

365-Day Annual Timer

SA-027HQ

Installation Manual



The ENFORCER SA-027HQ Annual Timer can be programmed to operate two Form C relays 24 hours a day, for an entire year for various applications including security, access control, lighting, and environmental control. Each relay can be programmed for up to 99 events with each event on a weekly or daily schedule. Block programming allows events to be repeated on consecutive days. Twenty programmable holidays disable the timer for a single day or the same day yearly.

- Two N.O. or N.C. Form C relays, 10A@14VDC, with one egress input per relay
- Each relay programmable for 99 events, to a total of 198 individual programmable events
- Each event can be set weekly, daily, or hourly, over the course of an entire year
- Passcode protection can be turned ON or OFF
- Block programming allows events to be repeated on consecutive days
- First-person-in function interrupts the normal operation of the annual timer
- Event outputs can be programmed to disable, ON, OFF, shunt, or momentary (1~99 seconds)
- 20 Programmable holidays
- Tandem mode allows both relays to operate simultaneously
- EEPROM Memory for safe data protection in case of power failure
- Built-in clock backup capacitor (saves date/time 7-10 days after power loss)
- Built-in smart backup battery charger for external backup battery (not included)
- Compensates for leap years and can be set for Standard or Daylight Savings Time.
- Alphanumeric backlit LCD display for easy programming

SECO-LARM®

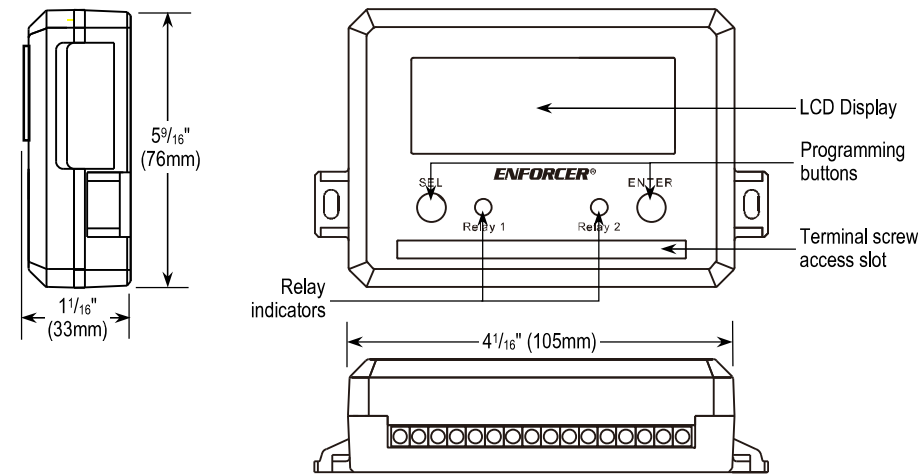
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Parts List

1x Timer	2x Mounting screws	2x Wires for optional backup battery	1x Manual
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Overview



Terminal Layout Chart (left to right)

- | | |
|--------------------------|---------------------------|
| 1. Power input | 9. Ground input |
| 2. Power input | 10. FM 1 – N.O. input |
| 3. Backup battery + | 11. Relay 2 – N.O. output |
| 4. Backup battery – | 12. Relay 2 – COM output |
| 5. Relay 1 – N.O. output | 13. Relay 2 – N.C. output |
| 6. Relay 1 – COM output | 14. Egress 2 – N.O. input |
| 7. Relay 1 – N.C. output | 15. Ground input |
| 8. Egress 1 – N.O. input | 16. FM 2 – N.O. input |

Specifications

Operating voltage	10~48 VDC / 12~24 VAC
Number of relays	2 Form C
Relay contact rating	10A@14VDC
Relay active current draw	60mA@12VDC $\pm 10\%$ (per channel)
Standby current draw	14mA@12VDC $\pm 10\%$
Backup battery type	12VDC Lead acid (not included)
Battery charge	Smart charge, 50mA max., when battery is $\geq 11.5V$ and $\leq 12.8V$
Event capacity	99 per relay
Operating temperature	-4°~167° F (-20°~75° C)
Dimensions	4 ¹ / ₈ "x3"x1 ⁵ / ₁₆ " (105x76x33 mm)
Weight	5.6-oz (158g)

