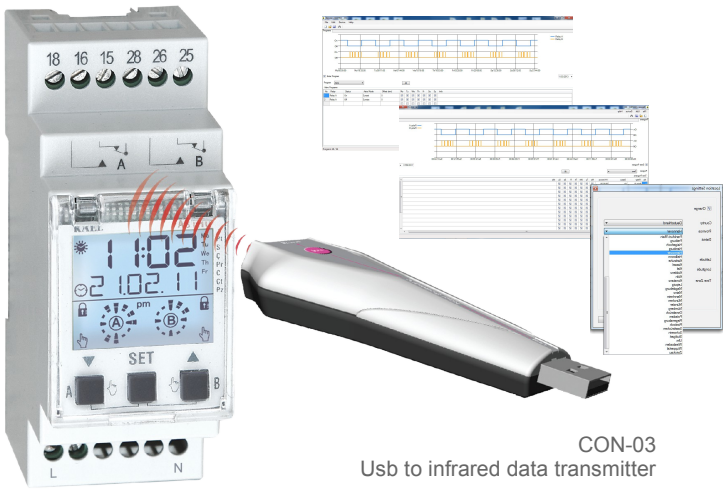
ASTRO-05 and ASTRO-15

Astronomical & Prayer Time Switch



- User replaceable battery
- 2 Relay Output (8A) ; ASTRO-05
- 2 Relay Output (16A) ; ASTRO-15
- No Backlight ; ASTRO-05
- **Backlight ; ASTRO-15**
- Easy to use with English menu
- Real time clock and calender
- 56 programs
- Prayer, astronomical or/and time switching function
- Preset and adjustable Fajr and Isha twilight angles
- Automatic or manual summer/winter time option
- ON/OFF switching times
- Easy to program with PC Software
- Optical loading the programs with CON-3 Device
- Graphical simulation program for both outputs
- Automatic sunrise/sunset calculation using coordinates and time
- Offset for adjustable programming of sunrise/sunset times
- Quiet mode
- 2 Manual modes
- PIN code protection

Area of Usage:

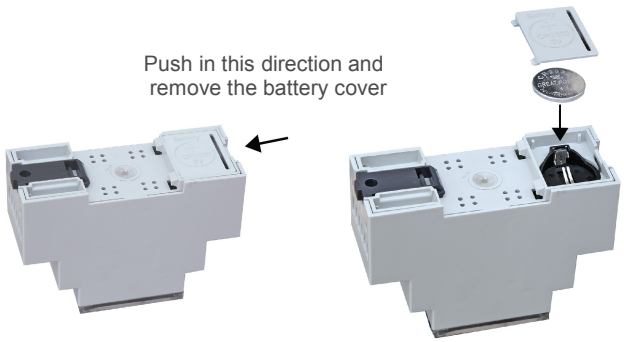
- Heating systems in mosques according the prayer times
- Park, garden and farm irrigation
- Street, park, garden illuminations
- ATM ,store window, billboard illuminations

General:

ASTRO is a digital time switch that calculates the sunset,sunrise and prayer times by using coordinates and real time clock. It operates according to the program setting and it has no need for a photocell sensor. Device could be used as astronomical, prayer or digital time switch.
ASTRO has two reserves to protect the real time clock and calender against power outage.
For long term reserve there is CR2032 battery. If the device is powered, battery life is approx. 5 years. When the battery life is expired,the user is able to replace the battery easily.
Super capacitor is used for short time power failures. It supplies the device for 3-7 hours. In this case battery is not used, so battery level is conserved.

NOTE1: Before commissioning the device, please insert the battery into the battery compartment .
NOTE2: If the device is not powered, ASTRO automatically enters power save mode to conserve the battery life. When the device is in this mode LCD screen is turned off. The screen would turn on when pressing any button and so the user would be able to change the settings and programming the device manually. After 15 seconds of inactivity, the screen would be turned off again.
NOTE3: 4 preset programs are available on the device.

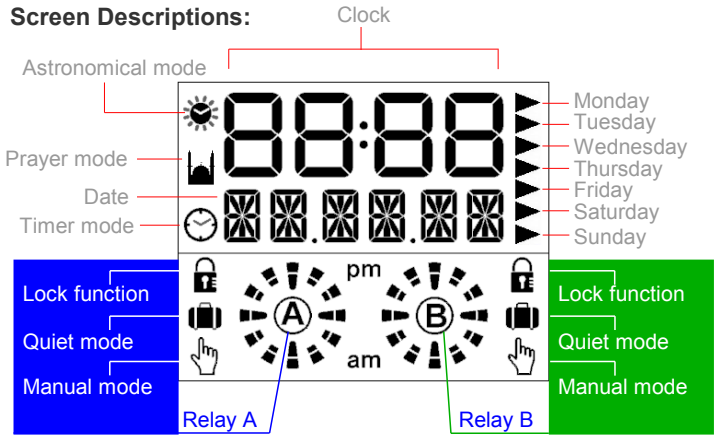
Program 1 : Relay A	Astro	Sunset	ON
Program 2 : Relay A	Astro	Sunrise	OFF
Program 3 : Relay B	Astro	Sunset	ON
Program 4 : Relay B	Time	00:00	OFF

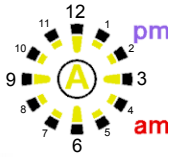


Insert the battery with the positive(+) side facing up as shown in the figure.

Make sure the battery is seated correctly in the battery slot. Replace the battery cover.

Screen Descriptions:





Clock faces represent output states of the relay contacts during current day.
Before midday, am icon appears.
After midday, pm icon appears.
There are two clock faces, on the left for Relay A and on the right for Relay B.

Warnings:

- The connection of device must be done by authorized technical service staff according to the wiring diagram.
- Before making the connections to device's terminals, please be sure that there is no voltage across the cables or terminals. Also be sure that the panel is de-energized.
- Before cleaning the device, please be sure that it is de-energized and use only dry tissue-paper to clean it. Water or any other chemicals used for cleaning may harm the device
- Before commissioning the device, please be sure that the terminal connections are made exactly
the same as in the connection diagram
- To protect the device, please mount it on DIN rail in a panel.
- Contact your authorized dealer, if a problem occurs with your device.

Following the precautions is to prevent the users from physically and spiritual damage. The manufacturer is not responsible for any injuries or damages due to violation of the warnings.

Button Functions:

ASTRO is an easy to use device with 3 buttons.

▼ : Press to move between menus or decrease the related parameter.
▲ : Press to move between menus or increase the related parameter.
SET : Press to go into the menu or save the related parameter.
▼ ▲: Press two buttons at the same time to go back to the pre-menu screen
Press two buttons long at the same time to return to the main screen.

MANUAL MODE

Manual mode is used for setting or testing the desired relay output, or deactivating the program operation. This mode could be activated for both of the relays separately. If output A is locked it can't be switched to manual mode for output A, but it can be switched for output B.
For blocking the activation of manual mode, the related output should be locked. Lock function is described on page 7.
There are two different manual modes.

1-TEMPORARY MODE : When the subsequent program steps in, temporary manual mode would be deactivated.

Temporary manual mode for Relay A :

Push ▼ button until the flashing hand icon appears on the left of the screen.
Throughout the manual mode, for changing Relay **A** output, it is necessary to push and release ▼ button.
In this mode, if the subsequent program for Relay **A** changes the output, manual mode would be deactivated automatically and ASTRO operates the program. Otherwise manual mode would continue to be active for Relay **A**.
To deactivate this mode for Relay **A** as an option, push ▼ button until the flashing hand icon disappears.

Temporary manual mode for Relay B :

Push ▲ button until the flashing hand icon appears on the right of the screen.
Throughout the manual mode, for changing Relay **B** output, it is necessary to push and release ▲ button.
In this mode, if the subsequent program for Relay **B** changes the output, manual mode would be deactivated automatically and ASTRO operates the program. Otherwise manual mode would continue to be active for Relay **B**.
To deactivate this mode for Relay **B** as an option, push ▲ button until the flashing hand icon disappears.

2- PERMANENT MODE : It is only possible to deactivate permanent mode as manually.

