

ELKO SHT-13 Multifunction Digital Time Switch With Wifi Connection



ELKO SHT-13 Multifunction Digital Time Switch With Wifi Connection Owner's Manual

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Characteristics

- All programs in one device (daily, weekly, yearly and astronomical).
- Universal supply voltage in the 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 during power outages.
- Built-in web server for setup and control via Wi-Fi connection.
- Time synchronization through NTP server (require internet connection).
- Possibility of permanent connection to the local network.
- New well-arranged display with white backlight.
- ASTROnomic program: manual entry of coordinates or selecting from one of more than 500 preset cities.
 - selection of days of the week
 - Astro interrupt function (night break): controls the sunrise/sunset times and compares them with the set-OFF/ON times
 - high position accuracy thanks to two decimal places in latitude/longitude
- One/two-channel design (each with an operating hours counter).
- Pulse/cycle output mode.
- Transition of summer/winter time – AUTO or OFF.
- Sealable transparent front panel cover.
- PIN code protection against unauthorized changes.
- Wireless firmware update – current version 1.40

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

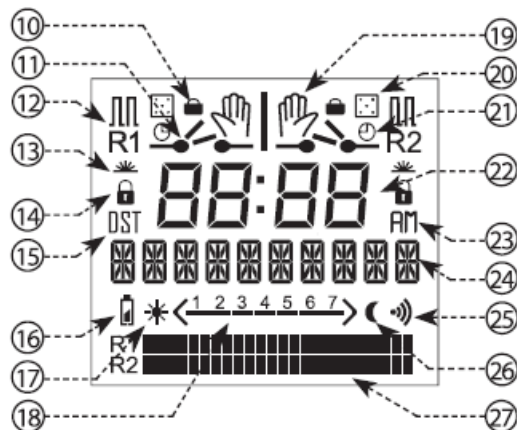
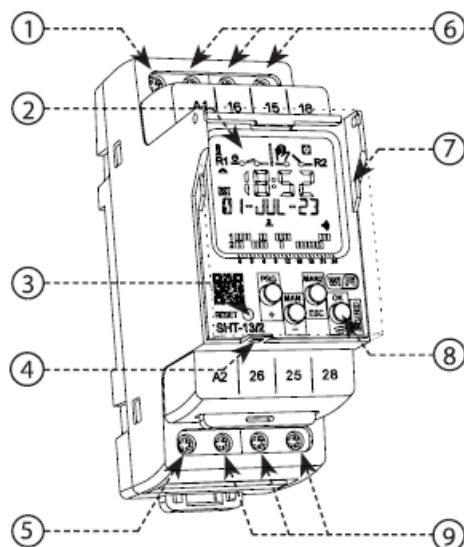
Each channel can be assigned a different program or operating switching mode, this allows control of two

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)
 - HOLIORYS / TIME PROGRAM (switches according to set holidays and time programs)
 - RSTRO / 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 10-120 min)
 - LOCKED – MANURL (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 – MANURL).
- The time switch can work in CLIENT and AP wireless communication modes independently of each other.
- 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 / SK / HU / PL / ES / DE / BG / RU
- 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.

Description

SHT-13/2



1. Supply terminal (AI)
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) SHT-13/2 only
10. Holiday program
11. Output indication
12. Pulse/cycle mode
13. Astro program
14. Manual control locked
15. Summertime
16. Battery indication
17. Sunrise indication
18. Days in a 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 AND BATTERY POWER BEHAVIOUR

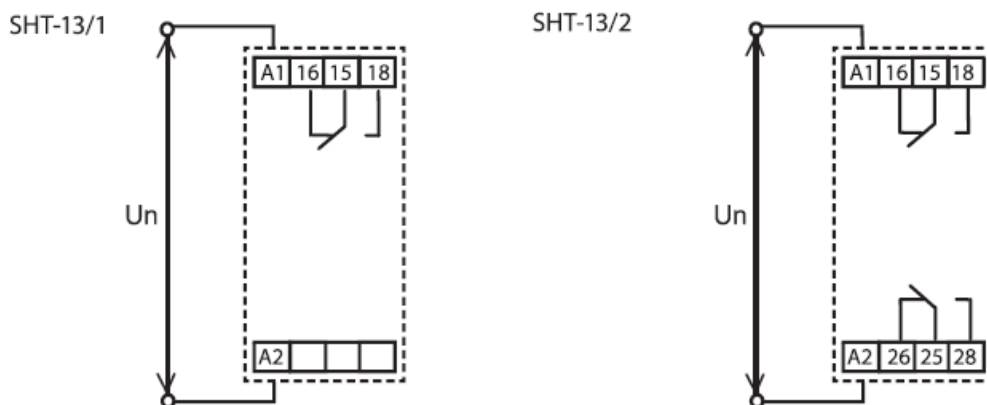
Powered: By default, the display is backlit for 90 seconds from the time of the last press of any button. The display still shows: the date, time, day of the week, state of contacts, and battery or the type of program in progress. The

backlight is permanently switched on/off by a long press of the MAN1, MAN2, and OK buttons at the same time. When activating / deactivating the permanent backlight, the display will briefly flash twice.

