

WEEKLY AND ASTRONOMICAL TIME RELAYS TMRTC AND TMAST



WEEKLY AND ASTRONOMICAL TIME RELAYS

THE RANGE



WEEKLY AND ASTRONOMICAL TIME RELAYS

THE RANGE

TMRTC weekly time relay



Purpose

Control the activation of the relay output at user-programmable time intervals based on **the day and time of the week**. Examples:

- Monday to Friday from 8:00 am to 5:30 pm
- Tuesday and Thursday from 8:00 p.m. to 8:20 p.m.
- Every day from 5:00 p.m. to 5:15 p.m.

TMAST astronomical time relay



Purpose

Automatic calculation of **sunrise and sunset times** for a specific location based on the geographical coordinates set (latitude and longitude).

Applications: control of public lighting, car park lights, fountain and monument lights, shop windows, illuminated signs.

WEEKLY AND ASTRONOMICAL TIME RELAYS

COMMON TECHNICAL
FEATURES



WEEKLY AND ASTRONOMICAL TIME RELAYS

TECHNICAL CHARACTERISTICS



TMRTC



TMAST

- Auxiliary power supply **220...240VAC** 50/60Hz
- 1 NO relay output **16A** 250VAC, dry contact
- **Zero crossing** load switching, ideal for controlling LED lamps
- **Integrated Real Time Clock**
- **NFC connectivity** for programming from Android and iOS smart devices with the LOVATO NFC app
- **Integrated backup battery** (not replaceable) for maintaining date and time in the absence of power supply, duration **>10 years** (in the absence of power)
- Front button for manual control
- Automatic summer/winter time change
- Modular enclosure (1U), mounting on 35mm DIN rail.

