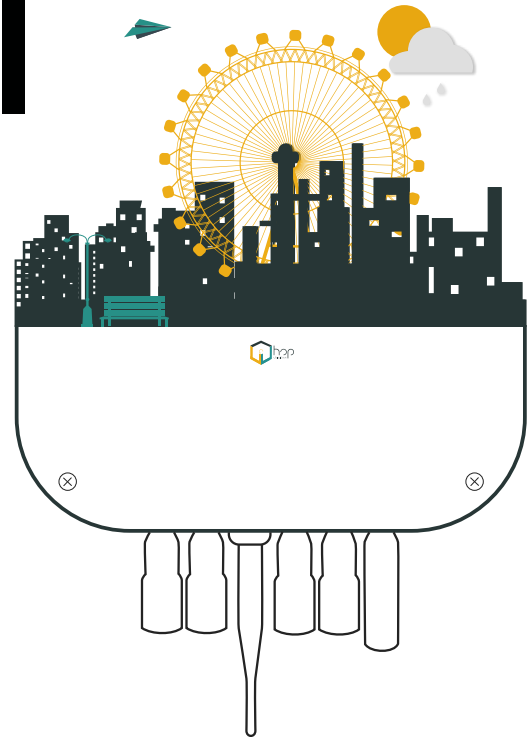
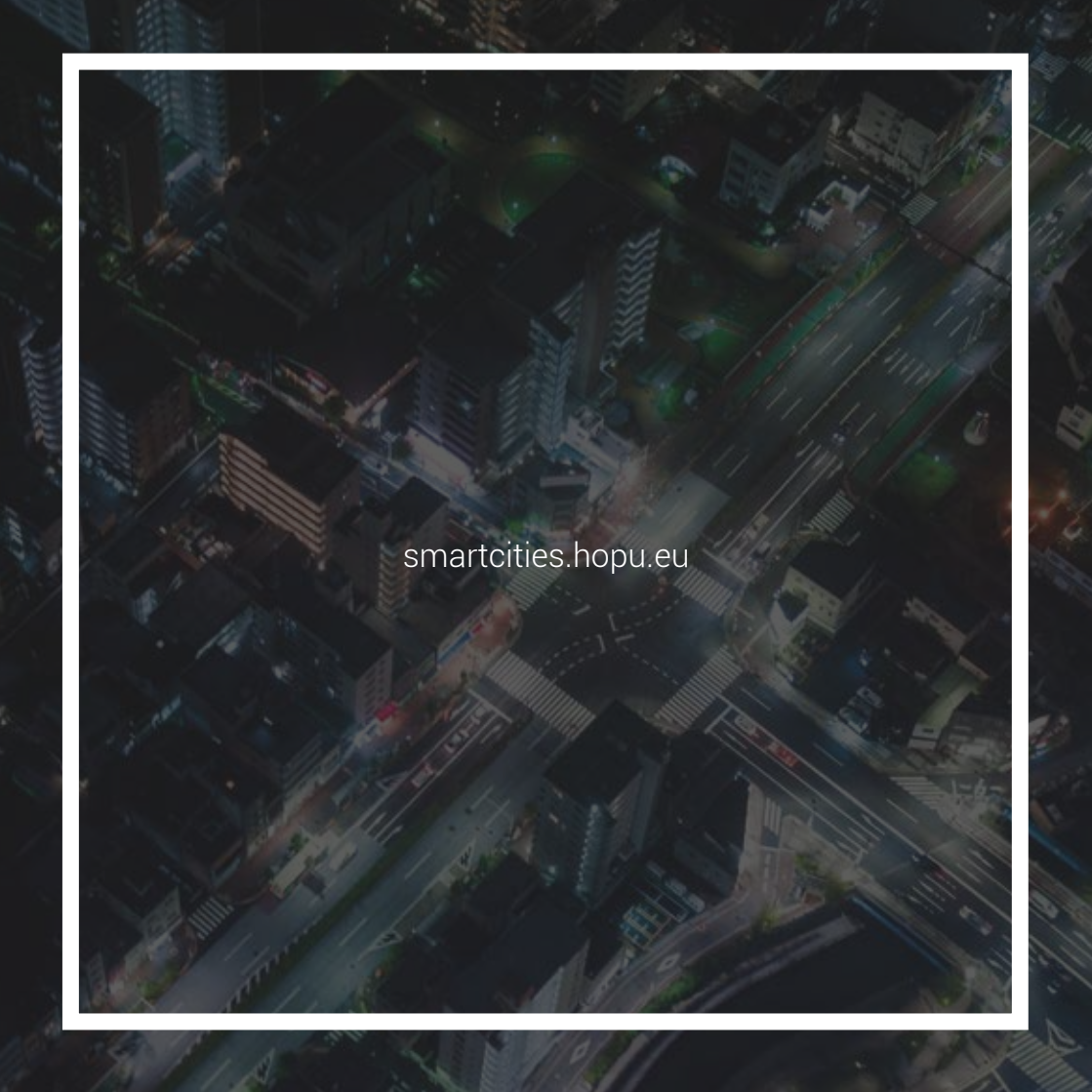
SMART
POI