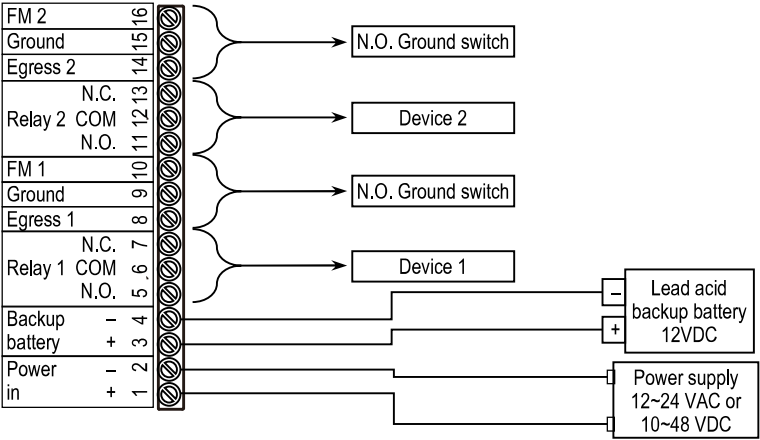
Installation

1. Find a location where the LCD display is visible, and the buttons accessible. Mark the location.
2. Connect the wires (see *Overview*, *Terminal Layout Chart*, pg. 2 and *Basic Wiring*, pg. 4).
3. Connect a 12~24 VAC or 10~48 VDC power supply to the power input terminals, 1 and 2.
4. Connect the 12VDC battery backup to the backup battery input terminals 3 (+) and 4 (-) if desired (not included).
5. Connect the devices that are being controlled to the outputs of relays 1 and/or 2 as well as any other devices being connected.

NOTE: To protect the relay, you must install a 1N4004 diode—with the cathode (striped end , not included) wired toward the positive side—in parallel with the power supply and as close to the lock as possible for DC powered locks **unless** your lock has a diode built in. AC powered locks and electromagnetic locks require a varistor/MOV (05D390K or similar, not included) wired in the same location **if the lock does not have one built in** (all SECO-LARM electromagnetic locks have built-in protection). Failure to use these as directed will void the warranty.

6. Close the case and mount the unit to the location marked above.

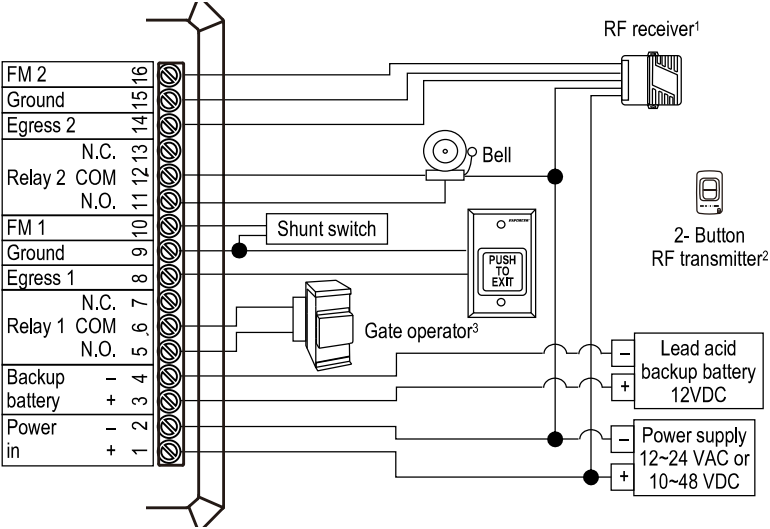
Basic Wiring



NOTES

- When connecting to a backup battery, the battery voltage must be 12VDC ONLY.
- Only a battery can be connected to the backup battery input. Do not connect a power adapter.
- When its optional N.O. switch is activated, the *first person-in* function suspends the operation of the timer. If the corresponding relay is turned on before *first-person-in* is activated, the relay will remain on until the *first-person-in* switch is deactivated. Once deactivated, the timer will turn on the last programmed function prior to the *first-person-in* activation.

Sample Application



¹An RF receiver can be used to trigger the egress wirelessly. The receiver's COM terminal is connected to a ground and the N.O. terminal is connected to the timer's egress input. A second output on the RF can be connected to the *first-person-in* terminal.

²A compatible RF transmitter can then be used to trigger the egress, via the RF receiver and the *first-person-in* function.

³A gate operator connected to the lock relay output is triggered and opens a gate.

