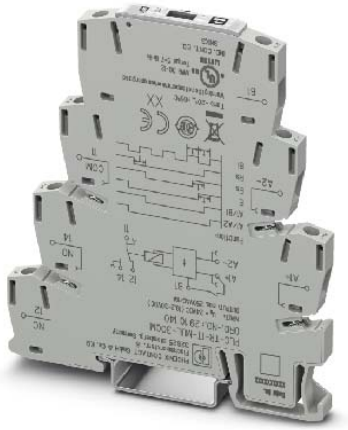
PLC-TR-1T-MUL-300M(-PT)

Highly compact multi-functional timer relay with an adjustable time range



Data sheet
300000_en_01

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1 Description

Highly compact multi-functional timer relay in 6.2 mm housing is for controlling time sequences.
Highly compact multi-functional timer relay provides different functions and time ranges that can be set via the DIP switch on the side of the device.
Time can be set using the marked knurled wheel on the front of the device, which is of recessed design to protect against accidental modification. Screwdriver can be used to adjust the setting (blade width 2.5 mm).
Highly compact multi-functional timer relay is available with screw connection or push-in connection.

Features

- 6.2 mm ultra-narrow housing
- multifunctional (4 functions)
- Time range from 0.1 s to 300 min (4 setting ranges)
- Adjustable time
- Time can be set easily and precisely
- Power supply 24 V DC
- Output: one floating PDT

WARNING: Risk of electric shock

Never carry out work when voltage is present.

Make sure you always use the latest documentation.
It can be downloaded from the product at phoenixcontact.net/products.

This document is valid for the products listed in the “Ordering data”.

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3 Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ultra-narrow multi-function time relay with 4 functions, adjustable time range (0.1 s - 300 min), 1 PDT, screw connection	PLC-TR-1T-MUL-300M	2910140	1
Ultra-narrow multi-function time relay with 4 functions, adjustable time range (0.1 s - 300 min), 1 PDT, push-in connection	PLC-TR-1T-MUL-300M-PT	2910141	1

4 Technical data

Input data	
Input voltage range	24 V DC (19.2 V DC...30 V DC)
Recovery time	50 ms
Time setting range	0.1 s ... 300 min. (4 time end ranges)
Function	E: with switch-on delay Es: with switch-on delay and control contact Rs: release delay and control contact Bi: cycle pulse output (initial status is 1)
Setting accuracy	≤ 2.5 % (of scale end value)
Repeat accuracy	≤ 0.5 % (of scale end value)
Nominal power consumption	0.45 W (at 24 V DC)

Output data	
Contact type	1 floating PDT
Maximum switching voltage	250 V AC
Interrupting rating (ohmic load) max.	1500 VA (6 A / 250 V AC)
Output fuse	6.3 A (fast-blow)

Control contact	
Control contact	Non-floating, terminals A1-B1
Control pulse length	≥ 50 ms

General data	
Mechanical service life	approx. 2x 10^7 cycles
Service life, electrical	approx. 2x 10^5 cycles at ohmic load, 1000 VA
Operating mode	100% operating factor
Degree of protection	IP20
Degree of pollution	2
Overvoltage category	III, Basic insulation
Rated insulation voltage	300 V AC
Flammability rating according to UL 94	V0
Mounting	on standard DIN rail NS 35 in accordance with EN 60715
Mounting position	any

General data	
Width	6.2 mm
Height	80 mm
Depth	86 mm
Type of housing	Polyamide PA, self-extinguishing
Color	traffic grey A RAL 7042

Connection data	Screw connection	Push-in connection
Conductor cross section, solid	0.14 mm² ... 2.5 mm²	0.14 mm² ... 2.5 mm²
Conductor cross section, flexible	0.14 mm² ... 2.5 mm²	0.14 mm² ... 2.5 mm²
AWG	30 ... 12	26 ... 14
Stripping length	8 mm	8 mm
Tightening torque	0.6 Nm ... 0.8 Nm / 5 lb in ... 7 lb in	

Ambient conditions	
Ambient temperature (operation)	-20 °C ... 65 °C
Ambient temperature (storage/transport)	-25 °C ... 80 °C
Permissible humidity (operation)	15 % ... 85 %
Altitude	≤ 2000 m

Conformance/Approvals	
Conformance	CE-compliant
UL, USA/Canada	UL/C-UL Listed UL 508
DNV GL	DNVGL-CG-0339: 2019

Conformance with EMC Directive 2014/30/EU	
Noise immunity according to	EN 61000-6-2
Noise emission according to	EN 61000-6-3

