RT-1 Magnetic Susceptibility Meter

USER MANUAL

Manufactured in Australia

CoRMaGeo INSTRUMENTS

GeoRESULTS Pty Ltd

Sales, Support and Customisation

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RT-1 MAGNETIC SUSCEPTIBILITY METER

Model RT-1

OPERATOR'S MANUAL Version 1.2

Designed & Manufactured in Australia by:

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This manual has been written to help users of the RT-1 Magnetic Susceptibility Meter to gain the most from the equipment.

Whilst all reasonable efforts have been taken to ensure that facts are correct and advice given is sound, the user must accept full responsibility for the operation of their equipment and the interpretation of data.

CONTENTS

WARRANTY

CoRMaGeo warrants the RT-1 Magnetic Susceptibility Meter against defective components and workmanship for repair at the office of CoRMaGeo Instruments or authorized repair facilities free of charge for a period of twelve (12) months from date of sale. Shipment costs are to be borne by the customer. Malfunction due to improper use is not covered in this warranty. CoRMaGeo Instruments disclaim any liability for consequential damage resulting from defects in the performance of the equipment. The RT-1 is not warranted as being fit for a particular purpose and there is no warranty of merchantability.

This warranty applies only if:

I. The items are used solely under the operating conditions and in the manner recommended in the RT-1 User Manual;
II. The items have not been misused or abused in any manner or repairs attempted thereon;
III. Written notice of the failure within the warranty period is forwarded to CoRMaGeo Instruments and the directions received for properly identifying items returned under warranty are followed; and
IV. The return notice authorizes CoRMaGeo Instruments to examine and disassemble returned products to the extent CoRMaGeo Instruments deems necessary to ascertain the cause for failure.

The warranties expressed herein are exclusive. There are no other warranties, either expressed or implied, beyond those set forth herein, and CoRMaGeo Instruments does not assume any other obligation or liability in connection with the sale or use of the said product. Any product or service repaired under this warranty shall be warranted for the unexpired portion of the original warranty period only.

This warranty does not apply to limited life components such as cables, batteries, etc.

1. GENERAL INFORMATION

The RT-1 Magnetic Susceptibility Meter is designed to measure the magnetic susceptibility of rock outcrops, rock samples and drill core.

The mineral that largely governs the magnetic behaviour of a rock, and which accounts for most of the susceptibility observed, is magnetite. The susceptibility of magnetite depends on several factors, such as the intensity of the magnetising field, the chemical composition of the magnetite and its grain size. Susceptibility can, however, be used to determine the magnetic abundance, provided that the dependence between susceptibility and magnetic abundance is known.

2. QUICK START Operating Instructions

BATTERIES

RT-1 instruments operate on three AA batteries. Use 1.2V or 1.5V alkaline, NiMH, or lithium batteries.

To install the batteries:

1. On the back face of the RT-1, unscrew the two screws and remove the battery cover.
2. Insert three (3) "AA" type batteries, observing polarity.
3. Replace and screw down the battery cover.

To turn the RT-1 on or off:

1. To turn on the RT-1, press ESC

   Note: During startup, hold in air away from anything metallic as unit automatically zeros

2. To turn off the RT-1, either:

   i. Press and hold ESC for ~2.5 sec. 3 beep alerts will sound and the RT-1 will power off. If ESC is released before the 3rd beep sounds, the RT-1 will remain on.

   OR

   ii. Go to the **Main Menu**, press ENT and scroll to the "Power Off" menu item using the arrow keys ↑ and ↓, then press ENT.

When turned on the unit will automatically:

1. Display the start-up screen for about 2 seconds;
2. Zero in air (~ 4 seconds);
3. Go directly into **Measuring** (reading) mode.

To zero the RT-1:

1. Go to the Main Menu.
2. Hold the instrument clear of any magnetic or conductive material or any electronic devices.
3. Select the "Zero" menu item and then press 

.
4. You are now ready to take a reading

Note: the zeroing should take 4 seconds

To take a reading with the RT-1:

In the Measuring screen, readings can be taken in either *SCAN* or *STEP* mode:

SCAN mode (continuous readings):

1. Place and hold the sensor end of the RT-1 against the sample.
2. Continuous readings will be displayed on the RT-1 screen (see Fig 4).
3. Press either the right or left black round "Measure" buttons  on the side of the RT-1 (see Fig 1 and 2) to store a reading.
4. The reading will be displayed on the RT-1 screen (see Fig 4).

STEP mode (individual point reading):

1. Place and hold the sensor end of the RT-1 against the sample.
2. Press either the right or left black round "Measure" buttons  on the side of the RT-1 (see Fig 4) to store a reading.
3. The reading will be displayed on the RT-1 screen (see Fig 4).

3. DESCRIPTION OF INSTRUMENT

The RT-1 is designed as a one piece instrument with a graphics display for the presentation of the magnetic susceptibility values in both digital and analog format. An audible tone of varying frequency related to the value allows the operator to find the peak reading using the graphical display or the highest frequency sound and then record a digital value. It has solid-state memory with the ability to store readings into groups and label (with a flag) individual readings.

The RT-1 has Bluetooth connection for transferring data to a PC computer.