Programming Introduction

A convenient feature is the ability to program it before installation. The EEPROM memory stores and protects programming instructions even in case of power failure and after a full charge (about 24 hours) the super capacitor will continue to preserve the correct date and time for 7~10 days after power is lost.

Programming is easier and faster if you know exactly how you want to use the timer and have a good understanding of the functions it has.

Programming Recommendations

1. It is recommended that you follow the programming instructions in the order given as this will make the installation easier.
2. Determine which relays will operate the devices that will be controlled.
3. Determine whether two relays will be used in tandem.
4. Decide whether you wish to use Daylight Savings Time or Standard Time. For a full explanation, see *Programming Daylight Savings Time* on pg. 9.
5. Using a separate piece of paper, write down your programming notes.
 - a. Any events that can be block coded. i.e., events on consecutive days like Monday through Friday or Saturday and Sunday.
 - b. All the events you want to program, as well as their duration (up to 99 per relay).
 - c. Any holidays you wish to program to override the programmed events (up to 20).
6. Decide whether you want to use a PIN code or not. See *Programming a PIN Code* on pg. 10.

LCD Display Icons

Besides the obvious text entries, there are some abbreviations or icons that should be noted.



Indicates backup battery is charging



Return to parent menu



Indicates Daylight Savings Time is activated



PCB temperature in Celsius



Indicates device is locked with PIN code



PCB temperature in Fahrenheit¹

¹The standard temperature display is in Celsius and is not programmable. A version with display in Fahrenheit is available by special order.

Programming Buttons

Programming is accomplished with two buttons.

1. **SEL** – The *Select* button is used to navigate the menu to select the function to be programmed.
2. **ENTER** – When a choice has been selected, the *Enter* button is used for changing and confirming an option. Pressing once will change to the next option. Pressing and holding will cycle ahead rapidly, handy for number options when you need to skip much further ahead.

Programming Introduction (Continued)**Programming Menu Flow Chart**

When you first apply power to the timer, you will see a startup screen for about 3 seconds followed by a home screen showing the date and time (which you will set later) and a reading of the timer's internal temperature. Repeatedly pushing the *SEL* button will then rotate you through the basic programming menus as shown below.



Screen Readout	Description
Set Events	<i>ENTER</i> to set timed events (up to 99 per relay) including event number, relay number, how the relay will operate, and the day and time the event is scheduled. Block programming for events on consecutive days is also available.
Set Holiday	<i>ENTER</i> to program holidays (up to 20), i.e., dates when the normal operation of the timer should be suspended.
Set PinCode	<i>ENTER</i> to set a PIN code to secure the timer from unauthorized tampering (optional, 4-digits, factory preset = 0000).
Set Time	<i>ENTER</i> to set both the current date and time (using 24-hour, military time format).
Set DST	<i>ENTER</i> to set Daylight Savings Time options – OFF (Standard time), USA (US DST), EU-W (Europe west DST), EU-C (Europe central DST), EU-E (Europe east DST), ON (Add 1hr)
Systm Test	<i>ENTER</i> to show the current status of both relays, whether on or off and to test the operation of each relay.
Set Disply	<i>ENTER</i> to adjust the contrast of the display using relative numbers 1~10.
Set Tandem	<i>ENTER</i> to enable or disable the two relays to trigger together in tandem.
Clr Memory	<i>ENTER</i> to clear all programmed items except the PIN code from the memory. You will be required to confirm yes or no.
Exit	<i>ENTER</i> to exit programming mode and return to the home screen.

Programming

The basic steps for programming are as follows.

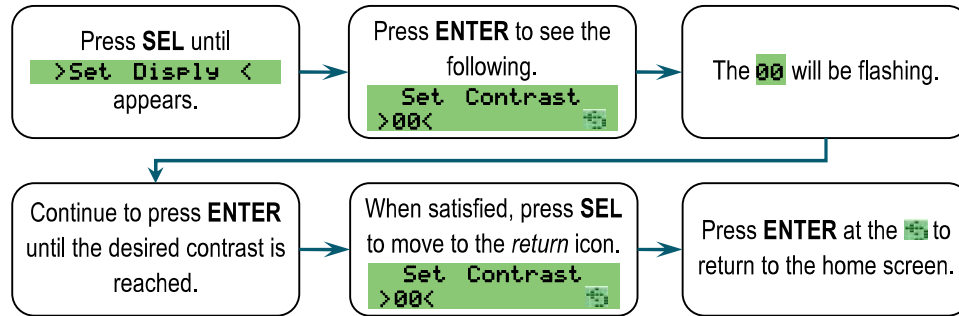
1. Go to the menu for the feature you wish to program by pressing the *SEL* button.
2. Press the *ENTER* button to enter that menu.
3. The first programming option will be flashing. Press the *ENTER* button to change that option and press the *SEL* button to move to the next option and repeat.
4. Move to the *Return*  icon and press the *ENTER* button to save your changes and exit to the home screen.

