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SHT-13, SHT-13/2

Multifuntion digital time switch with Wi-Fi connection



Characteristics

- All programs in one device (daily, weekly, yearly and astronomical).
- UNiversal supply voltage in range of AC/DC 24 - 240 V (AC 50-60 Hz).
- Simple setting after the first start-up.
- User replaceable battery to back up the set time.
- Built-in web server for setup and control via Wi-Fi connection.
- Time synchronization through NTP server (require internet connection).
- New well-arranged display with white backlight.
- ASTROnomic program: manual entry of coordinates or selecting one of the preset cities.
- One/two channel design (each with an operating hours counter).
- Pulse/cycle output mode.
- Transition of summer/winter time - AUTO or OFF.
- Lead-sealing transparent front panel cover.
- PIN code protection against unauthorized changes.
- Wireless firmware update.

A first setup wizard will guide you through the initial configuration after inserting the battery or after connecting to the power supply.

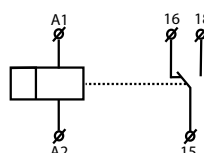
Each channel can be assigned a different program or operating switching mode, this allows control of two independent circuits. In the event of a mains power failure, the device will retain all the set values required for reliable switching after the power is restored. After installation, it does not require any special service or maintenance.

The astronomical program does not need any optical sensors or other external devices to function. Its operating principle is that during the year every day, based on an algorithm and real-time (set in the time switch), automatically controls switching on and off times of e.g. public lighting. This is because the sunrise and sunset times change throughout the year. With the offset (deviation) function, the turning ON and switching OFF times can be corrected within ± 120 minutes. The delay is fixed for each day but can be adjusted for each channel separately.

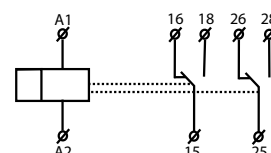
- Operation modes of switching: (configurable for each channel separately)
 - **TIME PROGRAM** (switches according to set time programs)
 - **HOLIDAYS / TIME PROGRAM** (switches according to set holidays and time programs)
 - **ASTRO / TIME PROGRAM** (switches according to the set astronomical and time program)
 - **HOLIDAYS / ASTRO / TIME PROGRAM** (switches according to set holidays, astronomical and time program)
 - **RANDOM PROGRAM** (switches randomly in an interval of 10-120 min)
 - **LOCKED - MANUAL** (fixed output state that cannot be changed other than through settings)
- Possibility to manually control the output contacts at any time (outside the operation mode, **LOCKED - MANUAL**).
- 200 memory locations for time programs (common for both channels).
- Up to 30 memory locations for holidays
- Programming can be done under power and in backup mode.
- Optional languages – CZ / EN
- Selection of summer/winter time transition:
 - **AUTO** (changes automatically according to the entered time zone)
 - **OFF** (permanently switched off winter/summer time transition)
- The time switch is backed up by a battery, which enables it to operate in backup mode in the event of a power failure. All settings and programs are saved in memory in the event of a power failure - they can thus be restored even in the event of a power failure and a discharged battery. However, a time correction will need to be made.

Symbol

SHT-13

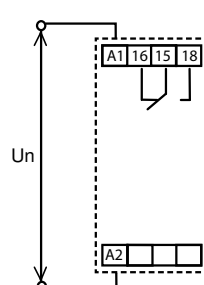


SHT-13/2

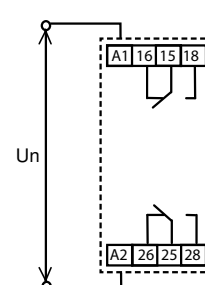


Connection

SHT-13



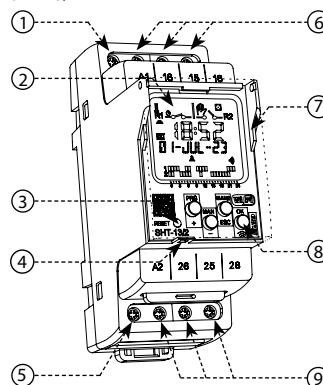
SHT-13/2



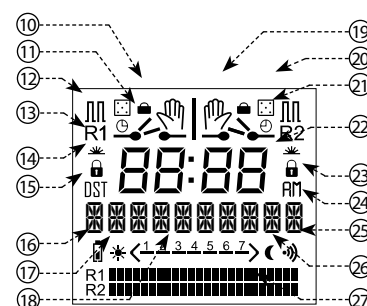
Prescribed minimum output protection: class B circuit breaker 16A.