WEEKLY AND ASTRONOMICAL TIME RELAYS

INTEGRATED REAL TIME CLOCK



RTC

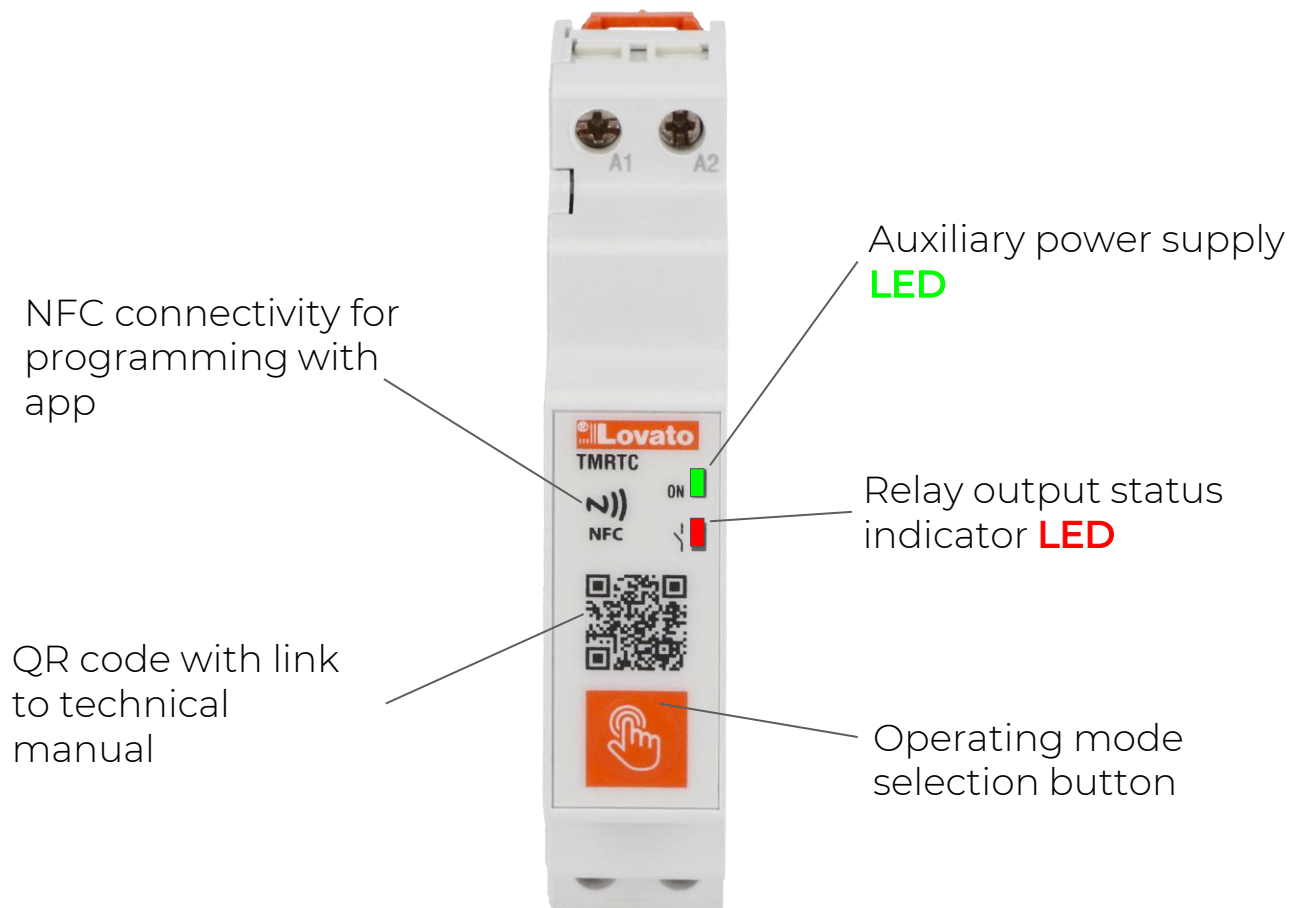


Time zone

- **Integrated clock** with date and time (RTC, Real Time Clock)
- **Integrated backup battery** for maintaining date and time in the absence of power, duration **>10 years** (in the absence of power)
- Automatic daylight saving time management, with a choice of 4 different geographical areas (Europe, USA, Australia, New Zealand)
- Automatic acquisition of date and time from the smartphone used for configuration.

WEEKLY AND ASTRONOMICAL TIME RELAYS

FRONT LAYOUT



- **2 status LEDs:**

- Green LED, indicating the presence of power supply (steady on = power supply present and automatic mode active, flashing = holiday mode active)
- Red LED to indicate the status of the relay output (off = open, steady on = closed, short flash = new programming received, continuous flash = date and time must be set)

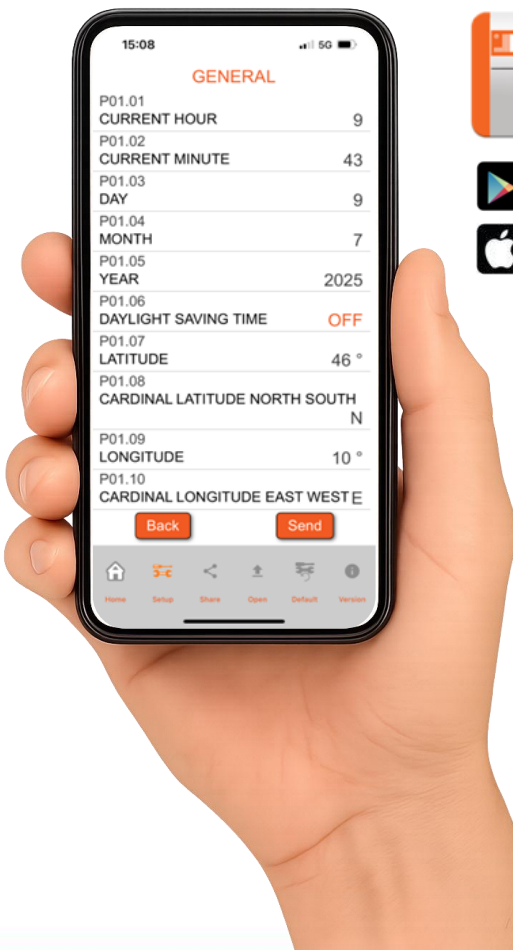
- **NFC connectivity**

- **QR code** for link to www.LovatoElectric.com for downloading the technical manual

- **Button** for selecting the **operating mode**, choosing between automatic, manual and holiday.

