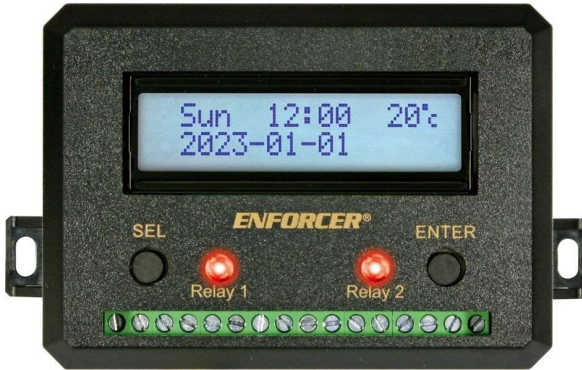


ENFORCER®

365-Day Annual Timer

SA-027HQ

Installation Manual



The ENFORCER SA-027HQ Annual Timer can be programmed to operate 2 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, daily, or hourly schedule. Block programming allows events to be repeated. Twenty programmable holiday events disable the timer on the same date yearly.

- Wide operating voltage range – 10~48 VDC, 12~24 VAC
- Two N.O. or N.C. Form C relays, 10A@14VDC, with one egress input per relay
- 99 Programmable events per relay (total, 198) set weekly, daily, or hourly, over a year
- 20 Programmable holiday events – each holiday event from 1~31 days in duration
- Block programming allows events to be repeated
- EEPROM Memory for safe data protection in case of power failure
- No clock battery to replace - built-in super capacitor saves date/time 7-10 days after power loss
- Built-in leap year compensation, auto US/EU switch to Daylight Savings Time or manual DST
- Smart backup battery charger for external backup battery (not included) extends battery life
- Easy troubleshooting status checks – relay test, input voltage, backup battery voltage/charge
- Passcode protection can be turned ON or OFF
- First-person-in (first-man-in, FM) function interrupts the normal operation of the annual timer
- Event outputs can be programmed to disable, ON, OFF, shunt, or momentary (1~99 seconds)
- Tandem mode allows both relays to operate simultaneously

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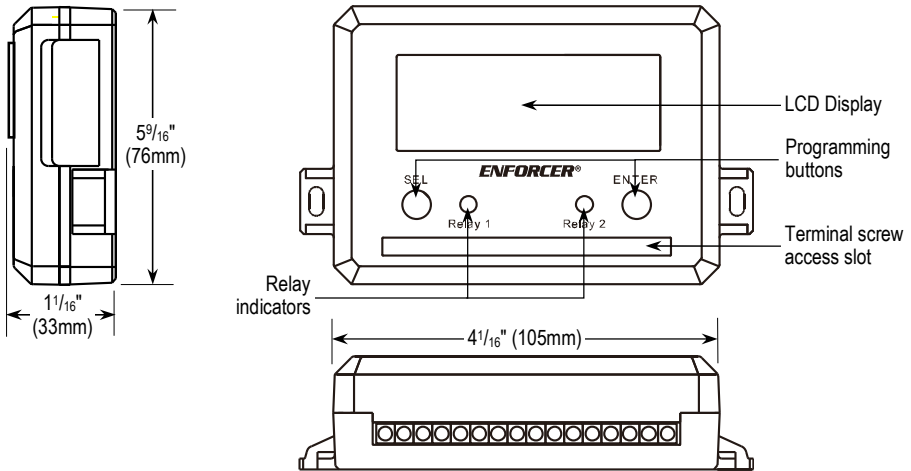
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Parts List

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

Overview



Terminal Layout Chart (left to right)


- | | |
|--------------------------|--------------------------------------|
| 1. Power input | 9. Ground input |
| 2. Power input | 10. First person (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. First person (FM) 2 – N.O. input |

