

**INTERRUTTORE CREPUSCOLARE
ASTRONOMICO DIGITALE**

Manuale d'Uso

memo AST NFC

Digital astronomical twilight switch



Vemer
SPA

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USER MANUAL

The digital time switches of memo AST are electronic devices for the management of electrical loads between sunset and sunrise times (astronomical program).

It has a NFC interface that allows it to be coupled with mobile devices (smartphone or tablet and, thanks to the free app that can be downloaded from Google Play store, it is possible to program and make settings directly on your smartphone, and then transfer all the data to the time switch. The reverse procedure is also possible, i.e. to copy the programming of a time switch on your mobile device.

The backup battery allows you to keep the settings even in case of black-out and can be replaced through the cover on the back of the time switch.

The time switches of Memo series are devices that perform actions of 1B type, intended to operate in environments with III overvoltage category and pollution degree 2 in accordance with EN 60730-1 standard.

Code	Model	Description
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VE344800	memo AST1	Astronomical twilight switch 1 channel with NFC interface
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VE343000	memo AST2	Astronomical twilight switch 2 channels with NFC interface
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TECHNICAL FEATURES

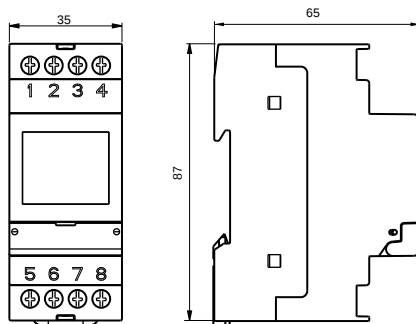
- Power supply: 230 Vac (-15% ÷ +10%) 50/60 Hz
- Power consumption:
 - memo AST1: 1W (3.5 VA)
 - memo AST2: 1.5W (5.5 VA)
- Lithium backup battery: 3V, CR2032 type (replaceable)
- Output:
 - memo AST1: 1 monostable change-over relay with maximum switchable load of 16 (10)A / 250V
 - memo AST2: 2 monostable change-over relays with maximum switchable load of 16 (10)A / 250V
- Display LCD with backlighting (active with AC power supply)
- NFC communication interface
- Storable programs:
 - memo AST1: 120 events
 - memo AST2: 120 events (divisible on 2 channels)
- Actions type: 1B
- Operating temperature: -20 ÷ +50°C
- Operating humidity: 20 ÷ 90% non condensing
- Storage temperature: -10 ÷ + 70°C
- Container: 2 DIN modules
- Protection degree: IP20
- Insulation: reinforced between accessible parts (front) and all the other terminals

SAFETY WARNINGS

■ ***During product installation and operation it is necessary to observe the following instructions:***

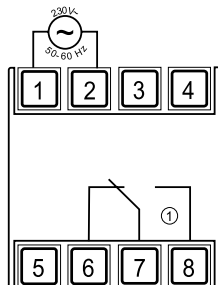
- 1) The instrument must be installed by a qualified person, strictly in observance of the connection diagrams shown in this manual.***
- 2) After installation inaccessibility to the terminals without using dedicated tools must be guaranteed.***
- 3) Before accessing the connection terminals, make sure that the leads are not live.***
- 4) Do not connect or feed the instrument if any part of it is damaged.***
- 5) The product must be installed and activated in compliance with current electric systems standards.***
- 6) Do not use the product for anything other than the indicated purpose.***
- 7) In the electrical system upstream of the device must be installed a protection device against the overcurrents***
- 8) The product can be used in environments with Measurement Category III and Pollution degree 2, according to the Standard EN 60730-1***

DIMENSIONS

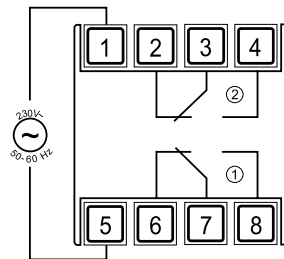


WIRING DIAGRAMS

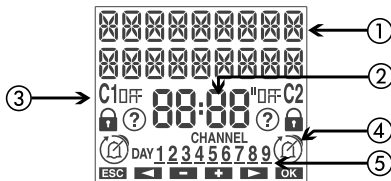
Memo AST1



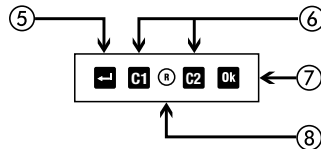
Memo AST2



DISPLAY AND KEYBOARD DESCRIPTION



- ① General indications
- ② Time indication
- ③ Channel 1/channel 2 status indication
 - ON / OFF channel status
 - 🔒 blocked switchings
 - Ⓜ active random switchings
 - active holiday program
 - 🕒 active pulse program
 - 🕒 active manual program
- ④ Day of the week (DAY) indication



- ⑤ Turn on the display
Access the menu
ESC (1 level back)
- ⑥ Key "**C1**": decrease datum/previous menu/ switching channel 1/
lock channel 1
Key "**C2**": increase datum/next menu/ switching channel 2/
lock channel 2
- ⑦ Confirm selection
- ⑧ Hardware reset

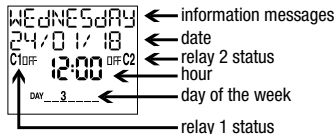
Key "**Ok**" + "**C1**" (3 sec): random switching channel 1
 Key "**Ok**" + "**C2**" (3 sec): random switching channel 2

INITIAL OPERATION

- Once out of the package, memo is off: press the key  and wait a moment before activating the display
- The set language is Italian. To change it, press the key  for at least 3 seconds. Choose among: Italian, English, Spanish, French or German and confirm with 
- Make connections following the diagrams on page 5 of this manual
- Power memo: the backlighting turns on permanently.
- The presence of the backup battery allows the memo to have updated date and time.
To make the other settings follow the following steps:

Date	- format: DD/MM/YY - 1 st day of the week: Monday
Astronomical coordinates	- country: Italy - city: Agrigento - latitude: North (37° 19' 12") - longitude: East (13° 34' 12")
Daylight Saving time (DST) change: active	- start of daylight saving time (DST): last Sunday of March at 02:00 o'clock - end of daylight saving time (DST): last Sunday of October at 03:00 o'clock
Time correction:	- sunrise: +0:00 - sunset: +0:00
Time zone:	+1:00 UTC
Random switchings:	- minimum: 1 minute - maximum: 5 minutes
Keyboard lock with PIN:	disabled (---)
NFC interface	active

START PAGE (or main)



Information messages

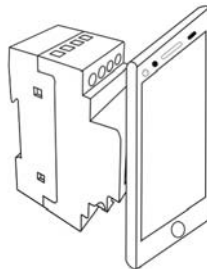
- day of the week
- product identification code and serial number
- battery status (only if discharged)
- NO SUPPLY*

- Press the key

↓ to access the menu of memo

C1 and **C2** to change channel 1 and channel 2 status (only for memo AST2)

OK to display the calculated sunrise and sunset times**



NOTE: the NFC interface is active only when the memo displays the initial (main) page. The action range of the NFC interface is deliberately limited: in order for the memo and the smartphone to communicate, it is necessary to place the latter on the memo display.