WEEKLY AND ASTRONOMICAL TIME RELAYS

NFC CONNECTIVITY



- Integrated **NFC connectivity** on the front for parameter configuration with the LOVATO NFC **app**, compatible with Android and iOS smart devices
- LOVATO NFC app can be downloaded free of charge from Google Play Store and App Store
- Advantages:
 - Easy access from the front
 - **Electrical safety** (no access to live parts)
 - Operation even when the device **is not powered**
 - **Password** protection against parameter tampering
 - Possibility to **save** the programming and **transfer** it to other devices of the same model in a very short time or send it by email.

WEEKLY AND ASTRONOMICAL TIME RELAYS

OPERATING MODE



3 modes:



Automatic



Manual



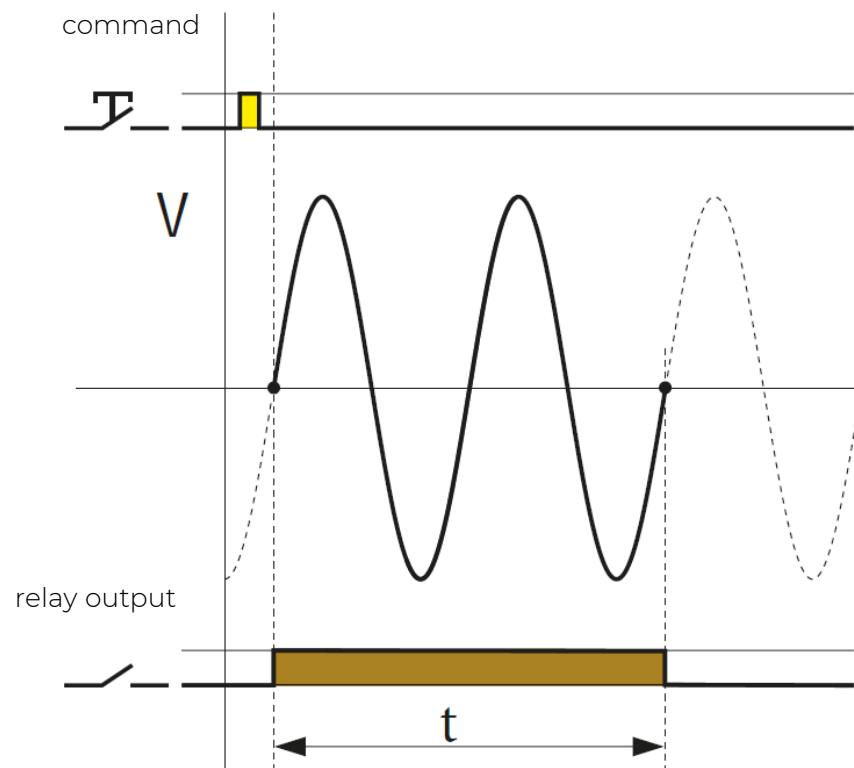
Holiday

Operating modes:

- **Automatic:** the timer runs the program for which it has been configured
- **Manual:** if the front button is pressed briefly (1 second) during automatic operation, the output switches its status. The timer automatically returns to normal operation at the first useful trigger (i.e. when the programming requires activation or deactivation) or by resetting the auxiliary power supply
- **Holiday** (permanent manual): if the front button is pressed and held (>5s) during automatic operation, the output switches its status and remains in this status. To restore normal operation, briefly press the front button.

WEEKLY AND ASTRONOMICAL TIME RELAYS

ZERO CROSSING TECHNOLOGY



Zero crossing technology

- Load switching with zero crossing technology, which allows monitoring of the sinusoidal mains voltage and switching the load on at the exact moment when the voltage passes through zero
- Advantages:
 - **Reduction of the inrush current** generated when the load is activated, which can reach very high values, especially when controlling LED lamps
 - **Load protection** and consequent extension of electrical life
 - **Protection of the timer relay contact** from the risk of welding
 - **Reduction in consumption.**