Human oriented smart & sustainable cities


smartcities.hopu.eu

HOP UBIQUITOUS

We design innovative cities thanks to the deployment of Smart Points of Interaction (Smart POIs), this solution creates a multi directional communication channel among citizens, visitors and city managers, establishing co-creation, culture sharing and environmental control open tools.

Our solutions meet the requirements of the **Open Agile Smart City** (OASC), use **OMA LWM2M** communication protocols, allow integration with **oneM2M** platform and **FIWARE** enablers.

ETSI World Class Standards

Members

Smart Cities Data Models

ITU International Telecommunication Union

IoT & Smart Cities Members

Data Processing & Management (FG-DPM)

FIWARE FOUNDATION

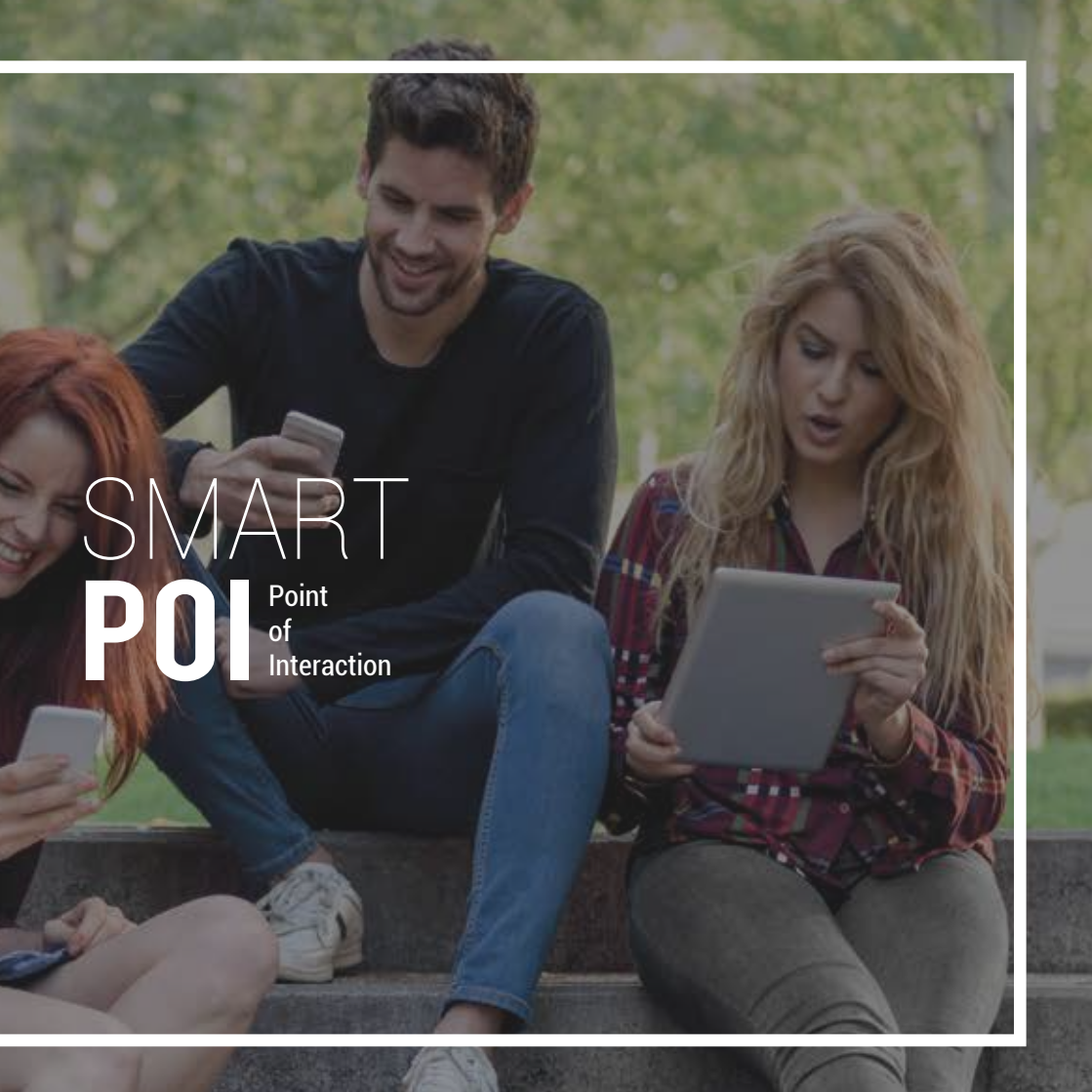
Gold Members

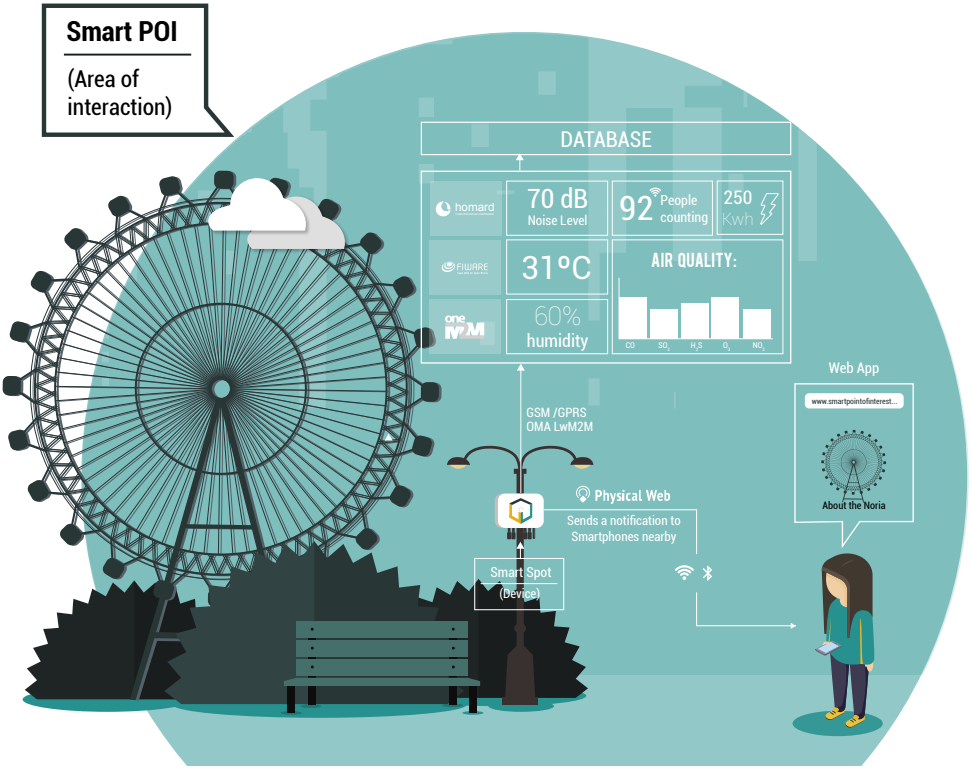
Smart City Open Ecosystem

IEEE Internet of Things

Co-chair

Quality of Data Sensors (IEEE PAR 2510)


SMART
POI
Point
of
Interaction



Smart POIs are interactive areas (1-80 metres) where users interact via their Smart Phones thanks to a device known as a Smart Spot that sends "push" notifications with digital content through Bluetooth and Wi-Fi without the need to install native Apps.
Smart Spots also measure atmospheric factors such as air quality, temperature, humidity, noise pollution, energy consumption and allow crowd monitoring in these smart areas.

