

SET45-18

*Seven Day Programmable
Timer Control*

MANUFACTURING **SELC Ireland Limited.**

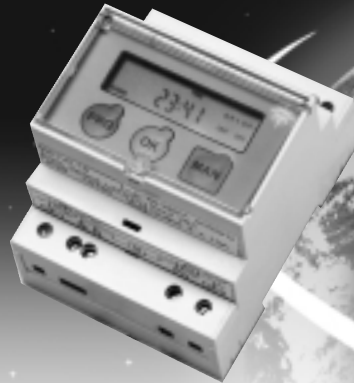
Industrial Estate, Belmullet, Co Mayo, Ireland
Tel: + 353 97 81200/9 Fax: + 353 97 81400
E-mail: selc@iol.ie



SALES **SELC Electronics Ltd.**

Red Hill House, Hope Street,
Saltney, Chester, CH4-8BU, U.K.
Tel: + 44 1244 682948 Fax: + 44 1244 682951
E-mail: sales@selc.demon.co.uk

SET45-18 MANUAL REV 2



OPERATING INSTRUCTIONS

The Heating and Lighting Controller in One

Features

- Easy to programme
- "Daylight hours" compensated timed control of lighting throughout the year.
- Independent timed control of central heating/air conditioning.
- 7 day programming with up to 12 settings/day for heating and 8 settings for lighting.
- Clock/calendar tracks year, month, day of month, day of week, hour, minute & second.
- Automatic leap year compensation.
- Automatic adjustment for BST/GMT hour change twice yearly.
- Each control output can switch loads up to 10 A, 265V AC.
- Backlit LCD with clear visual display of functions and settings.
- Illuminated keys.
- Universal Power Supply.
- Twin Security Feature.
- 5 Year battery back-up from Lithium Thionyl Chloride battery.
- 2 Weeks back-up from NiMH battery (rechargeable).

Lighting - Control Output #1

The SET45-18 controller allows you to program your lighting requirements in direct relation to sunrise and sunset times.

The controller is pre-programmed to adjust it's daylight tracking settings throughout the year for your position of latitude which is factory programmed. The appropriate latitude to your location should be confirmed when ordering.

This feature allows you for example, to switch on automatically 1 hour before sunset and switch off at 11 p.m. You can then, if you wish, switch on again at 3 a.m. and switch off 1 hour after sunrise.

Before midday, if a NORMAL TIME ON setting is later or equal to the SOLAR TIME OFF setting then that NORMAL TIME ON setting has no effect on switching.

After midday, if the SOLAR TIME ON setting is later than or equal to a NORMAL TIME OFF setting then the SOLAR TIME ON setting has no effect on switching.

For the purpose of programming, times related to sunrise and sunset will be referred to as "Solar" times and other time settings will be referred to as "Normal" times.

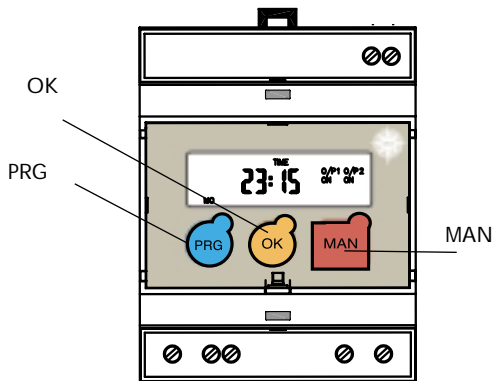
Central Heating/ Air Conditioning - Control Output #2

The SET45-18 controller allows you to programme your heating requirements based on "Normal" time settings. There are 6 "on" and 6 "off" settings available per day.

Programming is carried out using a 3 key Keypad on the face of the controller with visual confirmation of input clearly displayed through an LCD window on the keypad.

The 3 keys are:-

- PRG: For selection of output, hour, minute, day etc, to be programmed.
- OK: For selection and setting of programming input values.
- MAN: To over ride programmed settings so as to temporarily manipulate switching and for testing purposes.



