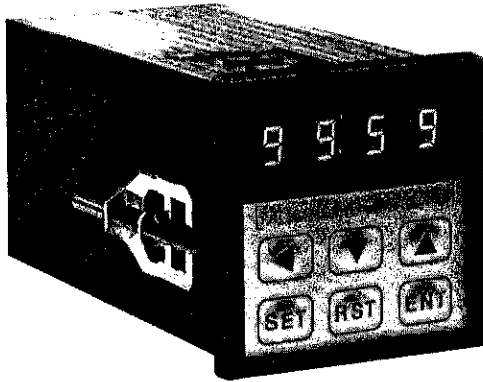SX450

## SX450 SERIES
## DUAL OUTPUT INTERVAL TIMER
## WITH TIME INHIBIT



The SX450 is a dual output timer with two independently programmable, timing interval setpoints. The two outputs can be programmed to operate either simultaneously or in sequence, providing the equivalent operation of two interval timers. The sequential output operation can also be used to provide repeat cycle timer operation.

The SX450 has eight programmable time ranges. Time ranges from 99.99 seconds to 999.9 hours are available to allow the use of one unit in many applications. Easy to use minute:second and hour:minute ranges are also available.

The SX450 is housed in a standard DIN style case with a 72 millimeter (2.83 inch) square front bezel. The small case and front bezel require minimal panel space, yet provide easy to use programming keys and an easy to read .36 inch LED display.

The four operating modes and the eight time ranges are programmed using rocker switches on the back of the unit. This programming method provides both simplicity and security. The front panel display has a prompted programming routine that shows the user how to program the setpoints.

Some of the other features of the SX450 Timer include:

- Two 5 Amp SPDT relay outputs (socket mounted).
- Four output operating modes.
- Eight time ranges.
- Time inhibit input.
- Setpoint to zero or zero to setpoint cycle progress indication.
- LED indicators for output status.
- Front panel and remote reset inputs.
- Keypad lock function.
- Non-volatile memory (NOVRAM) for program and data retention.
- Removable terminal blocks for wiring connections.
- +12 VDC, 100 milliamp sensor power supply.

# SPECIFICATIONS

## Time Ranges

| SYM. | MAXIMUM RANGE | MINIMUM SETTING |
|------|---------------|-----------------|
| 1 | 99.99 Sec | .01 Sec |
| 2 | 999.9 Sec | .1 Sec |
| 3 | 99.99 Min | .01 Min |
| 4 | 999.9 Min | .1 Min |
| 5 | 99.99 Hr | .01 Hr |
| 6 | 999.9 Hr | .1 Hr |
| 7 | 99 Min:59 Sec | 1 Sec |
| 8 | 99 Hr:59 Min | 1 Min |

## Setting Accuracy
± 0.05% of setting or 50ms, whichever is larger

## Repeat Accuracy
± 0.001% of setting or 35ms, whichever is larger

## Power On Response
200 milliseconds maximum

## Reset Time
15 milliseconds

## Operating Temperature
+32° to +122°F (0° to 50°C)

## Operating Voltage/Frequency
| SYMBOL | VOLTAGE & FREQUENCY |
|--------|---------------------|
| A6 | 120 VAC 50/60 Hz |
| B6 | 240 VAC 50/60 Hz |

## Sensor Power Supply
+12 VDC, 100 milliamps

## Output Rating
Relay — 5 Amp, 10 to 264 VAC

## Vibration
Unit function is unaffected by 2.5G sinusoidal vibration magnitude in both directions of the perpendicular mounting axes imposed from 10 to 100 Hz.

## Static Discharge
Unit function is unaffected by a constant 3600 volt peak, 60 Hz discharge applied to the grounded front plate at a relative humidity of less than 25%.

