remains within the acceptable service life of the battery. If it is used more often, the battery life will be shorter. In this case, a maintenance fee will be charged for a battery change. The device logs the number of times the clicker is used and the duration.

w/ALERT-ALARM THRESHOLD

EXCEEDING DOSE RATE ALERT THRESHOLD (w/ALERT VERSION)

The GAMMA-SCOUT® w/ALERT emits an acoustic alert when the dose rate exceeds a specified level. The factory default threshold is set at 5 µSv/h. When this value is exceeded when measuring radioactivity, the ⚠ icon will also appear. To clear the ⚠ icon, press the ☢ button twice.

USER-DEFINED DOSE RATE THRESHOLD ALERT

Press the ✎ button to switch to the "Log frequency" mode (see p. 16). Now press the button again to switch to "Alert level". The current threshold now appears in the display. Press the △ or ▽ button to increase or decrease the level. The value will now flash. The smallest and largest possible values are 0.1 µSv/h and 2 mSv/h, respectively. The increment is 0.1 µSv/h at lower levels and becomes larger in the higher range. (Try different settings.) Select AOFF to deactivate the dose rate alert. To enter (save) the new threshold, press the ↵ button.

AUTOMATIC ALERT LEVEL (w/ALERT VERSION)

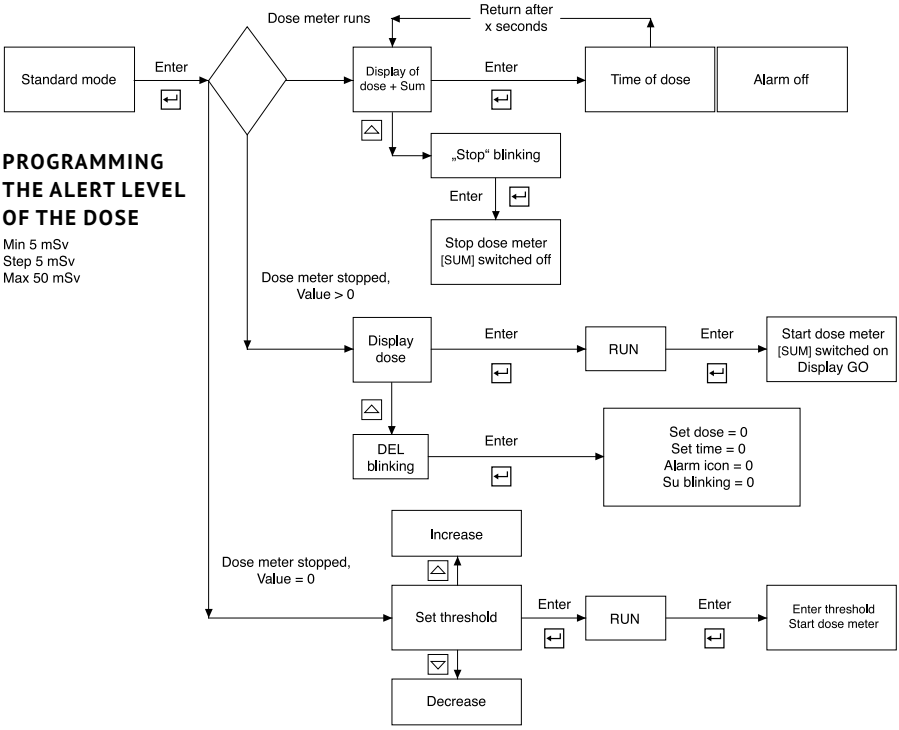
When the defined alert threshold is exceeded, GAMMA-SCOUT® sounds an alert and an ⚠ icon blinks on the display. This icon continues blinking until the user shuts it off by pressing the ☢ button twice.

DOSE MEASUREMENT

GAMMA-SCOUT® also provides information on the cumulative dose detected by the device over time. As described below, the user can stop the cumulative tracking, reset it from a previous level, or delete it to restart at zero. For this and other reasons, this cumulative tracking of the dose cannot be used as a certified "personal dose meter".

DISPLAYING AND RESETTING THE DOSE METER

When the dose meter is running, the !!! symbol shows in the display. The dose is displayed in X.XX mSv format, with values below < 0.01 mSv indicated as 0.00 mSv. To start, stop, restart and reset the dose display and to set the alarm threshold, follow the chart below (automatic return to standard mode at the end of each branch).



LOG SETTINGS, CLEARING MEMORY

GAMMA-SCOUT® automatically logs the number of pulses measured, and stores this data in its internal memory. With our Windows and MAC OS X software, you can quickly and easily read and process these data on your system (see p. 17 ff)

Under the factory settings, the GAMMA-SCOUT® logging process stores the pulses every two hours. On this basis, the memory capacity is sufficient to store weekly values for seven years.

As the following table demonstrates, you can also set faster logging frequencies, with corresponding reductions in the storage capacity. Logging will stop when the storage is full.

SETTING THE LOGGING FUNCTION

» Press the button to switch to the "Log" mode. The log icon appears. A bar chart appears briefly, indicating the current utilization of the log storage. (1 bar represents around 1000 measurements, so 32,000 measurements correspond to approx. 3% of the storage space.)

» Press the button to select more frequent logging and, consequently, shorter logging intervals.

» Press the button to select less frequent logging and, consequently, longer logging intervals.

» Press the button to confirm the selected logging interval. If is pressed after pressing (without making changes with or), the current remaining logging period is displayed in years, months, days, hours and minutes. The device then exits the log setting mode.

» You can transfer the logged data to a computer at any time and then clear the log storage of your GAMMA-SCOUT®.

When only 256 bytes (of 65,280 bytes) of logging capacity remains in the memory, GAMMA-SCOUT® automatically resets back to a 7-day logging interval. In this case, you can only set shorter logging intervals again after clearing the storage.

