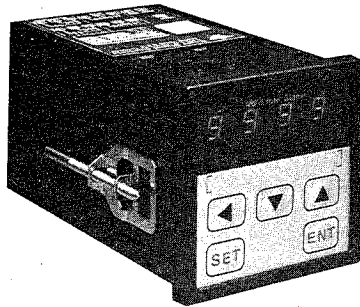


## SX200 SERIES MICROPROCESSOR BASED DIGITAL TIMER



The SX200 timer is a microprocessor based digital timer 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 provides large, easy to use programming keys and a .3 inch high LED display.

The programmable features of the SX200 timer include eight time ranges and eight output operating modes. These operating modes, and all other set-up functions are programmed with miniature rocker switches located on the back of the housing.

The SX200 timer uses a non volatile RAM memory to retain the setpoint, actual time values, and program parameters. The expected life of data in memory is ten years.

The front panel of the unit is a sealed membrane keypad which provides excellent protection for most industrial environments. The keypad includes a special surface just below the display on which the function of the timer can be marked with a pen or pencil.

The SET and ENT keys on the front panel provide access to the setpoint and to the front panel programmed functions. Programming changes are entered using the increment and decrement keys.

A keypad "lock" function is built into the software of the unit which allows the setpoint to be viewed, but does not allow unauthorized changes.

The timing cycle progress is shown on four .3 inch red LED displays for easy readability. The front panel also has a flashing LED at the right side of the display to indicate that the unit is in the timing cycle, and a LED at the left side of the display that lights when the programmed contacts are energized.

Terminal connections for the unit are made by two removable terminal blocks with screw gate style wire clamps. The removable terminal blocks permit prewiring of the panel without the timer in place, and eliminate rewiring should the unit need to be removed or replaced.

The outputs for the SX200 timer are two DPDT relays with five amp contact ratings for long life. One relay is a set of instantaneous contacts that energize when the timing cycle starts, and remain energized until the timer is reset. The other relay is a set of programmable contacts that can be programmed to turn on and off in several different operating modes. The two relay outputs are socket mounted for easy replacement.

## SPECIFICATIONS

### Time Ranges

SYM	MAXIMUM RANGE	MINIMUM SETTING
1	99.99 Sec	.01 Sec
2	999.9 Sec	1 Sec
3	9999 Min	1 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

### Reset Time

15 milliseconds

### Power On Response

200 milliseconds maximum

### 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

### Output Rating

Relay — 5 Amp 10 to 264 VAC

Current capacity derates from 7 amps at 25°C to 5 amps at 50°C with all output contacts used.

### 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.



## START INPUTS

There are two start modes for the SX200 timer. The start modes are programmed using rocker switch 8 as is described in the PROGRAMMING PROCEDURE section.

In the standard start mode power is applied to terminal 1 to start the timing cycle. The timer will reset if power is interrupted to terminal 1.

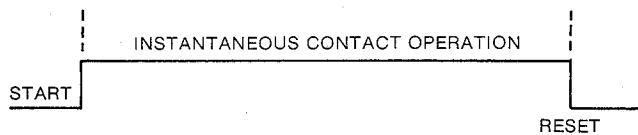
In the reverse start mode, power is applied to terminal 1 to reset the timer. The timing cycle begins when power is disconnected from terminal 1. Terminal 15 provides the power to operate the timer in the reverse start mode.

In the reverse start mode the unit will retain its actual cycle progress value if power is interrupted. If it is desired that the unit continue its cycle instead of resetting if there is a power failure, the reverse start mode must be used.

The SX200 timer can be used with either a sustained start input or a momentary start input. When a momentary start input is used with the standard start mode, an OXO interval output must be used to provide power back to terminal 1 to lock in the start input. See the wiring diagrams for more information.

