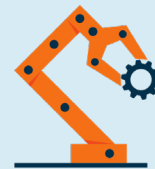


Environmental Conditions Monitoring Sensors Lab



NAIRI-STEM

science - technology - engineering - math



Overview

The training platform is intended to familiarize with the basics of sensors for measuring and monitoring environmental parameters as well as conducting educational practical experiments to determine some important parameters.

The training workbench consists of 5 modules, each of them measures specific set of environmental parameters. Every module has its own identification number, so students can register it in a web cloud environment. Measurement results are sent to the cloud through Wi-Fi connection, allowing students accumulate practical skills on the technology of internet of things (IoT).

The software with an attractive and user friendly interface allows students to view measurements results coming from cloud in real time mode, and also track parameter changes on graphical and numerical indicators. All of the measurement results can be saved in a file for further processing.

The interactive help section helps students to make connections, as well as take measurements and process the results.

The modules work on rechargeable batteries charged with standard USB-Micro charging adaptor. Charge level can be monitored with an indicator light located on the case of modules, or through the web cloud environment.

The modules are realized on the base of system-on-a-chip (SoC) of the ESP32 series with integrated Wi-Fi and Bluetooth modules, providing low power consumption and high Performance.

Measured parameters

- Temperature
- Humidity
- Barometric pressure
- Total volatile organic compounds (TVOC)
- Carbon dioxide equivalent (eCO₂)
- Particulate matter (PM)
- Illuminance
- Motion intensity
- Noise level
- Vibration
- Magnetic field
- Radiation level

Technical specifications

| Module | Measured parameters | Measurement range |
|----------------------|---|--|
| Climatic conditions | Temperature | 0-65 °C |
| | Humidity | 10-95 % |
| | Barometric pressure | 30-110 kPa |
| Air quality | Total volatile organic compounds (TVOC) | 0-29206 ppb |
| | Carbon dioxide equivalent (eCO ₂) | 400-32768 ppm |
| | Particulate matter (PM1, PM2.5, PM10) | 10 µg/m ³ -1000 µg/m ³ |
| Light, motion, noise | Illuminance | 5-150000 lx |
| | Motion intensity | 0-100 motion/minute |
| | Noise level | 30-110 dB |
| Physical impacts | Vibration | ±10 g |
| | Magnetic field | ±300 G |
| Radiation | Radiation level | 10-1000 µSv/h |