UNIT LAYOUT OVERVIEW

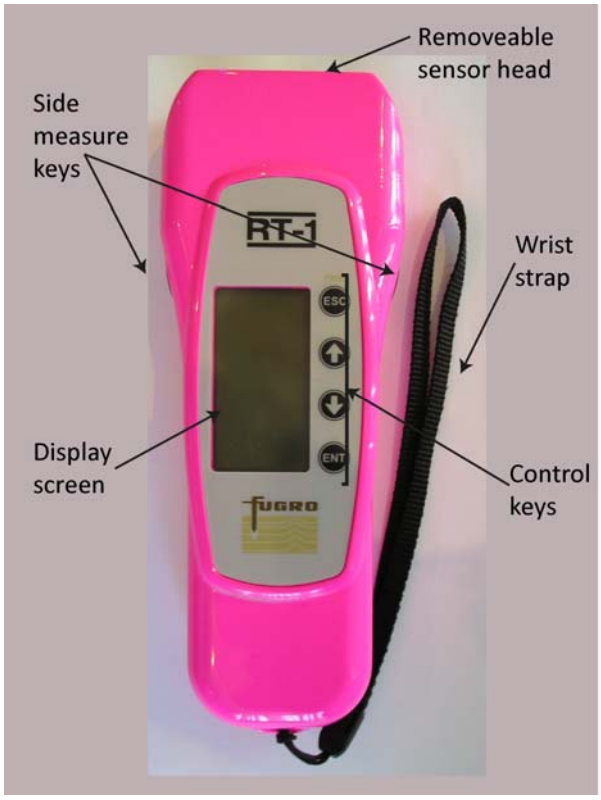


Figure 1 Front

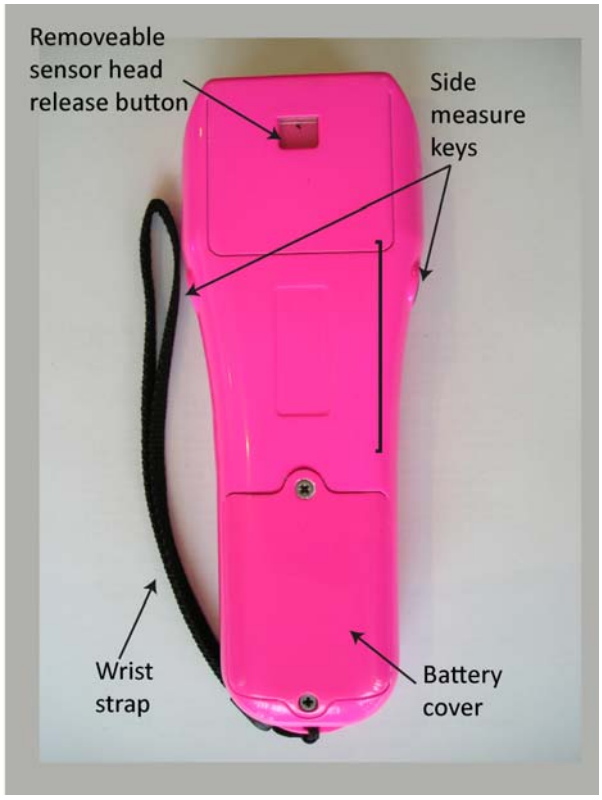


Figure 2 Back

OPENING SCREEN

On start up, the RT-1 will flash the opening screen, showing the firmware version of the unit (Fig 3a). Following this, it will automatically “zero” (Fig. 3b) before moving to the Measuring Screen (see next section).

Note: Always turn the RT-1 on and perform “zeroing” in the open air, away from presence of items with high magnetic susceptibility (see Definitions / Useful Information for more details).

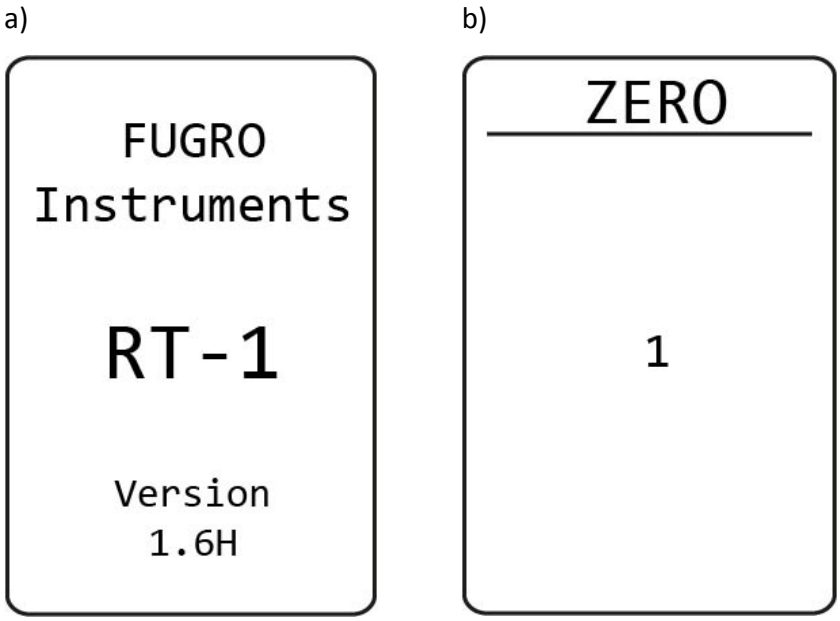


Figure 3 a) The opening screen and b) zeroing screen

MEASURING MENU SCREEN

The Measuring Screen is used to view and record magnetic susceptibility readings. A bar graph indicating the strength of the magnetic susceptibility is located on the left side of the screen, with the setup and memory parameters displayed centrally (these values can be changed using the various menus – see following sections).

