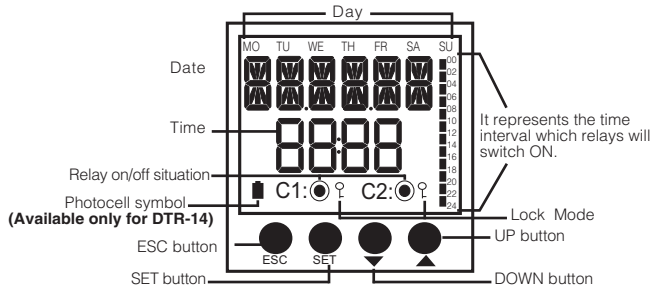
# ASTRONOMIC RELAY (DTR-10)
# ASTRONOMIC PHOTOCELL RELAY (DTR-14)

DTR-10/14 which has a real time clock, is an electronic timer that calculate the sunset and sunrise periods automatically. It designed for controlling the devices which are connected to it's contacts according to sunset, sunrise and the time periods which are proggrammed by the user. DTR-14 has also a photocell option in addition to above features.




**ESC button** : Go to previous menu.
**SET button** : Go to next menu.
**DOWN button**: Scrolling between menus or decreasing related value. Pushing this button 3 seconds on DTR-10's main menu, C1 relay position will be changed manually. Selecting Lock Mode at DTR-14, C1 relay will be on/off on main menu.
**UP button** : Scrolling between menus or increasing related value. Pushing this button 3 seconds on DTR-10's main menu, C2 relay position will be changed manually. Selecting Lock Mode at DTR-14, C2 relay will be on/off on main menu.

### Safety Precautions

If below precautions are not properly observed and carried out, it can cause to physical accident or damage to the device and installation.
- Disconnect power before working on the device.
- When device is connected to the network, do not remove the front panel.
- Do not clean the device with solvent or similar items. Only clean with dried cloth.
- Verify correct terminal connections before operate the device.
- Connect the device to the electrical panel.
- Electrical equipment should be serviced only by your competent seller.

**No responsibility is assured by the manufacturer or any of its subsidiaries for any consequences rising out of the use of this material.**

• If the auxiliary supply does not exist, device passes to sleep mode and display disappears. However, real time clock and related functions continue to operate. If 4 buttons are pressed at the same time, main menu displays and so user can see or change all settings.

• **The loads connected to the C1/C2 relays do not function if auxiliary supply is off. Even relay status can be mentioned as "on" (C1◉ ve /veya C2◉), but auxiliary supply is a must for the functionality.**

• There are two reserves in the device. Programmed data is protected by these reserve against power failure.

• For long time reserve, battery CR-2032 is used. The shelf life of this battery is 5 years, if the device is continously voltage supplied. If the device is not continously voltage supplied and waited in the shelf, the life of the battery is 2-3 years (changes according to humidity of the shelf).

• For short time, super capacitor is used:

• If power fails for 6-10 hours, programmed data is protected by super capacitor and device continues to its operation. During this time battery (CR2032) is not used; so battery life extends.

• CR-2032 reserve battery should only be changed by authorized service.

• In order to use the photocell function, photocell sensor and auxiliary supply always must be connected. **(Available only for DTR-14)**

## MANUEL USING :

Using DTR-10's relay on manuel mode, display must be on main menu. Pushing DOWN (▼) button during 3 seconds C1 relay; pushing UP (▲) button during 3 seconds C2 relay; After 3 seconds releasing this button related relays position will change. If relays at ON position it will be OFF, at OFF position it will be ON. Lock Mode selection does not affect this application (For details please look at LOCK MODE section).

Using DTR-14's relay on manuel mode, Lock Mode must be selected. On main menu Lock sign (🔑) must be displayed. Changing C1 relay position use Down (▼) button, for C2 relay use UP (▲) button.
**Note: Push same button for returning previous position of relay.**

## MENUS :

### 1 ) PROGRAM (PROG) :

In this menu, program settings can be done. **Only one function ON or OFF can be assigned to each program. Only one of TIME, SUNRISE or SUNSET functions can be selected (assigned) for this function. The day and/or days of active can be selected separately for this program.** 4 different program assigned in order to make eaiser the using of device by switch it ON at "sunset" time and switch OFF at "sunrise" time. These programs which are assigned as default, can be deleted or changed by the user.

