



Colibri®: Hand-Held Health Physics Communication ALARA* Platform

Features

- TTC: H*(10) dose rate equivalent measurement from background up to 10 Sv/h (1000 rem/h)
- VLD (Patent pending): H*(10) dose rate equivalent measurement from 10 nSv/h to 1 mSv/h (1 µrem/h to 100 mrem/h)
- Fast start up time: <15 sec
- Multiple CSP™ probe host controller
- Mapping applications with GPS, Barcode or RFID reader
- Multiple usability levels via profile and user management
- Easy data transfer and instrument setup with standard PC web browser
- Background subtraction mode
- Timer/Scaler for better MDA
- Large data storage
- Traceability: When, How, Who, Where for each record
- Wired or wireless probe connection
- Large control buttons to accommodate use with gloves
- Large color touch screen
- Easy to read display in all light conditions
- Waterproof to 1 meter depth
- Rechargeable batteries with no memory effect
- Always visible dose-rate display for better user safety
- Bluetooth® headset connection
- Loud audio alarm and vibrator
- Free and easy to upgrade software via PC connection

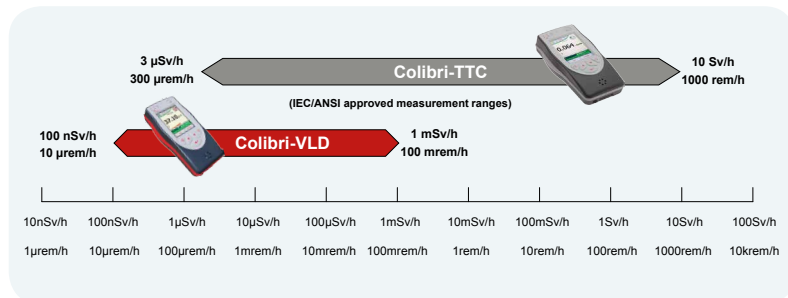
Description

Colibri is a comprehensive health physics instrument with unique characteristics that can lower the dose exposure of HP technicians and other workers in radiation areas. The “always on” gamma dose feature ensures the worker is always informed – even when using the Colibri for contamination surveys with attached probes. The Colibri also allows for wireless data collection from pre-positioned detectors that can be placed in radiation areas – eliminating the need to attach probes, get close to the source – then manually transcribe data. Walk into the room – and Colibri performs the survey for you – allowing exit from the rad area in a fraction of the normal time.

Colibri is available in two different versions:

1. TTC (grey gasket) – for radiation area measurements up to 10 Sv/h (1000 rem/h). Colibri TTC will not saturate in case of a sudden increase of radiation and will always provide the user with a reliable and precise dose-rate information when most other conventional instruments will stop measuring. Thus, Colibri TTC is the ideal tool for daily survey inside nuclear buildings, for radiation post accident follow-up and emergency response follow-up (dose and contamination).
2. VLD – Very Low Dose (red gasket) for public area measurements starting from 10 nSv/h (1 µrem/h). Colibri VLD is the smallest versatile instrument capable of measuring precisely and quickly background level of dose-rate changes starting from 10 nSv/h with a saturation limit that allows quantification of significant dose-rate hazard.

The large color touch screen reports real-time, error-free measurements for up to eight CSP-CANBERRA Smart Probes (seven via Bluetooth and one via CSP standard cable) while always displaying dose-rate at worker location.



*ALARA = As Low As Reasonably Achievable

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Colibri provides both fast reacting semi-log bargraph and averaged digital reading for each measurement window. The main window displays either the internal detector dose-rate or the external probe read-out and the secondary window shows the cumulated dose or the Colibri dose-rate when one or multiple external probes are connected.

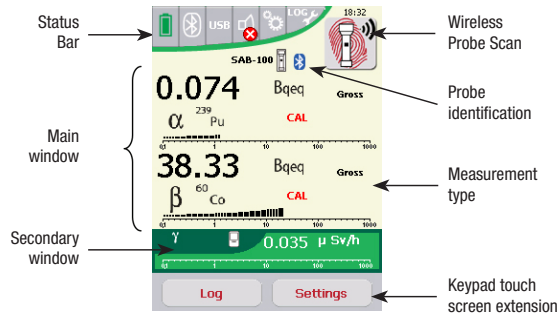


Figure 1: Colibri screen with external alpha/beta probe connected

It is always ready to go with no-memory-effect rechargeable batteries and accompanies the worker in the field with minimum constraint. It can be worn on the belt with a permanent smooth clip, or held comfortably in the hand using the finger strap and secure wrist strap.