Description

SHT-13/2



1. Supply terminal (A1)
2. Backlight display
3. Reset
4. Sealing spot
5. Supply terminal (A2)
6. Output - 1. channel (16-15-18)
7. Transparent cover
8. Control buttons
9. Output - 2. channel (26-25-28)
10. Holiday program
11. Output indication
12. Pulse/cycle mode
13. Astro program
14. Manual control locked



15. Summer time
16. Battery indication
17. Sunrise indication
18. Days in week
19. Manual control
20. Random program
21. Time program
22. Time
23. AM/PM
24. Text line
25. Wi-Fi connection
26. Sunset indication
27. Bargraph

DISPLAY BACKLIGHT CONTROL

Powered: By default, the display is backlit for 90 seconds from the time of the last press of any button. The display still shows: the date, time, day of the week, state of contacts, and battery or the type of program in progress. The backlight is permanently switched on/off by long press of MAN1, MAN2, and OK buttons at the same time. When activating / deactivating the permanent backlight, the display will briefly flash twice.

Backup mode: In the event of a power failure, the display will automatically switch to sleep mode, during which time only the following will flash on the display: the date, time, day of the week, and battery state. The time switch can then be woken up at any time by pressing the OK button to the standard mode, e.g. for setting (without working Wi-Fi or output contacts) - however, take into account that in this case the consumption from the battery is significantly increased, which affects its service life. It will return to sleep mode if no buttons are pressed for 20 seconds.

Technical parameters

SHT-13		SHT-13/2	
Supply terminals:	A1-A2		
Supply voltage:	AC/DC 24 – 240 V (AC 50-60 Hz)		
Consumption (max.):	Wi-Fi "OFF" 0.5 W/2 VA "ON" 1 W/3 VA		
Supply voltage tolerance:	–15 %; +10 %		
Output			
Contact type:	1x changeover (AgSnO ₂)	2x changeover (AgSnO ₂)	
Rated current:	16 A/AC1*		
Switched power:	4000 VA/AC1, 384 W/DC1		
Inrush current:	30 A/< 3 s		
Switching voltage:	250 V AC/24 V DC		
Power dissipation (max.):	1.2 W	2.4 W	
Mechanical life:	30.000.000 ops.		
Electrical life (AC1):	100.000 ops.		
Time circuit			
Accuracy:	max. ±0.5 s/day at 23°C (73.4 °F)		
Min. switching interval:	1 s		
Data retention time:	min. 10 years		
Set time backup:	up to 120 days (CR 2032 - 3V)		
Program circuit			
Number of memory locations:	200		
Program type:	daily, weekly, yearly, astro		
Displayed data:	LCD display with white backlight		
Settings via website:	by Wi-Fi (2.4 GHz)		

Other information	
Operating temperature:	–20 .. +55 °C (–4 .. 131 °F)
Storage temperature:	–30 .. +70 °C (–22 .. 158 °F)
Dielectric strength:	supply – output AC 4 kV
	output 1 – output 2 AC 4 kV
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 front panel / IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Cross-wire section – solid/ stranded with ferrule (mm ²):	max. 1x 2.5, 2x 1.5/
	max. 1x 2.5 (AWG 14)
Dimensions:	90 x 35 x 64 mm (3.5" x 1.4" x 2.5")
Weight:	122 g (4.3 oz) 135 g (4.8 oz)
Standards:	EN 61812-1

* With a permanent maximum load on the relay contacts of 16 A/AC1 and ambient temperature of +55 °C, the manufacturer recommends using a supply wire with insulation temperature resistance (min.) up to +105 °C.

