EnviroSens Ltd.
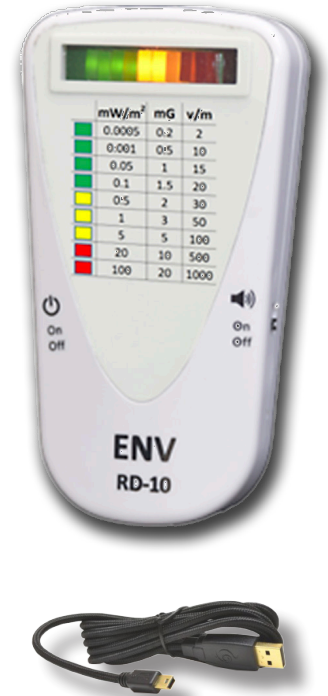## *Environmental meters*

ENV RD-10
Electromagnetic Field Meter

Introduction:

The **ENV RD-10** is a compact, simple to use, but sophisticated, general purpose EMF (Electromagnetic Field) meter that can measure EMF intensity from: cell towers, mobile phones, smart meters, Wi-Fi routers, various cordless devices, magnetic and electric fields from power lines, fuse boxes, home appliances and more.

The **ENV RD-10** can also detect spy cameras, wireless bugs, and other such devices across a very wide frequency range *(see details below)*.

It was designed, with great care, to assist EMF sensitive people; allowing them to monitor their environment during daily activities with a simple device that may be carried in a pocket or purse. *(Weighing less than 2 ounces, or 50 grams)*. The **ENV RD-10** may also be connected to a computer, making it an invaluable tool in research and tech environments.

mW/m²	mG	v/m
0.0005	0.2	2
0.001	0.5	10
0.05	1	15
0.1	1.5	20
0.5	2	30
1	3	50
5	5	100
20	10	560
100	20	1000

ENV
RD-10

IMPORTANT NOTICE:
This detector shows the intensity of measurements using 9 LEDs: green, yellow and red. *(Green = low, Red = high)* These colors are intended as a visual guide , and not to indicate safe or unsafe readings. Furthermore, this device is intended to allow non-professionals to measure EMF levels with a simple, intuitive, interface. Measurements taken for legal or professional use require special equipment, and trained operators.

Package contents:

- **ENV RD-10** EMF meter including: 1x LiPo rechargeable battery *(installed)*.
- A mini-USB cable for charging and data transfer. **Note:** *This is a non-standard cable designed especially for use with this product.*

Note: Proprietary software, for use with this product, is available at:
http://www.envirosens.com/software/Monitoring.zip.
Drivers available at: http://www.envirosens.com/software/driver/CDM21228_Setup.exe

Operation:

The **RD-10** is a 3-mode detector, these modes are: **RF, LFM** and **LFE** *(Radio Frequency, Low Frequency Magnetic and Low Frequency Electric, fields).*

It is recommended to fully charge the device before using it for the first time. To do so, use the supplied mini-USB cable to connect to a USB charger or computer. During charging, the LED will show RED – when fully charged the LED will be off. A full charge should give 8-10 hours of operation.

Note: On activation the meter will perform a quick *(3 second)* self-test before full operation. This includes:
- Cycling through the LEDs from left to right, accompanied by a tone. *(If the sound is turned ON).*
- The device will then check the battery status and show the charge:

100% 90% 80% 70% 60% 50% 40% 30% 20%

Battery level indicators
(During self-test)
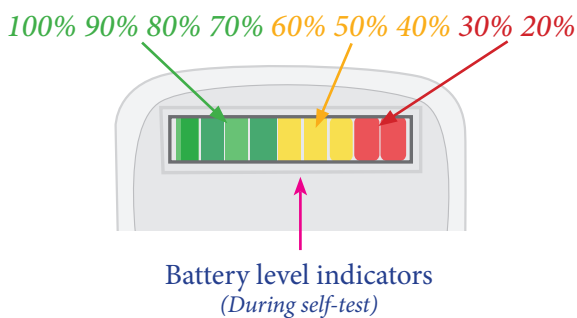
Turn the meter on with the Power **ON/OFF** switch.

Use the **Mode Switch** to select a detection mode:
- **RF Mode** – the detectors measures radio frequencies in the defined range. *(See specifications.)*
- **LF-M Mode** – the detector measures low frequency magnetic fields
- **LF-E Mode** – the detector measures low frequency electric fields.

Readings in the Yellow or Red zone, will be accompanied by a tone; this feature may be disabled by using the sound 🔊 **on/off** switch.