The Colibri's speaker emits alarm sounds as well as other audible signals. In the event of a radiation hazard, regardless of working conditions, an alarm will sound along with a flashing LED and vibrator. The standard available off the shelf Bluetooth headset will better support source and contamination location in noisy environments. When using a mixed Alpha/Beta probe, the Colibri emits separate sounds to differentiate between Alpha and Beta counts. This allows the user to focus their eyes on things other than the Colibri.

Colibri TTC integrates a GM detector with CANBERRA superior Time-To-Count technique that covers never achieved dose rate range from background up to 10 Sv/h reducing the risk of saturation in unexpected high dose rate situations. Colibri VLD is based on a CsI scintillator with a novel energy compensation technique that improves sensitivity over entire energy range (patent pending). Colibri VLD allows quick measurement of very low dose-rate while other instruments only estimate such background level. Dose-rate is automatically stored every five seconds in a date stamped internal file allowing for post analysis.

Quality assurance and traceability is naturally embedded in Colibri operations for each logged data and answer typical questions like:

Q: When was the measurement taken?	A: With date and time stamped records.
Q: Who drove the measurement?	A: User login settable access.
Q: Was the instrument/probe calibration valid?	A: Calibration validity check and storage.
Q: Where was the user?	A: Internal GPS and/or external wireless barcode/RFID reader.

Colibri Upgrades

You can download free of charge Colibri upgrades on the firmware upgrade database available at www.canberra.com. This database will provide all further software versions and applications to enable additional features.

Colibri is compatible with all CANBERRA Smart Probes (CSP). The probes extend the capabilities of the instrument to a range of general surveying applications. With CSP design, key components of hardware circuitry (high voltage, amplifier, discriminator, etc.) are located directly inside of the probe housing rather than in the host survey instrument. Also, the intelligence associated with controlling those components is located in the probe – that is, control and storage of key parameters, settings, calibrations, probe ID, alarm settings, etc. Thus the probe is a fully-integrated subsystem acquiring and transmitting the measurement to the instrument, which is used for display.

With high voltage and digitization of the data occurring in the probe rather than the instrument, measurement accuracy is no longer dependent on cable quality as with older analog systems. Also, the probes can be plugged in “hot” without powering down the instrument – the instrument immediately recognizes the probe and automatically switches measurement to the mode required for that specific probe.

Calibrations and QA measurements can be performed directly with the probe, without even using the instrument, by connecting the probe to a computer with the CANBERRA calibration software (CSPS™). This allows Colibris' to remain deployed in the field while various probes are being calibrated.

The Colibri can be connected to external probes by a cable. It can also connect to the CSP probes with wireless technology (Bluetooth) via CSP-COM modules, eliminating the need for a cable. This eases contamination surveys as the user is not dependent on cable length and cable coil-ups.

Timer Scaler

Colibri incorporates a scaler timer mode that allows user to select an integration time from 1 s to 65535 and improves MDA. It displays the number of counts for the selected period of time and the average value in selected unit.



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Source Finder Mode

The source finder mode has been designed to monitor and display on an easy-to-understand graphic showing the radiation trend vs. time, in any of the pre-selected units. The graphic updates can be chosen within three different dwell times: Fast = 250 ms, Medium = 500 ms or Slow = 1 s.

This mode is useful in decommissioning applications with contamination probes, when the audio control is not enough and when a more precise control is required.

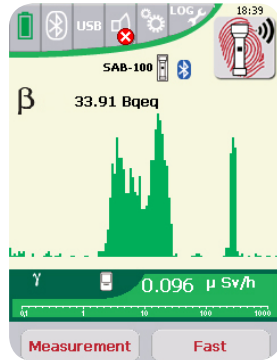


Figure 2: Colibri source finder mode

Background Subtraction

Colibri includes a background subtraction mode. It allows acquisition of a background for a selected duration and subtracts it from next measurements to display and store net results. Colibri allows for the setting of a validity period after which the device will query the user to perform a background update. This mode is useful when performing contamination measurement in a constant background area, thus obtaining measurements reflecting real contamination of a monitored object.

