

ECOsense



Revision	Date	Author	Modification
V1.2	29/11/2009	MS	Initial Release
V2.0	06/05/2011	MS	Android software addition
V3.0	21/11/2011	MS	New features/Sensdots database
V4.0	12/12/2011	CB	APK on the Android Market
V4.1	05/04/2012	CB	New instruction of use

Contact: infos@sensaris.com

SENSARIS
452 Rue des sources
38920 CROLLES
FRANCE

Website: <http://www.sensaris.com>

Telephone: +33672995202

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I. Introduction

ECOsense is the first commercial systems to provide real time monitoring and mobile mapping of urban environmental conditions.

It is a small wearable device fitting in the palm of the hand and is designed to communicate with mobile phones, send or store recorded data on a memory card for later upload to the Internet.

The purpose is to enable any citizen to see on Google Maps the noise, CO, NOx, humidity and temperature levels within a city as they walk or cycle around (the data is automatically measured every second).

In this sensor you have:

A microcontroller (the brains of the Pod), a GPS chip, a Bluetooth radio, a microSD Memory card, a rechargeable lithium polymer battery, a microphone, a chip measuring CO and NOx concentrations in the air, a chip providing relative humidity and temperature, and some other goodies that created a lot of sleepless nights for us.

Enjoy using ECOsense everywhere.

II. Installing software on Android devices.

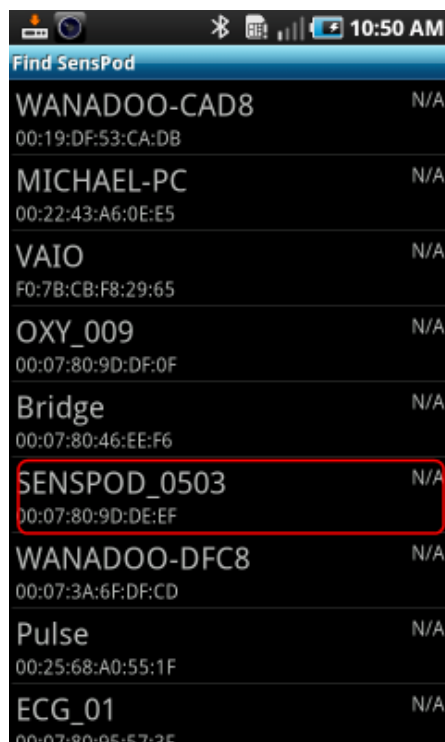
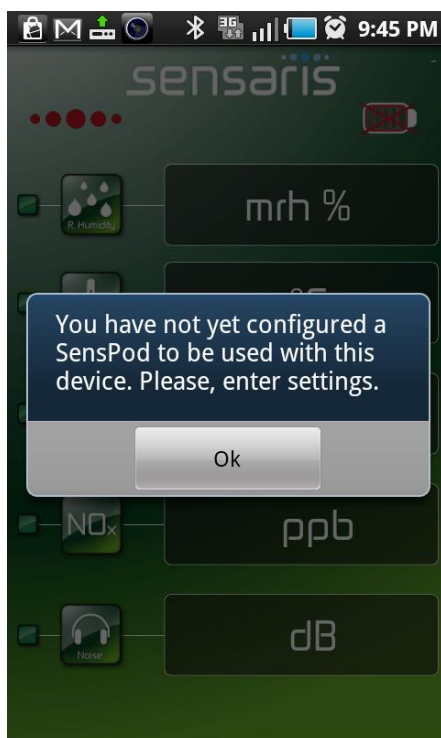
To install your mobile application, simply go to the Android Market, look for ECOsense and download it.

You can also go to our website in the application page and flash the QR code to find it directly on the Market <http://www.sensaris.com/applications>