This detector is a peak level detector, which means that on every update it shows the maximum, or peak level, detected since the last update. Updates are recorded approximately 5 times a second for the LEDs, and twice a second by the PC software.

Note: The **RD-10** is a broadband detector, meaning it captures all signals from all sources within the selected mode frequency range at a particular location. For example: in RF mode, if both a Wi-Fi router and cell phone transmit at the same time, the meter will capture both signals and give a combined result.

EMF levels

Charging
(Hidden when not active)

USB connection

Mode switch

Power ON/OFF

2
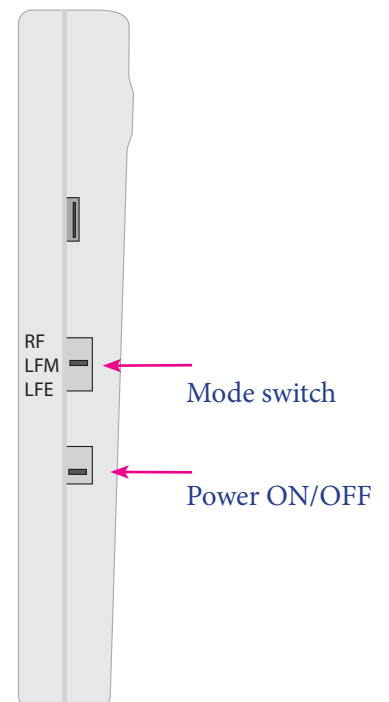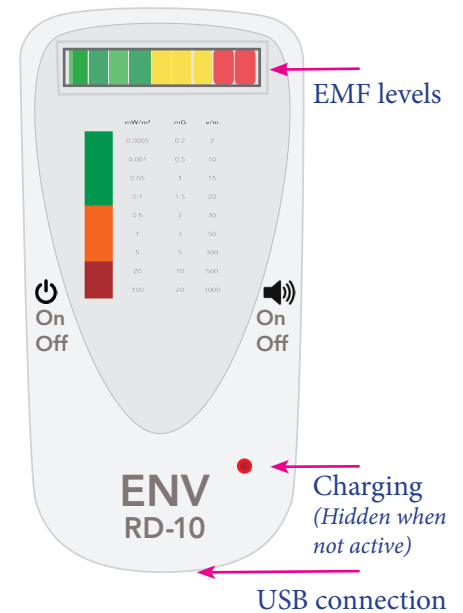
Performing measurements:

Switch on the device and select a measurement mode:
There are 9 levels of intensity shown by 9 LEDs: from **GREEN** through **YELLOW** to **RED**. By matching the LED reading with the appropriate numbers on the chart, numerical values can be noted.

The device uses directional antennas for the measurements, thus it is necessary to carefully rotate the device in all directions at any location a measurement is performed. The readings may change as the device is rotated – the highest reading found is the correct one.

The RF and LFE antennas are located on the left side of the device – blocking them with your grip may reduce the reading. When performing RF and LFE measurements, the device should be held using the right hand on the right side of the Meter.

Notes on signal sources:
- Be aware that some EMF sources in the home, such as cell phones, smart meters, and Wi-Fi emitters (RF signals), change levels very rapidly due to protocol definitions.
- Cell phones will adjust their levels based on the signal strength from the cell tower and any intervening obstacles to that signal.
- Smart-meters often send very fast signal bursts every few seconds. And Wi-Fi routers adjust signal strength based on the transfer load.
- LFM and LFE sources are usually more consistent, but, as with RF signals, the device must be rotated to all directions to find the highest, and most accurate, reading.
- Also, Users should be aware that measuring too close to a transmitter will reduce the accuracy of the measurement considerably. *(Further reading on the topic of near and far fields is advisable, and not covered here.)*

mW/m²	mG	v/m
0.0005	0.2	2
0.001	0.5	10
0.05	1	15
0.1	1.5	20
0.5	2	30
1	3	50
5	5	100
20	10	500
100	20	1000

Understanding the readings:

mW/m² = Milliwatts per square meter.
Used to measure the power density of an RF (Radio Frequency) source. Use this value when measuring EMF from: cell towers, smart meters, Wi-Fi, Bluetooth, cordless phones and microwave ovens.
**mG = Milligauss.**
Used to measures AC *(Alternating current)* magnetic field intensity, such as from AC power lines, fuse boxes, and home appliances.
Note: This meter cannot detect DC *(Direct Current)* magnetic fields, such as those from magnets.
V/m = Volts per meter.
This is used to measure the intensity of an electric field near voltage sources such as power outlets and power lines.