NOTES:

- In the instructions below, the PIN Code will be assumed to be disabled. If enabled, you'll need to enter your PIN code before beginning programming.
- Holding the *ENTER* button down will cause it to quickly move through the options.

Programming (Continued)

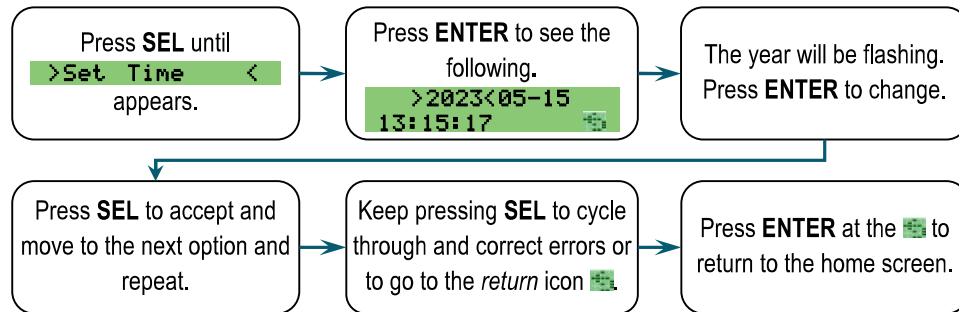
Setting the Display Contrast



NOTES

- The contrast is represented relatively from 00~10 (default, 00). Continuing to press **ENTER** after reaching 10 will start the cycle over at 00.
- The display contrast can also be set at any time by pressing and holding the **SEL** and **ENTER** buttons at the same time. The screen contrast will gradually adjust. If you continue to hold them, the contrast settings will cycle back to 00 and start over. When it reaches the level that you desire, release the buttons.

