ENFORCER®

7-Day Timer

SA-027WQ

Installation Manual

The ENFORCER SA-027WQ 7-Day Timer can be programmed to operate two Form C relays 24 hours a day on a weekly basis for various applications including security, access control, lighting, and environmental control. Each relay can be programmed for up to 60 events with each event on a weekly or daily schedule. A programmable holiday disables the timer for a single day weekly.

- 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
- 60 Programmable events per relay (total of 120) set weekly, daily, or hourly, over a week
- Programmable holiday event – holiday from 1~31 days in duration
- 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
- 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
- Tandem mode allows both relays to operate simultaneously
- Passcode protection can be turned ON or OFF
- First-person-in (first-man-in, FM) function interrupts the normal operation of the timer
- Event outputs can be programmed to disable, ON, OFF, shunt, or momentary (1~99 seconds)
- Enable/Disable 1-hour offset as a quick setting during Daylight Savings Time
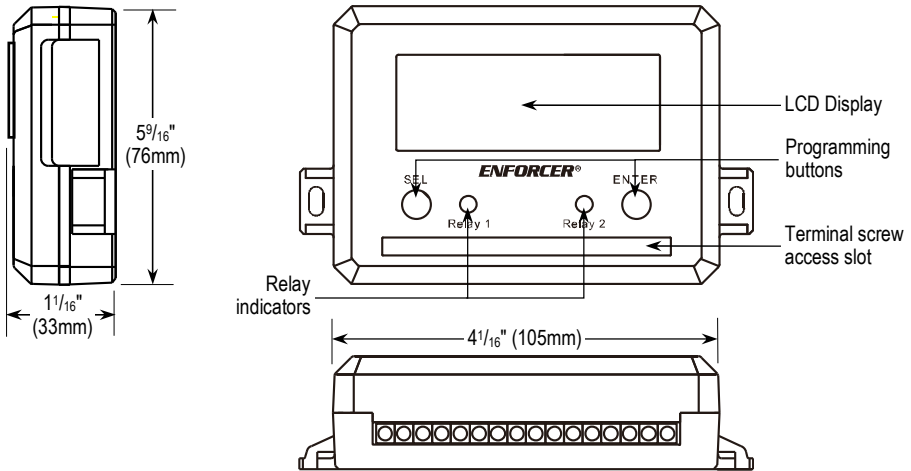- Alphanumeric white backlit LCD display for easy programming

SECO-LARM®

Table of Contents

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
2. Power input
3. Backup battery +
4. Backup battery –
5. Relay 1 – N.O. output
6. Relay 1 – COM output
7. Relay 1 – N.C. output
8. Egress 1 – N.O. input
9. Ground input
10. First person (FM) 1 – N.O. input
11. Relay 2 – N.O. output
12. Relay 2 – COM output
13. Relay 2 – N.C. output
14. Egress 2 – N.O. input
15. Ground input
16. First person (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	110mA@12VDC ±10% (per channel)
Standby current draw	14mA@12VDC ±10%
Backup battery type	12VDC (supports lead-acid compatible battery, not included)
Battery charge	Smart charge, 50mA max., when battery is ≥11.5V and ≤12.8V
Event capacity	60 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
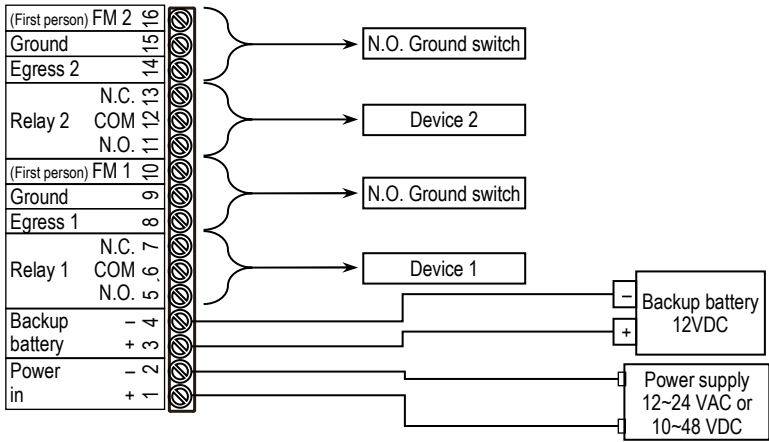
NOTES