## Transient Protection
Immune to 2500 volts peak transients up to 50 microseconds in duration.

## Eagle Signal Controls
A Mark IV Industries Company
8004 Cameron Road, Austin, Texas 78753 U.S.A.

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## CONTROL INPUT FEATURES

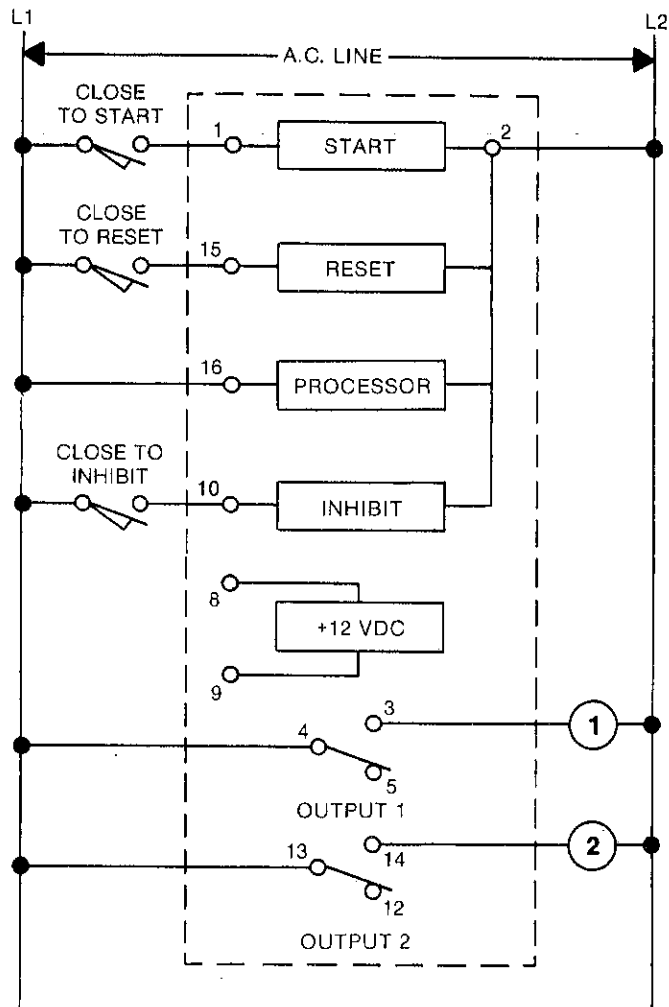The SX450 Timer uses all line voltage control inputs for high noise immunity.

The start input enables the timer and initiates the programmed output sequences. This allows the timer operation to be started independently of when power is applied to the unit. This input can be set up to respond to sustained or momentary inputs.

When power is applied to the inhibit input the time cycle stops and the outputs are held in their last state. The inhibit condition will continue as long as power is applied to the inhibit input or until the unit is reset.

When power is applied to the reset input, the timer resets and the outputs are de-energized. The reset and output de-energized state will continue as long as power is applied to the reset input. A front panel reset key is also provided for manual reset operation.

All inputs are optically isolated and designed to respond in 15 milliseconds or less.

A 12 VDC 100 milliamp power supply is provided for user convenience although the SX450 time uses line voltage inputs.

L1 — A.C. LINE — L2

CLOSE TO START — 1 — START — 2
CLOSE TO RESET — 15 — RESET
16 — PROCESSOR
CLOSE TO INHIBIT — 10 — INHIBIT
8 / +12 VDC / 9
4 / 3 / 5 — OUTPUT 1 — (1)
13 / 14 / 12 — OUTPUT 2 — (2)

## OUTPUT FEATURES

The SX450 has two 5 amp SPDT outputs. These relays are socket mounted for easy service. LED indicators on the display indicate when the outputs are energized.

OUT 1 — SET 1
OUT 2 — SET 2

## OUTPUT OPERATING MODES

Both outputs operate in the interval timing mode. That is, they are energized for the amount of time established by their respective setpoint values. There are four output operating modes.

**1. Simultaneous Intervals, Beginning Together** — Both outputs are energized together. They have separately programmable timing intervals.
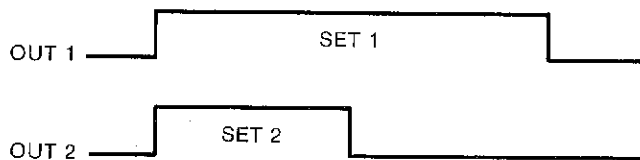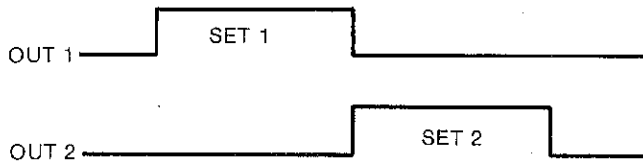
**2. Simultaneous Intervals, Ending Together** — Output 1 is energized first. The setpoint for Output 2 determines how long before the end of the Output 1 interval that Output 2 is energized.