Permanent manual mode for Relay A:

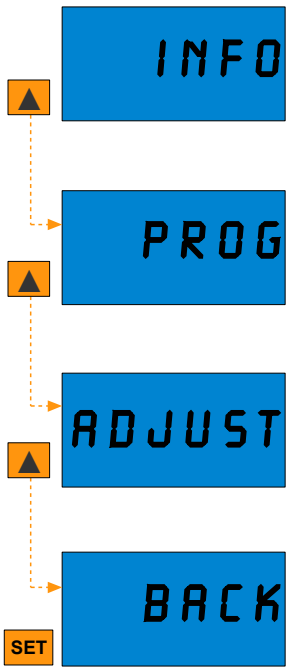
Push ▼ and **SET** buttons at the same time until the hand icon appears on the left of the screen.
Permanent manual mode is not deactivated automatically. The only way to deactivate this mode is manually.
Throughout the manual mode, for changing Relay **A** output, it is necessary to push and release ▼ button.
To deactivate this mode for Relay **A**, push ▼ button until the hand icon disappears.

Permanent manual mode for Relay B:

Push ▲ and **SET** buttons at the same time until the hand icon appears on the right of the screen.
Permanent manual mode is not deactivated automatically. The only way to deactivate this mode is manually.
Throughout the manual mode, for changing Relay **B** output, it is necessary to push and release ▲ button.
To deactivate this mode for Relay **B**, push ▲ button until the hand icon disappears.

MENUS:

Press SET button on the main screen to access the menus. If the lock function is deactivated, PROG menu appears on the screen. Use the direction buttons to see ADJUST,DISPLY and EXIT

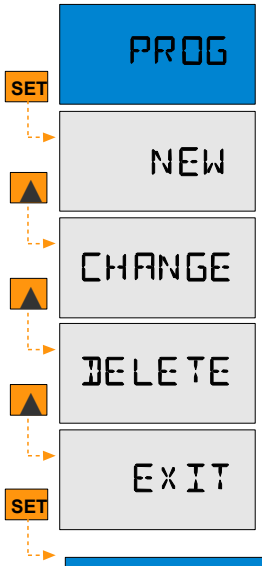


information :
In this menu, program and device settings could be monitored without making changes. Use the direction buttons to see information about sunrise, sunset, programs, memory status, season (summer-winter), latitude, longitude,quiet mode status.

PROGRAM:
All program settings could be done. Creating new program, changing or deleting an existing program.

ADJUST:

Device settings could be done.

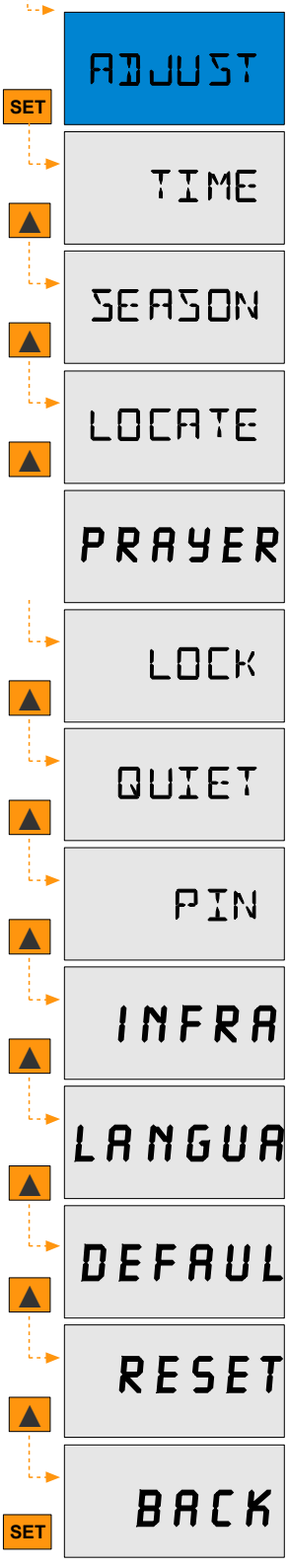


PROGRAM MENU:
Press SET button on PROG screen to access the Program Menu. Use the direction buttons to see NEW,CHANGE,DELETE and EXIT menus.

NEW : New programs are created.

CHANGE : Existing programs could be changed.

DELETE : Existing programs could be deleted. It is possible to delete all of them or the selected one.



ADJUST MENU:
In this menu, device settings could be done.

Real Time Clock and Calender could be set in TIME menu

In this menu, daylight saving time settings could be done. If AUTO is chosen, device determines beginning dates of the summer and winter automatically.

Coordinates and time zone settings of the location could be done in this menu.

Prayer times calculation method could be set in this menu.

Lock function could be activated to prevent unauthorized persons from using the device. This mode could be activated for both of the relays separately.

Quiet mode could be activated to stop the program operation for a certain period.

In this menu, PIN code could be changed. PIN code is a 4 digit number.

Infrared (con03) communication could be Enabled or disabled

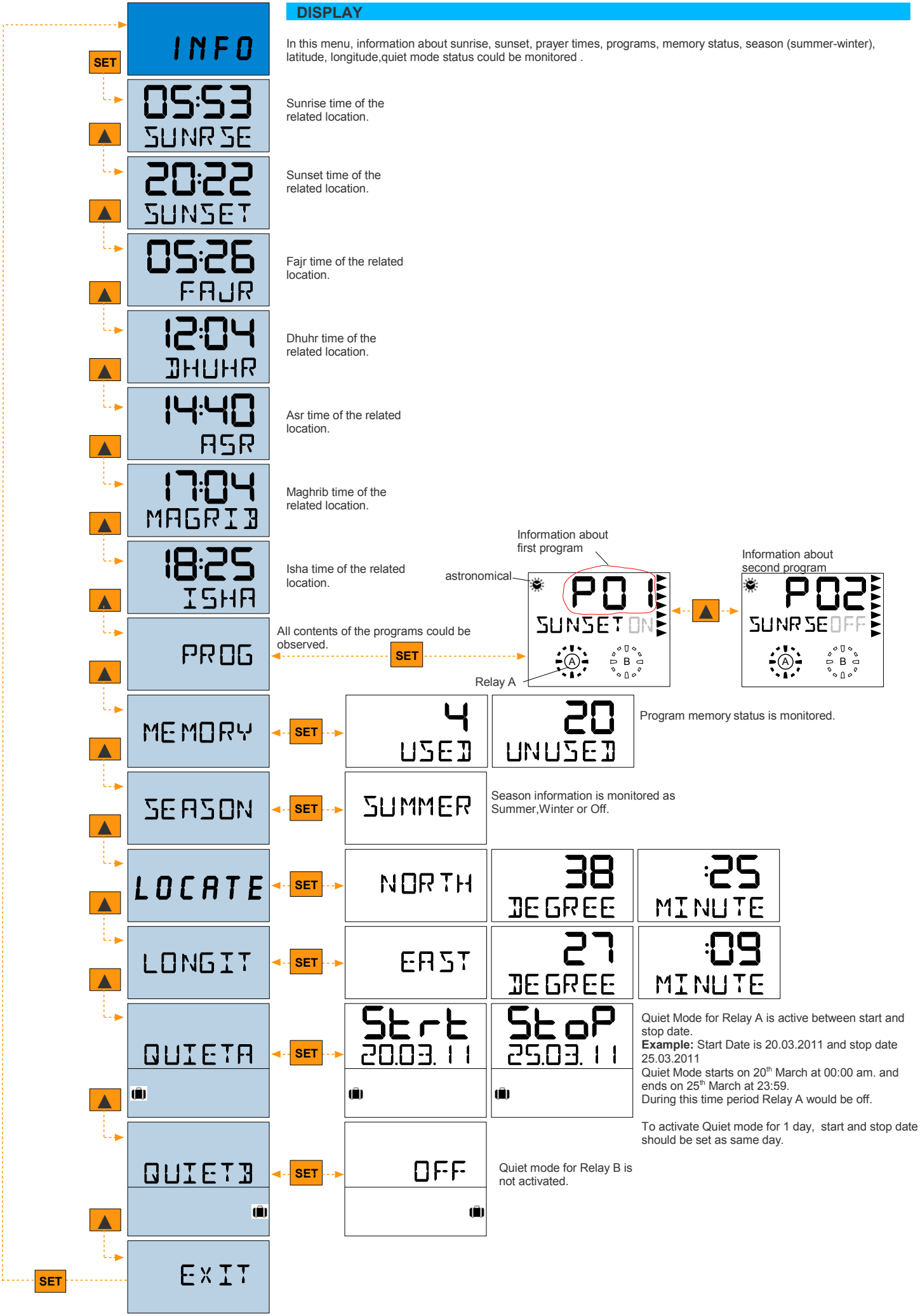
Language could be changed to turkish or english

All device settings except time and date are set to default.