a. FIRST USE

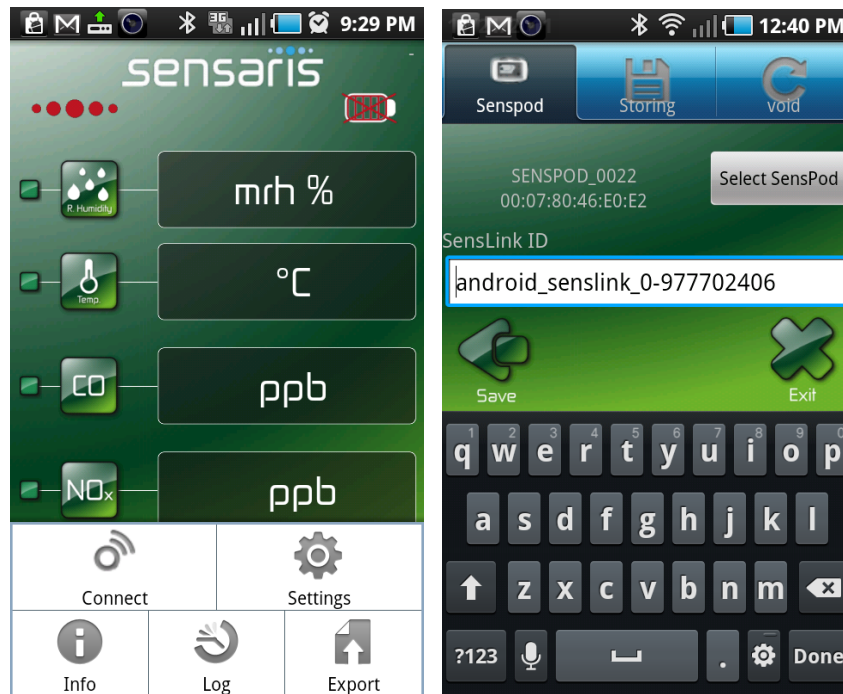
1. Active Bluetooth on your phone.
2. Turn on your ECOsense.
3. Launch the Sensaris ECOsense app.
4. Tap ok and then select the ECOsense you just turned on.
5. The pairing code is 1111.

Note: If you face troubles while trying to connect your ECOsense, shut down ECOsense application, disconnect then reconnect Bluetooth mode from the mobile phone and try again.



b. SELECTING AN OTHER ECOsense

1. Tap on the MENU button then SETTINGS
2. Tap on the Select Senspod button.
3. The phone will then perform a search of Bluetooth devices and select the new ECOsense you would like to connect to.



III. DATABASE TRANSMISSION FREQUENCY

In Settings/Storing you can set the frequency with which the ECOsense sends data to the database (Sensdots server).

By default, data is sent to our server: sensdots.Com and Port 80.

You can choose to select one or several way to store / export data. To do so, go to menu / settings / storing.

a. *Send data to Sensdots:*

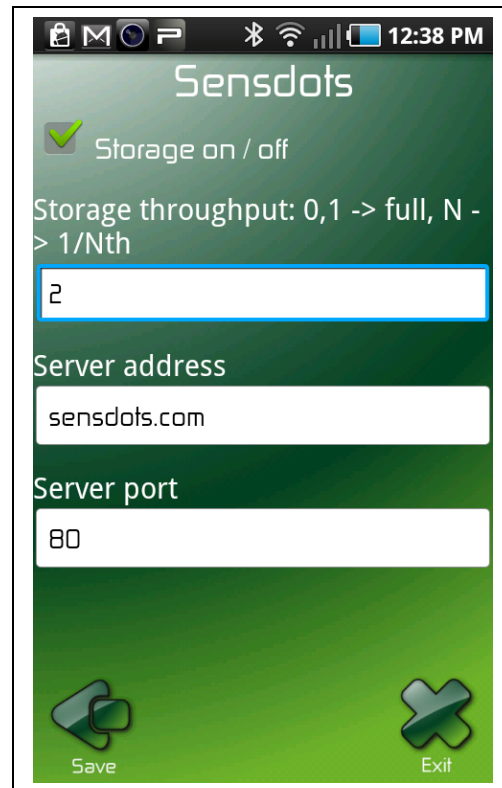
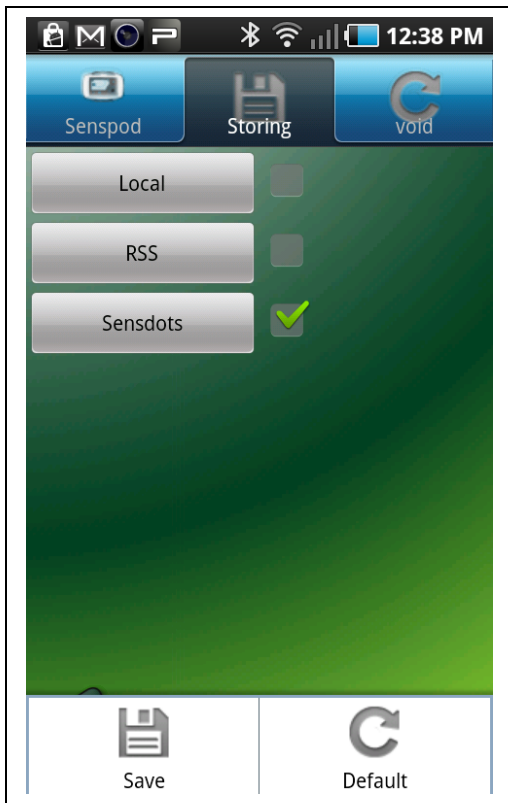
- Hit the Sensdots grey button and you'll be taken to the configuration page shown on the right.
- You can then select the frequency at which data is sent to the database. In the example shown, 2 indicates that the data frame is sent every 2 seconds. If you put 15, then a data frame is sent every 15 seconds etc.....(The other 14 frames are lost).

