# MODBUS DO-8 Digital (Relay) Output Modules

8-Channel Digital Output Module is used to control different equipments through 230Vac 10A relay outputs. Each output relay is changeover type and can also be controlled manually using dedicated switch (Manual ON, OFF and AUTO positions).

If serial communication between module and Modbus master fails, each output can preserve their current states or get preset values as programmed.

Indication LED is lit when corresponding relay is activated. All important values are saved to eeprom during power off.

Module's address and communication speed is selected using onboard dip-switch.Module address and communication speed is selected using onboard dip-switch.

**Features**

- 8 230Vac 10A SPCO Relays
- LED Indication for the Output Status
- Manual ON, OFF and AUTO Override Switch for Each Output
- Plug-in Terminals and DIN-rail Mounting
- RS-485 Communication using Modbus RTU

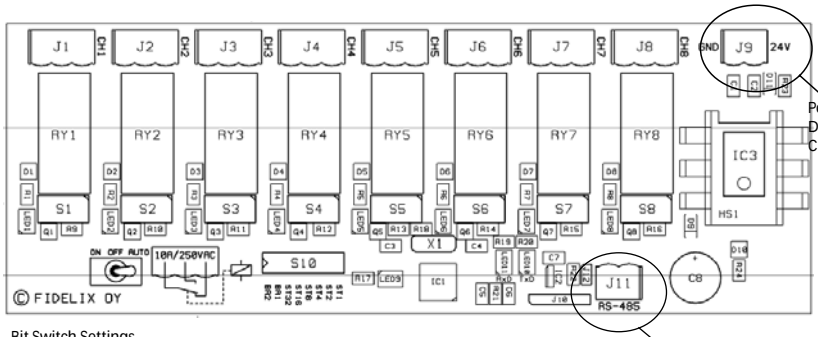
**Model Type**

| Model | Description |
|---|---|
| **MODBUS-DO8** | 8 Digital (230Vac 10A Relay) Output Module, Modbus Communications. |

**Technical Data**

| | |
|---|---|
| Operating Voltage | 20..26Vdc |
| Power Consumption | 15mA |
| Communication | Modbus RTU |
| Communication Speed | 9600 bps, 19200 bps, 38400 bps or 57600 bps |
| Address Range | 1..63 via bit switch |
| Rated Load Output | 10A / 250VAC Resisitive Load<br>7.5A / 250VAC Inductive Load (p.f. = 0.4, R/L = 7ms) |
| Maximum Switching Capacity | 2500VA |
| Coil Current | Approx. 26mA / Active Relay |
| Operating Temperature | 0..50°C |
| Dimensions | W205 x H95 x D65 mm |

**Wiring Details**




Bit Switch Settings


Communication Speed

| Speed | BR 1 | BR 2 |
|---|---|---|
| 9600bps | Off | Off |
| 19200bps | On | Off |
| 38400bps | Off | On |
| 57600bps | On | On |

Modbus Address

Use ST 1 + ... + ST 32 to set the modbus address.
e.g.
ST 1 only ON = Modbus Slave Address 1
ST 4 only ON = Modbus Slave Address 4
ST 4 and ST ON = Address 5 (1+4) etc..

**Modbus Registers and Operation**

The MOD-DO8 is a Modbus slave. Via the Modbus communication channel each of the relay outputs can be overriden ON/OFF, and the default state of each of the outputs can be configured.

| Modicon Modbus Register | Description | WebBiter Data Register | WebBiter Data Type |
|---|---|---|---|
| Reg 0 | Holding Register for Digital Output Status / Override (Binary Coding)<br>1 = DO1 ON<br>2 = DO2 ON<br>4 = DO3 ON<br>8 = DO4 ON<br>...<br>128 = DO8 ON | 1 | Unsigned 16 |
| Reg 1 | Holding Register for Default Values if No Modbus Signal receiver in 30 seconds or after power failure | 2 | Unsigned 16 |

**Modbus Registers - Bit Settings**

Register 0 sets the output relay status.

| BIT | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| REG0 | X | X | X | X | X | X | X | X | RLY8 | RLY7 | RLY6 | RLY5 | RLY4 | RLY3 | RLY2 | RLY1 |

X = NOT USED

Register 10 sets the output relay default condition in case of no message in 30 seconds, or after power failure before valid message.

| BIT | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| REG1 | MOD8 | MOD7 | MOD6 | MOD5 | MOD4 | MOD3 | MOD2 | MOD1 | SET8 | SET7 | SET6 | SET5 | SET4 | SET3 | SET2 | SET1 |

Register 0 controls output relays. If bit is set corresponding relay operates (if mode switch is in AUTO position). Clearing bit causes relay to release. Only 8 least significant bits are used. This register is read and write register (Holding register, Modbus Function 6).

Example: To switch ON outputs 3 and 4 write (4 + 8) to the register.

Register 1 maintains the default values for outputs. Default values are used when power is turned on and substation has not been sending new data. Higher byte of register determines for each channel independently if preset values is in use. If bit is set, preset value is taken from lower byte of register. Otherwise current state of output is preserved. Same Preset values are also used if communication failure occurs. Communication failure means that mudule hasn't got any modbus messages for 30 seconds. This register is read and write register.

Example: To maintain outputs OFF after power failure and not to switch outputs to the default values after 30 seconds, write 0 to this register.