Security Code

Press PRG and a two digit number will appear on the display with the left digit flashing. Use an OK key to enter the left digit then press the PRG key again and use the OK key to enter the right digit. If the correct two digits are entered then pressing PRG will progress you through the programming sequence otherwise the displayed time will return.

Programming Sequence

Pressing the PRG button will bring you through the following programming sequence.

Lighting - Output #1

- 1 Solar time on
- 2 Normal time off
- 3 Normal time on
- 4 Normal time off
- 5 Normal time on
- 6 Normal time off
- 7 Normal time on
- 8 Solar time off

Heating /Air Conditioning - Output #2

- 9 Normal time on
- 10 Normal time off
- 11 Normal time on
- 12 Normal time off
- 13 Normal time on
- 14 Normal time off
- 15 Normal time on
- 16 Normal time off
- 17 Normal time on
- 18 Normal time off
- 19 Normal time on
- 20 Normal time off

- Press PRG and "SOLAR TIME ON" display will appear with "hours" flashing.
- Press OK repeatedly and "hours" will progress forward in 1 unit steps until desired hours setting is reached. Hold finger down on OK and hours setting will move forward continuously.
- Press PRG; the hours setting displayed is automatically programmed and the "minutes" will now be flashing.
- Press OK to progress the "minutes" to the desired setting as previously described.
- Press PRG, the minutes setting displayed is automatically programmed and the days of the week, Monday to Sunday will now be flashing.
- Press PRG and the "SOLAR TIME ON" selected above will be automatically programmed for all days of the week.
Note: To programme a time setting for a particular day or a group of days press OK when days of week are flashing. Press PRG and grouping "Monday to Friday" will flash. You can accept this grouping by pressing OK or move on to grouping "Saturday to Sunday". Press OK to accept or press PRG again to move on to individual day selection. In this mode you can select or reject individual days until you have gone through each day of the week. Select a day by pressing OK. Reject a day and move on to next day by pressing PRG. When the last day of the week has been set, press PRG to move on to the next setting.

Note that you can select a combination of days not necessarily in sequence. It should also be noted that even though you may have selected "Monday to Friday" for the previous output, "Monday to Sunday" will always flash as the first available selection for a new output. You can only programme the days that are flashing, which can be selected as described above.

- Proceed with the method until you have programmed all settings in the sequence 1 up to 20. **Note that if a particular switching setting is not required it should be set to "--:--". This is known as a null switching setting and is ignored by the SET45-18.**
- Programming is completed by entering the year, month, day, day of week, time of day, and activating GMT/BST adjustment i.e "0" = non active, and "1" = active.
- Confirmation of the latitude will be given by the controller display for checking but this cannot be modified by the user.

Note: To change the day of week setting after setting the day of the month, first press PRG and the current setting will flash, then press OK and the current setting will continue to flash, press PRG to step through the days of the week and finally OK to confirm the setting.

- Note 1: When programming settings a "--:--" indicates that there is no setting and is ignored by the controller.
- Note 2: When selecting the days of the week for a particular setting, only the days displayed on the screen will be applicable to that setting. If no days are displayed then the controller will ignore that particular setting.
- Note 3: When the BST/GMT adjust feature is active (i.e. set to "1"), the time clock shifts forward one hour at 01:00 on the last Sunday in March and back one hour at 02:00 on the last Sunday in October.
- Note 4: It is possible to programme the controller when not in situ by using the battery pack, if charged, or by connecting up to a mains supply.
- Note 5: When the controller is powered up for the first time and the internal battery is not charged the display will flash to indicate that the time should be programmed.

Important: Pressing the "PRG" and "OK" keys together results in the controller resetting itself to a state where all switching settings are cleared, and the time/date is set to 00:00 1/1/01 GMT/BST = 1

Power Fail battery back-up time

5 Years @20°C from date of manufacture (internal Lithium Thionyl Chloride battery).

2 weeks from internal auxiliary rechargeable NiMH battery.

Batteries are not drained by circuit when product is connected to mains supply.

Batteries are not user replaceable.