LOGGING INTERVAL	DISPLAY	STORAGE CAPACITY	LOGGING INTERVAL	DISPLAY	STORAGE CAPACITY
One week	Pr. 7d	approx. 615 years	Pr. 10 min.	Pr. 10min	approx. 7,3 months
3 d	Pr. 3d	approx. 263 years	Pr. 5 min.	Pr. 5min	approx. 3,7 months
1 day	Pr. 1d	approx. 88 years	Pr. 2 min.	Pr. 2min	approx. 1,5 months
12 h	Pr. 12h	approx. 44 years	Pr. 1 min.	Pr. 1min	approx. 20 days
2 hrs.	Pr. 2h	approx. 7,3 years	Pr. 30 s	Pr. 30s	approx. 10 days
1 hr	Pr. 1h	approx. 3,7 years	Pr. 10 s	Pr. 10s	approx. 3 days
30 min.	Pr. 30 min.	approx. 1,8 years			
Clear log	PDEL				Delete data
Switch off log	POFF				Switch off log

DATA ANALYSIS TOOLBOX SOFTWARE FOR WINDOWS

The GAMMA-SCOUT® TOOLBOX 5 software uploads measurement data collected by the GAMMA-SCOUT® and stored in its memory. The data are uploaded automatically when the GAMMA-SCOUT® is connected to a computer USB port. The measurement data are processed into list format and can be saved either as a text or XLSX file.

GAMMA-SCOUT® Toolbox 5 Realtime software uploads and displays the current values measured by the GAMMA-SCOUT® Online (real time). See also p. 25 ff

www.gamma-scout.com
(» Help).

SYSTEM REQUIREMENTS

The GAMMA-SCOUT® Toolbox software requires a Microsoft Windows PC (Windows 8/8.1; 10 and 11; 32 or 64-bit version), a USB port and a valid operating system license. The user must also have admin rights on the system. An internet connection is needed only for more recent software updates.

Before installing the new GAMMA-SCOUT® TOOLBOX 5 be sure that you completely delete/uninstall any older GAMMA-SCOUT® versions (such as TB 4.3 and older).

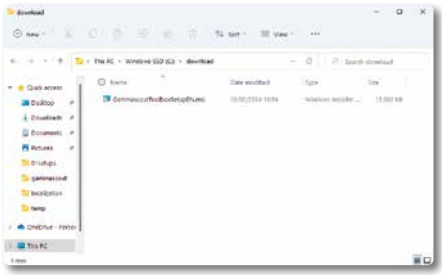
INSTALLING THE SOFTWARE AND DRIVERS

Toolbox 5 and Toolbox 5 Realtime are included in the installation along with the necessary drivers. A Dotnet Framework 4.0 or higher must be installed on the computer. If the computer is connected to the internet, it will be loaded and installed upon request.

DATA ANALYSIS IN WINDOWS: INSTALLATION

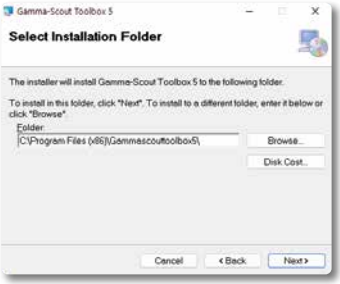
INSTALLATION OF GAMMA-SCOUT TOOLBOX 5

1. Open the file **GammascoutToolboxSetupDE.msi** in the Windows Explorer

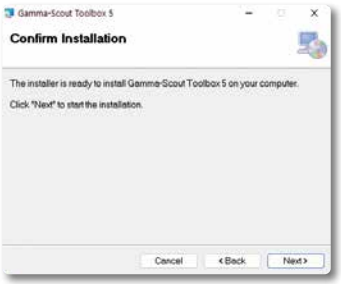


2. Click **Next >**

3. Do not change the folder or user settings. Click **Next >**

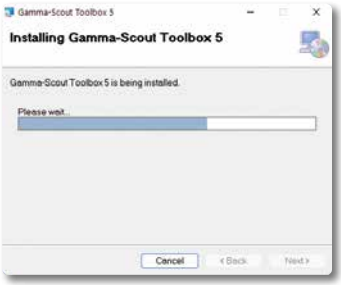


4. Click **Next >**

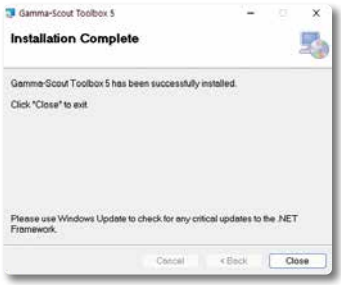


5. Click **Yes**

6. Installation progress is displayed



7. Click **Close** when installation is complete.



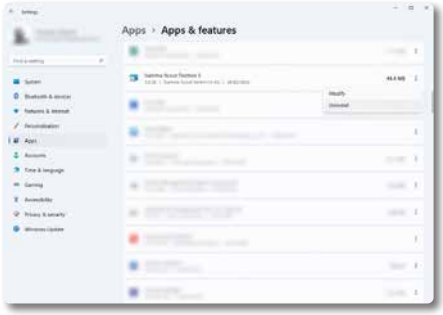
DATA ANALYSIS IN WINDOWS: UNINSTALLING THE SOFTWARE

8. The GAMMA-SCOUT® programs can be launched with the desktop icons or in the Start menu.

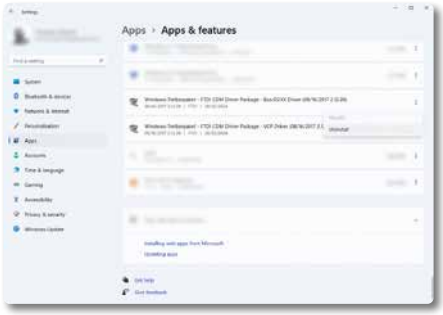
9. In the German version of Windows, the GAMMA-SCOUT® programs open with a German interface. You can switch manually to English by clicking the flag.