Data-Logging and Mapping applications

Colibri is the perfect instrument for mapping applications. It can save a large number of measurements associated with location data, such as GPS coordinates, barcode, RFID tag or simply an incremental index. GPS is a Colibri internal option while Barcode or RFID readers connect via Bluetooth link.

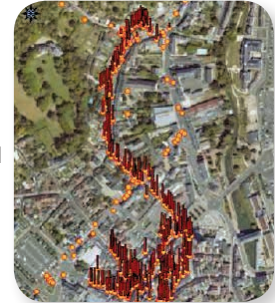
Each logged data is encapsulated with QA information about external probes and/or internal detector calibration traceability. A comment can be entered via a virtual touchscreen keyboard to highlight any specific information for each measurement point.

The automatic data-logging function stores up to 60 000 records of 0 to 65535 seconds acquisition with time interval of 0 to 200 000 seconds. It is a powerful mapping tool when GPS coordinates are available.

Colibri manages three date stamped CSV files (MS-EXCEL compatible) for each day of operation:

1. Automatic and transparent storage of dose-rate every five seconds.
2. Manually triggered data-logging with internal detector and/or external probes.
3. Automatic data-logging.

This selection facilitates data retrieval because the user only needs to identify the day of interest.



Example of Automatic Data logging measurements achieved with Colibri GPS and displayed on a map

Colibri improves ALARA

Colibri will always warn you of any radiation hazard. When used without an external probe, Colibri displays both the dose rate and the cumulative dose taken



since the Colibri has been powered on. When an external probe is connected, it displays both the external probe measurement and the internal dose rate, allowing the user to be aware of the dose rate level when he is focused on the contamination survey.

Figure 3: Colibri with external single channel probe

Colibri features a loud audible alarm, visible LED and vibrator, triggered by alarm set-point for dose-rate, cumulative dose and external probes.

Colibri can connect to remote probes with the wireless Bluetooth link. Probes can transmit measurement data from the hot zone to the user, eliminating the need for the user to enter the hot zone to control the area. It can also be used to assess the radiation risk before entering into a hazardous area. This decreases the total dose exposure for the worker.

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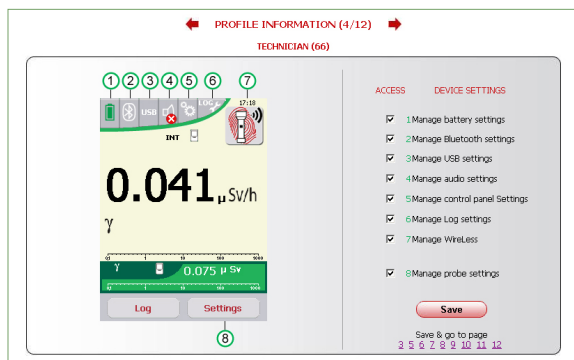
A Customizable Instrument

Colibri connects to a PC using a standard web browser for data transfer and instrument setup. Connection can be wired with the USB Colibri cable (part of standard delivery) or wireless with internal Bluetooth link if the user computer is Bluetooth capable.

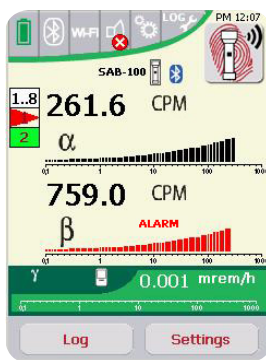
Colibri can be set to any level between fully open and highly restricted for a dedicated worker or a group of users.

Colibri includes user and profile management to adapt the instrument to worker capabilities depending on his primary task. The log-in function can be enabled to bring an additional level of traceability since each measurement stored is then linked to a specific user name or group of users.

Colibri data and parameters are password protected.



Multiple Probe Connection



Colibri with two probes connected; focus on alpha/beta probe with beta channel alarming

A Ruggedized Platform

Colibri has been built to resist harsh environment constraints. Its ABS housing is shock absorbant. Its silicon rubber keypad provides excellent tactile control compression recovery, and superior resistance to extreme temperatures unlike an ordinary keypad.

