



ZAMEL sp. z o.o.



ul. Zielona 27, 43-200 Pszczyna, Poland
Tel. +48 (32) 210 46 65, Fax +48 (32) 210 80 04
www.zamel.com, e-mail: export@zamel.pl

DESCRIPTION

PCM-09 is a multi-functional time relay for timer-based automatic control. The time relay features 26 independent operating modes, each triggered with supply voltage or external trigger input (from L or N wire). Key benefits include a very wide range of time settings, and the product can be switched on or off continuously. The operating mode can be switched to a different one before it ends.

FEATURES

- 26 operating modes (triggered externally or via the line voltage input).
- Double 7-segment LED display for easy programming and status read-outs.
- High time measurement accuracy
- Three separately programmable time settings.
- Continuous on/off functions.
- Relay output: one 16 A max. switchable contact.
- DIN-Rail mountable.

INSTALLATION

1. Isolate from power the wiring system to be connected with this product with its circuit breaker, overcurrent device or disconnector, as applicable.
2. Use a suitable tester to verify that the isolated power input wiring is not live.
3. Install the PCM-09 on a DIN-Rail in the respective switchboard.
4. Connect the wiring to the terminals, see the applicable wiring connection diagram.
5. Turn on the power of the connected wiring system.

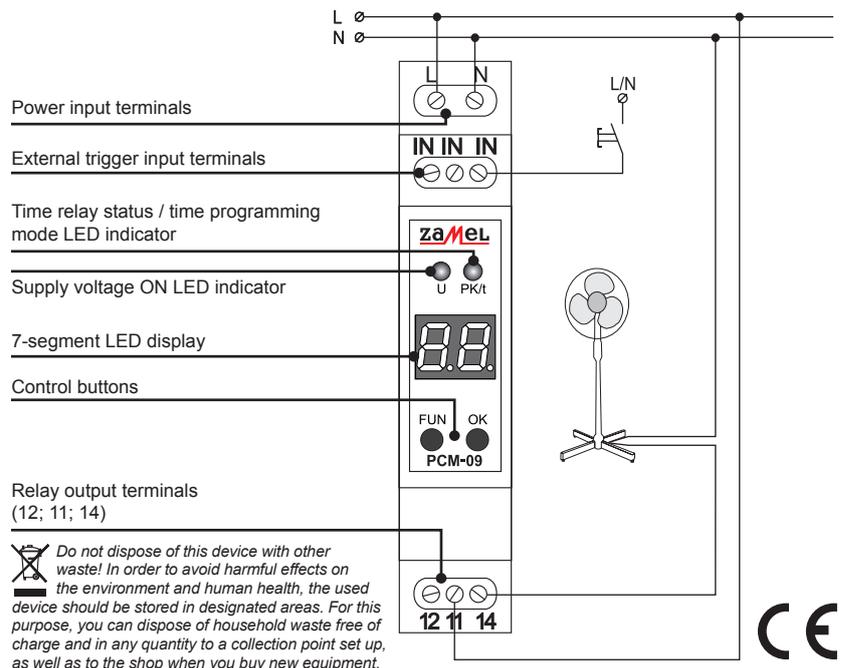


Connect this product to a single-phase power system according to applicable electrical and safety standards and regulations. See this Manual for the wiring instructions. Installation, wiring and adjustment/setting shall only be done by qualified electricians who have read and understood this User Manual and the functions of the product. Do not open or otherwise disassemble the product housing; otherwise the product warranty will be void and an electrocution hazard may occur. Prior to installing and wiring this product, make sure that the wiring to be connected is not live. The conditions and methods of transport, storage and operation of this product may affect its performance. Do not install the product if any of its components are missing, the product is damaged or deformed in any way. If any malfunctions are found, consult the manufacturer.