Setting the Date and Time

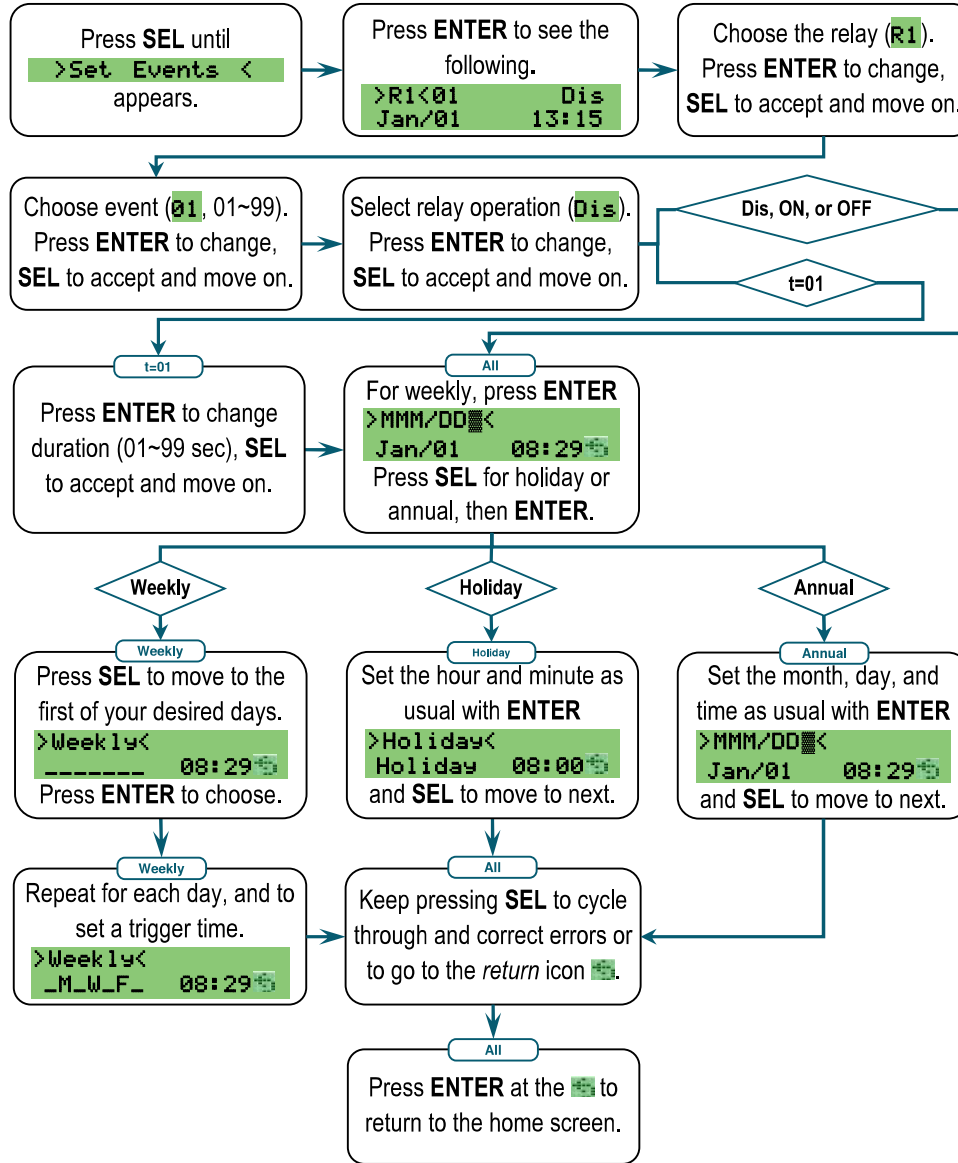


NOTES

- The time is displayed in 24-hour, military format where 1:00 PM is written as 13:00:00.
- The programmed calendar extends through the year 2135. Scrolling past 2135 returns to 2023.

Programming (Continued)

Programming Events

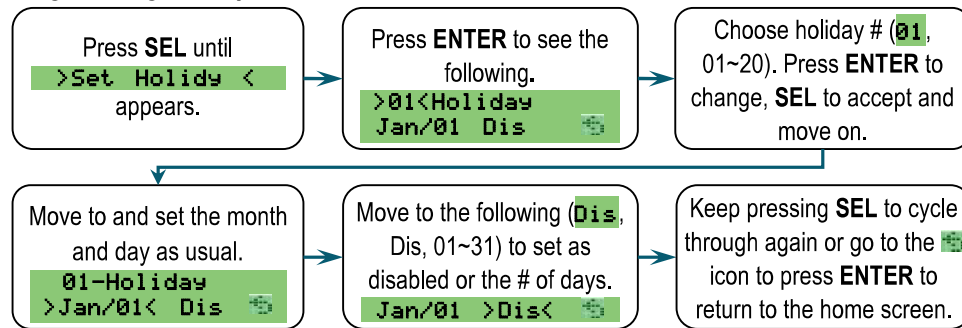


NOTES

- Relay operations are Dis (shunt), ON, t=x (momentary, where x=01~99 seconds), or OFF.
- Holiday events should not be confused with programmed holidays. Holiday events are events that should be performed on holidays even though other events are disabled by the holiday.

Programming (Continued)