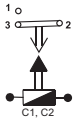
Related steps are mentioned as below:

**1.1) Program selection (P01...P16):** Device has 16*different programs. User can assign 1 function to any program between P01-P16. Only 1 relay can be selected via one program and also this relay can only be set as "switch on" or "switch off".
For instance; If the status of C1 relay is set as "ON (switch on)", 1 program is used.
In order to switch off the relay which was set as "ON" before, another program must be used (Such as 2nd program).
Star sign which exists after the program number (P01- *) represents that the program is assigned.
***There are 15 different program choices for DTR-10 (P01...P15).**

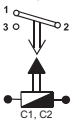
**1.2) Enter / Delete settings ( P01ENT / P01DEL ) :** P01ENT is used to set a new program or to change the existing program. " P01DEL" is used to delete the existing program.
The relay, which is switched on via any program, can not be switched off by deleting the related program. We can switch off the relay in two ways:
**a)** Released with manually (for details please look at MANUAL USING section).
**b)** Enter the switch off time (OFF) for any relay. Delete the program after the relay switched it off (OFF).

**1.3) C1 / C2 relay selection ( P01-C1 / P01-C2 ):** C1 or C2 relay can be selected via "P01-C1" or "P01-C2". 2 different loads can be controlled with different functions in this way.

**1.4) ON/OFF selection ( C1-ON / C1-OFF) / ( C2-ON / C2-OFF) :** In this menu, it is selected that whether selected C1 or C2 relay will switch on or switch off.




When programmed C1-ON or C2-ON in program menu, related relays are programmed as ON. Relay contact position looks like on the figure at left side. Relay contacts seem at monitor as C1◉ or C2◉.

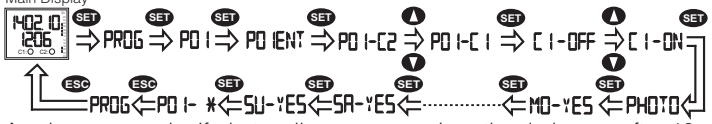



When programmed C1-OFF or C2-OFF in program menu, related relays are programmed as ON. Relay contact position looks like on the figure at left side. Relay contacts seem at monitor as C1○ or C2○.

**1.5) Function selection ( PHOTO / TIME / SUNRSE / SUNSET ) :** Function selection is done in this menu. 1 function can be selected for each program. 4 functions exist: Photo, time, sunset and sunrise. **("PHOTO" function available only for DTR-14)**

**1.5.1)** ( PHOTO )
When photocell sensor perceives the light, ( ▮ ) symbol lights.
If lights do not exist, this symbol does not light.
C1 relay can be switched on at all weekdays via photocell function by using P01 program.

Main Display

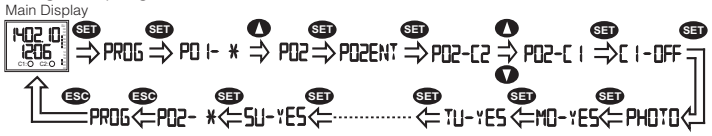



As above example, if photocell sensor perceives the darkness, after 10 seconds, photocell symbol ( ▮ ) does not light on the main menu and the relay switches on within 1 minute.

**NOTE:** Device can only switch on between 12:00 AM and 24:00 PM. Device can not switch on except this time interval.

C1 relay can be switched off at all weekdays via photocell function by using P02 program.

Main Display



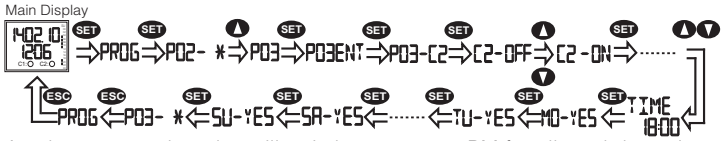

As above example, if photocell sensor detects the daylight, after 10 seconds, photocell detected symbol ( ▮ ) lights on the main menu and the relay switches off within 1 minute.

**NOTE:** Device only can switch off between 24:00 PM and 12:00 AM. Device can not switch off except this time interval.

Device can switch on&off once per day via photocell function. Device can not switch on/off more than once.

**1.5.2)** ( TIME ) Selected relay can be switched on/off at defined time period.

Main Display




As above example, relay will switch on at 18:00 PM for all weekdays via time function.