- 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* (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
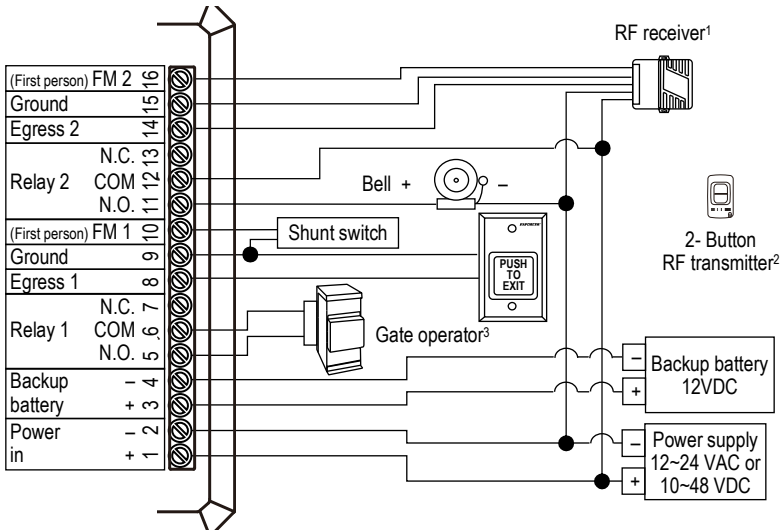
[1]An RF receiver can be used to trigger the egress wirelessly. The receiver's COM terminal is connected to a ground and the N.O. terminal is connected to the timer's egress input. A second output on the RF can be connected to the *first-person-in* (first-man-in, FM) terminal.
[2]A compatible RF transmitter can then be used to trigger the egress, via the RF receiver and the *first-person-in* (first-man-in, FM) function.
[3]A gate operator connected to the 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 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 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. 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 60 per relay).
    c. Any holiday you wish to program to override the programmed events.
5. Decide whether you want to use a PIN code or not. See *Programming a PIN Code* on pg. 10.

LCD Display

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

Indicates device is locked with PIN code

NOTE: OFF or ON in the top right corner of the screen refers to the relay status. OFF means that neither relay is triggered. If either relay is on, the display will change to ON.

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 day and time (which you will set later). Repeatedly pushing the *SEL* button will then rotate you through the basic programming menus as shown below.

Screen Readout	Description
Set Events	*ENTER* to set timed events (up to 60 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 Holidy	*ENTER* to program a holiday event, i.e., a day when the normal operation of the timer should be suspended.
Set PinCode	*ENTER* to set a PIN code to secure the timer from unauthorized tampering (optional, 4-digits, factory preset = 0000).
Set Time	*ENTER* to set both the current day and time (using 24-hour, military time format).
Set DST	*ENTER* to enable/disable Daylight Savings Time – Disable (Standard time) or Enable (Add 1hr)
Systm Test	*ENTER* to show the current status of both relays, whether on or off and to test the operation of each relay.
Set Disply	*ENTER* to adjust the contrast of the display using relative numbers 00~09.
Set Tandem	*ENTER* to enable or disable the two relays to trigger together in tandem.
Clr Memory	*ENTER* to clear all programmed items except the PIN code from the memory. You will be required to confirm yes or no.
Exit	*ENTER* to exit programming mode and return to the home screen.

SEL

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

Press **SEL** until
`>Set Disply <`
appears.
	Press **ENTER** to see the
	following.
	`Set Contrast`
	`>00<`
		The `00` will be flashing.