TECHNICAL DATA

Power input terminals:	L; N
Rated supply voltage:	230 V AC
Supply voltage tolerance:	-15 to +10 %
Rated mains frequency:	50 / 60 Hz
Power rating:	0.4 W
External trigger input terminals	IN, IN, IN (trigger input from L or N wire)
Works with backlit control switches	NONE
Operating modes:	26
LED display:	double, 7-segment, red
Supply voltage ON LED indicator:	green LED
Time relay status / time programming mode LED indicator:	multi-colour LED
Time setting resolution:	0.1 s (99h 59m 59.9s)
Time measurement accuracy:	± 3 s / 24h max. at 25 °C
Relay contact ratings:	1NO/NC-16 A/250 V AC1 4000 VA
Wiring terminals:	8
Wiring size:	0.2 ÷ 2.50 mm ²
Operating temperature:	-20 ÷ +60 °C
Installation orientation:	any
Housing mounting:	DIN-Rail
Housing protection rating:	IP20
Overvoltage category:	II
Pollution class:	2
Surge voltage:	2 kV
Dimensions	single module 90x17.5x66 mm
Weight:	0.080 kg

APPEARANCE / CONNECTION



Do not dispose of this device with other waste! In order to avoid harmful effects on the environment and human health, the used device should be stored in designated areas. For this purpose, you can dispose of household waste free of charge and in any quantity to a collection point set up, as well as to the shop when you buy new equipment.

Button description:

	Normal operating mode (no time counting in progress)	Normal operating mode (time t1 or t2 counting in progress)	Programming mode ^{1,2}
FUN	Press and hold for 3s: opens the settings programming mode (mode, time t1, t2, and t3). Short press twice: opens the current settings display mode. Each next press: cycles to the next current settings display.	Press and hold for 3s: opens the settings programming mode (mode, time t1, t2, and t3) (interrupts the operating mode in progress and stops the time relay).	Cycles through programmable settings (Operating mode (FU)-t1-t2-t3- enters the selected operating mode3) / increments the selected setting value.
OK	-	Switches between a percentage display of the time left to count down (from 99% to zero, if the time setting is > 10 s) and the time relay operating status display (which indicates the on / off time countdown).	Opens the displayed setting programming mode; acknowledges the selected mode / time setting. The modified settings are saved to the memory when exiting the programming mode.

¹ Opening the programming mode will interrupt the current operating mode and stop the time relay.

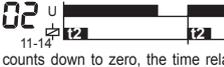
² The last selected operating mode and the last time value settings are restored after a power cycle.

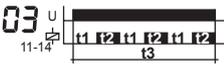
³ The operating mode is executed immediately once it has been selected, and the supply voltage does not have to be disconnected and reconnected to start it.

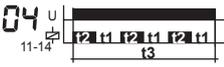
7-segment LED display indications:

- “-” – no time countdown in progress
- display segments cycle clockwise – the time to switch off the time relay (t1) is counted down
- display segments cycle counter-clockwise – the time to switch on the time relay (t2) is counted down
- “FU” – operating mode
- “t1” – the time to switch off the time relay
- “t2” – the time to switch on the time relay
- “t3” – total operating mode time (applies to modes 3, 4, 25, and 26)

01 U  DELAYED SWITCH ON – once the supply voltage has been applied to the inputs, t1 countdown begins. When the time is counted down to zero, the time relay is ON (make outputs 11-14). The current mode starts again when the power supply voltage is cycled.

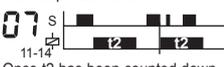
02 U  DELAYED SWITCH OFF – once the supply voltage has been applied to the inputs, the relay switches on immediately (make outputs 11-14), and t2 countdown begins. When the time counts down to zero, the time relay switches off (make outputs 11-12). The current mode starts again when the power supply voltage is cycled.

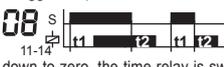
03 U  SPECIFIC PULSE COUNT GENERATION (from the switch off operation) – once the supply voltage has been applied to the inputs, t1 countdown begins. When the time is counted down to zero, the time relay is ON (make outputs 11-14) for the duration of t2, after which the time relay is OFF. This cycle repeats for the duration of t3, and when t3 expires, the time relay

04 U  SPECIFIC PULSE COUNT GENERATION (from the switch on operation) – once the supply voltage has been applied to the inputs, the relay switches on immediately (make outputs 11-14), and t2 countdown begins. Afterwards the time relay is switched OFF (make outputs 11-12) for the duration of t1, after which the time relay is ON again. This cycle repeats for the duration of t3, and when t3 expires, the time relay is switched off.