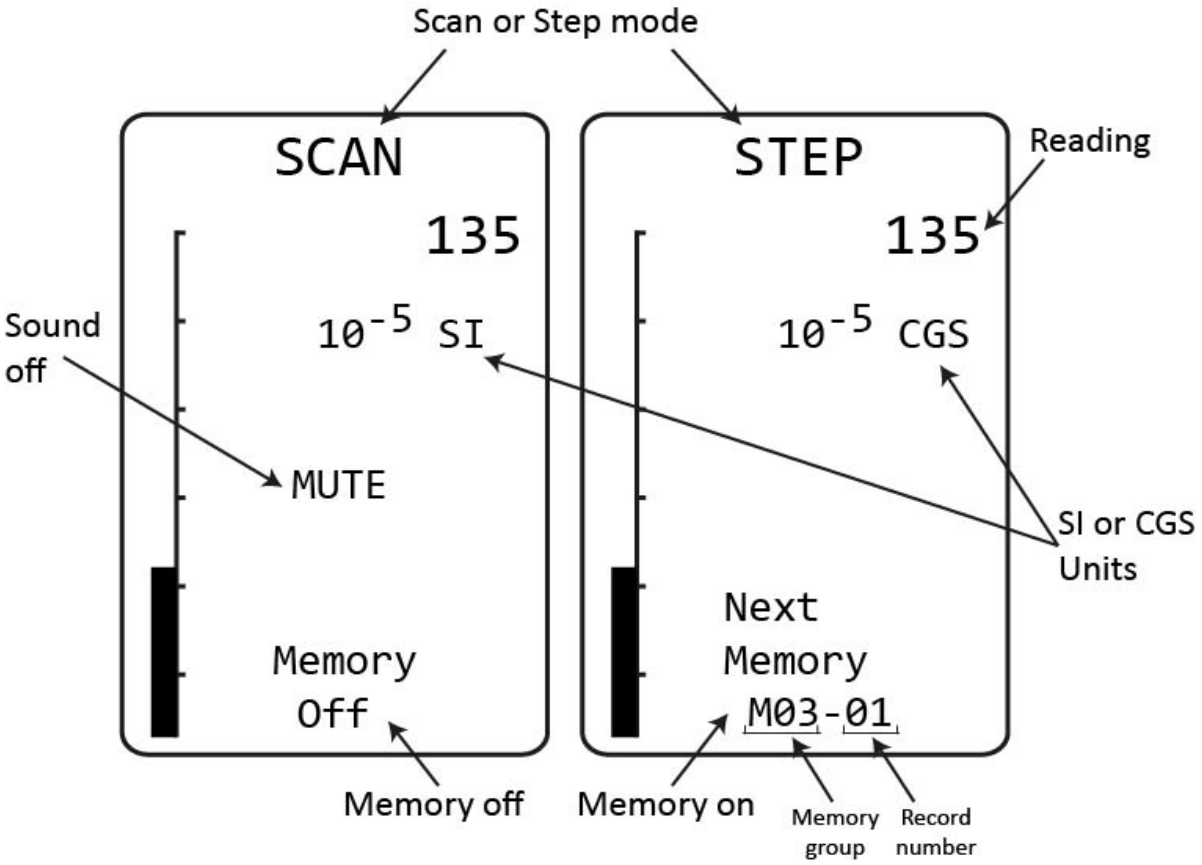
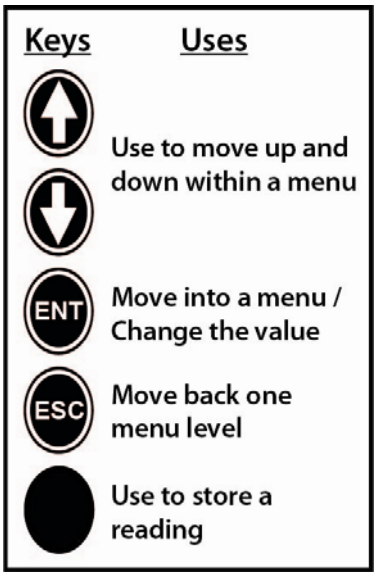


Figure 4 Measuring screen

CONTROLS

The RT-1 has four top push buttons associated with the operation of the menu system (control keys) and two side push buttons (left and right) associated with taking readings (measure keys). These are shown in Fig. 5:

a)



b)

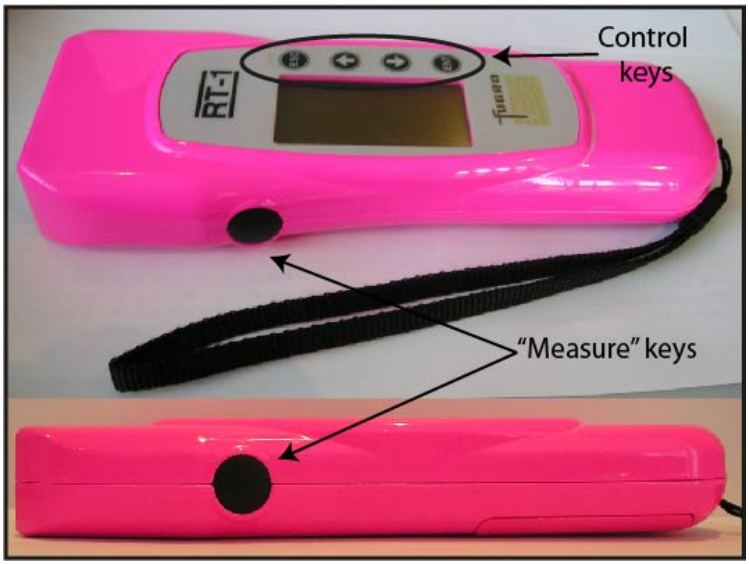


Figure 5 a) The RT-1 keys and b) The RT-1 key locations.

FLAG SYMBOLS

A flag sets a marker next to an individual reading. Flags are useful for such things as helping to remember readings of interest, to note bad readings or readings to recheck etc. There are 4 markers available:

Symbol	Suggested Corresponded Meaning
E	error
X	bad
C	check
i	interesting

It is important to note that once a reading has been flagged in the RT-1 unit, the Flag cannot be removed.

4. PRINCIPLE OF OPERATION

The function of the RT-1 is based on electromagnetic induction. There are two coils placed orthogonally to each other in the detector head, which is mounted in the top of the RT-1 case. In the non-magnetic environment the voltage induced from the transmitter coil to the receiver coil is zero. When a rock sample is brought near the coils, a voltage which is proportional to the magnetic susceptibility of the sample is induced in the receiver coil. This signal is detected by a phase-locked amplifier and after rectification it is used to drive the circuitry for the display of the magnetic susceptibility readings. The reading is directly calibrated for susceptibility. See Fig. 6 below.

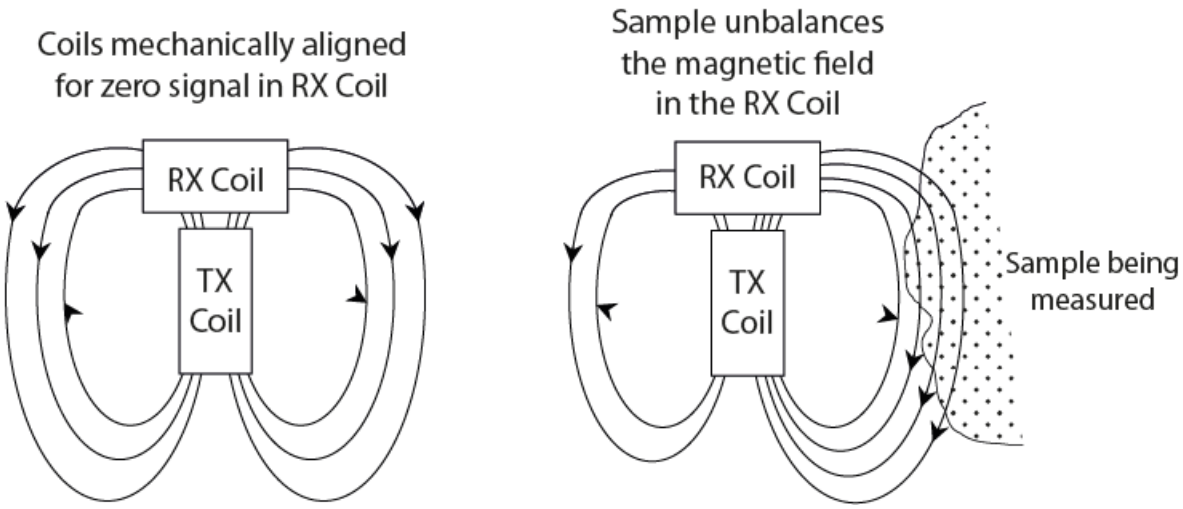


Figure 6 Principle of operation: A 750Hz sign wave is constantly fed into the transmitter (TX) Coil, the resulting magnetic field induces a 750Hz sign wave in the RX Coil. The signal induced in the receiver (RX) Coil varies due to the magnetic susceptibility and conductivity of the sample. The magnetic susceptibility component is virtually 90 degrees out of phase to the conductive component.