Continue to press **ENTER**
until the desired contrast is
reached.
	When satisfied, press **SEL**
	to move to the *return* icon.
	`Set Contrast`
	`>00<`
		Press **ENTER** at the 🔄 to
		return to the home screen.
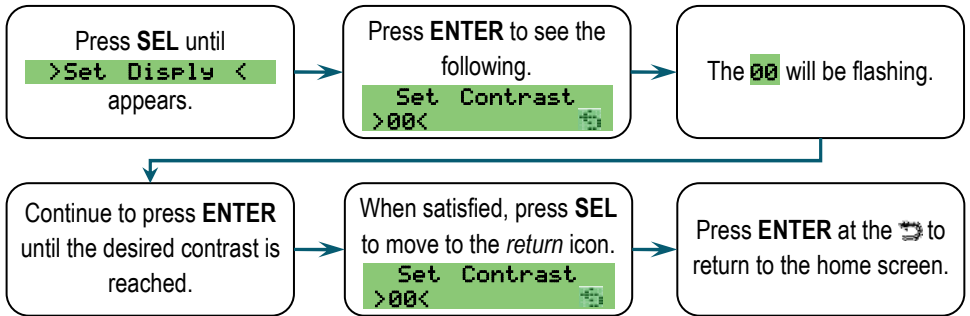
NOTES

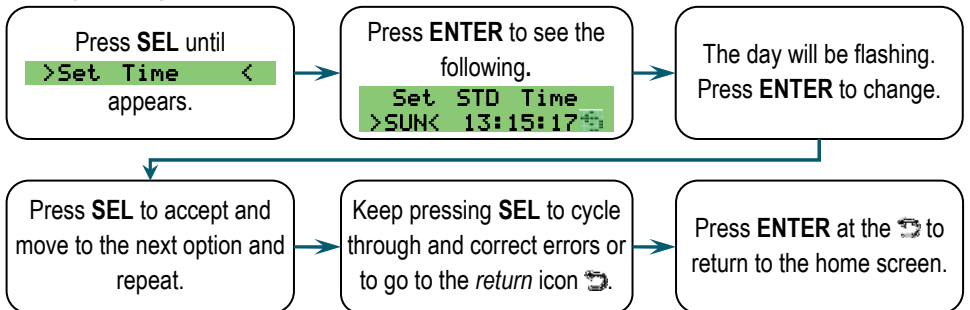- The contrast is represented relatively from 00~09 (default, 00). Continuing to press ENTER after reaching 09 will start the cycle over at 00.
- The display contrast can also be set at any time by pressing and holding the **SEL** and **ENTER** buttons at the same time. The screen contrast will gradually 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 Day and Time