Backup/sleep mode: In the event of a power failure, the display will automatically switch to backup mode for 60 minutes, during which time the display will only flash: the date, time, day of the week and battery status. After 60 minutes from the outage, the display switches to sleep mode, when only the text POWER OFF and battery status appear on the display. During both of the above modes, it is possible to wake up the timer at any time by pressing the OK button to the standard mode, e.g. to change settings or programs (without Wi-Fi functionality or output contacts) – however, take into account that in this case the battery drawn is significantly increased, which will affect its lifetime.

The time switch cannot be woken up to standard mode if the battery is discharged and its symbol on the display is flashing. Therefore, we recommend that you make changes in the settings primarily after connecting to the power supply, and only enter the standard mode when powered from the battery in an extreme emergency. If no button is pressed in the 20 seconds, it will return to backup mode.

Connection



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

Technical parameters

SHT-13/1**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:	1× changeover (AgSnO ₂)	2× changeover (AgSnO ₂)
Current rating:	16 A/AC1*	
Breaking capacity:	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 half a year with 60 outages (CR 2032 - 3V)

Program circuit

Number of memory locations:	200 - time programs, 30 - holidays
Program type:	daily, weekly, yearly, astro
Displayed data:	LCD display with white backlight
Settings via website:	by Wi-Fi (2.4 GHz)

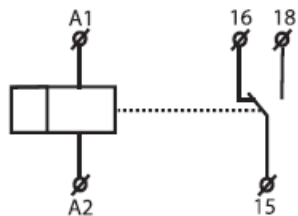
Other information

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. 1× 2.5, 2× 1.5/ max. 1× 2.5 (AWG 14)
Dimensions:	90 × 35 × 64 mm (3.5" × 1.4" × 2.5")
Weight:	122 g (4.3 oz) 135 g (4.8 oz)
Standards:	EN 61812-1

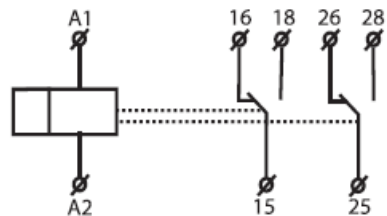
With a permanent maximum load on the relay contacts of 16 A/ACI and ambient temperature of +55 °C, the manufacturer recommends using a supply wire with insulation temperature resistance (min.) up to + 105 °C.

Symbol

SHT-13/1



SHT-13/2



Control description

The device differs in short and long button presses.

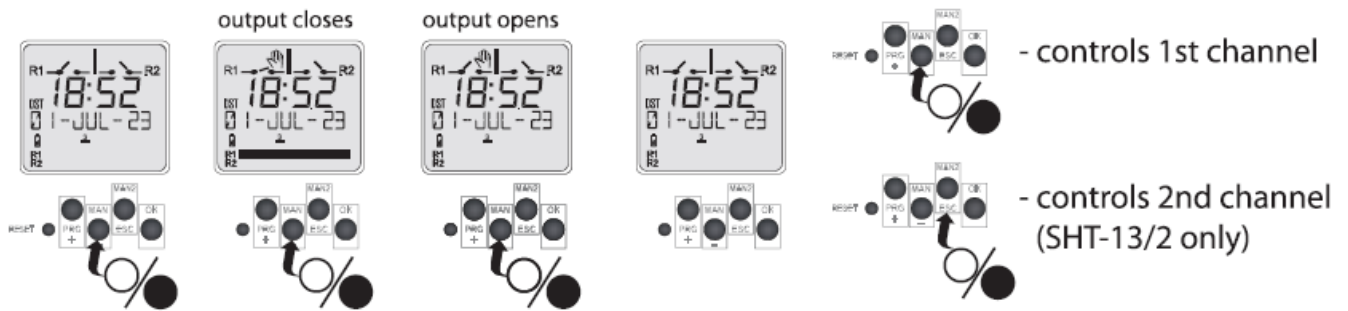
In the manual marked as:

- short button press (< 1s)
- long button press (> 1s)

After 120 s of inactivity (from the last press of any button), the device will automatically return to the main screen.

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

Manual output control



We have two types of manual controls available:









• Permanent – long press (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 – short press (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 or when adding 1st time program. 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.

Type of load	 $\cos \varphi \geq 0.95$ AC1	 AC2	 AC3	 AC5a uncompensated	 AC5a compensated	 AC5b 1000W	 AC6a	 AC7b	 AC12
Contact material AgSnO ₂ , 16A	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

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
 	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

- 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.