UNINSTALLING GAMMA-SCOUT TOOLBOX 5

1. In the Control Panel, uninstall **GAMMA-SCOUT TOOLBOX 5**.



2. Then uninstall the **two FTDI CDM driver packages**.

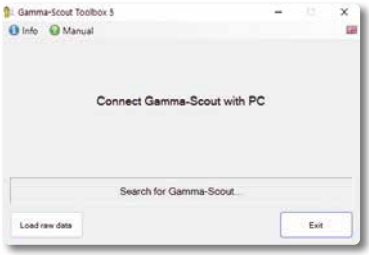


DATA ANALYSIS IN WINDOWS

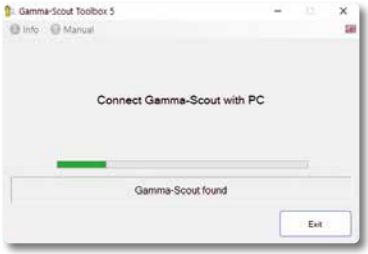
DATA READ-OUT

Requirements: The device software (Toolbox 5) must be installed on the hard drive before data can be read out.

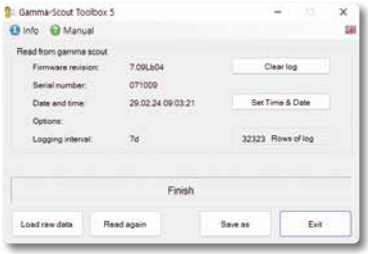
1. Start the program on your PC: Start » All programs » GAMMA-SCOUT® TOOLBOX 5 » GAMMA-SCOUT® TOOLBOX 5



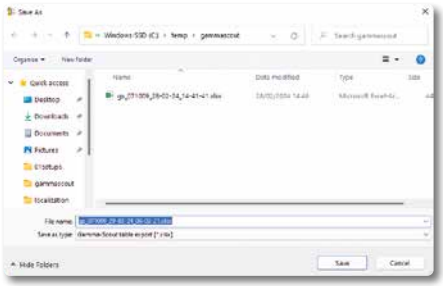
2. Connect the GAMMA-SCOUT® to the computer using the supplied USB cable. The data transfer starts automatically and is indicated by a progress bar.



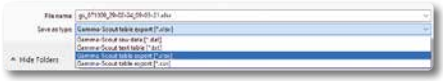
3. When the data transfer is complete, the options **Save as**, **Read again**, **Delete log** and **Set date & time** appear.



4. Click **Save as** to save your data to a file. The Save dialog will open.

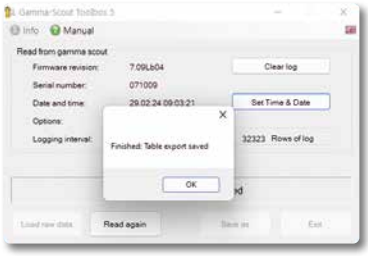


5. You can edit the suggested file name and folder. The file type indicates the format for storing the log data.



FILE TYPE	ENDING	DESCRIPTION
Raw data	.dat	GAMMA-SCOUT® memory dump – needed for customer support
Text table	.txt	Formatted table with time, pulse numbers and dose rates.
Table export	.csv	Formatted table with time, pulse numbers and dose rates. The separator is a semicolon.
Table export	.xlsx	Table format with time, pulse numbers and dose rates. Can be opened with common spread sheet software.

6. Click **Save** to store the data in the selected file format.



7. Click Set **Date & Time** to overwrite the internal GAMMA-SCOUT® clock with the current date and time from your system.

8. Click **Delete Log** to clear the GAMMA-SCOUT® log storage.

9. Click **Reload** to upload the log data from the GAMMA-SCOUT® storage again.

10. After disconnecting the USB cable the **Save As** and **Set Date & Time** buttons are no longer displayed.

11. Click **Load raw data** to load a previously saved raw data file. You can now select **Save As** to save it as a text table or table export.

CLEARING THE MEMORY

To clear the memory, select: , and scroll up or down with and , until PDEL appears. Then press . You can also clear the memory by selecting Clear Log in the Toolbox.

SOFTWARE UPDATE

You can check your software status quickly and easily and update the software free of charge on request. All you need is an internet connection.

Simply click [i] followed by **Check for updates**. If a new version is available, start the installation process by selecting **Install New Version**.

1. 

2. 

3. 

4. 

DATA ANALYSIS IN WINDOWS

DATA READ-OUT BEFORE FIRMWARE VERSION 6.0

GAMMA-SCOUT® firmware older than Version 6.0 does not support the automatic switch to PC mode. Instead the user switches PC mode on and off manually using the GAMMA-SCOUT® keypad. If the software recognizes a GAMMA-SCOUT® with an older firmware version, the toolbox displays an error message.

1. Press the button on the GAMMA-SCOUT® and then click **OK** in the Toolbox dialog.

2. The data transfer will take longer with an older GAMMA-SCOUT® model. Another toolbox dialog opens when the upload is complete.

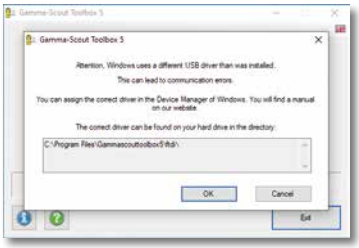
3. Press the **Radiation reading** button on the GAMMA-SCOUT® and click **OK** in the Toolbox dialog that appears.

For the next steps, see the chapter **Data Read-out** from Point 3.

TROUBLESHOOTING THE USB CONNECTION

Older USB 3.0 PC connections may be subject to errors when recognizing the GAMMA-SCOUT® version. The Toolbox then displays an error message. Disconnect the USB cable and use another USB plug on the computer.