Spread the digital content through
Bluetooth and Wi-Fi (Beacon)

Temperature &
humidity

Remote management by
OMA LWM2M, oneM2M
& FIWARE platforms

Noise pollution monitoring
(30dB - 130 dB)

Bespoke encapsulated
IP-65 /Waterproof

Crowd monitoring
(Wi-Fi devices)

Air Quality monitoring
NO_2, CO_2, SO_2, NO & O_3
(Calibrated sensors)

Measure energy
consumption
(non-invasive)

*Create interaction areas thanks to Physical web**

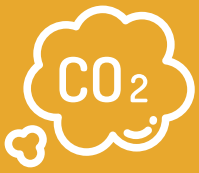
Physical Web technology enables interacting with citizens´ Smart Phones in an area up to 80 metres through Bluetooth or Wi-Fi without installing any App. This URL shows up as a non-intrusive notification which allows access to online content to enjoy in these physical areas. The digital online content can be changed thanks to the URL Manager, a software platform that permits editing the push notification that Smart Spot transmits.

* Physical Web is a technology developed by Google widely supported by Google Chrome, Android, OS and iOS devices.

vodafone ES
09:21
90 %
Search
Thursday,
21 September
CHROME
Show More
+ New Tab
Voice Search
Read more about your city
CALENDAR
No Events
WEATHER
Show Less
Ceuti
Mostly Sunny
Chance of Rain: 0%
18°
31° / 17°
Now
10
11
12
13
14

Discover the temperature and humidity of every point

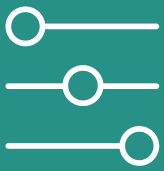
This function provides information in real time about temperature and humidity in specific points in the city gathering complementary data to a meteorological station at a lower cost.



Monitor the air quality in strategic places (Promoting Sustainability)

In order to monitorize the air pollution, Smart Spot measures the **NO_2, CO, SO_2, NO** and **O_3** at specific points in real time. We have a sophisticated high precision lab, with a Mass Flow Controller and a Zero Air Generator, where through Machine Learning algorithms we improve the precision of our sensor measures reducing the effect of cross sensitivity.

AQI
AIR QUALITY INDEX



Manage remotely the devices

For the care and management of data collected by the Smart Spot a maintenance platform is needed, our device could be managed remotely by platforms which use OMA LWM2M as FIWARE, oneM2M and our IoT device management platform Homard.

homard
OMA Resources Dashboard

oneM2M

FIWARE
Open APIs for Open Minds

LightweightM2M

Measure people flow in delimited areas (crowd monitoring)

This system provides information about crowds in specific areas, detecting people with Smart Phone Wi-Fi switched-on, making it possible to know the distance between citizens and any Smart Spot.

The measure time is scalable allowing to establish periods from 1 min, 10 min, 60 min and set hours of the day to understand human dynamics and people behaviour. The collected data is visualized in real time and stored in historical databases.