WEEKLY AND ASTRONOMICAL TIME RELAYS

WEEKLY TIME RELAY TMRTC

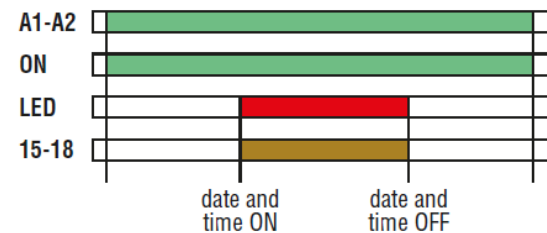


WEEKLY AND ASTRONOMICAL TIME RELAYS

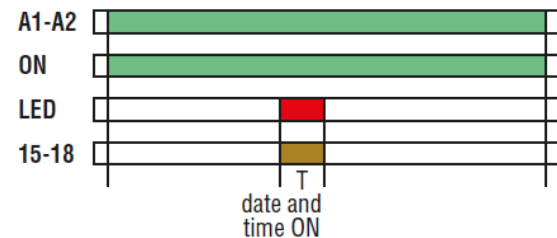
TMRTC: GENERAL FEATURES



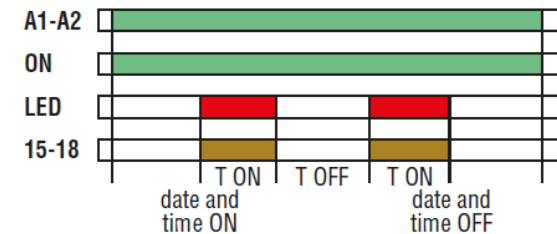
Timing with start and end at a set time



Pulse



Intermittent



- Time relay with **weekly time programming**
- Up to 16 different RTC function blocks can be configured and combined with each other
- For each function block, you can configure:
 - Activation date and time
 - Function type, selectable from:
 - ON (switch on)
 - OFF (switch off)
 - Pulse (generation of a timed pulse)
 - Intermittent (the output switches on and off cyclically, with configurable times)
 - Days of the week on which to perform the function.