Windows 10 sometimes uses a different USB driver than the one installed with Toolbox 5. This depends on the Windows 10 security settings. The GAMMA-SCOUT® has no control over these settings. An incorrect USB driver often causes timeout errors when reading out the data. The Toolbox checks whether an incorrect driver is being used and then displays an error message.



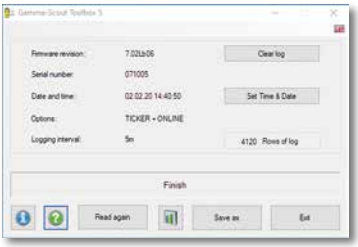
The user has to find the correct driver in the Windows 10 Device Manager and assign it to the GAMMA-SCOUT® connection. The folder with the correct driver files is displayed in the screen dialog.

Detailed instructions are available on the GAMMA-SCOUT® website.

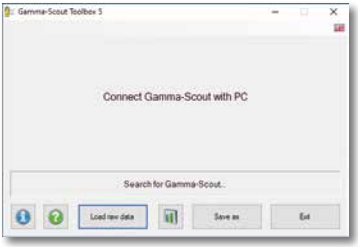
GRAPHIC TOOL FOR GAMMA-SCOUT® ONLINE

SHOW BAR CHART AND DISPLAY OPTIONS

1. Connecting an ONLINE model with firmware 7.02 or newer allows the user to display the data readout as a bar chart. The **bar chart icon** appears.



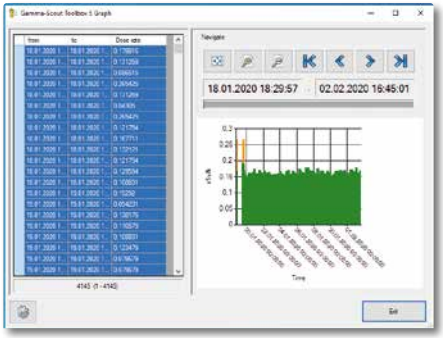
2. Raw data files from an ONLINE model with firmware 7.02 or newer can be saved and loaded again later without the device. The **bar-chart icon** also appears with loaded raw data.



3. Click the **bar chart icon** to open the GAMMA-SCOUT® Toolbox 5 Graph Dialog.

4. The dialog has three sections:

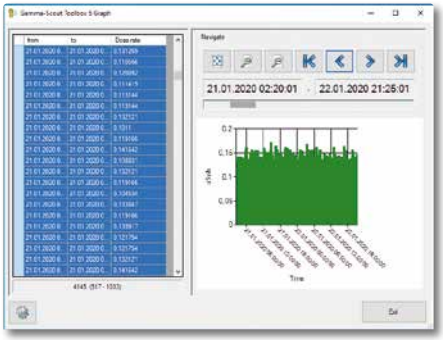
   - **data table** on the left
   - **navigation**, top right
   - **bar chart**, bottom right



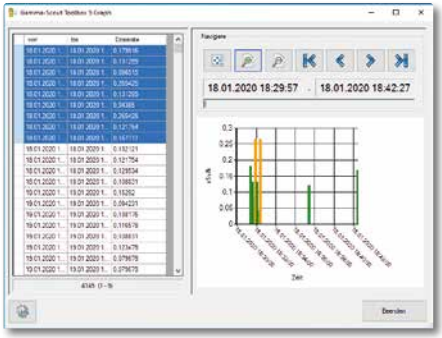
5. The values selected in the table are shown in the bar chart. Click on a row in the table. Hold the mouse button and move the cursor to select the desired table section. Release the mouse button. The selected table rows are displayed as a bar chart. The X axis represents the measurement time period. The Y axis shows the level of the dose rates as colored bars.

   You can navigate the values using the buttons at the top right (see next page).

6. The size and position of the readings currently displayed are shown by a gray horizontal bar. The same applies to the date and time corresponding to the start and end of the current zoom window.



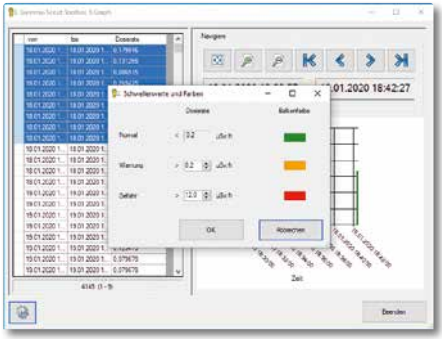
As you zoom in, the horizontal gray bar becomes narrower and fewer values are displayed in the graph.



7. The colors of the bars indicate the dosage rate levels. The user can set the thresholds and colors.

   Select the **gear icon** to make changes.

8. A settings dialog opens.



You can set two limits for the dose rate on the left. Set the desired bar colors on the right.

BUTTONS

Display all values in a graphic.
Enlarge view: Zoom in to readings.

Minimize view: Zoom out of readings.
Jump to **first entry**
Move view back by one zoom field.

Move view forward by one zoom field.
Jump to **last entry**

GAMMA-SCOUT® ONLINE MODEL / REALTIME FOR WINDOWS

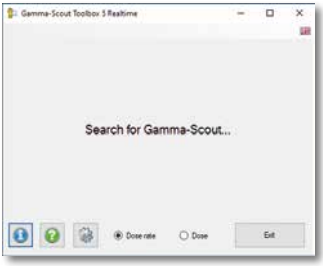
The ONLINE model is intended for transferring measurement data between the GAMMA-SCOUT® and a connected PC on a cyclical basis (as measurements are made). When operating with a fixed-connection PC (online), power is supplied to the interface via the PC's USB port.

SYSTEM REQUIREMENTS

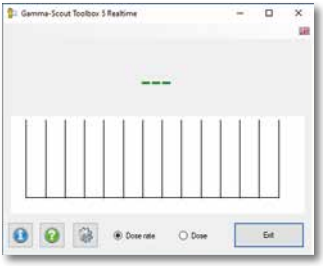
REALTIME transfer is possible only with the GAMMA-SCOUT® ONLINE model.

