

# **CT008-F**

# **User's Manual**

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

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# 1 Introduction

The CT008-F is a small radiation contamination detector. It responds to alpha, beta and gamma radiation. The CT008-F uses a plastic scintillator and solid state photomultipliers to detect radiation.

The CT008-F is sensitive enough to respond to low levels of radiation to check for contamination, yet, can measure dangerously high levels exceeding 10 Sv/h.

The CT008-F uses solid state technology which offers the ability to withstand air pressure changes without rupturing.

The CT008-F can be used as a stand alone detector or in conjunction with the *GammaGuard* app, available on the Google Play Store and iOS App Store. It wirelessly connects to smartphones via Bluetooth for enhanced functionality.

## 2 Device Overview



Figure 2.1 CT008-F Front Face Plate

An overview of the front and back is given in Figure 2.1 and 2.2. The CT008-F controls include:

**OLED Screen** – displays readings in units of CPM,  $\mu\text{Sv/h}$  or  $\text{mRem/h}$ , and detector information. The display will automatically switch unit magnitude when appropriate. For example, the display will go from  $999 \mu\text{Sv/h}$  to  $1.00 \text{mSv/h}$ . The smaller unit is displayed on the right, while the larger unit ( $\text{mSv/h}$ ) is displayed on the left to make it obvious that the unit magnitude has changed;



Figure 2.2 CT008-F Back

Buzzer – each beep tone represents a detected count. It will also beep if the battery is low. You can enable or disable the “Count Tones” through the settings on the GammaGuard app;

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

LED – each blink represents a detected count. You can enable or disable the “count light” through the settings on the GammaGuard app;

Alpha/Beta Shield – the shield blocks alpha and most beta particles. Have the shield covering the window when measuring gamma radiation.

Battery Door – Held in place by a M3x8 screw. Remove the batteries when the unit won't be in use for several weeks or longer- see “Battery Change” section for instructions on changing batteries;

Sensor Window – detects alpha and beta radiation through the window when the shield is open. To open, slide the shield towards the battery door. Open the shield from the side of the unit, not the back, to avoid damaging the window with your fingers.

** Important:**

**Keep fingers and objects away from the exposed window.**

**Keep window closed when not in use and when carrying.**

**Keep away from water and dust.**

**Remove batteries when not in use for several weeks or longer.**

### 3 Basic Operation

Basic operation of the CT008-F is as follows:

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 read 'waking up' and start showing the readings.

2. The CT008-F detector is now operating! By short pressing (up to 2 seconds), toggle through the screens for different measurement unit readings.

The detector will now automatically start radiation detection. The OLED screen has 5 screen display options:

- 1) Count Rate (Counts per minute (CPM) or CPS)
- 2) Gamma Dose Rate ( $\mu\text{Sv/h}$  or mRem/h)
- 3) Total Counts and Total Dose (C, mSv 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 GammaGuard App.

## 4 App Usage

The CT008-F can be wirelessly connected to *GammaGuard* app, 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

GammaGuard is available on both Android and iOS systems.

**For iOS users**, search the App Store and install the “GammaGuard 2.0” app. *It has to be 2.0* to work with the newer devices.

**For Android**, 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](http://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 Nearby Devices and Location Services.** The app will not work otherwise! We do **NOT** track your location. These permissions are required for Bluetooth.