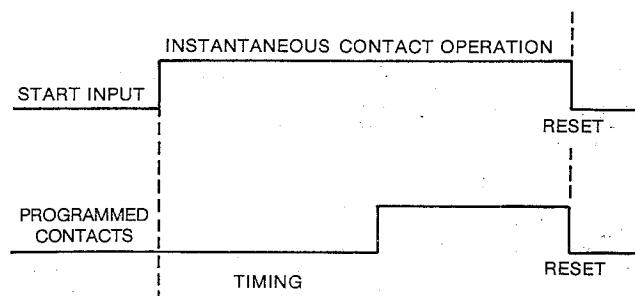
## OUTPUT OPERATION

The SX200 timer has two 5 amp relay outputs. The instantaneous contacts energize when the timing cycle begins. These contacts remain energized until the timer is reset.



The programmable contacts are programmed using the first three rocker switches as described in the PROGRAMMING PROCEDURE. The output sequences available are:

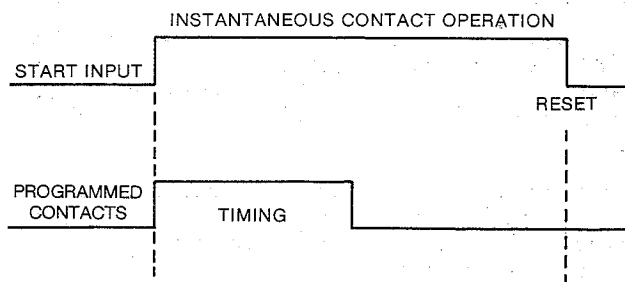
**ON DELAY OPERATION** - The contacts are energized at the end of the timing cycle and remain energized until the timer is reset. At the end of the timing cycle the cycle progress display stops at zero or the setpoint value depending on the programming of the up/down cycle progress direction.



### ON DELAY OPERATION WITH TIME TOTALIZATION -

The contacts operate as they do in the ON delay mode above. When the timing cycle is completed, and the programmed contacts are energized, the SX200 timer begins time totalizing and continues until the unit is reset. If the unit is not reset before the totalizer time value reaches the maximum of the programmed time range, the display will roll over to zero and continue time totalizing.

**INTERVAL OPERATION** - The contacts are energized during the timing cycle and deenergize at the end of the timing cycle. At the end of the timing cycle the cycle progress display stops at either zero or the setpoint value depending on programming.

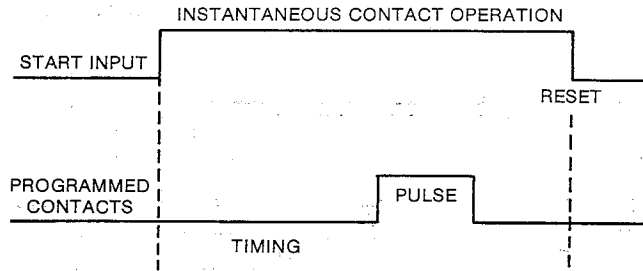


### INTERVAL OPERATION WITH TIME TOTALIZATION -

The contacts operate as they do in the interval mode above. The contacts are energized during the timing cycle and deenergize at the end of the timing cycle. When the timing cycle is completed and the programmed contacts are deenergized, the SX200 timer begins time totalizing and continues until the unit is reset. If the unit is not reset before the totalizer time value reaches the maximum of the programmed time range, the display will roll over to zero and continue time totalizing.

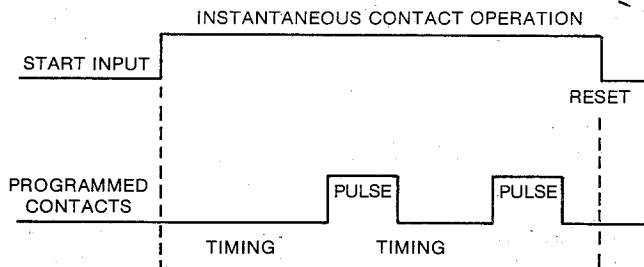
**SINGLE PULSE OPERATION: 99.99 Second Pulse** - The contacts are energized at the end of the timing cycle for a pulse duration that is user programmable to a maximum length of 99.99 seconds regardless of the time range selected for the main cycle setpoint. This mode is used where a short pulse length is required.