5. DEFINITIONS / USEFUL INFORMATION

Operation Mode

The RT-1 operates in two modes being continuous SCAN mode or single reading STEP mode.

SCAN mode updates the readings continuously by locating peak readings, approximately once per second.
STEP mode takes readings only when a button is activated and essentially takes a “snap-shot” of the magnetic susceptibility at that point. Selecting STEP mode when storing measurements will freeze the display with the value just stored in memory.

Bar Graph

The bar graph is a log scale to base ten (10) and is capable of showing values between 1 x 10-5 SI units and 9.999 SI units.

Battery Replacement

The RT-1 does not currently have a low battery warning (Firmware version 1.6H). To replace the batteries, remove the lid on the back face of the RT-1 by unscrewing the two screws and replace the batteries with three (3) “AA” type batteries.

Note: In future versions of the firmware, the device will display a “low battery symbol” when the batteries are low and an “empty battery symbol” when the batteries are exhausted.

Zeroing

The RT-1 must be zeroed occasionally to correct for drift. This is the reference point against which all other analytical signals will be measured. This is properly performed under the instrument’s normal operating conditions.

When you "zero" the RT-1 you are telling the instrument to use the electrical output of the sensor at the time the sensor is zeroed as the point of reference for all future readings. Change in sensor output is then measured with respect to the output at the time the instrument was zeroed.

Always perform “zeroing” away in the open air, away from presence of items with high magnetic susceptibility. When you zero the RT-1, the electrical output of the sensor *at that moment* becomes the point of comparison. If the sensor is zeroed close to something with high magnetic susceptibility then the instrument may display a false reading.

Re-zeroing the RT-1

When taking readings on samples of high magnetic susceptibility it may be necessary to re-zero the meter before taking readings again on samples of much lower susceptibility. This is due to remnant energy being stored in the sensor coil making readings with low magnetic susceptibility appear too high.

Drill Core Correction Factors

In general, if samples are too small so that air is sensed by the detector, the reading will be somewhat less than the true value. How much depends on actual dimensions but it is rarely less than half.

Correction factors for certain drill core sizes are given in Table 1.

Table 1 Drill core correction factors

CORE	DIAMETER	CORRECTION FACTOR
AQ	27mm	1.82± 0.02
BQ	33mm	1.77± 0.02
NQ	48mm	1.51± 0.02
HQ	62mm	1.44± 0.02
PQ	85mm	1.24± 0.02

4. DETAILED OPERATING INSTRUCTIONS

WARNING

Very strong magnetic fields can affect calibration.

IMPORTANT

Always perform “zeroing” in the open air, away from presence of items with high magnetic susceptibility.

BATTERIES

RT-1 instruments operate on three (3) AA batteries. Use 1.2V or 1.5V alkaline, NiMH, or lithium batteries.

To install the batteries:

1. On the back face of the RT-1, unscrew the two screws and remove the battery cover.
2. Insert three (3) “AA” type batteries, observing polarity.
3. Replace and screw down the battery cover.

NOTICE

Remove the batteries for shipping or when you do not plan to use the RT-1 for several months. Stored data is not lost when batteries are removed.

To turn the RT-1 on or off:

1. To turn on the RT-1, press 

2. To turn off the RT-1, either:

i. Press and hold ESC for ~2.5 sec. 3 beep alerts will sound and the RT-1 will power off. If ESC is released before the 3rd beep sounds, the RT-1 will remain on.

OR

ii. Go to the **Main Menu**, press ENT and scroll to the "Power Off" menu item using the arrow keys ▲ and ▼, then press ENT.

When turned on the unit will automatically:

1. Display the start-up screen for about 2 seconds;
2. Zero in air (~ 4 seconds);
3. Go directly into **Measuring** (reading) mode.

To navigate between the Measuring screen and Main Menu screen (Fig 4 and 8 respectively):

1. To move from the Measuring screen to the Main Menu screen: press ENT OR either of the arrow keys ▲ and ▼.
2. To move from the Main Menu screen to the Measuring screen: press ESC.

Navigating and Selecting the Main Menu options:

1. To navigate between the menu options, use the arrow keys ▲ and ▼.
2. To select a menu option, press ENT.
3. To escape a menu option, press ESC.

To zero the RT-1:

1. Go to the Main Menu.
2. Hold the instrument clear of any magnetic or conductive material or any electronic devices.

3. Select the "Zero" menu item and then press ENT.
4. You are now ready to take a reading

Note: the zeroing should take 4 seconds

To take a reading with the RT-1:

In the Measuring screen, readings can be taken in either *SCAN* or *STEP* mode:

SCAN mode (continuous readings):

1. Place and hold the sensor end of the RT-1 against the sample.
2. Continuous readings will be displayed on the RT-1 screen (see Fig 4).
3. Press either the right or left black round "Measure" buttons on the side of the RT-1 (see Fig 1 and 2) to store a reading.
4. The reading will be displayed on the RT-1 screen (see Fig 4).

STEP mode (individual point reading):

1. Place and hold the sensor end of the RT-1 against the sample.
2. Press either the right or left black round "Measure" buttons on the side of the RT-1 (see Fig 4) to store a reading.
3. The reading will be displayed on the RT-1 screen (see Fig 4).

Note 1: The display will indicate whether the reading is in SI or CGS units. Either can be selected from the menu (see *Settings Menu | Units* below on how to change units).

Note 2: If you need to turn the RT-1 upside-down for this, you will notice the screen display will flip around for ease of use!

To store a reading in the RT-1:

Before you can store a reading, you must turn the memory on. Memory On or Memory Off is indicated at the bottom of the Measuring screen (see Fig 4).

