

CT007-M

User's Manual

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

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Contents

1 Introduction.....	2
2 Device Overview.....	3
3 Basic Operation.....	6
4 App Usage.....	7
5 Changing Batteries.....	12
6 Other Useful Information.....	13
6.1 Data Logging.....	13
6.2 Data Share by Email.....	13
6.3 External Accessory Kits.....	14
6.4 One Year Limited Warranty.....	16
7 Support and Contact.....	17
7.1 Troubleshooting/FAQ.....	17
7.2 Contact Us.....	18

1 Introduction

The CT007-M microR meter is a very sensitive gamma radiation detector intended for measuring low levels of radiation or for finding 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 in this stand-alone configuration.

Alternatively, the CT007-M may be wirelessly linked to your smartphone with the readings displayed on the phone's screen. This allows you to take readings in locations that are not in line of sight. A telescoping handle is available for access at a distance. The phone can be clipped to the handle, enabling one-handed operation. The Smartphone provides a large display with access to a feature-rich menu. The cordless connection to your Smartphone has a range of approximately 40 meters and the telescoping handle can be extended with an ordinary painter pole. The GammaGuard app, running on your smartphone allows you to log data to a file on the phone or upload data to RadResponder, a web based database. You can use earphones, connected to the phone, 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 controls is given in Figure 2.1 and 2.2. The CT007-M controls include:

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



Figure 2.2 CT007-M Side and Back View

2. Buzzer – each beep represents a detected count. You can enable or disable the “count tone” through the settings on GammaGuard App. It 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 turn on/off the device;

4. LED – lights up when the device is first powered up (battery inserted);
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 (see Figure 2.3).



Figure 2.3 CT007-M Back

3 Basic Operation

Basic operation of the CT007-M is outlined in the following steps.

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

In 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), toggle the screens for different measurement unit readings.

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

- 1) Counts per minute (CPM)
- 2) Dose Rate (uSv/h or mRem/h)
- 3) Total Counts and Total Dose (C, uSv or mRem)
- 4) Device Information (name, mac address, version number & battery percentage)

Individual screens 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 modes between “gamma mode” and “contamination mode”
- 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
- Keep your detectors updated

GammaGuard is available on both Android and iOS. On iOS, simply search for "GammaGuard" in the App Store. On Android, GammaGuard may not be found when searching the Play Store. In this case, a link to it may be found on gammawatch.com, or by manually entering <https://play.google.com/store/apps/details?id=nu.eic.gammaGuard> in your web browser.

Find the app with the following app icon, seen Figure 4.1. Click and install the “GammaGuard” app on your smartphone.



Figure 4.1 App Icon

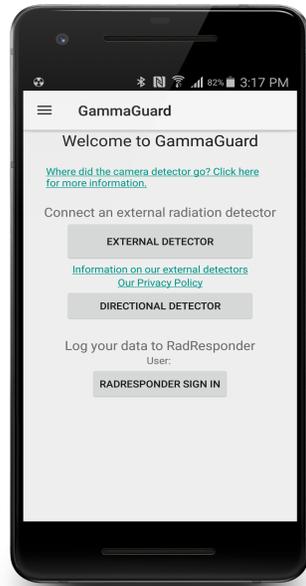


Figure 4.2 Detector Type Select

Click the *GammaGuard* app icon. It shows the welcome screen as Figure 4.2 and let you choose to connect to either a camera detector or an external detector. For CT007-M, select “External Detector”.

It will direct the user to the “Detector Scan” screen. All nearby Bluetooth Low Energy devices will be listed. Choose the one called “CT-M-##”, where ## is the unit number for the M detector.

During connection, your unit's firmware will be checked to see if an update is required. If so, this process will be done automatically, and will take several minutes. Upon connecting, the local display on CT007-M will be turned off automatically and user will use the phone UI as display screens. Short press the button will turn the local display on while it's connected to the smartphone.