# TIME CONTROL



**SINGLE PULSE OPERATION: Programmed Time Range Pulse** - The contacts operate as they do in the single pulse mode above. The contacts are energized at the end of the timing cycle for a pulse duration that is user programmable. However, in this mode the pulse length is on the same time base as the time range selected for the main cycle setpoint. This mode is used where a longer pulse length is required.

**PULSE AND REPEAT OPERATION: 99.99 Second Pulse** - The contacts are energized at the end of the timing cycle for a pulse duration that is user programmable for a maximum of 99.99 seconds regardless of the time range selected for the main cycle setpoint. At the same time that the timing cycle is completed and the pulse output begins, the timing cycle resets automatically and begins again. This repeat operation continues as long as the start input is energized. This mode is used where a short pulse length is required.



**PULSE AND REPEAT OPERATION: Programmed Time Range Pulse** - The contacts operate as they do in the pulse and repeat mode above. The contacts are energized at the end of the timing cycle for a pulse duration that is user programmable to the same time base as the time range selected for the main cycle setpoint. At the same time that the timing cycle is completed and the pulse output begins, the timing cycle resets automatically and begins again. This repeat operation continues as long as the start input is energized. This mode is used where a longer pulse length is required.

## PROGRAMMING PROCEDURE

### Rocker Switch Settings

The time ranges and operating modes are programmed using a series of 8 rocker switches located on the back of

the unit. The switches should only be changed with power removed from the unit. Any switch changes made while the unit is operating will not be recognized until power to the unit has been cycled OFF and then ON again. If the switch settings have been altered and power has been cycled, the numeric setpoint is intentionally deleted from memory to prevent a previous setpoint from being accidentally used for a new operating mode. The setpoint display will show four hyphens (----) indicating that a new numeric setpoint should be entered.

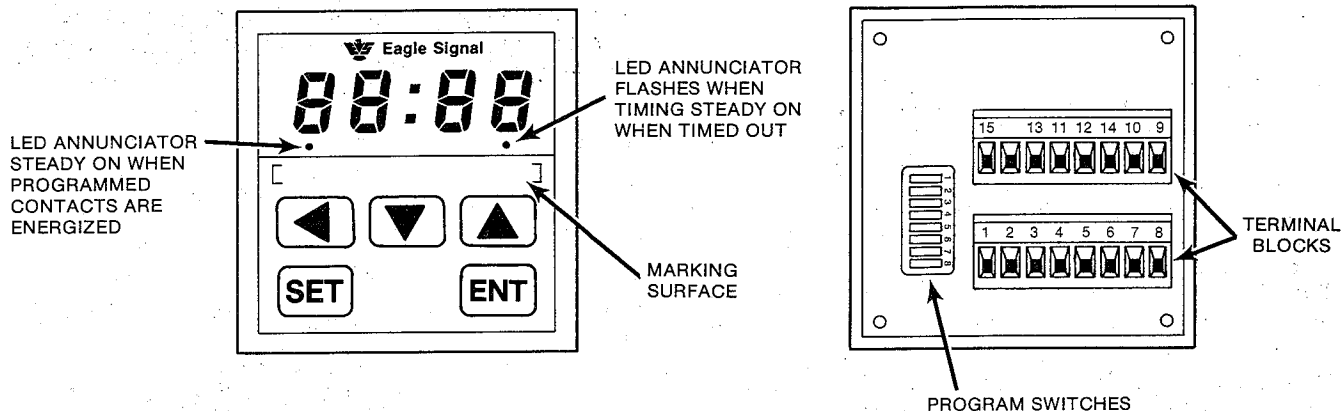
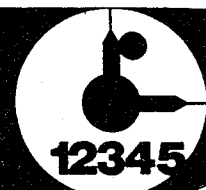
The following table defines the switch conditions for the various operating parameters. **CAUTION: The product label should always be marked to indicate the operating mode of the unit.**