Turn the memory on:

1. Go to the Main Menu.

2. Select the “Memory” menu item and then press **ENT**.
3. Select the “Log Record” menu item and then press **ENT** to toggle ON (or OFF).
4. Go to the Measuring screen. When the memory is ON the bottom of the screen will show ‘Next Memory’ followed by the memory log number (**Mxx**-xx) and record number (Mxx-**xx**). When the memory is OFF, the screen will show “Memory Off”.

Change the memory group:*

** Memory group refers to a specific subset of record numbers within the RT-1 memory bank where readings can be stored. There are 99 memory logs, named M01 to M99. Each memory group can hold up to 99 readings.*

1. Go to the Main Menu.
2. Select the “Memory” menu item and press **ENT**.
3. Select the “Change Log” menu item and press **ENT**.
4. Select the new group and press **ENT**.
5. The memory group has now been updated.

Note 1: An * symbol next to a group indicates that there are readings stored in that group. You can continue to save readings to any group until the group is full (99 readings). (Firmware version 1.6H).

Note 2: In future versions of the firmware, the device will flash a warning notice once the memory group is full and it will automatically jump to the next empty group.

Take and store a reading

1. Place and hold the sensor end of the RT-1 against the sample.
2. Press either the right or left black “Measure” buttons (see Fig 1 and 2) to take a reading (see “**To take a reading with the RT-1**”).
3. The record number (Mxx-**xx**) at the bottom of the screen will increase by one value if a reading has been successfully stored.

To view a reading / log of readings:

1. Go to the Main Menu.
2. Select the “Memory” menu item and press **ENT**.
3. Select the “View Log” menu item and press **ENT**.
4. Select the group of interest and press **ENT**.
5. Using the arrow keys ↑ and ↓, scroll up and down to view readings within the group.
6. To Flag a reading:
    a. Highlight the reading of interest
    b. Press **ENT** to view the Flag options
    c. Scroll up and down using the arrow keys ↑ and ↓
    d. Press **ENT** **to select a Flag**
    e. The selected Flag will appear next to the **“Flag:”** text in the middle of the display screen if the Flag has been successfully stored
7. To exit, press **ESC**.

Important Note: Once a reading has been flagged, the Flag cannot be removed or changed

To erase / clear a log:

Note: It is not possible to erase individual readings, only entire groups – by erasing a group all the readings in that group will be deleted and cannot be recovered! It is possible to Flag suspect individual readings for future reference, without the need to delete the entire group.

1. Go to the Main Menu.
2. Select the “Memory” menu item and press **ENT**.
3. Select the “Erase Log” menu item and press **ENT**.
4. By scrolling, select the log you want to erase and press **ENT**.
5. As a safe guard, you will be asked “Erase Group XX – No / Yes”.

6. If you are sure you wish to erase the entire group, select “Yes” and press  .
7. The group has now been erased.

Connecting the RT-1 to the PC (via Bluetooth):

Windows XP and Windows 7

Please see supplementary notes for more information on the RT-1 PC connection instructions provided on the USB key in your RT-1 box.

Document name: *RT-1_BT_PC_Connection Instructions.pdf*

❖ ***Installing the Bluetooth Software Dongle Provided***

If your computer has no built-in Bluetooth software, please take the following steps before attempting to connect to the RT-1:

- Insert Bluetooth USB Dongle provided with the RT-1
- Allow PC time to connect to internet and download Bluetooth drivers

IMPORTANT: The CD provided with the Bluetooth Dongle is **not necessary** in cases where Windows successfully finds the correct device drivers and recognises the Bluetooth Dongle (be aware this can take upwards of 5-10 mins depending on internet connection and operating system). If after inserting the dongle you have waited an appropriate amount of time (10mins) and Windows has not found the correct drivers and recognised your dongle then the provided CD can be installed. Follow the instructions provided with the CD.

Note: you will need to connect the external Bluetooth USB dongle to the computer each time you wish to connect to the RT-1 to download data

RT-1 **Passkey** for Bluetooth: 1

RT-1 device name/ID name: **RT1_SNXXXX** (XXXX denotes the unit serial number)

❖ ***Pairing and Connecting the Device with Bluetooth for the first time***

1. Make sure Bluetooth is turned on and working on your computer

2. Turn on the RT-1 unit
3. Bluetooth Icon should appear in systems tray (If Bluetooth icon is not in the system tray, go to the start menu, open the control panel, open “devices and printers” and click “add device”)
4. Go through the “Add Bluetooth Device Wizard” to add a new device.
5. RT-1 should appear as “RT1_xxxxxxx”, click on this and press next (XXXX denotes the RT-1 serial number)
6. You will be prompted for a passcode, enter the passcode 1 and press next
7. Your device should now be successfully paired with computer
8. On the RT-1, a Bluetooth symbol will appear on the screen when connected

❖ ***Reconnecting the Device with Bluetooth (2 methods)***

Method 1

1. Click Bluetooth icon in system tray and click “show Bluetooth devices”, you should see a device named “RT1_xxxxxxx”, (or if Bluetooth icon is not in the system tray, go to the start menu, open the control panel and find device named “RT1_xxxxxxx”)
2. Right click on “RT1_xxxxxxx” and select “remove device”
3. Click yes when prompted
4. Follow steps for connecting for the first time

Method 2

1. Click Bluetooth icon in system tray and click “show Bluetooth devices”, you should see a device named “RT1_xxxxxxx”, (or if Bluetooth icon is not in the system tray, go to the start menu, open the control panel and find device named “RT1_xxxxxxx”)
2. Right click on “RT1_xxxxxxx” and select “properties”
3. Select “services”
4. Tick box for “Drivers for keyboard, mice etc (HID)”
5. Click “apply”
6. Click “ok”
7. RT-1 should now be reconnected and ready to download data

To download data to the PC (via Bluetooth): Dumping the Data

Once the RT-1 and the computer are paired and connected, you can dump the data to the computer. No specialist software is required when dumping the data.

!IMPORTANT!

Before starting the dumping process, make sure that no other processes or applications are running on you computer. If another application (e.g. backup program or anti-virus software) starts running during the dumping process, the data stream will be disrupted and the data corrupted.

