MIDAM BDO3501

35 digital outputs module

Microprocessor controlled module featuring 35 binary (digital) outputs. The serial line communication is based on Modbus RTU (RS485) protocol. Native modbus map grants seamless integration into variety of PLC/SCADA systems.

IO MODULES

Application

- 35 digital outputs module
- Binary signal control
- Integration into PLC topology
- General use

Function

The BDO3501 module controls up to 35 digital (open collector) outputs. The outputs are designed for switching small voltage up to 30 V DC, maximum current 0,5 A. It is recommended to use small DC relays connected to the outputs in order to galvanically separate power part from low voltage circuits. The device has factory-set values to ensure the correct default function and allows direct reading and writing of values to the Modbus map, which is available in a separate document. All settings are also stored in the Modbus map directly in the device. If the module is terminating the communication bus, i.e. it is the last in line, a terminating 120 R resistor may be switched on by short-circuiting of the BUS END DIP switch. Three LEDs located inside of the housing enable fast diagnostics – power, communication and system circle indication. The communication circuits are protected against overvoltage and galvanically isolated from other parts of the module. 35 LEDs indicate the status of each of the output separately. The module is equipped with a watchdog.

PLC system integration

The module can be integrated via the Modbus RTU (RS485).

Addressing

The Modbus address can be set in two ways. Using DIP switches, they increase their bit weight from right to left, see image with example where address of 98 is set by activation of switches 2, 3, and 7 with bit weight of 64, 32, and 2 respectively. Valid settable range is 1 to 254. Address 0 (all switches OFF) means that the address is set as entered in the Modbus table. Address 255 (all switches ON) brings the module to INIT (factory settings) mode, where Modbus address is 1 and communication parameters are set to 9600/ 8/N/1. Software addressing is available using appropriate software tool delivered by the device manufacturer. The software addressing feature is active provided the hardware addressing switch is set to 0 only. All changes apply after the module is switched off and on again.

Configuration

The device is configured using the manufacturer's tool or with a standard modbus tool, modifying the appropriate registers. The different operation modes and user access can be configured in this way. Modifications to the controller configuration can be made afterwards without the need for any special tools.

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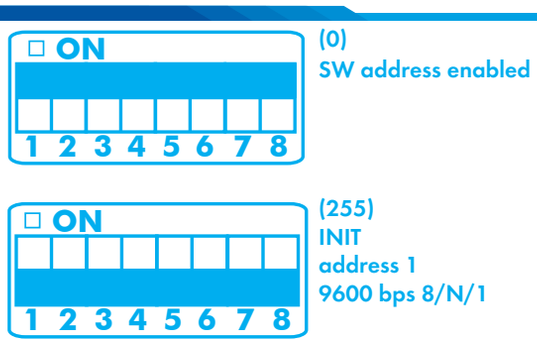
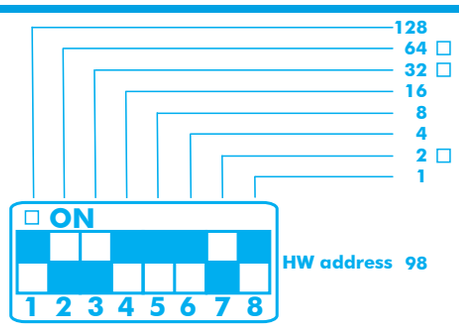
Technical data

Power supply	24 V AC/DC ± 20 %
Consumption	1 W
Communication	**RS485, Modbus RTU (K+, K-)** baud rates 300 ... 115 200 bit/s, parity and bits are set over Modbus RTU, default 9600/8/N/1 maximal bus length 1200 m, maximum number of modules depends on requested response time, for common HVAC applications 255 addresses are supported galvanic isolation 1 kV
Protocol	Modbus RTU, 256 node (RS485).
Indication	35 x DO (yellow LED, DO activation), PWR (green LED, power supply), RUN (yellow LED, device active), TXD (red LED, RS485 communication).
Outputs	35 x DO. Maximum 50 V DC, 0.5 A per single output. Typically 24 V DC, 0.1A.
Mechanical and dimensions	105.6 x 98.7 x 64 mm (l x w x h) Polycarbonate enclosure (UL94V0) IP20, 2x DIP switch block - ADR (AUTO - all in OFF position, INIT – all in ON position), BUS END
Terminals	5x M3 screw terminals (PWR, K+, K-), 40 x M2 screw terminals (outputs, COMx) Recommended wire diameter 0.35 to 1.5 mm^2.
Ambient conditions	-5 to +45 °C, 5 % to 95 % rH (EN 60721-3-3 class 3K5).