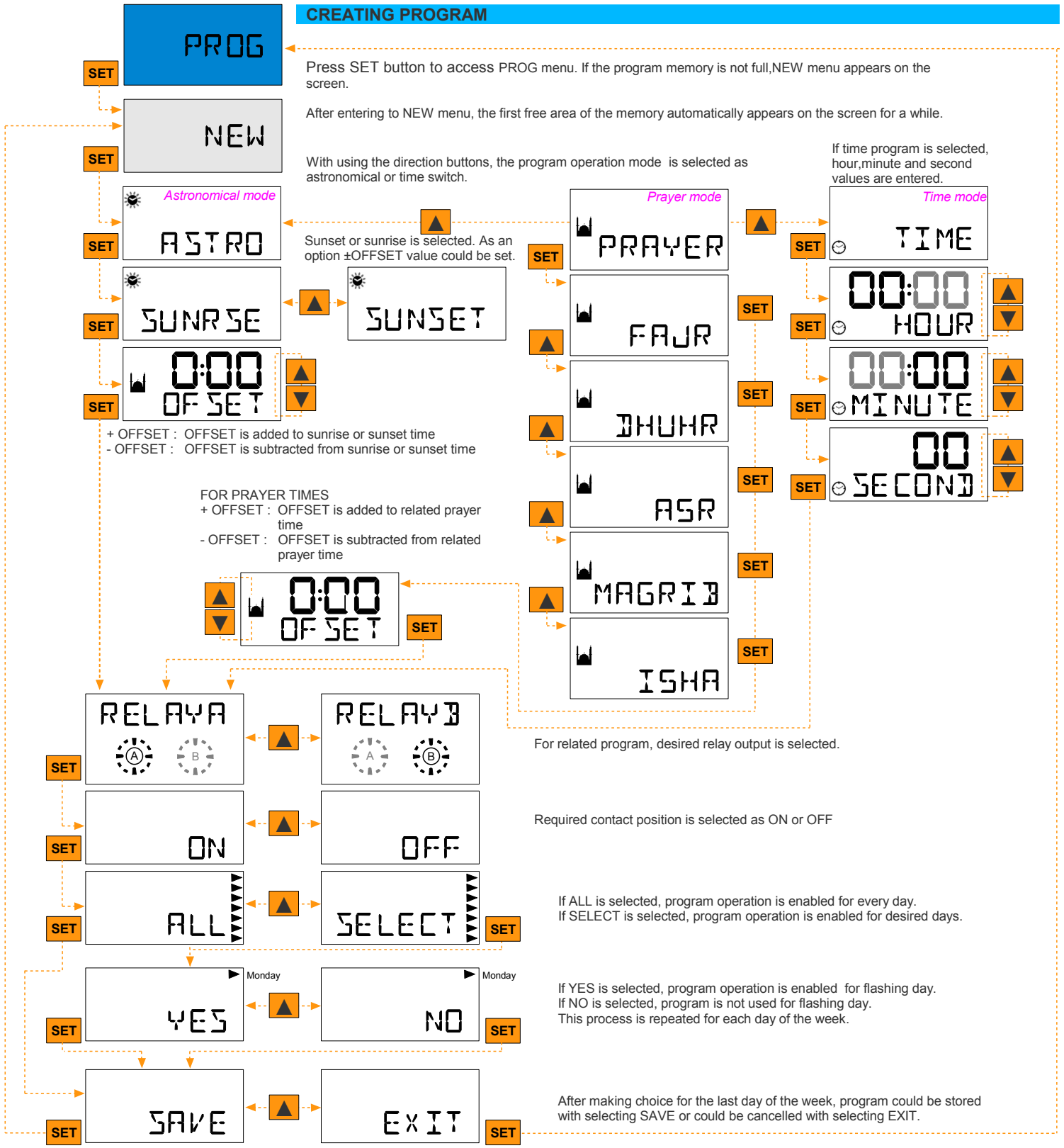
The device could be restarted time and date Settings would be cleared.

DISPLAY

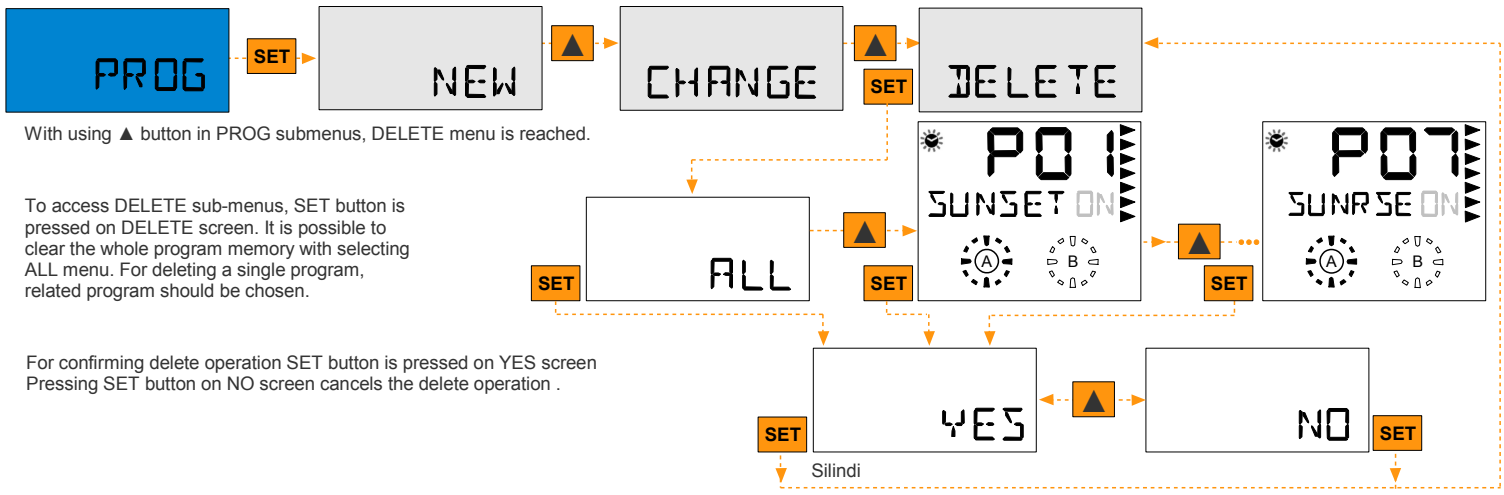
In this menu, information about sunrise, sunset, prayer times, programs, memory status, season (summer-winter), latitude, longitude,quiet mode status could be monitored .



CREATING PROGRAM



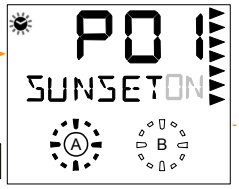
DELETING PROGRAM

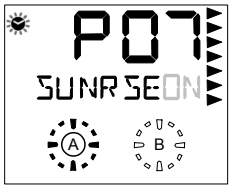


CHANGING PROGRAM

CHANGE menu could be reached by pressing ▲ button in PROG sub-menus.
NOTE: If there is no program on the memory, CHANGE menu does not exist.

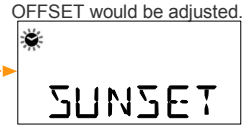
SET button is pressed on CHANGE menu. The programs that has been set before, appear on the screen with using the direction buttons respectively.
SET button is pressed on desired program to change.





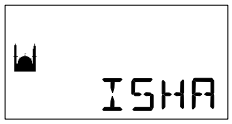
Astronomical mode

Sunrise or Sunset is set. If it is desired, OFFSET would be adjusted.

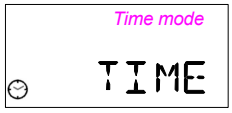


+ OFFSET : OFFSET is added to sunrise or sunset time
- OFFSET : OFFSET is subtracted from sunrise or sunset time

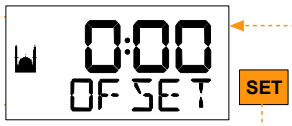
Prayer mode

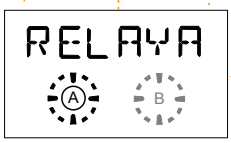


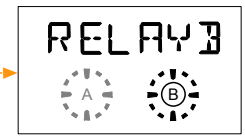
Time mode



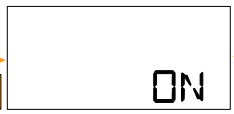
FOR PRAYER TIMES
+ OFFSET : OFFSET is added to related prayer time
- OFFSET : OFFSET is subtracted from related prayer time

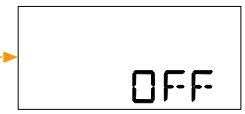




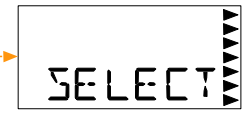


For related program, desired relay output is selected.