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 sat 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

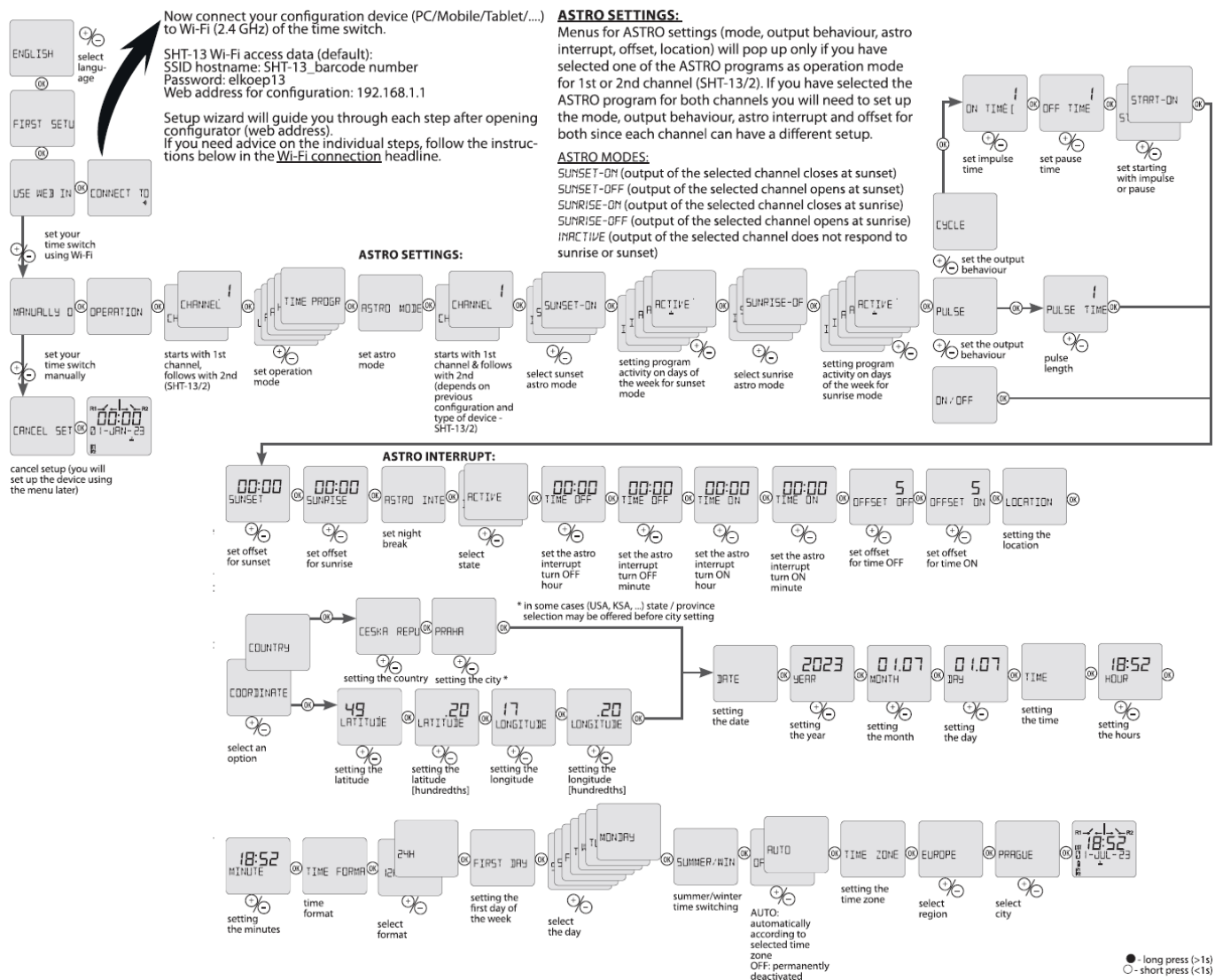
To set up the time switch you have two options (including cancelling it), please follow the steps below.

ASTRO SETTINGS:

Menus for ASTRO settings (mode, output behaviour, Astro interrupt, offset, location) will pop up only if you have selected one of the ASTRO programs as operation mode for 1st or 2nd channel (SHT-13/2). If you have selected the ASTRO program for both channels you will need to set up the mode, output behaviour, Astro interrupt and offset for both since each channel can have a different setup.

ASTRO MODES:

- SUNSET-ON (output of the selected channel closes at sunset)
- SUNSET-OFF (output of the selected channel opens at sunset)
- SUNRISE-ON (output of the selected channel closes at sunrise)
- SUNRISE-OFF (output of the selected channel opens at sunrise)
- INACTIVE (output of the selected channel does not respond to sunrise or sunset)



ASTRO INTERRUPT

It works on a similar principle as a time program with the difference that the set-off and ON times are compared by an algorithm with sunset and sunrise times. Possible offsets for the sunset and sunrise are counted together with a set offset for time OFF and ON in the Astro interrupt submenu. In practice, it can be used e.g. for the so-called night break at set Astro mode SUNSET-ON, SUNRISE-OFF (e.g. street light control).

With the above configuration, Astro interrupt ensures that when the value for set time OFF + its offset is before sunset, the contact does not open. When the value for set time OFF + its offset is after sunset, the contact opens (night break start). Likewise, astro interrupt takes care if configured like above that when the value for set time ON + its offset is after sunrise, the contact did not close. When the value for set time ON + its offset is before sunrise, the contact is closed (night break end).