* Only if memo is not powered by mains.

In this condition the backlighting is not active and the relay is in off status.

** The displayed times take into account possible entered values of correction (see page 18).

If the display shows **— □ —** means that the calculated sunrise time is after the sunset time.

If the display shows **□** means that the calculated sunrise time is before 00:00 or that the calculated sunset is at 23:59.

Access the store of your device, install and start the free app Memo – Vemer.



English

- ① At the start the app displays the list of the associated memo devices (both Bluetooth and NFC).
To associate a new memo NFC, press the symbol “+” in the upper right corner.
- ② In the “Choose connection type” screen, select NFC.
- ③ Place the smartphone on the display of the memo to be associated.

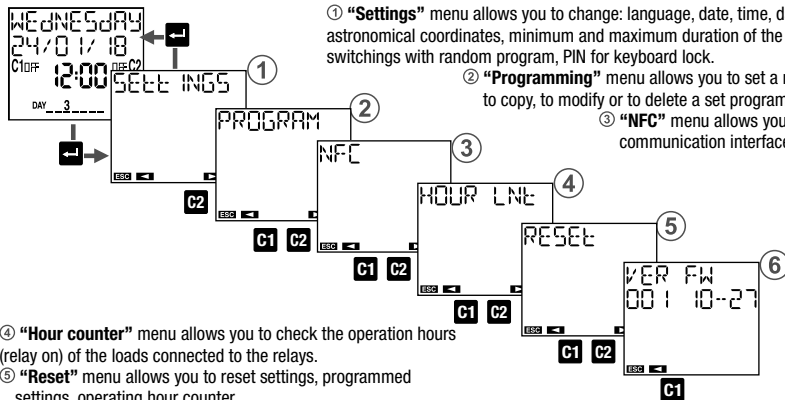
Note: each device is identified by the product code (for example VE343000) and by the serial number (for example 00000020).
These informations can be viewed from the main page of the memo.

Warning: make sure that the display shows the main page (initial). Otherwise the NFC interface is not active and the device is not visible.

Note: from this screen you can create a virtual memo. With a virtual memo you can create programs even if you do not have a memo available. The programming and settings of the virtual memo can be saved in the app and then transferred to the memo.

- ④ The app shows the detected memo: do a tap on the memo to complete the association. Once the procedure is complete, the memo is added to the list of associated devices.
Select the memo on which to act from the list of associated devices.
- ⑤ The app displays the initial page of the selected memo. From this page you can:
 - a. Create new programs that will then be copied to the memo
 - b. View the parameters and associate an alias (name that identifies the time switch, such as “memo AST2 Belluno”) to the memo

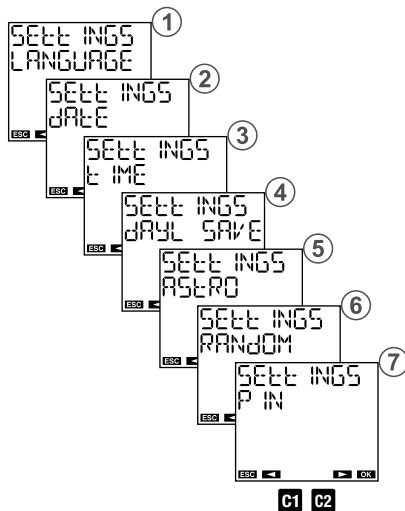
MENU DESCRIPTION



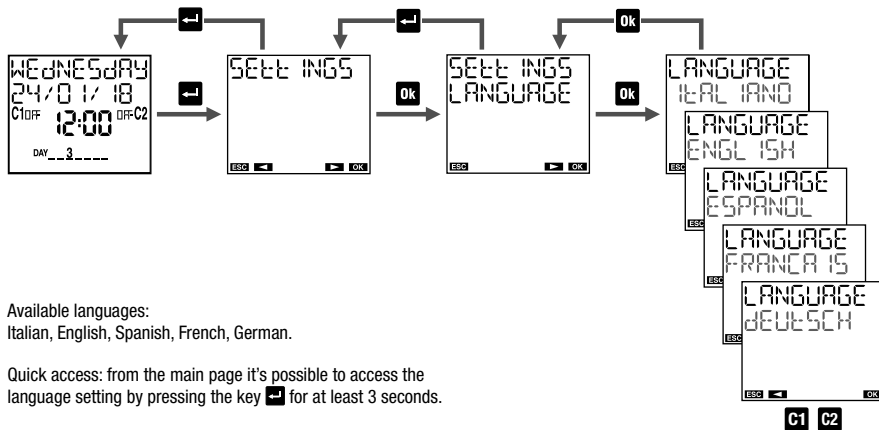
SETTINGS MENU

“Settings” menu allows you to view and eventually to modify the the general operation settings of memo, such as:

- ① language
- ② date
- ③ time
- ④ automatic daylight saving time (DST) change
- ⑤ position (astronomical coordinates)
- ⑥ interval duration between two random switchings
- ⑦ keys protection by PIN



Language setting menu



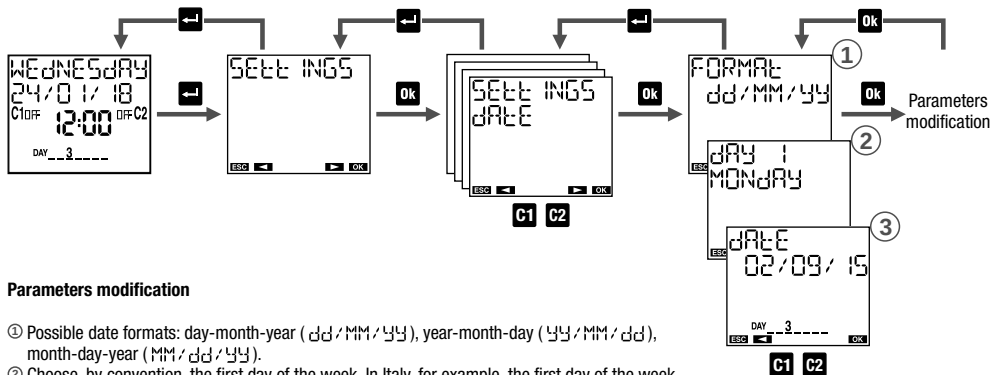
Available languages:

Italian, English, Spanish, French, German.