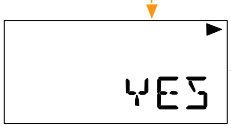


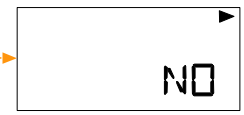


Required contact position is selected as ON or OFF

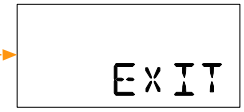


If ALL is selected, program operation is enabled for every day.
If SELECT is selected, program operation is enabled for desired days.





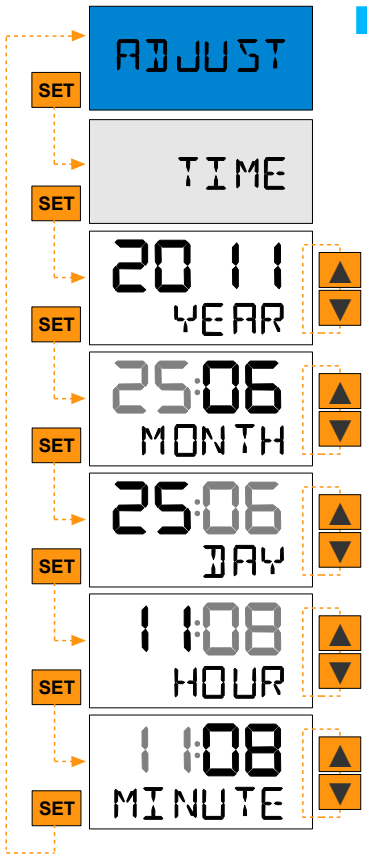
If YES is selected, program operation is enabled for flashing day.
If NO is selected, program is not used for flashing day.
This process is repeated for each day of the week.



After making choice for the last day of the week, program could be stored with selecting SAVE or could be cancelled with selecting EXIT.

TIME AND DATE

In ADJUST sub-menus could be accessed TIME menu.



With using ▼▲ buttons, year value is increased or decreased.
When desired value is reached, it is stored by pressing SET button.

With using ▼▲ buttons, month value is increased or decreased.
When desired value is reached, it is stored by pressing SET button.

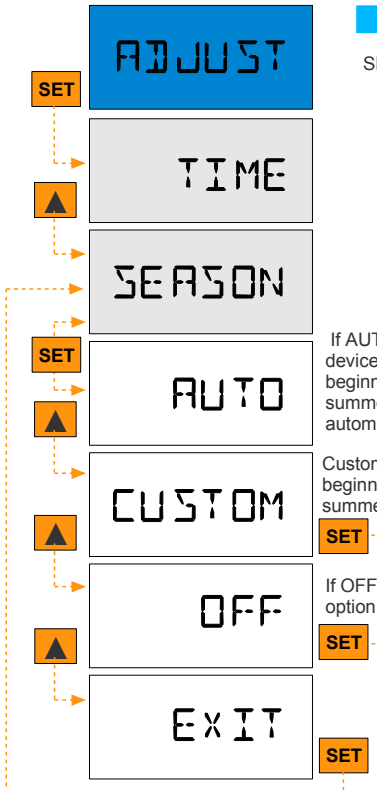
With using ▼▲ buttons, day value is increased or decreased.
When desired value is reached, it is stored by pressing SET button.

With using ▼▲ buttons, hour value is increased or decreased.
When desired value is reached, it is stored by pressing SET button.

With using ▼▲ buttons, minute value is increased or decreased.
When desired value is reached, it is stored by pressing SET button.

SEASON

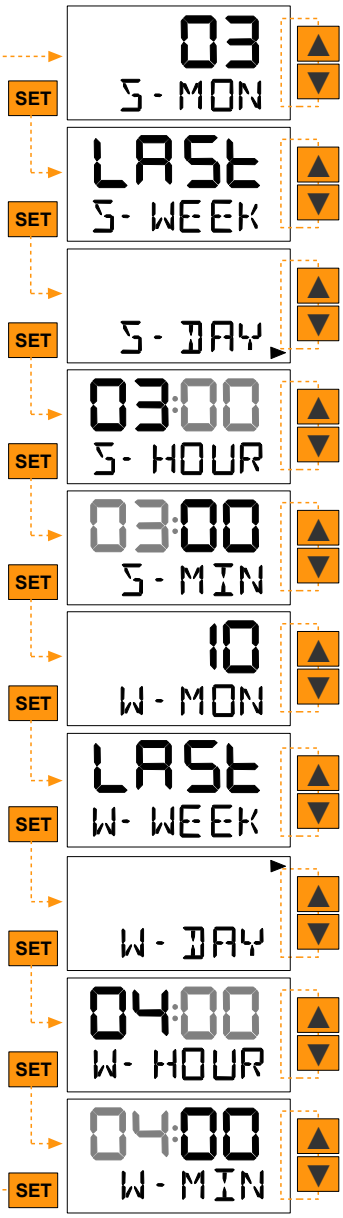
SEASON menu could be reached by pressing ▲ button in ADJUST sub-menus.



If AUTO is chosen, device determines beginning dates of the summer and winter automatically

Custom dates for beginning of the summer and winter

If OFF chosen, daylight saving option is disabled.



First parameter of custom season setting is beginning month for the summer season. With using ▼▲ buttons, month value is increased or decreased. When desired value is reached, it is stored by pressing SET button

Second parameter is beginning week for the summer in chosen month. With using ▼▲ buttons week value is set as 1,2,3,4 or last.

Third parameter is beginning day for the summer. With using ▼▲ buttons day is set.

Fourth parameter is beginning hour for the summer. With using ▼▲ buttons hour value is set.

Fifth parameter is beginning minutes for the summer. With using ▼▲ buttons minute value is set.

Sixth parameter is beginning month for the winter season. With using ▼▲ buttons, month value is increased or decreased. When desired value is reached, it is stored by pressing SET button

Seventh parameter is beginning week for the winter in chosen month. With using ▼▲ buttons week value is set as 1,2,3,4 or last.

Eighth parameter is beginning day for the winter. With using ▼▲ buttons day is set.

Ninth parameter is beginning hour for the winter. With using ▼▲ buttons hour value is set.

Tenth parameter is beginning minutes for the winter. With using ▼▲ buttons minute value is set.

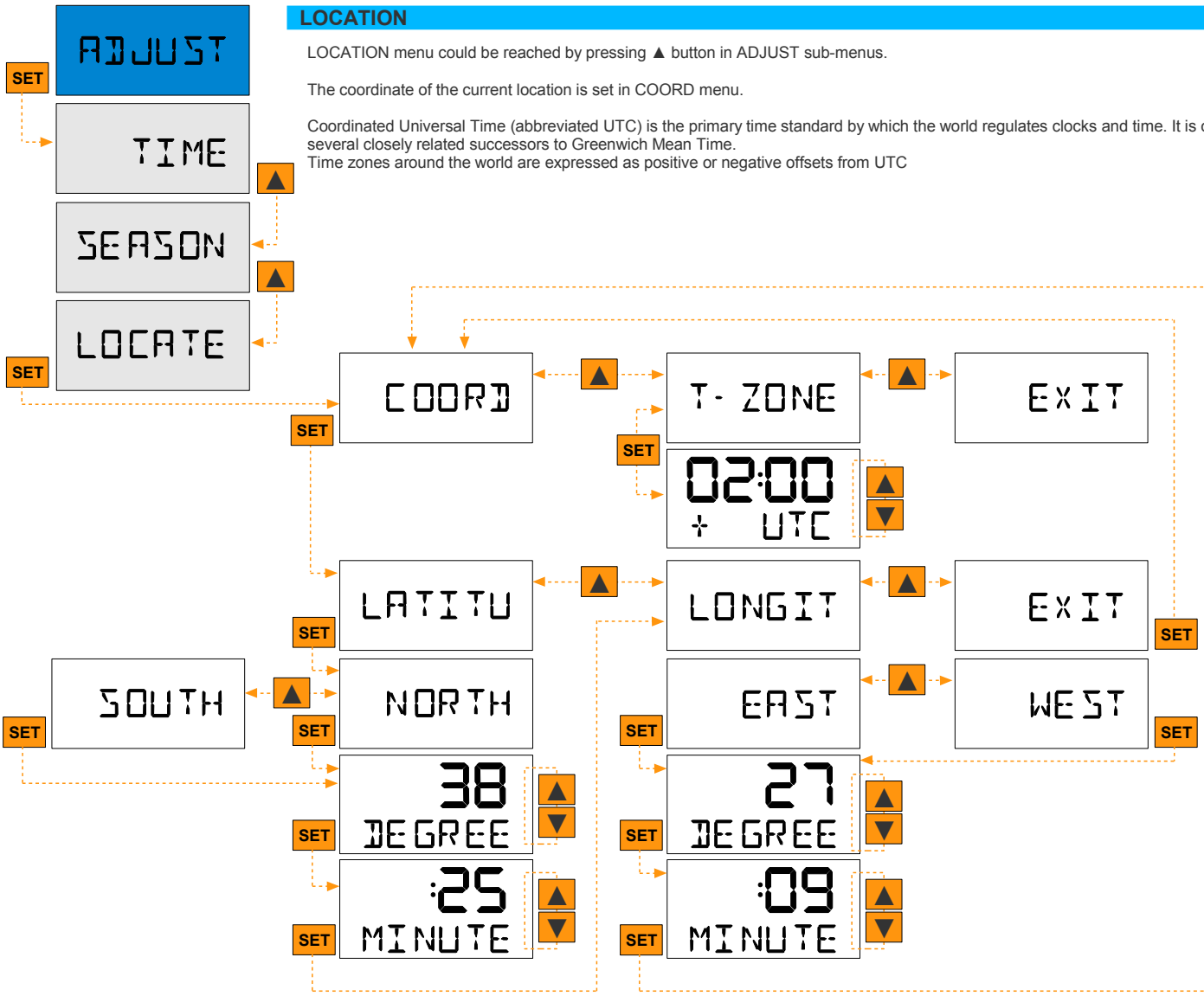
NOTE:
Auto Season mode
winter→summer change: last Sunday in March 03:00:00
(Clocks are adjusted forward one hour)
summer→winter change: last Sunday in October 04:00:00
(Clocks are adjusted backward one hour)