USING THE SOFTWARE

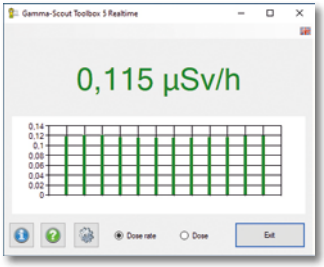
1. Start » All programs » GAMMA-SCOUT® TOOLBOX 5 » GAMMA-SCOUT® TOOLBOX 5 ONLINE



2. Connect the GAMMA-SCOUT® to your computer using the cable supplied. The software establishes a connection with the GAMMA-SCOUT®. This can take a few seconds.



3. When the connection is made, the software shows the current readings from your GAMMA-SCOUT®. Below the reading you can see a bar graph showing the trend in the most recent readings, with the oldest readings on the left and the newest readings on the right. You can set the number of recent readings.



4. You can choose to display either the dose rate or the dose.

SET LIMITS AND COLORS

You can set two limits that will cause the display color to change when exceeded. This makes it easy to understand the current readings at a glance.

You can set two limits for dose rate and dose readings on the left. On the right you can individually select the font and background colors for the two warning levels and the "normal" range. In the **Number of readings** in the graph box, you can enter the number of recent readings to be displayed in the bar chart.

TROUBLESHOOTING

Problem: A connection cannot be established. The error message "Searching for GAMMA-SCOUT" appears.
Solution: Disconnect your GAMMA-SCOUT® from your computer and close the software. Restart the software and connect the GAMMA-SCOUT®. If this is not successful, check the connection cable and all devices (e.g. the USB hub) connected between GAMMA-SCOUT® and your computer.

Problem: A connection cannot be established. The error message shows "---".
Solution: Check the firmware version of your GAMMA-SCOUT®. GAMMA-SCOUT REALTIME® with the ONLINE function can be used only with the firmware version 6.1 or higher.

Problem: The system will not switch back and forth between the dose rate and the dose.
Solution: Switch again, wait for a value to appear, and switch back. If that does not work, close the software and restart it.

Problem: he dose constantly shows 0.000.
Solution: The dosimeter in your GAMMA-SCOUT® must be running in order to log dose data.

For detailed information on using the REALTIME software, see » Help at www.gamma-scout.com.

DATA READOUT FOR GAMMA-SCOUT READER® FOR MAC

SYSTEM REQUIREMENTS

Apple Mac computer with at least macOS or OSX 10.11. and USB-A connector or suitable adapter. An internet connection is needed to load the software and any updates. You do not need an internet connection to run the software. To display and process the log data, you will need a program that can read Excel files, e.g. Microsoft Excel or Apple Numbers. A GAMMA-SCOUT® with firmware version 6.1 or later is needed.

INSTALLING THE SOFTWARE

Download the software from www.gamma-scout.com. The software is delivered in a zip file. If the browser does not automatically extract the file, double click on the file in your download folder. This will extract the software. After extraction the software is ready for use and can be launched by double clicking. However, it is advisable to place the software in the program folder. To do this, click the GAMMA-SCOUT READER® icon and drag the file into the program folder.
For quick access to the program, you can create a shortcut in the Dock. Just click the program icon and drag it to the desired location in your Dock.

USING THE SOFTWARE

1. Connect the GAMMA-SCOUT® to your computer using the cable supplied.

2. Launch the GAMMA-SCOUT READER® by clicking the icon in the Dock or double clicking the icon in the program folder.

3. The software establishes a connection with the GAMMA-SCOUT® and displays the firmware version, serial number, date and time of your device.

TRANSFERRING THE LOG DATA

1. After starting the software, click **Transfer Log Data**.

2. Select a location for the log data. Click the arrow on the bottom right next to the file name to enlarge the dialog and see your favorites, devices and permissions. Click **Save** on the bottom right after selecting the file name and destination.

3. The log data will now be transferred from your device. While this is happening, your GAMMA-SCOUT® will display the message “PCon” and the transfer symbol will blink. This process can take several minutes, depending on how many log entries are on your device and which device version you are connecting. You can stop the process at any time by clicking **Cancel**.

4. When the transfer is completed, the GAMMA-SCOUT READER® can open the log file automatically for you using a compatible program or display it in the Finder. Otherwise click **OK**.

DISPLAY BAR GRAPH WITH DISPLAY OPTIONS

1. Connecting an ONLINE model with firmware 7.02 or newer allows the user to display the data readout as a bar chart. The Display Graph button appears.

2. After starting the software, click Display Graph.

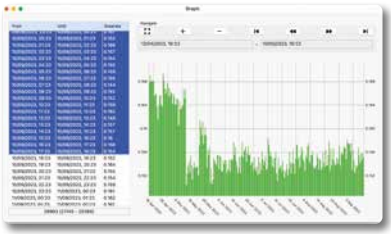
3. The log data will now be transferred from your device. While this is happening, your GAMMA-SCOUT® will display the message "PCon" and the transfer symbol will blink. This process can take several minutes, depending on how many log entries are on your device and which device version you are connecting. You can stop the process at any time by clicking Cancel.

4. When the transfer is complete, a new window opens with the graphic analysis. It has three sections:

» data table on the left

» navigation, top right

» bar chart, bottom right



The values selected in the table are shown in the bar chart. Click on a row in the table. Hold the mouse button and move the cursor to select the desired table section. Release the mouse button.

Or you can click the first row, scroll to the bottom and click the bottom row while holding the ⇧ shift key. The selected table rows are displayed as a bar chart. The X axis represents the measurement time period. The Y axis shows the level of the dose rates as colored bars.

