Micromanometer User's Manual

Model RDM3

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1. Device Overview

Figure 1.1

An overview of the front face of the RDM3 micromanometer is given in Figure 1.1. The front face includes:

- **Model** – This shows in the scan list, followed by the device serial number.
- **OLED screen** – display screens: live or an average of 10 seconds pressure readings in unit of Pascal or in H_2O, and device information. *Device is set to in H_2O from the manufacturer. The Gamma App is required to switch measurement units to Pascals.*
- **Port 1 & 2** – the manometer measures the pressure differences between these two ports.
- **Button** – control device to turn on and off, to toggle OLED screens and to manually set zeros.
- **Operation Information** – indicates button operations.

2. Basic Operation

Basic operation of the RDM3 micromanometer is outlined in the following steps:

1. There should be two (2) new AA batteries in the device when you receive the micromanometer. The micromanometer should be in sleep mode. To start the micromanometer, press and hold the button (for more than 3 seconds) until OLED displays “Release to Start”. Powering On” will then be displayed, followed by regulatory information. After this, it will show the “LIVE” Screen. “LIVE” screen readings are the average readings of one (1) second. See Section 3 “OLED Screen Overview” for screen interpretation."
2. Short pressing the button (for less than 2 seconds) toggles screens. There are three screen displays, they are in the order of:
    a) Live readings (average of one (1) second);
    b) Average readings (average of 10 seconds by default. This can be modified through app); and
    c) Device information (Name, MAC address, battery percentage and temperature).

The screen toggles from (a) to (c), followed by a blank screen (to conserve battery power while using the phone display or logging data) and then back to (a) again. The OLED screen updates every second.

3. When you press and hold the button for more than 2 seconds, the OLED starts displaying instructions. You can follow the instructions on the OLED:

Button Press Time	Result
Short (<2s)	“Toggle Screens”
Long (2~5s)	“Release to Shut Down”
Extra Long (>5s)	“Release to Zero”

When the OLED displays “*Release to Shut Down*” and you release the button, then the device will display “*Shutting Down*” and it starts the shut down process. The OLED will be off after 3 seconds and then the manometer will enter sleep mode.

When the OLED shows “*Release to Zero*”, it means if you release the button now, the manometer will display “*Zeroing*” and it stores[ii] the pressure reading at that point as the new “zero point”/offset. It will then go back to the display screen before this button operation. Make sure the device is perfectly still when zeroing.

There are no further button options upon “Extra Long” button press.

4. To turn on the device again, follow Step “1)” above.

Notes:

(i) If the manometer does not start when you press and hold the button for more than 3 seconds, you can try to:

- Open the battery door and check if there are batteries inside.
- If there are already batteries inside of the device, remove one of them for a few seconds then install it once again. This will cause the device to reset and start without any button press. If none of the previous try works, try to use two (2) new AA batteries. Follow the "Changing Battery" section.

(ii) The "Zeroing" function stores the new offset value into flash memory, so it remembers the last offset value the next time the device boots up.

3. OLED Screen Overview

The OLED display not only shows pressure readings but also other useful information. For example, the "AVG" screen indicates that the average of 10 seconds is shown in Figure 3.1. If the manometer encounters a recoverable error, it will display the message "Remove battery for 30 seconds". Doing so will allow it to restart and recover from the error. If the manometer encounters a non-recoverable error, it will display the message "Sensor Error", followed by an error code. This indicates that the manometer requires repairs. The screen display includes:

Screen Name – There are "LIVE" screen for one (1)-second average reading screen, and "AVG" screen for average of 10-second reading.

Battery Percentage – If the battery falls below 20% a low battery alarm will flash on the screen. This can be dismissed with a short button press. If the battery falls to 0%, it will automatically shut down. Insert new batteries if that happens.

Readings (Average or Live) – reading in the middle row is the main reading at the current screen. In the example below, it is the average reading of 10 seconds. If it is "LIVE", it is the average of one (1) second. The reading at smaller font in the bottom row is the live reading in this example. Note that there is no such smaller reading in the "LIVE" screen.

Unit – the readings are in the unit of Pascal by default. Users can change the unit to inches of water, through the app.