On the computer:

1. Open Microsoft Excel (downloading data will work in other programs that will accept a text string e.g. Word or Notepad however Excel is what we recommend)
2. Open a new blank document
3. Click in an empty cell, let go of mouse and do not move mouse or press keys on computer until data download is finished

On the RT-1:

1. Go to Main Menu > Memory
2. Select “Send to PC” menu item and then press ENT.
3. The dumping process will now start and the data will start populating the excel spreadsheet (do not touch the computer during this)
4. Save excel document
5. Once dumping is complete the RT-1 will prompt you “Do you wish to erase the entire memory”.
6. **BEFORE** selecting YES, check to make sure all the data was successfully transferred to the Excel document and the document has been saved.
7. By scrolling, select YES or NO and press ENT.
8. If you select YES, a bar graph will show the erasing progress.

9. Data download complete

Mac OS X

Please see supplementary notes for the RT-1 Mac OSX connection instructions provided on the USB key in your RT-1 box.

Document name: *RT-1_BT_Mac_OS_X_Connection Instructions.pdf*

Important Notes when dumping data:

- To abort the data dumping process press 

.
- When dumping the data, the entire memory will be dumped each time.
- If the entire memory is empty and you select “Dump to PC” then an empty record will dump to excel spreadsheet.
- The download process will abort if the Bluetooth connection is lost
- If the RT-1 is turned off, the Bluetooth connection will be lost

7. MENU ITEMS

The RT-1 has four (4) Menu Screens:

1. MAIN
2. MEMORY
3. SETTINGS
4. SPECIAL

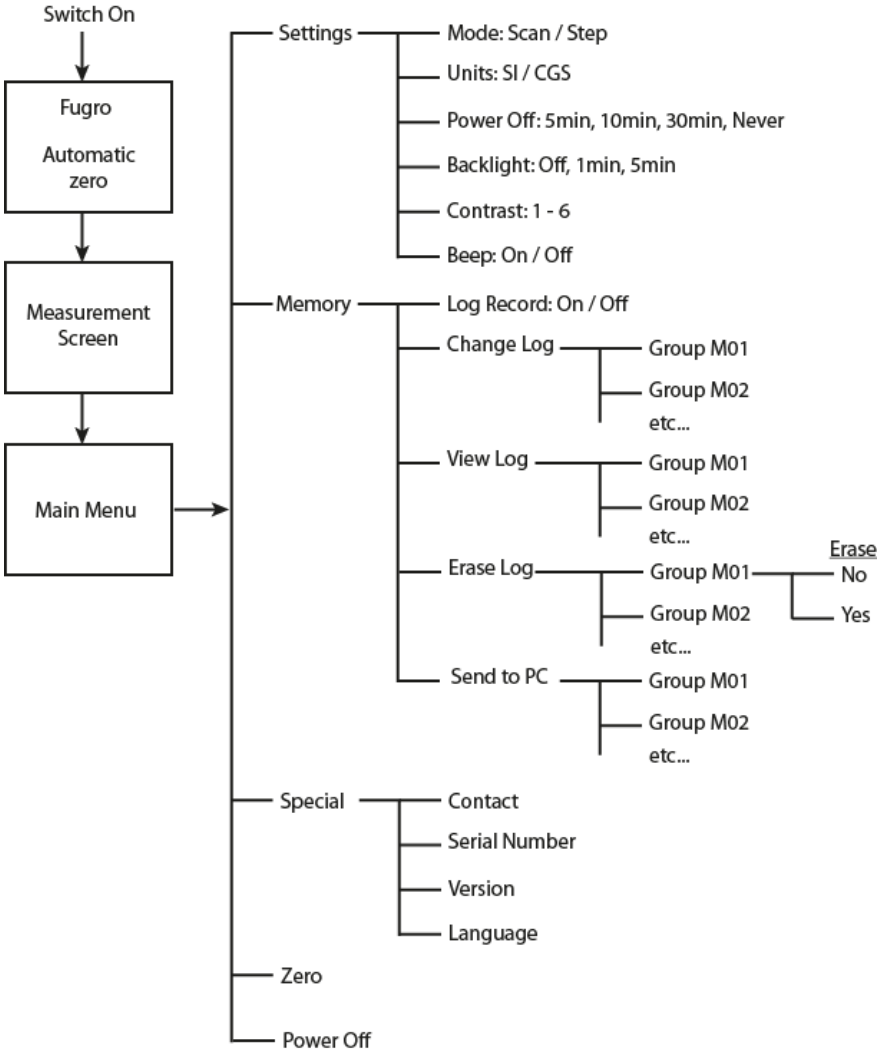


Figure 7 An overview of the menu structure for the RT-1

1. MAIN MENU

To go to the **Main Menu,** press ENT OR either of the arrow keys ▲ and ▼ from the Measuring screen or ESC from any of the other Menus. Scroll down through the menu items, press ▲ and ▼ scroll keys. To execute a menu item, press ENT when the desired menu item is highlighted.

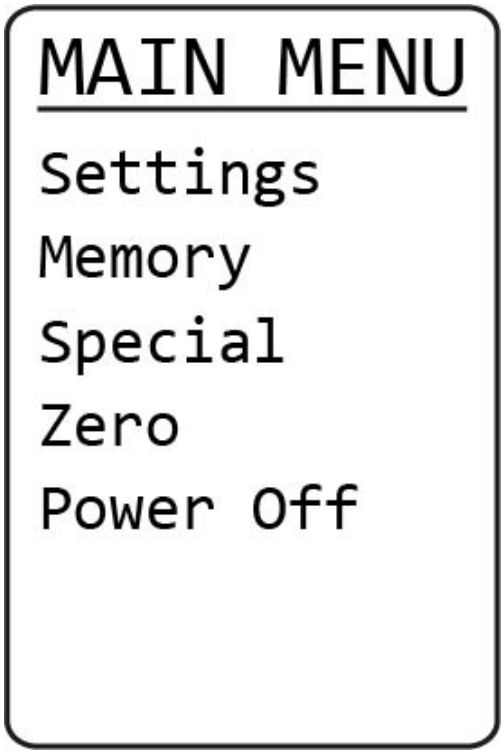


Figure 8 Main Menu screen

2. SETTINGS MENU

To change any Settings Menu values, use the arrow keys, and , to scroll to the setting you wish to change and press ENT to toggle through the various options. Once an option has been selected using the ENT **key**, it is saved and activated immediately. To exit the Settings Menu, press ESC

I. Mode

Switch between continuous SCAN and STEP modes of display operation.

