GRAVITON
MultiSensor

MULTISENSOR AIR QUALITY AND PARAMETERS RECORDERS

The GRAVITON multisensor recorders are designed for air quality monitoring within indoors areas of different purpose. The recorders are suitable for measuring Volatile Organic Compounds (VOC) concentration, Suspended Particulate Matter (SPM), Carbon Dioxide, as well as Temperature, Relative Humidity and Atmospheric Pressure.
Data exchange and power supply are carried out via the 4-wire address line connecting simultaneously up to 30 devices located within 1 km distance away of the controller.

Internet of Things

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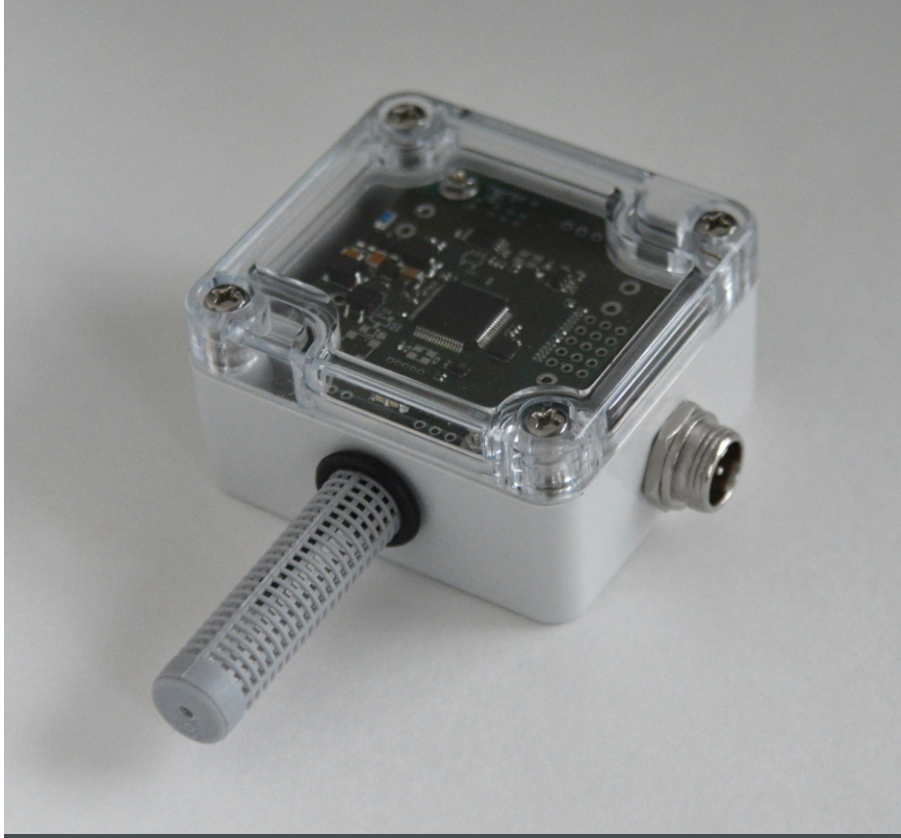


- Temperature
- Pressure, Humidity
- Particulate matter
- CO2 / VOC

SUPPORT EQUIPMENT

Multisensor recorders work with a specialized controller forming the 4-wire address line for data exchange and power supply. The controller modifies the received data into the commonly used Modbus TCP protocol.