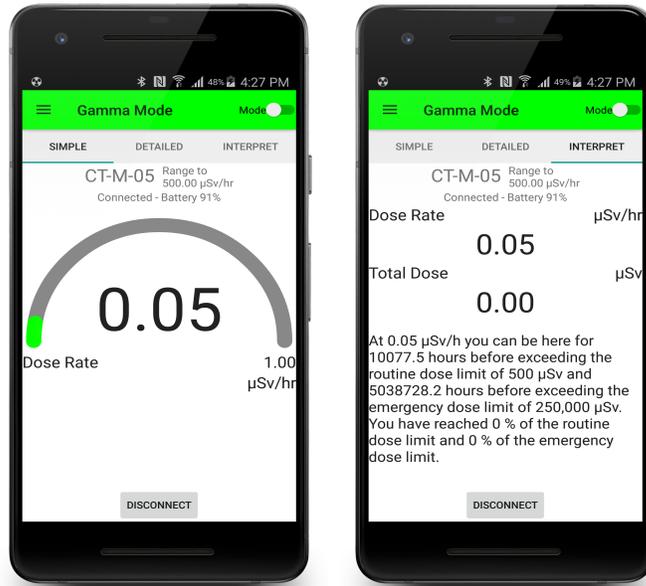


Figure 4.3 "SIMPLE" & "INTERPRET" Screens in Gamma mode

After a successful connection, a screen like the left figure in Figure 4.3 will show up. This is the default screen. It displays the dose rate level in a simple gauge. By swiping the screen, you can toggle the display between "SIMPLE", "DETAILED" and "INTERPRET" screens. The

“INTERPRET” screen interprets the current dose rate for non-technical users.

There is a mode toggle switch at the top right corner on the status bar, to switch between Gamma mode and Contamination mode. Depending on the detection purposes, use gamma mode to measure gamma levels and switch to contamination mode when doing contamination measurements.

Gamma mode is the default mode and it displays and interprets data in dose rate and total dose. On the other hand, contamination mode uses counts and counts per minute as its measurement and interpretation base units. The alarm levels will be adjusted according to the current operation modes.

When click the menu icon on the top left corner, it brings up the menu bar, seen as the left figure in Figure 4.4. Click “Settings” under “External”. The password prompt will display. If you hit “Cancel” or enter the wrong password, you only have access to user settings. If you enter the correct password, you also have access to administrator settings. Be careful with these. The default password is 1234.

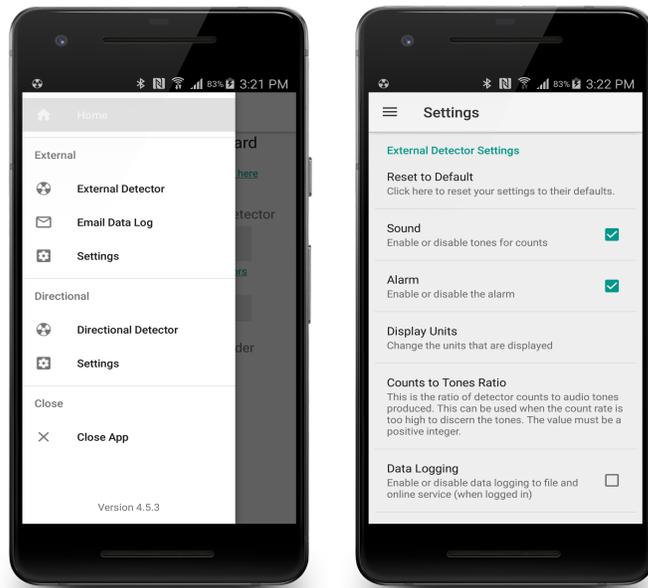


Figure 4.4 Menu Bar and Setting Screen

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.

6 Other Useful Information

6.1 Data Logging

By checking “Data Logging” in settings, the next available measurement data will be written into a CSV file, “dataLog-ExtDetector.csv” in a folder called “GammaGuard” in local storage. The data will be logged each “Logging Interval”.

6.2 Data Share by Email

Clicking “Email Data Log” will direct you to an email composition window, where the current data log file has been attached. Once the recipient email address is entered, the email can be sent out.

Note: If you don’t have an email account logged in on your smartphone, it will require you to enter the email account and password.

6.3 External Accessory Kits

A telescoping handle is provided for access at a distance. The phone 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.

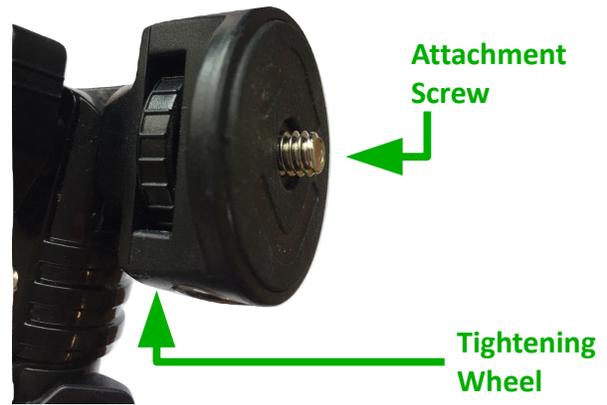


Figure 6.2 Telescope Handle Detector Attach Joint

The cordless 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.

This 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 damages caused by abuse, neglect, or misuse. This includes damage from drops, impacts, or any penetrations through the sensor screen. It will also be rendered void if the product has been repaired or altered by anyone other than EIC Inc.

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

7 Support and Contact

7.1 Troubleshooting/FAQ

If you have any troubles 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 not satisfied with the answers on our website or you need further assistance and technical supports, 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
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