Specifications

Operating voltage		10~48 VDC / 12~24 VAC
Current draw	Standby	14mA@12VDC ±10%
	Active	110mA@12VDC ±10% (per channel)
Inputs	First person	2x N.O. Ground (1 per relay)
	Egress	2x N.O. Ground (1 per relay)
Outputs	Number	2
	Type	Form C, NO/NC/COM
	Rating	10A@14VDC
Event capacity		99 per relay
Display		Large 2 ⁵ / ₈ "x5 ⁵ / ₈ " (66x16 mm) screen with white LED backlight
Connectors		Terminal block, accessible without opening case
Backup battery	Type	12VDC (supports lead-acid compatible battery, not included)
	Charge	Smart charge, 50mA max., battery ≥11.5V and ≤12.8V
Clock backup battery		Super capacitor, preserves time/date 7~10 days
Operating temperature		-4°~167° F (-20°~75° C)
Dimensions		4 ¹ / ₈ "x3"x1 ⁵ / ₁₆ " (105x76x33 mm)
Weight		5.6-oz (158g)

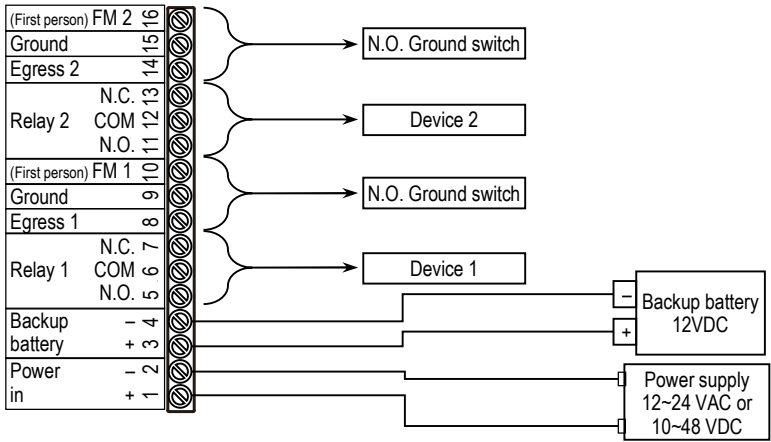
Installation

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 a 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.

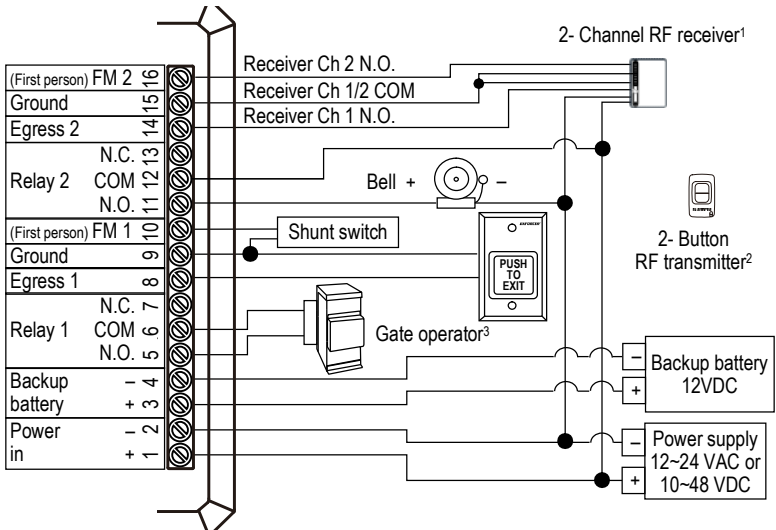
Basic Wiring



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* (first-man-in, FM) function suspends the timer operation. If the corresponding relay is turned on before *first-person-in* is activated, the relay remains 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 (N.O.) on the RF can be connected to the *first-person-in* (first-man-in, FM) terminal.

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

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

Programming Introduction

A convenient feature is the ability to pre-program before installation. The EEPROM memory stores and protects programming instructions even during a power failure and the super capacitor, after a full charge (about 24 hours), will preserve the 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 its functions.