Using and installing the software:
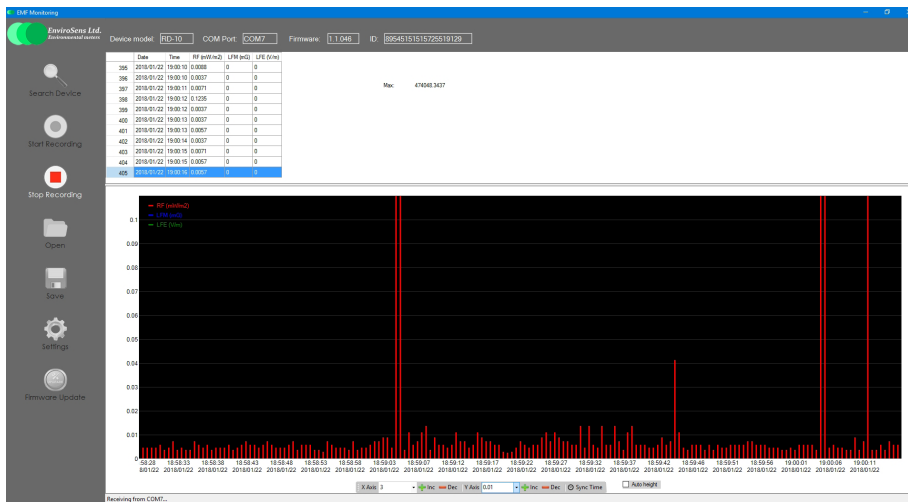
The **RD-10** software (which is a download) can be used to record and view readings from the Meter once it is connected to a PC using the supplied mini-USB cable.

Files are saved in **CSV** format, and can be imported into Microsoft Excel or other similar software.

Before connecting the device to your PC and using the software, it will be necessary to download and install the correct drivers for this device.

Download these **drivers** at:
http://www.envirosens.com/software/driver/CDM21228_Setup.exe

Download the latest version of the **RD-10 software** here:
http://www.envirosens.com/software/Monitoring.zip.

The software downloads as a zip file – Unzip the file and run the "Monitoring.exe" file. No installation is required.

Supported OS: Windows 7, Windows 8, Windows 8.1 and Windows 10.

Driver installation:

Download the drivers from:
http://www.envirosens.com/software/driver/CDM21228_Setup.exe

Open the download and start the installation by following the on-screen instructions. *(See sidebar graphic)* Once installed, no further action is required.
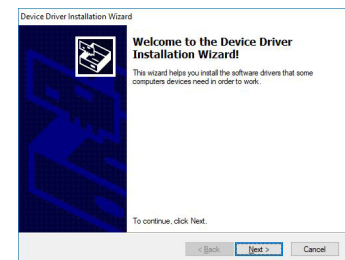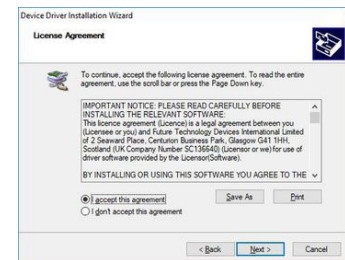
Download and open file.
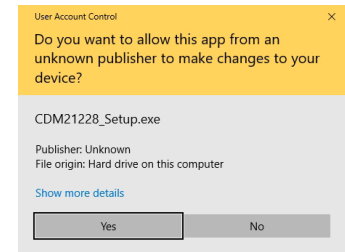
Accept by clicking 'Yes'.
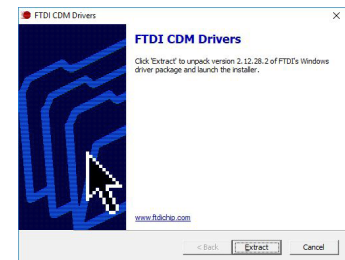
Click 'Extract'

Follow instructions to install the Driver.

Accept and install.
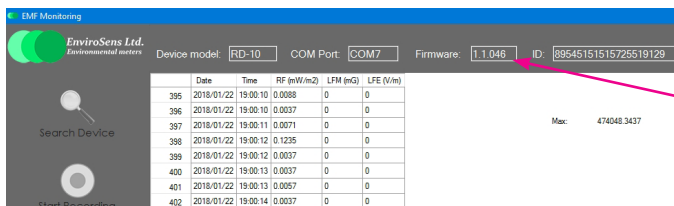
Using the Software:

Connect the meter to a PC using the special mini-USB cable supplied, and power ON.