Warning

This device is constructed for connection in 1-phase network AC/DC 24 – 240 V and must be installed according to norms valid in the state of an application. Installation, connection, setting and servicing must be carried out by qualified electrician staff only, which have perfectly understood the instructions and functions of the device. This device contains protection against overvoltage peaks and disturbing impulses in the power supply network. For the correct function of the protection of this device, there must be suitable protections of higher degrees (A,B,C) installed in front of them and according to the standards, interference of switching devices must be securely eliminated (contactors, motors, inductive loads, etc.). Before installation, make sure that the device is de-energized and the main switch is in the "OFF" position. Don't install the device to sources of excessive electromagnetic interference. Ensure correct installation by perfect air circulation so that during continuous operation and a higher ambient temperature, the device does not exceed the maximum allowed operating temperature. For installation and setting use a screwdriver with a width of approx 2 mm. Keep in mind that this is a fully electronic device and approach accordingly with the installation. Non-problematic function of the device is also dependent on the previous method of transportation, storage, and handling. In case of any signs of damage, deformation, malfunction, or missing parts, don't install this device and claim it at the dealer. The product must be treated as electronic waste at the end of its life.

Type of load	cos φ ≥ 0.95 AC1	AC2	AC3	AC5a uncompensated	AC5a compensated	HAL 230V AC5b	AC6a	AC7b	AC12
Contact material	250V / 16A	250V / 5A	250V / 3A	230V / 3A (690VA)	230V / 3A (690VA) to max. input C=14uF	1000W	x	250V / 3A	x
Type of load	AC13	AC14	AC15	DC1	DC3	DC5	DC12	DC13	DC14
Contact material	AgSnO ₂ , 16A x	250V / 6A	250V / 6A	24V / 16A	24V / 3A	24V / 2A	24V / 16A	24V / 2A	x

Control description

		entrance into programming menu
		browsing in menu
		setting of values
		quick shifting during setting of values
		entrance into required menu
		confirmation
		Wi-Fi activation/deactivation (on main screen)
		a step back
		back to the main screen

Device differs short and long button press.
In the manual marked as:
○ - short button press (< 1s)
● - long button press (> 1s)
After 120s of inactivity (from the last press of any button) the device will automatically return into the main screen.

Manual output control

- controls 1st channel

- controls 2nd channel (SHT-13/2)

- We have two types of manual controls available:
- Permanent (symbol glows)
The second highest priority of all control modes. The state of the output cannot then be changed other than by manual change (e.g. by switching to temporary manual control or by activating mode **LOCKED - MANUAL**, which has a higher priority). The last option is to deactivate this control mode.
 - Temporary (symbol flashing)
Temporary manual control has the same priority as the previous, permanent one. However, it can be changed in the future, unlike permanent manual control, by one of the programs with a lower priority (if configured in the time switch). With power supply disconnection, temporary manual control is deactivated.

Modes priority

	symbol	mode/program
highest priority		locked - manual control
		manual control (temporary permanent)
		random
		holidays
lowest priority		time
		astronomic

(symbol flashes on the display)
ASTRO and TIME PROGRAM can work at the same time on a single channel.

Display indication

 	time program is active time program is planned for future
 	astro program is active astro program is planned for future
	random program is active
 	holiday is active holiday is planned for future
 	temporary permanent manual control