Quick access: from the main page it's possible to access the language setting by pressing the key **↓** for at least 3 seconds.

English

Date setting menu



Parameters modification

- ① Possible date formats: day-month-year (dd/MM/yy), year-month-day (yy/MM/dd), month-day-year (MM/dd/yy).
- ② Choose, by convention, the first day of the week. In Italy, for example, the first day of the week is Monday, in the UK it's Sunday.
- ③ Enter the date: day, month, year.

Parameters modification

The diagram illustrates the sequence of screens and user interactions for modifying parameters. The flow starts with a main menu screen showing 'WEDNESDAY 24/01/18', 'C1 OFF', '12:00 OFF C2', and 'DAY 3'. Pressing 'ESC' leads to the 'SETTINGS' screen. Pressing 'OK' leads to a stack of 'SETTINGS' screens. Pressing 'ESC' leads to the 'TIME' screen. Pressing 'OK' leads to the 'TIME ZONE' screen. Pressing 'ESC' leads to the 'TIME' screen. Pressing 'OK' leads to the 'Parameters modification' screen. The 'TIME' screen shows '08:28' and 'TIME ZONE' shows '1:00'. The 'TIME' screen also shows 'TIME' and 'TIME ZONE'.

- ① Set the time: hours, minutes.
- ② Set the time zone. Range: -14:00 ÷ +14:00 at 15 minutes steps.
For Italy set +1:00.

Daylight saving time (DST)/winter time (CET) change setting menu

Daylight saving time (DST)/winter time(CET) change and vice versa can occur in an automatic way. In this case, memo:

- increases by an hour in the passage from winter time (CET) to daylight saving time (DST)
- decreases by an hour in the passage from daylight saving time (DST) to winter time (CET)

For every change it's necessary to specify:



the week of the month during
which the time change occurs
(first, second, third, fourth, last)



the day of the week
(Monday: 1, Tuesday: 2, ...)

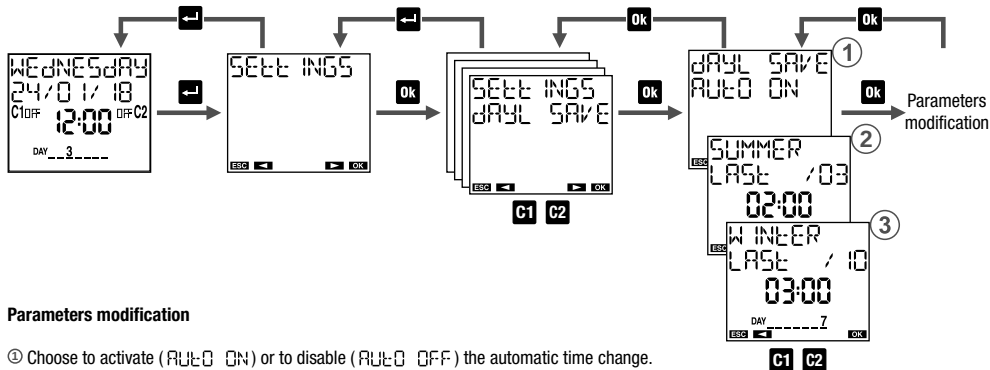


the month



the hour and the minutes

In Italy, for example, daylight saving time (DST) begins the last (LAST) Sunday (7) of March (03) at 02:00 o'clock and ends the last (LAST) Sunday (7) of October (10) at 03:00 o'clock.



Parameters modification

- ① Choose to activate (AUTO ON) or to disable (AUTO OFF) the automatic time change.
- ② Set date and time of the winter time (CET)-daylight saving time (DST) change.
- ③ Set date and time of the daylight saving time (DST)-winter time (CET) change.

Astronomical coordinates setting menu

The setting of the geographical coordinates of the installation place allows memo to calculate, for each day of the year, sunrise and sunset times.

To simplify the procedure, in the memo are stored the coordinates of the locations listed below; if your location is among them you can select it from the menu ①, otherwise it's necessary to enter the coordinates of latitude and longitude (menu ② ③).

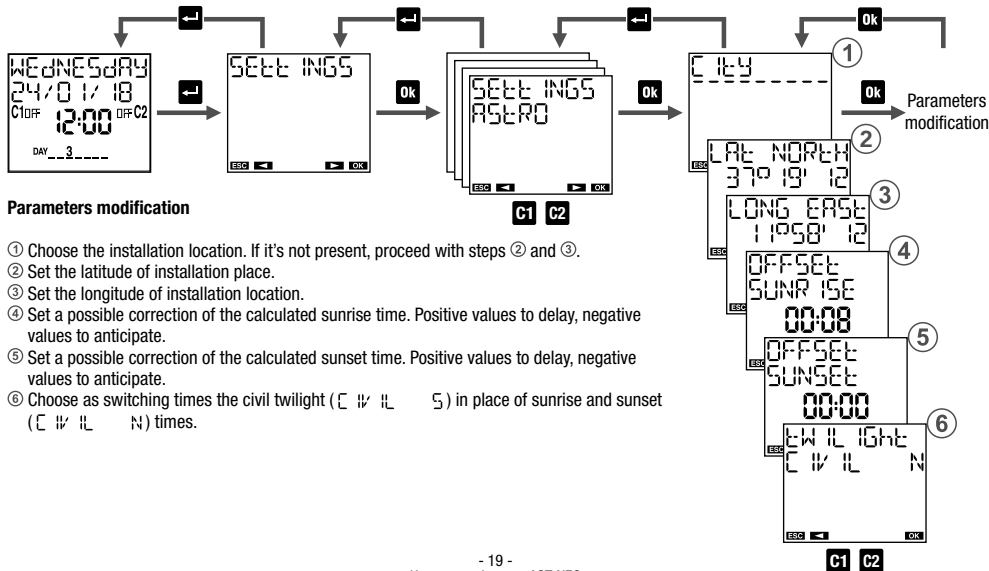
Note: the display on point ① shows "-----" if the coordinates have been entered manually.

