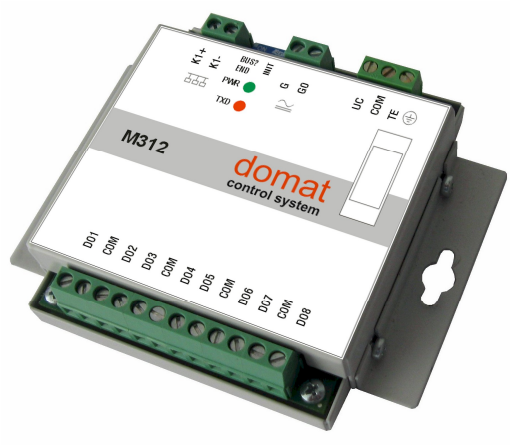
M312, M313 Triac PWM output module



Summary

The M312 and M313 are microprocessor-controlled, communicative 8 triac outputs modules. The triacs are controlled either by PWM signal with configurable period by analogue variables, or as 2-point outputs by binary variables. The module uses a RS485 bus for communication, and can be easily integrated in a variety of supervision and control systems.

Applications

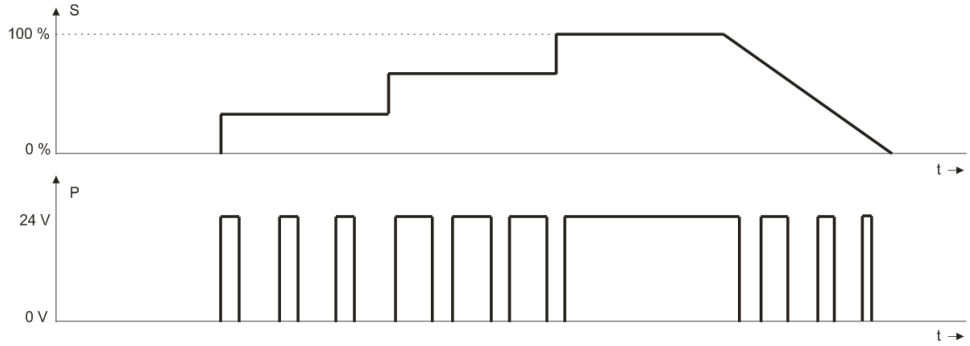
- **HVAC control systems – floor heating distribution points**
- **Inexpensive output module with 24 V AC (M312) or 230 V AC (M313) triac outputs**

Functions

The M31x modules have eight independent triac outputs which are capable of switching voltage up to 50 V AC (M312), or 500 V AC (M313). Output triacs are protected by a fuse, accessible from the front of the device. Replace the fuse only with the same type and rating.

Using the configuration software ModComTool it is possible to set every output as binary (on / off), or PWM (pulse-width modulation), which is a pulse signal with common period (default value 100 s) for all eight outputs, and duty time proportional to the analogue output signal 0 to 1000 (which corresponds to duty time 0 to 100 % of the period time). The register values are listed in the Modbus table of M312, for SoftPLC IDE and Merbon IDE the modules are predefined in the software libraries.

The PWM signal principle for M312 is shown at the following figure, where S is the control signal (0 to 100 %), and P is the resulting output voltage. The higher is the control signal, the longer is the output signal duty time and the more the thermic actuator at the output opens.



The module communicates by means of a RS485 data bus (optically separated). The communication protocol ensures smooth and easy integration in a number of control and data acquisition systems.

The communication circuits are protected against overvoltage. If the module is terminating the communication bus, i.e. it is the last in line, a terminating 120 Ω resistor may be switched on by short-circuiting of the BUS END jumpers. Two LEDs located inside of the housing enable fast diagnostics – power up and communication.

See *domat - Technical application notes* for connection examples.

All settings are backed up in a EEPROM chip. The module is equipped with a watchdog circuit and the communication part is galvanically separated. The Modbus table is available on request in a separate document.

Technical data

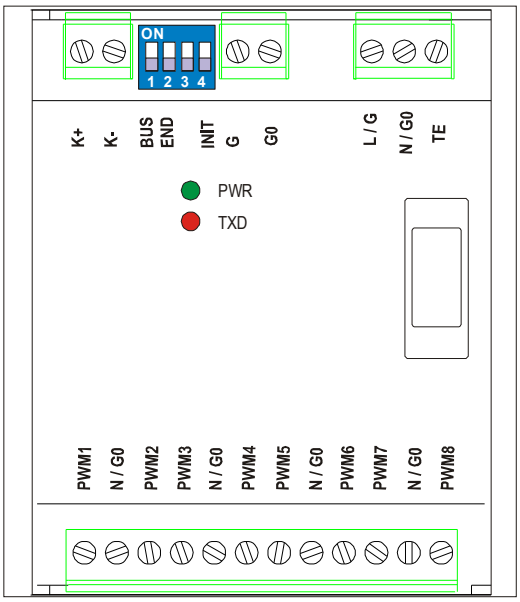
Supply voltage	10 V ÷ 35 V DC, 14 V ÷ 24 V AC
Consumption	max. 1000 mVA
Working temperature of the module	0 ÷ 70°C
Communication	RS485, 1200 ... 19200 bit/s, Modbus RTU
Max. bus length	1200m
Max. number of modules on the bus	256
Number of outputs	8 outputs
M312	
Output element	optotriac, zero switching
Output load	24 V AC, 0.4 A, max. voltage 60 V
Fuse	F3.15 A / 250 V
Minimum load current	5 mA
Minimum switched voltage	20 V AC
Maximum switched voltage	60 V AC
M313	
Output element	optotriac, zero switching
Output load	230 V AC, 0.12 A, max. voltage 600 V
Fuse	F1 A / 250 V
Maximum switched voltage	250 V AC
Dimensions	85 (115) (w) × 95 (h) × 25 (d) mm

without side flaps (with side flaps)