X = Switch ON O = Switch OFF Blank = Does Not Apply

SYM.	PROGRAMMED CONTACTS OUTPUT SEQUENCE	SWITCH NUMBER								Notes	
		1	2	3	4	5	6	7	8		
1	ON Delay	O	O	O							
2	ON Delay & Totalize	O	O	X							A
3	Interval	X	O	O							
4	Interval & Totalize	X	O	X							A
5	Pulse - 99.99 Sec	O	X	O							B
6	Pulse - Same range	O	X	X							B
7	Pulse Repeat - 99.99 Sec	X	X	O							B
8	Pulse Repeat - Same Range	X	X	X							B
TIME RANGE											
1	99.99 Seconds				O	O	O				
2	999.9 Seconds				X	O	O				
3	99.99 Minutes				O	X	O				
4	999.9 Minutes				X	X	O				
5	99.99 Hours				O	O	X				
6	999.9 Hours				X	O	X				
7	99 Min: 59 Sec				O	X	X				
8	99 Hr: 59 Min				X	X	X				
CYCLE PROGRESS DISPLAY											
1	Down - From setpoint down to zero									O	
2	Up - From zero up to setpoint									X	
START MODE											
1	Standard Start									O	
2	Reverse Start									X	B

### NOTES:

- The elapsed time total is limited to the maximum of the programmed time range. When the unit is indicating elapsed time, and the maximum value is reached, the display will roll over to zero and again begin timing to the maximum of the time range.
- In reverse start operation, if a power interruption occurs during the pulse output, the unit will power up in the pulse output mode and complete the time remaining for the pulse output.



## Entering and Displaying Setpoints

When the SX200 timer is powered up the first time, or when the unit is powered up after the rocker switch settings have been changed, the display will show four hyphens (----). The unit will not operate until a new setpoint has been entered clearing the display of the hyphens.

To create or change a setpoint, press the SET key. The display will either show zeros or the setpoint (if one exists) in memory. The other keys will also become active. If the unit is operating when the SET key is pressed, the timing operation and outputs are not affected.

When the SET key is pressed, the display will show the least significant digit at the right of the display flashing in cursor fashion. The flashing digit is the one which can be changed using the up and down keys. Pressing the ◀ key moves the position of the flashing cursor digit to the left so that any digit can be changed individually. The flashing cursor digit will return to the far right position if the ◀ key is pressed repeatedly.

The flashing cursor digit can be changed by pressing the Δ or ▽ keys. Pressing the Δ or ▽ keys changes the display digit once per key actuation. If the Δ or ▽ keys are held continuously, the display digits will change every .5 second until the key is released. Note that the display changes will carry to the digit on the left on 9 to 0 transitions using the up key. The display will subtract from the digits on the left on the 0 to 9 transitions when using the down key. On time ranges 7 and 8, the display will carry on the 59 to 00 transition and subtract on the 00 to 59 transition.

When the desired setpoint is displayed, press the ENT key. The new setpoint will be entered into memory, and the up and down keys will become inoperative. If the unit

is in the reset or timed out states, the display will show either zeros or the setpoint value depending on programming. If the unit is in the timing mode the display will show the actual time value. If a new setpoint has been entered while the unit is in the timing or timed out operating states, the new setpoint will not become effective until the unit is reset.

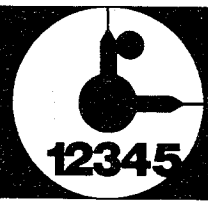
The setpoint may be displayed at any time without disturbing the timing operation by pressing the SET key. The actual value is returned to the display by pressing the ENT key.

## Front Panel Feature Programming

In addition to being used to change the main cycle setpoint, the SET and ENT keys are also used to access and change the front panel programmed software functions. One of these functions is the pulse output length setpoint when the pulse output operating modes (symbols 5-8) are used.