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 that occur in a pattern.
 - 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

NOTE: On-screen PCB temperature readout can be helpful in ensuring that the installation environment is suitable for the device. The temperature should not exceed the device specifications and, if it is consistently more than 20° C higher than the surrounding temperature, could indicate an overvoltage condition or impending malfunction.

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 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 00~09.
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.

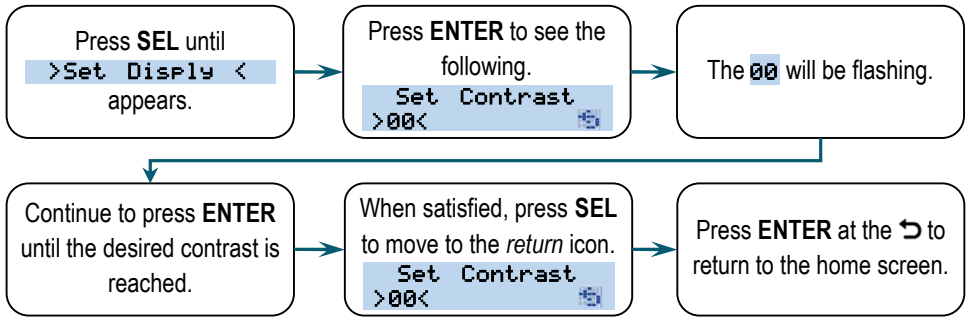
1. Go to the menu for the feature you wish to program by pressing the *SEL* button.
2. Press the *ENTER* button to enter that menu.
3. The first programming option will be flashing. Press the *ENTER* button to change that option and press the *SEL* button to move to the next option and repeat.
4. Move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

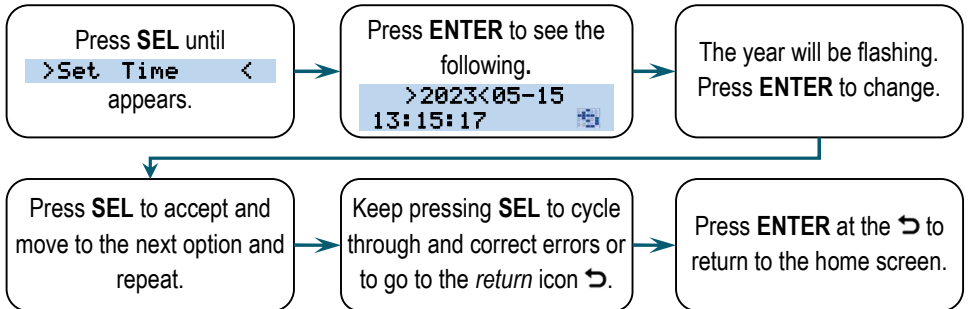
Setting the Display Contrast



NOTES

- The contrast is represented relatively from 00~09 (default, 00). Continuing to press *ENTER* after reaching 09 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

