



Indoor air quality sensor

RLW-THC

RW-THC

RLW-TH

RW-THC

PRODUCT DESCRIPTION

Unipi indoor air quality sensors are designed for measuring indoor air quality in office buildings, schools, factory halls and other similar objects. Sensors can be used to measure temperature, relative air humidity, barometric pressure, volatile organic compound concentration and ambient light intensity. Selected variants are also equipped with a carbon dioxide concentration sensor. Broad connectivity is provided by the support of communication via RS485 or Wi-Fi, selected models also feature an interface for the LoRaWAN wireless technology.

Basic characteristics

- measuring of up to six parameters (temperature, humidity, CO₂ concentration, VOC concentration, barometric pressure and ambient light intensity),
- compact size, easy on-wall installation,
- simple connection, start-up and configuration via Wi-Fi,
- broad connectivity (RS485, Wi-Fi, LoRaWAN),
- support of various communication protocols (Modbus TCP, Modbus RTU, MQTT, REST),
- web interface for measured data visualisation and device configuration,
- data are relayed to monitoring and regulation systems,
- a multi-coloured LED for indication of air quality and device status.

AVAILABLE MODELS OVERVIEW

Model	Temp.	Humidity	CO ₂ concentration	VOC	Bar. pressure	Ambient light	LoRaWAN	Wi-Fi host/AP	RS485 Modbus RTU
RW-TH	✓	✓	×	✓	✓	✓	×	✓	✓
RLW-TH	✓	✓	×	✓	✓	✓	✓	✓	✓
RW-THC	✓	✓	✓	✓	✓	✓	×	✓	✓
RLW-THC	✓	✓	✓	✓	✓	✓	✓	✓	✓

HARDWARE DESCRIPTION

The sensor's circuit board is mounted in a compact design box (IP20 protection) intended for indoor on-wall installation. The box is designed for easy access to the sensor board itself. The sensor features a terminal block for connection of power supply and RS485 bus, and also a MicroUSB power supply connector.

The sensor can be powered in two ways:

1. **24V DC/0,5A power supply connected to the sensor's terminal block**
2. **5V voltage via a USB power cable with long MicroUSB connector**

Note: Regular USB cables with short MicroUSB connector cannot be used to power Unipi indoor air quality sensors.

The sensor is also equipped with a multi-coloured LED. For models featuring a CO₂ sensor, the LED indicates carbon dioxide concentration (green = low concentration, red = high concentration). For variants lacking the CO₂ functionality, the LED then indicates air quality index roughly equivalent to CO₂ concentration. In all models, the LED has a secondary function of indicating wireless communication and device status.



USER INTERFACE

Sensors are provided with **web user interface** for displaying measured values and device configuration including remote firmware updates. A particularly useful feature is the option to store all measured values for up to 7 days. Values can be displayed directly in the interface or exported as an Excel file (CSV).

COMMUNICATION INTERFACE

The primary communication interface of indoor air quality sensors is a **wireless Wi-Fi connection**. For initial configuration, the device acts as a Wi-Fi access point. In regular usage, the sensor then switches to Wi-Fi client mode. Wi-Fi interface supports communication via **Modbus TCP, MQTT** (including encoded connection support) and **REST API**.

The second interface is the **RS485** standard serial bus for communication via **Modbus RTU**. The sensor functions as a Modbus slave, serial line and TCP parameters can be configured as needed.

Selected variants also feature wireless communication using the **LoRaWAN** technology, combining long signal range (up to several kilometres), low energy consumption and an option of bidirectional communication. Users can utilize existing networks of LoRaWAN connectivity providers or create private networks.

Note: In order to use LoRaWAN you need to register the sensor at the public operator or in a database of a private LoRaWAN gateway. Unipi technology currently does not offer LoRaWAN gateways.

SOFTWARE OPTIONS

The indoor air quality sensors are supported in **the Mervis system**- the official software solution for Unipi programmable logic controllers. As sensors function as Modbus devices, all you need to do to connect them into Mervis IDE development environment is to add a corresponding communication channel and detect the sensor on it. More information about Mervis is available [on this link](#).

Aside from Mervis, the sensors can be connected to other software solutions (ie. third-party software such as Node-RED or custom solutions) using any of the available communication protocols (see above).

POSSIBLE APPLICATIONS

Aside from air quality monitoring in households, commercial objects or school buildings the sensors can be also useful in monitoring and regulation projects. Here, you can use measured values for control and regulation of air conditioning, heating, heat recovery units and other similar devices.