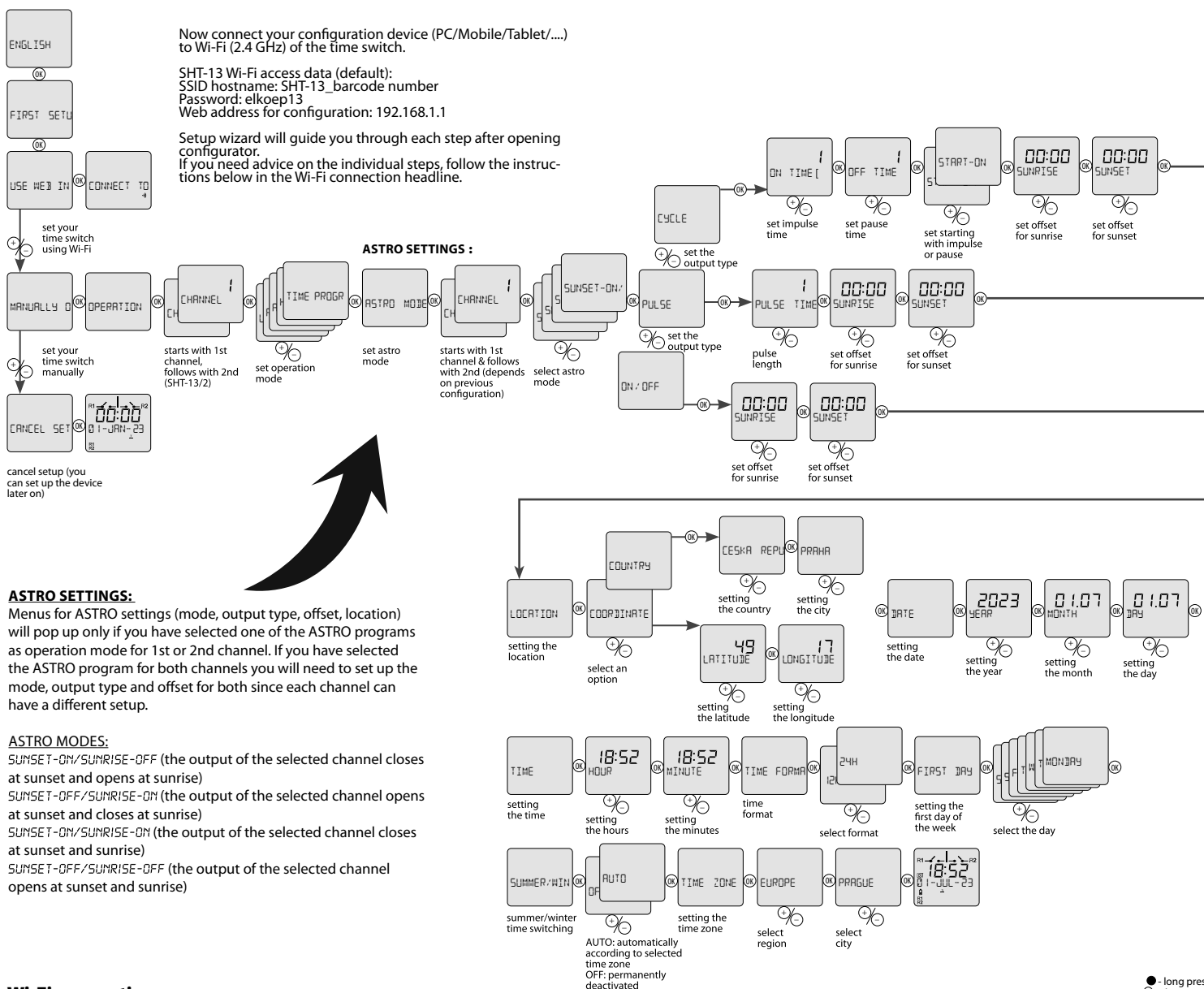
A pictogram with side lines indicates the flashing of the corresponding symbol on the SHT-13 display.
A pictogram without side lines indicates a constant glow of the symbol.

 	pulse program is active cycle program is active
	the device is connected via Wi-Fi to the configuration PC/ phone/...
	the device has active Wi-Fi but is not connected to the configuration PC/phone/...
  	battery is discharged 50% of capacity not inserted
 	sunrise sunset phase of astronomic program

THE BAR GRAPH reflects only time programs or permanent manual control! If the segment of the given time is lit, it means that there is a scheduled time program for switching the output for at least 1 s at the given hour. If the segment of the given time is not lit, it means that no time program for switching the output is scheduled at the given hour.

First setup

To set up the time switch you have two options (including canceling it), please follow the steps below.



Wi-Fi connection

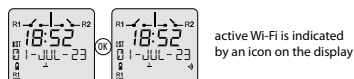
First, make sure that you have a configuration device (PC/phone/...) with Wi-Fi of 2.4 GHz band that supports a web browser and is close enough to SHT-13 that you want to connect. The time switch does not support a 5 GHz band.

It is possible to connect directly to the web server for configuration via the Wi-Fi generated by the SHT-13 (no router or internet connection required). If the time is to be synchronized, an internet connection via a Wi-Fi router is necessary.