The pulse output operating modes are described in the OUTPUT OPERATION section. The pulse length for these modes can be programmed for two switch selectable ranges. In one of these the maximum pulse output length is 99.99 seconds regardless of the time range selected for the main cycle setpoint. This mode should be used whenever a short pulse output is required. In the other mode the pulse length is based on the same time range as the main cycle setpoint. The minimum setting for the pulse output thus becomes the minimum setting for the time range selected. For example, the pulse length programmed for the hours:minutes range (symbol 8) would also be programmed for hours and minutes with a minimum pulse output duration of one minute.

# TIME CONTROL



To set the pulse output length, first press the SET key so that the main cycle setpoint is displayed. Press and hold the SET key again for 5 seconds or until the PULS prompt appears.



The appearance of the PULS prompt indicates that the unit is ready to accept programming of the pulse output length. Press the SET key again, and the display will show the default value for the pulse range (i.e., 00.10 second for the 99.99 second mode) with the least significant digit at the right of the display flashing in cursor fashion. The  $\Delta$  and  $\nabla$  keys can now be used to set the pulse length using the method described in the section on Entering Setpoints.

When the desired pulse setpoint is displayed, the value is entered into memory by pressing the ENT key. When the ENT key is pressed the display will flash once indicating that the setpoint has been entered. Note that the display will continue to show the pulse setpoint value so that further adjustments can be made if required. If the ENT key is not pressed after a change is made, the change will not be entered into memory.

When the correct pulse duration is programmed, press the SET key once to return the display to the main cycle setpoint. Press the ENT key to return the display to the actual time value.

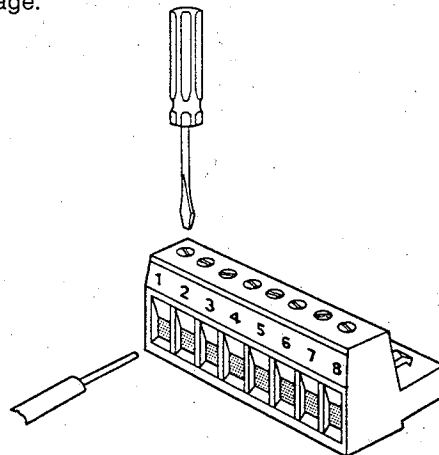
## Keypad Lock

The SX200 timer has a keypad lock function accessible on the front panel. To actuate the lock, make sure that the display shows the actual value, then press and hold the ENT key for 5 seconds. The setpoint and pulse length value can be displayed while the keypad is locked by using the SET key as described previously. When either of these setpoints is displayed with the keypad lock on, the least significant digit at the right of the display will flash in cursor fashion. However, the keypad lock disables the  $\Delta$ ,  $\Delta$ , and  $\nabla$  keys so that no changes can be made. To unlock the keypad, make sure the display is showing the actual value, then press and hold the ENT key for 5 seconds.

## WIRING

The SX200 timer uses two removable terminal blocks for wiring connections. Note that the terminal block with terminal numbers 1-8 must be placed in the bottom connector slot on the back of the unit. The block with terminals 9-15 must be placed in the top slot.

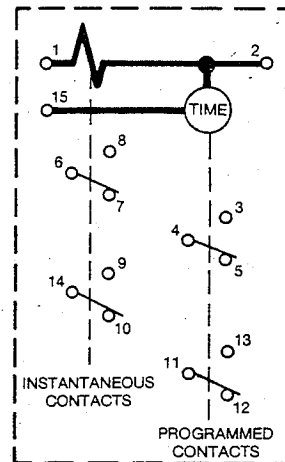
To secure a wire in the terminal block, turn the screw on the top of the block counterclockwise until the gate on the back of the block opens. Insert the wire into the gate and turn the screw clockwise until the gate closes and captures the wire. The terminal block will accept wires up to 14 gage.



