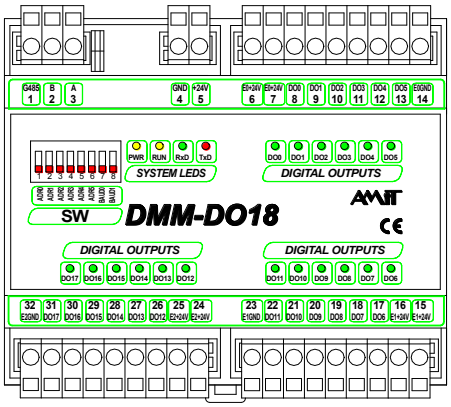
DMM-DO18

Module of digital outputs with protocol MODBUS

- **Module of 18 digital outputs 24 V DC**
- **PWM mode possibility for DO**
- **Outputs with galvanic isolation partitioned per six**
- **Operation through RS485 interface, protocol MODBUS RTU**



TECHNICAL DATA

Outputs	3 × 6
Switch type	Switches Ex+24V
Switching element	MOS
Safe state at connection loss	0 V DC
Safe state user definition	Not supported
Galvanic isolation of outputs	Yes *)
Switched voltage Ex +24 V	24 V DC ±20 %
Output voltage	(Ex+24V) – 1 V DC
Switched current (permanent)	300 mA DC
Current protection maximum current	0.7 A to 2.5 A DC
Common terminal maximum current	1 A DC
Contact closing time	40 µs
Contact opening time	100 µs
Short-circuits protection	Electronic
Inductive load handling	Transil 600 W
Communication	RS485
Interface galvanic isolation	Yes *)
Overvoltage interface protection	Transil 600 W
Communication speeds	9600 bps to 57600 bps
Number of modules on RS485 network	63
Number of modules on RS485 segment	31
Power supply	19.2 V to 28.8 V DC
Power consumption (without outputs)	Max. 100 mA at 24 V DC
Others	
Connection	Cage clamps WAGO 231
Ingress protection rate	IP20
Operating temperatures range	0 °C to 50 °C
Maximum ambient humidity	< 95 % non-condensing
Mounting	DIN rail 35 mm
Weight	250 g
Dimensions (w × h × d)	(106 × 97 × 73) mm

*) Insulation strength 500 V AC / 1 minute, galvanic isolation must not be used for safe and unsafe parts separation.

ORDERING INFORMATION

DMM-DO18	Module of 18 digital outputs with protocol MODBUS, connectors WAGO

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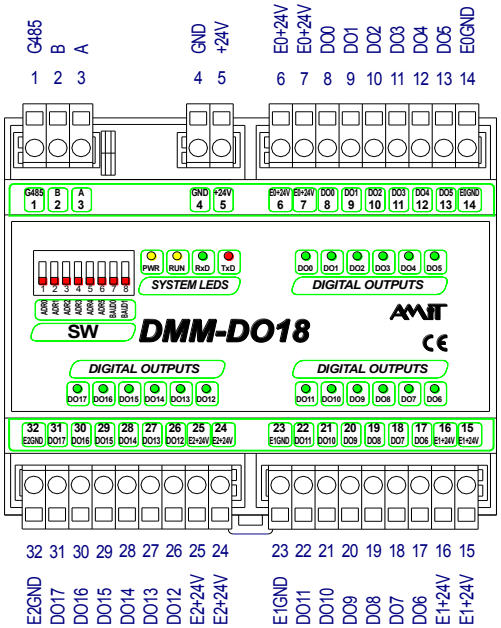
TERMINALS IDENTIFICATION

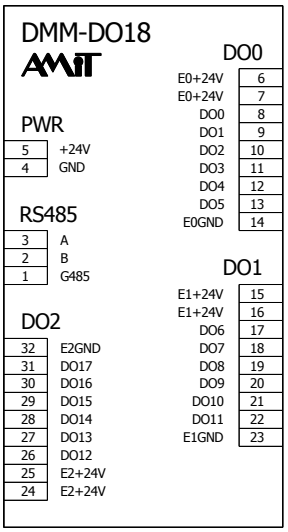
Terminal	Signal	Description
1	G485	RS485, shielding
2	B	RS485, wire B
3	A	RS485, wire A
4	GND	Power supply, ground
5	+24V	Power supply +24 V DC
6	E0+24V	Switched voltage DO0-5
7	E0+24V	Switched voltage DO0-5
8	DO0	Output 0
9	DO1	Output 1
10	DO2	Output 2
11	DO3	Output 3
12	DO4	Output 4
13	DO5	Output 5
14	E0GND	External GND
15	E1+24V	Switched voltage DO6-11
16	E1+24V	Switched voltage DO6-11

Terminal	Signal	Description
17	DO6	Output 6
18	DO7	Output 7
19	DO8	Output 8
20	DO9	Output 9
21	DO10	Output 10
22	DO11	Output 11
23	E1GND	External GND
24	E2+24V	Switched voltage DO12-17
25	E2+24V	Switched voltage DO12-17
26	DO12	Output 12
27	DO13	Output 13
28	DO14	Output 14
29	DO15	Output 15
30	DO16	Output 16
31	DO17	Output 17
32	E2GND	External GND