Activating the Wi-Fi of time switch:

After connecting the SHT-13 to the power supply, it is possible to activate/deactivate Wi-Fi by briefly pressing the OK button. If Wi-Fi is active and the configuration device is not connected, it will automatically turn off after 90 seconds.

NOTE.: Wi-Fi can be activated permanently through the settings, once the setup wizard is complete



Now connect your configuration device to the Wi-Fi of the time switch (follow the instructions provided by the manufacturer of the configuration device).

SHT-13 Wi-Fi access data (default):
SSID hostname: SHT-13_barcode number
Password: elkoep13

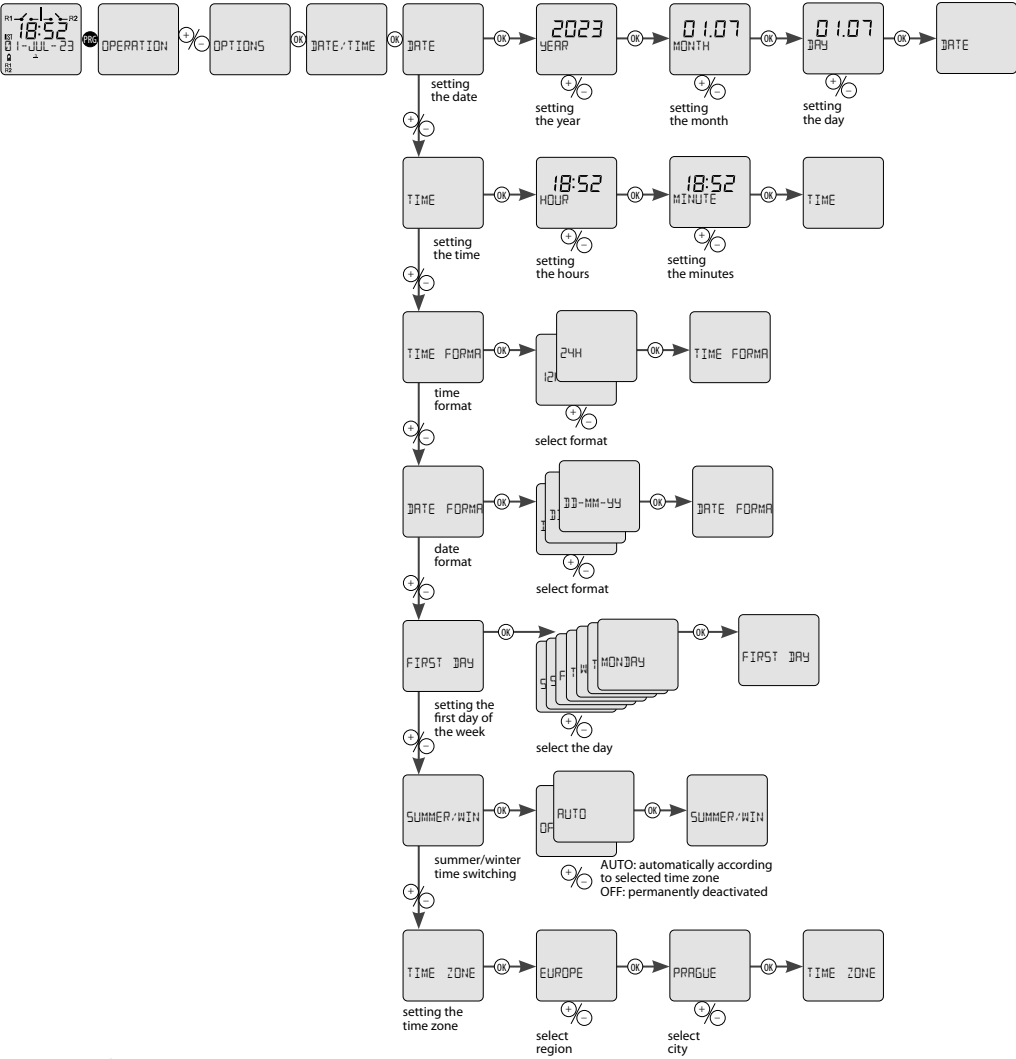
After the connection is established, the Wi-Fi symbol starts flashing on the display.