WEEKLY AND ASTRONOMICAL TIME RELAYS

TMRTC: TYPICAL APPLICATIONS



Public or private lighting



Siren/bell control



Air conditioning



Automatic irrigation



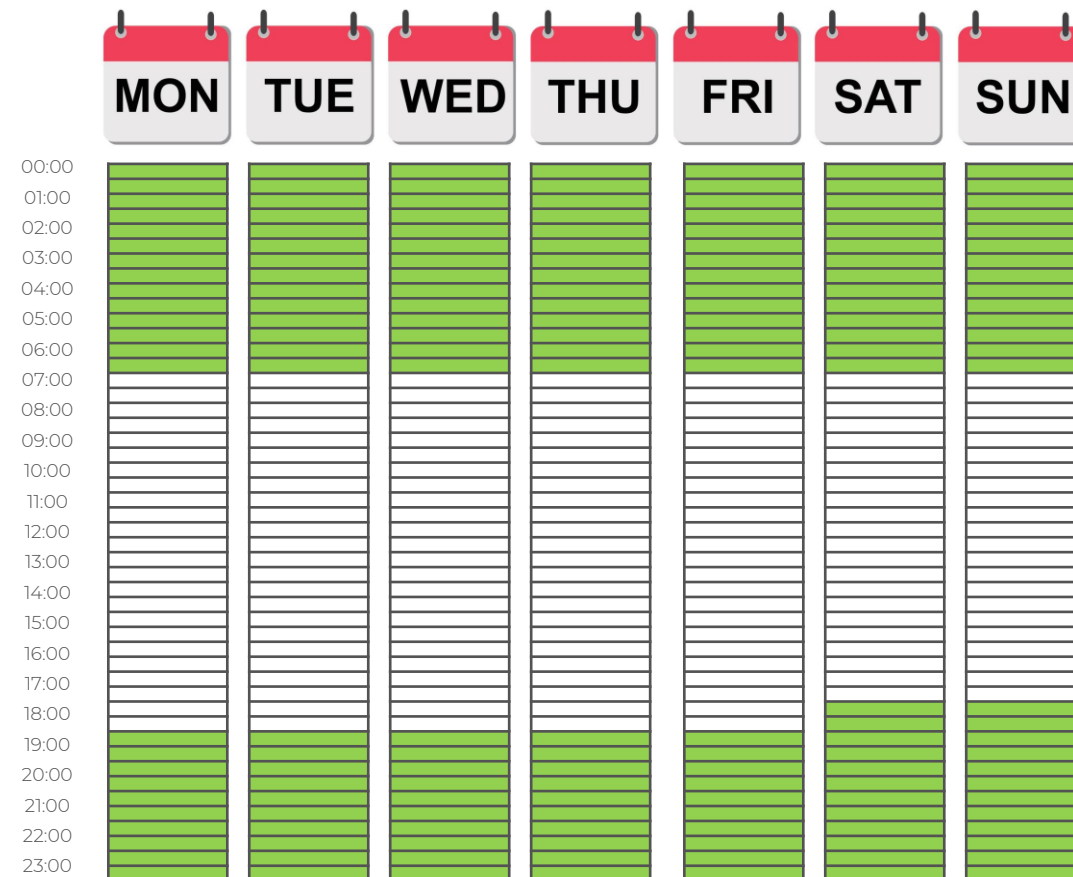
WEEKLY AND ASTRONOMICAL TIME RELAYS

TMRTC: EXAMPLES OF OPERATION: ON-OFF

EXAMPLE 1. GARDEN LIGHT CONTROL

Programming

- Monday to Friday: switch on at 18:30 until 7:00
- Saturday and Sunday: switch on at 17:30 until 7:00.



WEEKLY AND ASTRONOMICAL TIME RELAYS

TMRTC: EXAMPLES OF OPERATION: ON-OFF

EXAMPLE 1. GARDEN LIGHT CONTROL

Programming

- Monday to Friday: switch on at 18:30 until 7:00
- Saturday and Sunday: switch on at 17:30 until 7:00.



Parameter	Description	Setting
PRG01: ON from Monday to Friday at 18:30 (6.30 p.m.)		
P02.01.01	Command time	18
P02.01.02	Command minute	30
P02.01.03	Function	ON
P02.01.04	Days	MON, TUE, WED, THU, FRI
PRG02: ON from Saturday to Sunday at 17:30 (5.30 p.m.)		
P02.02.01	Command time	17
P02.02.02	Command minute	30
P02.02.03	Function	ON
P02.02.04	Days	SAT, SUN
PRG03: OFF every day at 7:00		
P02.03.01	Command time	7
P02.03.02	Command minute	0
P02.03.03	Function	OFF
P02.03.04	Days	MON, TUE, WED, THU, FRI, SAT, SUN

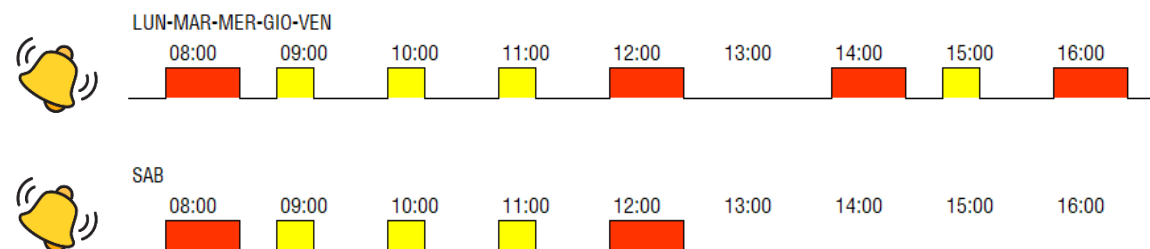
WEEKLY AND ASTRONOMICAL TIME RELAYS

TMRTC: EXAMPLES OF OPERATION: PULSE

EXAMPLE 2. SCHOOL BELL CONTROL

Programming

- Lessons in the morning from Monday to Saturday, 08:00-12:00
- Afternoon lessons from Monday to Friday, 14:00-16:00
- Start and end of lessons: bell rings for **20 seconds**
- Change of hour: bell rings for **5 seconds**.



WEEKLY AND ASTRONOMICAL TIME RELAYS

TMRTC: EXAMPLES OF OPERATION: PULSE

EXAMPLE 2. SCHOOL BELL CONTROL

Programming

- Lessons in the morning from Monday to Saturday, 08:00-12:00
- Afternoon lessons from Monday to Friday, 14:00-16:00
- Start and end of lessons: bell **20 seconds (PULSE 1)**
- Change of hour: bell **5 seconds (PULSE 2)**.



