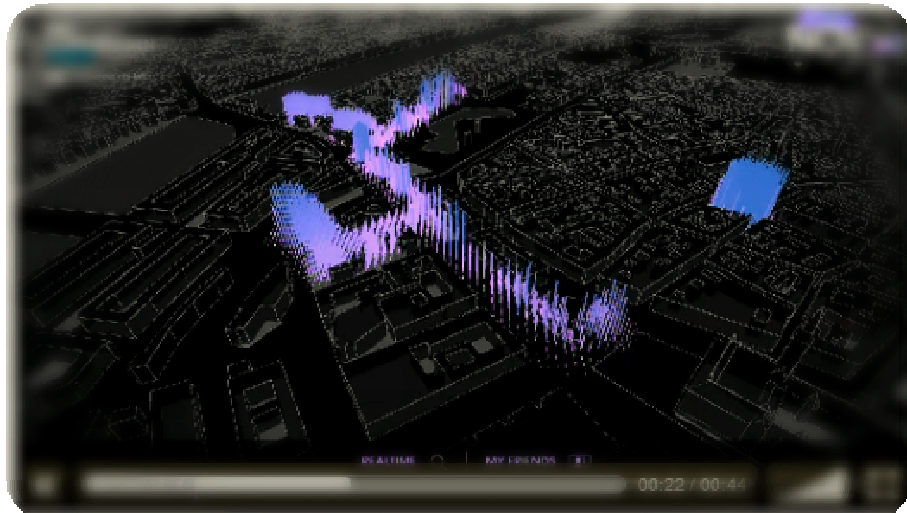


SENSPODS



Quick Start Manual

Revision	Date	Author	Modification
V1.2	29/11/2009	MS	Initial Release
V2.0	06/05/2011	MS	Android software addition

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1- Introduction

Senspods are the first commercial systems to provide real time monitoring and mapping of urban environmental conditions.

They are small wearable computers fitting in the palm of the hand and are designed to communicate with mobile phones or record the 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, UV, Ozone, CO₂, CO and NO_x levels within a city as they walk or cycle around (The data is automatically measured every second).

In each sensor you have:

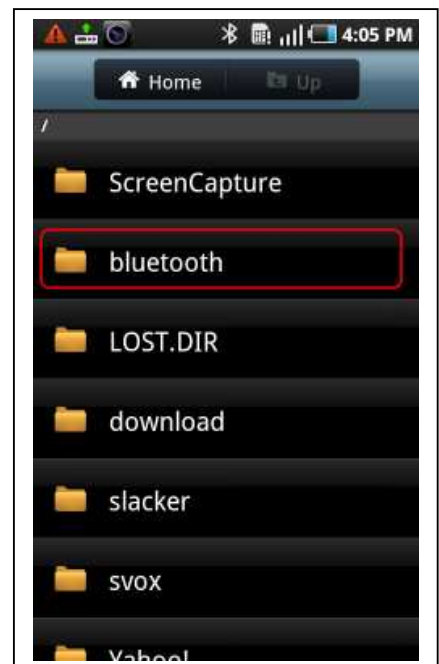
A microcontroller (the brains of the Senspod), a GPS chip, a Bluetooth radio, a microSD Memory card, a lithium polymer battery, Metal Oxide Semiconductor sensors to determine gas species concentrations in the air, a chip providing relative humidity and temperature, and some other goodies that created a lot of sleepless nights for us.(Yes we know that is a lot of silicon components and there is actually no extra room in the casing).

Enjoy using Senspods in your city.

2 - Installing Sensaris software on Android devices.

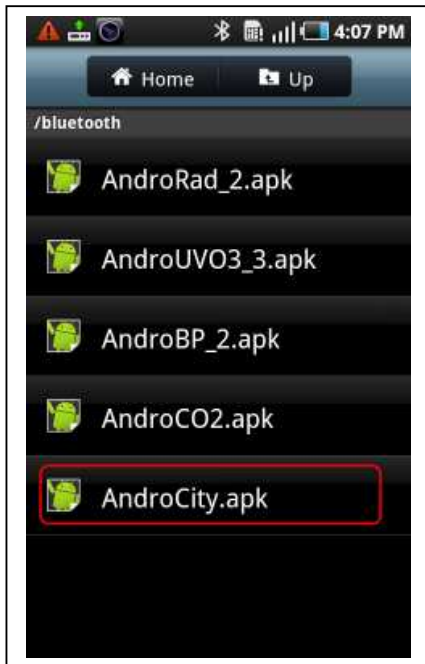
The apk file provided can be installed via Bluetooth on your phone. (or if you prefer, you can transfer the file to a micro SD memory card and then place this memory card in your phone).