Open the web browser of the configuration device and enter the IP address in the address bar: 192.168.1.1

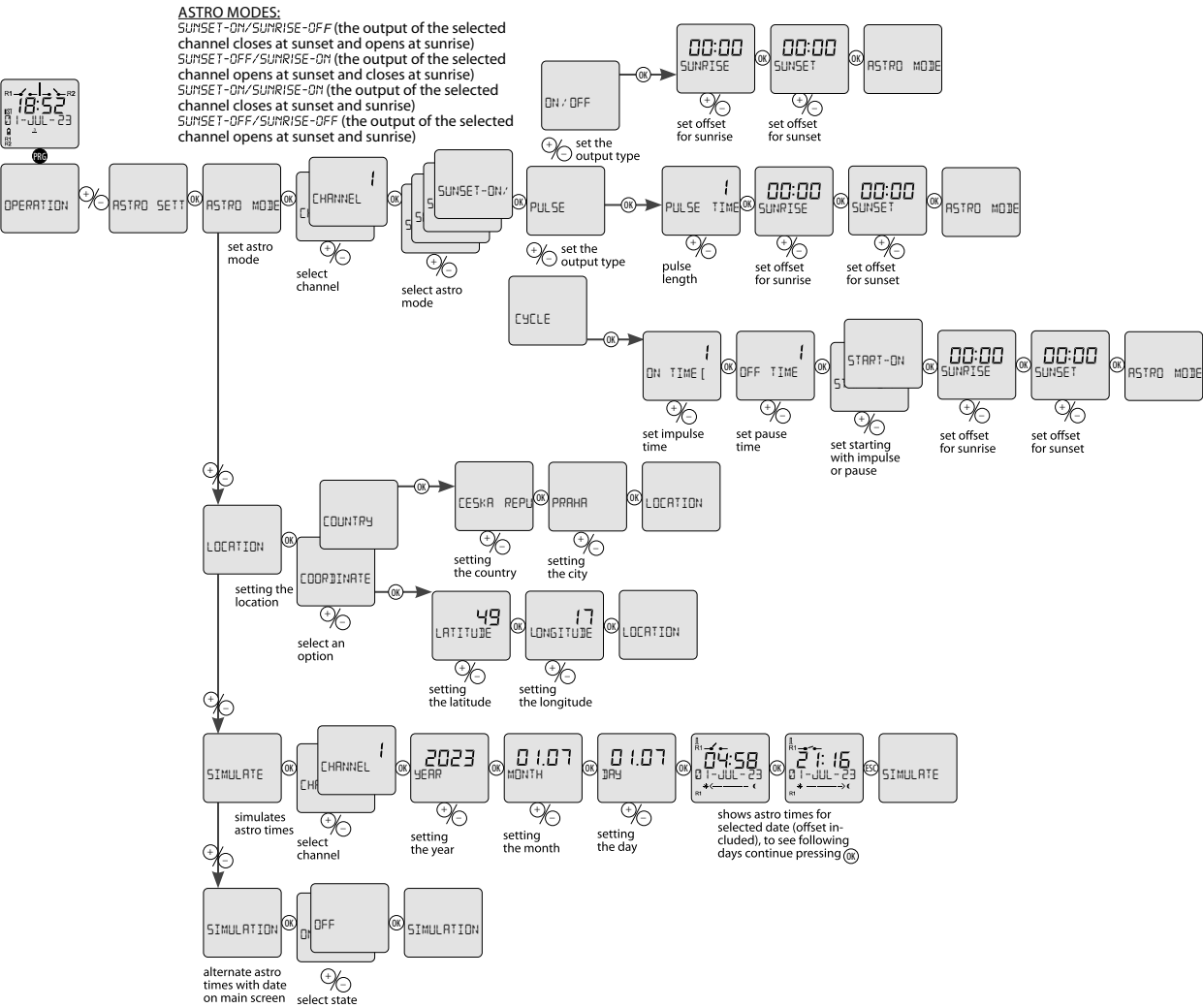


● - long press (>1s)
○ - short press (<1s)