CE conformity

CE

Terminals



K+	RS485 +
K-	RS485 -
G	power supply
G0	power supply, reference point
L / G	power supply for the outputs
N / G0	power supply for the outputs, ground
TE	technical ground
PWM1	output 1
...	
PWM8	output 8
N / G0	power supply for the outputs, ground

BUS END: if ON the bus is terminated, if OFF the bus is not terminated.

INIT if ON before power-up the module is in the INIT mode - address 1, communication speed 9600 bps

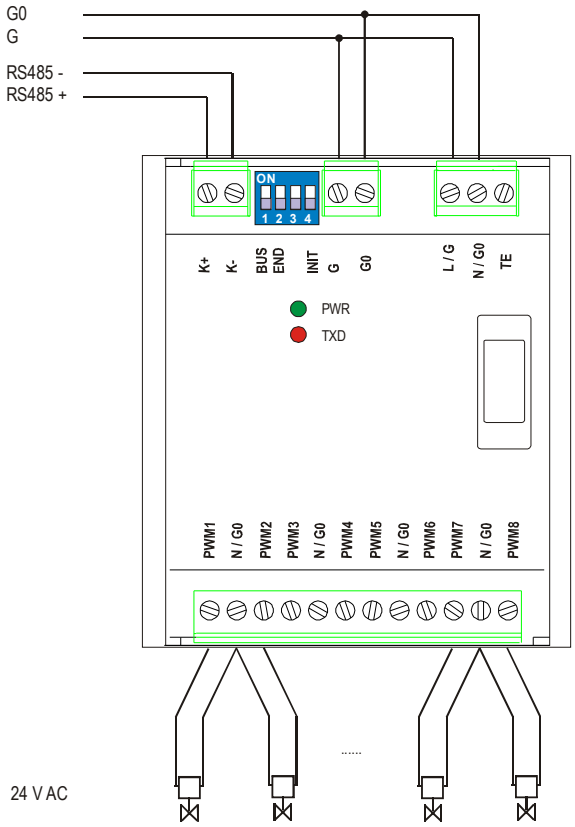
LED	colour	function
TXD	red	blinking – module is transmitting at RS485
PWR	green	on – power OK, off – no power or power supply damaged

Addressing

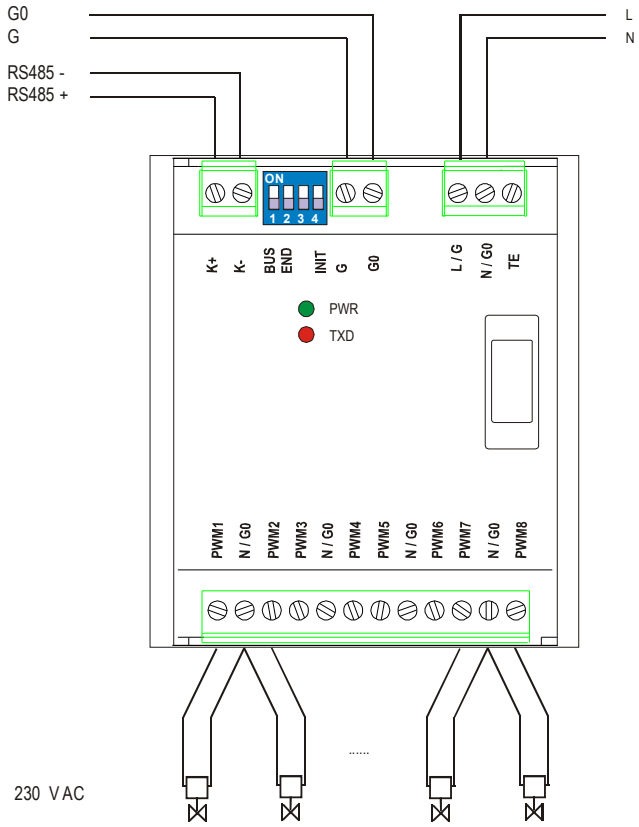
The Modbus address is set through ModComTool, a configuration software which is free to dowload at **www.domat.cz**. Default (factory settings) address is 1, communication parameters 9600, 8, N, 1.

Connection

M312 Power 24 V AC only!



M313



Related products

M...	I/O modules
IPLC201, 301	MiniPLC process station
IPCT.1	Process station with touchscreen
M012	RS485/RS232 converter
M080	RS485/USB converter

Changes in versions

09/2015 Dimensions added, domat.exe changed to ModComTool.
02/2016 PWM principles explained.