Location stored in memo:

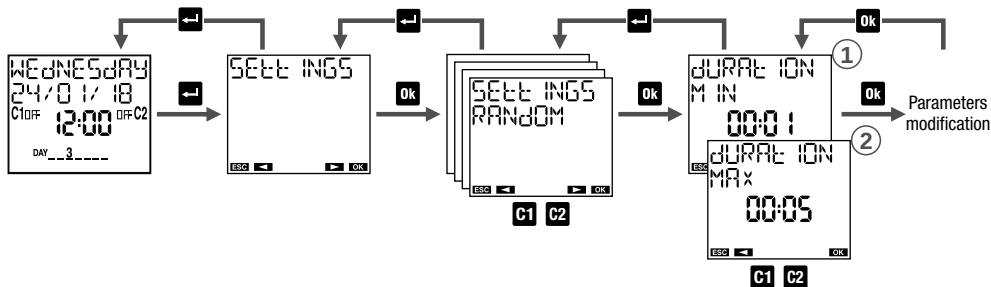
- Italy: all provinces
- United Kingdom: Cardiff, Belfast, Edinburgh, London
- Spain: Barcelona, Madrid, Seville, Valencia
- France: Lyon, Marseille, Paris, Toulouse
- Germany: Berlin, Hamburg, Cologne, Monaco

The correction of sunrise and sunset times is useful for applications that require the turning on of lights in particular localities. It's possible, in fact, that the presence of disturbing elements, such as the mountains, can influence actual times of sunrise and sunset, making it necessary to advance or delay of a few minutes the calculated times.

The twilight is the time interval before sunrise, or after sunset, characterized by the permanence of the light due to the spread by the atmosphere of the Sun light. During these time intervals it's possible to distinguish clearly objects and conduct outdoor activities without using additional lighting. Therefore, in some applications it is more interesting to take as times of switching on and off the twilight (civil) in place of sunrise and sunset. With memo it's possible to choose to turn on/off the loads depending on the times of sunrise and sunset or the civil twilight. The calculated time correction also applies to the times of twilight. To view the calculated switching on time (sunset) and switching off time (sunrise), from the main page press the key **Ok** (see page 8).



Random switchings setting menu



The “random switching ③” function (activated with the combination described on page 6) allows the channel on which it's active to automatically switch and at random time intervals.

In this menu it's possible to define the minimum and maximum duration of the time interval between two random switchings. Default minimum duration is 1 minute, maximum duration is 5 minutes.

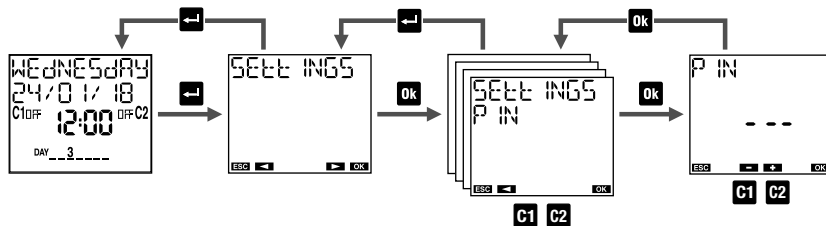
Parameters modification

① Set the minimum duration. It's possible to set values between 1 minute and the *maximum duration*.

② Set the maximum duration. It's possible to set values between the *minimum duration* and 23:59 hours.

Note: setting the minimum duration equal to the maximum, the switchings will occur at fixed time intervals.

Protection PIN setting menu



The protection code (PIN) is used to lock the keyboard and prevent changes by unauthorized persons. With active PIN protection, pressing any key, it's necessary to enter the PIN: if PIN is correct the keyboard unlocks; after 3 minutes without pressing a key, the keyboard will lock automatically.

To activate PIN protection:

- set a value between 000 and 999

To disable PIN protection:

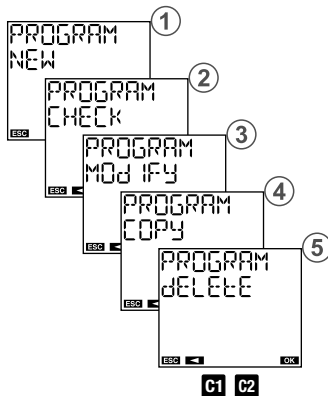
- set "---" (located before 000 or after 999)

Note: if you have forgotten your PIN code to unlock memo it's necessary to carry out a hardware reset (see page 44).

PROGRAM MENU

The menu “program” allows you to:

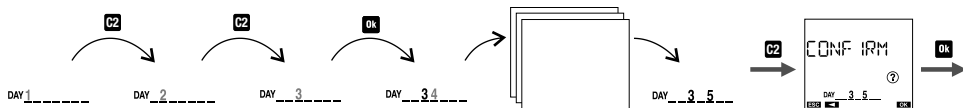
- ① create a new program
- ② check created programs
- ③ change or delete a created program
- ④ copy all created programs of channel 1 on the channel 2 and vice versa (only for memo AST2)
- ⑤ delete all programs of a channel



Select days

scroll through the days of the week from 1 to 7:

- by pressing the key **C2** to move to the next day without selecting the current day
- by pressing the key **Ok** to select/deselect the current day and move to the next



Memo AST carries out programs of astronomical type, i.e. in the interval delimited by sunrise and sunset*: ON/OFF, ON pulse, OFF pulse, holiday, night programs (see pages 30-31). ON switchings set before sunset are carried out at sunset, OFF switchings set after sunrise are carried out at sunrise (except for some night programs that can have switching on or switching off during the day. See on page 30).

* times of sunrise and sunset are automatically calculated by memo according to geographic coordinates set during installation. In place of sunrise and sunset times it's possible to use the times of civil twilight (see page 18).

Programs types

- ON/OFF program : is composed of a switching of the ON relay and of a subsequent switching of the OFF relay. It can have a daily period (everyday with the same modes), weekly (every week with the same modes)*.
- PULSE ON program: is an ON relay switching for a maximum duration of 59 seconds. It can have a daily period (everyday with the same modes), weekly (every week with the same modes)*.
- PULSE OFF program: is a relay switching OFF for a maximum duration of 59 seconds. It can have daily period (everyday with the same modes), weekly (every week with the same modes)*.
- HOLIDAY program: is a period of time defined by a start time and an end time within which all programmed switchings (of that channel) are disabled. The relay is in OFF position (OFF holiday) or in ON position (ON holiday).