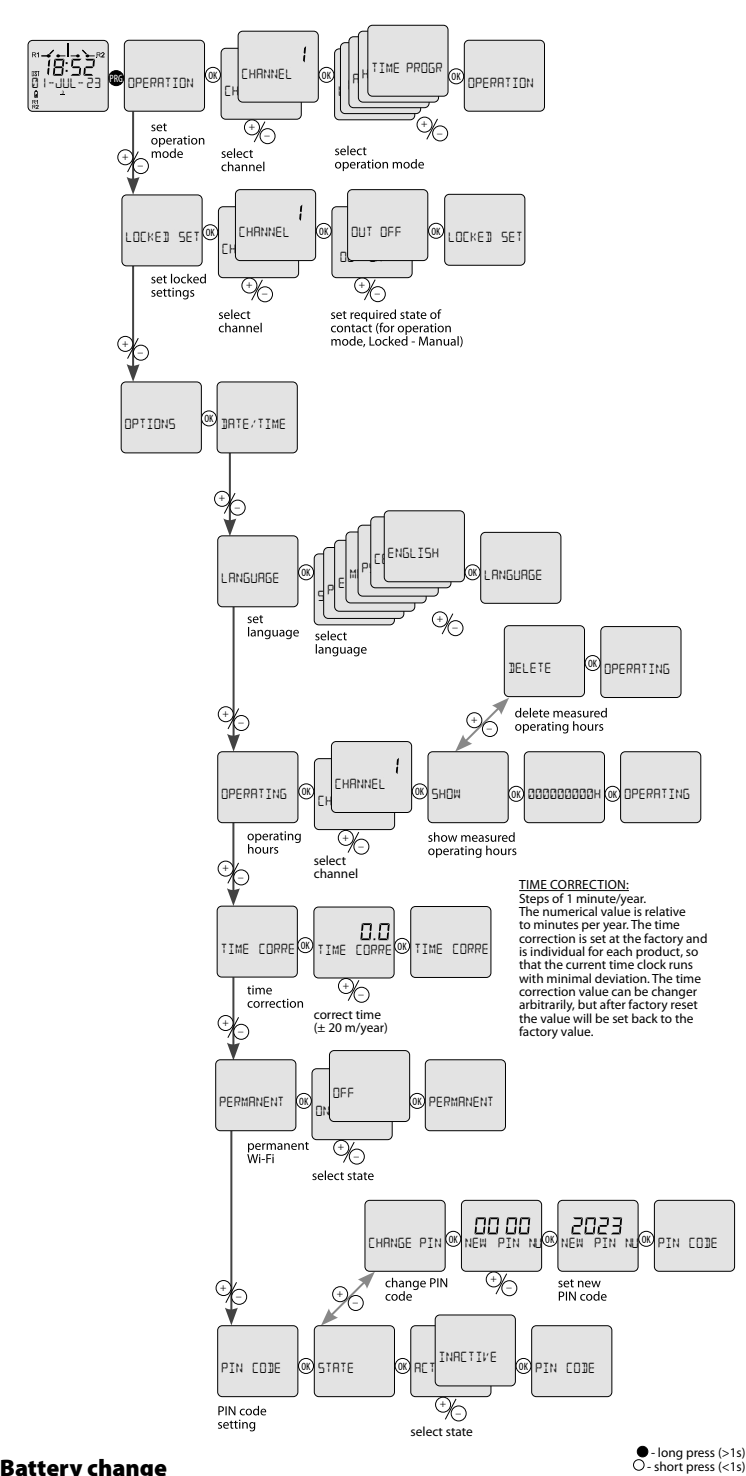
Date and time setting



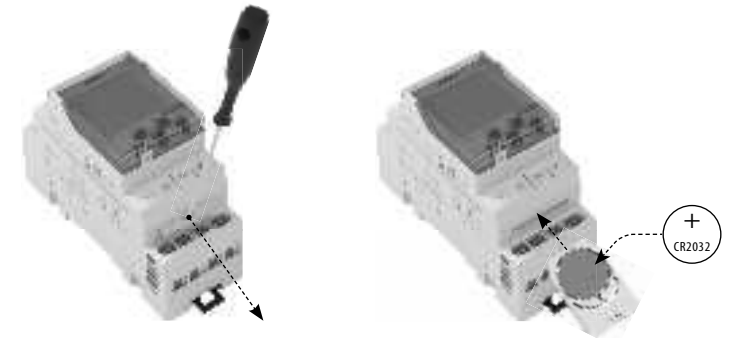
Astro settings



Other settings



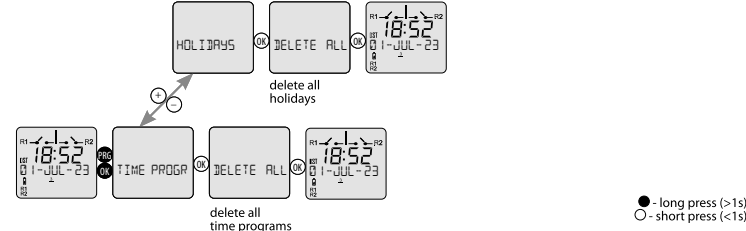
Battery change



You can replace the battery in a user-friendly way, without disassembling the device, with the mains voltage on or off.
When replacing the battery, note that terminal A2, 26, 25, 28 may be under voltage.

When replacing the battery, the following three situations may occur:
a. The timer is connected to the mains supply = proceed according to steps #3 – 6.
b. The timer is not connected to the mains supply (battery supply) = proceed according to steps #1 – 6
c. The timer is connected to the mains supply with a discharged battery = proceed according to steps #2 - 6

Delete all (programs/holidays)



To delete all time programs/holidays on a time switch simply press and hold the buttons as shown in the pictures above and follow the options.

Location - preset locations

AUSTRIA	INNSBRUCK	LATVIA	RIGA
	WIEN	LITHUANIA	VILNIUS
BELARUS	MINSK	NORWAY	OSLO
CESKA REPUBLIKA	PRAHA	POLAND	GDANSK
	BRNO		KRAKOW
	OSTRAVA		WARSAWA
	HRADEC KRALOVE	ROMANIA	ARAD
	CESKE BUDEJOVICE		BUCHAREST
ESTONIA	TALLINN	RUSSIA	MAGADAN
FRANCE	PARIS		MOSCOW
GERMANY	BERLIN		NOVOSIBIRSK
	MUNICH		ST-PETERSBURG
GREAT BRITAIN	EDINBURGH		SOCHI
	LONDON	SLOVENSKO	BRANSKA BYSTRICA
			BRATISLAVA
HOLLAND	AMSTERDAM		KOSICE
HUNGARY	BUDAPEST	SPAIN	MADRID
	DEBRECEM	SWITZERLAND	ZURICH
	PECS	UKRAINE	DONETSK
IRELAND	DUBLIN		KIEV
ITALY	ROMA		ODESSA

- Wake up the timer from the backup mode by short press of OK button, the main screen will appear.