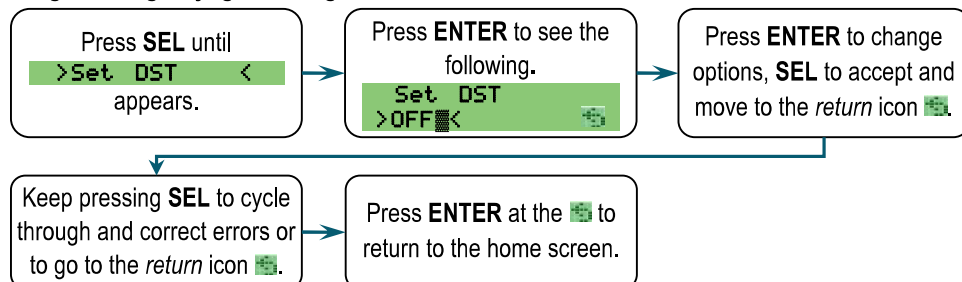
Programming Holidays



NOTES

- In programming holidays, "Dis" is an abbreviation for "disable" and does not refer to "shunt."
- Immediately after programming, the lower part of the home screen will show **>H(xx)**, where xx represents the number of days programmed for the holiday.
- Note that holidays are for 24-hour periods beginning at midnight and cannot be limited to certain hours. If you need to program events to occur on a holiday, program them as "holiday events" as shown in *Programming Events*, on pg. 8.
- On a holiday, the lower portion of the timer display will alternate between the date and **>H(xx)**, where xx represents the number of days remaining in the current holiday period.
- If power, including the backup power, is lost, holidays will need to be reprogrammed.
- If any other programming is done during a programmed holiday time, the holiday will be deleted and must be reprogrammed.

Programming Daylight Savings Time

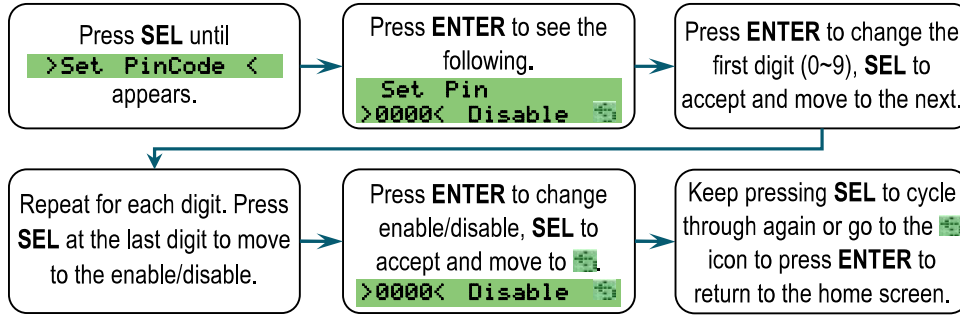


NOTE: DST options are as shown below.

- OFF – Standard time
- USA – from 2:00 AM on the 2nd Sunday in March~2:00 AM on the 1st Sunday in November
- EU-W – from 1:00 AM on the last Sunday in March~2:00 AM on the last Sunday in October
- EU-C – from 2:00 AM on the last Sunday in March~3:00 AM on the last Sunday in October
- EU-E – from 3:00 AM on the last Sunday in March~3:00 AM on the last Sunday in October
- ON – Adds one hour

Programming (Continued)

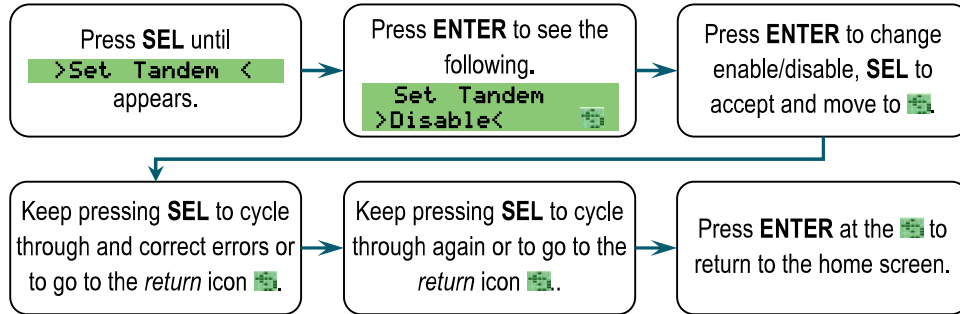
Programming a PIN Code



If you forget the PIN Code, proceed as follows to unlock the timer and enter programming mode.

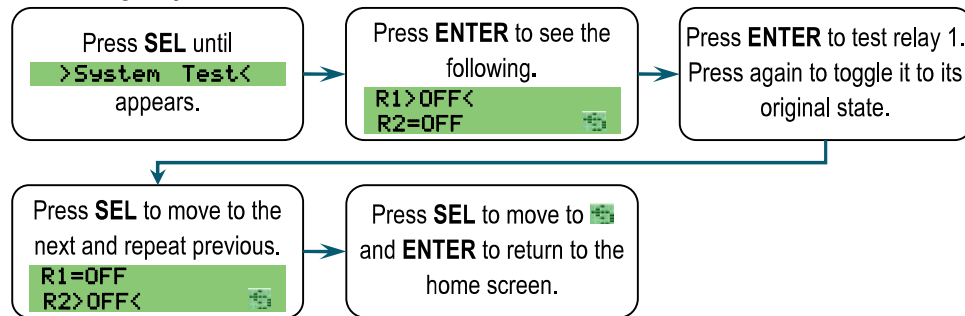
1. Turn off power to the timer and disconnect the backup battery.
2. Power up the timer and immediately press and hold the **ENTER** button for at least 3 seconds, until the lock icon disappears from the display. This returns the PIN code to 0000.
3. Proceed with programming as usual.