**NOTE :** Device calculates the sunrise and sunset times automatically according to the summer/winter time and coordinate information which are set by user.

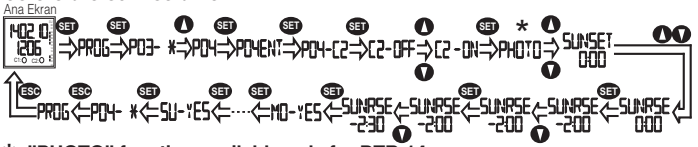
# ASTRONOMIC RELAY (DTR-10)
# ASTRONOMIC PHOTOCELL RELAY (DTR-14)

**1.5.3)** ( SUNRSE ) In this menu, sunrise function is enabled however sunrise time is not set.


Relay can be controlled before or after the sunrise time according to the entered time information. This value can be set as hour or minute. (Max: +9:59, Min: -9:59)

If "0:00" is set, relay will be controlled at sunrise time. By this feature, devices which are connected to the relays, can be controlled after or before the sunrise time.

Ana Ekran




*** :"PHOTO" function available only for DTR-14**

As above example, C2 relay will switch on 2 hours 30 minutes before the sunrise time for all weekdays.

**1.5.4)** ( SUNSET ) In this menu, sunset function is selected.


Sunset settings are similar with sunrise settings.

Ana Ekran




*** :"PHOTO" function available only for DTR-14**

As above example, C2 relay will switch off 1 hour 50 minutes before the sunset time for all weekdays.

**1.6) Day selection ( MO-YES / MO-NO , ..... , SU-YES / SU-NO ) :**

As last, working days for selected programs are set. This setting can be done for all days starting from Monday.


If "YES" selected, program function is enabled for related day.


If "NO" selected, program function is disabled for related day.

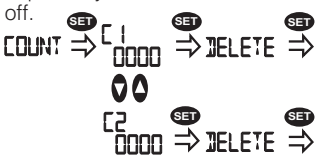
Main Display




As above example, program function is enabled for Monday, Wednesday and Friday.

## 2 ) SWITCH ON & OFF NUMBER of RELAYS (COUNT) :

In this menu, switch on&off numbers are displayed for C1 and C2 relay seperately. Device counts once for switching on and once for switching off.




Count number of C1 or C2 relay can be reset seperately by selecting DELETE option.

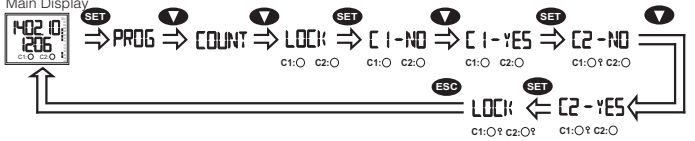
## 3 ) LOCK (MANUAL CONTROL) MODE ( LOCK) :

C1:○ C2:○ C1 and C2 relays can be locked individually for DTR-14 and they can be locked together for DTR-10.

A lock sign (⚿) displays near the relay which is locked.

**Below diagrams show that how devices can be locked; above diagram is for DTR-14, below is for DTR-10.**

Main Display

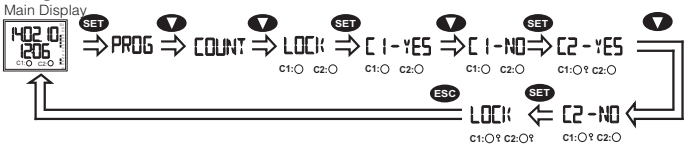



Main Display Main Display


C1:○ C2:○ When LOCK mode is disabled, device continues to work by the last program.

**Below diagrams show that how LOCK menu can be disabled; above diagram is for DTR-14, below is for DTR-10.**

Main Display




Main Display Main Display


## 4 ) REAL TIME SETTING ( TIME) :

Real time and date settings are done in this menu. Year, month, day, hour and minute can be set respectively.

## 5 ) GEOGRAPHICAL LOCATION SETTING ( ZONE ) :

Geographical location, which device will be used in, can be set in this menu.

For related settings, please refer to **Table-1**.

If some missing or inaccurate data is entered, wrong sunrise and sunset times are calculated.

Time zone (TIMZON), latitude (LATITU) and longitude (LONGIT) submenus exist in this menu.