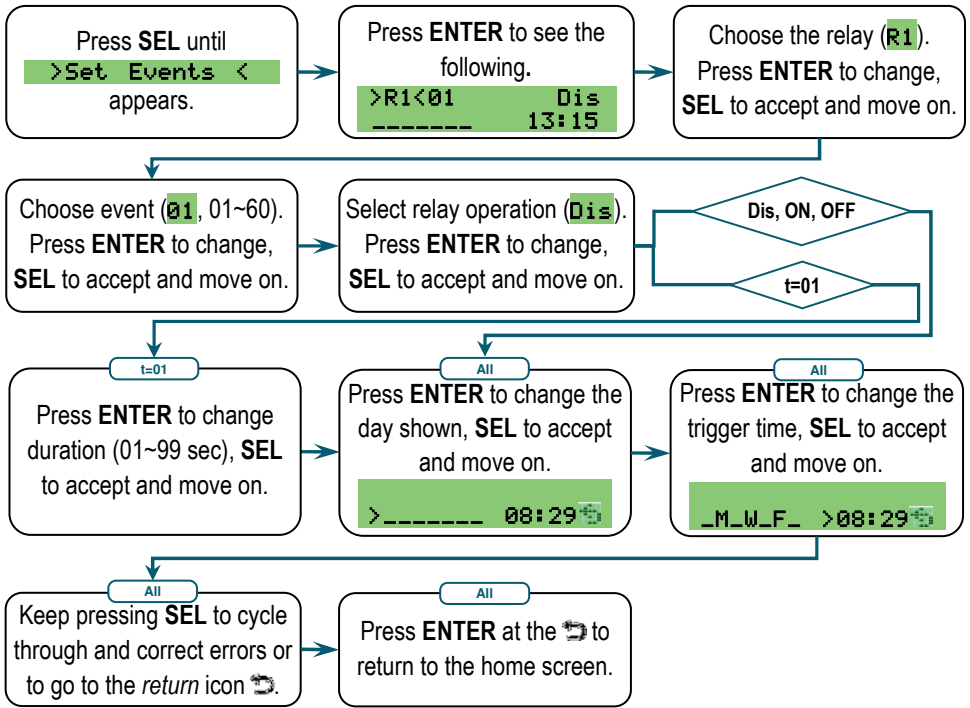|		

Press **SEL** until
`>Set Time <`
appears.
	Press **ENTER** to see the
	following**.**
	`Set STD Time`
	`>SUN< 13:15:17`
		The day will be flashing.
		Press **ENTER** to change.

Press **SEL** to accept and move to the next option and repeat.	Keep pressing **SEL** to cycle through and correct errors or to go to the *return* icon 🔄.	Press **ENTER** at the 🔄 to return to the home screen.

NOTE: The time is displayed in 24-hour, military format where 1:00 PM is written as 13:00:00.

Programming (Continued)

Programming Events

Press **SEL** until
>Set Events <
appears.

→

Press **ENTER** to see the following.
>R1<01   Dis
_____   13:15

→

Choose the relay (R1).
Press **ENTER** to change,
SEL to accept and move on.

Choose event (01, 01~60).
Press **ENTER** to change,
SEL to accept and move on.

→

Select relay operation (Dis).
Press **ENTER** to change,
SEL to accept and move on.

→

Dis, ON, OFF

t=01

t=01
Press **ENTER** to change
duration (01~99 sec), **SEL**
to accept and move on.

→

All
Press **ENTER** to change the
day shown, **SEL** to accept
and move on.
>_____ 08:29

→

All
Press **ENTER** to change the
trigger time, **SEL** to accept
and move on.
_M_W_F_ >08:29

All
Keep pressing **SEL** to cycle
through and correct errors or
to go to the *return* icon ↩.

→
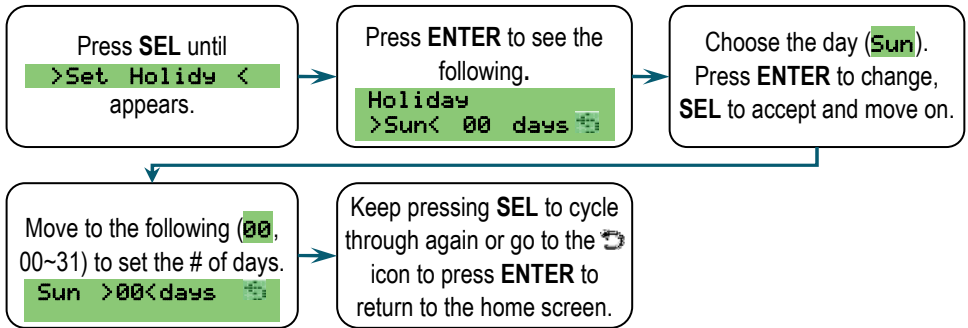
All
Press **ENTER** at the ↩ to
return to the home screen.

NOTE: Relay operations are Dis (shunt), ON, t=x (momentary, where x=01~99 seconds), or OFF.

Programming (Continued)

Programming a Holiday Event

Press **SEL** until
`>Set Holidy <`
appears.
	Press **ENTER** to see the
	following**.**
	`Holiday`
	`>Sun< 00 days `
		Choose the day (`Sun`).
		Press **ENTER** to change,
		SEL to accept and move on.

Move to the following (`00`, 00~31) to set the # of days. `Sun >00<days `	Keep pressing **SEL** to cycle through again or go to the icon to press **ENTER** to return to the home screen.