Power to the SX200 timer is applied to terminals 15 and 2. The timing cycle start and reset are controlled by applying power to terminal 1. See the START INPUTS section for information on the standard and reverse start operating modes. NOTE THAT POWER SHOULD BE APPLIED TO TERMINAL 15 AT LEAST 200 MILLISECONDS BEFORE POWER IS APPLIED TO TERMINAL 1.

The OOX, OXO, and other output sequences shown in the following wiring diagrams refer to whether the load is ON (X) or OFF (O) during the three operating states of the timer.

The three operating states are, respectively, when the unit is reset, when it is timing, and when it has completed its timing cycle. For example, an OOX sequence indicates that the load is OFF when the unit is reset, OFF during the timing cycle, and ON when the timing cycle is completed. The load operation sequences are programmable and are described in the OUTPUT OPERATION section.

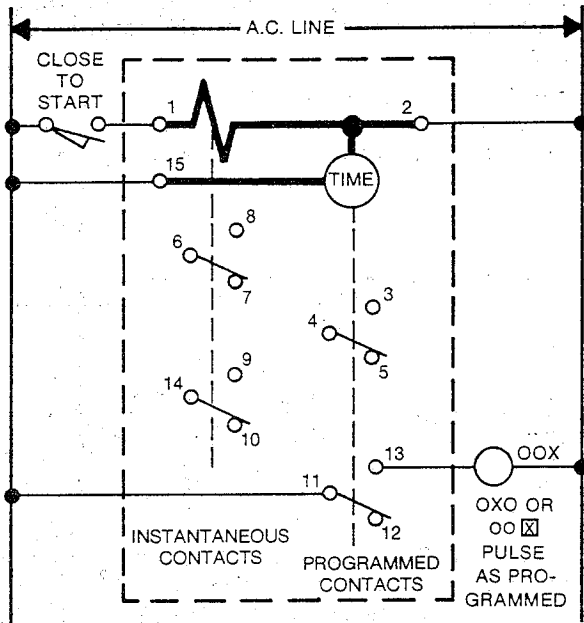


# TIME CONTROL

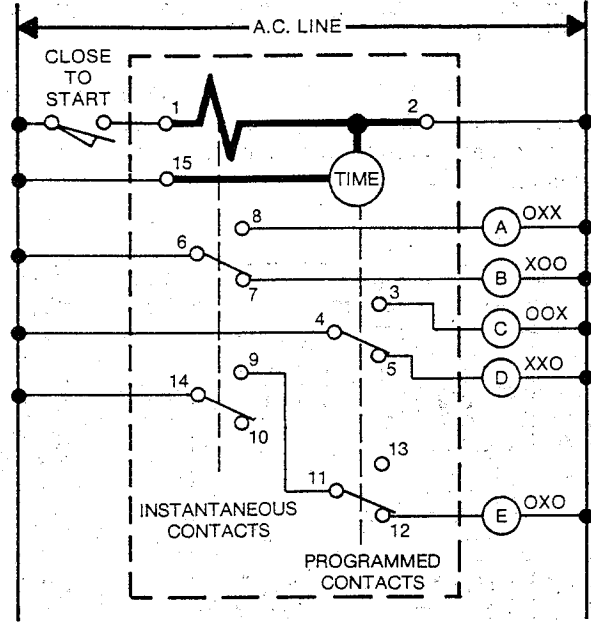


## WIRING DIAGRAMS

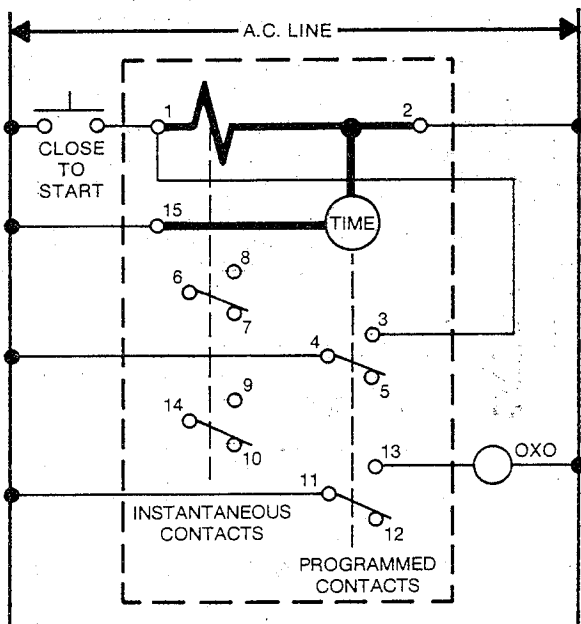