Parameter	Description	Setting
PRG01: Long pulse from Monday to Saturday at 8:00 a.m.		
P02.01.01	Command time	8
P02.01.02	Command minute	0
P02.01.03	Pulse	PULSE1
P02.01.04	Days	MON, TUE, WED, THU, FRI, SAT
PRG02: Short pulse from Monday to Saturday at 9:00 a.m.		
P02.02.01	Command hour	9
P02.02.02	Command minute	0
P02.02.03	Pulse	PULSE2
P02.02.04	Days	MON, TUE, WED, THU, FRI, SAT
PRG03: Short pulse from Monday to Saturday at 10:00 a.m.		
P02.03.01	Command time	10
P02.03.02	Command minute	0
P02.03.03	Function	PULSE2
P02.03.04	Days	MON, TUE, WED, THU, FRI, SAT
PRG04: Short pulse from Monday to Saturday at 11:00 a.m.		
P02.04.01	Command hour	11
P02.04.02	Minute control	0
P02.04.03	Function	PULSE2
P02.04.04	Days	MON, TUE, WED, THU, FRI, SAT
PRG05: Long pulse from Monday to Saturday at 12:00 p.m.		
P02.05.01	Command time	12
P02.05.02	Command minute	0
P02.05.03	Function	PULSE1
P02.05.04	Days	MON, TUE, WED, THU, FRI, SAT
PRG06: Long pulse from Monday to Friday at 2 p.m.		
P02.06.01	Start time	14
P02.06.02	Command minute	0
P02.06.03	Function	PULSE1
P02.06.04	Days	MON, TUE, WED, THU, FRI
PRG07: Short pulse from Monday to Saturday at 3 p.m.		
P02.07.01	Command time	15
P02.07.02	Command minute	0
P02.07.03	Function	PULSE2
P02.07.04	Days	MON, TUE, WED, THU, FRI
PRG08: Long pulse from Monday to Friday at 4 p.m.		
P02.08.01	Start time	16
P02.08.02	Command minute	0
P02.08.03	Function	PULSE1
P02.08.04	Days	MON, TUE, WED, THU, FRI

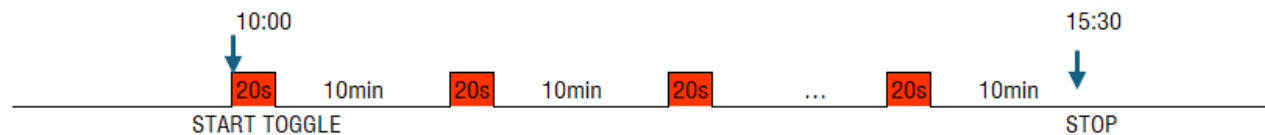
WEEKLY AND ASTRONOMICAL TIME RELAYS

TMRTC: EXAMPLES OF OPERATION: INTERMITTENT

EXAMPLE 3. MACHINERY CONTROL PERFORMING A CYCLICAL PROCESS

Program

- Start at 10:00
- End at 15:30
- Within this time frame, the output switches its status cyclically for 20 seconds ON and 10 minutes OFF.



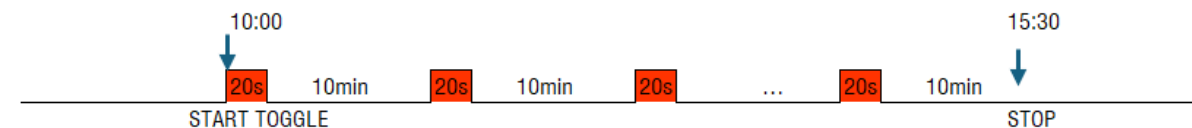
WEEKLY AND ASTRONOMICAL TIME RELAYS

TMRTC: EXAMPLES OF OPERATION: INTERMITTENT

EXAMPLE 3. MACHINERY CONTROL PERFORMING A CYCLICAL PROCESS

Program

- Start at 10:00
- End at 15:30
- Within this time frame, the output switches its status cyclically for 20 seconds ON and 10 minutes OFF.