Programming Relays in Tandem

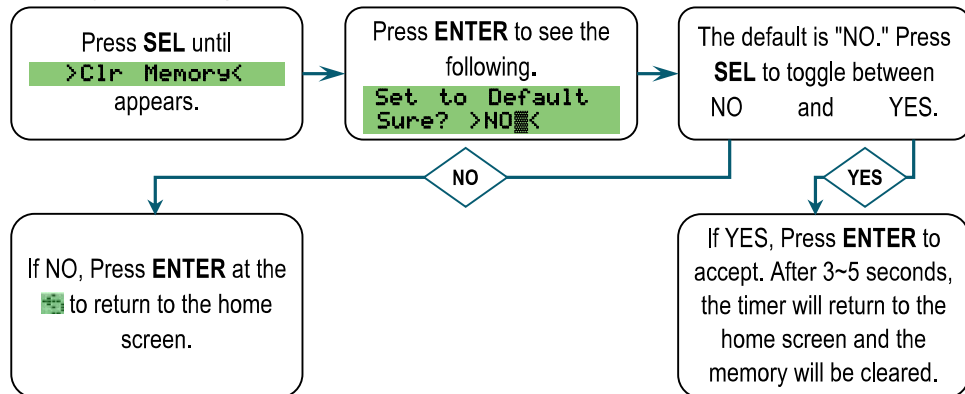


Programming (Continued)

Performing a System Test



Clearing the Memory



Smart Charging

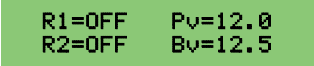
The timer's smart charging feature controls charging so that the battery is only charged when necessary to prolong the life of the battery and ensure that a battery is not overcharged.

When a backup battery is connected, the timer will automatically detect it and start charging if the battery voltage is less than 11.5V.

Charging will stop when the battery voltage reaches 12.8V and will remain on standby until the battery voltage again falls below 11.5V or after 2 weeks, whichever comes first.

Checking Power Input and Backup Battery Level

To check the power input and backup battery level, from the home screen, press the **ENTER** button.



The power input voltage will be shown as Pv=xx.x where xx.x represents the current input voltage.

The current backup battery level will be shown as Bv=xx.x or Bv🔌xx.x, where xx.x represents the current battery voltage and 🔌 indicates that the battery is currently being charged.

Troubleshooting

My backup battery is not charging	• Ensure all battery connections are correct and tight. • Note that the battery will stop charging when the battery reaches 12.9 V and will not resume charging until the battery's voltage falls below 11.5V or after 2 weeks, whichever comes first.
How can I test that a relay is working	• You can use the <i>System Test</i> (see pg. 11) to toggle each relay on and off to test that the relay works properly.

IMPORTANT: Users and installers of this product are responsible for ensuring that the installation and configuration of this product complies with all national, state, and local laws and codes. SECO-LARM will not be held responsible for the use of this product in violation of any current laws or codes.

California Proposition 65 Warning: These products may contain chemicals which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

WARRANTY: This SECO-LARM product is warranted against defects in material and workmanship while used in normal service for one (1) year from the date of sale to the original customer. SECO-LARM's obligation is limited to the repair or replacement of any defective part if the unit is returned, transportation prepaid, to SECO-LARM. This Warranty is void if damage is caused by or attributed to acts of God, physical or electrical misuse or abuse, neglect, repair or alteration, improper or abnormal usage, or faulty installation, or if for any other reason SECO-LARM determines that such equipment is not operating properly as a result of causes other than defects in material and workmanship. The sole obligation of SECO-LARM and the purchaser's exclusive remedy, shall be limited to the replacement or repair only, at SECO-LARM's option. In no event shall SECO-LARM be liable for any special, collateral, incidental, or consequential personal or property damage of any kind to the purchaser or anyone else.

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