Bold Lines are Internal Wiring



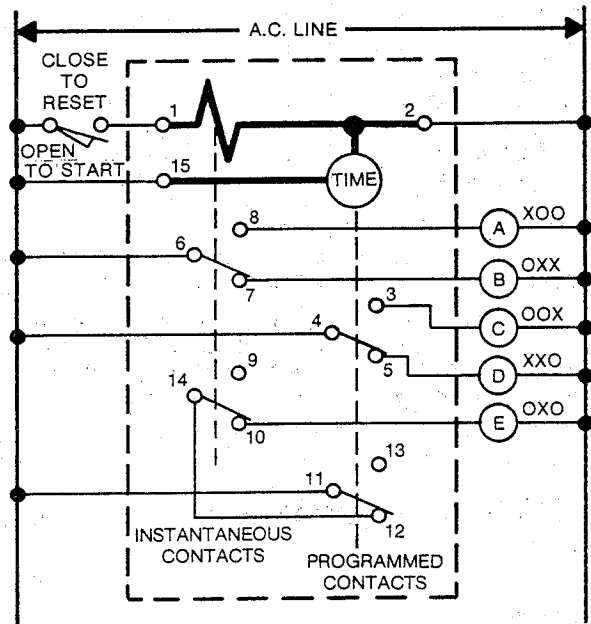
Sustained Start Input/Standard Start Mode - Close start switch to time; open to reset. Depending on mode programming, the programmed contacts will provide an OOX ON Delay, OXO Interval, OO [ ] Pulse, or OO [ ] Pulse and Repeat output.



Sustained Start Input/Standard Start Mode - Close start switch to time; open to reset. Programmed contacts set for OOX ON delay mode. Additional output combinations obtained by connecting contacts in series.



Momentary Start Input/Standard Start Mode - Close start switch to start timing; automatic reset. Programmed contacts set for OXO interval mode. Note the jumper between terminals 3 and 1 to provide "Lock In" power to the start switch.



Sustained Start Input/Reverse Start Mode - Open start switch to time; close to reset. Programmed contacts set for OOX ON delay mode. Note that power to the timer is provided through 15 when the start switch is opened. Actual cycle progress value is retained if power is disconnected from unit during the timing cycle.