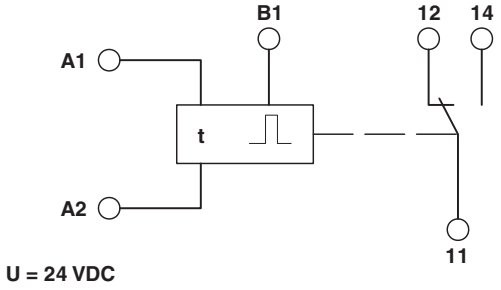
Conformance with Low Voltage Directive 2014/35/EU

Conformance with Standards IEC 61812-1, IEC 60947-5-1

5 Safety notes

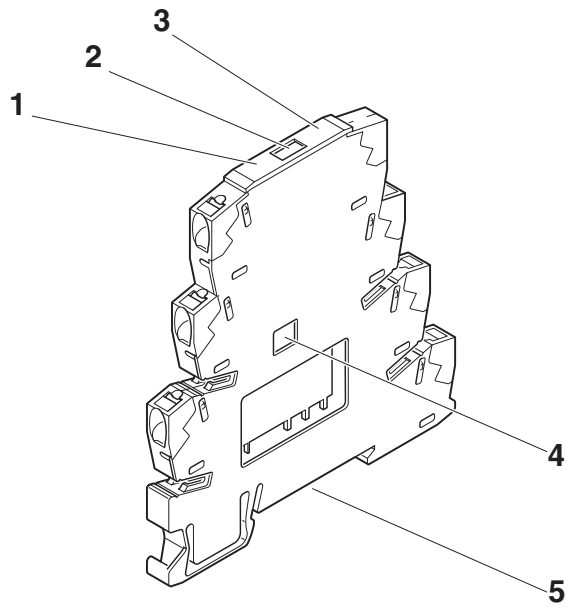
Warning: Do not touch when energized.

6 Basic circuit diagram



U = 24 VDC

7 Structure



1 LED U/t (green): power supply and adjustable time
2 Thumbwheel: preset value
3 LED R (yellow): output relay
4 DIP switch: function selection and time end range
5 Snap-on foot for DIN rail mounting

8 Installation

WARNING: Risk of electric shock
Never carry out work when voltage is present.

The module can be snapped onto all 35 mm DIN rails according to EN 60715.

UL requirement: Use copper cables approved for ≥ 75°C.

9 Configuration

Configuration via DIP switch

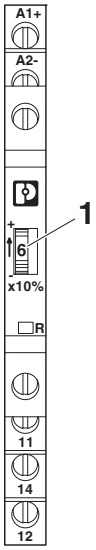
At delivery, all DIP switches are in the "OFF" position.

Configure the DIP switches according to the planned application functions and time end range using the configuration tables.

DIP switch		Function	DIP switch		Time range
S4	S3		S2	S1	
OFF	OFF	E	OFF	OFF	0.1 ... 10 s
OFF	On	Es	OFF	On	3 s ... 300 s
On	OFF	Rs	On	OFF	0.3...30 min
On	On	Bi	On	On	3...300 min

WARNING: Configuration is not recommended when energized

10 Time setting



Screwdriver can be used to adjust time setting (blade width 2.5 mm). Value set for the knurled wheel multipling 10 amounts to the percentage setting value of time end value.

Time end value can be set using DIP switch.

Example:

Specify time end range with DIP switch = 10 s

1 Exact time setting using knurled wheel = 6
6x10% = 60%

Time setting: 60% x 10 s = 6 s

Depending on the setting values of DIP switch and knurled wheel, you can read the time setting value from the table below.

Knurled wheel position	0.1 s - 10 s Time [sec]	3 s - 300 s Time [sec]	0.3 min - 30 min Time [min]	3 min - 300 min Time [min]
0	0.1	3	0.3	3
1	1	30	3	30
2	2	60	6	60
3	3	90	9	90
4	4	120	12	120
5	5	150	15	150
6	6	180	18	180
7	7	210	21	210
8	8	240	24	240
9	9	270	27	270
10	10	300	30	300

All medians (such as 1.5) can be adjusted. If preset time value is between "10" and "0", green LED flashes rapidly.

Adjust knurled wheel according to the ↑ direction of product front panel.

11 Diagnostics

The LEDs indicate the following error states:

LED U/t (green, knurled wheel backlight):

- Fast flashing: no defined time range, between "10" and "0"
- Flashing: supply voltage is present, the set time is elapsing
- Continuous light: supply voltage is present, the set time has expired

LED R (yellow)

- ON: output relay has picked up
- OFF: output relay has dropped out

12 Connection examples

NOTE:

Provide an over-current protection device (I≤4 A) in the installation.