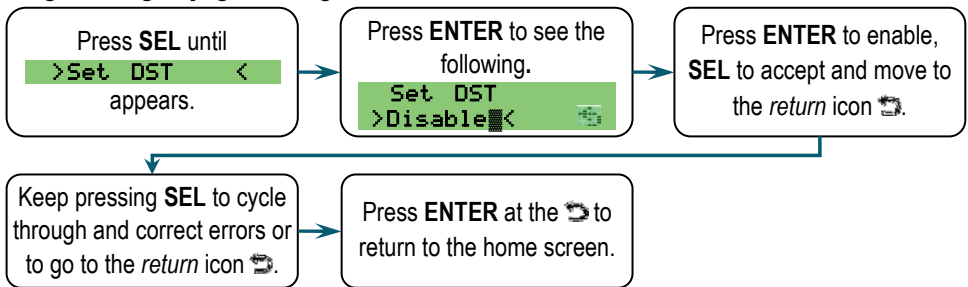### NOTES

- In programming holidays, 00 is equivalent to "disable."
- Note that holiday events are for 24-hour periods beginning at midnight and cannot be limited to certain hours.
- On a holiday, the lower portion of the timer display will alternate between the date and `>HOLI`.
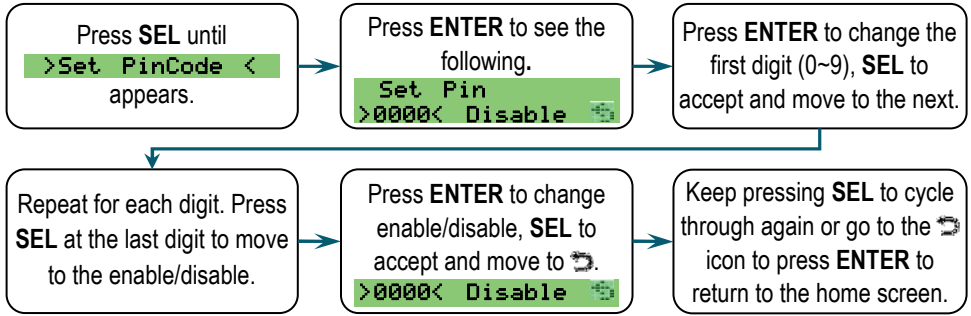
Programming Daylight Savings Time

Press **SEL** until
`>Set DST <`
appears.
	Press **ENTER** to see the
	following**.**
	`Set DST`
	`>Disable<`
		Press **ENTER** to enable,
		SEL to accept and move to
		the *return* icon.

Keep pressing **SEL** to cycle through and correct errors or to go to the *return* icon.	Press **ENTER** at the to return to the home screen.

NOTE: DST options are as shown below.

- Disable – Standard time
- Enable – Adds one hour

Programming (Continued)

Programming a PIN Code

Press **SEL** until
`>Set PinCode <`
appears.
	Press **ENTER** to see the following**.**
	`Set Pin`
	`>0000< Disable`
		Press **ENTER** to change the first digit (0~9), **SEL** to accept and move to the next.

Repeat for each digit. Press **SEL** at the last digit to move to the enable/disable.	Press **ENTER** to change enable/disable, **SEL** to accept and move to ↻. `>0000< Disable`	Keep pressing **SEL** to cycle through again or go to the ↻ icon to press **ENTER** to return to the home screen.

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.
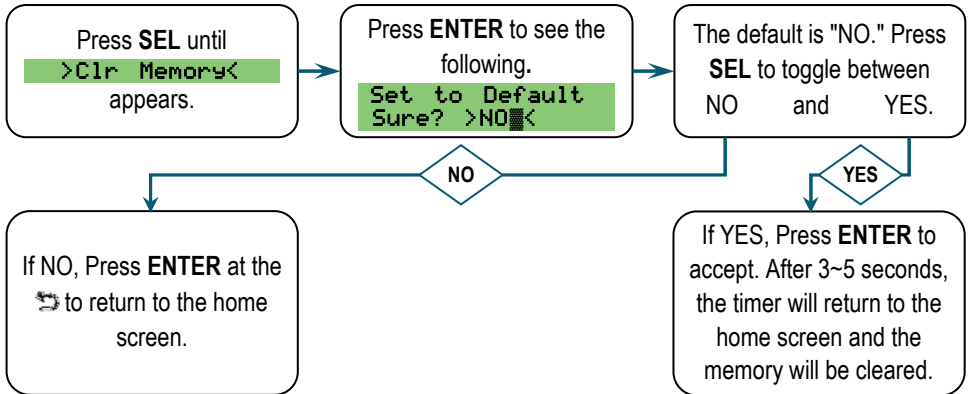
Programming Relays in Tandem