Colibri is also waterproof, which makes it operational in extreme environments.

Field Upgradable Software

Colibri software can be periodically upgraded via PC USB link with the standard delivered cable. As a result, user continues to receive the benefit of future software enhancement long after the instrument is purchased.

Colibri comes with a wrist strap, and a rubber finger strap. It also includes a smooth permanent metallic belt clip.



Figure 4: Wrist, belt and hand straps (left); Belt clip in use (right)

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The standard Colibri package includes a carrying case with USB cable and international AC power supply.

Options

- An optional handle which attaches the Colibri to compatible CSP probes (SG, SX, SA, SB, SAB probes) greatly eases contamination control as only one hand is required to perform measurements.
- An internal GPS with typical three meters accuracy.
- External Bluetooth barcode or RFID reader.



Figure 5: Handle for Colibri

The CSP-COM Bluetooth module is necessary to enable wireless communication from the probe side. As Colibri is natively Bluetooth no additional module is required on the Colibri side.

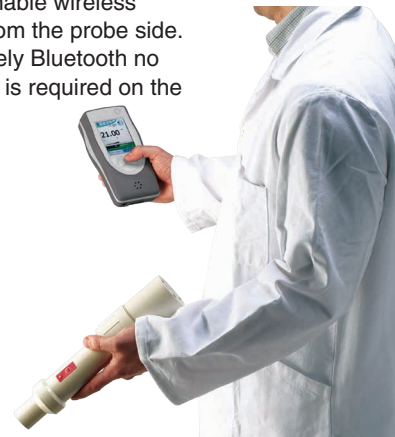


Figure 6: Colibri in use with external probe connected via Bluetooth with CSP-COM



Colibri is provided with a carrying case and accessories



Barcode or RFID wireless reader

	Emitter Displayed	Detector	Units Displayed												
			US Mode					SI Mode							
			CPM	CPS	DPMeq	DPMeq/100 cm ²	rem/h	R/h	c/s	Bqeq/cm ²	Bqeq	Sv/h	Svq/h		
SG-1R	γ, X	Nal		•						•	•				•
SG-2R	γ, X	Nal		•						•	•				•
SAB(G)-100	α, β	Phoswich	•		•	•				•	•	•	•		
SA-100	α	ZnS	•		•	•				•	•	•	•		
SB-100	β	Plastic	•		•	•				•	•	•	•		
SA-20-2	α	ZnS	•		•	•				•	•	•	•		
SA-32	α	ZnS	•		•	•				•	•	•	•		
SB-20	β	Plastic	•		•	•				•	•	•	•		
SX-2R	X	Nal	•		•	•				•	•	•	•		
STTC	$\gamma H^*(10)$	GM							•						•
SVLD	$\gamma H^*(10)$	CsI(Tl)							•						•
SPAB-15	α, β	PIPS®	•		•	•				•	•	•	•		
SN-S	n	³ He		•						•					
SABG-15+	α, β, γ	GM	•		•	•				•	•	•	•		
TELE-STTC-(C or R)	$\gamma H^*(10)$	GM							•						•

Figure 7: Compatible Probe List (non exhaustive)

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Specifications

NUCLEAR

- DISPLAY UNITS – Internal Detector: Sv/h, Sv or rem, rem/h. H*(10) ambient gamma dose equivalent rate (according to ICRP-60).
- With external probes – c/s, Bq_{eq}, Sv, Sv/h, Sv_{eq}, Bq_{eq}/cm², Sv_{eq}/h or cpm, rem/h, rem, R, R/h, DPM_{eq}, DPM_{eq}/100 cm².
- EMITTERS – Gamma.
- DETECTOR – TTC: Energy Compensated Geiger Mueller. VLD: Csl(Tl) with energy compensation.
- SENSITIVITY (¹³⁷Cs) – TTC: 0.73 c/s per μSv/h (438 cpm per mR/h), VLD: 70 c/s per μSv/h (27 kcpm per mR/h).
- MEASUREMENT RANGE – TTC: 0.05 μSv/h to 10 Sv/h (5 μrem/h to 1000 rem/h), VLD: 10 nSv/h to 1 mSv/h (1 μrem/h to 100 mrem/h).
- IEC APPROVED RANGE – TTC: 3 μSv/h to 10 Sv/h (300 μrem/h to 1000 rem/h), VLD: 100 nSv/h to 1 mSv/h (10 μrem/h to 100 mrem/h).
- IEC APPROVED ENERGY RANGE – TTC: Gamma 48 keV to 1.5 MeV, VLD: 59 keV to 1.5 MeV.