II. Units

Switch between SI and CGI units

The units are related as follows: k [SI] = 4 π k [CGS].

III. Power Off

To conserve power, the unit will power off after 5 minutes. This can be changed to either 5min, 10min, 30min or NEVER.

IV. Backlight

To conserve power, the backlight will dim after 1 minute. This can be changed to either 1min, 5min or OFF (always dims).

V. Contrast

This can be changed between values 1-6 to suit various viewing conditions.

VI. Beep

Switch the audio tone ON or OFF (only operates when meter is in SCAN mode)

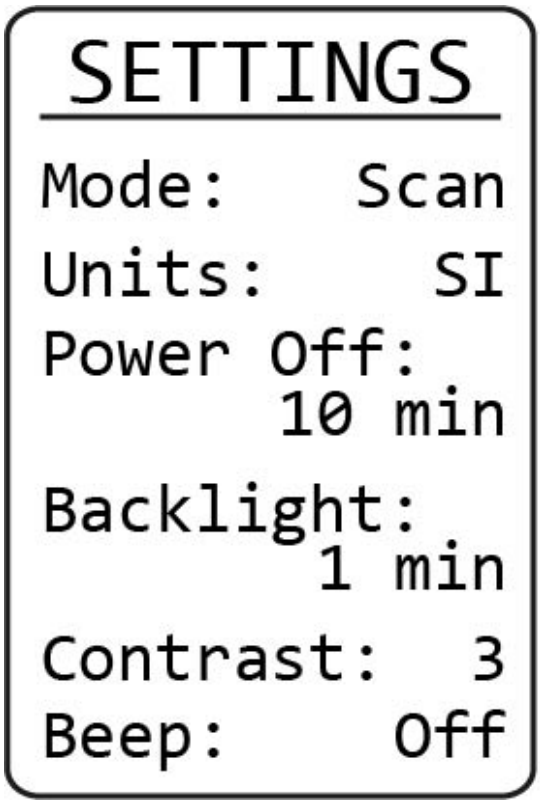


Figure 9 Settings Menu screen.

3. MEMORY MENU

To view or change options within the Memory Menu press ENT, use the arrow keys, ▲ and ▼, to scroll to the option you wish to view or change and press ENT to select the item or to change the various values. To exit the Memory Menu, press ESC.

The RT-1 unit is able to store over 9800 readings. Each individual reading is stored to a specific memory log. The RT-1 has 99 separate memory logs (M01-M99), with the capacity of 99 stored readings per log.

I. Log Record

Switch between memory ON or OFF.

II. Change Log

Change the memory group where the next reading(s) are to be stored.

III. View Log

View each memory group and the readings within each group. When viewing an individual reading, it is possible to flag that readings with a selection of 4 symbols.

IV. Erase Log

Erase an entire log of readings. Note that it is not possible to erase individual readings directly from the unit.

V. Send to PC

Send data to the PC

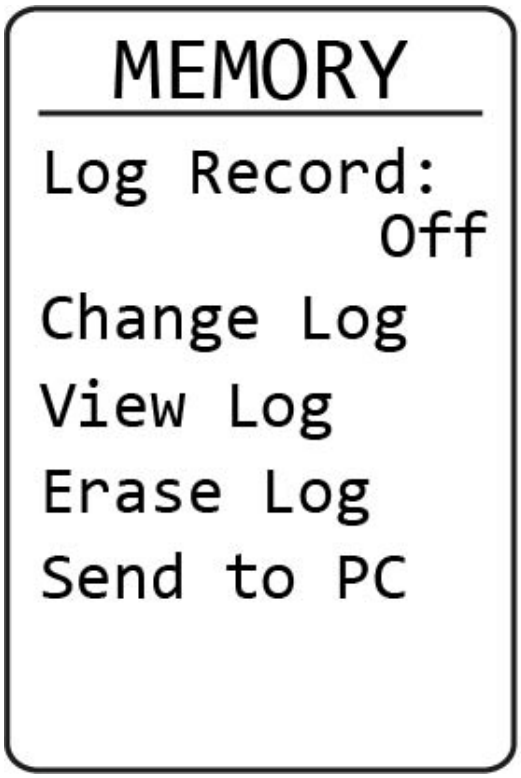


Figure 10 Memory menu screen.

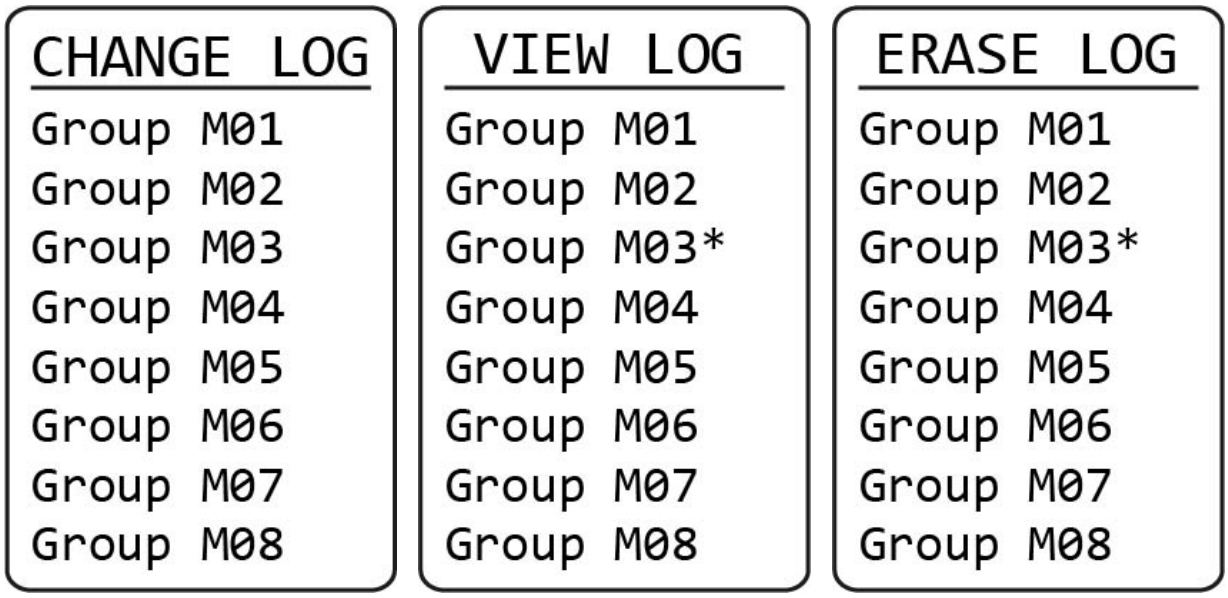


Figure 11 Three (3) sub-menus within the Memory menu.