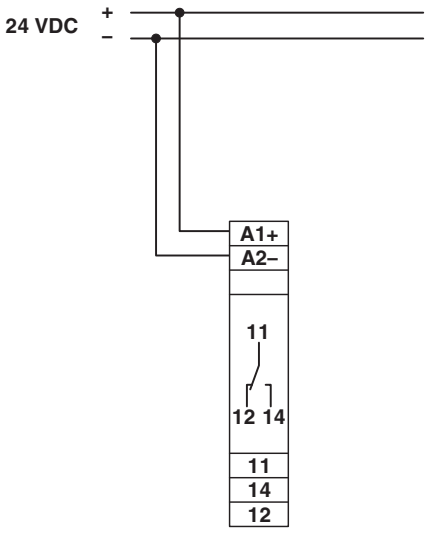


Figure 1 Connection without control contact

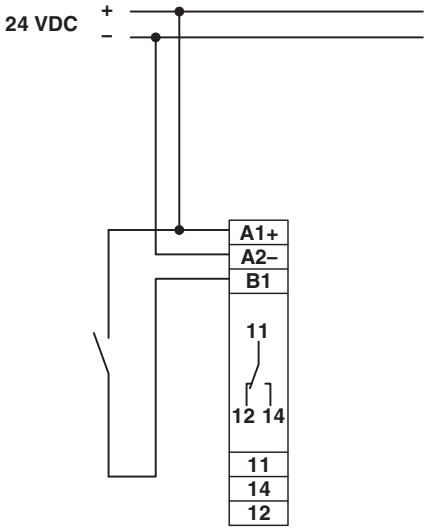


Figure 2 Connection with control contact

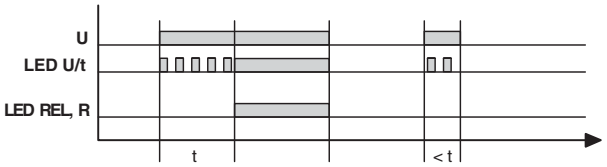
13 Function

NOTE: Module can become damaged

Set functions only when the power supply to modules is disconnected.
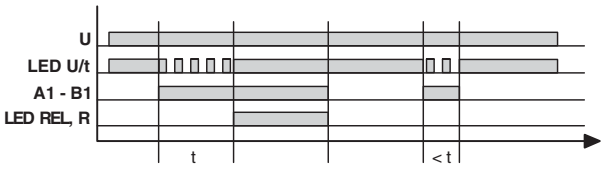
E: With Switch-On Delay

When supply voltage U is applied, set time t starts running (green "U/t" LED flashes). Once time t has elapsed (green "U/t" LED is ON), the output relay picks up (yellow "REL" LED is ON). This state is maintained until supply voltage U is interrupted. If supply voltage U is interrupted before time t has elapsed, the elapsed time is deleted (relay does not pick up). The next time supply voltage U is applied, the time is restarted.



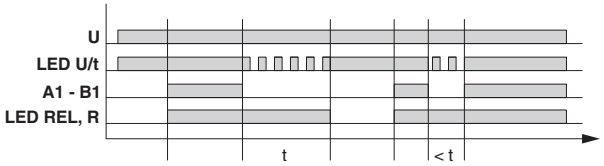
Es: With Switch-On Delay and Control Contact

Supply voltage U must be applied permanently at the device (green "U/t" LED is ON). When control contact A1-B1 is closed, set time t starts running (green "U/t" LED flashes). Once time t has elapsed (green "U/t" LED is ON), the output relay picks up (yellow "REL" LED is ON). This state is maintained until the control contact is opened. If the control contact is opened before time t has elapsed, the elapsed time is deleted (relay does not pick up) and restarted with the next cycle.



Rs: With release delay and control contact

Supply voltage U must be applied permanently at the device (green "U/t" LED is ON). If control contact A1-B1 is closed, output relay picks up (yellow "R" LED is ON). If control contact A1-B1 opens, set time t starts running (green "U/t" LED flashes). After time t has elapsed (green "U/t" LED is ON), output relay drops out (yellow "REL" LED is OFF). If control contact is closed again before time t has elapsed, the elapsed time is deleted and restarted with the next cycle.



Bi: cyclic pulse output (initial status is 1)

When supply voltage U is applied, output relay picks up (yellow "R" LED is ON) and set time t starts running (green "U/t" LED flashes). Once time t has elapsed, output relay drops out (yellow "REL" LED is OFF). Set time t starts running again. Output relay is triggered at a ratio of 1:1, until supply voltage is interrupted.