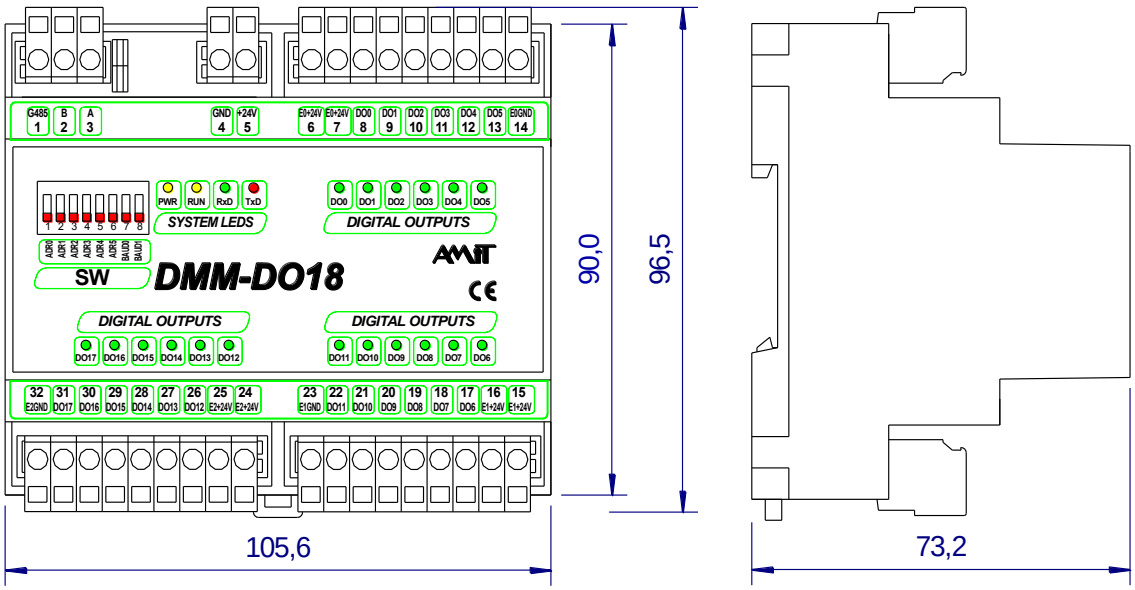
TERMINALS LOCATION



RECOMMENDED DRAWING SYMBOL



MECHANICAL DIMENSIONS



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JUMPERS – RS485 INTERFACE

Jumper	Description
J6, 1-2	Idle state line definition + A termination
J6, 3-4	Idle state line definition + B termination

PARITY SETTINGS

Turn the unit power supply off, set all switches to OFF position and turn the power supply on again. The parity can be set by the switches ADR0 (DIP 1) and ADR1 (DIP 2) according to a table:

ADR0 (DIP 1)	ADR1 (DIP 2)	Parity
OFF	OFF	None
ON	OFF	Even
OFF	ON	Odd

The settings must be confirmed by switching the switch BAUD1 (DIP 8) to a position ON ("light snake" is running on module LEDs). Parity settings are displayed on corresponding LEDs. A change will be active after turning the module off and on again.

SETTINGS OF ADDRESS AND COMMUNICATION SPEED

Address settings can be performed by the switches ADR0 (DIP 1) to ADR5 (DIP 6). Available address values are 1 to 63. **Address 0 is not allowed!** Communication speed settings can be performed by the switches BAUD0 (DIP 7) and BAUD1 (DIP 8).

ADDRESS

DIP	Value
ADR0 (DIP 1)	Value of 1
ADR1 (DIP 2)	Value of 2
ADR2 (DIP 3)	Value of 4
ADR3 (DIP 4)	Value of 8
ADR4 (DIP 5)	Value of 16
ADR5 (DIP 6)	Value of 32

COMMUNICATION SPEED

BAUD0 (DIP 7)	BAUD1 (DIP 8)	Communication speed
OFF	OFF	9600 bps
ON	OFF	19200 bps
OFF	ON	38400 bps
ON	ON	57600 bps

An example of address: address = 35, the switches 1, 2 and 6 (1 + 2 + 32) are ON. A change of switches settings will be active after turning the module off and on again.

SUPPORTED MODBUS FUNCTIONS

Function	Use
1	Reading of digital outputs state
3	Reading of set PWM parameters
5	Writing of one digital output
6	Writing of one PWM output parameter
15	Writing of multiple digital outputs
16	Writing of multiple PWM outputs parameters

Digital outputs are mapped to the network Modbus by the coils according to the table.

DMM-DO18 output	Modbus Coil number	Modbus Coil type	Description
DO0	0	R/W	DO0 switching-on / off
DO1	1	R/W	DO1 switching-on / off
…	…	…	…
DO16	16	R/W	DO16 switching-on / off
DO17	17	R/W	DO17 switching-on / off

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The values of PWM duty cycle and period are mapped to the network Modbus by output registers and holding registers according to the table.

DMM-DO18 output	Modbus IR (HR) number	Modbus IR (HR) type	Description
DO0	0	R (R/W)	PWM duty cycle for output DO0
DO1	1	R (R/W)	PWM duty cycle for output DO1
…	…	…	…
DO16	16	R (R/W)	PWM duty cycle for output DO16
DO17	17	R (R/W)	PWM duty cycle for output DO17
–	18	R (R/W)	Period for all DO

The PWM period is common for all digital outputs. In register, it may have a value 0 to 32767. This corresponds to a range 0 s to 100 s.
The PWM duty cycle may have a value 0 to 32767 in the registers. This corresponds to a range 0 % to 100 %.

A real module state of digital output is a logical sum of value written to the coil and the value written to the corresponding holding register.

Warning: A unit has implemented SW **WATCHDOG**. If the unit does not receive (for 10 seconds) any valid frame (even for another unit on the network), all outputs are set to log. 0.