- ⚠ **Important:** on the same channel can't coexist ON pulses and OFF pulses (if an ON pulse is already present, it's not possible to save a holiday OFF program and vice versa).
- ⚠ **Important:** on the same channel can't coexist holiday ON programs and holiday OFF programs (if a holiday ON program is already present, it's not possible to save a holiday OFF program and vice versa).

Programs priority

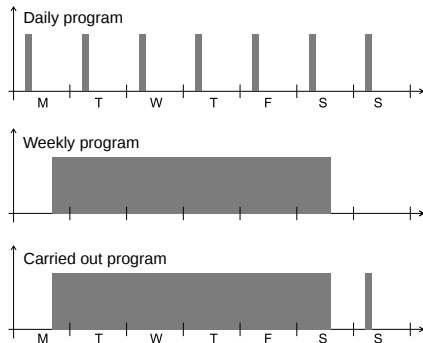
The priority programs defines how memo manages the case in which programs with different period are running at the same time (1 indicates higher priority).

Program	Date*	Annual	Monthly	Weekly	Daily
Holiday	1				
Night				2	
Pulse				3	
On/Off				4	5

* Date: select day, month, year (program carried "only once in the life of the product"). If the month is not specified, the program is carried out all days xx of all months of the specified year.

Priority on/off programs

In case in which, on the same channel, on/off programs are provided with different period (daily or weekly) to carry out in the same day, only the program with the highest priority is executed.

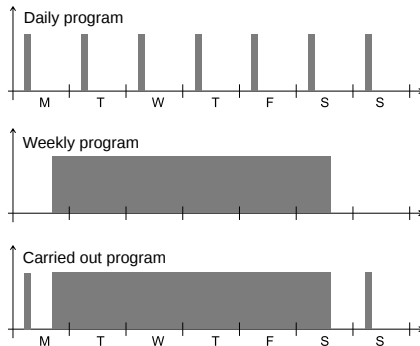


From this example it's possible to see that the daily event on Monday is not carried out because in the same day it is provided the beginning of the week program (even if the daily program

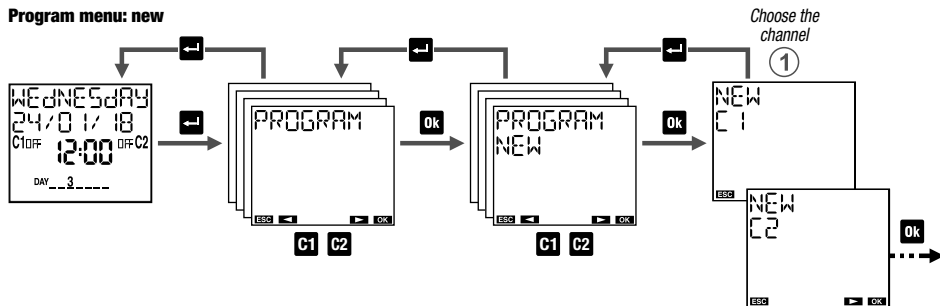
of Monday begins and ends before the beginning of the weekly program). Instead, the daily program of Sunday is carried out because it's the only one running for that day.

Holiday program

The holiday program just begins and ends exactly at the specified times.

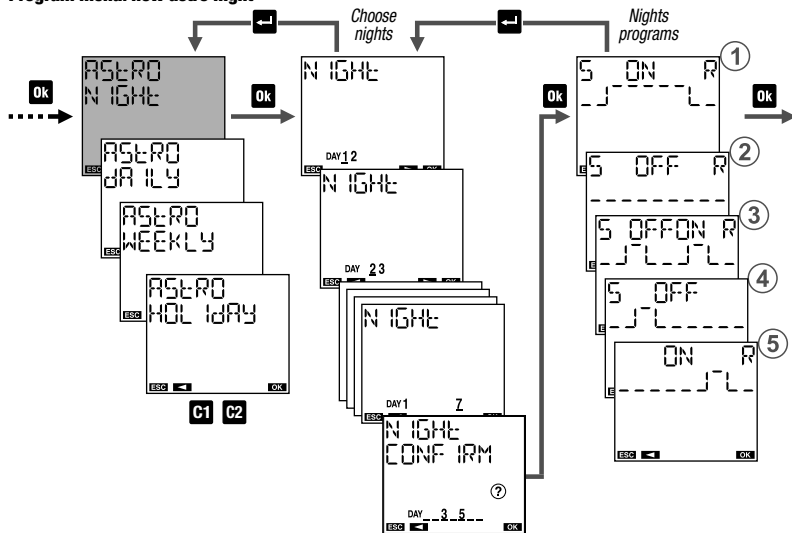


Program menu: new



① Choose the channel to program (only for memo AST2)

Program menu: new astro night



How to select nights

Scroll through the nights of the week from the first (1-2) to the last (7-1):

- by pressing the key **C2** to move to the next night without selecting the current night
- by pressing the key **OK** to select/deselect the current night and move to the next



How to interpret the selection

If the night between the days of A and B is selected, the day A is on and underlined while B is on (not underlined).

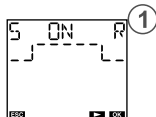
Examples of selection:

DAY 12345 Selected nights: between day 1 and 2, between day 2 and 3, between day 3 and 4, between day 4 and 5

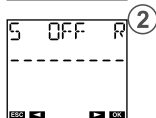
DAY 12345 Selected nights: between day 1 and 2, between day 2 and 3, between day 4 and 5

DAY 1234 7 Selected nights: between day 1 and 2, between day 3 and 4, between day 7 and 1

Night programs



- ① Turning on at sunset, turning off at sunrise.
No parameter required.

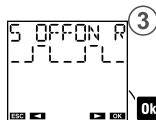


- ② Off from sunset to sunrise.
No parameter required.

* If off time is before sunset, switching is not carried out. If on time is after sunrise, switching is not carried out.