Check energy consumption in buildings and public services

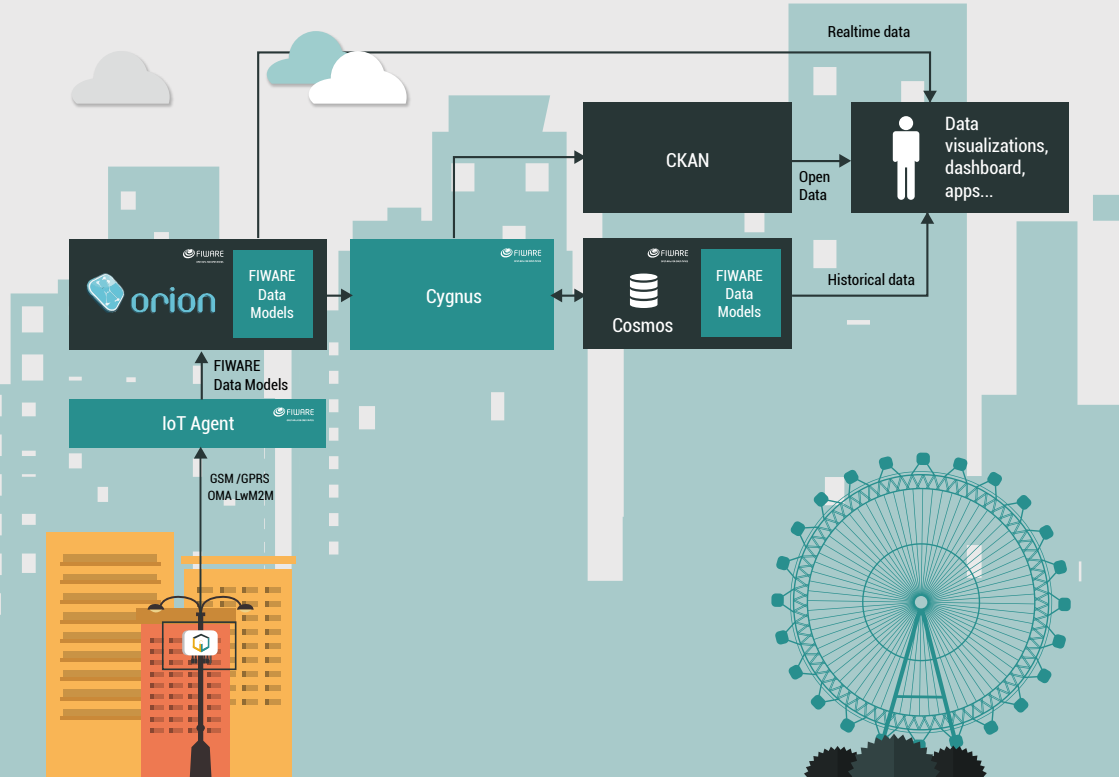
To monitor the energy consumption we are incorporating an ammeter clamp in our Smart Spot, installation is simple, only surround the wire without disrupting to the electrical circuit. Its measurements are produced through the creation of a magnetic field due to Hall Effect, permitting knowing the consumption in watts (W).

Oversee the noise pollution in your city

We are developing a smart sound level meter class A for our Smart Spot to measure noise levels (30 dB- 130dB) everywhere in real time.

homard OMA Resources Dashboard	Smart Spot deployment includes Homard subscription, our remote IoT devices and MVNO (Mobile Virtual Network Operator) Worldwide management platform for OMA LWM2M.
Cloud Storage	Our solution provides a storage space to data history adapted to the different device functions.
M2M Connection	Due to the agreement with different companies such as Telefonica we offer highly competitive rates for M2M GSM/GPRS device connection.
API Open APIs	All of our solutions are supported with the necessary APIs information to permit developing our product by the client.
FIWARE Open APIs for Open Minds	We deploy FIWARE to manage Smart Spot data and also, we integrate our solution in already existing FIWARE ecosystems.

Our solutions are fully integrated with FIWARE



SMART
SOLUTIONS

Citizen participation

Designing cities

The capacity to interact with users makes the Smart Spot an indispensable device to disseminate digital tools for citizen participation and co-creation, permitting contextualize webs and platforms in strategic points of the city, contributing to the municipal transparency and citizen engagement.

This innovative solution enables tools to involve people in a participative process, including Smart Spot deployment, co-creation App and data visualization platform.

We design smart infrastructures to improve citizen interaction with cultural heritage, local trade and cultural events, broadcasting digital tools of cultural information and tourism management through the Smart Spot.

This solution transforms a territory into a Smart Tourism Destination according to the ISO & AENOR standard, developing an environment that enhances the communication between cultural city elements, visitors and citizen.

Our smart tourism solutions comprise the Web-App design, data visualization platform and the adapting of cultural information to the Web-App.