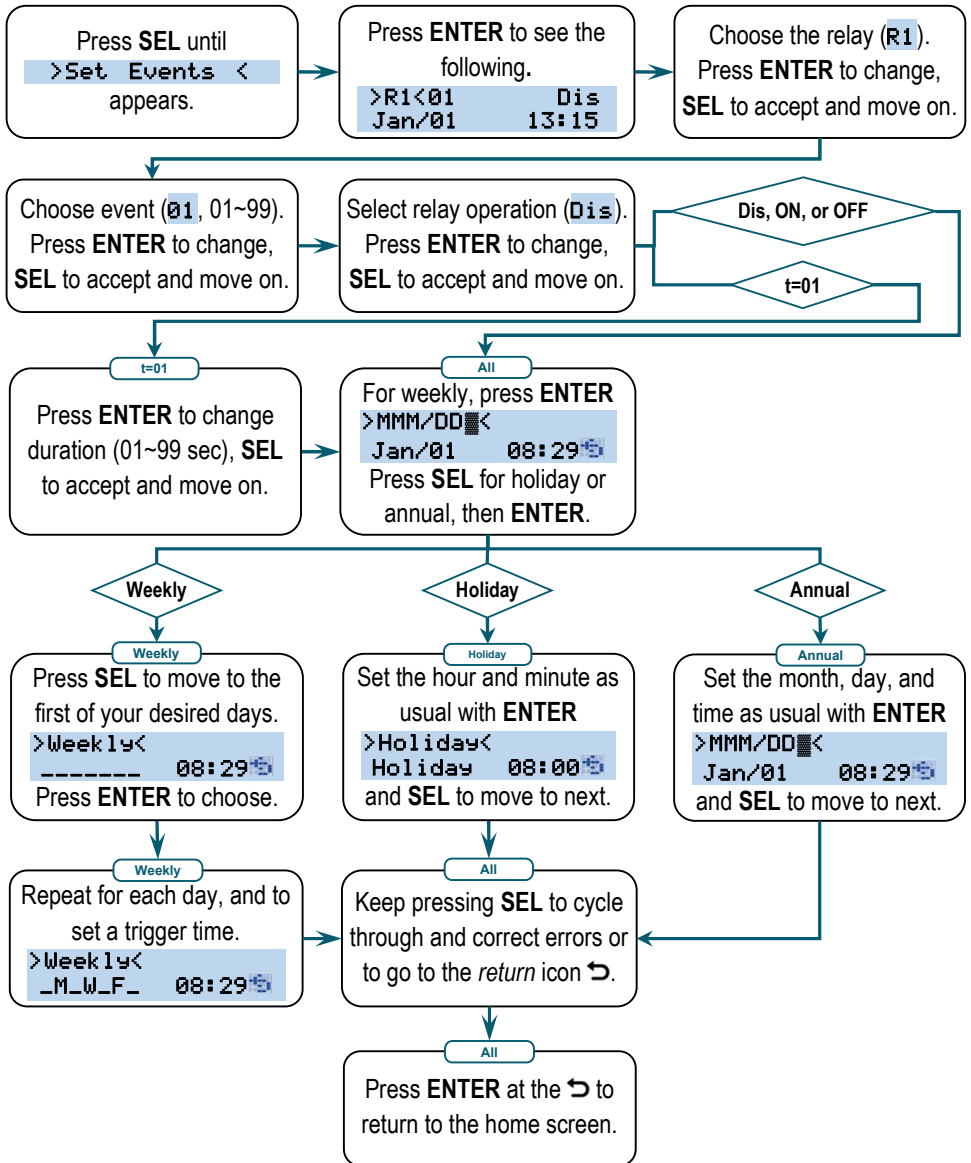


NOTES

- 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 cycles back to the beginning year.
- If you plan to use the automatic DST function, when you set the date and time, be sure to set the time to the standard time, without DST (i.e., if your area is currently in DST, set the time to one hour earlier). When you program DST as shown in the following pages (see *Programming Daylight Savings Time*, pg. 9), it will then update the time to the correct current time and will automatically subtract or add an hour yearly at the beginning and end of DST.

Programming (Continued)

Programming Events

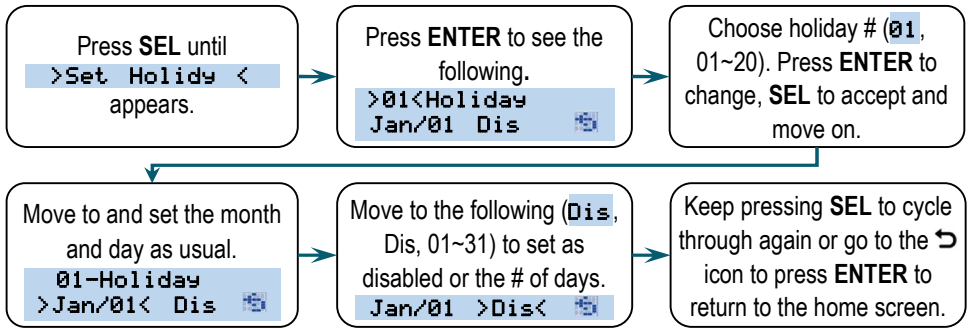


NOTES

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

Programming (Continued)