5. You can navigate the values using the buttons at the top right.

6. The date and time for the start and end of the current zoom window are shown at the top edge.

7. As you zoom in, the horizontal gray bar becomes narrower and fewer values are displayed in the graph.

8. The colors of the bars indicate the dosage rate levels. The user can set the thresholds and colors.

9. Go to Settings in the GAMMA-SCOUT® menu. (Keyboard shortcut cmd ⌘)

   You can set two limits for the dose rate on the left. Set the desired bar colors on the right.

SET DATE AND TIME

If the time or date setting of your GAMMA-SCOUT® differs from the system time, the user is prompted to set the time when connecting the device or when the software is started. Click **Yes** to reset the time and date on your GAMMA-SCOUT®. Otherwise click **No** to skip this step. If your GAMMA-SCOUT® is already set to the same time as your computer, you will not be prompted to set the time.

SOFTWARE UPDATE

If you have a working internet connection, you can check for software updates and download them.
> GAMMA-SCOUT READER® Menu >
Check for updates > Click **OK** to confirm.

This function is no longer working in Version 1.2. If you have this version on your device, please download a newer version as described above.

TROUBLESHOOTING

Problem: A connection cannot be established. The error message "No device connected" appears.
Solution: Disconnect your GAMMA-SCOUT® from your computer and close the software. Restart the software and connect the GAMMA-SCOUT® to your Mac computer. If this is not successful, check the connection cable and all devices (e.g. the USB hub) connected between GAMMA-SCOUT® and your Mac computer. Try disconnecting all USB devices from your Mac computer and connecting your GAMMA-SCOUT® directly to a port on your Mac.

Problem: A connection cannot be established. The error message "Device not responding" appears.
Solution: Check the firmware version of your GAMMA-SCOUT®. The GAMMA-SCOUT READER® can be used only with devices with firmware version 6.1 or later.

Problem: The transfer of the log fails. The error message "Timeout" or "Log processing error" appears.
Solution: Try to repeat the data transfer. If this fails, close the software, disconnect the GAMMA-SCOUT®, restart the software and connect GAMMA-SCOUT® again. Repeat the data transfer.

Problem: The transfer of the log data fails. The error message "Transfer interrupted" appears.
Solution: Check the connection to the GAMMA-SCOUT®. Use a direct connection to your computer without a USB hub, use a different USB cable or a different USB connector.

Problem: The transfer of the log data fails. The error message "Device contains no log entries" appears.
Solution: Your device does not contain log data, perhaps because it is very new or a logging interval has not elapsed since a recent reset. Wait a few days or set a shorter logging interval as described on p. 16.

Problem: Log transfer takes a long time
Solution: Your device contains a large number of log entries. You can greatly reduce the transfer time by deleting the log data as described on p. 16. Transfer the log to your Mac system if you wish to retain the data. After that, only new readings will be transferred.

GAMMA-SCOUT REALTIME® FOR MAC

SYSTEM REQUIREMENTS

Apple Mac computer with at least macOS or OSX 10.11. and USB-A connector An internet connection is needed to load the software and any updates. An internet connection is not needed to run the software.
To display and process the log data, a program is needed that can read Excel files, e.g. Microsoft Excel or Apple Numbers. A GAMMA-SCOUT® with firmware Version 6.1 or later and the ONLINE function is required.

SOFTWARE INSTALLATION

Load the software from the enclosed storage device. The software is delivered in a zip file. If your system does not automatically extract the file, double click on the file in your download folder. This will extract the software. After extraction the software is ready for use and can be launched by double clicking. However, it is advisable to place the software in the program folder. To do this, click on the GAMMA-SCOUT REALTIME® icon and drag the file into the program folder.
For quick access to the program, you can create a shortcut in the Dock. Just click on the program icon and drag it to the desired location in your Dock.

USING THE SOFTWARE

1. Connect the GAMMA-SCOUT® to your computer using the cable supplied.

2. Launch GAMMA-SCOUT REALTIME® by clicking the icon in the Dock or double clicking the icon in the program folder.

3. The software establishes a connection with the GAMMA-SCOUT®. This can take a few seconds.

4. When the connection is made, the software shows the current readings from your GAMMA-SCOUT®.

5. You can choose to display either the dose rate or the dose.

SET LIMITS AND COLORS

You can set two limits that will cause the display color to change when exceeded. This makes it easy to understand the current readings at a glance.

1. Select Settings in the GAMMA-SCOUT REAL-TIME® menu.

2. You can set two limits for dose rate and dose readings on the left.

3. On the right you can individually select the font and background colors for the two warning levels and the “normal” range.

4. All settings are adopted immediately and automatically saved for the next time the program starts.

TROUBLESHOOTING

Problem: A connection cannot be established. The message displayed reads “No device connected”.
Solution: Disconnect your GAMMA-SCOUT® from your computer and close the software. Restart the software and connect GAMMA-SCOUT®.

If this is not successful, check the connection cable and all devices, e.g. the USB hubs connected between GAMMA-SCOUT® and your MAC. Try to disconnect all USB devices from your MAC and connect GAMMA-SCOUT® directly with a port on your MAC.

Problem: A connection cannot be established. The message displayed reads “Device is not responding”.
Solution: Check the firmware version of the GAMMA-SCOUT®. GAMMA SCOUT REALTIME® can only operate with devices running firmware version 6.1 or later with ONLINE function.

Problem: Switching between dose rate and dose is not working.
Solution: Switch back again, wait until a value appears and then switch forward. If that does not help, end the software then restart it.

Problem: The dose constantly shows 0.000.
Solution: The dosimeter in your GAMMA-SCOUT® must be running in order to log dose data. Please refer to page 15.