SMART TOURISM

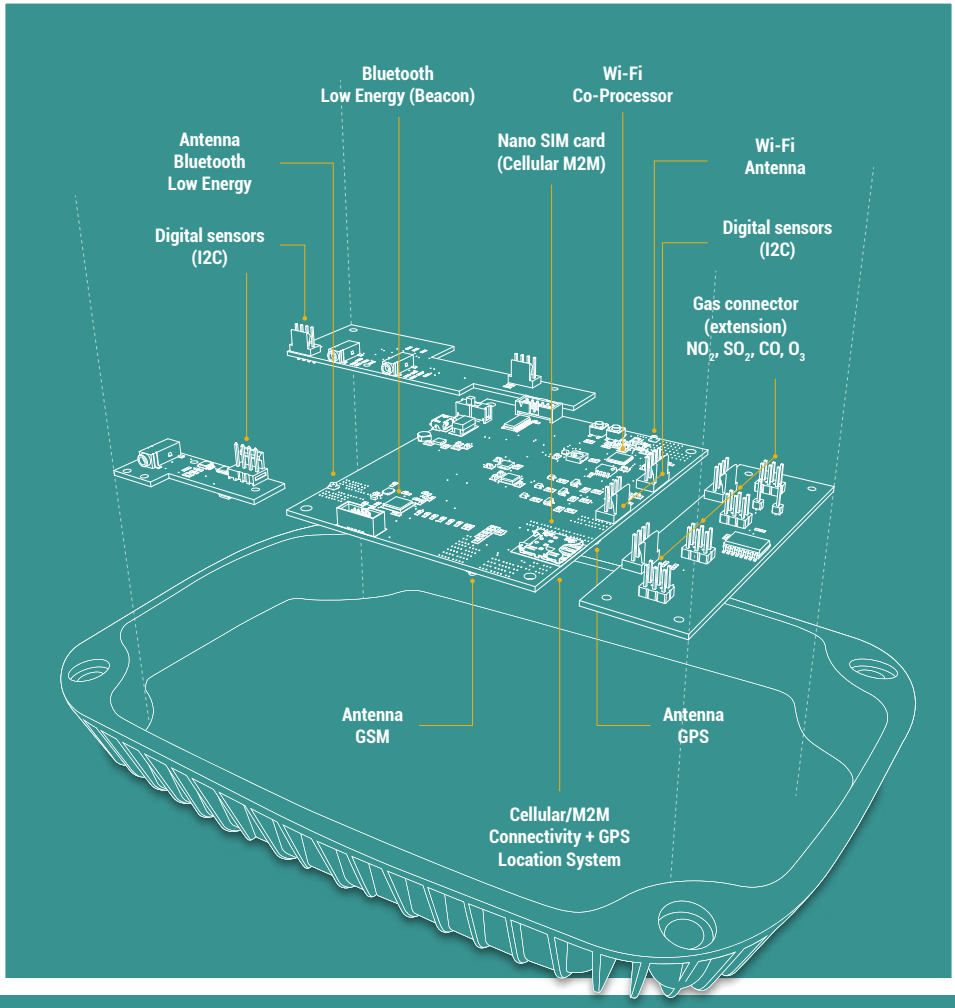
Interacting with the culture

SENSORIZATION & MONITORING

Taking care of your environment

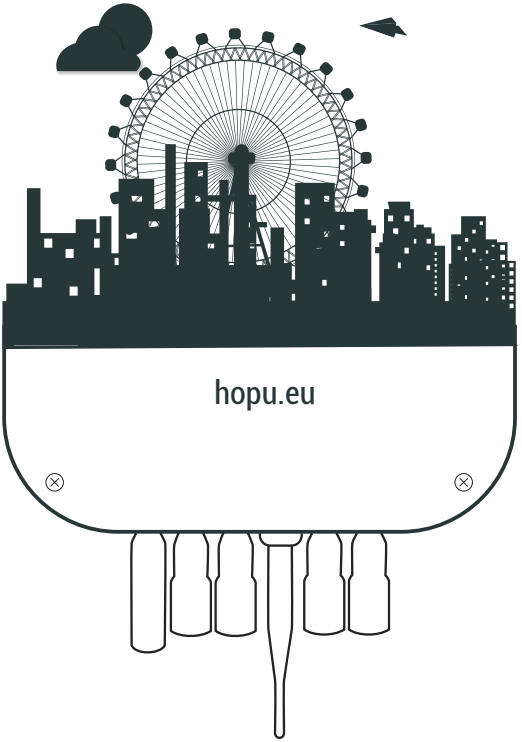
Smart Spot shows information about energy consumption (W), air quality (CO_2, NO_2, H_2S, O_3 and SO_2) and noise pollution (30dB-130db) in real time in strategic points, enabling the execution and plan actions to protect the environment.
This solution is administrable by our IoT device management platform Homard and compatible with every platform that uses OMA LWM2M communication protocol, oneM2M and FIWARE infrastructures.
The data collected by the Smart Spot could be sent to an external database and stored in FIWARE. A default data storage plan is offered with all our solutions based on MongoDB and Hadoop. All data can be exported as open data via CKAN.

DATA SHEET


Bluetooth
Low Energy (Beacon)
Wi-Fi
Co-Processor
Antenna
Bluetooth
Low Energy
Nano SIM card
(Cellular M2M)
Wi-Fi
Antenna
Digital sensors
(I2C)
Digital sensors
(I2C)
Gas connector
(extension)
NO_2, SO_2, CO, O_3
Antenna
GSM
Antenna
GPS
Cellular/M2M
Connectivity + GPS
Location System

MCU Core / Clock Speed	Tensilica Xtensa dual-core 32-bit LX6 / 240MHz
Internal Memory	• ROM: 448 KiB (For booting and core functions) • SRAM: 520 KiB (For data and instruction) • RTC Slow SRAM: 8 KiB (For co-processor accessing during deep-sleep mode.) • RTC Fast SRAM: 8 KiB (For data storage and main CPU during RTC Boot from the deep-sleep mode.)