MAN

This button is used to temporarily switch on or off the controlled lighting or heating outputs, for example to provide lighting when the appropriate setting might be in the "off" position. This function is de-activated when the next switching setting is reached.

First press of button:

Both outputs on.

Second press of button:

Output #2 off (Heating)

Third press of button:

Output #1 off (Lighting)

Remote activation of this function is possible when a momentary action (normally open) switch is connected to the remote "MAN" terminal block.

SPECIFICATION

of the SET45-18

Programming:

Output #1

Lighting

8 user programmable settings.
Solar on, 3 Normal off, 3 Normal on,
Solar off.

Each setting can be active on any combination of week days. "Solar on" and "Solar off" settings are automatically adjusted in relation to the changing sunset and sunrise times respectively throughout the year. This data is pre-programmed for a specific latitude.

Output #2

Heating/Air Conditioning

12 user programmable settings
6 Normal On, 6 Normal Off.

Each setting can be active on any combination of week days.
A two digit security code must be entered before programming the product

MAN key

Allows controlled settings to be temporarily switched on or off. This may also be accomplished remotely by connecting a momentary action (normally open) switch to the remote "MAN" terminal block on the product

Power Supply

(Ph to N) 85-265V, 50/60Hz
The SET 45-18 should be protected by means of an external 20A ultra rapid fuse on the Ph supply to the product.

Output #1

Relay Assisted Triac (RAT) output capable of switching loads up to 10 A reactive.

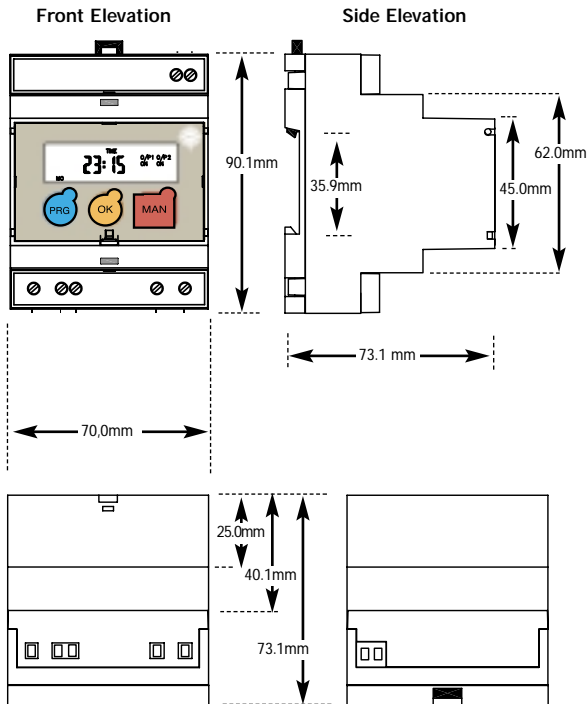
Output #2

Relay Assisted Triac (RAT) output capable of switching loads up to 10 A reactive.

SPECIFICATION

of the SET45-18

Maximum current	20 A (10A maximum per Output)
Time Base Accuracy	± 1second per day @20°C
Battery Back Up Reserve	5 Years @20°C from date of manufacture (internal Lithium Thionyl Chloride battery). 2 weeks from internal auxiliary rechargeable NiMH battery. Batteries are not drained by circuit when product is connected to mains supply. Batteries are not user replaceable.
Dimensions	Height-90mm, Width-70 mm, Depth-73mm (4 modules wide as per DIN 43880).
Mounting	Suitable for mounting on a symmetric 35 mm DIN Rail.
Connections	4mm ² maximum conductor size.
Enclosure	Flame Retardant Plastic. Enclosure has sealable transparent cover to prevent unauthorised tampering with product
Enclosure Protection	IP20
User interface	LCD display (backlit when mains supply present) Three key membrane keypad (illuminated when mains supply present)
Operating Temperature	-10°C to + 45°C
EMC	Meets the essential requirements of Directive 89/336/EEC for Electromagnetic Compatibility
LVD	Meets the requirements of the Low Voltage Directive 73/23/EEC for product safety as amended by 93/68/EEC
Product Type	Electronic 1.Y.T., Software Class A. Not suitable for controlling loads where secure disconnection during conditions of mains abnormality is essential to safety