05 U  DELAYED 0.5s PULSE GENERATION – once the supply voltage has been applied to the inputs, the set t1 is counted down for 0.5s and switched OFF again (make outputs 11-12). The next time this mode is executed is when the supply voltage is cycled again.

06 S  RISING EDGE TRIGGERED TIME PULSE – when a rising edge trigger is input, the power load switches ON the time relay (make outputs 11-14) and the set time is counted down. Once t2 has been counted down, the time relay is OFF (make outputs 11-12). Impulse time duration is not important here.

07 S  FALLING EDGE TRIGGERED TIME PULSE – when a falling edge trigger is input, the power load switches ON the time relay (make outputs 11-14) and the set time is counted down. Once t2 has been counted down, the time relay is OFF (make outputs 11-12). If the trigger edge falls again during the set time countdown will not restart the countdown (the system is non-retriggerable).

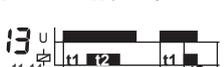
08 S  DELAYED SWITCH ON/OFF – when a rising edge trigger is input, the power load switches the time relay OFF (make outputs 11-12) and t1 countdown begins. When the time is counted down to zero, the time relay is switched ON (make outputs 11-14). When the trigger edge falls, the set t2 is counted down after which the time relay is switched OFF (make outputs 11-12). If the trigger duration < set t1, the time relay is switched on for t2 only.

09 S  BISTABLE TIME-LIMITED RELAY – when a rising edge is input, the power load switches the time relay ON (make outputs 11-14) and t2 countdown begins. When the next trigger has a rising edge or t2 expires (whichever comes first), the time relay is switched OFF. The trigger duration is irrelevant for the system's operation.

10 S  TIME PULSE TRIGGERED WITH A RISING EDGE AND DELAYED SWITCH OFF (retriggerable) – when a rising edge trigger is input, the power load switches the time relay ON (make outputs 11-14). When a falling edge trigger is detected, the set t2 is counted down, after which the time relay is switched OFF (make outputs 11-12). If a trigger is input during the t2 countdown, the cycle is restarted (the system is retriggerable).

11 S  TIME PULSE TRIGGERED WITH A RISING EDGE AND DELAYED SWITCH OFF (non-retriggerable) – when a rising edge trigger is input, the power load switches the time relay ON (make outputs 11-14). When a falling edge trigger is detected, the set t2 is counted down, after which the time relay is switched OFF (make outputs 11-12).

12 U  TRIGGERED DELAYED SWITCH ON – when a rising edge trigger is input, the power load keeps the time relay OFF (make outputs 11-12); simultaneously, the set t1 countdown begins. When the time is counted down to zero, the time relay is switched ON (make outputs 11-14). The time relay remains ON until the power load supply voltage is isolated, and no next trigger affects the time relay status.

13 U  DELAYED SWITCH ON – once the supply voltage has been applied to the inputs, t1 countdown begins. When the time is counted down to zero, the time relay is ON (make outputs 11-14) for the duration of t2. The cycle is repeated when the supply voltage is cycled.

LED PK/t indications:

Normal operating mode:

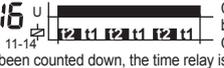
- LED off – the time relay is OFF (outputs 11 and 12 are made)
- LED on and red – the time relay is ON (outputs 11 and 14 are made)

Setting programming mode:

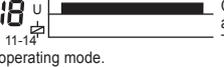
- LED off – setting a value in tens of a second
- LED on and red – setting a value in seconds
- LED on and green – setting a value in minutes
- LED on and amber – setting a value in hours

14 U  DELAYED SWITCH OFF – once the supply voltage has been applied to the inputs, the relay switches on immediately (make outputs 11-14), and t2 countdown begins. When the time is counted down to zero, the time relay is OFF (make outputs 11-12) for the duration of t1, after which the time relay is switched ON again. The cycle is repeated when the supply voltage is cycled.

15 U  CYCLIC SWITCHING (from OFF) – once the supply voltage has been applied to the inputs, t1 countdown begins. Once the countdown ends, the time relay is switched ON (make outputs 11-14) for the duration of t2 after which the time relay is switched OFF (make outputs 11-12) for the duration of t1. The system repeats this cycle until the supply voltage is isolated.

