M-SENS: Ambient conditions measuring module

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	Technical data	Dimensions	Environment
	Supply voltage 11 — 16V DC	**Width** 60mm	**Temperature** -40 — 50°C
	Current consumption 6mA	**Height** 60mm	**Humidity** ≤95%RH, non-condensing
	Communication interface IR	**Depth** 10mm	

The image above is for illustration purpose only. The actual module may vary from the one presented here.

General features

Module M-SENS is a component of the Ampio system. Required voltage to power the module is 11 — 16V DC. The module is controlled via CAN bus.

The module allows for the measurement of ambient conditions in closed spaces. The device is also equipped with an IR receiver, which makes it possible to receive commands from remote controls based on the NEC protocol.

Measurement of ambient conditions

The module facilitates measuring a number of parameters for the environmental conditions present in closed spaces. Measurement results are available for all devices operating within the building automation bus. They may turn out to be particularly useful for purposes related to the regulation of temperature or ventilation of rooms, or for the presentation of measurement results on touch panels and in the Ampio mobile application.

The values measured by the device are:

- temperature (°C),
- air humidity (%),
- atmospheric pressure (hPa),
- light intensity (lux),
- CO_2 equivalent,
- sound pressure.

> The CO_2 equivalent is calculated using results from other sensors and changes in the environment may result in it being recalibrated. Autocalibration is carried out on an ongoing basis and can take up to 2 weeks.

Indoor air quality index

In addition to the measurement of the previously mentioned values, the device is equipped with a volatile organic compounds (VOCs) sensor. Such compounds include respiratory gases, such as, carbon dioxide. The results of the measurements are expressed in the form of a numerical index of indoor air quality (IAQ) ranging from 0 to 500. The IAQ value interpretation guide is presented in the table below:

IAQ	Air quality
< 50	Excellent
51 − 100	Good
101 − 150	Lightly polluted
151 − 200	Moderately polluted
201 − 250	Heavily polluted
251 − 350	Severely polluted
> 351	Extremely polluted

The result of the air quality measurement can be used to control the recuperation and ventilation systems.

IR transmitter

The module allows one to save a pool of IR commands, which can be later recreated by it in order to trigger an action on external devices. It is possible to record commands from IR transmitters with a carrier wave of 38kHz using any protocol. The number of commands that can be memorised depends on their length and complexity.

> The IR receiver in the M-SENS module operates at a distance of no more than 50 cm. For more extensive IR integration, please use the M-CON-IR module.

Typical application

- Heating control;
- control of ventilation and recuperation systems;
- presentation of measurement results on touch panels and in a mobile application;
- using IR remotes to control any devices connected to the Ampio system, e.g. lighting, blinds, etc.

Installation

The device is mounted directly on a wall or any other flat surface. **The junction box is not used for the installation.** The module consists of two parts - the body and the casing. At the back of the body there are two holes with a diameter of 4mm for mounting the device, and one with a diameter of 10.5mm, which serves as a cable grommet.

After mounting the body onto the wall, one may install its casing. The casing assembly is based on a magnetic mechanism.

Programming

The module is programmed with the use of the Ampio Designer software. It allows you to modify the parameters of the module and define its behaviour in response to signals directly available to the module as well as general information coming from all devices present in the home automation bus.

> For the M-SENS module to work properly, at least three modules must be available on the bus: M-SENS and two modules other than those from the M-SENS family.

Module dimensions

Dimensions expressed in millimeters.
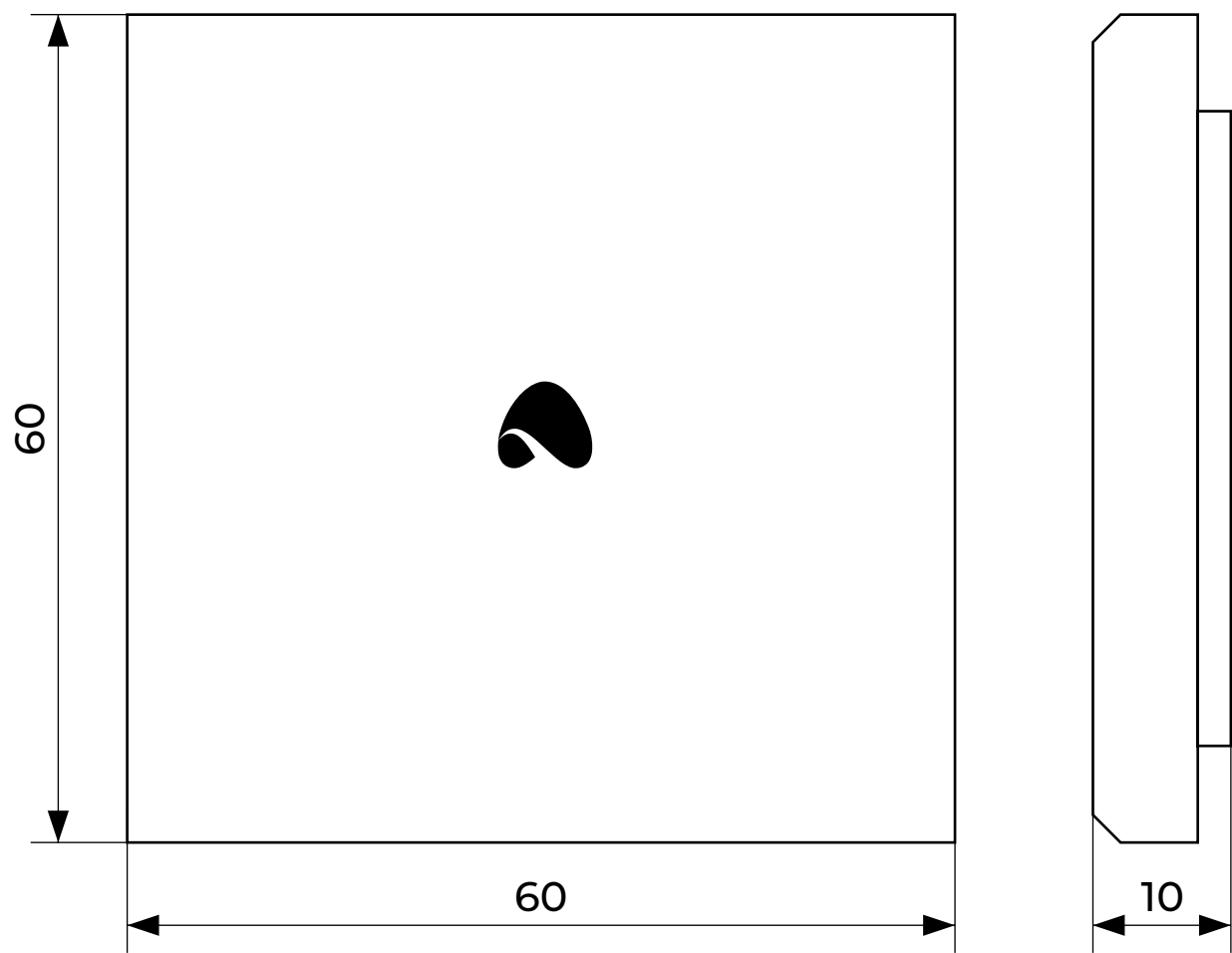
Connection diagram

In order to show the CAN bus connector, the figure presents only the body of the module without its casing.

CAN H
CAN L
+12V
GND