Addressing (example)





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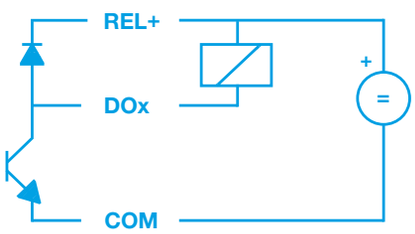
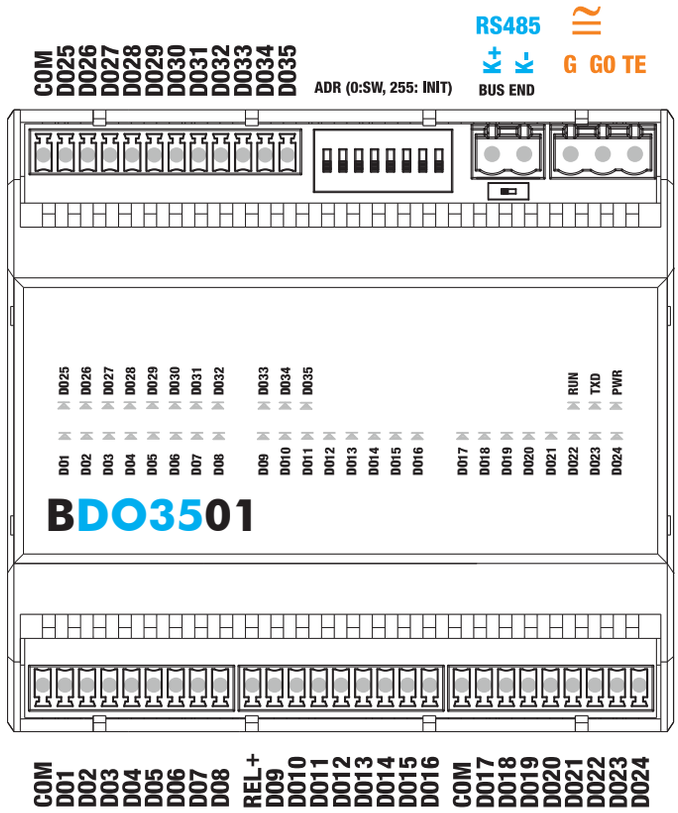
Terminals and connection

COM	Common contact for DO 25 - DO 35
DO 25 - 35	Digital outputs 25 - 35
K+	Serial line RS485 +
K–	Serial line RS485 –
G	Power
G0	Power
TE	Technical ground
COM	Common contact for DO 1 - DO 8
DO 1 - 8	Digital outputs 1 - 8
REL+	Voltage peak protection, see recommended connection of the relays below. Usual voltage used 24 V DC.
DO 9 - 16	Digital outputs 9 - 16
COM	Common contact for DO 17 - DO 24
DO 17 - 24	Digital outputs 17 - 24





LED indication and DIP switches

ADR (INIT)	If ON at power-up, configuration parameters are brought to defaults (address 1, communication parameters 9600/8/N/1)
BUS END	In ON position, the first and last devices on bus should have bus end ON.
RUN	Yellow LED – system cycle (OK: LED flashes periodically 1s ON, 1s OFF; ERROR: LED flashes in other pattern, LED is still ON or OFF).
TXD	Red LED – RS485 transmitting data to the field bus (flashing: transmitting data; OFF: no data traffic).
PWR	Green LED – power (ON: power OK; OFF: no power applied, weak or damaged power supply, ...).
DO1 - 35	Yellow LED - indicates active digital output on respected terminal (ON: output active; OFF: output inactive).

Changes in versions

04/2019	New datasheet version (v19/01)