LOCATION

LOCATION menu could be reached by pressing ▲ button in ADJUST sub-menus.

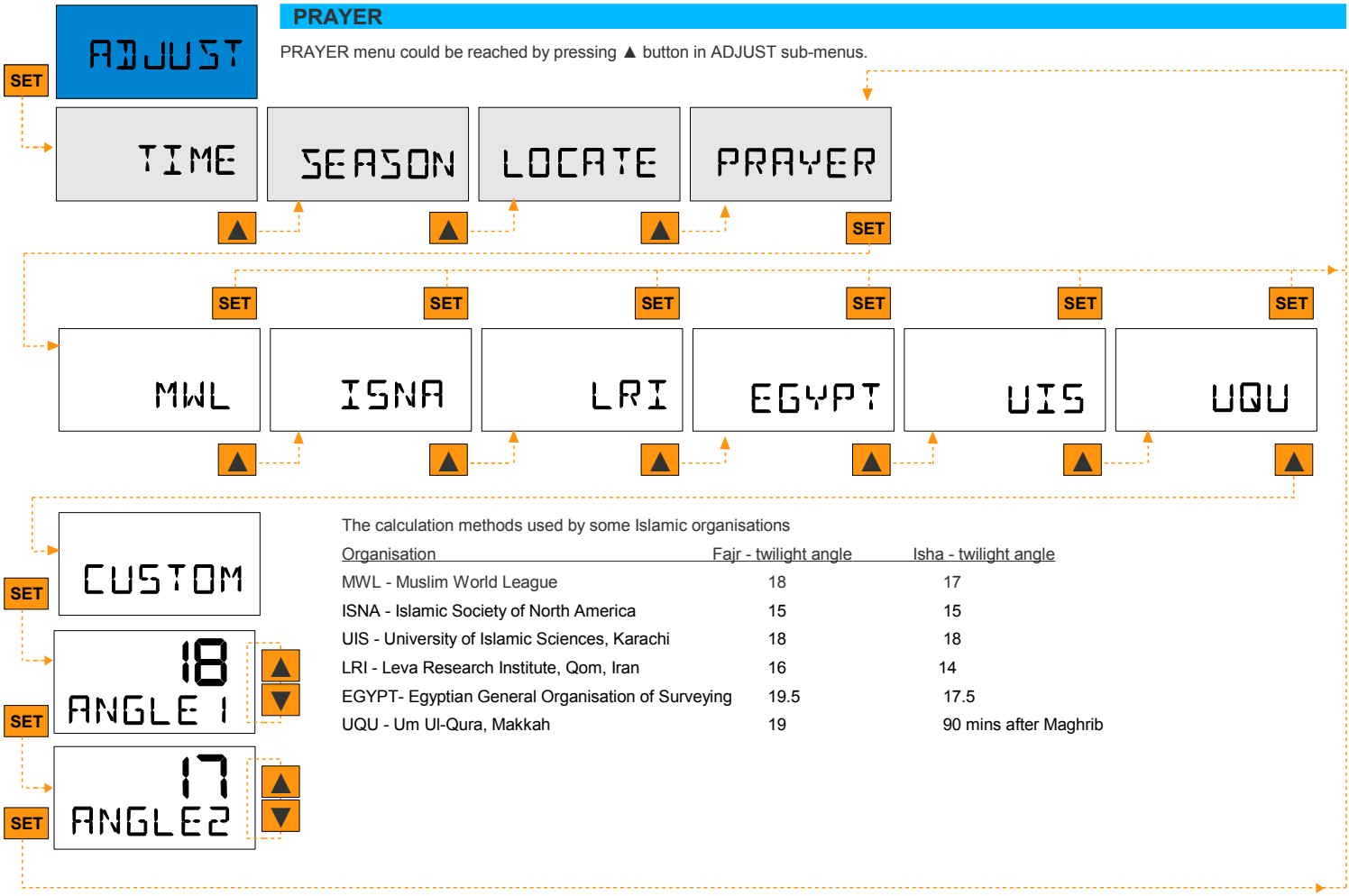
The coordinate of the current location is set in COORD menu.

Coordinated Universal Time (abbreviated UTC) is the primary time standard by which the world regulates clocks and time. It is one of several closely related successors to Greenwich Mean Time.
Time zones around the world are expressed as positive or negative offsets from UTC



PRAYER

PRAYER menu could be reached by pressing ▲ button in ADJUST sub-menus.

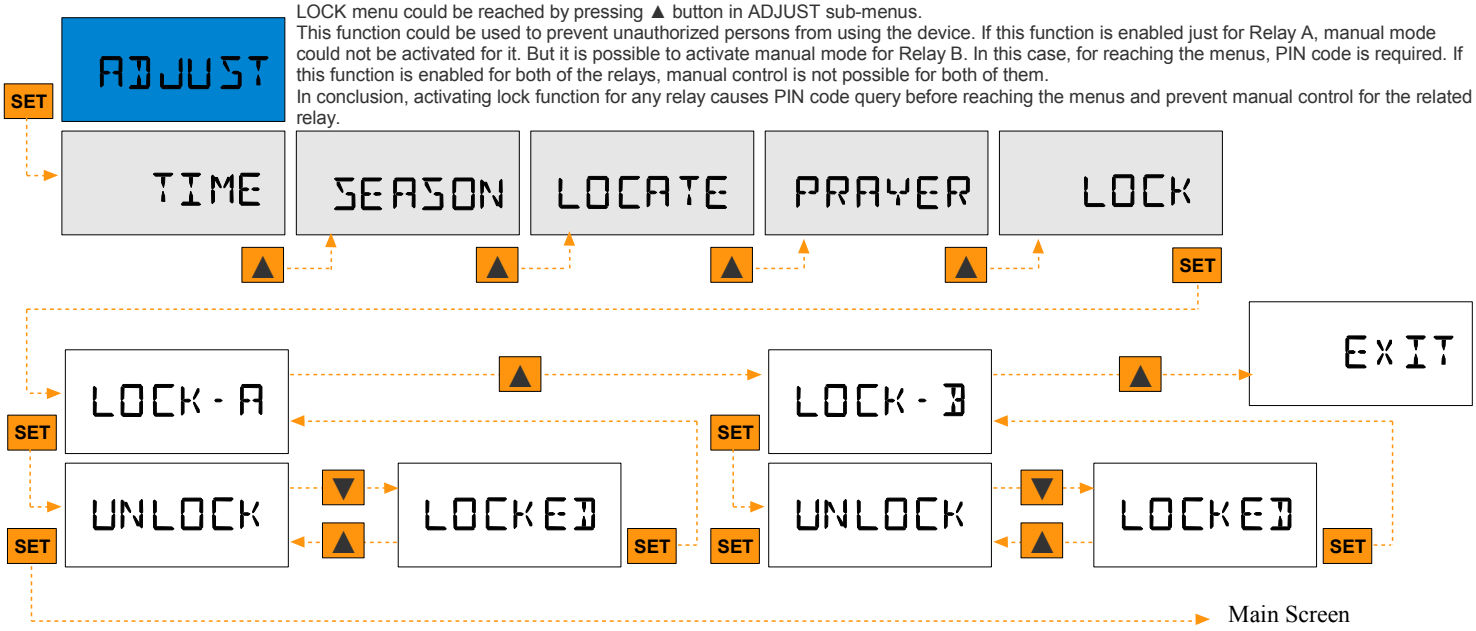


The calculation methods used by some Islamic organisations

Organisation	Fajr - twilight angle	Isha - twilight angle
MWL - Muslim World League	18	17
ISNA - Islamic Society of North America	15	15
UIS - University of Islamic Sciences, Karachi	18	18
LRI - Leva Research Institute, Qom, Iran	16	14
EGYPT- Egyptian General Organisation of Surveying	19.5	17.5
UQU - Um Ul-Qura, Makkah	19	90 mins after Maghrib