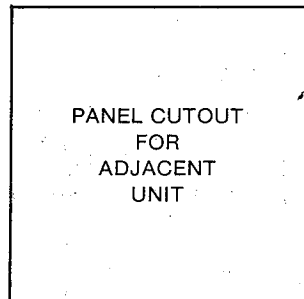
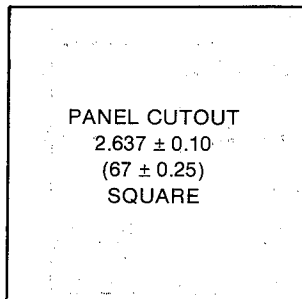
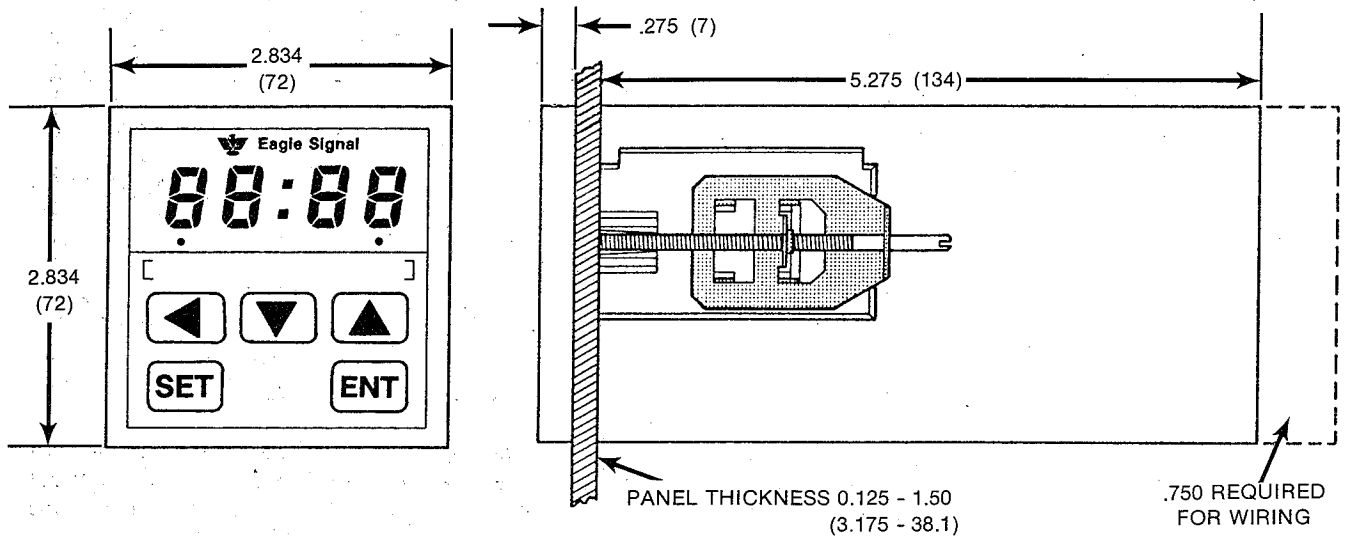
# TIME CONTROL



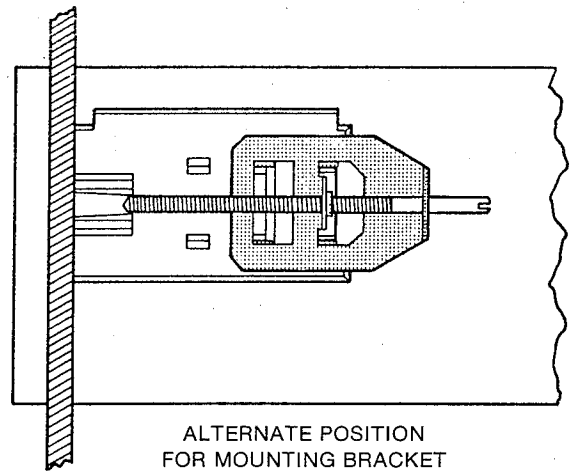
## MOUNTING

The SX200 timer uses two clips with mounting screws to mount the enclosure in a panel as shown below. To mount the unit, slide the gasket onto the timer case until it is against the back of the bezel, and place the unit in the panel cutout from the front of the panel.

To attach the mounting clips, press them into the indentations on the side of the case and slide the clips toward the back of the unit until the metal clips slide under the raised plastic nodes. Turn the screws on the clips until the bezel and gasket of the unit are seated firmly against the front of the mounting panel. **CAUTION: Overtightening may cause damage to the timer case.**



MINIMUM DISTANCE BETWEEN PANEL CUTOUTS 0.236 (6).  
NOTE: MOUNTING BRACKETS MAY BE USED ON ANY OF THE FOUR SIDES OF THE UNIT TO FACILITATE MOUNTING MULTIPLE UNITS WITH MINIMUM SPACING.



## ORDERING INFORMATION

OUTPUT TYPE		VOLTAGE & FREQUENCY	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
00	Relay Output	A6	120 VAC 50/60 Hz
		B6	240 VAC 50/60 Hz