Wi-Fi connection

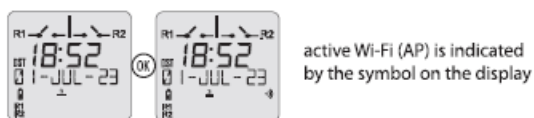
- First, make sure that you have a configuration device (PC/phone/...) with Wi-Fi of 2.4 GHz band that supports a web browser and is close enough to SHT-13 that you want to connect. The time switch does not support a 5 GHz band.
- It is possible to connect directly to the web server for configuration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

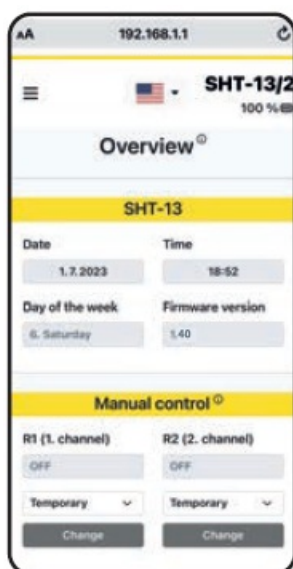
Wi-Fi can be activated permanently through the settings, once the setup wizard is complete.



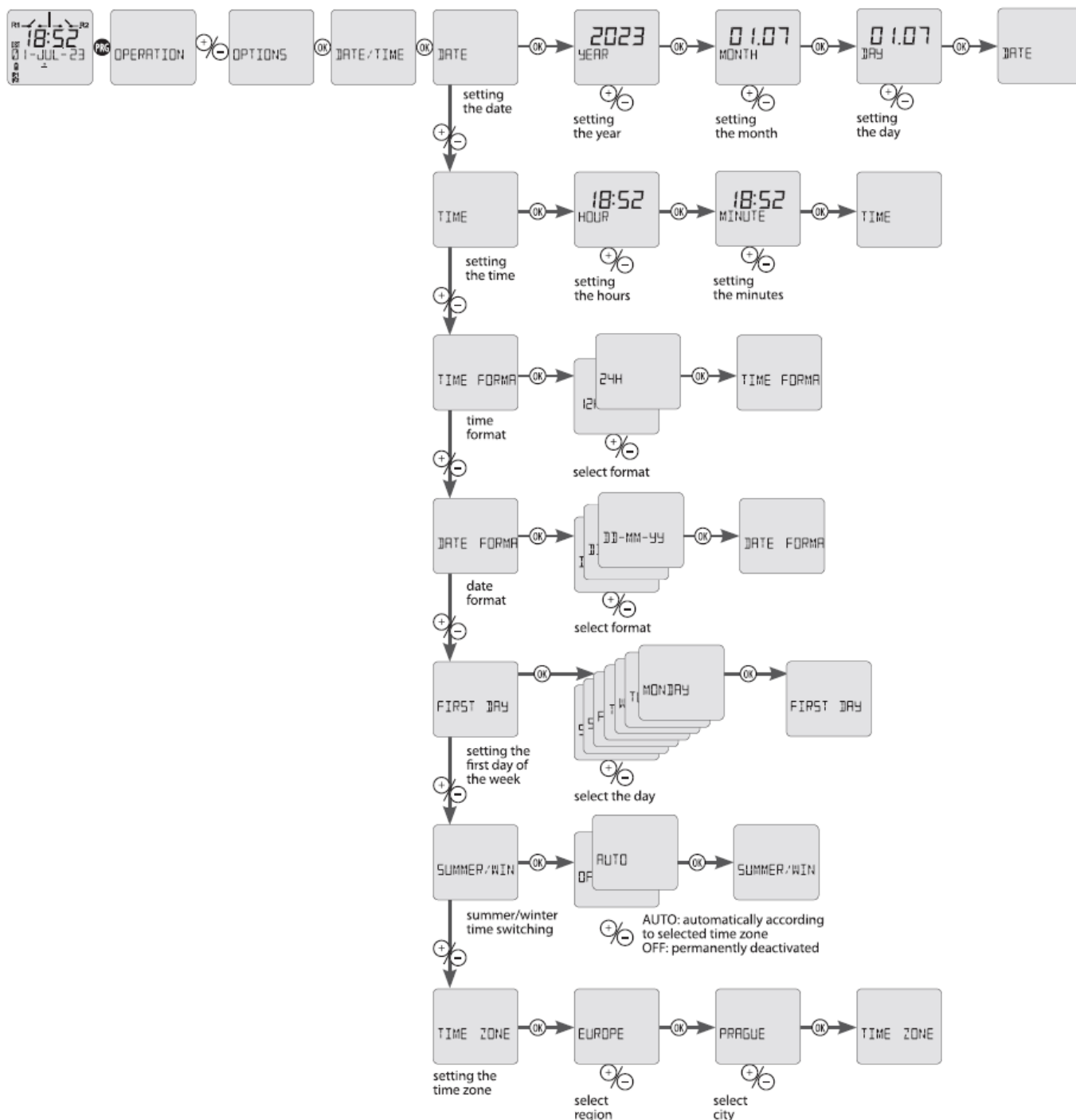
Now connect your configuration device to the Wi-Fi of the time switch (follow the instructions provided by the manufacturer of the configuration device).

