1. Intended use

The IMS20-485 is designed for the continuous measurement and conversion of relative humidity and temperature values of non-corrosive gaseous media into a digital signal via the Modbus RTU protocol over an RS485 interface.

The device is intended for continuous environmental monitoring in workspaces, warehouses, storage facilities, offices, and residential premises. The device is suitable for applications across a wide range of industries, including the food and medical sectors. It is also utilized in HVAC (Heating, Ventilation, and Air Conditioning) systems, meteorology, public utilities, and research and development (R&D) facilities.

The device is designed for operation in closed, explosion-safe premises free of corrosive vapors and gases.

For the device configuration and data communication via USB connection, please use the akYtec ToolPro software.

IMS20-485 can be ordered in various models depending on specifications required (see the ordering key below):

IMS20-X.XXX.X.RHT

- **Display:**
  - **B** – Without display
  - **D** – Integrated display
- **Output signal:**
  - **485** – RS485 digital signal
- **Housing color:**
  - **W** – White
  - **B** – Black
  - – Custom (available on request)

2. Recycling and disposal



The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU and may not be disposed of as domestic garbage.

- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

3. Design and features

The technique of measuring humidity is based on the dependence of the dielectric permittivity of a polar polymer sorbent (used as a moisture-sensitive layer) on the amount of absorbed moisture.

When measuring temperature, the technique is based on the dependence of the resistance of the sensing element on the measured ambient temperature.

The design of the device is shown in *Figure 1*.

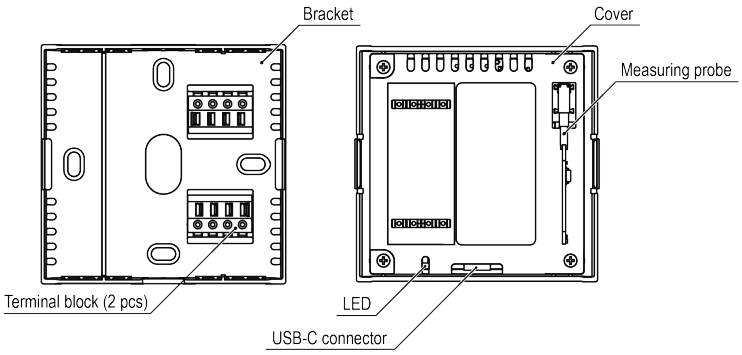


Fig. 1 – Design

There is a display on the cover of IMS20-D (see *Figure 2*) presenting:

1 – measured relative humidity

2 – measured temperature

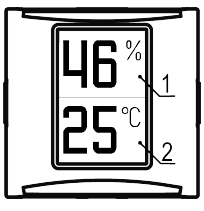


Fig. 2 – Display

NOTE
You can choose a display font from the list available in the akYtec ToolPro software. Display description is presented in the User Guide.

4. Specifications

Table 1 Specifications

Parameter	Value
Power supply	
Power supply voltage	24 (10...30) V DC
Maximum power consumption	1 W
Measurement channels	
Conversion function	Linear
Relative humidity measurement range	5...95 %
Relative humidity measurement accuracy	±3.0 %
Temperature measurement range	0…+50 °C
Temperature measurement accuracy	±0.5 %
Warm-up time, max.	30 s
RS485 interface	
Communication protocol	Modbus RTU
Baud rate	1200…115 200 bit/s
Line length, max.	1200 m
USB-Device interface	
Number of ports	1
USB standard	USB 2.0
Communication protocol	Modbus RTU
Cable length, max.	3 m
Mechanical	
Dimensions	(82 × 80 × 22.5) ±2 mm
IP code	IP20
Flammability rating	V2
Weight, max.	0.1 kg
Display	
Display type (matrix)	EPD
Backlight	no
Number of display colors	2
Size	2.7″
Work area	38.2 × 57.3 mm
Resolution	264 × 176 px
Reliability	
Mean time between failures	≥ 50 000 h
Average service life	≥ 7 years
Environmental conditions	
Ambient air temperature	0...+50 °C
Relative humidity	5...95 % (non-condensing)
Atmospheric pressure	84.0...106.7 kPa

5. Installation

CAUTION
Any connections to the device and maintenance work must be performed only when the power is switched off and there is no voltage on the communication lines.

Regarding protection against electric shock, the device corresponds to protection class III according to EN 61140:2016.

During connection, operation, and maintenance of the device, the requirements of EN 50191:2010 must be observed.

Installation, connection, and inspection of the technical condition of the device during operation must be carried out by qualified personnel in accordance with this manual.

Avoid moisture ingress into the device.

The device must not be used in corrosive environments containing acids, alkalis, oils, etc.

The overall and mounting dimensions of the device are shown in *Fig. 3*.

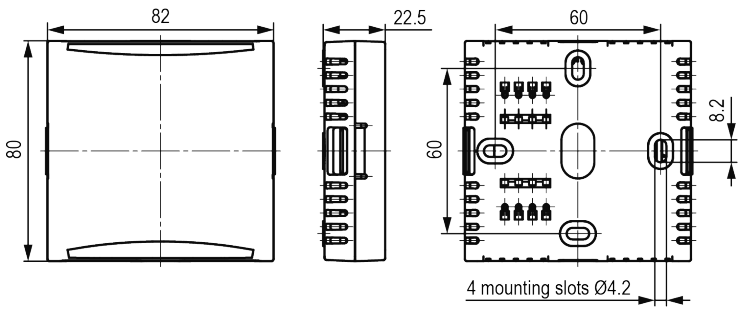


Fig. 3 – Overall and mounting dimensions

The device should be installed and fastened in a prepared site using the fastening elements included into the scope of delivery (see *Figures 4 and 5*).