b. *Save data locally:*

- Check local checkbox.
- Hit the Local grey button and you'll be taken to the configuration page.
- You can then select the frequency at which data is recorded in your phone.

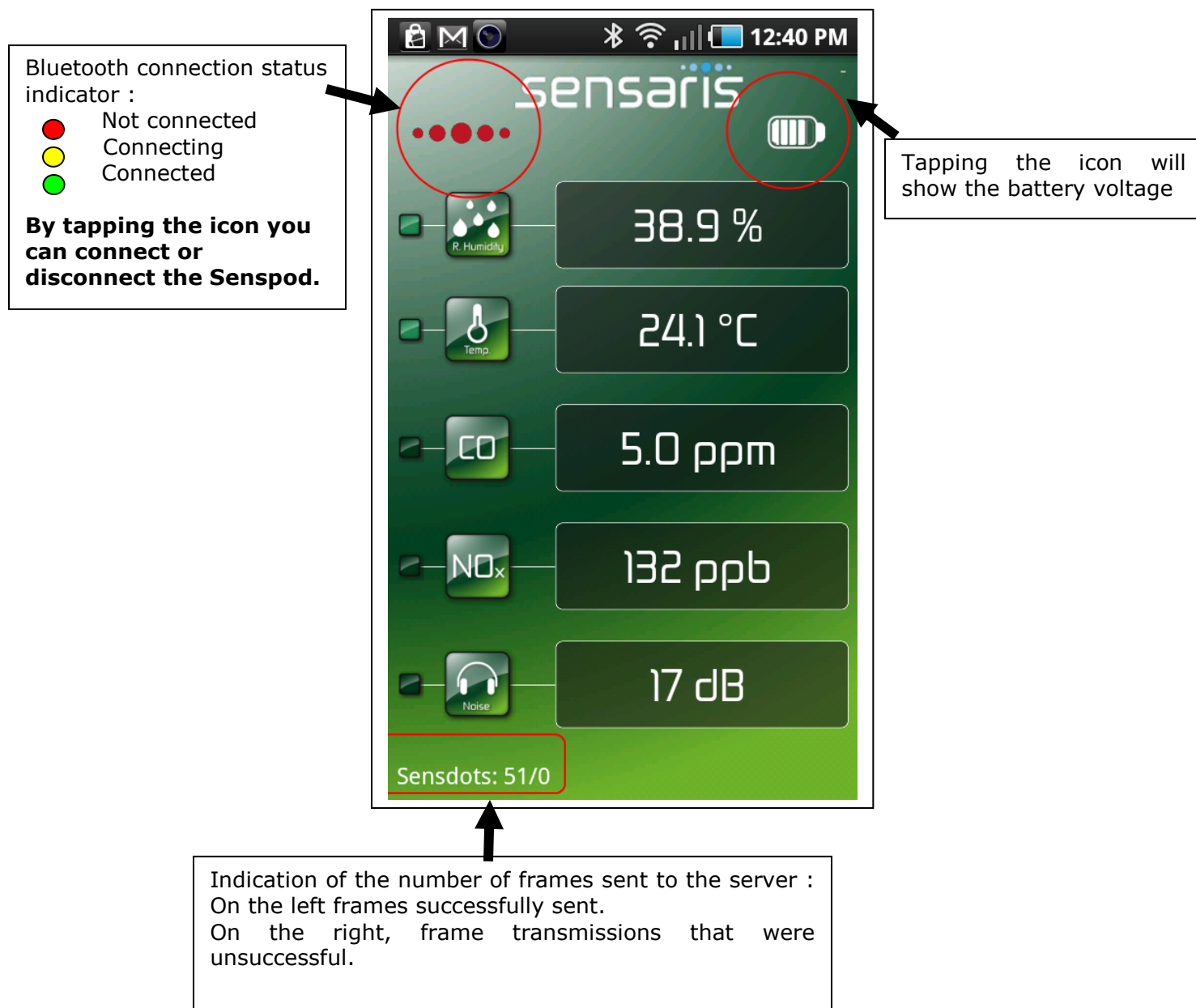
c. *Send data using RSS:*

- Check RSS checkbox.
- Hit the RSS grey button and you'll be taken to the configuration page.
- You can then select the frequency at which data is sent, specify the name of server address as well as server port.

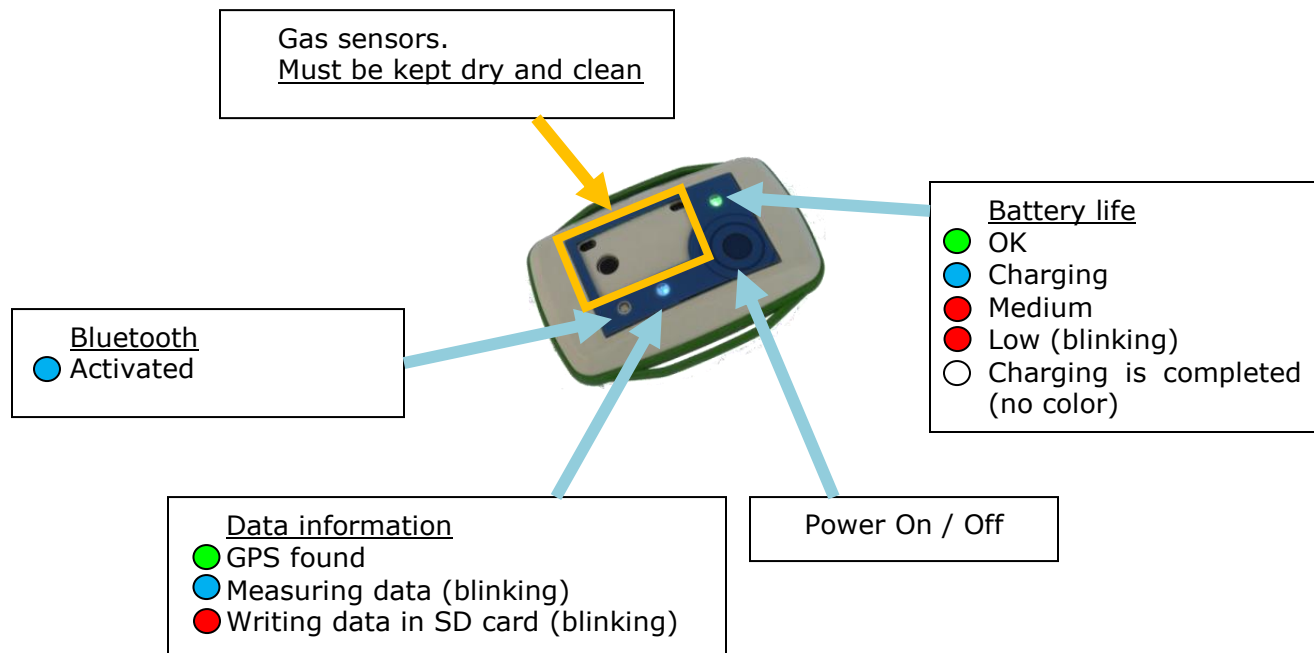


IV. REGULAR USE

Now the phone will connect to the ECOSense and you can see data on your screen.



V. Understand your ECOsense:



VI. Fix the GPS

If you use a geolocalized Senspod (GPS embeded), you'll need to fix the GPS when you turn it on. For that, it is better to go outside and wait for green central LED to be on.

Then you'll get GPS coordinates in your data frames.

VII. Managing data

a. On the ECOsense

By default, data are recorded on the memory card, waiting to be collected by your gateway (mobile phone, plus computer etc.). Notice that data are not erased on the ECOsense memory card once collected by your phone.

b. On your mobile

You get different choices:

- Data can be stored locally. They can be exported in a CSV format (see CSV manual).
- Data can be sent via RSS to external server.

- And finally, you can send data to SensDots, our web interface (see SensDots Manual).

