

High-end and low-cost sensing platforms

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Partner in charge: IAAC

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Summary

The report documents the current state of the hardware that forms the iSCAPE sensor platform. It is to be considered as a preliminary deliverable as many of the tools might evolve during the next months following the completion of the field sensor tests and the deployment of the whole platform on the different test sites. Before the end of the project, the sensor development status will be compiled into a final comprehensive report that will replace the existing one.

Environmental sensors play a critical role in the ISCAPE project with sensor solutions being developed for both the **Citizen Kit** and the **Living Lab Station**.

The sensor platform builds on the legacy of previous Smart Citizen Kit generations to develop a new set of tools especially aimed at providing meaningful data insights on a low budget. That means the report documents new components, developed specifically for the project, but frames them inside the Smart Citizen ecosystem.



Figure 1 Citizen Kit with Prototype Enclosure

The **Citizen Kit**, formerly known as the Low-Cost Sensor, is aimed at providing a low-cost environmental sensor solution that can be easily deployed by non-technical users. The design developed for the project is a complete reiteration of the Smart Citizen Kit, a piece of hardware for citizen sensing already tested in other projects. On this iteration, new sensors have been added,

and all the electronic design has been redone from the ground up to improve the data accuracy and reduce the manufacturing costs.

The design is built around two boards the Smart Citizen Data Board and the

Smart Citizen Urban Sensor Board. The first board contains the data acquisition, the power management, and the communication unit. The second contains a set of sensors aimed at the outdoor urban environment including: Air Temperature, Relative Humidity, Noise Level, Ambient Light and Barometric Pressure.

The **Living Lab Station**, formerly known as the High-End Sensors, is aimed at providing the Living Labs with a system for monitoring the performance of their interventions. The Station aims at providing a solution that can be used by the Living Labs not just from a scientific point of view but also as a tool to engage local communities on air pollution related issues.



Figure 2 Living Lab Station Prototype Deployed in Vantaa, FI

The station is designed with a modular principle where sensors can be easily added expanding the capabilities of the installation or replaced when they are damaged or the sensors lifetime is over.

The design builds on top of the Citizen Kit adding an extra set of more accurate sensors especially aimed at measuring air pollutants. The sensors include the Gas Sensor Board, featuring EC Carbon Monoxide, Dioxide Nitrogen and Ozone sensors and the PM Sensor Board, featuring a PM 2.5 / PM 10 sensor.

The sensor development status will be compiled into a final comprehensive report before the end of the project.



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