** Switching on continues for the entire set time interval (also if off time is after sunrise).

*** Switching on occurs before sunrise of the entire set time interval (also if on time is before sunset).



- ③ Turning on at sunset, turning off during the night. Turning on during the night, turning off at sunrise.
Choose one of the three following cases:



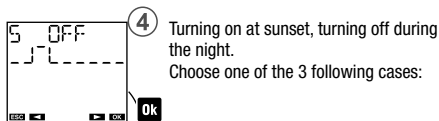
- Turning on at sunset, turning off at a settable time.
Turning on at a settable time, turning off at sunrise. (*)



- Turning on at sunset, turning off after a settable time interval.
Turning on before sunrise of a settable time interval, turning off at sunrise.



- Turning on at sunset for a settable short duration (pulse, max 59 seconds).
Turning on at sunrise for a short settable duration (pulse, max 59 seconds).



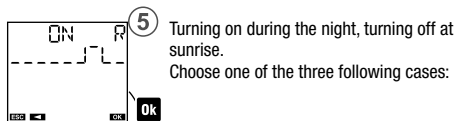
Turning on at sunset, turning off at a settable time. (*)(**)



Turning on at sunset, turning off after a settable time interval. (**)



Turning on at sunset for a settable short duration (pulse, max 59 seconds).



Turning on at a settable time, turning off at sunrise. (*)(***)

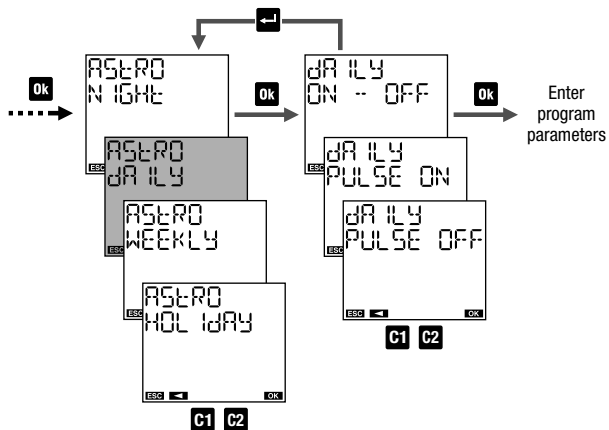


Turning on before sunrise of a settable time interval, turning off at sunrise. (***)



Turning on at sunrise for a settable short duration (pulse, max 59 seconds).

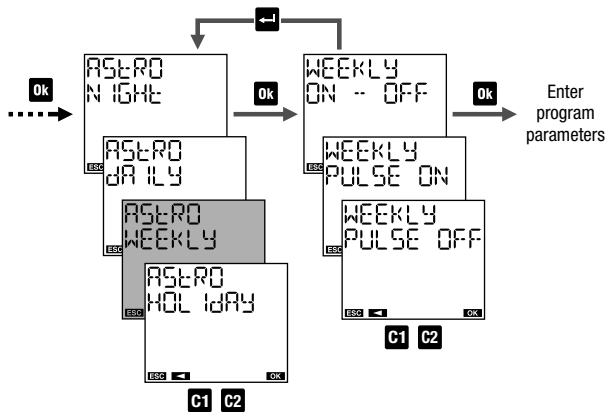
Program menu: new astro daily



Program parameters

- on/off: on time and off time
- on pulse: time and pulse duration (maximum 59 seconds)
- off pulse: time and pulse duration (maximum 59 seconds)

Program menu: new astro weekly

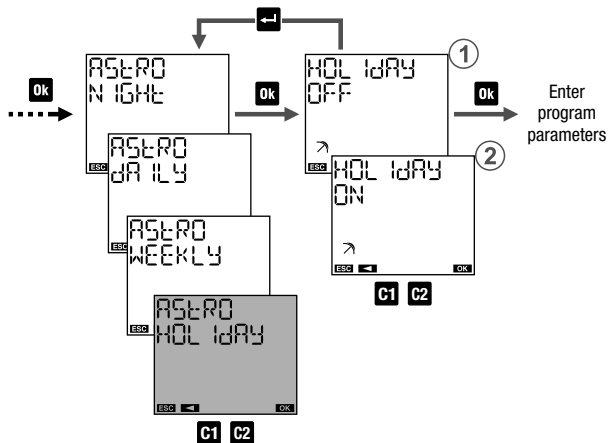


Program parameters

- on/off: day (or days)* and on time, day (or days) and off time
- on pulse: day (or days)* and pulse time, pulse duration (max 59 seconds)
- off pulse: day (or days)* and pulse time, pulse duration (max 59 seconds)

* See "Days selection" on page 23

Program menu: new astro holiday

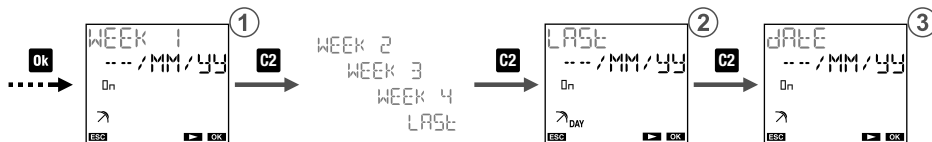


- ① HOLIDAY OFF: the relay is OFF from the beginning to the end of holiday program.
- ② HOLIDAY ON: the relay is ON from the beginning to the end of holiday program.

Program parameters

- beginning of the program
- end of the program

How to choose the day (or days) in a holiday astro program



① to set the program:

in the first, second, third, fourth or last week of the month
in / the day/s (Monday, ...) of the week just specified
the specified month (MM for all months)
the given year (YY for all years)

Note: in this case, the holiday program must begin and end in the
same day. Otherwise ERROR 0 0 is signaled.

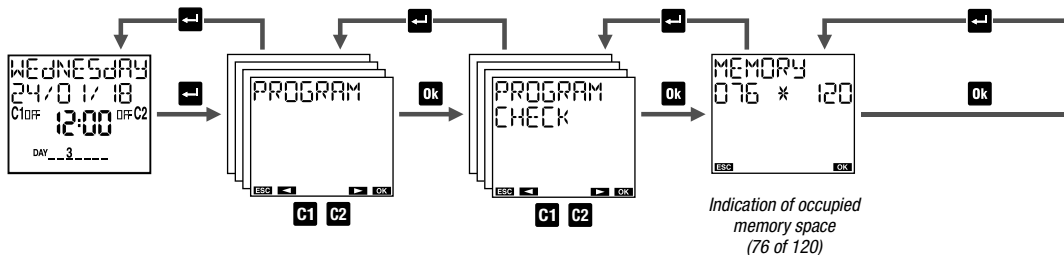
② to set the program on the last day:

-- /MM/YY of all months of all years
-- /VV/YY of the specified VV month of all years
-- /MM/ZZ of all months of the specified ZZ year
-- /VV/ZZ of the specified VV month of the specified ZZ year

③ to set the program on the day XX (1,2,3...):

xx /MM/YY of all months of all years
xx /VV/YY of the specified VV month of all years
xx /MM/ZZ of all months of the specified ZZ year
xx /VV/ZZ of the specified VV month of the specified ZZ year

Program menu: check

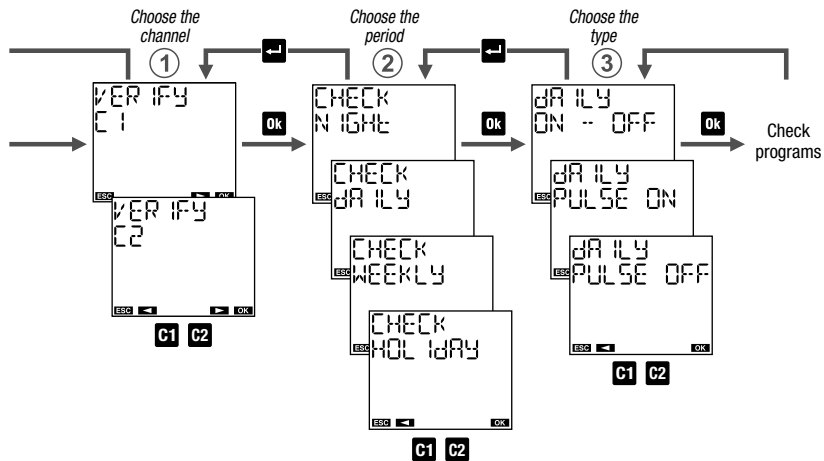


How to check a program

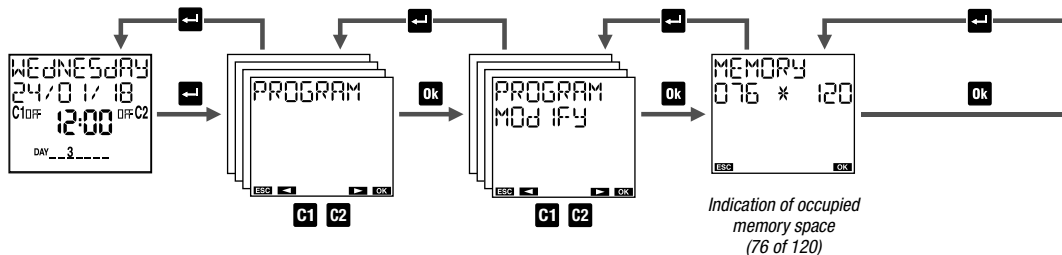
- ① choose the channel (only for memo AST2)
- ② choose the period: daily, weekly, holiday, night.
- ③ choose the type: on/off, on pulse, off pulse or a night program.

Note: a program requires more screens to be displayed:

- press the key **OK** to move from the first to the second part of the same program
- press the keys **C1** and **C2** to switch from one program to another



Program menu: modify



How to modify or to delete a program

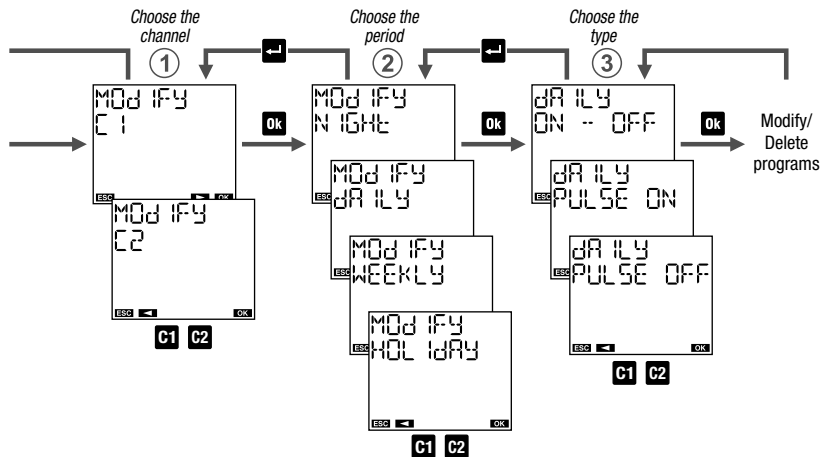
- ① choose the channel (only for memo AST2).
- ② choose the period: daily, weekly, yearly, holiday, night.
- ③ choose the type: on/off, on pulse, off pulse or a night program

Note: a program requires more screens to be displayed:

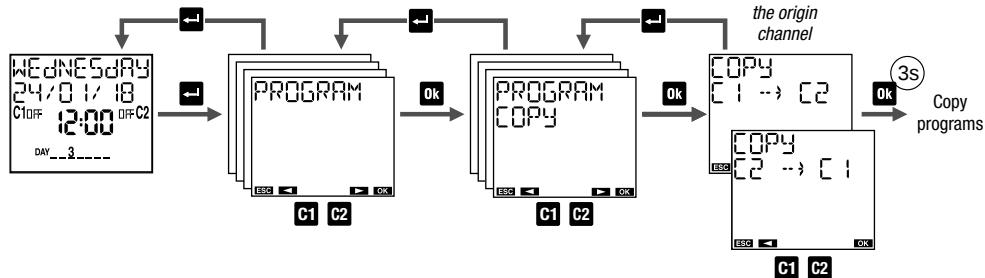
- press the key **Ok** to move from the first to the second part of the same program
- press the keys **C1** and **C2** key to switch from one program to another

To modify: press for a long time (at least 3 seconds) the key **Ok**

To delete: press for a long time and simultaneously the keys **Ok** and **↵**



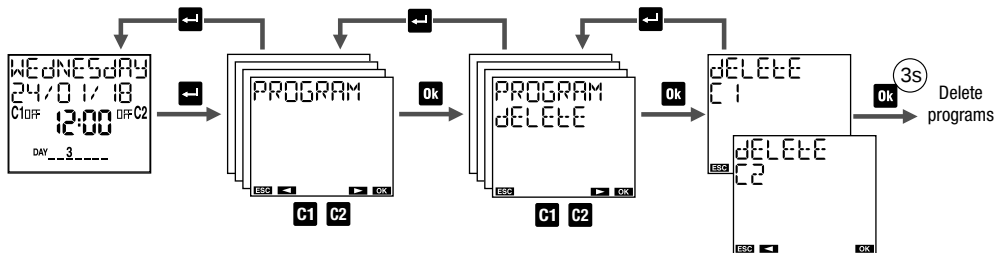
Program menu: copy (only for memo AST2)



“Copy” menu allows copying the programs of a channel (origin channel) on the other channel (channels destination).