OUT 1 — SET 1
OUT 2 — SET 2
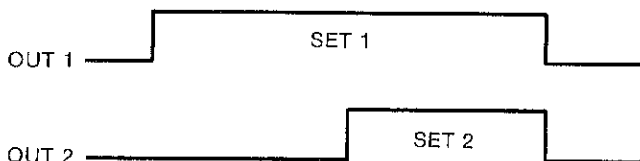
**3. Sequential Intervals** — The timing interval for Output 1 is followed by the timing interval for Output 2.

OUT 1 ⎍ SET 1 ⎎

OUT 2 ⎍ SET 2 ⎎

**4. Repeating Sequential Intervals** — The timing interval for Output 1 is followed by the timing interval for Output 2. After the timing interval for Output 2, the timing interval for Output 1 begins again, and the cycle repeats.

OUT 1 ⎍ SET 1 ⎎ SET 1 ⎎

OUT 2 ⎍ SET 2 ⎎ SET 2
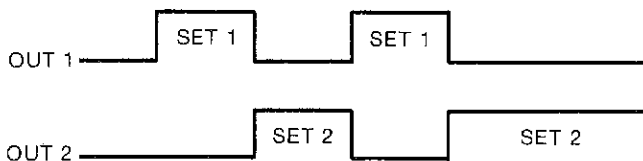
## RESET OPERATION

The SX450 Timer is programmable to either reset on power interruption and start over when power is reapplied or to retain its actual cycle progress value and continue with the cycle when power is reapplied. This operation is determined with a switch setting on the back of the unit.

## CYCLE PROGRESS INDICATION

The time progress display can be programmed either to cycle DOWN from the setpoint to zero or to cycle UP from zero to the setpoint. In the simultaneous output timing modes the display will show the cycle progress for the Output 1 timing interval. In the sequential output timing modes the display will show the cycle progress for the Output 1 timing interval followed by the cycle progress for the Output 2 timing interval. The operation of the cycle progress display is determined with a switch setting on the back of the unit.

## START INPUT OPERATION

The SX450 Timer uses line voltage applied to terminals 1 and 2 to initiate the timing cycle. The start signal can either be a sustained voltage input or a momentary voltage pulse. When the sustained start input mode is used, removal of power from terminals 1 and 2 will stop the timing cycle. When the momentary start pulse mode is used, the timing cycle is initiated by the voltage pulse, and the timing cycle continues even if the signal is removed. The timer will normally reset at the end of the timing cycle. The timer can also be reset either by using the front panel reset (RST) key, or by applying a reset signal on terminal 15. The operation of the start input is determined with a switch setting on the back of the unit.

## FRONT PANEL PROGRAMMING

The SX450 Timer uses a sealed front panel keypad for entry of the setpoints.
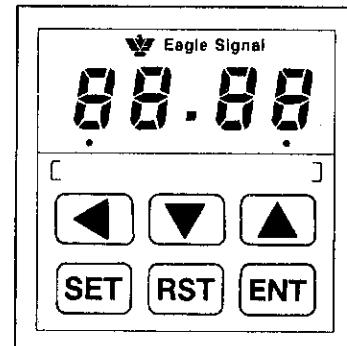


Pressing the SET key calls the prompted programming routine for the two interval setpoints. These are indicated with "SEt1" and "SEt2" prompts. Each setpoint is displayed with the lease significant digit flashing. The position of the flashing digit can be changed using the ◀ key. The ▲ and ▼ keys increment and decrement the value of the flashing digit. The ENT key enters any setpoint changes into memory.

A keypad lock function is provided for security. Pressing and holding the ENT key for about five seconds will alternately lock and unlock the front keypad. When locked, the SET key will call the two setpoints, but the ▲, ▼, and ◀, and RST keys will be inoperative.

