



OPERATION & PROGRAMMING OF THE SERIES 2000 TIMING CONTROLLERS

Installation of Standby Battery

First, connect unit to 120VAC power. Then install a fresh 9 volt alkaline battery (Mallory Duracell recommended) using clip and holder provided. Make sure unit is properly grounded.

Clock Setting

When 120VAC power is applied for the first time, controller will display Sunday 12:00 PM. To set the clock for the correct time of day use the following procedure. If, for example, the time is Monday 8:30 AM press the keys as follows:

MON DAY 8 3 0 AM CLOCK

Now whenever the **CLOCK** key is depressed the correct time of day will be displayed.

Timer Setting

1. Example

To set switch 2 to turn ON at 10:00 AM on Tuesday, press the keys as follows:

2 SW TUE DAY 1 0 0 0 AM ON

To set switch 2 to turn OFF press the same sequence of keys but press the **OFF** key instead of **ON**. Or, if the next entry is to be made for the same day, a short cut entry may be used as follows:

4 0 0 PM OFF

This will turn switch 2 OFF at 4:00 PM on Tuesday. Other days of the week are programmed in the same manner, substituting the desired day for **TUE** in above example.

2. Example

Setting timer for "every day" operation: To set switch 3 to turn ON at 8:00 AM every day, press the keys as follows:

3 SW EVERY DAY 8 0 0 AM ON

To turn switch 3 OFF every day at the same time press the same sequence of keys but press **OFF** instead of **ON**. The short cut entry may also be used as in the first example.

Clearing Memory

1. To clear all set points stored in the memory press both

MEM CLEAR keys two times.

Both keys must be pressed simultaneously. This is to prevent accidental memory clearings.

2. To clear the memory for one day of the week only press, for example,

FRI DAY MEM CLEAR

In this case the **MEM CLEAR** keys should be pressed only once (still simultaneously however). This will clear the memory of Friday set points. Note, however, that set points originally programmed for every day of the week will still be valid on Friday. These cannot be cleared except by a technique of using additional "contradictory set points," to be explained later.

Direct Control of Switches

To override the program and turn switch 1 ON at will, press

1 SW ON

To turn switch 1 OFF press **OFF** instead of **ON**.

This procedure will not affect the program. However, note that the computer will take over control of the switch again when the next set point in the program is reached relating to switch 1.

Memory Display

1. To display all the set points stored in the memory for one particular switch, press for example,

4 SW SW SW SW

This procedure will cause a consecutive display of all the set points for switch 4 in the order in which they were originally programmed. Every second depression of the **SW** key will cause the next point to be displayed.

2. To display only the set points for one day of the week, press example,

SAT DAY DAY DAY

This will display every set point programmed for Saturday except those programmed for "every day."

3. To display the set points programmed for every day of the week press

EVERY DAY DAY DAY

Corrections of Wrong Entries

In case of a wrong entry, if the last key in the memory entry procedure has not yet been pressed, simply press the **CLEAR** key and start over. If the last key was pressed, the wrong data has been put into memory and can only be removed by clearing the memory as discussed earlier. The only exception is the clock setting which can be changed simply by reentering the correct time as in the first example.

Error Display

- The display will show 1999 if any unrealistic time entry is attempted, such as a number larger than 12 in the hours position or a number larger than 59 in the minutes position.
- The display will show 1888 if an attempt is made to program more than 18 set points.

Programming Hint to Save Memory Set Points

Using contradictory set points.

Example:

Switch 1 must be turned ON at 8:00 AM and OFF at 4:00 PM every day except Saturday and Sunday. Enter program as follows:

1 SW EVERY DAY 8 0 0 AM ON
4 0 0 PM OFF
1 SW SAT DAY 8 0 0 AM OFF
1 SW SUN DAY 8 0 0 AM OFF

CONTRADICTIONAL SET POINTS

The above program uses only 4 set points. If the program had been entered for the individual days, Monday through Friday, 10 set points would have been used. Total savings: 6 set points. (See page 2 example of full program using this technique.)

Final Step

After all memory entry or memory display has been completed, press the **CLOCK** key as the final step. This will cause the time of day to be continually displayed as the timing controller goes through its 7 day cycle.

Power Interruptions

If 120VAC power fails, the 9V battery will provide sufficient power to maintain the memory intact for approximately 24 hours. However, during battery powered operation the panel displays will be off to conserve power.

If there are no power interruptions a fresh 9V alkaline battery should last several years. However, it would be good practice to change the battery at least once a year or after a prolonged power interruption.

NOTE: If power fails with the battery in poor condition or if the power is off for an extended period, the unit may exhibit erratic behavior when power is restored. Typically, the display may show meaningless numbers or no numbers at all and will not respond to any keyboard entry. If this occurs, remove all power including battery, wait a few minutes, restore 110VAC power, and install a fresh battery. Unit must now be reprogrammed.

USING CONTROLLER AS INTERVAL TIMER:

The timing controller may also be used as an interval timer, not related to any particular time of day. For example: To set switch 4 to turn ON in 1 hour and 30 minutes, press

4 SW 1 3 0 ON

This requires one set point, and will cause switch 4 to turn on in exactly 1 hour and 30 minutes from the time the **ON** key is pressed. Note however that if there is a regular program in the timing controller, the computer will take over control of switch 4 again when the next set point in the program is reached relating to switch 4.