- On your PC: Open the **RD-10** application. Make sure the Meter is turned on, and that it is connected to the PC via the supplied USB cable. Now 'click' the **"Search device"** button. The software will locate the device, and, once found, will show the device, along with the model name and firmware version at the top of the application window. Once connected, it is possible to start capturing data.
- Press the "**Start Recording**" button to capture real-time data from the device. The device updates readings twice a second, using the peak value for that time segment.
- To stop the capture, press the "**Stop Recording**" button.
- Data may be saved to a file by pressing the "**Save**" button; choose a location on your hard drive and press Save.
- Recorded data may be viewed by either: Pressing the "**Open**" button and navigating to a saved file, or by left-clicking in the graph area on the screen.

Firmware Updates:

Firmware, is software installed on the Meter. It is important to check that the version on the Meter is up to date.

The current firmware on the device will be shown at the top of the application window once the device is connected:

Firmware version

Go to our website to check for the latest release at:
http://www.envirosens.org/software/rd-10/firmware/
If there is a later version available download it to your computer.
Once you have the file on your local drive: Click the **"Firmware Update"** button – you will be prompted to locate the file you have downloaded.
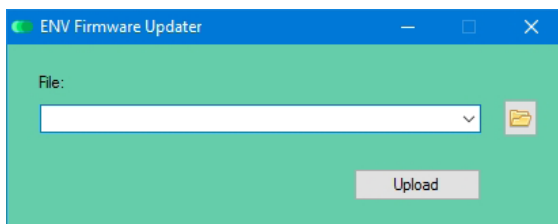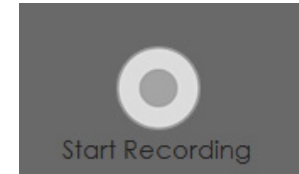

Enter the location, on your hard drive, of the file that you have downloaded, and click "Upload." The firmware on your device will be updated.
Note: *The Meter must be connected to the computer via the USB cable.*
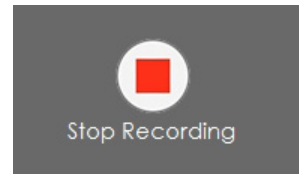
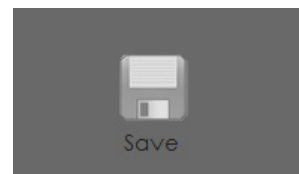## Application window features and controls:
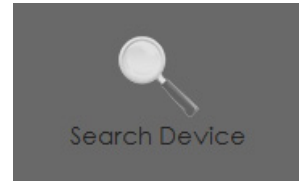
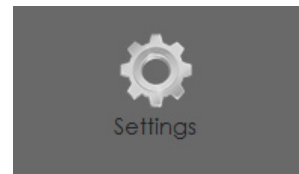*Search for and connect to a compatible device via the COM port on your computer.*

Starts data collection from the device.
(This button will only work if a compatible device is connected.)

Stops data collection from the device.

Save collected data to file.

Enter software settings.

Updates the firmware on the device.

Trouble shooting:

	Question:	Answer:
RD-10	The device does not turn on when not connected to the USB.	• The battery is not charged. Connect the device to a power source with the USB cable, and allow to charge for several hours.
RD-10	No tones from meter	• Make sure the sound switch is in the ON position. • **Note:** Tones only sound for measurements high enough to activate the Yellow or Red LEDs.
Software	The software cannot find the device.	• Make sure the device is turned on. • Make sure to use the correct USB cable. *(The cable supplied is of special design – regular mini-USB cables will not function correctly).*

Technical specifications:

RF Frequency range:	100MHz to 8GHz
RF measuring range:	-60dBm to +5dBm
RF Typical accuracy:	±6 dB
LFM (magnetic field) Frequency range:	50Hz to 10KHz
LFM measuring range:	0mG to 50mG with 0.1mG resolution
LFM accuracy:	20%
LFE (electric field) Frequency range:	50Hz-50KHz
LFE measuring range:	2v/m to 1000v/m
LFE accuracy:	25%
Display:	Sampling rate:
Sampling rate:	20,000/sec (updates 5 times a second on the LEDs / 2 times a second for USB data)
RF technologies:	Analog RF and Digital burst RF (GSM, TDMA, CDMA, LTE, DECT, ZigBee, Bluetooth, UWB, Wi-Fi, WiMAX 2.4GHz, 3.6GHz, 5.8GHz, 2,3,4 generations).

Warranty:

The **RD-10** comes with a 1 year limited warranty.
For more information, or to contact us, please email to: support@envirosens.com

Maintenance:

Always keep the device away from excessive heat or humidity.
Note: Please remember to follow local ordinances regarding disposal of electronic equipment.