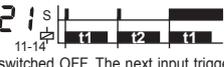
16 U  CYCLIC SWITCHING (from ON) – once the supply voltage has been applied to the inputs, the time relay is immediately switched ON (make outputs 11-14) for the duration of t2. Once the time has been counted down, the time relay is switched OFF (make outputs 11-12) for the set t1 duration, after which it is switched ON for t2. This cycle is repeated until the supply voltage is isolated.

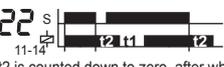
17 U  CONTINUOUS SWITCH ON MODE – once the supply voltage has been applied, the time relay remains switched ON. The settings of t1, t2 and t3 are ignored when enabling this operating mode.

18 U  CONTINUOUS SWITCH OFF MODE – once the supply voltage has been applied, the time relay remains switched OFF. The settings of t1, t2 and t3 are ignored when enabling this operating mode.

19 S  DELAYED SWITCH ON/OFF (retriggerable) – when a rising edge trigger is input, the power load keeps the time relay OFF (make outputs 11-12) and the set t1 countdown begins. When the time is counted down to zero, the time relay is switched ON (make outputs 11-14). When a falling edge trigger is input, t2 is counted down, after which the time relay is OFF (make outputs 11-12). If the trigger duration is < t1 setting, the time relay is not switched ON. When a trigger is input during t2 countdown will not switch off the time relay, but t2 countdown will be reset when the trigger edge falls down.

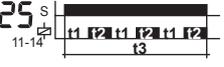
20 S  DELAYED SWITCH ON/OFF (non-retriggerable) – when a rising edge trigger is input, the power load keeps the time relay OFF (make outputs 11-12) and the set t1 countdown begins. When the time is counted down to zero, the time relay is switched ON (make outputs 11-14). When a falling edge trigger is input, t2 is counted down, after which the time relay is OFF (make outputs 11-12). The trigger input state can be switched during t2 countdown without affecting the operation. If the trigger duration is < t1 setting, the time relay is not switched ON.

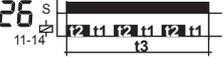
21 S  ALTERNATING DURATION PULSE GENERATION – when a rising edge trigger is input, the power load switches the time relay ON for the duration of t1, after which the time relay is switched OFF. The next input trigger will switch the time relay ON for the duration of t2. The next input trigger will switch the time relay ON for the duration of t1, etc. The trigger duration does not affect the time during which the time relay remains switched ON.

22 S  FALLING EDGE TRIGGERED DELAYED SWITCH OFF – when a trigger is input, the power load switches the time relay ON (make outputs 11-14). When the trigger edge falls, the set t2 is counted down to zero, after which the time relay is switched OFF (make outputs 11-12) for the duration of t1. Before t1 expires, all trigger inputs are ignored. Once t1 has been counted down, the time relay is switched ON again if a rising edge trigger is input.

23 S  TIME PULSE TRIGGERED WITH A SPECIFIC TRIGGER DURATION – when a trigger is input with a duration of t1 or longer, the power load switches the time relay ON (make outputs 11-14) for t2. If the trigger is < t1, the time relay is not switched ON. When the time relay remains ON, all triggers are ignored.

24 S  RISING/FALLING EDGE TRIGGERED PULSE – when a rising edge trigger is input, the power load switches the time relay ON (make outputs 11-14) for the duration of t1, after which the time relay is switched OFF. A falling edge trigger input switches the time relay ON (make outputs 11-14) for the duration of t2, after which the time relay is switched OFF. When the time relay is ON, the trigger inputs are ignored.

25 S  SPECIFIC PULSE COUNT GENERATION (from OFF) – when a rising edge trigger is input, the power load starts t1 countdown. After this, the time relay is switched ON (make outputs 11-14) for the duration of t2, after which the time relay is switched OFF. The cycle is repeated for the duration of t3, and once it expires, the time relay is switched OFF. During the t3 countdown, all trigger inputs are ignored.

26 S  SPECIFIC PULSE COUNT GENERATION (from ON) – when a rising edge trigger is input, the power load switches the time relay ON (make outputs 11-14) and t2 countdown begins. After this, the time relay is switched OFF (make outputs 11-12) for the duration of t1, after which the time relay is switched ON. The cycle is repeated for the duration of t3, and once it expires, the time relay is switched OFF. During the t3 countdown, all trigger inputs are ignored.