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



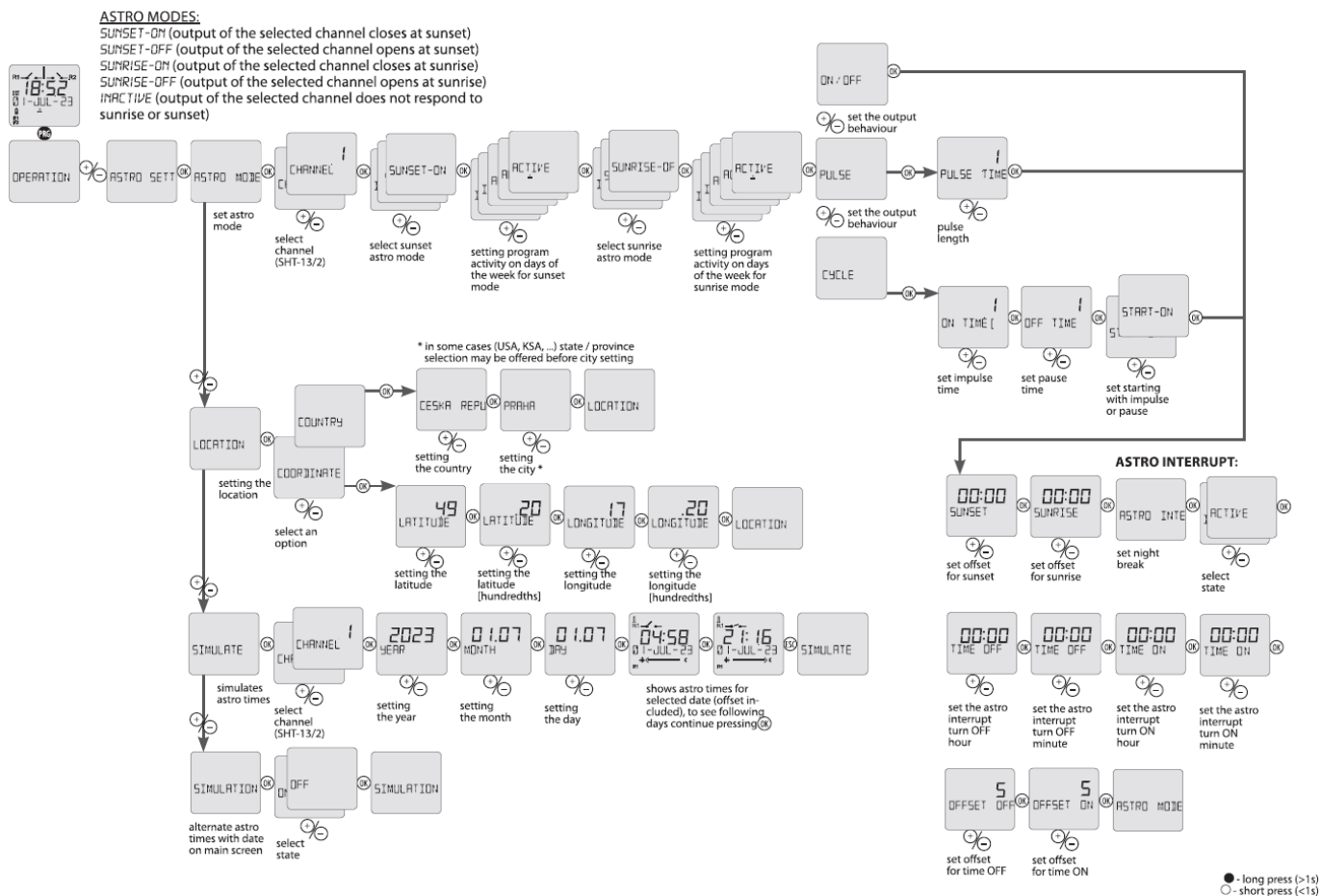
Date and time setting



Astro settings

ASTRO MODES:

- SUNSET-ON (output of the selected channel closes at sunset)
- SUNSET-OFF (output of the selected channel opens at sunset)
- SUNRISE-ON (output of the selected channel closes at sunrise)
- SUNRISE-OFF (output of the selected channel opens at sunrise)
- INRETIVE (output of the selected channel does not respond to sunrise or sunset)