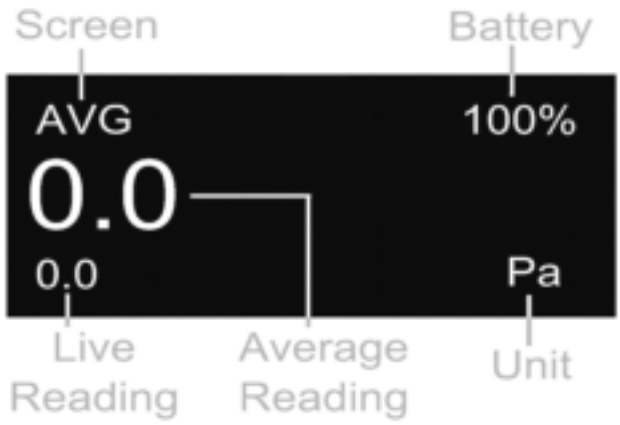


Figure 3.1

4. Changing Batteries

The micromanometer uses two AA batteries. Follow these steps to replace the batteries:

1) Remove silver Philips screw and open battery door.
2) Replace AA batteries.
3) Close battery door and screw tight.

5. Connecting Sampling Tubing

The ports are sized to fit 3 mm ID silicone tubing supplied with the instrument.

6. The GammaGuard App

6.1 How to Get GammaGuard

The micromanometer can be connected to an Android and iOS app, *GammaGuard*, which allows you to see the results remotely and to graph the results over time.

ANDROID:

The link of the "GammaGuard" App in the Google Play Store: https://play.google.com/store/apps/details?id=com.eic.gammaguard

You can also search Google Play for "GammaGuard". (Use the exact spelling and do not use Google's suggested alternate spelling.)

iOS:

In the App Store, search for "GammaGuard 2.0". Make sure it is 2.0. The older version does not support micromanometers.

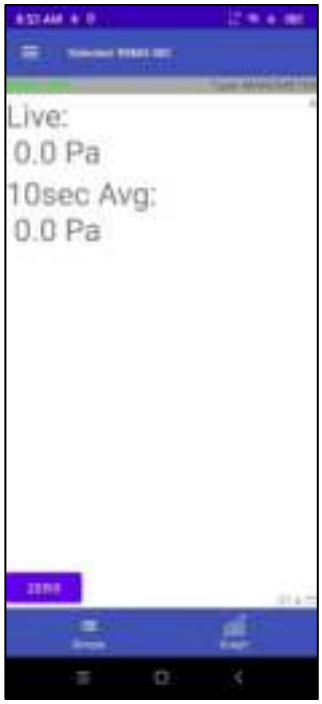
6.2 Connect to a RDM3 Micromanometer

- Before starting GammaGuard, be sure that Bluetooth is enabled on the phone.
- The first time GammaGuard is started, it will request location permissions and nearby device permissions. These both need to be granted in order to connect to Bluetooth devices. If given the option, be sure to grant "Precise" location permissions. Notification permissions are optional, but better allow Bluetooth devices to stay connected in the background.

- GammaGuard will display Bluetooth devices within range. Swipe down to refresh the list.
- The device will appear as “RDM3” followed by the device serial number at the top of the screen.
- Click “Connect” to try to connect to manometers.
- If the connection process is repeatedly failing, try restarting your mobile phone. If the process is still failing, pull the batteries from the RDM3 device.

6.3 Collect Data with GammaGuard

- Once the manometer is successfully connected to GammaGuard, it will display the screen of both “Live” and “AVG” readings in the unit of Pascal by default.
- You can zero the readings both on app and on device by clicking the zero button on the screen on the app.
- When you enable the graphing function (Menu > App Settings > Data Recording), you can view the reading in the Graph View tab.



- You can change the response time by sliding the “RESPONSE TIME” bar at the bottom to get a desired interval.
- Once a data logging session has ended, it will then be available in the archive section for later viewing and exporting.

6.4 Store Data on Device

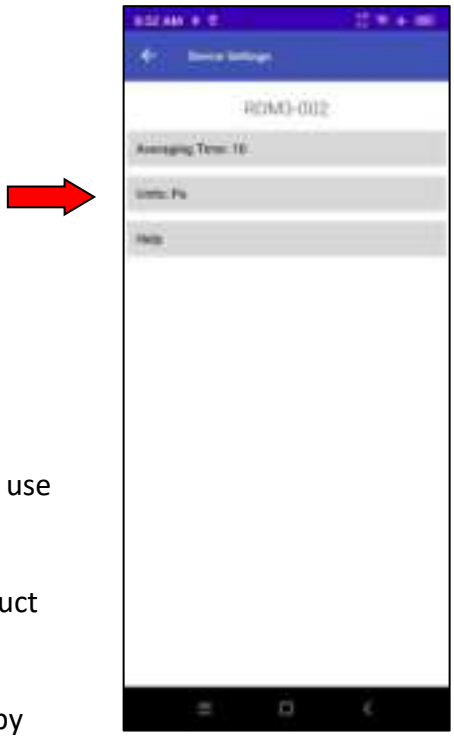
Data can also be logged on the micromanometer itself, allowing collection of data when not connected to GammaGuard. Start by enabling this option in Device Settings. To access stored data, go to Menu > Local Data. If Local Data doesn't appear, Menu > Settings, scroll down to Enable Local Data, enable the checkbox for this feature.

