

NEW

## Automation module MA-02



### Product description

MA-02 module is designed to control signal towers of the WS-Ad series via a serial interface. The physical layer of the interface is RS-485, a MODBUS RTU transmission protocol. There are two possible modes of the module operation: full-duplex and half-duplex. MA-02 was developed as a universal output device, it permits control over eleven outputs of the OC type (open collector). Thanks to using this module, the user can easily control the operation of the WS-Ad series signal tower directly from the PLC controller level or a PC computer. The RS-485 interface is galvanically isolated from the rest of the device.

### Technical data

Power supply	20-30V DC
Current consumption at 24V DC	Inactive outputs < 25mA Active outputs < 60mA
Baud rate	2,4kbps – 115,2kbps
Address range	0-31
Transmission protocol	Modbus RTU
Outputs number	11
Outputs type	Transistor OC (separated from control circuits)
Ingress protection	IP20
Working temperature range	-25°C ÷ 55°C
Max. cross-section	2,5mm <sup>2</sup>
Weight	~125g
Dimensions	45x75x45mm

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**NEW**



**Construction**

The module casing is made of ABS plastic, the casing shape design allows for direct mounting of the module on a DIN rail. MA-02 module is equipped with two terminal blocks, consisting of eight tracks each. Connection terminals of the module are located on the front panel of the casing, which facilitates the device wiring. Communication with the module takes place in accordance with the requirements of the MODBUS RTU protocol. The module address on the bus and baud rate can be set via micro-switches S2, S1. Other communication settings are: 1 start bit, 8 data bits, 2 stop bits. The module acts as an output device, so only some features of the MODBUS RTU protocol are used - see list in Table 1.

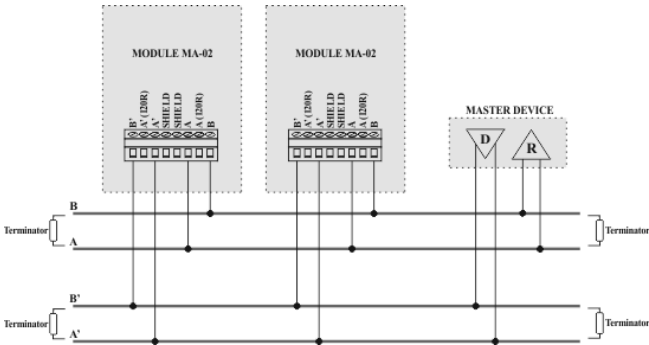
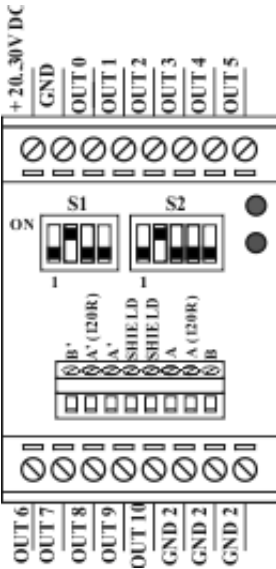
**Tab. 1.** Implemented functions of the MODBUS RTU protocol

Function code	Function description
01 <sub>H</sub>	Read coils
05 <sub>H</sub>	Write single coil
0F <sub>H</sub>	Write multiple coils

Operation of the module is indicated by LED diodes located on the front panel of the casing. The green LED light informs the user of ongoing data transmission, while the red LED informs that the module is being powered. The output circuits are implemented on the basis of opto-isolators in open collector configuration, which provides galvanic isolation of the module outputs.

To set the output to a LOW state (output activation - shorted to ground), the logical 1 should be entered into the frame responsible for setting the digital output. After the reading of the states of digital outputs is completed, the device returns a value of 1 for the output that is active (shorted to ground).

**'Connection diagram**



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