WARNING: ISOLATE FROM MAINS SUPPLY BEFORE MAKING CONNECTIONS

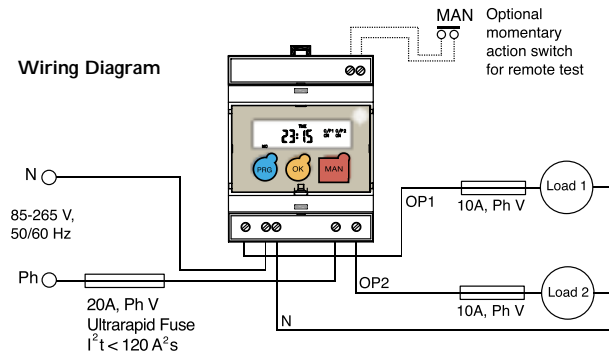
At switch on the switched output is internally connected to the Ph terminal. OP1 and OP2 are always momentarily connected internally to Ph at power up through normally closed relay contacts.

A leakage current of less than 1milliAmpere flows through each load in the off state.

This product contains semiconductor power switching components. This product should be installed by qualified personnel and must be mounted in a protective enclosure.

This product is suitable for mounting in an enclosure suitable for mounting modular products as per DIN43880.

Wiring Diagram



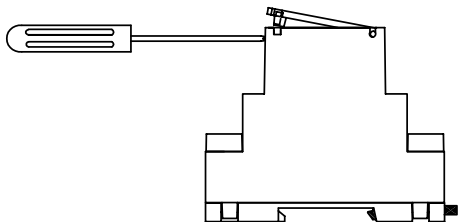
WARNING:

The SET45-18 contains a Lithium Thionyl Chloride battery which if subjected to temperatures in excess of 100°C presents a fire/explosion /severe burn hazard. The SET45-18 must not therefore be incinerated, disposed of in fire or cut open.

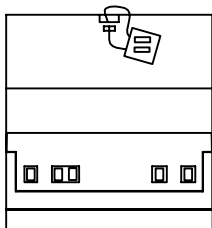
Appendix



To Open cover



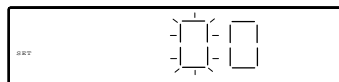
To Seal cover



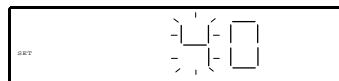
* The following figures illustrate the method of setting up the control (with the 230 V ac, 50 Hz mains applied) to the following settings

Security setting feature

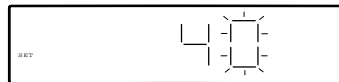
PRG



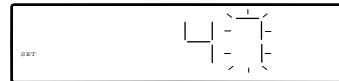
OK**



PRG

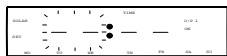


OK**

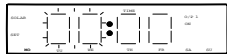


PRG

1 Solar Time On: 19:23 active
Monday to Sunday inclusive



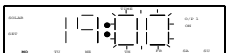
OK



OK**



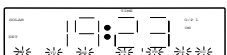
PRG



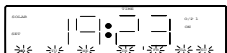
OK**



PRG

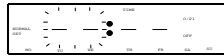


OK



OK

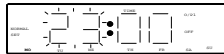
2 Normal Time Off: 23:59
active Monday to Saturday
inclusive



OK



OK**



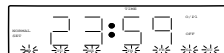
PRG



OK**



PRG



OK



PRG



PRG

**Multiple Presses

2 (Continued)



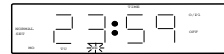
PRG



OK



OK



OK



OK



OK



OK



PRG

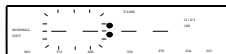
2 (Continued)



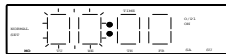
PRG

**Multiple Presses

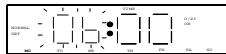
3 Normal Time On: 06:00 active Monday to Saturday inclusive



