CT007-M
User's Manual

Serial Number 100 and Higher

Environmental Instruments Canada Inc.
http://www.eic.nu

April 27, 2023

Contents

1 Introduction

The CT007-M microR meter is a very sensitive gamma radiation detector intended for measuring low levels of radiation or for locating sources. The CT007-M is a small and light instrument with a small sensor housing on the back of the unit. The CT007-M can be used independently as a stand-alone device, or it can be wirelessly connected to the GammaGuard smartphone App using Bluetooth Low Energy.

When the CT007-M is connected to the GammaGuard app, readings are displayed on the smartphone. This allows measurements to be taken in locations not in direct line of sight of the device display. A telescoping handle is available for probing at a distance. The smartphone can be mounted to the handle, enabling one-handed operation. The Smartphone provides a large display with access to a feature-rich GammaGuard app. The Bluetooth connection has a range of approximately 40 meters. The telescoping handle can be extended with an ordinary painter's pole. The GammaGuard app allows you to save data to a file on the smartphone and upload to other platforms. Earphones connected to the smartphone can be used to improve the ability to hear beeps or alarms in noisy environments.

2 Device Overview

Figure 2.1 CT007-M Front Face Plate

An overview of the front and back face plates, and controls is given in Figure 2.1 and 2.2. The CT007-M controls include:

1. OLED Screen – displays readings in units of CPM, μSv/h or mRem/h, and detector information;

Sensor Housing

Battery Door

Figure 2.2 CT007-M Side and Back View

2. Buzzer – a beep tone represents multiple detected counts. "Count tones" can be enabled or disabled on the GammaGuard app. "Counts per Tone" can also configured. A value of Ten (10) is reasonable for background radiation. The device also beeps if the battery is low;

3. Button – ***short press*** (up to 2 seconds) to toggle the screens and ***long press*** (2 to 9 seconds) to wake the device or put the device into low power sleep mode;

4. LED – blinks at the same frequency as configured for the tone indicator. You can enable or disable the "count light" through the settings on the GammaGuard app;

5. Battery Door – see "Battery Change" section for changing batteries;

6. Sensor Housing – The centre of the detector is the centre of the Sensor Housing indicated by the yellow 'X' in Figure 2.3.

Figure 2.3 CT007-M Back

3　Basic Operation

Basic operation of the CT007-M is as follows:

    1. Power unit on by long pressing (2 to 9 seconds) the button on the front face plate.

After a few seconds, the indicator light will illuminate for one second and the display will start showing the readings.

    2. The CT007-M detector is now operating! By short pressing (up to 2 seconds), step through the screens for different measurement unit readings.

The detector will now automatically start radiation detection. The OLED screen has 4 screen displays:

    1) Count Rate (CPM, CPS)

    2) Dose Rate (μSv/h or mRem/h)

    3) Total Counts and Total Dose (C, μSv or mRem)

    4) Device Information (name, mac address, version number & battery percentage)

    5) Screen Off to save battery. The detector is still operating while the screen is off.

Individual screens, except the blank screen, can be disabled from the app.

4 App Usage

The CT007-M can be wirelessly connected to *GammaGuard*, via Bluetooth Low Energy to:

- View detailed and interpreted detector data

- Switch measurement display modes between count rate (CPM, CPS) and dose rate (µSv/h, mRem/h)

- Set alarms for elevated levels

- Change device settings, such as the conversion factor, enabling device count tone or device alarm

- Log your data with GPS coordinates

- Update your detector firmware

GammaGuard is available for both Android and iOS system.

<u>For iOS users</u>, search the App Store and install the "GammaGuard 2.0" app. ***It has to be 2.0*** to work with the newer devices.

<u>For Android</u>, search the Play Store and install the "GammaGuard" app. ***Don't use the "Legacy"*** version, it does not work with the newer devices.

For both Android and iOS, you can go to www.gammawatch.com and follow the links on home page to get to the correct version of the app.

When prompted, allow the app to use Location Services. It will not work without!

Figure 4.1 App Icon

Figure 4.2 Detector Type Select

Click the *GammaGuard* app icon. It shows the welcome screen as in Figure 4.2.