Time difference (UTC/GMT) according to the Greenwich, London is set. This value is '02' for Turkey. Negative time differences must be subtracted from '24'. For example, time difference for Mexico City is '-6' hours and so TIMZON value must be set as '18'. (24-6=18)

Values which are mentioned in **Table-1** are calculated before. Therefore, there is no need to calculate these values again.

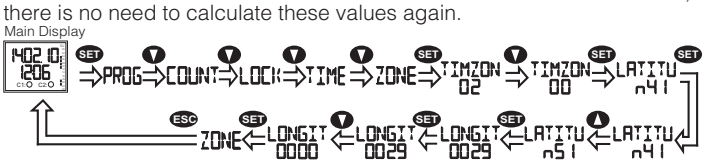

Latitude value is set in this menu. North (n)/South (S) hemisphere is selected and related degree value is set.
(For example, Istanbul, North (n) 41°.


Longitude value is set in this menu. If the longitude is east, degree value is set directly. If the longitude is west, degree value is subtracted from 360° and then entered. (For example, Istanbul, East (e) 29°).

For instance, longitude value is 99° west for Mexico City and so longitude value must be set as '261'. (360-99=261)

Values which are mentioned in **Table-1** are calculated before. Therefore, there is no need to calculate these values again.

Main Display




The programming of geographical zone for London is mentioned above.

## 6 ) SUMMER / WINTER TIME SETTING ( SEASON) :

In this menu, summer/winter time settings are done.

**6.1)** If Auto ( AUTO) menu is selected, last sunday of March 02.00 AM and last Sunday of October 03.00 AM are loaded. For Turkey and Europe, automic mode is in use.

**6.2)** Date and hour also can be set by user manually via manual (MANUAL ) menu.

First, month, day, hour and minute is set for summer tariff (WS) and then same settings are done for winter tariff (SW).

**6.3)** If summer/winter time application does not exist in the related region, NOTUSE option must be selected.


Main Display Main Display

## 7 ) FACTORY SETTING ( DEFAUL ) :

In this menu, all settings are reset except hour and date. By selecting LOAD option, all programs are reset, counters are reset, relays, which are switched on, are switched off, lock mode is disabled. Coordinates are programmed according to Istanbul, season is set as auto and LCD contrast value is set as '13'.


Main Display Main Display

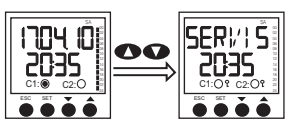
## 8 ) LCD CONTRAST SETTING ( LCDCNT) :

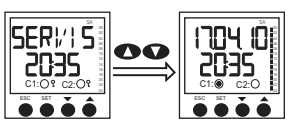
LCD contrast value can be set between '0-15' by user.


Main Display Main Display

## 9 ) SERVICE MODE (SERVIS):

**This mode is valid only for DTR-10** and lets the user control and maintain in urgent situations. In order to choose service mode, lock mode shouldn't be selected before. In the main menu, up and down buttons (▲▼) should be pressed **at the same time.** When this mode is selected, assigned programs can not change the relay position. " SERVIS" and lock signs (⚿) are displayed. In order to exit the service mode, up and down buttons should be pressed at the same time. Date information will be displayed instead of " SERVIS ". Lock sign will be removed. In case of escaping the "service mode", the last program continues its execution. For user safety, it is not possible to enter to lock ( LOCK ) and factory settings ( DEFAUL ) modes, when service mode is activated.



# ASTRONOMIC RELAY (DTR-10)
# ASTRONOMIC PHOTOCELL RELAY (DTR-14)

## DISPLAYS :

Settings, which are done in the 'menus' section, can be observed in this section. It is not possible to set any parameter in this section.


On the main menu, dashes, which exist near the numbers between '00-24', represent total working time of C1 and C2 relay.

Displays can be observed by pressing ESC button.
Regarding to assign programs, dashs which are next to the numbers of 00 - 24, represent for “switch on” and “switch off” time of the relays. Each dash represents two hours.


This display represents working time (cronogram) of C1 relay and also working time internal which relay will operate. As this example, C1 relay will switch on for 4 hours between 18-22.


As above example, C2 relay will switch on for 8 hours. As the left side example, “08:00” shows the duration of how long C2 relay will be switched on. If switch on time is set 05:01 instead of 04:00, “04-06” interval does not have any dashes and also working time becomes 06:59 instead of 08:00.