Parameter	Description	Setting
Setting the flashing times		
P01.10	Intermittent duration ON	20 sec
P01.11	Intermittent duration OFF	60
PRG01: flashing starting at 10:00		
P02.02.01	Command time	10
P02.02.02	Command minute	0
P02.02.03	Function	INTERMITTENT
P02.02.04	Days	MON, TUE, WED, THU, FRI, SAT, SUN
PRG03: OFF at 15:30		
P02.03.01	Command time	15
P02.03.02	Command minute	30
P02.03.03	Function	OFF
P02.03.04	Days	MON, TUE, WED, THU, FRI, SAT, SUN

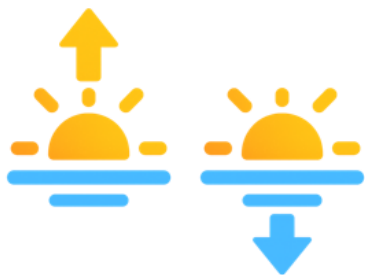
WEEKLY AND ASTRONOMICAL TIME RELAYS

ASTRONOMICAL TIMER
TMAST

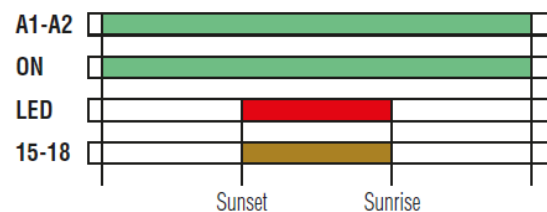


WEEKLY AND ASTRONOMICAL TIME RELAYS

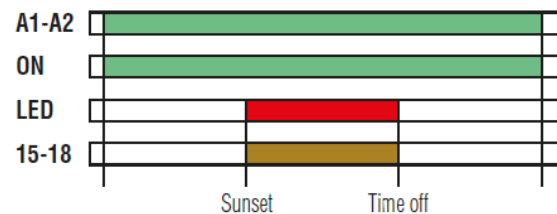
TMAST: GENERAL FEATURES



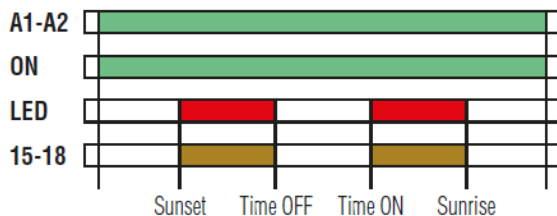
Switch-on from sunset to sunrise



Switch-on at sunset and switch-off at a set time



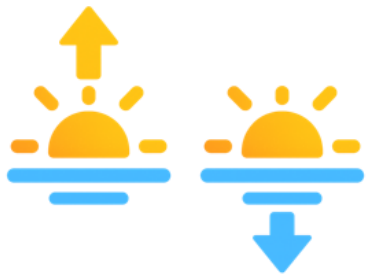
Switch-on at sunset and switch-off at a set time, switch-on again at a later time and switch-off at sunrise



- **Astronomical** timer
- Automatic calculation **of sunrise and sunset times** for a specific location based on the geographical coordinates set
- Automatic acquisition of date, time, geographical coordinates and time zone from the smartphone used for configuration
- Available operating modes:
 - Switch on from sunset to sunrise
 - Switch on at sunset and switch-off at a set time
 - Switch on at sunset and turns off at a set time, switch-on again at a later time and switch-off at sunrise.

WEEKLY AND ASTRONOMICAL TIME RELAYS

TMAST: TYPICAL APPLICATIONS



Public lighting



Car park lights



Illuminated signs, shop windows



Fountain lights, monuments, etc.



WEEKLY AND ASTRONOMICAL TIME RELAYS

MAIN COMPETITORS



WEEKLY AND ASTRONOMICAL TIME RELAYS

MAIN COMPETITORS



Lovato
electric



finder
SWITCH TO THE FUTURE



Schneider
Electric



SIEMENS



Vemer
SPA



ABB



bticino



ELECTRIC
PERRY

Lovato
electric

WEEKLY AND ASTRONOMICAL TIME RELAYS

SELLING POINTS VS COMPETITORS

- **Compact size**, only 1 DIN module
- **Much simpler** and **more** intuitive **programming**
 - User-friendly app graphical interface, with clear descriptions
 - No display with small, unclear and difficult to read icons
 - No small buttons that are difficult to press
- **Zero crossing** technology to preserve the relay contact
- Possibility to **copy** settings and transfer them to other time relays of the same model via NFC app
- Programming even when the device **is powered off**
- **No need to replace the battery** (used only to maintain the date and time when the power is off, not to maintain the program).





THANK YOU FOR
YOUR
ATTENTION!