Figure 4.1 App Icon

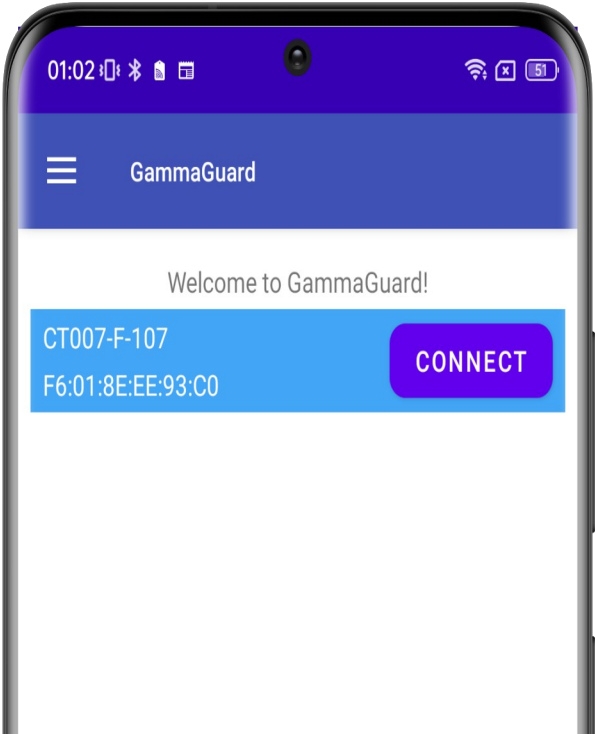


Figure 4.2 Detector Type Select

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 “CT008-F-##”, where ## is the unit number for the detector.

Upon connecting, the device display on CT008-F display will be turned off automatically and the user will use the smartphone UI for display. Short pressing the button will turn the device display back on while it’s connected to the smartphone.

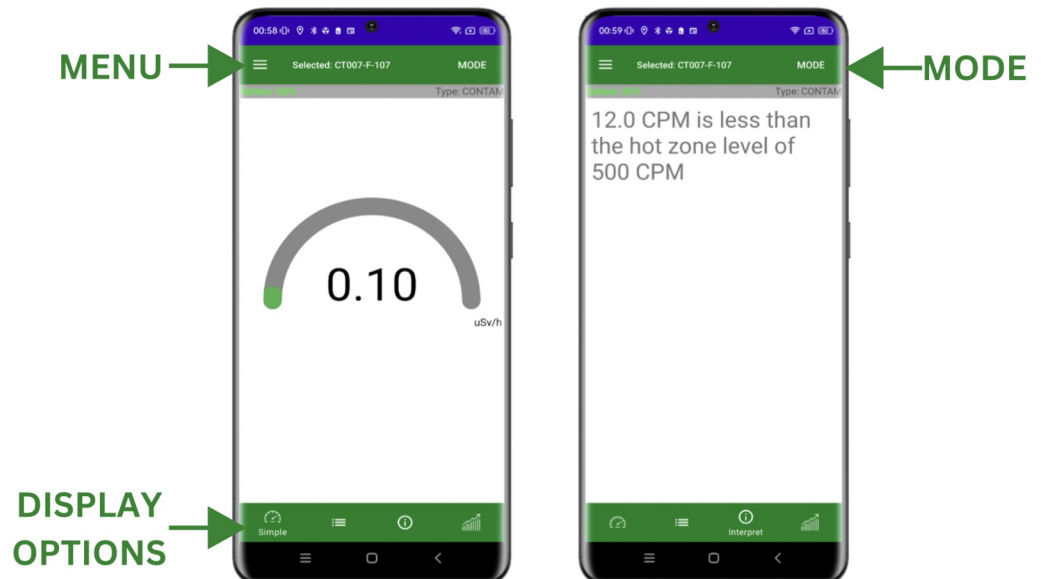


Figure 4.3 “SIMPLE” & “INTERPRET” Screens in Gamma mode

Display Options – 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.

**Mode** – The MODE switch, located in the top right of the status bar, allows you to switch between ***Gamma*** mode or ***Contamination*** mode.

***Gamma*** mode is the default mode. Data is displayed and interpreted in dose rate and total dose in micro/milli-Sieverts ( $\mu\text{Sv}$ ,  $\text{mSv}$ ), or milli-Rem ( $\text{mRem}$ ) as configured.

***Contamination*** mode displays measurement units in counts and counts per second/minute (CPS, CPM) for display and interpretation.

Appropriate alarm levels will be used according to the current operation mode.

**Menu** – Tapping the menu icon  $\equiv$  on the top left corner, brings up the GammaGuard app menu, seen as the left figure in Figure 4.4. You can choose options including “App Settings” and “Device Settings” (CT008-F). Updated device settings are in effect until the batteries are removed from the device.