The app will direct the user to the "Connected Devices" screen. All nearby supported Bluetooth Low Energy devices will be listed. Choose the device called "CT007-M-##", where ## is the unit number for the detector.

Upon connecting, the device display on CT007-M will be turned off automatically and the user will then use the smartphone UI for display. Short pressing the button will turn the device display back on while it's connected to the smartphone.
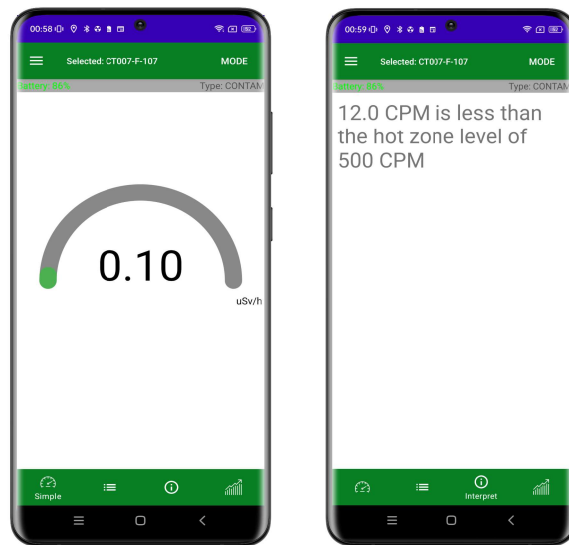

Figure 4.3 "SIMPLE" & "INTERPRET" Screens in Gamma mode

Upon successful connection, the simple dose rate gauge is displayed, similar to left figure in Figure 4.3. Available display options are *Simple*, *Detailed, Interpret and Graph*.

The ***Interpret*** screen interprets the current dose rate for non-technical users.

The MODE switch, located in the top right of the status bar, allows you to switch between the ***Dose Rate*** (µSv/h, mRem/h) and ***Count Rate*** (CPS, CPM). The selected operational units are applied to the other displays

Tapping the menu icon ≡ on the top left corner, brings up the GammaGuard app menu, seen as the left figure in Figure 4.4. You can chose options including "App Settings" and "Device Settings" (CT007-M). Updated device settings are in effect until the batteries are removed from the device.
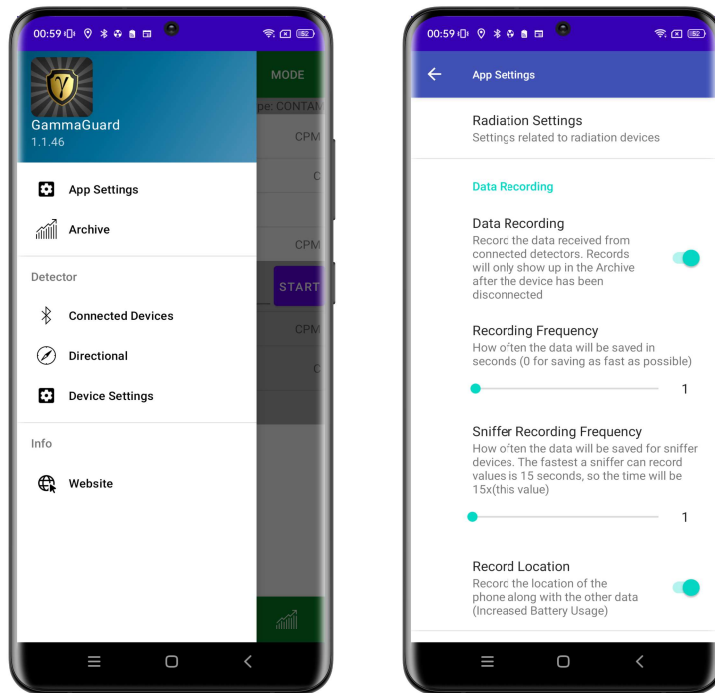
Figure 4.4 Menu Bar and Setting Screen

5 Changing Batteries

The CT007-M uses two AA batteries. Follow these steps to replace the batteries:

1) Unscrew the battery door screw;

2) Open the battery door;

3) Replace two AA batteries;

4) Close the battery door, make sure the hinge catches;

5) Drive the battery door screw back in while holding the door closed with your thumb.