This display represents the sunrise time which is calculated according to coordinate, season and real time settings. According to this example, sunrise time is 05:30 AM


This display represents the sunset time which is calculated according to coordinate, season and real time settings. According to this example, sunset time is 18:38 PM.

| | UTC / GMT | LATITUDE | LONGITUDE | DST |
|---|---|---|---|---|
| Accra, Ghana | 0 | n 06 | 0360 | No known DST |
| Addis Ababa, Ethiopia | 3 | n 09 | 0039 | No known DST |
| Aden, Yemen | 3 | n 13 | 0045 | No known DST |
| Algiers, Algeria | 1 | n 37 | 0003 | No known DST |
| Amman, Jordan | 2 | n 32 | 0036 | 26-03-2010, 00:00 / 29-10-2010, 01:00 |
| Amsterdam, Netherlands | 1 | n 52 | 0005 | 28-03-2010, 02:00 / 31-10-2010, 03:00 |
| Andorra La Vella, Andorra | 1 | n 43 | 0002 | 28-03-2010, 02:00 / 31-10-2010, 03:00 |
| Athens, Greece | 2 | n 38 | 0024 | 28-03-2010, 03:00 / 31-10-2010, 04:00 |
| Baku, Azerbaijan | 4 | n 40 | 0049 | 28-03-2010, 04:00 / 31-10-2010, 05:00 |
| Beirut, Lebanon | 2 | n 34 | 0036 | 28-03-2010, 00:00 / 31-10-2010, 00:00 |
| Bangkok, Thailand | 7 | n 14 | 0100 | No known DST |
| Bern, Switzerland | 1 | n 47 | 0007 | 28-03-2010, 02:00 / 31-10-2010, 03:00 |
| Bogota, Colombia | 19 | n 05 | 0286 | No known DST |
| Brussels, Belgium | 1 | n 51 | 0004 | 28-03-2010, 02:00 / 31-10-2010, 03:00 |
| Buenos Aires, Argentina | 21 | n 34 | 0301 | No known DST |
| Cairo, Egypt | 2 | n 30 | 0031 | 30-04-2010, 00:00 / 06-08-2010, 00:00 |
| Caracas, Venezuela | 20 | n 11 | 0293 | No known DST |
| Casablanca, Morocco | 0 | n 34 | 0352 | No known DST |
| Copenhagen, Denmark | 1 | n 56 | 0013 | 28-03-2010, 02:00 / 31-10-2010, 03:00 |
| Damascus, Syria | 2 | n 34 | 0036 | 26-03-2010, 00:00 / 29-10-2010, 00:00 |
| Dhaka, Bangladesh | 6 | n 24 | 0090 | 31-03-2010, 23:00 / 01-11-2010, 00:00 |
| Doha, Qatar | 3 | n 25 | 0052 | No known DST |
| Dubai, United Arab Emirates | 4 | n 25 | 0055 | No known DST |
| Dublin, Ireland | 0 | n 56 | 0347 | 28-03-2010, 01:00 / 31-10-2010, 02:00 |
| Berlin, Germany | 1 | n 53 | 0013 | 28-03-2010, 02:00 / 31-10-2010, 03:00 |
| Glasgow, Scotland | 0 | n 56 | 0356 | 28-03-2010, 01:00 / 31-10-2010, 02:00 |
| Helsinki, Finland | 2 | n 60 | 0024 | 28-03-2010, 03:00 / 31-10-2010, 04:00 |
| Havana, Cuba | 19 | n 23 | 0278 | 14-03-2010, 00:00 / 31-10-2010, 01:00 |
| Hong Kong, China | 8 | n 22 | 0114 | No known DST |
| Islamabad, Pakistan | 5 | n 34 | 0073 | 15-04-2010, 00:00 / 01-11-2010, 00:00 |
| Istanbul | 2 | n 41 | 0029 | 28-04-2010, 03:00 / 31-10-2010, 04:00 |
| Jerusalem, Israel | 2 | n 32 | 0035 | 26-03-2010, 02:00 / 12-09-2010, 02:00 |
| Johannesburg , South Africa | 2 | s 26 | 0028 | No known DST |
| Khartoum, Sudan | 3 | n 16 | 0033 | No known DST |
| Kuala Lumpur, Malaysia | 8 | n 03 | 0102 | No known DST |