Navigate to the Bluetooth folder using any file management software (Simply choose Files in "Applications" or "Astro" from the Android market).





Double click on AndroCity (or any other application you would like to install such as AndroUVO3 in the example below).



Select the option to install the file.

3 - Pairing with the Senspod

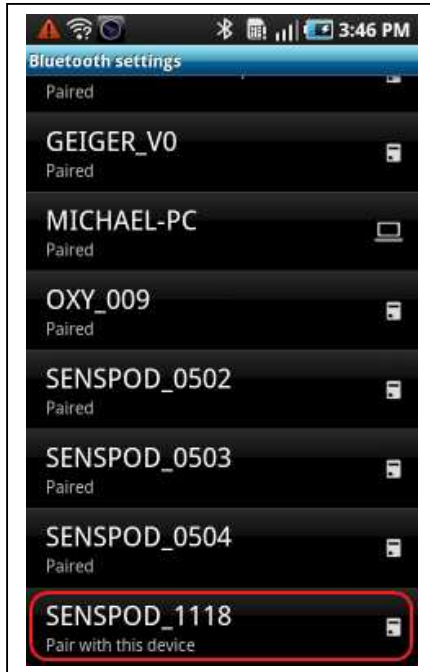
Turn on your Senspod.

Select Settings in your phone's menu (1). Then pick Wireless and Network (2), and navigate to Bluetooth (3) to select Scan Devices.