LOCK FUNCTION

LOCK menu could be reached by pressing ▲ button in ADJUST sub-menus.
This function could be used to prevent unauthorized persons from using the device. If this function is enabled just for Relay A, manual mode could not be activated for it. But it is possible to activate manual mode for Relay B. In this case, for reaching the menus, PIN code is required. If this function is enabled for both of the relays, manual control is not possible for both of them.
In conclusion, activating lock function for any relay causes PIN code query before reaching the menus and prevent manual control for the related relay.

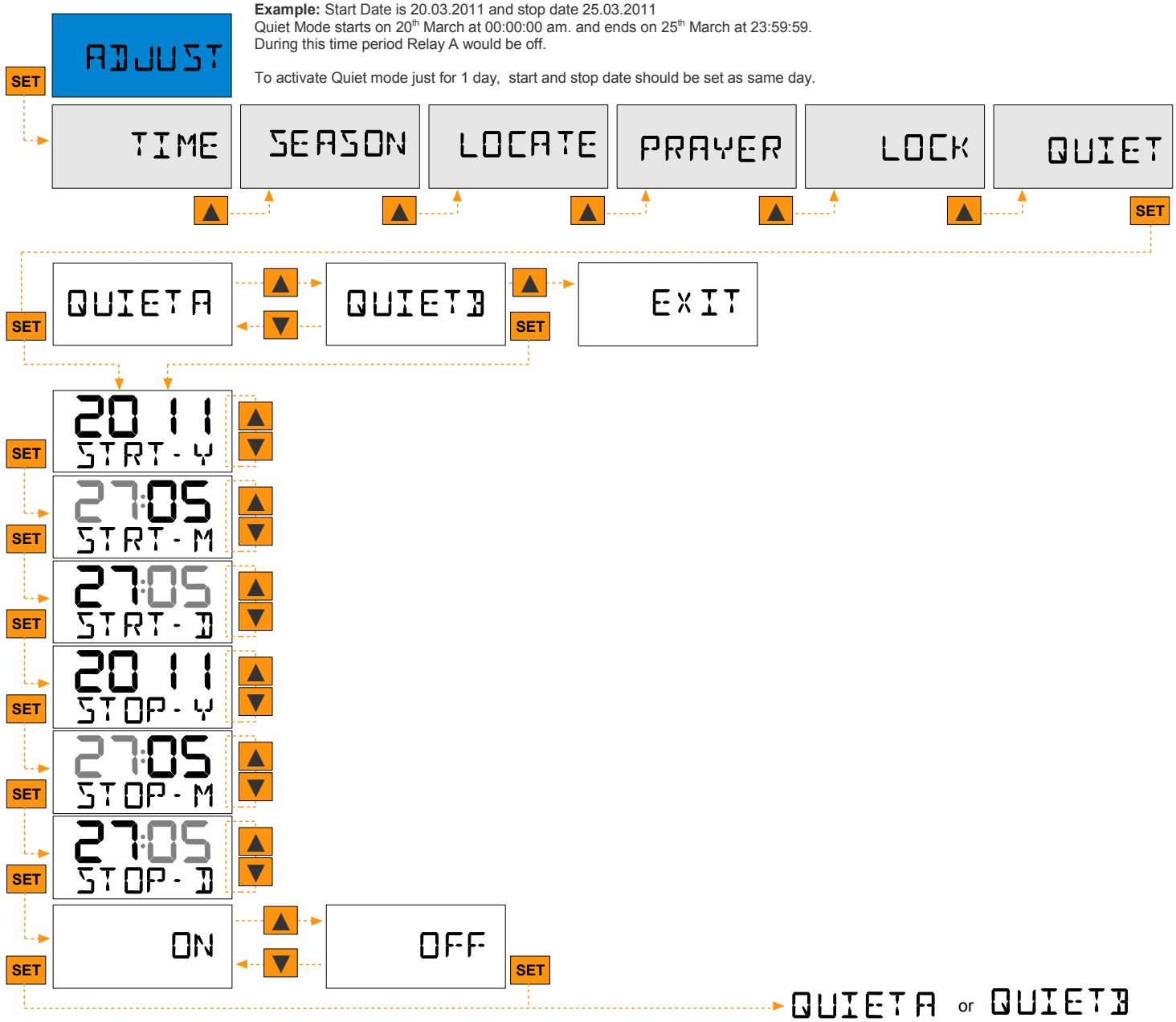


QUIET MODE

QUIET menu could be reached by pressing ▲ button in ADJUST sub-menus.
Quiet mode allows forcing of the OFF output for a time period. This mode could be activated for Relay A and/or Relay B.
Firstly, the time interval is set for related relay. Confirming on YES screen is obligation to activate this mode. If the time period is set but not confirmed, related relay would not be entered to the quiet mode.

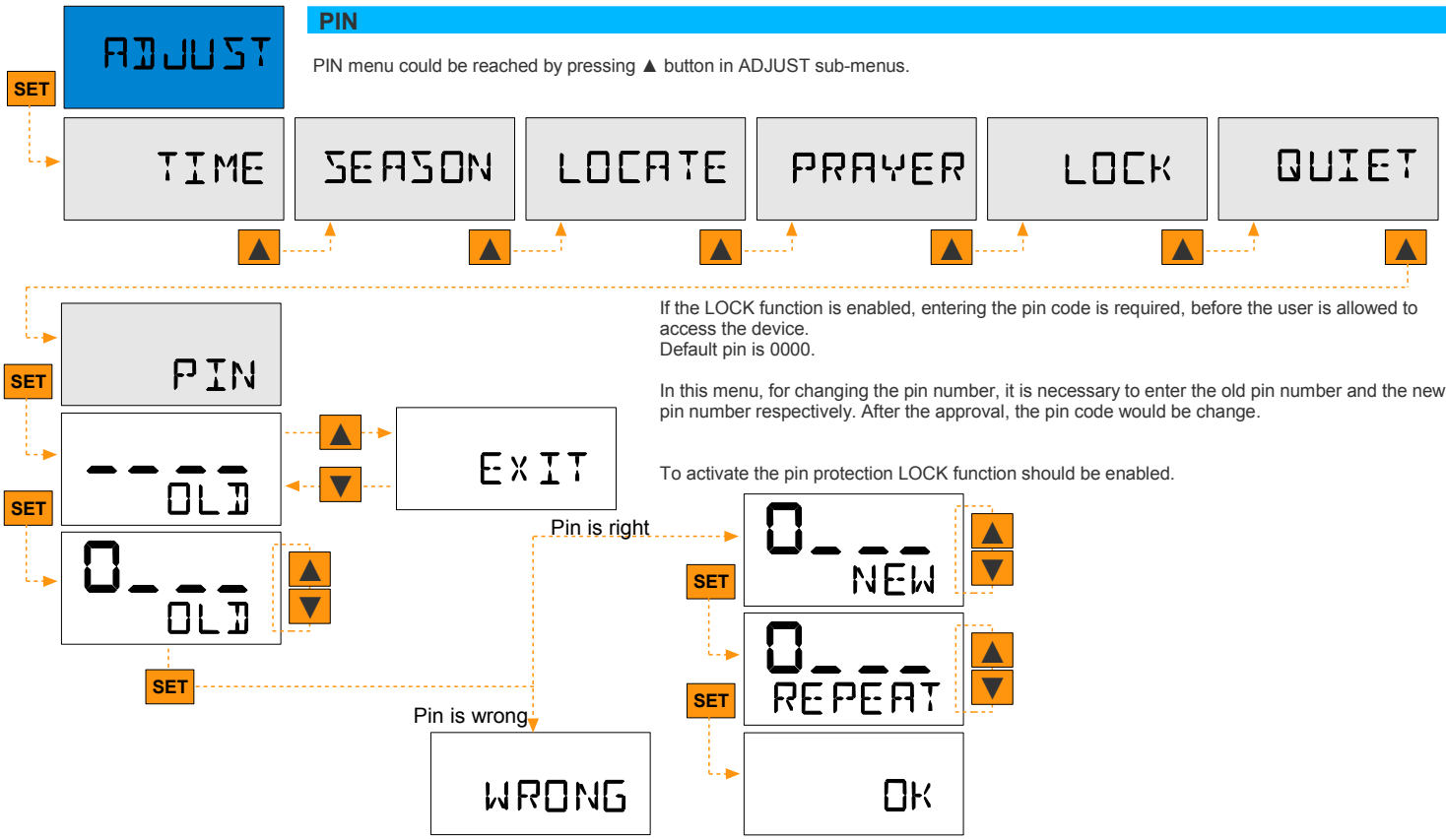
Example: Start Date is 20.03.2011 and stop date 25.03.2011
Quiet Mode starts on 20th March at 00:00:00 am. and ends on 25th March at 23:59:59.
During this time period Relay A would be off.