TECHNICAL DATA, CALIBRATION, SUPPORT, RESET

PHYSICAL PARAMETER	SI UNIT	OLD UNIT	CONVERSION
Activity	Becquerel (Bq) 1 Bq = 1/s	Curie (Ci)	1 Ci = 3.7 * 10 ^{10} Bq 1 Bq = 2.7 * 10 $^{-11}$ Ci = 27 pCi
Ion dose I	Coulomb / kg	Röntgen (R)	1 R = 2.58 * 10 $^{-4}$ C/kg 1 C/kg = 3876 R
Energy dose D	Gray (Gy)	Rad (rd)	1 rd = 0.01 Gy 1 Gy = 100 rd
Equivalent dose H	Sievert (Sv)	Rem (rem)	1 rem = 0.01 1 Sv = 100 rem
Effective Dose E	Sievert (Sv) 1 Sv = 1 J / kg		Calculated value / radiation protection

CALIBRATION

The counter tube is not expected to suffer fatigue under environmental radiation and will therefore not require re-calibration. However, if the user holds ISO certification, periodic calibration is mandatory. We offer the following service:

Testing is sub-contracted to an assembly operation, which tests it for 72 hours against a master device that is calibrated against a gauged reference source (Cs-137). A data log is then generated. To the best of our knowledge, this record is accepted as compliant by ISO auditors without exception.

For current prices for calibration and repairs, visit:

www.gamma-scout.com/support

TECHNICAL SUPPORT

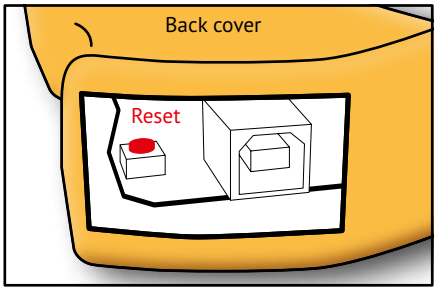
If your GAMMA-SCOUT® exhibits unusual behavior or faults, please begin by consulting the document “Helping customers to help themselves” before sending in the device for repair. The document is available under:

www.gamma-scout.com/help/download

It is often helpful to connect the device to the power supply or perform a reset to eliminate problems or narrow down the possible causes.

RESET BUTTON

The device can be restarted by pressing the reset button (next to the opening for the USB interface, flat on the circuit board). This returns the device to the factory settings.



SUPPORT WITH IT ISSUES

In case of problems when installing the software, please do not hesitate to contact us:

Tel: +49 (0) 2234 / 20 22 743
E-Mail: info@gamma-scout.com

DISPLAY	Liquid-crystal display (LCD), 4-digit, numeric with description, quasi-analog logarithmic bar chart Operating mode indicators
RADIATION DETECTOR	End-window counter tube based on the Geiger-Müller principle Stainless steel housing Measuring length 38.1 mm, measuring diameter 9.1 mm Mica window, 1.5 to 2 mg/cm^2 Zero rate <10 pulses per minute with screening by 3 mm Al and 50 mm Pb, operating temperature -20 to +60°C, operating voltage approx. 450 V, calibrated range 0.1 µSv/h to 1,000 µSv/h (above and below this, we refer to as the "display area")
RADIATION TYPES	α from 4 MeV β from 0.2 MeV γ from 30 keV
SELECTION SHIELD (FOR POINT RADIATION)	α + β + γ without shield β + γ: aluminum foil, approx. 0.1 mm, fully blocks α radiation γ: Al shield approx. 3 mm - fully blocks α radiation; blocks β radiation up to 2 MeV; less than 7% attenuation of γ based on Cs-137
RECYCLING	By written request devices can be returned free of charge for recycling.
POWER CONSUMPTION	Less than 10 microamperes under environmental radiation
STORAGE	64 KB (approx. 32,000 data records)
HOUSING	Impact-resistant plastic
DIMENSIONS	163 mm x 72 mm x 30 mm
INTERFERENCE PROTECTION	European CE standard; US standard FCC-15 Data reset is not a malfunction
SERVICE & REPAIRS	**GAMMA-SCOUT GmbH & Co. KG** Max-Planck-Str. 22, D-50858 Cologne / Germany Tel: +49 (0) 2234 / 20 22 743 E-Mail: info@gamma-scout.com
MEDIA ENQUIRIES IT SUPPORT	**GAMMA-SCOUT GmbH & Co. KG** Max-Planck-Str. 22, D-50858 Cologne / Germany Tel: +49 (0) 2234 / 20 22 743 E-Mail: e.mirow@gamma-scout.com
LAST REVISED	See back cover (We reserve the right to make changes without notice)

TERMS AND CONDITIONS, SAFETY REGULATIONS

SCOPE OF APPLICATION

Our supplies, services and offers are made and provided solely on the basis of the following Terms and Conditions. These form an integral part of all contracts concluded with our customers/ buyers in respect of the goods offered by us.

OFFER AND CONCLUSION OF CONTRACTS

Offers and pricing stated in brochures, advertisements and other promotional material are non-binding and subject to change without notice. The customer is bound by any order sent via internet, fax or email and not yet accepted by us for a period of 14 calendar days after the sending of that order. The sales contract comes into effect as soon as our acceptance of the order is received by the customer and no later than the arrival of the goods.

Orders of up to three units are due for delivery immediately and no later than five working days following receipt of order.

PRICING AND PAYMENT

In Germany the prices stated include statutory value added tax. Unless otherwise agreed in writing, our prices include packing costs. There are no shipping costs for recipients within Germany. Shipping costs for recipients within the EU are €20.00 plus VAT (see website). Payment is permissible only through authorised direct debit from the bank account provided by the customer or through BACS transfer to the bank account specified by us. Buyers can then only set off their own claims against our claims, if the buyer's claims are uncontested or have been established as legally binding.