Note: It is good practice to remove the batteries if the device is to be stored for more than two (2) months.

6   Other Useful Information

6.1   Data Logging

By checking "Data Recording" in settings, measurement data will be saved on the smartphone and can be graphed and exported. The data will be logged each "Recording Frequency".

6.2   Data Share by Email

If you would like to share the data, from the Archive menu, identify the data you wish to share. Select "Export," followed by the preferred data type, **and** the 'share' option. Then select "Export" to proceed. You will be prompted to save the data locally as a file, then your method to share. If you select "email", your email app will open and the saved file will appear as an attachment. (This assumes that you have previously configured your email application.)

6.3 (Optional) External Accessory Kits

A telescoping handle is provided for access at a distance. The smartphone can be clipped to the handle, enabling one-handed operation. The Smartphone provides a large display with access to a feature-rich menu.

Figure 6.1 Telescope Handle

To attach the CT007-M to the telescope handle, attach the attachment screw into the threaded hole on the front face of the detector. Then turn the tightening wheel to tighten the screw by driving the screw into the threaded hole. Figure 6.2 illustrates the attachment screw and the tightening wheel in a zoom-in view.
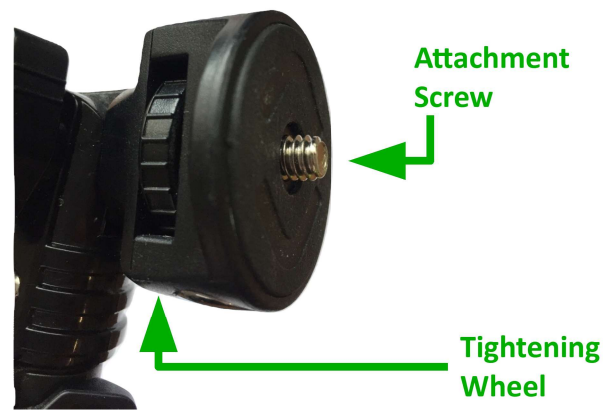
Figure 6.2 Telescope Handle Detector Attach Joint

The Bluetooth connection to your Smartphone has a range of approximately 40 m and the telescoping handle can be extended with an ordinary painter pole.

Figure 6.3 Painter Pole Attached

6.4 One Year Limited Warranty

This limited warranty applies to CT007 series radiation detectors, purchased from Environmental Instruments Canada Inc. or authorized vendors.

Warranty covers defects in material or workmanship under normal use for a period of one year after receipt of the product. During this one year period, EIC Inc. will repair or replace the product at no charge.

Exclusions: This warranty does not cover damage caused by abuse, neglect, or misuse. This includes damage from drops, or impact. The warranty will be rendered void if the product has been repaired or altered by anyone other EIC Inc.

There are no warranties, express or implied, including without limitation any implied warranty of merchantability or fitness. If the product does not perform as warranted herein, purchaser's sole remedy shall be repair or replacement, at the option of EIC Inc. In no event will EIC Inc. be liable for damages, lost revenue, lost wages, or any other incidental or consequential damages, arising from the purchase, use, or inability to use product.

To obtain this warranty service, please contact us at: admin@eic.nu.

7 Support and Contact

7.1 Troubleshooting/FAQ

If you have any difficulty with the product or questions, please visit our troubleshooting and frequently asked question pages on our GammaWatch website:

http://www.gammawatch.com/trouble-shooting/

http://www.gammawatch.com/frequently-asked-questions/

7.2 Contact Us

If you are unable to find the information you are looking for on our website or you need further assistance and technical support, please don't hesitate to contact us.

Phone	+1(306) 974-6055
Online Contact Form	http://www.gammawatch.com/contact-us/
E-mail	admin@eic.nu
Facebook Group	CT007 Users Group
Address	202-135 Robin Cres. Saskatoon, SK S7L 6M3, Canada