Press **SEL** until
`>Set Tandem <`
appears.
	Press **ENTER** to see the following**.**
	`Set Tandem`
	`>Disable<`
		Press **ENTER** to change enable/disable, **SEL** to accept and move to ↻.

Keep pressing **SEL** to cycle through and correct errors or to go to the *return* icon ↻.	Press **ENTER** at the ↻ to return to the home screen.	
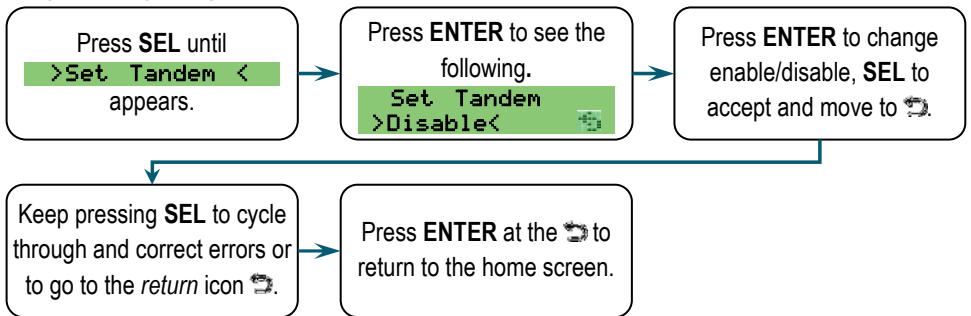
Programming (Continued)

Performing a System Test

| Press **SEL** until
`>System Test<`
appears. | → | Press **ENTER** to see the following.
`R1>OFF<`
`R2=OFF` | → | Press **ENTER** to test relay 1. Press again to toggle it to its original state. |

| Press **SEL** to move to the next and repeat previous.
`R1=OFF`
`R2>OFF<` | → | Press **SEL** to move to ↻ and **ENTER** to return to the home screen. |
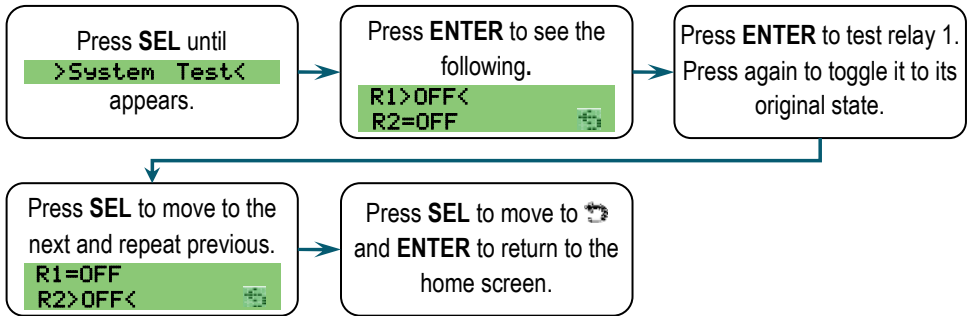
NOTE: Performing the system test on a relay toggles that relay based on its current state. If the relay is currently ON, pressing ENTER to test will toggle it OFF and vice versa. If currently OFF, it would toggle to ON.

Clearing the Memory

| Press **SEL** until
`>Clr Memory<`
appears. | → | Press **ENTER** to see the following.
`Set to Default`
`Sure? >NO<` | → | The default is "NO." Press **SEL** to toggle between NO and YES. |

NO

YES

If NO, Press **ENTER** at the ↻ to return to the home screen.

If YES, Press **ENTER** to accept. After 3~5 seconds, the timer will return to the home screen and the memory will be cleared.

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 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.

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