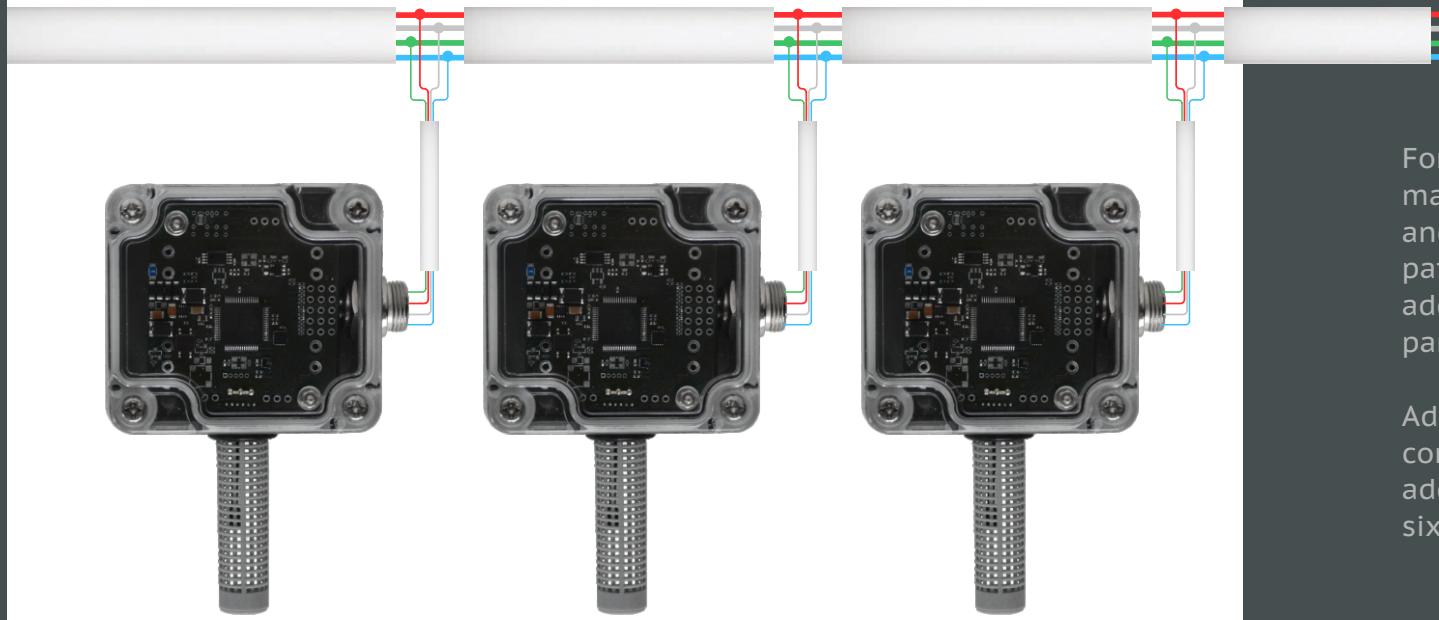
Modbus

The controller is housed in a hermetically-sealed plastic body containing a power supply and a switching panel with quick-release terminals. The internal components can be easily access via the special shutter.

CONNECTION

The controller connects to the upper-level equipment via the Ethernet port. With the Modbus TCP communication protocol the controller is able to transfer the streaming data from the connected recorders, to set the threshold values for each measured parameter and to operate localy the event flags occuring when the measured parameters overrun the set values

Via the Modbus TCP protocol the upper-level equipment can set down the threshold values, receive event flags and streaming data from all the sensors of the multisensor recorders connected to the controller. All these operations can be performed in the calling sequence set by the user