VIII. Recharging the battery

The autonomy in normal circumstances is greater than 5 hours.

Some precautions must be taken for the recharge of battery:

- Charge it with constant current (lower or equal to 1C₅A) and constant voltage (lower than 4.25V) mode;
- Charge it when temperature is comprised between 0° and 40°C.

Once the ECOsense is charged, the blue LED goes out.

Lithium-ion battery under-performed when temperature is below 0°C, it discharges very quickly.

To recharge the battery:

1. Insert mini USB charging cable into USB port of computer.
2. Connect charging cable with the charging port of the ECOsense (on the back)

Note: Choosing travel charger or USB cable depends on different countries or areas and actual demands.

IX. Use precautions

a. Care of your ECOsense

ECOsense is designed to work when temperatures are comprised between 0 and 35°C and to be stored between -20 and 45°C. Out of this scope temperatures may damage or reduce life time of battery and cause momentary stop of the ECOsense. Avoid brutal change in temperature as it may produce condensation inside the casing. Don't fall off on the floor or knock the hard substance. It may damage interior circuit. Don't use chemical or detergent to clean the product. Don't scrap the surface.

b. Don't open the casing

Opening the casing is strictly forbidden without which guarantee will be rendered null and void.

c. Take care of the battery

Don't bend, pierce, fall, hit, burn or try to damage the battery in any way.

Prohibition of disassembly cells, of cells immersion into liquid such as water or seawater, of dumping cells into fire, of using damaged cells. The cells with a smell of electrolyte or leakage must be placed away from fire to avoid firing.

In case of electrolyte leakage contact with skin, eye, physicians shall flush the electrolyte immediately with fresh water and medical advise is to be sought.

If the battery has to be changed, don't do it yourself but ask a professional.



d. Protect the ECOsense from dust and humidity

Each ECOsense comes in a black felt pouch. When not actively measuring, it is best to place the ECOsense back in its pouch to reduce the amount of dirt that could possibly get into the casing.

In order for the sensors to be in contact with air and for the microphone to be able to sample sound, we had to make a lot of openings in the casing.

Therefore, when using the device outdoors, please take appropriate measures to AVOID AT ALL COSTS RAIN OR WATER GETTING INSIDE THE CASING as this will irreversibly damage the sensor and might even result in *dangerous* reaction with the lithium ion battery inside. Sensaris would not replace any device damaged by water.

e. Device disposal

The ECOsense must not be disposed with normal household waste because it contains electronic materials and a lithium battery which can be recycled.

When ECOsense reaches the end of its useful life, it must be taken to an electronic equipment recycling point.

- The equipment must be disposed of in a selective waste collection system, and not that for urban solid residue. Please manage its disposal properly.
- Send it back to us if you buy a new ECOsense

X. Certification and conformity

This product complies with the 1999/519/CE Council Recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz). This equipment respect following standard: EN 300 328, EN 301 489-17, EN 60950-1.

This wireless device complies with R&TTE directive.



a. Declaration of conformity for European Union:

Deutsch: Hiermit erklärt Sensaris SARL, dass sich Bluetooth Sensor in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befinden.

English: Hereby, Sensaris SARL declares that this Bluetooth device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Español: Por medio de la presente Sensaris SARL declara que este dispositivo Bluetooth cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/EC.

Français: Par la présente Sensaris SARL déclare que le capteur Bluetooth est conforme aux exigences essentielles et aux dispositions pertinentes de la directive 1999/5/EC.

Italiano: Con la presente Sensaris SARL dichiara che questo dispositivo Bluetooth è conforme ai requisiti essenziali e dalle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/EC

XI. Calibration

- UV calibration: The Senspods are calibrated against a Lutron UV-340 UV meter:

Ultra-violet irradiance measurement for UVA & UVB
UV detector spectrum from 290 nm to 390 nm

http://www.lutron.com.tw/ugC_ShowroomItem.asp?hidKindID=1&hidTypeID=71

- Ozone:

EcoSense: A-21ZX

<http://www.ozonesolutions.com/A-21ZX.html>

- Nitrous Dioxide: Environmental Sensors Co : Z – 1400

<http://www.environmentalsensors.com/nitrogen-dioxide-monitor-z-1400.html>

- Temperature/humidity: Trotec T-200

<http://mikroklima.com.hr/pdf/Trotec/TRO-TR-KAT-MUME-07-GB.pdf>