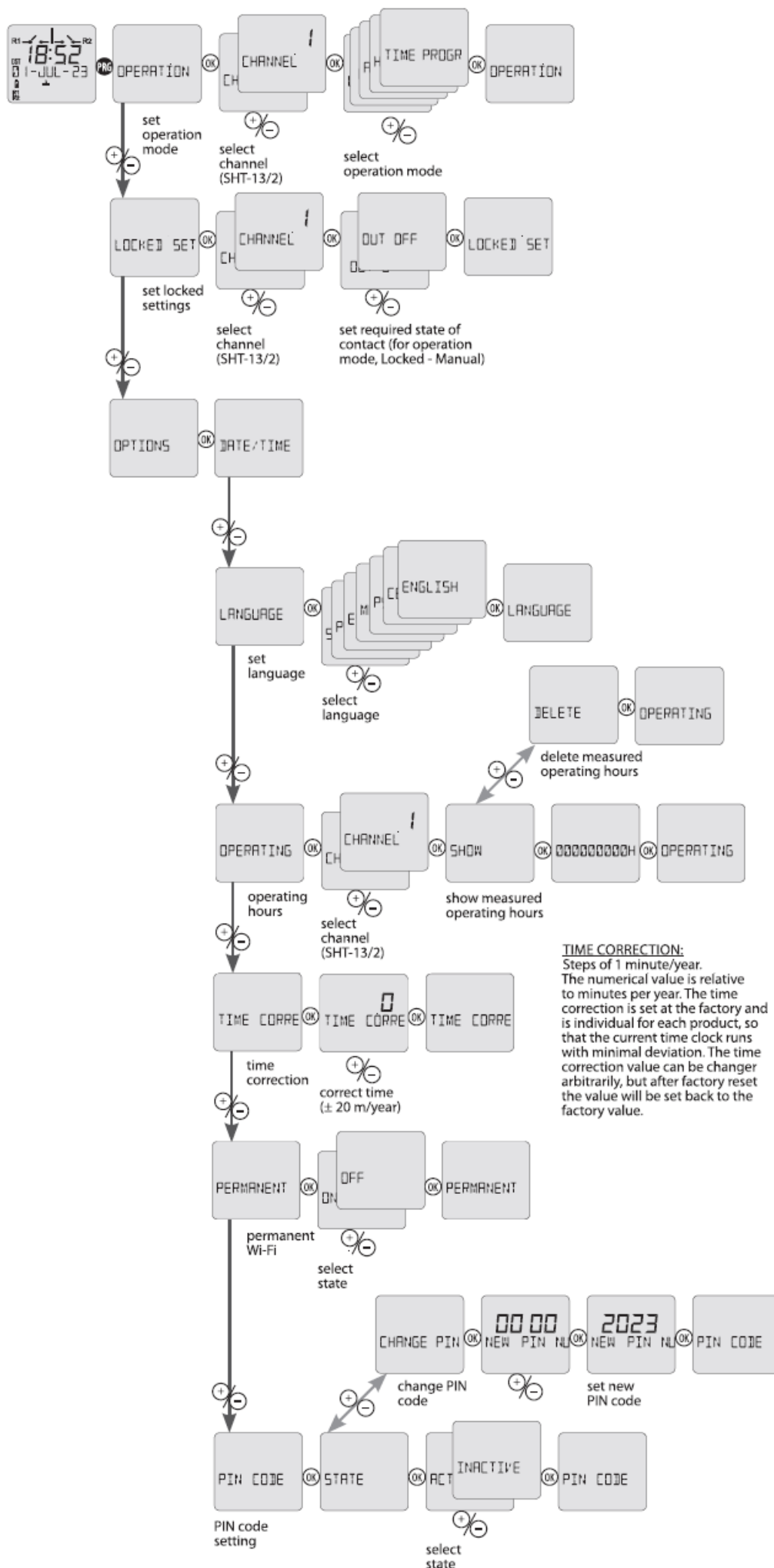


ASTRO INTERRUPT:

It works on a similar principle as a time program with the difference that the set-off and ON times are compared by an algorithm with sunset and sunrise times. Possible offsets for the sunset and sunrise are counted together with a set offset for time OFF and ON in the Astro interrupt submenu. In practice, it can be used e.g. for the so-called night break at set Astro mode SUNSET-ON, SUNRISE-OFF (e.g. street light control).

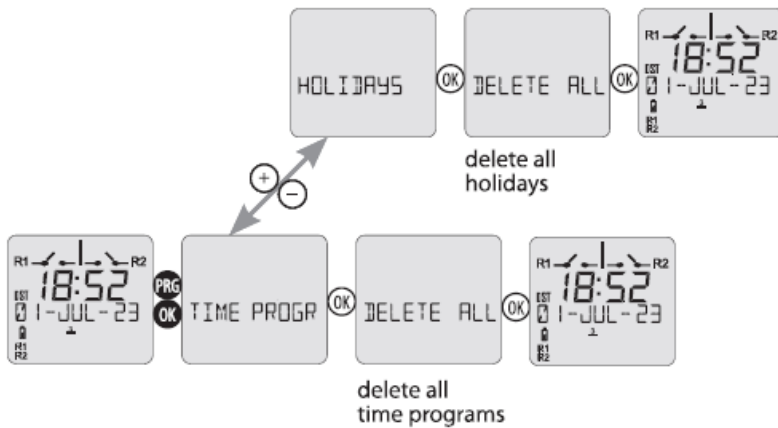
With the above configuration, Astro interrupt ensures that when the value for set time OFF + its offset is before sunset, the contact does not open. When the value for set time OFF + its offset is after sunset, the contact opens (night break start). Likewise, astro interrupt takes care if configured like above that when the value for set time ON + its offset is after sunrise, the contact did not close. When the value for set time ON + its offset is before sunrise, the contact is closed (night break end).