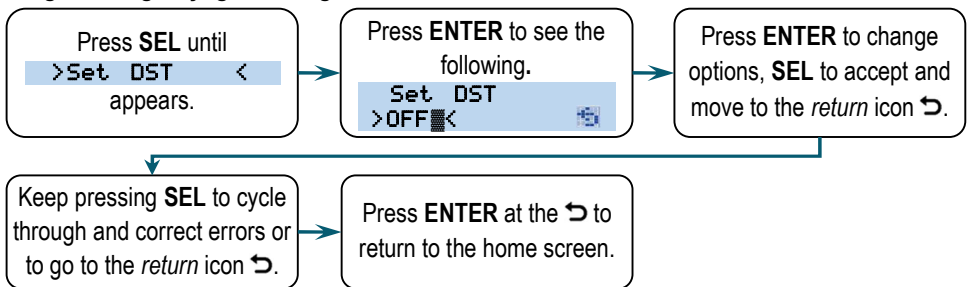
Programming Holiday Events



NOTES

- In programming holiday events, "Dis" is an abbreviation for "disable" and not referring 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 event.
- Note that holiday events 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 "event holidays" 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

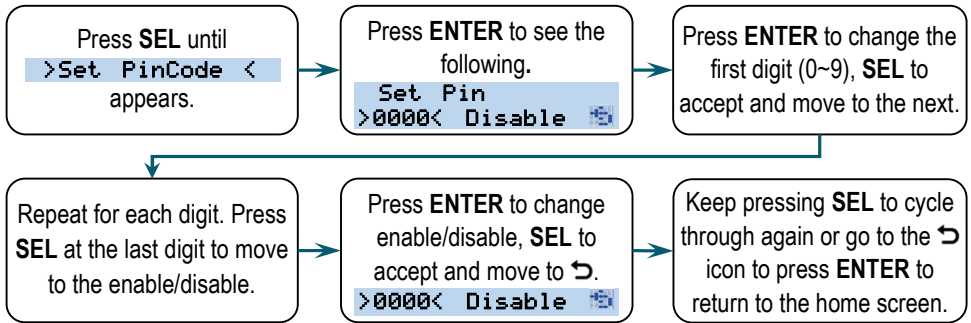


NOTE: DST options (clocks are auto-adjusted for USA, EU-W, EU-C, and EU-E options):


- 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 (manually enabled/disabled when DST begins/ends, respectively)

Programming (Continued)