External Flash	4MiB (Up to 4x16MiB QSPI Flash)
External SRAM	8MiB SRAM (with AES hardware encryption)
Hardware accelerated encryption (Security)	AES / SHA2 / Elliptical Curve Cryptography / RSA-4096
WiFi	Wi-Fi: 802.11 b/g/n/e/i (802.11n @ 2.4 GHz up to 150 Mbit/s)
GSM (SIMCom 868)	• Quad-band 850/900/1800/1900MHz • GPRS multi-slot class 12/10 • GPRS mobile station class B • Compliant to GSM phase 2/2+ - Class 4 (2 W @ 850/900MHz) - Class 1 (1 W @ 1800/1900MHz) • GPRS class 12: max. 85.6 kbps (downlink/uplink) • Coding schemes CS 1, 2, 3, 4 • Micro-SIM card slot (15mm x 12mm – 3FF)
On board sensors	• BME280: Temperature/Humidity/Pressure • MPU6050: Accelerometer/Gyroscope

GPS (SIMCom 868)	· Receiver type - 22 tracking /66 acquisition -channel - GPS L1 C/A code · Sensitivity - Tracking: -166 dBm - Cold starts: -148 dBm · Time-To-First-Fix - Cold starts: 29s (typ.) - Hot starts: <1s - Warm starts: 22s · Accuracy · Horizontal position: <2.5m CEP
Dimensions/size	105mm x 83mm x 0.8mm
Temperature Range	-20ºC to 80ºC operating temperature
Power Supply	5V (Micro-B USB Connector)
Antennas	· External Bluetooth Low Energy (Texas Instruments CC2541) Antenna · External WiFi 802.11 b/g/n/e/i (STA-AP) / Bluetooth Low Energy Antenna · External GSM/GPRS Antenna (Cellular) · GPS Antenna
Bluetooth Co-processors	· Main Chipset: - Bluetooth Classic BR/EDR - Bluetooth Low Energy 4.2 (BLE) · Extra integrated Texas Instruments CC2541 - Bluetooth Low Energy 4.0 (BLE)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