| | UTC / GMT | LATITUDE | LONGITUDE | DST |
|---|---|---|---|---|
| Kiev, Ukraine | 2 | n 50 | 0030 | 28-03-2010, 03:00 / 31-10-2010, 04:00 |
| Lagos, Nigeria | 1 | n 12 | 0009 | No known DST |
| Lefkosa, Cyprus | 2 | n 32 | 0036 | 28-03-2010, 03:00 / 31-10-2010, 04:00 |
| Lima, Peru | 19 | s 12 | 0283 | No known DST |
| Lisbon, Portugal | 0 | n 39 | 0351 | 28-03-2010, 01:00 / 31-10-2010, 02:00 |
| London, United Kingdom | 0 | n 52 | 0000 | 28-03-2010, 01:00 / 31-10-2010, 02:00 |
| Madrid, Spain | 1 | n 40 | 0356 | 28-03-2010, 02:00 / 31-10-2010, 03:00 |
| Manila, Philippines | 8 | n 15 | 0121 | No known DST |
| Mexico City, Mexico | 18 | n 19 | 0261 | 04-04-2010, 02:00 / 31-10-2010, 02:00 |
| Monrovia, Liberia | 0 | n 06 | 0349 | No known DST |
| Moscow, Russia | 3 | n 56 | 0038 | 28-03-2010, 02:00 / 31-10-2010, 03:00 |
| Nairobi, Kenya | 3 | s 01 | 0037 | No known DST |
| New Delhi, India | 5 | n 29 | 0077 | No known DST |
| Oslo, Norway | 1 | n 60 | 0011 | 28-03-2010, 02:00 / 31-10-2010, 03:00 |
| Paris, France | 1 | n 49 | 0002 | 28-03-2010, 02:00 / 31-10-2010, 03:00 |
| Pyongyang, North Korea | 9 | n 30 | 0126 | No known DST |
| Rarotonga, Cook Islands | 14 | s 21 | 0200 | No known DST |
| Reykjavik, Iceland | 0 | n 64 | 0338 | No known DST |
| Rio de Janeiro, Brazil | 21 | s 22 | 0317 | 21-02-2010, 00:00 / 17-10-2010, 00:00 |
| Riyadh, Saudi Arabia | 3 | n 25 | 0047 | No known DST |
| Rome, Italy | 1 | n 42 | 0013 | 28-03-2010, 02:00 / 31-10-2010, 03:00 |
| San Jose, Costa Rica | 18 | n 10 | 0084 | No known DST |
| Santiago, Chile | 20 | s 33 | 0289 | 14-03-2010, 00:00 / 10-10-2010, 00:00 |
| Seoul, South Korea | 9 | n 38 | 0127 | No known DST |
| Shanghai, China | 8 | n 31 | 0121 | No known DST |
| Sofia, Bulgaria | 2 | n 43 | 0023 | 28-03-2010, 03:00 / 31-10-2010, 04:00 |
| Singapore, Singapore | 8 | n 01 | 0104 | No known DST |
| Stockholm, Sweden | 1 | n 59 | 0018 | 28-03-2010, 02:00 / 31-10-2010, 03:00 |
| Sydney, Australia | 10 | s 34 | 0151 | 04-04-2010, 03:00 / 03-10-2010, 02:00 |
| Taipei, Taiwan | 8 | n 25 | 0122 | No known DST |
| Tehran, Iran | 3 | n 36 | 0052 | 22-03-2010, 00:00 / 22-09-2010, 00:00 |
| Tripoli, Libya | 2 | n 33 | 0013 | No known DST |
| Tokyo, Japan | 9 | n 36 | 0140 | No known DST |
| Vienna, Austria | 1 | n 48 | 0016 | 28-03-2010, 02:00 / 31-10-2010, 03:00 |