Other settings



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

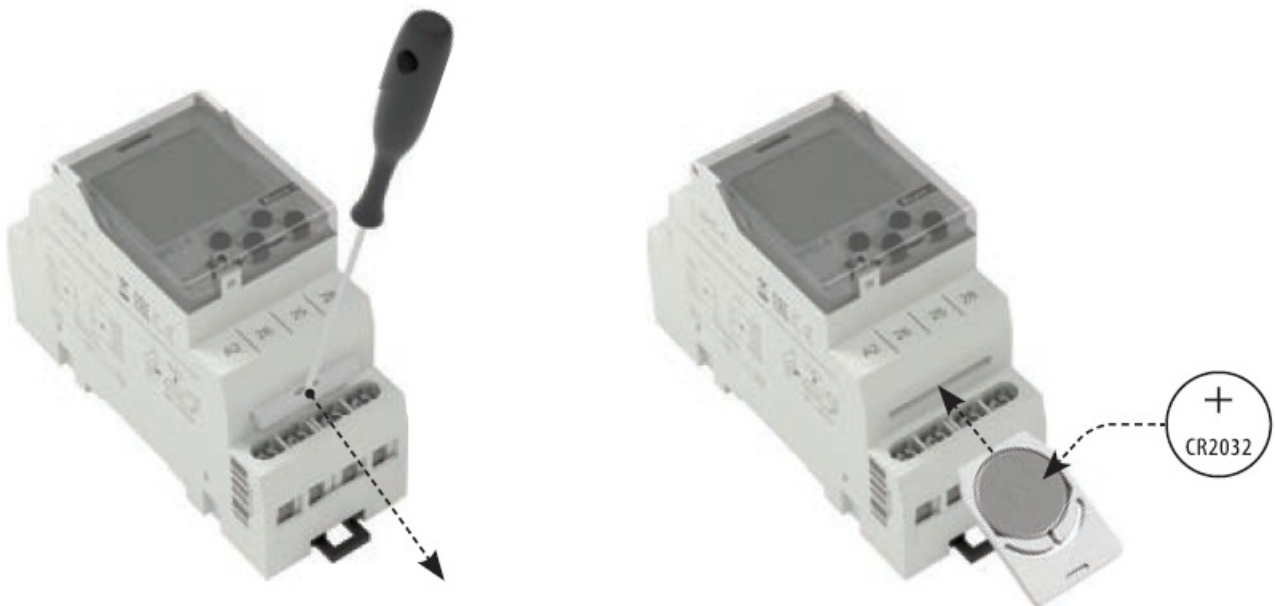
Delete all (programs/holidays)



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

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.

Battery change



When replacing the battery, the following three situations may occur:

- The timer is connected to the mains supply = proceed according to steps #3 – 6.
- The timer is not connected to the mains supply (battery supply) = proceed according to steps #1 – 6
- The timer is connected to the mains supply with a discharged battery = proceed according to steps #2 – 6

1. Wake up the timer from the backup/sleep mode by a short press of the OK button, the main screen will appear.
2. Press and hold the PRG button on the main screen, use +/- to navigate to OPTIONS, short press OK, use +/- to navigate to BATTERY CHANGE [305], and 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.

3. slide out the plug-in module with the battery

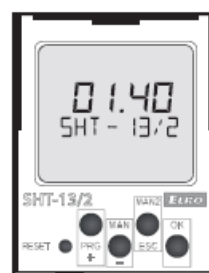
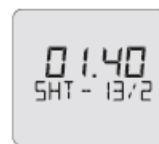
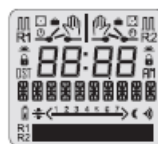
4. remove the original battery

5. insert the new battery so that the upper edge of the battery (+) is aligned with the plug-in module

6. 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 repeatable and long-term running accuracy, use time synchronization via Wi-Fi connection using the web interface in the Options tab.

Firmware update/factory reset/restart



• Firmware update:

- The web interface itself will guide you through the update process. After connecting to Wi-Fi SHT-13 and opening the configurator in the browser, go to the Service menu, select the file with the new firmware and click the update button.
- The hidden RESET button has two functions depending on the length of the press:

• Factory reset:

