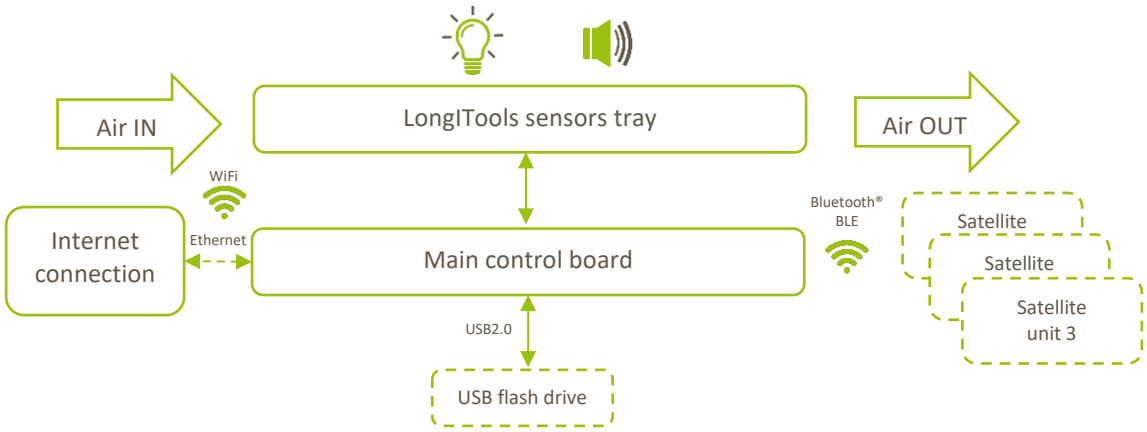
LongITools Environmental Hub

Recent and constant improvements in sensors technology have opened up the way for versatile and low power environmental data logging stations. The CyNexo **Environmental Hub** is a modular and configurable system for high quality data measurement of indoor air quality, ambient noise and light. This versatile unit can operate as a stand-alone data logger or can be configured to send selected data to external services, using encrypted communications through a Wi-Fi or Ethernet connection. The hub can connect to up to three satellite systems via Bluetooth® BLE thus extending the number of variables and environments the hub can measure using compatible indoor or outdoor units.

System block diagram



The LongITools hub as part of the LongITools Health Risk Assessment System focuses on a number of variables research has determined to be correlated to the cardiovascular wellbeing.

Variable	Unit	Range	Variable	Unit	Range
Temperature	°C	-40 +80	**NO_2**	ppm	0.05-10
Relative Humidity	%	0-100	**CO**	ppm	1-1000
NOx Index	-	1-500	**H_2**	ppm	1-1000
VOC Index	-	1-500	**CH_4**	ppm	> 1000
CO_2	ppm	400-10000	**C_2H_5OH (Ethanol)**	ppm	10-500
CO_2 HR (optional)	%	0-100	**H_2S (optional)**	ppm	0-50
CH_2O (Formaldehyde)	ppb	0-1000	**O_2 (optional)**	%	0-25
PM 1.0, 2.5, 4.0, 10	µg/m^3	0-1000	**Ambient pressure**	mbar	300-1200
Light (full spectrum)	lux	10-5000	**Noise (average)**	dB(A)	30-120
Light (IR spectrum)	µW/cm^2	5-500	**Accelerometer**	g	-2 +2
NH_3	ppm	1-500	**Gyroscope**	dps	-250 +250

Table 1: sensors list

This project has received funding from the European Union's Horizon 2020 research and innovation programme under G.A. No 874739.

Main features

Multiple exposure monitoring: the device is capable of monitoring a selected set of air quality parameters, light and noise for the LongITools project, part of the EHEN within Europe's Horizon 2020 framework.

Edge computing: data are stored and processed locally, with statistical or basic AI models. An API provides external communication with cloud or dedicated servers for further functionality.

Open-source GNU/Linux system: each device contains a fully programmable GNU/Linux embedded controller that can be adapted to different needs.

Ultra quiet: the system manages fan speed to ensure optimal airflow for data gathering while maintaining near-silent performance.

Power saving mode: a configurable sleep mode allows for discontinuous data gathering in order to reduce power consumption during battery powered operations.

Connectivity: the hub is equipped with a Dual-Band 802.11ac Wi-Fi and a 10/100Mbit RJ45 Ethernet port for wired connections.

USB host interface: the device includes a service port for system software recovery and can be adapted for additional functionalities.

Design: small, portable and robust device packaged in an appealing aluminium housing.

SPECIFICATIONS	
OS support	*GNU/Linux embedded*
Communication	*Wi-Fi, wired Ethernet 10/100, Bluetooth® 5.0 BR/EDR and BLE*
Status	*Configurable RGB LED and buzzer*
Power	*5V 15W max (EN60601-1 compliant medical grade power supply included)*
Dimensions (max)	*218 x 109 x 58 mm*
Weight	*720 g (depending on sensor configurations)*

RELATED PRODUCTS
Environmental Satellite

OPTIONS / ADD-ONS

- *O_2 sensor*
- *CO_2 high saturation sensor*
- *Customised sensors package / tray*
- *Power cable with USB plug for battery operation*
- *Customized software*

Figure 1: Mechanical dimensions (mm)

CyNexo, as company, promotes the UN's Sustainable Development Goals (SDGs).
This product has been designed to meet:

- Recyclability: aluminium case and 3D printed parts, with minimal waste
- Power consumption: 3W average with optional discontinuous mode

longITools HEALTH & ENVIRONMENT DYNAMICS

MEMBER OF THE European Human Exposome NETWORK

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