

M-METEO: Weather station

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Technical data

Supply voltage
11 – 16V DC

Current consumption
10mA*

1-Wire
one sensor

Number of ground detecting inputs
1

Dimensions

Width
269mm

Height
164mm

Depth
131mm

Environment

Temperature
-40 – 50°C

Humidity
≤95%RH, non-condensing

Ingress protection class
IP55

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

* Current consumption does not include the optional rain sensor powered by the module.

General features

Module M-METEO is a component of the Ampio system. Required voltage to power the module is 11 – 16V DC. It is controlled via the RS-485 interface using the Modbus RTU protocol.

Each M-METEO weather station comes with an M-CON-485 module, which enables the device to work with the CAN bus of Ampio building automation system. Thanks to the use of the Modbus RTU interface, the M-METEO weather station module can be integrated with the majority of BMS systems available on the market.

The module enables the measurement of a number of weather parameters:

- atmospheric pressure (hPa),
- wind speed (km/h),
- temperature (°C),
- light intensity (lux),
- air humidity (%).

The module has a 1-Wire interface that enables the connection of an additional temperature sensor and one ground-detecting input for connecting a rain sensor.

Additional temperature sensor

If the weather station is installed in a place exposed to sunlight, the temperature measurement of the built-in sensor will be distorted due to the heat generated by sun exposure.

The module is equipped with a 1-Wire interface connector that allows one to connect a Dallas DS18B20 digital temperature sensor. The sensor can be installed away from the weather station, in a shaded place, which will facilitate obtaining reliable temperature measurements.

Rain sensor input

The module has an input that goes into an active state when it is shorted to ground. It is designed to integrate an external rain sensor with a potential-free contact output, a potential-free relay output, or an optocoupler output with a collector voltage greater than 12V.

A dedicated power supply output can be used to power the sensor, providing a supply voltage identical to the module's supply voltage. This output has a short-circuit protection enabling a maximum current consumption of 100mA.

The rain sensor is not a part of the M-METEO set.

Typical application

- Presentation of measurement results on touch panels and in the mobile application;
- control of roller shutters and blinds in response to changing weather conditions.

Installation

The module should be mounted on a mast or any other external surface. There are two mounting holes for M7 screws at the base of the module's casing. The spacing of the holes is 80mm.

Programming

The M-METEO weather station can be used as part of the Ampio building automation system using the supplied M-CON-485 module, or it can be integrated with a BMS system of other manufacturers. Depending on the intended usage scenario, programming can be performed in one of the two ways described below.

Integration via M-CON-485

If the weather station is used as part of the Ampio building automation system, it is possible to use a dedicated version of the M-METEO module's software intended for integration with the device. The M-CON-485 module supplied with the weather station is pre-prepared to work in this version of the software and has the appropriate firmware version preloaded.

If the dedicated software does not provide the flexibility necessary to obtain the expected functionality, it is also possible to use the M-CON-485 module's software intended for the integration with devices supporting the Modbus RTU protocol, and to carry out integration based on the table of registers of the M-METEO weather station.

More information on the use and method of programming the M-CON-485 module can be found in its documentation.

Modbus integration

The M-METEO weather station module communicates using the standard Modbus RTU protocol via the RS-485 interface. In order to integrate through the M-CON-485 module operating in the general-purpose Modbus integrator mode, or in the case of integration with BMS systems of other manufacturers, it is necessary to know the structure of the device's registers and how to access them.

The registers in the table below are read-only registers. The readout is carried out by the input register readout function (code 4).

Address	Registry name	Data type	Description
1000	SOFT_VER	<i>unsigned int</i>	Module firmware version.
1001	STATUS	<i>unsigned int</i>	Device status information.
1002	RAIN	<i>unsigned int</i>	Rain sensor input status.
1003	WIND	<i>unsigned int</i>	Fixed-point value of wind speed with a step of 0.1km/h.

Address	Registry name	Data type	Description
1004	PRESSURE	<i>unsigned int</i>	Atmospheric pressure in hPa.
1005	TEMPERATURE	<i>unsigned int</i>	Fixed-point temperature value with a step of 0.1°C increased by 1000°C.
1006	HUMIDITY	<i>unsigned int</i>	Air humidity in %.
1007	BRIGHTNESS	<i>unsigned int</i>	Light intensity in lux.
1008	BRIGHTNESS_DIV_10	<i>unsigned int</i>	Fixed-point value of light intensity with a step of 10lux steps.
1009	TEMPERATURE_DALLAS	<i>unsigned int</i>	Fixed-point temperature value of additional sensor with a step of 0.1°C increased by 1000°C.