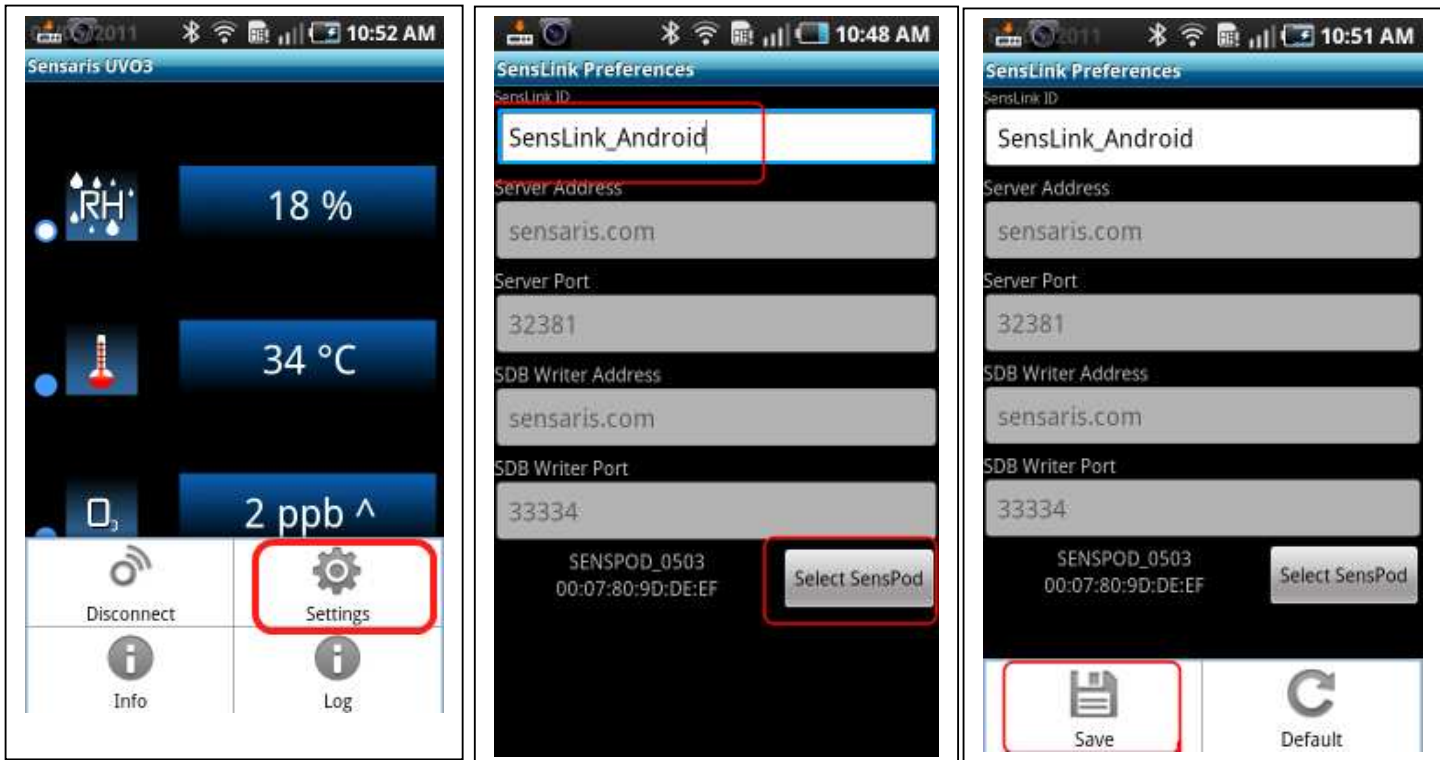


Once a full scan has been completed, select your Senspod, enter its pairing code 1111.





4 – Network configuration and default Senspod selection.



Launch the application.
Tap on the MENU button.

Select SETTINGS

CHANGE SensLink ID to one that is unique and suits you !! and adjust parameters if you are using your own database and server.

Choose Select Senspod (bottom right).

Hit SAVE.

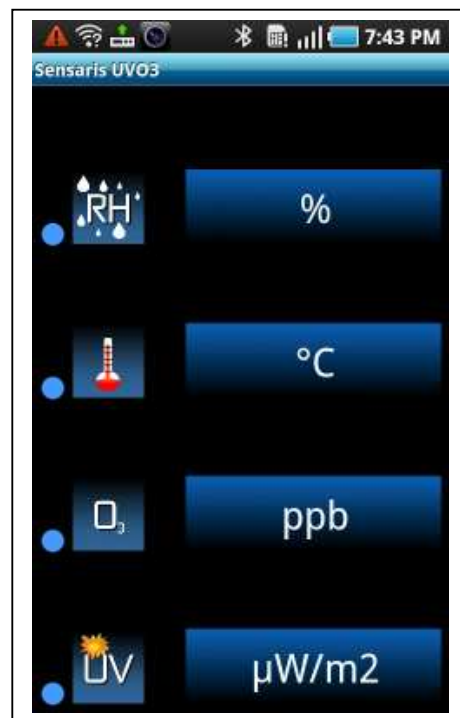
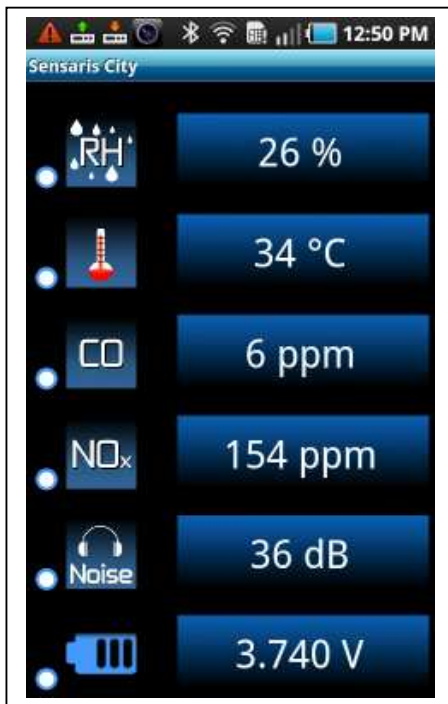


5 – Regular Use

Launch the application.

You will be asked if you want to connect automatically to the Senspod you were connected to previously.

Now the phone will connect to the Senspod and you can see real time data on your screen.



Care about your Senspod.