**Tablo-1 :** Geographical locations in the world.

## TECHNICAL FEATURES

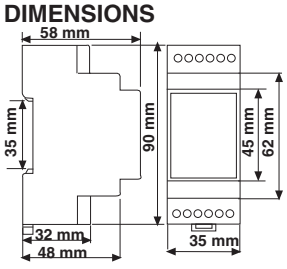
| Electrical Features | |
|---|---|
| Operating Voltage (Un) | Please, look at the lateral label. |
| Operating Range (Auxiliary Supply) | Please, look at the lateral label. |
| Output Contact | 2 Output Contacts / 8 A, 2000 VA |
| Refresh Time | 60 sec. |
| Sensor **(for DTR-14)** | CdS (Photocell Resistor) |
| Light Power **(for DTR-14)** | 1-3 lux |
| Power Consumption | < 3 VA |
| Accuracy | ≤ 1 sec. /Day |
| Display | 1,3” LCD |
| Program Number | 15 (For DTR-10) / 16 (For DTR-14) |
| Program Reserv Time | 2 Years |
| Addional Reserv Time | 6-10 hours |
| **Mechanical Features** | |
| Equipment Protection Class | Class II (⧈) |
| Ambient Temperature | -5°C, +50°C |
| Degree of Protection | IP20 |
| Installation | Rail Mounted |
| Dimension | PK25 |
| Weight | 0,2 kg |
| Quantity in 1 carton | 5 pcs |

**Note: Different operating voltages are available upon request. Please notify voltage with the order.**

| | | | | | |
|---|---|---|---|---|---|
| ENT | Enter | TH | Thursday | S | South |
| DEL/DELETE | Delete | FR | Friday | LONGIT | Longitude |
| C1 | 1st Relay | SA | Saturday | SEASON | Season |
| C2 | 2nd Relay | SU | Sunday | AUTO | Automatic |
| ON | On | * | Selected | MANUAL | Manual |
| OFF | Off | COUNT | Counter | WS | Winter / Summer interval |
| PROG | Program | LOCK | Lock (Manual) | SW | Winter / Summer interval |
| PHOTO | Photocell | CHOICE | Choice | NOTUSE | Not use |
| TIME | Time (Date, hour) | LOCKED | Locked | DEFAUL | Factory Settings |
| SUNRSE | Sunrise | UNLOCK | Unlock | LOAD | Load |
| SUNSET | Sunset | ZONE | Coordinate | LCDCNT | LCD contranst |
| MO | Monday | TIMZON | Time difference | CR-C2 | Cronogram (switch on & off time) of C2 relay |
| TU | Tuesday | LATITU | Latitude | CR-C1 | Cronogram (switch on & off time) of C1 relay |
| WE | Wednesday | N | North | | |

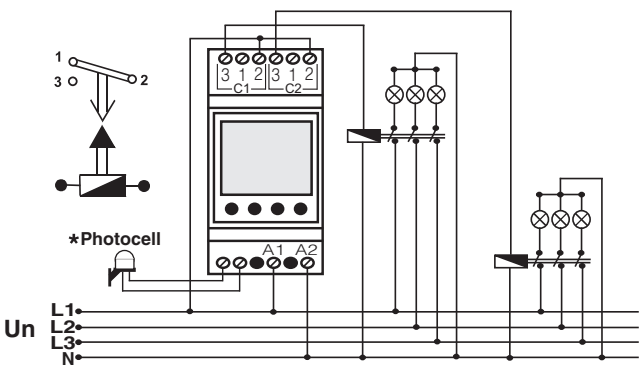
**Tablo-2 :** Menu abbreviations.