Note: The * symbol indicates readings have been stored within that memory group.

4. SPECIAL MENU

To view information within the Special Menu (Contact / Serial No. / Version / Language), use the arrow keys, ⬆ and ⬇, to scroll to the information you wish to view and press ENT to select the item.

To change the Language settings within the Special Menu, use the arrow keys, ⬆ and ⬇, to highlight the Language option and keep pressing ENT to move through the various languages.

To exit the Special Menu, press ESC.

I. Contact

Displays the contact information for the manufacturer (CoRMaGeo Instruments).

II. Serial No.

Displays the serial number details for the instrument.

III. Version

Displays the software version installed on the instrument.

IV. Language

Displays the language setting for the instrument and allows the user to change the language setting. English, Spanish, French and Italian are offered.

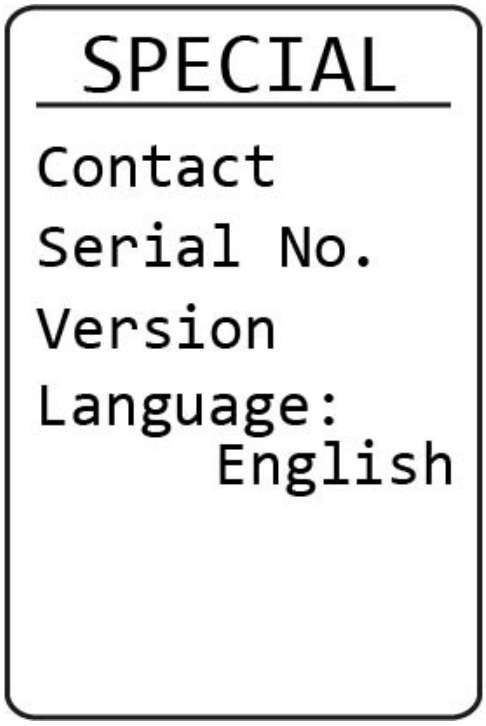


Figure 12 Special Menu screen.

8. BLUETOOTH INTERFACE

The RT-1 can communicate to a PC via an inbuilt Bluetooth interface. Once the RT-1 and the computer is paired and connected, you can dump the data to the computer.

Before starting the dumping process, make sure that no other processes or applications are running on you computer. If another application (e.g. backup program or anti-virus software) starts running during the dumping process, the data stream will be disrupted and the data corrupted.

It is important to note that when dumping the data, the entire memory will be dumped each time and the download process will abort if the Bluetooth connection is lost

Built-in Bluetooth

If you are using a computer with built-in Bluetooth the process for pairing the RT-1 will differ than the steps described on p.18. Please refer to instruction from the manual of your computer or operating system.

9. TROUBLESHOOTING

The RT-1 is a sophisticated measuring instrument. Any unauthorized modifications or adjustments to the RT-1 electronics will void the Warranty.

If any operation described in this manual does not work, check the following:

1. Check that the battery has sufficient power and replace if in doubt.
2. Check the battery contacts and clean contacts if necessary.
3. Check alignment and fit of the removable sensor head into the meter. It should slide smoothly into the meter.

If these checks do not rectify the problem, it will be necessary for the unit to be returned to CoRMaGeo Instruments for repair.

IMPORTANT NOTES

1. **Always ship or store the instrument without batteries, as leakage can cause serious damage to the instrument.**
2. **Very strong magnetic fields can affect calibration.**

10. CALIBRATION FREQUENCY

How often should the RT-1 be calibrated?

RT-1 users frequently ask how often factory calibration of the unit is required.

There is no single correct answer to this question. Calibration always represents an instantaneous snapshot of conditions which is dependent upon a variety of factors, for instance:

- Level of stress to which the equipment is subjected
- Stability of past calibrations
- Required measuring accuracy
- Quality assurance requirements

This means that the period of time between any two calibrations must be determined and monitored by the user. To help you check and monitor your RT-1 calibration, a ***Magnetic Susceptibility Test Pad*** is provided on the base of RT-1 case. To use, simply place your RT-1 on the "TEST HERE" sticker and take a reading. Values should fall within the range specified on the calibration sheet. This range is also posted under the foam insert inside the lid.

We recommend a factory calibration interval of 1 to 2 years. In order to assist our customers, CoRMaGeo Instruments offers the first calibration service for your RT-1 ***free*** (ex freight). Simply send your RT-1 unit back to us and we will check and recalibrate the unit and issue a current RT-1 Calibration Sheet.

Please contact us with any further questions about this service.

11. SPECIFICATIONS

Standard System (What's in the Box)

The RT-1 standard system is supplied with:

- ✓ RT-1 Console with removable sensor unit
- ✓ 1GB USB with Operating Software, Operations Manual & Quick Start Guide
- ✓ Bluetooth USB & Software
- ✓ Three Alkaline AA Batteries & Mini-Philips Screwdriver
- ✓ Wrist Strap & Lanyard
- ✓ 1-year Warranty
- ✓ Calibration Certificate
- ✓ Magnetic Susceptibility Test Pad
- ✓ Sturdy Pelican® Case with foam insert
- ✓ Protective silicon gummy

Technical Specifications

Sensitivity (SI)	1×10^{-5}
Operating Range	1×10^{-5} to 1.0 SI
Units	SI or CGS
Operating Frequency	750Hz
Response Time	Less than 1 second
Operating Mode	Single or Continuous readings
Memory	More than 9800 readings and flags
Display Type & Rate	Liquid Crystal Display, with backlight 55 mm x 28 mm Displays analog and digital readings and menus
Audio Output	Audio output on key touch Selectable Continuous Audio Indication of relative reading values
Power Source	3 x 1.5V AA Alkaline Batteries Power down feature with auto shut-off Low battery is indicated (coming soon)
Battery Life	Better than 25 hours continuous use
Water Resistance rating	IP65
Coil Type	Ferrite
Temperature Range (°C)	Operating: 0°C - +50°C Storage: -40°C - +60°C
Relative Humidity	10 to 90% (non condensing)
Data Output	Bluetooth
Length:	155 mm
Width:	84 mm
Height:	34 mm
Weight (device only):	0.35 kg