To activate Quiet mode just for 1 day, start and stop date should be set as same day.



PIN

PIN menu could be reached by pressing ▲ button in ADJUST sub-menus.



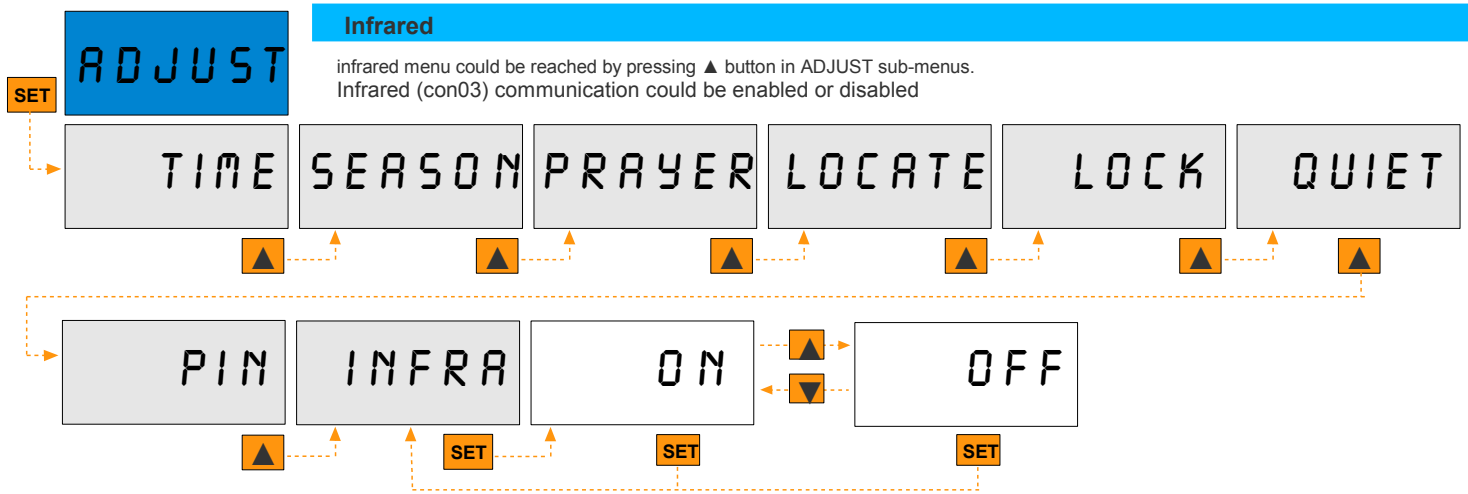
If the LOCK function is enabled, entering the pin code is required, before the user is allowed to access the device.
Default pin is 0000.

In this menu, for changing the pin number, it is necessary to enter the old pin number and the new pin number respectively. After the approval, the pin code would be change.

To activate the pin protection LOCK function should be enabled.

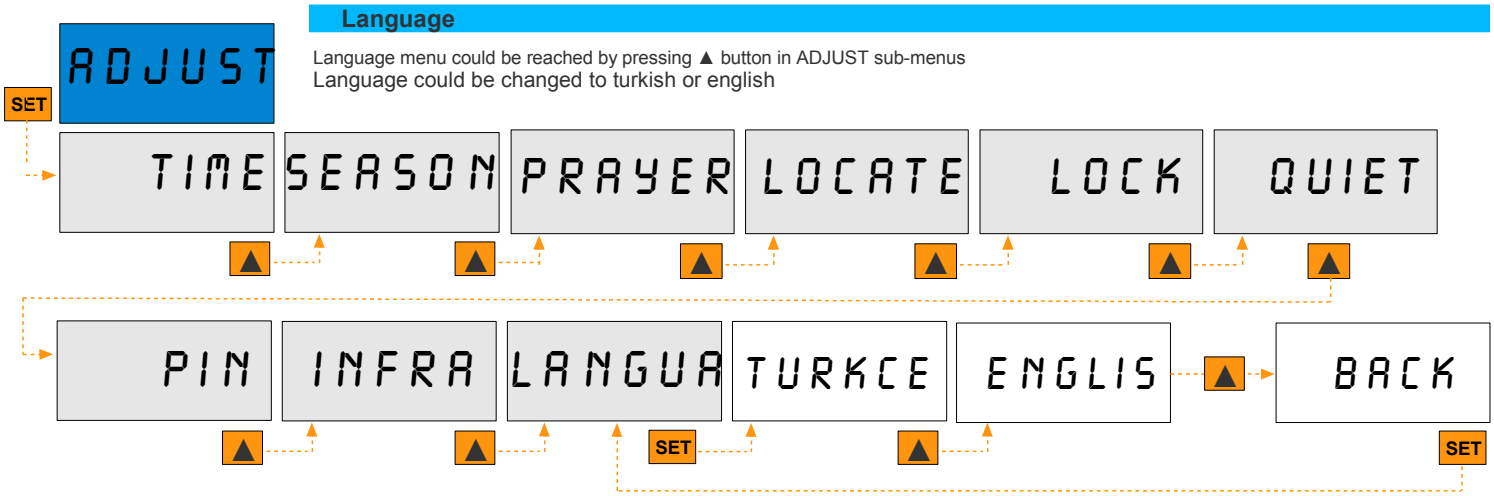
Infrared

infrared menu could be reached by pressing ▲ button in ADJUST sub-menus.
Infrared (con03) communication could be enabled or disabled



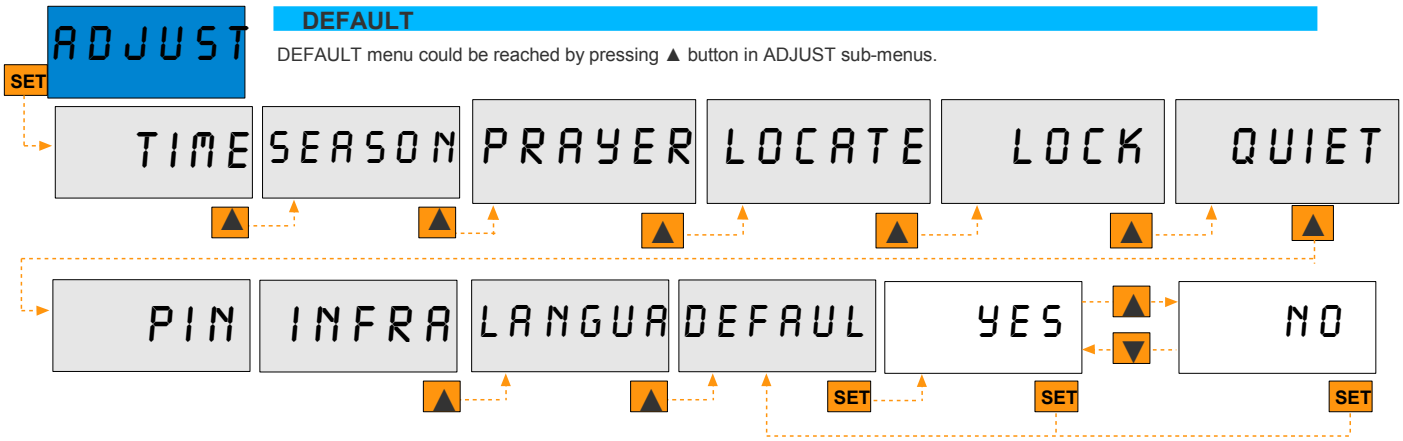
Language

Language menu could be reached by pressing ▲ button in ADJUST sub-menus
Language could be changed to turkish or english



DEFAULT

DEFAULT menu could be reached by pressing ▲ button in ADJUST sub-menus.