## DIMENSIONS




TYPE PK25

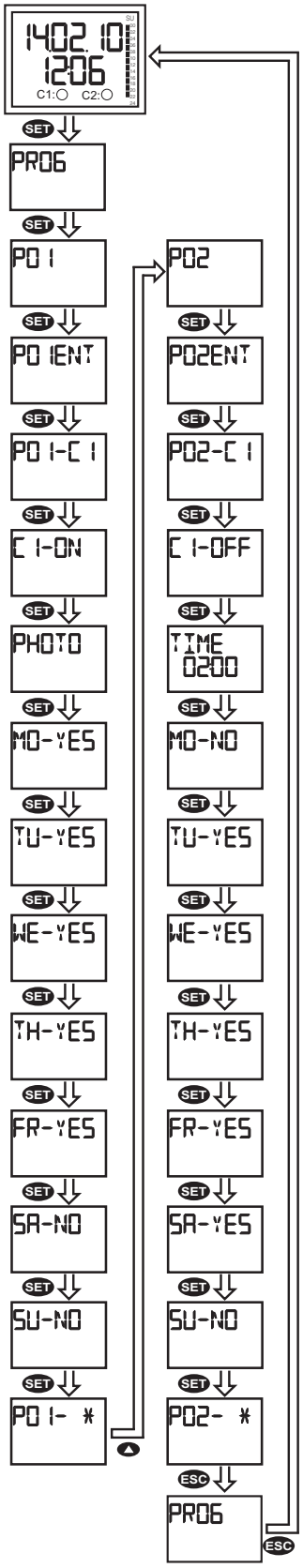
## CONNECTION DIAGRAM




**⋆ Available only for DTR-14**

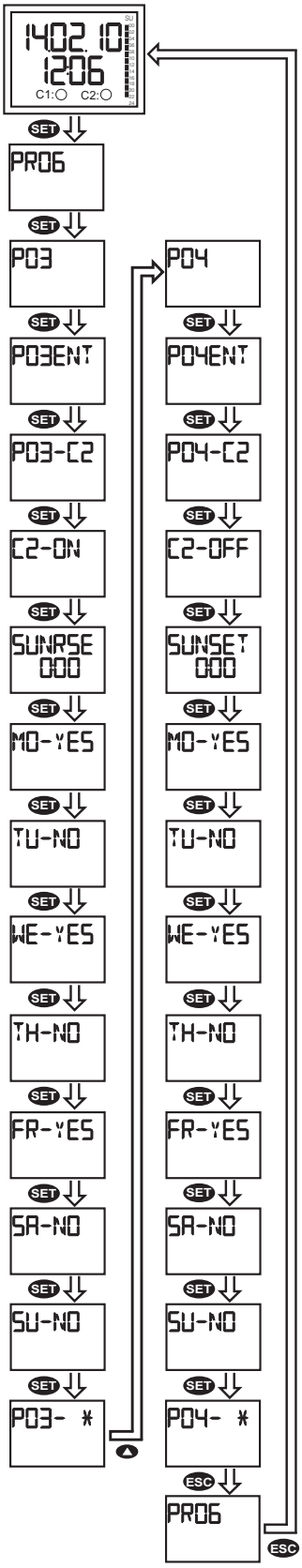
# ASTRONOMIC RELAY (DTR-10)
# ASTRONOMIC PHOTOCELL RELAY (DTR-14)

**Example 1:** This relay will switch on via photocell sensor and will switch off on 02:00 AM.

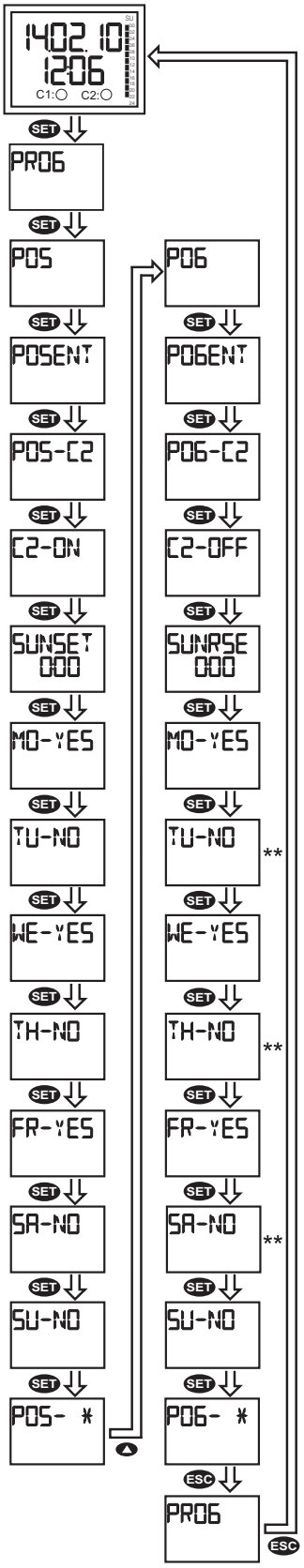



**This illustration is available for DTR-14.**

**Example 2:** This relay will switch on at sunrise time and will switch off at sunset time.




**Wrong application :** This relay will switch on at sunset timeand will switch off at sunrise time.




In this application, there is a mistake at P06 program when, switch off time settings are done for weekdays. Relays will switch off according to the sunrise time and so program settings are wrong for Tuesday, Thursday and Saturday.

CE