Each City Senspod comes in a black felt pouch. When not actively measuring, it is best to place the Senspod 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

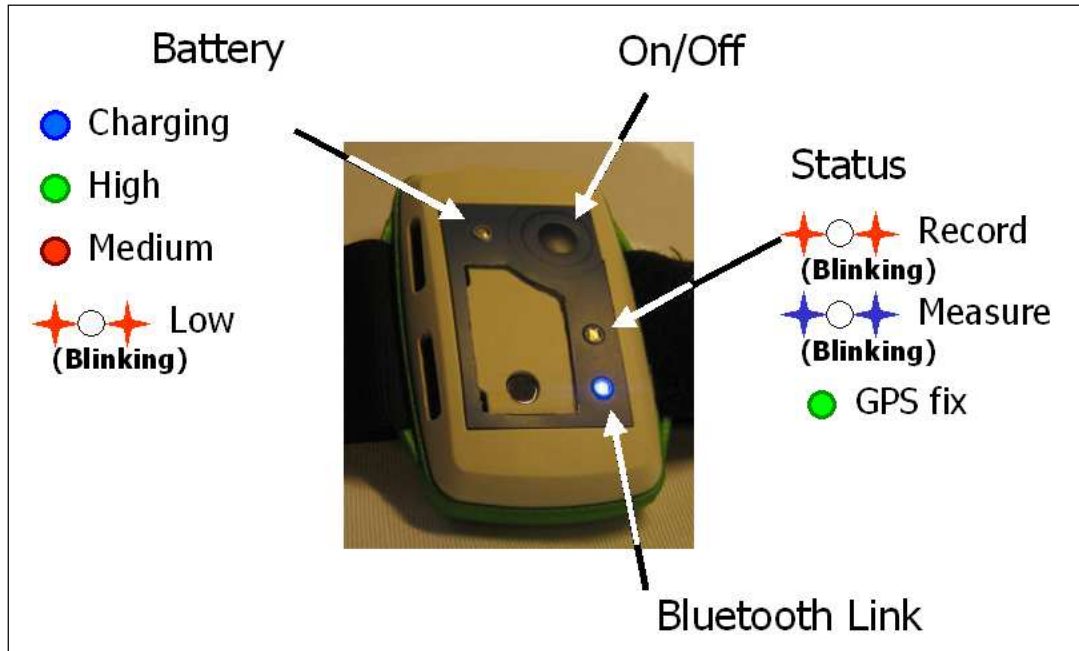


irreversibly damage the sensor and might even result in *dangerous* reaction with the lithium ion battery inside.



Sensor front panel

There are three LEDs on the front to indicate various messages as outlined below.



When you turn the Senspod ON or OFF, it will emit a little jingle (from a buzzer inside).

Recording data on the memory card.

Simply turn the sensor on. Go outside, wait for the status light to be Green/Blue, which means that the GPS chip has located the satellites and has obtained a correct latitude and longitude. The first time it takes about 1 to 2 minutes. The next times you turn the sensor on it is much faster.

If you do not have GPS coordinates, the data will be useless, so please make sure that the status light indicates GPS has a fix before starting to pedal.

Sometimes the GPS will also work indoors if you are close to windows, but to get the GPS to lock a position it is much faster (and easier on the batteries) outside.

Recharging the battery

The autonomy in normal circumstances is greater than 5 hours.

The City Senspod can be recharged using the mini USB plug located on the back of the sensor.

Use a standard USB to mini USB cable and "wall to 5 Volt USB" charger provided. You may also recharge the sensor by connecting the miniUSB cable to a USB port on a computer.



Calibration and dataframes

- 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>

The dataframes for environmental Senspods are the following:

CITY

```
#010100:000629:274,$PSEN,Batt,V,4.09
#010100:000629:279,$PSEN,RTC,Date,010100,Time,000629
#010100:000629:287,$PSEN,Noise,dB,035
#010100:000629:292,$PSEN,NOx,V,2.963
#010100:000629:296,$PSEN,COx,V,1.362
#010100:000629:587,$PSEN,Hum,H,44.96,T,27.79
#010100:000629:957,$GPRMC,000217.026,V,8960.0000,N,00000.0000,E,0.00,0.00,060180,,,N*7E
#010100:000630:260,$PSEN,Noise,dB,028
#010100:000630:266,$PSEN,NOx,V,2.964
#010100:000630:271,$PSEN,COx,V,1.361
#010100:000630:563,$PSEN,Hum,H,46.82,T,27.82
#010100:000630:958,$GPRMC,000218.026,V,8960.0000,N,00000.0000,E,0.00,0.00,060180,,,N*71
#010100:000631:237,$PSEN,Noise,dB,030
#010100:000631:243,$PSEN,NOx,V,2.968
#010100:000631:247,$PSEN,COx,V,1.353
#010100:000631:539,$PSEN,Hum,H,48.47,T,27.83
#010100:000631:958,$GPRMC,000219.026,V,8960.0000,N,00000.0000,E,0.00,0.00,060180,,,N*70
#010100:000632:213,$PSEN,Noise,dB,030
#010100:000632:219,$PSEN,NOx,V,2.967
#010100:000632:224,$PSEN,COx,V,1.349
#010100:000632:516,$PSEN,Hum,H,49.89,T,27.86
#010100:000632:957,$GPRMC,000220.026,V,8960.0000,N,00000.0000,E,0.00,0.00,060180,,,N*7A
#010100:000633:191,$PSEN,Noise,dB,026
#010100:000633:201,$PSEN,NOx,V,2.971
#010100:000633:206,$PSEN,COx,V,1.342
#010100:000633:493,$PSEN,Hum,H,50.95,T,27.88
#010100:000633:958,$GPRMC,000221.026,V,8960.0000,N,00000.0000,E,0.00,0.00,060180,,,N*7B
```



UV,O3

#010100:001236:868,\$PSEN,Batt,V,4.10
#010100:001236:872,\$PSEN,RTC,Date,010100,Time,001236
#010100:001236:885,\$PSEN, UV,V,0.135
#010100:001236:893,\$PSEN, O3,V,9.008
#010100:001237:029,\$GPRMC,235950.027,V,8960.0000,N,00000.0000,E,0.00,0.00,050180,,N*70
#010100:001237:187,\$PSEN,Hum,H,51.98,T,26.98
#010100:001237:861,\$PSEN, UV,V,0.135
#010100:001237:870,\$PSEN, O3,V,8.808
#010100:001238:026,\$GPRMC,235951.027,V,8960.0000,N,00000.0000,E,0.00,0.00,050180,,N*71
#010100:001238:160,\$PSEN,Hum,H,51.50,T,26.98
#010100:001238:837,\$PSEN, UV,V,0.135
#010100:001238:846,\$PSEN, O3,V,1.008
#010100:001239:028,\$GPRMC,235952.027,V,8960.0000,N,00000.0000,E,0.00,0.00,050180,,N*72
#010100:001239:137,\$PSEN,Hum,H,51.19,T,27.00
#010100:001239:814,\$PSEN, UV,V,0.135
#010100:001239:823,\$PSEN, O3,V,6.308
#010100:001240:026,\$GPRMC,235953.027,V,8960.0000,N,00000.0000,E,0.00,0.00,050180,,N*73
#010100:001240:114,\$PSEN,Hum,H,50.64,T,26.98
#010100:001240:790,\$PSEN, UV,V,0.136
#010100:001240:799,\$PSEN, O3,V,2.808
#010100:001241:029,\$GPRMC,235954.026,V,8960.0000,N,00000.0000,E,0.00,0.00,050180,,N*75

CO2

#010100:004242:039,\$PSEN,Batt,V,4.16
#010100:004242:044,\$PSEN,RTC,Date,010100,Time,004242
#010100:004242:140,\$PSEN,CO2,ppm, 1368
#010100:004242:441,\$GPRMC,000000.026,V,8960.0000,N,00000.0000,E,0.00,0.00,060180,,N*7A
#010100:004243:116,\$PSEN,CO2,ppm, 1354
#010100:004243:441,\$GPRMC,000001.026,V,8960.0000,N,00000.0000,E,0.00,0.00,060180,,N*7B
#010100:004244:093,\$PSEN,CO2,ppm, 1354
#010100:004244:441,\$GPRMC,000002.027,V,8960.0000,N,00000.0000,E,0.00,0.00,060180,,N*79
#010100:004245:069,\$PSEN,CO2,ppm, 1354
#010100:004245:441,\$GPRMC,000003.027,V,8960.0000,N,00000.0000,E,0.00,0.00,060180,,N*78
#010100:004246:046,\$PSEN,CO2,ppm, 1356
#010100:004246:441,\$GPRMC,000004.027,V,8960.0000,N,00000.0000,E,0.00,0.00,060180,,N*7F