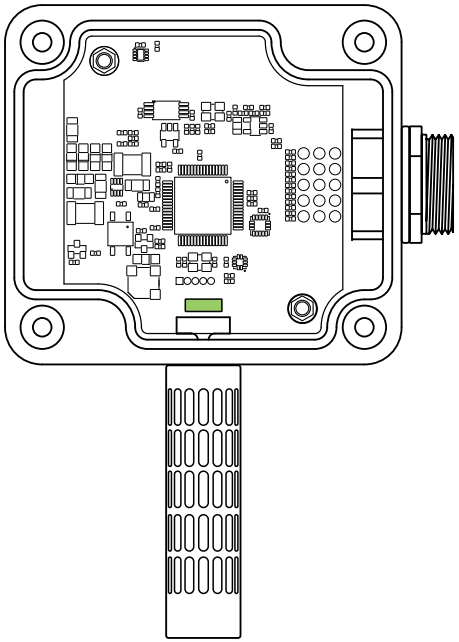


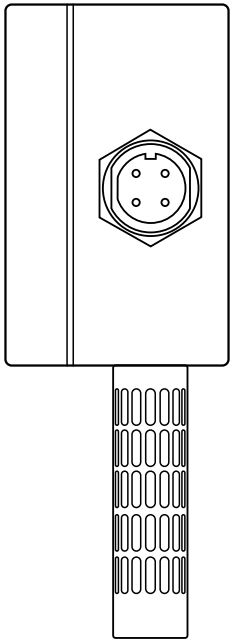
For the ease of installation and maintenance, the wires of the address line and the supply voltage are connected to the patch panel terminal blocks. Next an addressable controller is installed into the panel

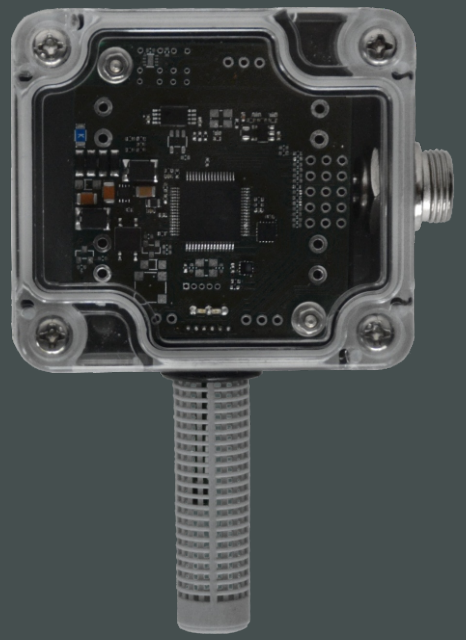
Additional operational units can be connected to the patch panel via the the additional terminals providing switching to six controller relays

TECHNICAL CHARACTERISTICS

Thermal Mode 1 / 2	-10 + 50 °C / -45 +50
Power supply / Power demand	8 - 15 V / 0.07 W
Communication protocol	Modbus TCP
Overall dimension / Weight	72 x 120 x 36 mm \ 750 gr
Temperature channel (max differential)	-55 + 125°C (± 0,5°C)
Relative humidity channel	1-100 % (± 2%)
Pressure channel	600 - 1 200 hPa (± 2.6 hPa)
PM 2,5 / PM 10 channel	0 - 1000 мкг/м³ (± 15% range)
CO2 channel	400 - 5000 ppm (± 10%)
VOC channel	100 - 20 000 ppb (± 25%)
Operating time	20 000 hours







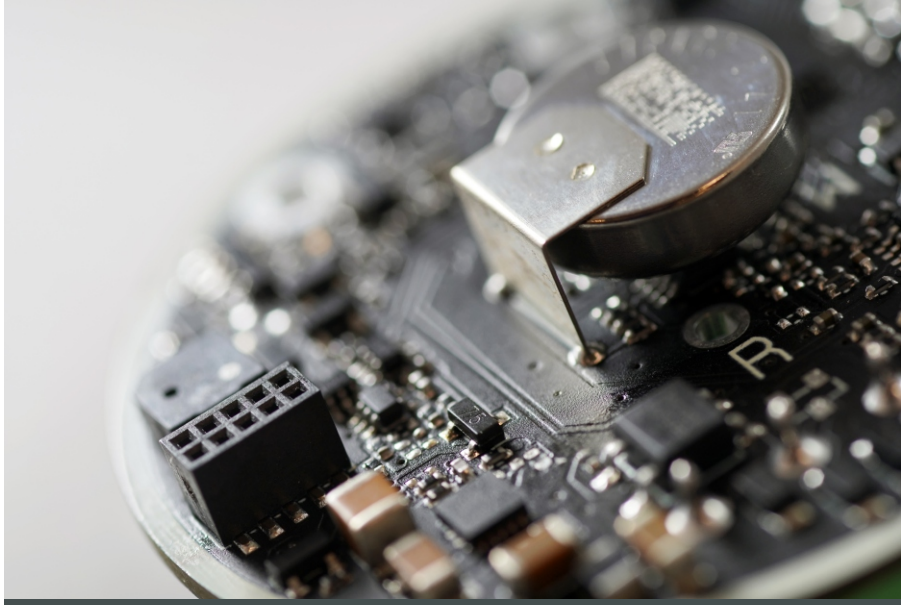
The multisensor recorder is a plastic body with a connector, an air intake probe and a transparent top cover allowing to determine the particulate level in the measuring chamber. The recorder body also includes the forced air intake system, measuring modules, LED indicator, power supply and a microcontroller