ALARM THRESHOLD

- USE – Choice of one within a list of 10 preset and editable values.
- EXTERNAL PROBES – 10 editable values for each unit to display, stored in probe memory.
- Each value is editable via PC setup software (CSPS) and Colibri.

ERGONOMIC

- DISPLAY – 3.5 in. QVGA TFT 240*320 with backlight.
- ALARM –
 - AUDIBLE ALARM – >85 dB at 30 cm, typical: 90 dB.
 - Vibrator.
 - VISUAL – Flashing red LED, alarm pictogram and screen display color (red).
- KEYBOARD – Ruggedized silicon keyboard with six buttons: power, audio, light, up, down, enter.
- OPERATING CONTROLS – Complete and automatic self test when switching on. Periodical control of main functions when in use.
- DATA STORAGE (internal or external detector) – Measure, selected thresholds, probe identification, serial number, time and date, calibration data and location data. 512 MB flash memory.

ELECTRICAL

- BATTERIES – Integrated rechargeable Batteries (Li-ion).
- EXTERNAL CHARGER – 100-240 V ac/47-63 Hz.
- CHARGE TIME – 2 hours approx.
- BATTERY LIFE – Up to 25 h (based on TTC version); display of 'low battery' pictogram when battery life is <1 hour.

MECHANICAL

- HOUSING – Molded polycarbonate housing with elastomer and Silicon keyboard. Waterproof and easy to decontaminate.
- DIMENSIONS – 195 x 100 x 69 mm (7.6 x 3.9 x 2.7 in.) (L x W x H).
- WEIGHT – ~630 g depending on version and options (22.2 oz).
- CONNECTOR FOR PROBES – Waterproof Fisher socket.

ENVIRONMENTAL

- OPERATING TEMPERATURE – TTC: -20 °C to +50 °C (-4 °F to 122 °F), VLD: -10 °C to +40 °C (14 °F to 104 °F).
- STORAGE TEMPERATURE – TTC: -25 °C to +60 °C (-13 °F to 140 °F), VLD: -25 °C to +50 °C (-13 °F to 122 °F).
- RELATIVE HUMIDITY, INGRESS PROTECTION – 10% to 95% at +35 °C – IP67 (waterproof down to 1 meter (3.4 ft) during 30 min.).

APPLICABLE STANDARDS

- Bluetooth Class 2.
- ANSI – Compliant with ANSI 42.17A.
- IEC – Compliant with IEC 60846:2009 and IEC 60325 with external contamination probes. Colibri-TTC is approved to IEC 60846:2009 – Type approval N° 0111-CS-A046-11.
- CE – Meets CE requirements.
- Radio/FCC – Conform.

ORDERING REFERENCES

- Colibri TTC-Basic – EM96846. (Does not include BT, Wi-Fi or GPS)
- Colibri TTC-GPS – EM87771.
- Colibri VLD-Basic – EM96146. (Does not include BT, Wi-Fi or GPS)
- Colibri VLD-GPS – EM86789.
- Spare Colibri AC charger – EM87452.
- Spare Colibri carrying case – EM89305.
- Colibri Car DC charger – EM88805.
- Barcode reader with charging cradle and key retractable reel – EM89303.
- RFID reader with charging cradle and key retractable reel – EM89304.
- Handle for Colibri and one CSP probe – EM87501.
- Straight 1.5 meter cable for CSP – EM77336.
- Straight 10 meter cable for CSP – EM99006.
- Straight 20 meter cable for CSP – EM98830.
- Coil cable 0.7-1.5 meter for CSP – EM77337.
- CSP-COM Bluetooth – EM82481.
- Colibri internal detector calibration cable – EM88940.
- Colibri internal detector calibration English software CSPS-E (SI units) – EM80643.
- Colibri internal detector calibration English software CSPS-R (US units) – EM80642.
- Colibri internal detector calibration French software CSPS-F (US units) – EM78468.

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