EXAMPLE:

Example of a full program demonstrating, to maximum advantage, the use of the "Every Day" set point function together with contradictory set points:

Desired Program:	Set points needed without using EVERY	Set points needed using EVERY & contradictory set points
Switch 1 on at 7:00 AM Mon thru Sat off at 3:00 PM Mon thru Fri off at 12:00 Noon on Saturday	6 5 1	4
Switch 2 on at 7:30 AM Mon thru Fri off at 3:30 PM Mon, Tue, Thu, Fri off at 12:30 PM on Wednesday	5 4 1	5
Switch 3 on at 8:00 AM Mon thru Sat on at 6:00 AM Sunday off at 4:00 PM Mon thru Sat off at 3:00 PM Sunday	6 1 6 1	4
Switch 4 on at 8:30 AM Mon thru Sat off at 5:30 PM Mon, Tue, Wed, Thu, Sat off at 10:00 PM Friday	6 5 1	5
Total Set Points	48	18

Actual program using **EVERY** & contradictory set points is entered as follows:

1 SW EVERY DAY 7 0 0 AM ON	3 0 0 PM OFF	
1 SW SUN DAY 7 0 0 AM OFF		(Contra. S.P.)
1 SW SAT DAY 12 0 0 PM OFF		(Early off S.P.)
2 SW EVERY DAY 7 3 0 AM ON	3 3 0 PM OFF	
2 SW SAT DAY 7 3 0 AM OFF		(Contra. S.P.)
2 SW SUN DAY 7 3 0 AM OFF		(Contra. S.P.)
2 SW WED DAY 12 3 0 PM OFF		(Early off S.P.)
3 SW EVERY DAY 8 0 0 AM ON	4 0 0 PM OFF	
3 SW SUN DAY 6 0 0 AM ON		(Early on S.P.)
3 SW SUN DAY 3 0 0 PM OFF		(Early off S.P.)
4 SW EVERY DAY 8 3 0 AM ON	5 3 0 PM OFF	
4 SW SUN DAY 8 3 0 AM OFF		(Contra. S.P.)
4 SW FRI DAY 5 3 0 PM ON		(Contra. S.P.)
	10 0 0 PM OFF	

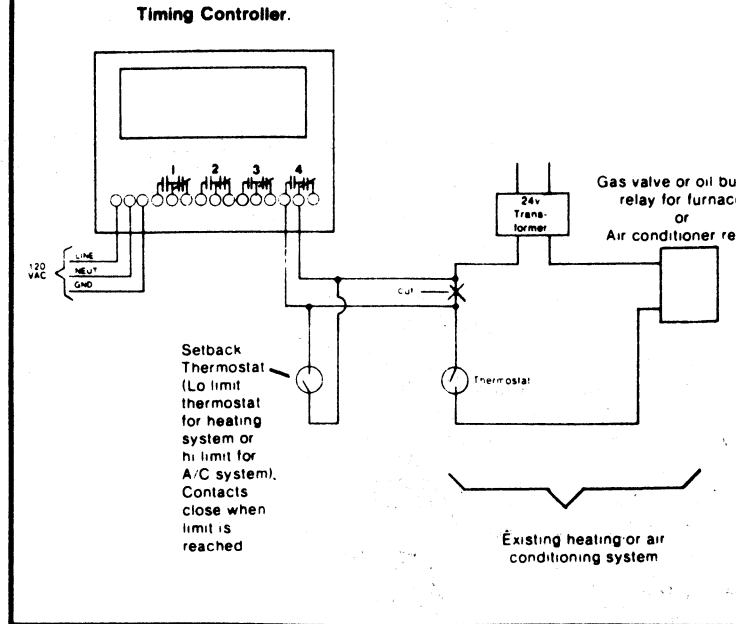
TOTAL SAVINGS 30 SET POINTS

Using the override function on the Model 2000 Timing Controller

The small 5-position terminal block along the right side of the controller is dedicated to the override function. The terminals are labelled C, 1, 2, 3, 4 referring to "common" and the respective number of the output which that terminal can override. These terminals can be used to override any one or more of the Timing Controller outputs, forcing them ON in response to contact closures from thermostats, limit switches, CO monitors, manual switches, or any other signalling control. Only dry contact closures should be used. No voltage should be applied to these terminals.

One thermostat (or other signalling device) can override a single output, any combination of outputs, or all of the outputs by connecting the desired override terminals to one side of the thermostat and connecting the other side of the thermostat to the common (C) terminal. Also, different thermostats (or other devices) may be used to override different outputs. In that case one side of all the thermostats are connected to the common terminal, the other sides connected to the

Basic Wiring Diagram for a temperature set back system using output #4 of the Model 2000 Timing Controller.



SPECIFICATIONS:

- Required input power: 120VAC, 1A, 60HZ
- Rating of output contacts: 120VAC, 10A Resistive
240 VAC, 5A Resistive
2000VA Max total all contacts
- Ambient temperature range: 0° to 125° F
- Immunity to line transients: will withstand pulses over 150V, up to 10 joule
- Timing accuracy on standby battery operation: = .001%

2000B-unit with locking enclosure
size: 12" x 9½" x 3½"
shipping weight: 11 lbs.

2000
Size: 9" x 7" x 3"