The device's communication interface parameters are as follows:

- Device ID: 2,
- Transmission speed: 9600,
- Number of data bits: 8,
- Stop bit: 1,
- No parity check.

The parameters of the communication interface can be read and modified through the registers shown in the table below. The readout of the values from the registers below is performed by the register readout function (code 3), while the write function is performed by the single register write function (code 6).

Address	Registry name	Data type	Description
2001	DEVICE_NUMBER	<i>unsigned int</i>	Device ID.
2002	RS_SPEED	<i>unsigned int</i>	Transmission speed.
2003	RS_DATA_BITS	<i>unsigned int</i>	Number of data bits.
2004	RS_STOP_BITS	<i>unsigned int</i>	Stop bit configuration.
2005	RS_PARITY	<i>unsigned int</i>	Parity bit configuration.
2006	RS_CHANGE	<i>unsigned int</i>	Configuration commit.

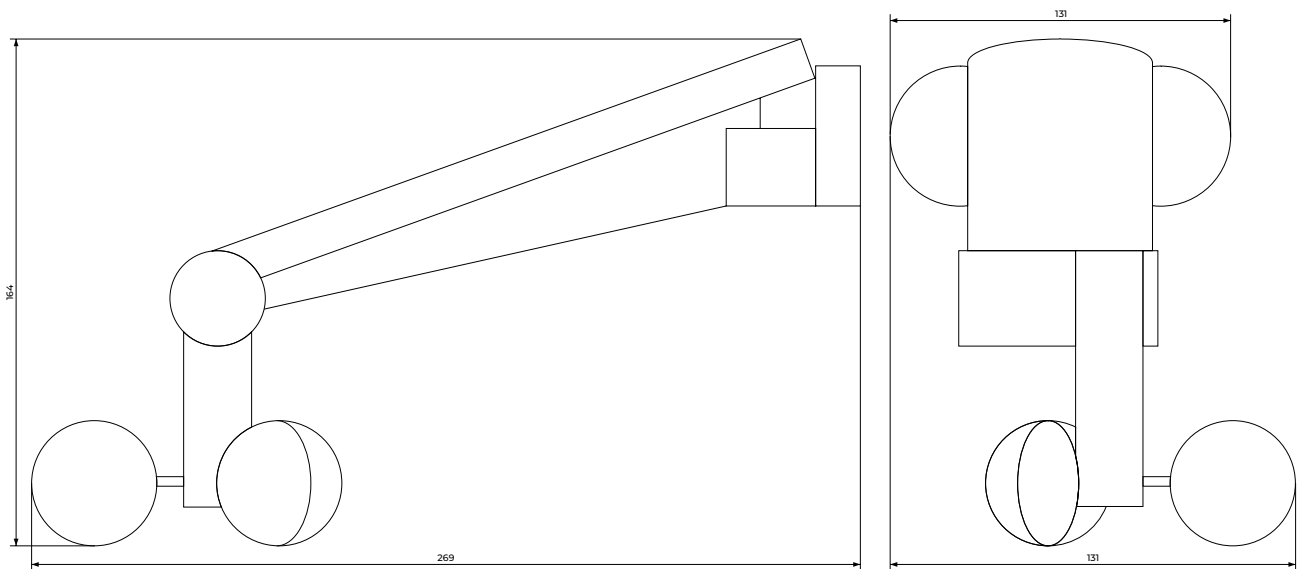
RS-485 interface configuring registers take the following values:

- RS_SPEED: 1 - 2400; 2 - 4800; 3 - 9600; 4 - 19200; 5 - 38400.
- RS_DATA_BITS: 1 - 7 bits; 2 - 8 bits; 3 - 9 bits.
- RS_STOP_BITS: 1 - 1 bit; 2 - 1,5 bit; 3 - 2 bits.
- RS_PARITY: 1 - none; 2 - even; 3 - odd.

Once changes are introduced in registers whose name is preceded by the prefix RS, they should be confirmed by entering the value 1 into the RS_CHANGE register.

Module dimensions

Dimensions expressed in millimeters.



Connection diagram

The connection diagram shows only the M-METEO module connector, not the whole module. The connector is located under the weather station's top cover.

In case of communication errors of the RS-485 interface, it is recommended to make a connection between the ground of the weather station and the SC terminal of the integration module. For third party integration modules, the reference line input can also be labeled *G* or *reference*.