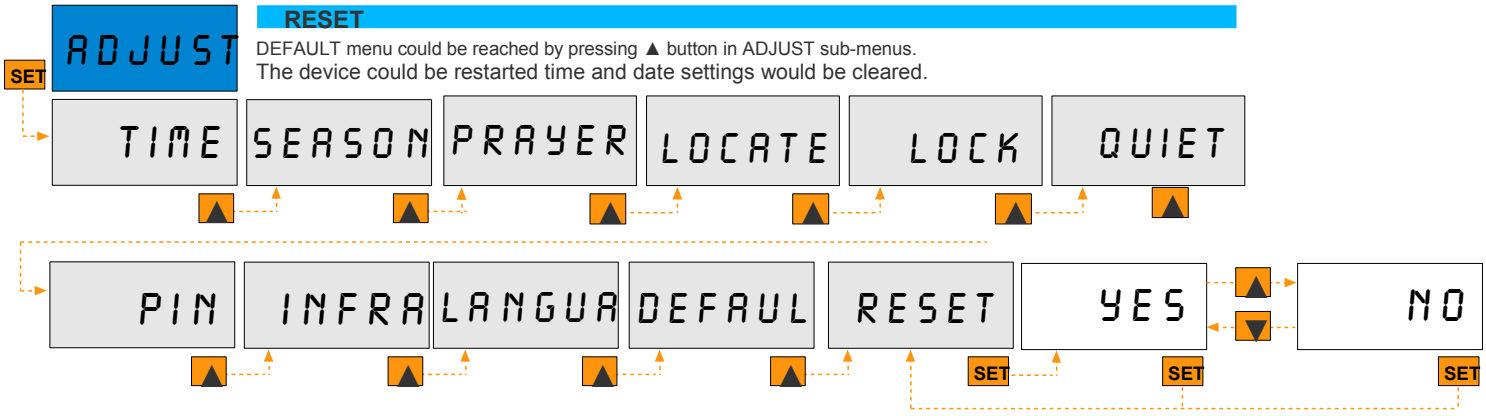
By restoring an ASTRO to factory defaults, following settings are installed.

Programs : 4 preset programs
Lock A-B : Off
Quiet A-B : Off
Manual A-B : Off
Season : Auto
Location : !!!!!!!!
Contrast : 7

NOTE:
Reset an ASTRO to factory defaults does not change the pin code and the real time.

RESET

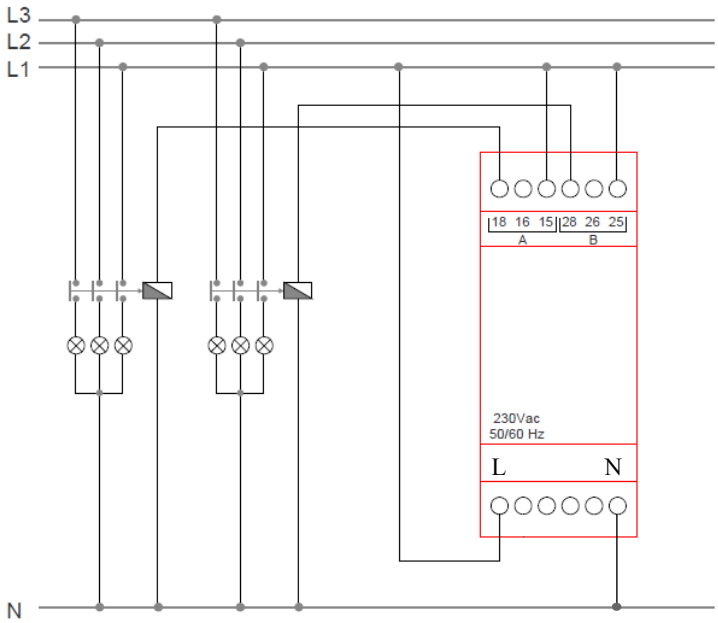
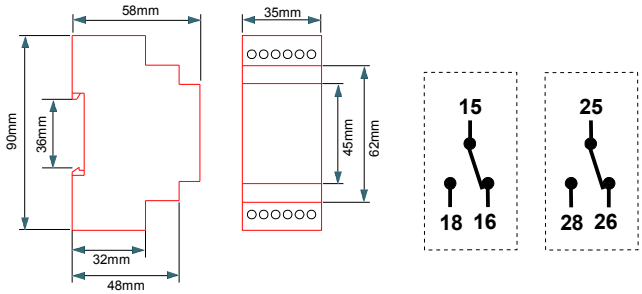
DEFAULT menu could be reached by pressing ▲ button in ADJUST sub-menus.
The device could be restarted time and date settings would be cleared.



ABBREVIATIONS

ADJUST	adjust
ALL	entire week
ANGLE1	Fajr twilight angle
ANGLE2	Isha Twilight angle
ASR	Asr
ASTRO	astronomical mode
AUTO	automatic
CHANGE	change
CON-03	data is coming from CON-3 device
COORD	coordinates
CUSTOM	custom
DAY	day
DEFAUL	factory defaults
DEGREE	degree
DELETD	deleted
DELETE	delete
DHUHR	Dhuhr
EAST	east
EGYPT	Egyptian General Organisation of Surveying
ERR1	CON3 communication error
ERR2	PIN code error
ERR3	Parameter values are out of max-min.
ERR4	CON-3 has no data
ERR5	Program overload error
EXIT	exit
FAJR	Fajr
HOUR	hour
INFO	display
INFRA	infrared
IR OK	data communication is Successful
ISHA	Isha
ISNA	Islamic Society of North America
LANGUA	language
LATITU	latitude
LOCATE	locate
LOCK	lock
LOCKA	lock function for relay A
LOCKB	lock function for relay B
LONGIT	longitude
LRI	Leva Research Institute
MANUAL	manual
MAGRIB	Maghrib
MINUTE	minute
MONTH	month
MWL	Muslim World League
NEW	new
NO	no
NORTH	north
OFF	off
OFF	relay is off
OFSET	offset
OK	okay
OLD	old
ON	on
ON	relay is on
P1 OK	program1 is saved.
PIN	pin code
PRAYER	prayer
PROG	program
QUIET	quiet mode
QUIETA	quiet mode for relay A
QUIETB	quiet mode for relay B
RELAYA	relay A
RELAYB	relay B
RESET	reset
REPEAT	repeat
S-DAY	summer beginning(day)
S-HOUR	summer beginning(hour)
S-MIN	summer beginning(minute)
S-MON	summer beginning(month)
S-WEEK	summer beginning(week)
SAVE	save
SEARCH	data signal is not coming from CON-3
SEASON	season
SECOND	second
SELECT	select the day
SOUTH	south
STOP-D	end of quiet mode(day)
STOP-M	end of quiet mode(month)
STOP-Y	end of quiet mode(year)
STRT-D	start of quiet mode(day)
STRT-M	start of quiet mode(month)
STRT-Y	start of quiet mode(year)
SUMMER	summer
SUNRSE	sunrise
SUNSET	sunset
T-ZONE	time zone
TIME	time
UIS	University of Islamic Sciences
UNUSED	unused
USED	used
UTC	coordinated universal time
UQU	Umm al-Qura
W-DAY	winter beginning(day)
W-HOUR	winter beginning(hour)
W-MIN	winter beginning(minute)
W-MON	winter beginning(month)
W-WEEK	winter beginning(week)
WEST	west
WINTER	winter
WRONG	wrong
YEAR	year
YES	yes

TECHNICAL DATA

Rated Voltage (Un)	: 230Vac
Operation Range	: Un x (0,85 – 1,10)
Contact Current(15-18)(25-28)	: max. 8 A / 250Vac (N.O) ; ASTRO-05
Contact Current(15-18)(25-28)	: max. 16 A / 250Vac (N.O) ; ASTRO-15
Supply Power Consumption	: < 3VA
Clock Precision	: ± 1 sec/day
Programming Resolution	: 1 sec
Number of Programs	: 56 programs
Memory	: EEPROM
Battery	: CR2032 (Replacable)
Battery Life	: 5 year (not inserted in device)
Additional Reserv Time	: 3 - 7 hour
Screen	: LCD
Language	: English
Programming with InfraRed	: Yes
Mounting	: To connection rail in electrical panel
Storage Temperature	: -10 ºC ..... +70 ºC
Ambient Temperature	: 0 ºC ..... +50 ºC
Device Protection Class	: IP 20
Connector Protection Class	: IP 00
Dimensions	: 2 x DIN modules

CONNECTION