



Electromechanical Timer Replacement

Lawn Sprinkler System Using a PIC12C508

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APPLICATION OPERATION

This Lawn Sprinkler System is an electronic timer that can be programmed to activate and deactivate the sprinkler electric valve.

You can program it to activate anytime up to fifteen days, with 1 to 15 minutes for each sprinkler circuit. The sprinkler circuits will vary depending on the lawn installation. The number of sprinkler circuits are programmable.

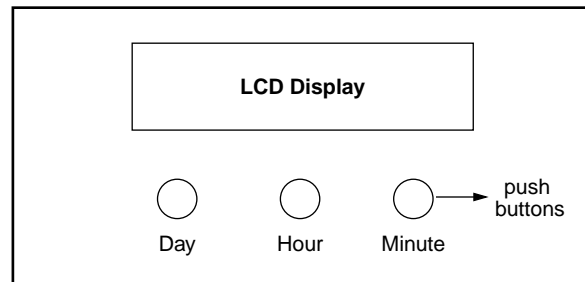
There will also be a bypass switch that will allow the user to activate the electric valve bypassing the electronic circuit at any time.

To improve the system a backup battery would hold the data in case of a power failure.

OPERATION

The user has an LCD Display and three push buttons to program the unit as shown in Figure 1.

FIGURE 1: SIMPLE DIAGRAM



1. Set the number of sprinkler circuits.

To set the number of sprinkler circuits, press and hold the day and hour buttons together, then press the minute button to select from 1 to 8 circuits.

2. Select the day, the start and end time for each sprinkler circuit.

Press the day button to scroll from 1 to 15, then press the hour and minute buttons to select the desired sprinkler circuit. Then enter start hour and minute and stop minute. The duration can be from 1 to 20 minutes per sprinkler circuit.

Repeat the above steps for each circuit.

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THE SOFTWARE

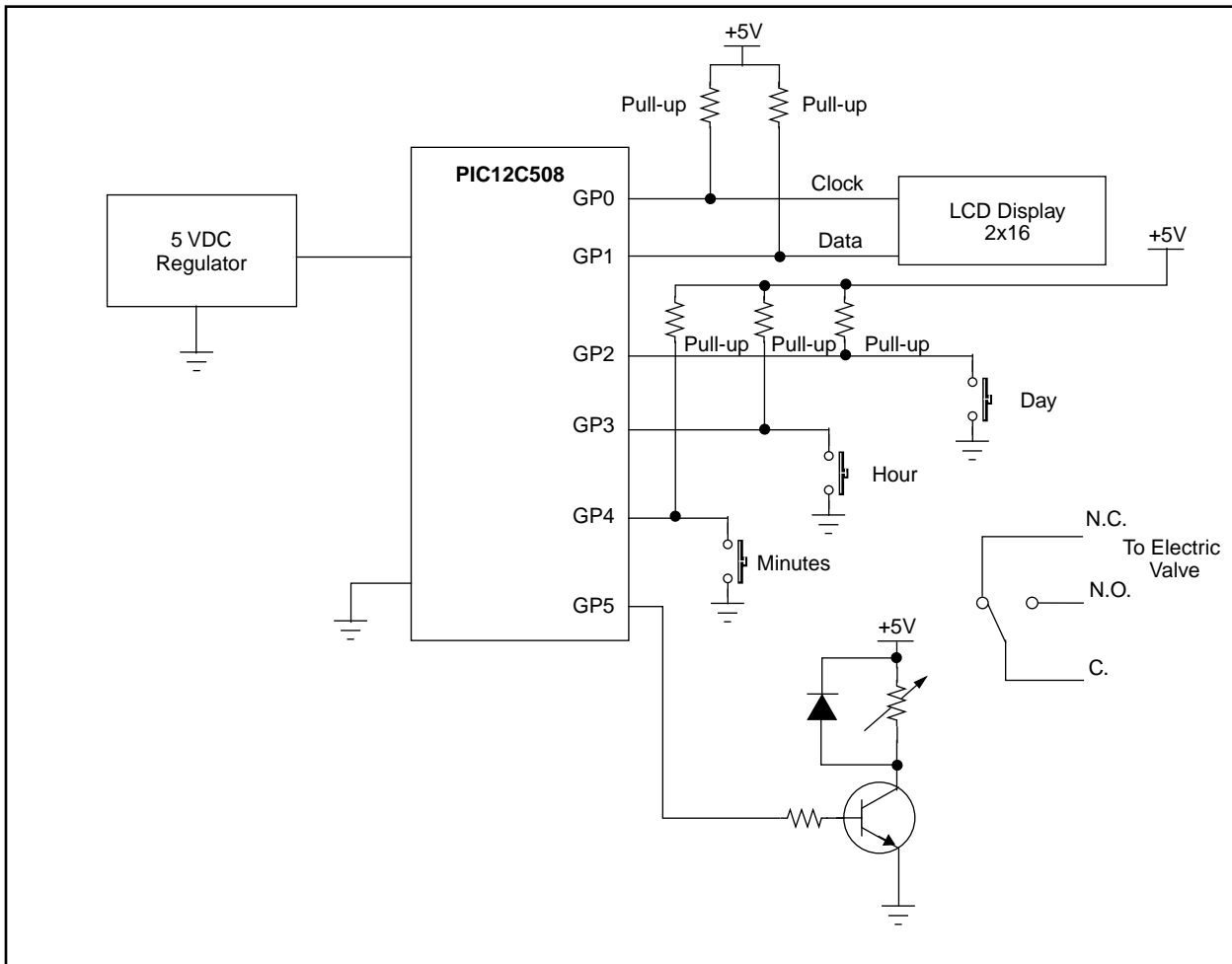
The software consists of a timer that will count seconds, minutes, hours and days up to fifteen days. After that it will start the first day again and so on. It then checks the activation/deactivation table and will turn on the relay, through GP5 output, for the amount of time programmed for each sprinkler circuit. The switching of the sprinkler system happens outside in the sprinkler gear using the water flow.

The pushbuttons are read by the software and will display the corresponding message depending on which button was pressed.

This is a low cost sprinkler system, it consists of the following components:

1. PIC12C508
2. 3 Push buttons
3. 6 Pull-up resistors (10 kOhms)
4. Serial LCD Display (2 Rows x 16 Columns)
5. NPN Transistor
6. Relay
7. 5 Volt Regulator
8. Wall Transformer (Input 110 VAC, output 9 VDC).
9. Diode
10. Bypass Switch.

FIGURE 2: SCHEMATIC



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NOTES:



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