OK



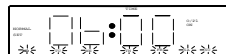
OK **



PRG



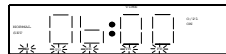
PRG



OK



PRG



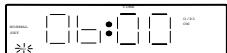
PRG



PRG

**Multiple Presses

3 (Continued)



OK



OK



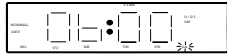
OK



OK



OK



OK

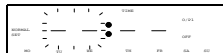


PRG



PRG

4 Normal Time Off: 22:00 active Sunday only



OK



OK**



PRG



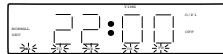
PRG



OK



PRG



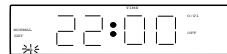
PRG



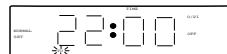
PRG

**Multiple Presses

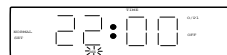
4 (Continued)



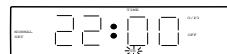
PRG



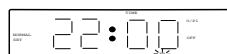
PRG



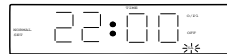
PRG



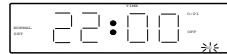
PRG



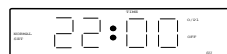
PRG



PRG

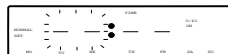


OK

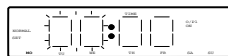


PRG

5 Normal Time On : 08:00
active Sunday only



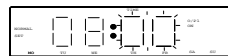
OK



OK**



PRG



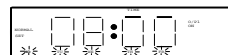
PRG



OK



PRG

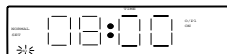


PRG

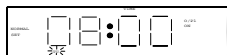


PRG

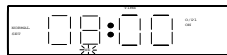
5 (Continued)



PRG



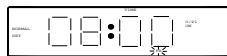
PRG



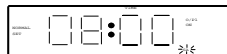
PRG



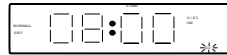
PRG



PRG



PRG

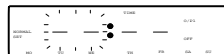


OK

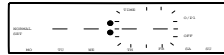


PRG

6 & 7 Normal Time Off and
Normal Time On - Nulled



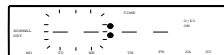
PRG



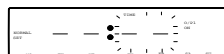
PRG



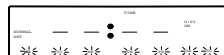
PRG



PRG



PRG

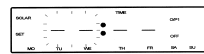


PRG

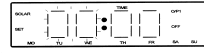


**Multiple Presses

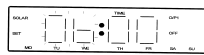
8 Solar Time Off:
06:37 active Monday
to Sunday inclusive