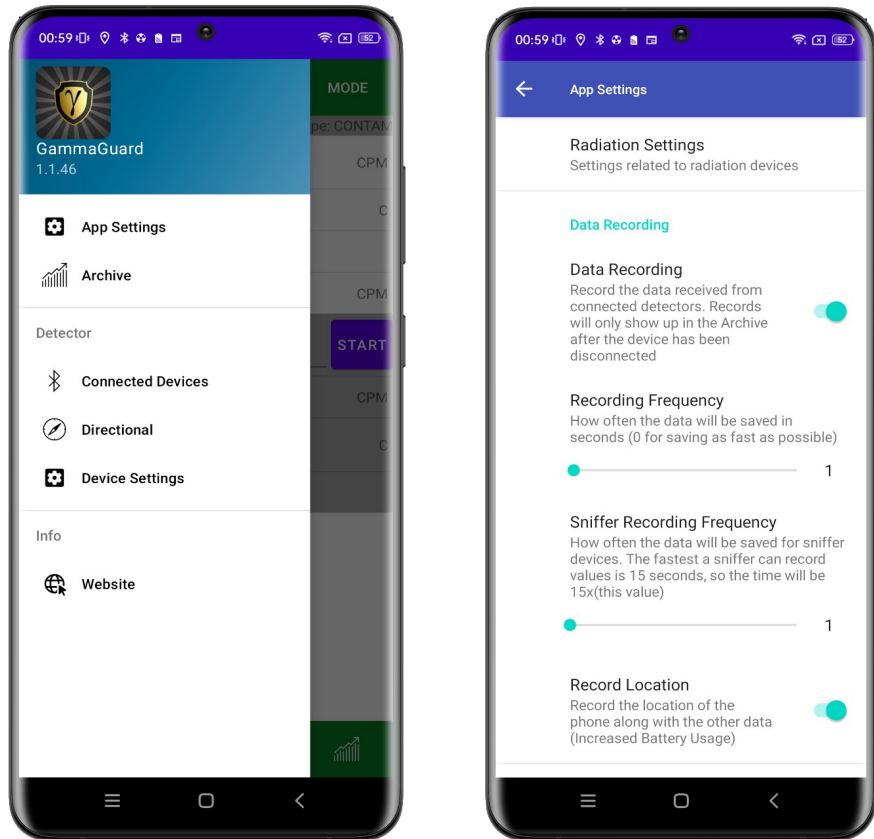


Figure 4.4 Menu Bar and Setting Screen

## 5 Changing Batteries



Figure 5.1 Back View of the Case

The CT008-F uses two AAA batteries. The battery replacement processes are:

- 1) Make sure the Alpha shield is pushed all the way to the top of the case where it won't block the battery door from opening or closing (see Figure 5.1);

- 2) Unscrew the battery door screw (see Figure 5.1);
- 3) Open the battery door;
- 4) Replace two AAA batteries;
- 5) Close the battery door;
- 6) Drive the battery door screw back in, being careful not to over tighten.

Note: It is good practice to remove the batteries if the device is to be stored for several weeks or longer.

# 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”. The data will be in the Archive where you can name it and export it.

## 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 choose 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 Demonstration Video

There are several videos on YouTube and on the [gammawatch.com](http://gammawatch.com) website.

## 6.4 One Year Limited Warranty

This limited warranty applies to CT008 series radiation detectors, purchased from Environmental Instruments Canada Inc.

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 damage 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.*

*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](mailto: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 you are unable to find the information you require on our website or you need further assistance and technical supports, please don't hesitate to contact us.

Please send an email or use the contact form and follow up with a phone call if we don't get back within a couple of days.

<b>Phone</b>	+1(306) 974-6055
<b>Online Contact Form</b>	<a href="http://www.gammawatch.com/contact-us/">http:// www.gammawatch.com/ contact-us/</a>
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