B-DO-35-01 – 35 open collector outputs

- **bit address = 16 * (word address – 1) + 1**
- **OC – open collector**

Supported Modbus functions:
01 Read Coils – read bits
02 Read Discrete Inputs – read bits
03 Read Holding Registers – read words
04 Read Input Registers – read words
15 Write Multiple Coils – write bits
16 Write Multiple Registers – write words

Register type:
R – register is read only
W – register is write only
RW – register is read/write,
RWE (default value) – register is read from EEPROM, written to EEPROM, default value in brackets

name	address	type	description	note
relay	1 2 3	RW	set / reset OC outputs	bit 0 - OC1 ... bit 34 - OC35
firmware version	1000	R	firmware version	FW version is **always** the same as this document version
module ID	1001	R	module identification number	module ID is F009hex
status LSB	1002 LSB	RW	module status – low byte **bit 0** – enable write to EEPROM **bit 1** – enable SW reset **bit 4** – EEPROM initialization **bit 5** – disable write to all RW registers	**EEPROM initialization:** 1) start device in init mode (address DIP switch is all high – 255 – at start) 2) set DIP switch to any other value than 255 3) set status LSB bit 4, initialization is indicated in status MSB bit 2 **SW reset:** set bit 1, then write any non-zero value to reg. 1011

status MSB	1002 MSB	R	module status – high byte **bit 0** - 0 normal mode - 1 init mode **bit 1** - 1 next write to EEPROM register causes writing of **all** data to EEPROM - 0 next write to register is to RAM only **bit 2** – 1 – EEPROM initialized **bit 3** – write to all RW registers disabled **bit 4** – 0 **bit 5** - SW reset enabled **bit 6** - 0 **bit 7** – 1	bit 1 ... indication that command given by bit 0 in status LSB was accepted bit 2 ... indication that command given by bit 4 in status LSB was accepted bit 3 ... indication that command given by bit 5 in status LSB was accepted bit 5 ... indication that command given by bit 1 in status LSB was accepted
address	1003	RWE (1)	modbus address of the module	registers change immediately, communication parameters change after restart (data must be written to EEPROM)
baud rate	1004	RWE (13)	10_{dec} … 1 200bps 11_{dec} … 2 400bps 12_{dec} … 4 800bps 13_{dec} … 9 600bps 14_{dec} … 19 200bps 15_{dec} … 38 400bps 16_{dec} … 57 600bps 17_{dec} … 115 200bps	
serial port settings	1005	RWE (0)	**bits 0, 1** – parity 0 none 1 even 2 odd **bit 2** – stopbits 0 one stopbit 1 two stopbits	
up time	1006 1007	R	time in seconds since last restart or power up	
serial number	1008 1009	RWE (unique)	module serial number, can be written if it is zero	not implemented yet
EEPROM writes	1010	R	EEPROM writes counter	counter 0 …. FFFEh, counting stops at value FFFEh
SW reset	1011	RW	if **status LSB bit 1** (and status MSB bit 5) is set, writing non-zero value causes SW reset	
dip switch	1100	R	actual DIP switch value	
relay com	1101 1102 1103	RWE (0)	**0** – communication loss is ignored for particular output **1** – communication loss causes setting of particular output to value given by **relay state** register	bit 0 - OC1 ... bit 34 - OC35

relay state	1104 1105 1106	RWE (0)	particular output is set to value given by this register if valid modbus frame wasn't received for time given by **relay time** register and is enabled by **relay com** register	bit 0 - OC1 ... bit 34 - OC35
relay time	1107	RWE (30)	time period in seconds since last valid modbus frame to set outputs to values given by **relay com** and **relay state** registers	value of zero deactivates communication loss feature
relay start enable	1108 1109 1110	RW (0)	**0** – no action on particular output on start of the module **1** – particular output is set to value given by **relay start** register	bit 0 - OC1 ... bit 34 - OC35
relay start	1111 1112 1113	RWE (0)	particular output is set to value given by this register on start of the module if enabled by **relay start enable** register	bit 0 - OC1 ... bit 34 - OC35