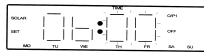
OK



OK**



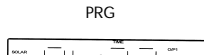
PRG



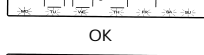
PRG



OK**



PRG

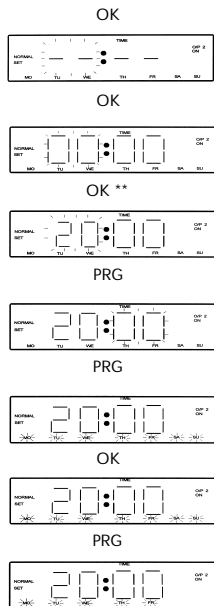


OK



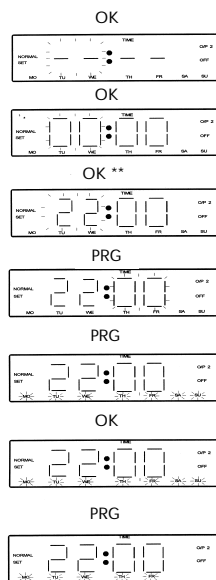
OK

- 13** Normal Time On:
20:00 active Monday
to Friday inclusive

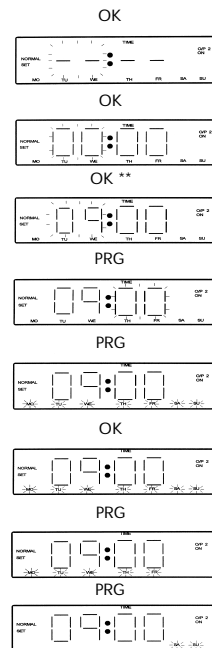


**Multiple Presses

- 14** Normal Time Off:
22:00 active Monday
to Friday inclusive

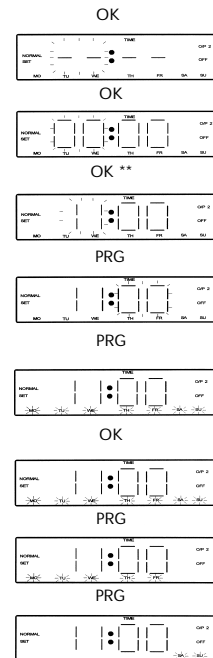


- 15** Normal Time On:
9:00 active Saturday
and Sunday

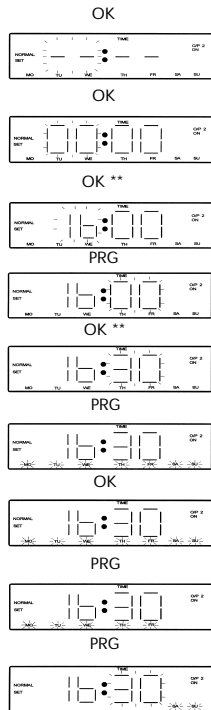


**Multiple Presses

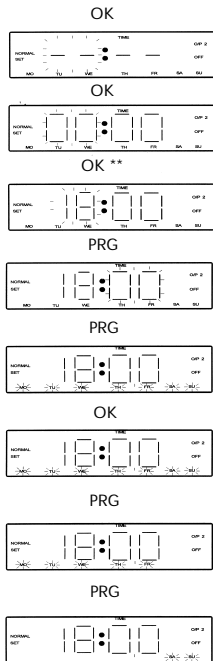
- 16** Normal Time Off:
11:00 active Saturday
and Sunday



- 17** Normal Time On:
16:30 active Saturday
and Sunday

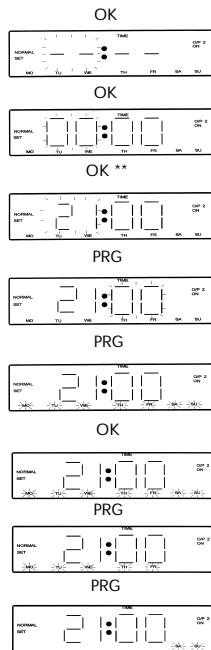


- 18** Normal Time Off:
18:00 active Saturday
and Sunday



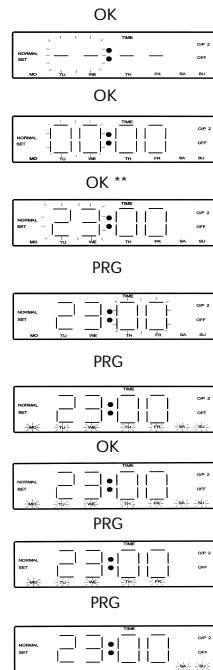
**Multiple Presses

- 19** Normal Time On:
21:00 active Saturday
and Sunday



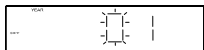
**Multiple Presses

- 20** Normal Time Off:
23:00 active Saturday
and Sunday

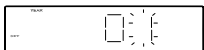


Date: Wednesday 29/10/2003

OK



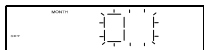
PRG



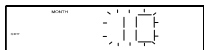
OK **



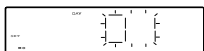
PRG



OK **



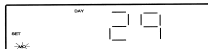
PRG



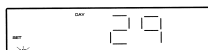
OK **



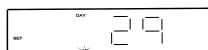
PRG



OK

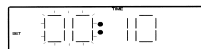


PRG **



OK

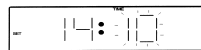
Time of Day: 14:19



OK **



PRG

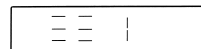


OK **

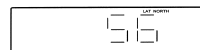


GMT/BST Adjust: Active

PRG

Latitude of Operation:
56 Degrees North
(cannot be altered by user)

PRG



PRG