You can either press "Export" to export the data stored locally on the manometer to your phone, or press "Delete" to delete all local data stored on the manometer. When data is exported or deleted, this is applied to all data stored on the manometer, specific data points or sequences cannot be exported or deleted individually. Data is stored on the phone is CSV format for viewing in either a text editor or spreadsheet application.

6.5 Changing Device Settings in GammaGuard

Click Menu > Device Settings.

You can change the averaging time and units of the device on the app via BLE.



7. One Year Limited Warranty

This limited warranty applies to the RDM3 micromanometer, purchased from RadonAway.

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, RadonAway will replace the product at no charge.

* Exclusions: This warrant does not cover damages caused by abuse, neglect, or misuse. It will also be rendered void if the product has been repaired or altered by anyone other than the manufacturer.

To obtain this warranty service, please contact us at:
sales@radonaway.com

8. Contact Information

Device Related
RadonAway
3 Saber Way
Ward Hill, MA 01835
Phone: (978) 521-0901
E-mail: sales@radonaway.com

Product App. Related
Environmental Instruments Canada Inc.
135 Robin Cres., Unit 202
Saskatoon, SK, Canada S7L 6M3
Phone: (306) 974-6055
admin@eic.nu

9. Safety Information

1. It is the end users' responsibility to follow local country regulations, including operation within legal frequency channels, output power, cabling requirements.

2. Before you work on any RadonAway equipment, be aware of the hazards involved with electrical circuitry, and be familiar with standard practices for preventing accidents. The installer should be familiar with network structures, terms, and concepts.

3. Keep this product away from water, fire, humidity, or hot environments.

4. We cannot guarantee that no accidents or damage will occur due to the improper use of the device. Please use this product with care and operate at your own risk!

5. Not certified for use in an explosive atmosphere.

6. In the case of device failure, please disconnect it from power. The fastest way to do so is by removing the batteries.

7. Improper use of device battery may result in fire or explosion. Do not Heat, open, puncture, mutilate, or dispose of your device or its battery in fire. Do not leave device in direct sunlight for an extended period of time. Doing so may cause damage or melt the battery.

8. Do not try to repair of modify the device yourself. Opening and/or repairing your device can present electric shock, device damage, fire, and personal injury, and other hazards.

9. This device should not be used by children.

10. FCC Information

Federal Communication Commission Interference Statement
FCC ID: X8WBT832
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Exposure to Radio Frequency Radiation: This Environmental Instruments Canada Inc. equipment complies with the FCC radiation exposure limits set forth for an uncontrolled environment.

Innovation, Science and Economic Development Canada
FCC ID: 4100A-BT832
This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science, and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions: (1) This device may not cause interference. (2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : 1) L'appareil ne doit pas produire de brouillage; 2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe [B] est conforme à la norme NMB-003 du Canada.

The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

Les dispositifs fonctionnant dans la bande de 5 150 à 5 250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

Exposure to Radio Frequency Radiation: This Environmental Instruments Canada Inc. equipment complies with the FCC radiation exposure limits set forth for an uncontrolled environment.
Exposition aux rayonnements de radiofréquence : cet équipement Environmental Instruments Canada Inc. est conforme aux limites d'exposition aux rayonnements IC définies pour un environnement non contrôlé.

CE Compliance

CE Declaration of Conformity: Hereby, Environmental Instruments Canada Inc. declares that the radio equipment type CT008-F is in compliance with Directive 2014/53/EU and 2011/65/EU (RoHs), including Commision Delegated Directive (EU) 2015/863. The full text of the EU declaration of conformity is to be provided by request.

This Environmental Instruments Canada Inc device meets Maximum TX power limits per ETSI regulations. For more detailed information see Declaration of Conformity.

Max Transmit Power: 1.42 dBm

Exposure to Radio Frequency Radiation: This Environmental Instruments Canada Inc equipment complies with the European Union radiation exposure limits set forth for an uncontrolled environment.
Manufacturer: Environmental Instruments Canada Inc, 135 Robin Cres., Unit 202 Saskatoon, SK Canada S7L 6M3

Product Specifications:

Powering Source: 2x AA Batteries
Nominal Battery Voltage: 1.5V
Battery Operating Temperature Range: -20°C to 54°C (-4°F to 130°F)
Product Operating Temperature range: -10°C to 40°C