Note: the programs previously stored on the channel destination will be deleted.

Program menu: delete



"Delete" menu is used to delete all stored programs on the specified channel.

Note: to delete one single program to see "modify" mode (see page 38).

NFC MENU

The NFC menu allows you to enable or disable the NFC interface

To enable the NFC interface:

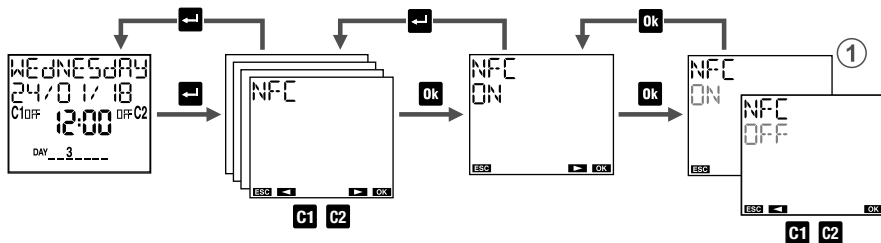
- ① set NFC ON

Warning: to make the NFC interface active, the memo must be mains powered and connected to the main page (see page 8). The NFC interface is therefore not active when browsing through the memo NFC menus. To guarantee a stable communication, lay the smartphone on memo's display

To disable the NFC interface:

- ② set NFC OFF

In this way no communication can take place between your device and memo. The memo works with the settings and programs already set; any changes or creation of new programs must be made by acting directly on the keyboard of memo.



RESET MENU

“Reset” menu allows you to restore the initial state of the device.

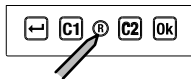
Available resets:

- ① Settings reset: deletes all the carried out settings (except the language and the PIN)
- ② Holiday programs reset: deletes all saved holiday programs
- ③ Astro programs reset: deletes all saved astronomical programs
- ④ Counter reset: resets the counters of all channels
- ⑤ Reset all: carries out all the above described resets and deletes the language and PIN protection

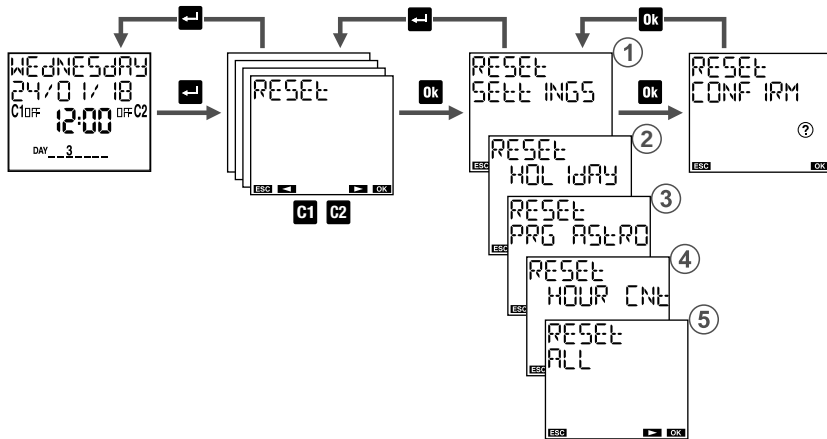
There is also another reset, of hardware type, which allows you to reset the device in case it responds to the pressing of the keys so unexpectedly, without losing the carried out settings/programs (only the date and the time are lost).

To carry out a hardware reset:

1. press the key “R” with a sharp object

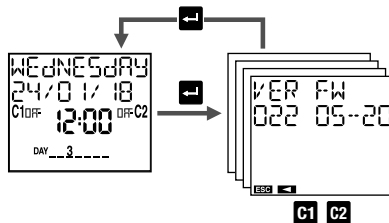


The hardware reset is also useful when you forget PIN protection. Reset, in fact, unlocks the keyboard for 3 minutes, the necessary time to access the appropriate menu and check/disable PIN.



FIRMWARE MENU

This menu shows the firmware installed in the device, where:
 022 is the revision index
 05 is the month
 20 is the day



ERROR SIGNALS

When setting up programs, in case of a discrepancy, the following error messages can occur:

- ERROR 001 on and off events with different frequency (each on event must have an off event)
ERROR 002 on and off concomitant events of the same program
ERROR 003 Two or more consecutive on events of the same program / Two or more consecutive off events of the same program
ERROR 004 Invalid date
ERROR 005 Insufficient memory
ERROR 006 Attempt to set an on pulse on a channel where is already stored an off pulse (see page 25)
ERROR 007 Attempt to set an off pulse on a channel where is already stored an on impulse (see page 25)
ERROR 008 Attempt to set an on holiday program on a channel where is already stored an off holiday program (see page 25)

- ERROR 009 Attempt to set a holiday off program on a channel where a holiday on program is already stored (see page 25)
ERROR 010 Attempt to set a holiday program of on and off events on different days of the week (see page 31)
ERROR 030 Error accessing memory *

* In this case, carry out a hardware reset (see page 44).
If the error persists, contact Vemer technical support (tel.+ 39.0439.879885).

BATTERY MANAGEMENT

When the battery is close to empty, on the first line of the display appears **LOW BATTERY**. In this case, the battery must be replaced as soon as possible. **Use only batteries of CR2032.**

To replace the battery:

- disconnect the mains
- remove the battery slot cover, turning it anti-clockwise
- replace the battery and remount the cover, turning it clockwise
- connect the power supply

Warning: do not use metal objects (such as screwdrivers) to remove the battery because this may cause the power reserve to be canceled, resulting in a loss of date and time.

Warning: in order not to lose the programming steps and carried out settings, it is necessary to ensure that the time for the battery replacement doesn't exceed 60 seconds (in absence of power by means).



Dispose of the used batteries observing the laws in force in relation to the disposal of hazardous waste.

REFERENCE STANDARDS

Compliance with Community Directives:

2014/35/EU (LVD)

2014/30/EU (EMCD)

is declared in reference to the harmonized Standards

- EN 60730-2-7

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