The RST key is a manual reset. Pressing the RST key resets the timer and holds the outputs in their normal, deenergized states until the key is released. The front panel reset key can be disabled using the keypad lock function.
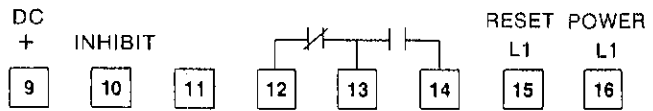
## SWITCH PROGRAMMING

The SX450 Timer uses eight miniature rocker switches on the back of the unit to program the operating modes as follows:
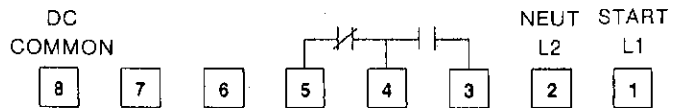
X = Switch ON   O = Switch OFF   Blank = Does Not Apply

| SYM. | OPERATING MODE | SWITCH NUMBER | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | OUTPUT OPERATION | | | | | | | | |
| 1 | Simultaneous - Start Together | O | O | | | | | | |
| 2 | Simultaneous - End Together | X | X | | | | | | |
| 3 | Sequential | X | O | | | | | | |
| 4 | Sequential - Repeat | O | X | | | | | | |
| | CYCLE PROGRESS | | | | | | | | |
| 1 | DOWN - From setpoint to zero | | | O | | | | | |
| 2 | UP - From zero to setpoint | | | X | | | | | |
| | TIME RANGES | | | | | | | | |
| 1 | 99.99 Seconds | | | | O | O | O | | |
| 2 | 999.9 Seconds | | | | X | O | O | | |
| 3 | 99 Minutes:59 Seconds | | | | O | X | O | | |
| 4 | 99.99 Minutes | | | | O | O | X | | |
| 5 | 999.9 Minutes | | | | X | O | X | | |
| 6 | 99 Hours:59 Minutes | | | | X | X | O | | |
| 7 | 99.99 Hours | | | | O | X | X | | |
| 8 | 999.9 Hours | | | | X | X | X | | |
| | RESET OPERATION | | | | | | | | |
| 1 | Reset on Power Interruption | | | | | | | | O |
| 2 | Non-Reset on Power Interruption | | | | | | | | X |
| | START OPERATION | | | | | | | | |
| 1 | Sustained Start Input | | | | | | | | O |
| 2 | Momentary Start Input | | | | | | | | X |

## TERMINAL ASSIGNMENTS

The SX450 Timer uses two removable terminal blocks to provide wiring connections, with the following terminal assignments.

DC +   INHIBIT                                    RESET POWER
                                                   L1    L1
[9]  [10]  [11]  [12]  [13]  [14]  [15]  [16]

OUTPUT 2

DC COMMON                                         NEUT  START
                                                   L2    L1
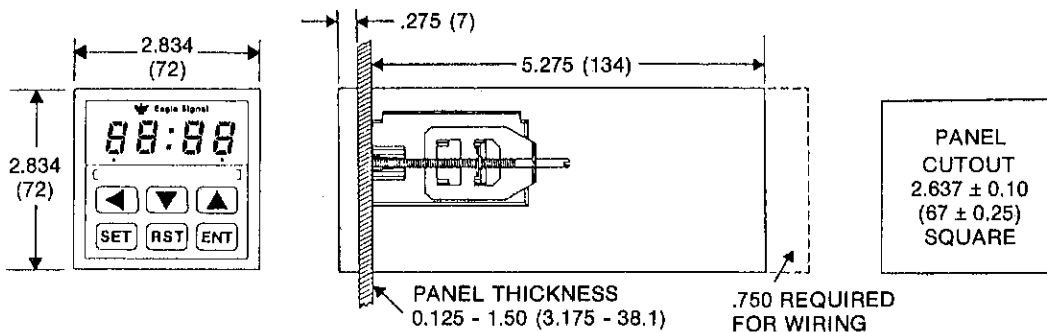[8]  [7]  [6]  [5]  [4]  [3]  [2]  [1]

OUTPUT 1

For more information, refer to the SX450 Instruction Manual, publication number 5005-802.

## MOUNTING

The SX450 Timer uses two removable mounting clips with adjustable screws to mount the enclosure in a panel as shown below.

2.834 (72)

2.834 (72)

.275 (7)

5.275 (134)

PANEL CUTOUT 2.637 ± 0.10 (67 ± 0.25) SQUARE

PANEL THICKNESS 0.125 - 1.50 (3.175 - 38.1)

.750 REQUIRED FOR WIRING

## ORDERING INFORMATION

SX4   50   A6

### OUTPUT TYPE

| SYMBOL | DESCRIPTION |
|---|---|
| 50 | Relay Output |

### VOLTAGE & FREQUENCY

| SYMBOL | DESCRIPTION |
|---|---|
| A6 | 120 VAC 50/60 Hz |
| B6 | 240 VAC 50/60 Hz |