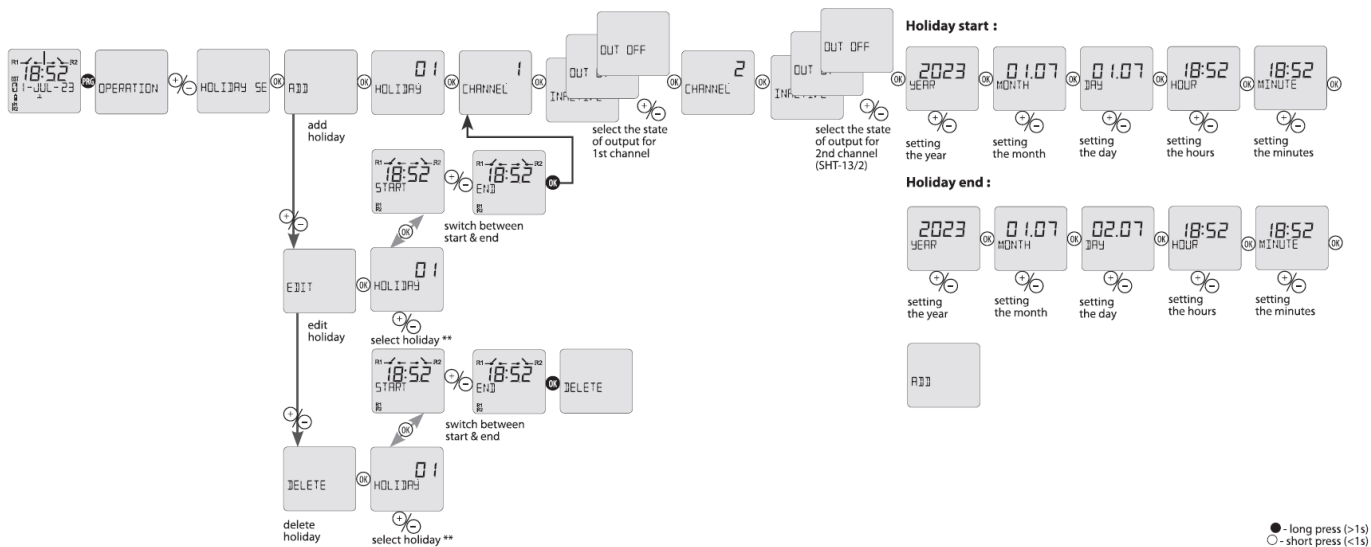
- It is performed by long pressing >5 with a blunt tip of the hidden RESET button (e.g. a pen or a screwdriver with a diameter of max. 2 mm).
- The display briefly shows all display segments, then the device type and firmware version. The following

- Settings and all configured programs/holidays are erased by this step.

It is done by briefly pressing < 1 with the blunt tip of the hidden RESET button. The display briefly shows all display segments, then the device type and firmware version. This is followed by a transition to the main screen – date, time, program activity, contact status, etc. This step will not result in the loss of settings or configured programs/holidays.

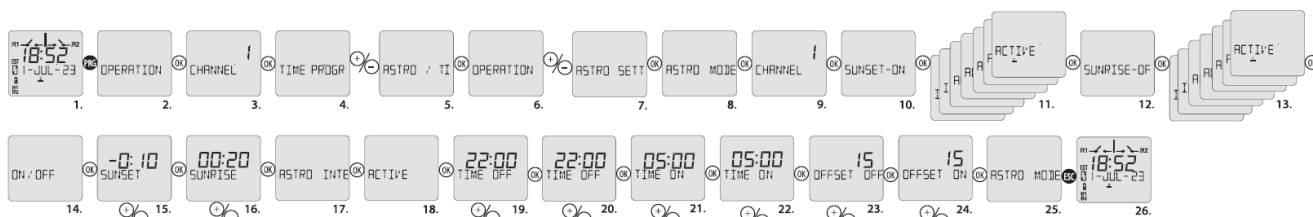
Time program setting

By shortly pressing **ok**, you can toggle between the program number and the display of its settings. Use +/- to toggle preset programs. By holding **ok** you can proceed with the required step EDIT/DELETE. If you do not want to proceed, press **ESC** to go to the main screen without any change. Alternatively, it will happen automatically after 120 seconds from the last button press. If the program memory is full, you will see FULL MEMORY on the display. If the program's memory is empty and you want to change or erase a program, the display will show MO PROGRAMS/ NO HOLIDAYS.



SHT-13 programming example

- Setting the 1st channel to switch ON from sunset to sunrise with an offset (deviation) of -10 min for sunset and +20 min for sunrise with night break using Astro interrupt from 22:00 to 5:00 every MONDAY – FRIDAY with a 15 min offset of Astro interrupt for sunset/sunrise.
- This configuration respects the sunrise and sunset times which in this particular example setup will not allow the contact to open/close if the sunset/sunrise time has not yet occurred, while the astro interrupt offset is also respected.



- Setting the 1st channel to switch ON from sunset to sunrise with an offset (deviation) of -10 min for sunset and +20 min for sunrise with night break using time programs from 22:00 to 5:00 every MONDAY – FRIDAY.
- This configuration does not respect the sunrise and sunset times, which can cause the contact to close even when it may no longer be desirable (e.g. after sunrise).

Documents / Resources

	<p>ELKO SHT-13 Multifunction Digital Time Switch With Wifi Connection [pdf] Owner's Manual</p> <p>SHT-13 Multifunction Digital Time Switch With Wifi Connection, SHT-13, Multifunction Digital Time Switch With Wifi Connection, Digital Time Switch With Wifi Connection, Switch With Wifi Connection, Wifi Connection, Connection</p>
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References

- [User Manual](#)

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