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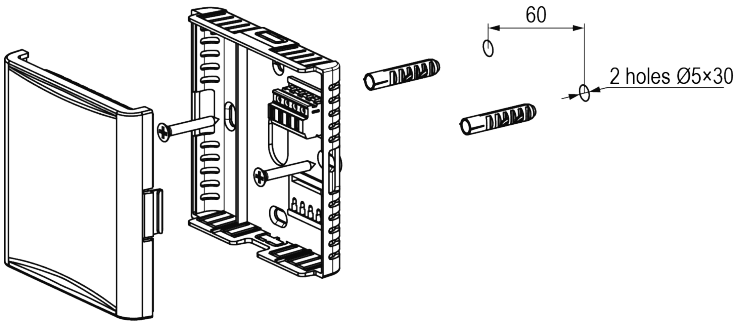


Fig. 4 – Wall mounting

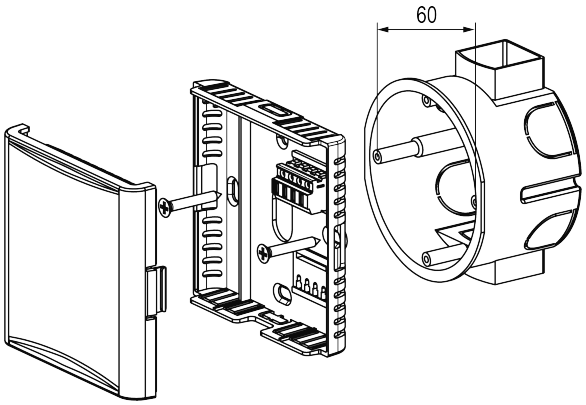


Fig. 5 – Mounting in a socket box

6. Connection

External connections to the device should be made using a round cable with an outer diameter of 4 to 6 mm and a wire cross-section of 0.2 to 0.75 mm². The total length of signal lines must not exceed 1200 m.

Prepare the cable before connection according to the steps below (see *Figure 6*):

1. Remove 35 mm of cable jacket insulation.
2. Strip off 8-10 mm of insulation of the cable wires and clean the wire conductors.
3. Twist and tin the wire conductors or terminate them using cable ferrules.

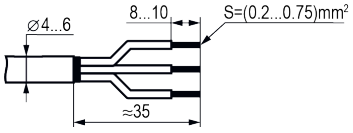


Fig. 6 – Cable preparation

NOTE
Cable is not included into the scope of delivery.

Connection steps:

1. Simultaneously press the latches on the device cover with the thumb and middle finger of one hand and pull the cover (see *Figure 7* (1)) or insert a flat screwdriver home into the groove of the bracket, along the bevel of the latch, and remove the cover (see *Figure 7* (2)) .
2. Pass the prepared cable through the central hole (for concealed wiring) or through the top/bottom hole (for open wiring), having previously broken out the corresponding knockout in the bracket.
3. Connect the conductors to the screwless terminal block according to the diagram (*Figure 8*).
4. Install the device cover back into place until it clicks. There should be no gaps between the bracket and the cover.

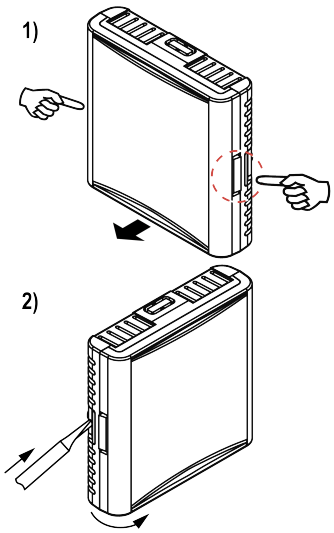


Fig. 7 – Removing the cover

Figure 8 illustrates the bus connection of several devices.

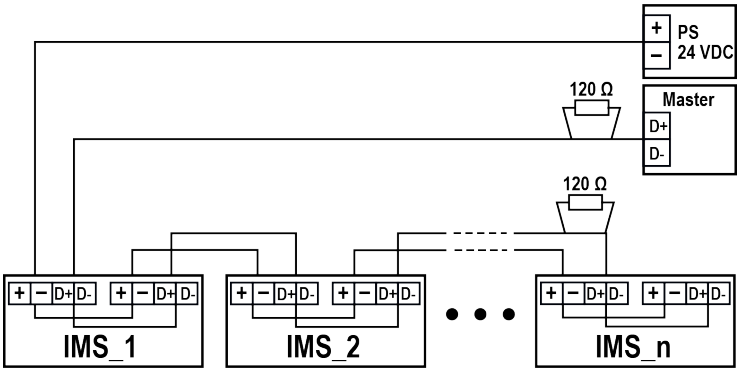


Fig. 8 – Bus topology diagram

7. LED indication

LED indications depending on the operating mode are presented in the table below.

Table 2 LED indications

LED	Device status
Solid green	Device is operating, connection to the measuring probe is established, no communication via RS485
Flashing green (sampling frequency)	Device is operating, connection to the measuring probe is established, communication via RS485 is in progress
Flashing green at 2 Hz	Relative humidity measurement is out of range
Flashing green at 1 Hz	Temperature measurement is out of range
Flashing red (sampling frequency)	Failure when receiving packet via RS485
Solid red	Device error

8. Faults

Table 3 Possible faults and remedies

Fault	Possible cause	Remedy
LED is off	No power supply	Check the power supply circuit, measure the voltage at the "+" and "-" terminals
	Indication disabled	Enable indication via akYtec ToolPro
LED is red	Alarm condition (see the "Device status" parameter under address 0x1000 in akYtec ToolPro)	Open the device and make sure the probe is correctly installed in the connector

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