RETENTION OF TITLE

We retain ownership rights to the goods delivered until payment of the purchase price for those goods and any other arrears has been received in full. As long as retention of title is in force, the purchaser may not sell the goods or utilize its title in any other manner. To secure our claims, any receivables resulting from an unlawful reselling or divestment are herewith transferred to us. We accept this transfer. Commercial distributors are permitted to resell the goods. The amount of their purchase price is assigned to us until settlement of our claims, and is collected by the distributor with our permission on our behalf and forwarded to us. We accept this assignment. The buyer is obliged to store free-of-charge and safely such goods as remain in our ownership. In the event that our property is seized by a third party (particularly bailiffs), the buyer must inform such parties of our ownership and inform us without delay.

WARRANTY / COMPENSATION / LIABILITY LIMITATION:

In the event of faults or defects in the goods supplied, the buyer's full statutory rights are retained. Compensation claims on the part of the buyer due to obvious material defects are excluded if the buyer does not inform us of the defect within a period of two weeks following delivery of the goods. Our liability for compensation, regardless of basis in law and in particular due to delay, defects or other breach of duty, is limited to damages of a foreseeable and normal contractual nature. Our devices are Geiger Müller counters. They are for the purposes of measuring ionising radiation within the scope of measuring procedures for handheld Geiger counters. We cannot accept liability for damages if the device has been opened or used improperly. We take no responsibility for incorrect interpretation of the measurement values shown.

ELEKTROG (WEEE) (GERMAN ELECTRICAL AND ELECTRONIC EQUIPMENT ACT)

We accept the return of our devices for recycling and disposal purposes in accordance with the

German Electrical and Electronic Equipment Act. (WEEE Reg. No. DE 77672754)

DATA PROCESSING – DATA PROTECTION

Personal and corporate data relating to our customers are stored in information systems for business purposes. They are used only in accordance with the rules set out in the German Data Protection Act.

GENERAL PROVISIONS

The contractual relationship is subject entirely to the jurisdiction of German law. The United Nations Convention on Contracts for the International Sale of Goods (CISG) does not apply. Due legal process is required in the event of dispute. There is no provision for out-of-court dispute resolution.

In relation to commercial resellers, the court of jurisdiction is that applicable to the headquarters of Gamma-Scout GmbH & Co. KG.
Should individual provisions of these Terms and Conditions prove to be or become ineffective, this does not affect the validity of the remaining provisions and those of the overall transaction.

LINKS ON OUR WEBSITE:

While we do not preclude links between our website and those of our business partners, we do not accept any liability for their content.

RIGHT OF WITHDRAWAL, CANCELLATION POLICY

Consumers (§ 13 BGB – Section 13 of the German Civil Code) have the right to withdraw from their contractual statement after submitting the order up to 14 days after receiving the goods without providing reasons, either in writing or by returning the goods accompanied by a statement that the return constitutes a withdrawal from the contract.

The revocation period shall be deemed observed if the goods or notice of revocation are dispatched within the stated period.

Revocation and returns shall be addressed to:

GAMMA-SCOUT GMBH & CO. KG,
Eva K. Brand-Mirow
Max-Planck-Str. 22
50858 Cologne Germany

CONSEQUENCES OF REVOCATION:

In the event of a valid revocation, payments or goods received by either party, including any possible benefits gained, must be returned/repaid within 14 days. If you cannot return payment or goods received from us in whole or in part or can return the goods only in unimpaired condition, you must provide due compensation for the loss of value. This also applies to any impairment that occurs when using the goods in question as intended (particularly destruction of the counter tube). You should therefore avoid any value impairment.

Obligations to return payments must be fulfilled within 14 days. This period begins for you as soon as you send your statement of revocation or ship the goods; and for us, on their receipt.

GAMMA-SCOUT GmbH & Co. KG,
Cologne, October 2024

INDEX

A
Alarm threshold 4, 14

B
Bar chart 7, 16, 23
Battery 5, 12
Battery voltage 2, 12
Becquerel 10, 32

C
Calibration 4, 32 ff
CE Declaration of Conformity 5
Clicker 2, 4, 13
Connection cable 20, 26, 29
Continuous operation 4

D
Data analysis 17–22, 27–29
Date 2, 11, 20 ff, 23
Deletion 16, 21
Dose 4, 7 ff, 14, 20, 23–26, 28, 31 ff

E
Equivalent dose 7, 32

F
FCC Rules 5

G
GAMMA-SCOUT READER® 4 ff, 27
GAMMA-SCOUT REALTIME® 5, 25 ff, 30 ff
Geiger-Müller tube 6, 33

I
Installation 5, 17–19, 21, 30, 32
Interface 2, 4, 12, 17, 25

L
Limits 8, 24–26
Logging 2, 8, 11, 13, 16, 20 ff, 27–29, 32
Logging frequency 14, 16
Logging interval 16
Logging symbol 2, 16

M
MAC 4, 5, 16, 27–31
Measurement time 9, 10
Microsievert 2, 7, 8, 32

O
ONLINE model 4, 23–26, 31
Operating modes 7, 10, 14 ff
Operating system 5, 17

P
Pulse counting 2, 9
Pulse rate measurement 2, 10

R
Radiation exposure 7, 8
Radiation selection switch 2, 6
Rem 2, 4, 7, 32
Reset button 2, 32
Revocation of contract 5, 35

S
Set date and time 11
Storage 4, 16 ff, 20 ff
Support 5, 17, 21, 26, 32 ff

T
Technical data 32 ff
Terms and conditions 34
TOOLBOX software 4, 5, 17–22
Types of radiation 6, 7

U
Updates 21, 29
USB interface 2, 4, 12, 17, 25

W
Weekly value 16
Windows 4, 5, 11, 16–22, 25

NOTIZEN / NOTES

Information on GAMMA-SCOUT®, instructions for software (processes GAMMA-SCOUT® data) and technical support available at

www.gamma-scout.com

GAMMA-SCOUT GmbH & Co. KG

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info@gamma-scout.com
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Last Revised: October 2024

NOTICE: We accept all returns for recycling – on your request.