°C H P CO2 VOC PM

HARDWARE COMPONENTS

To ensure the high measurement accuracy and trouble-free operation of multisensor recorders and controller for the entire service life, we use only the high-quality components from leading world manufacturers as following:

- DC-DC ST1S14PHR, MAX15062AATA **MAXIM, ST Microelectronics**
- microcontrollers pic16F1829, pic16F1947 **Microchip Technology**
- temperature and humidity sensors SHT-30 **SENSIRION**
- operational amplifiers AD8515ARTZ **Analog Devices**
- atmospheric pressure sensor LPS22HBTR **ST Microelectronics**
- solid particle meter HPMA115S0, HPMA115C0-004 **Honeywell**
- luminosity sensor APDS-9005-020 **Broadcom Limited**
- VOC sensor TGS 8100 **Figaro**
- CO2 sensor CDM7160-C00 **Figaro**
- reference voltage sources ADR291GRZ **Analog Devices**
- SRAM memory 24LC512 **Microchip Technology**
- real time clock MCP79410-I/SN **Microchip Technology**
- accelerometer LIS3DH **ST Microelectronics**
- NFC/RFID CR95HF-VMD5T **ST Microelectronics**
- transistors and transistor assemblies **Infineon Technologies**
- Stand-Alone Ethernet-Control ENC28J60-I/SO **Microchip Technology**



Circuit solutions and PWB design are based on the highest standards for the industrial equipment, ensuring the parameters stability and performance in the most difficult operating conditions

STANDART CONFIGURATION COST

In the standart configuration, the Graviton Multisensor recorder is manufactured in a compact form-factor of 72 x 120 x 36 mm and includes a set of sensors sufficient to solve a wide range of tasks related to indoor air parameters and composition monitoring.

The Graviton Multisensor standart configuration cost:

up to 100 pcs 360 USD
100-1 000 pcs 310 USD
1 000-10 000 pcs 220 USD
more than 10 000 pcs 160 USD

The Graviton Multisensor recorder is an addressable device designed for operation with a special controller supplying powers to the recorder, acting as a Modbus TCP gateway with an ETHERNET port and also providing connection to the upper-level systems. Up to 30 Graviton Multisensor recorders with different sets of basic or additional sensors can be connected to one controller.

The cost of the Graviton controller with a patch panel and a power supply in the hermetically-sealed IP 64 case:

up to 100 pcs 480 USD
100-1 000 pcs 420 USD

ADDITIONAL OPTIONS

The Graviton Multisensor is an extandable platform to which can be connected up to 8 additional expander boards with sensors of various types .

A GRIO connector is provided for additional sensors commuting to the switch board. Up to 4 operation units can be linked up to the GRIO connector.

When connecting pinch boards and operation units, the overall dimensions and form-factor of the Graviton Multisensor might be changed.

The additional sensors connected to the Graviton Multisensor may include as following:

-luminosity
-tilt
-low-frequency vibration (10-350 Hz)
-noise level
-electrochemical gas sensors

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IoT SOLUTIONS FOR AIR QUALITY AND PARAMETERS MONITORING

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