 - Press and hold the PRG button on the main screen, use +/- to navigate to **OPTIONS**, short press OK, use +/- to navigate to **BATTERY CHANGE (30S)**, short press OK to confirm, this will bring you to the **START** option.
 - If you are doing the replacement according to situation b., confirm the above **START** option again with the OK button. The display will show **CHANGE**. Time data has now been saved for the 30 seconds during which you replace the battery, continue with step #3.
 - If you are doing the replacement according to situation c., confirm the above **START** option again with the OK button. The display will show **CHANGE**. You can disconnect in the next 2 minutes supply voltage from the mains. When the supply voltage is disconnected, time data are saved for 30 seconds, during which you replace the battery, continue with step #3.
- NOTE: It is good to physically insert a new battery when the 30 second replacement interval is running out, in order to minimize the deviation of the set time.
- slide out the *plug-in module* with the battery
 - remove the original battery
 - insert the new battery so that the upper edge of the battery (+) is aligned with the *plug-in module*
 - insert the *plug-in module* as far as it will go into the device - pay attention to the polarity (+ up)

If you did it right, the battery symbol on the display will go out after the replacement (if the battery is fully charged) and there will be no or only a minimal deviation in the time data. To achieve repeated and long-term running accuracy, use time synchronization via a Wi-Fi connection - see the Wi-Fi connection section.