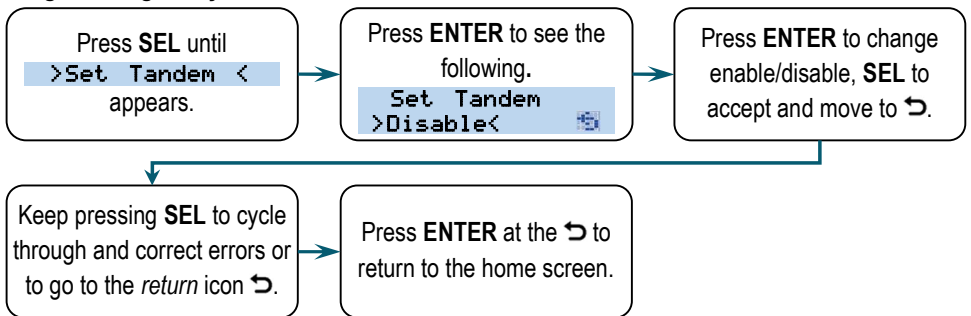
Programming a PIN Code



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

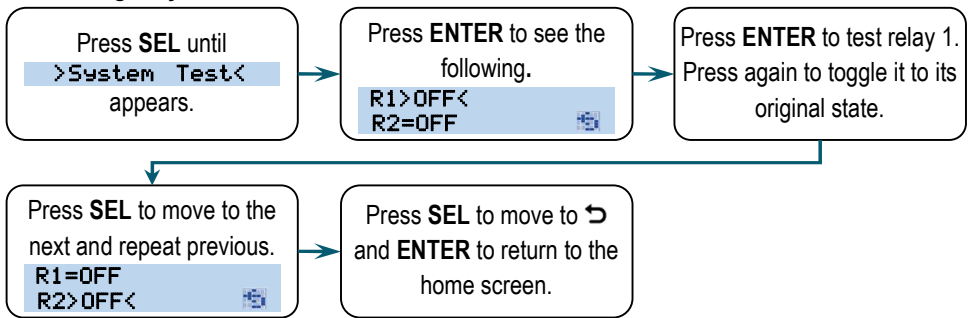
1. Turn off power to the timer and disconnect the backup battery.
2. Power up the timer and immediately press and hold the **ENTER** button for at least 3 seconds, until the lock icon  disappears from the display. This returns the PIN code to 0000.
3. Proceed with programming as usual.

Programming Relays in Tandem



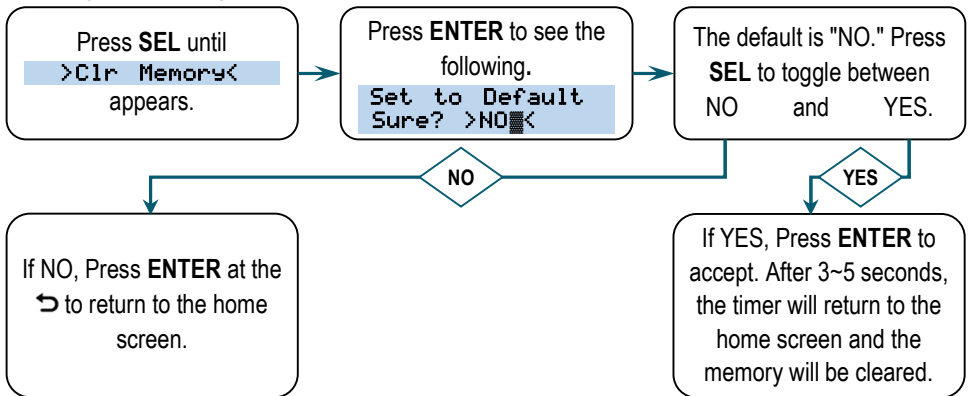
Programming (Continued)

Performing a System Test



NOTE: Performing the system test on a relay toggles that relay based on its current state. If the relay is currently ON, pressing ENTER to test will toggle it OFF and vice versa. If currently OFF, it would toggle to ON.

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. However, if a battery's voltage is too far below that level, the timer will not charge the battery to avoid a potential unsafe condition.

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.

R1=OFF	Pv=12.0
R2=OFF	Bv=12.5

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.
- Press the ENTER button from the home screen to show the "power input and battery level" screen to confirm that the battery is connected but not charging.
- 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 *System Test* (see pg. 11) to toggle each relay on and off to test that the relay works properly.

I set up my timer while DST is active in my area, but when I enable DST, it shows the wrong time.

- Daylight Saving Time adds one hour to the displayed time without changing the internal clock. To get the correct time, set the clock to standard time (see *Setting the Date and Time*, pg. 7), one hour earlier than DST, then enable DST.

I am unsure that my device is receiving the correct input voltage

- From the home screen, press the **ENTER** button to see both the input voltage and the backup battery voltage.

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.

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SECO-LARM® U.S.A., Inc.

16842 Millikan Avenue, Irvine, CA 92606
Phone: (949) 261-2999 | (800) 662-0800

Website: www.seco-larm.com
Email: sales@seco-larm.com

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