



Electromechanical Timer Replacement

Darkness Controller for Poultry

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OVERVIEW

Laying hens are very sensitive to the number of hours of light that they receive each day. The light has a direct affect on their hormonal systems and hence egg production. Ideal lighting conditions would never allow them to experience a decrease in daily light. This, in effect, means that their nights should be consistently as short as the shortest night of the year.

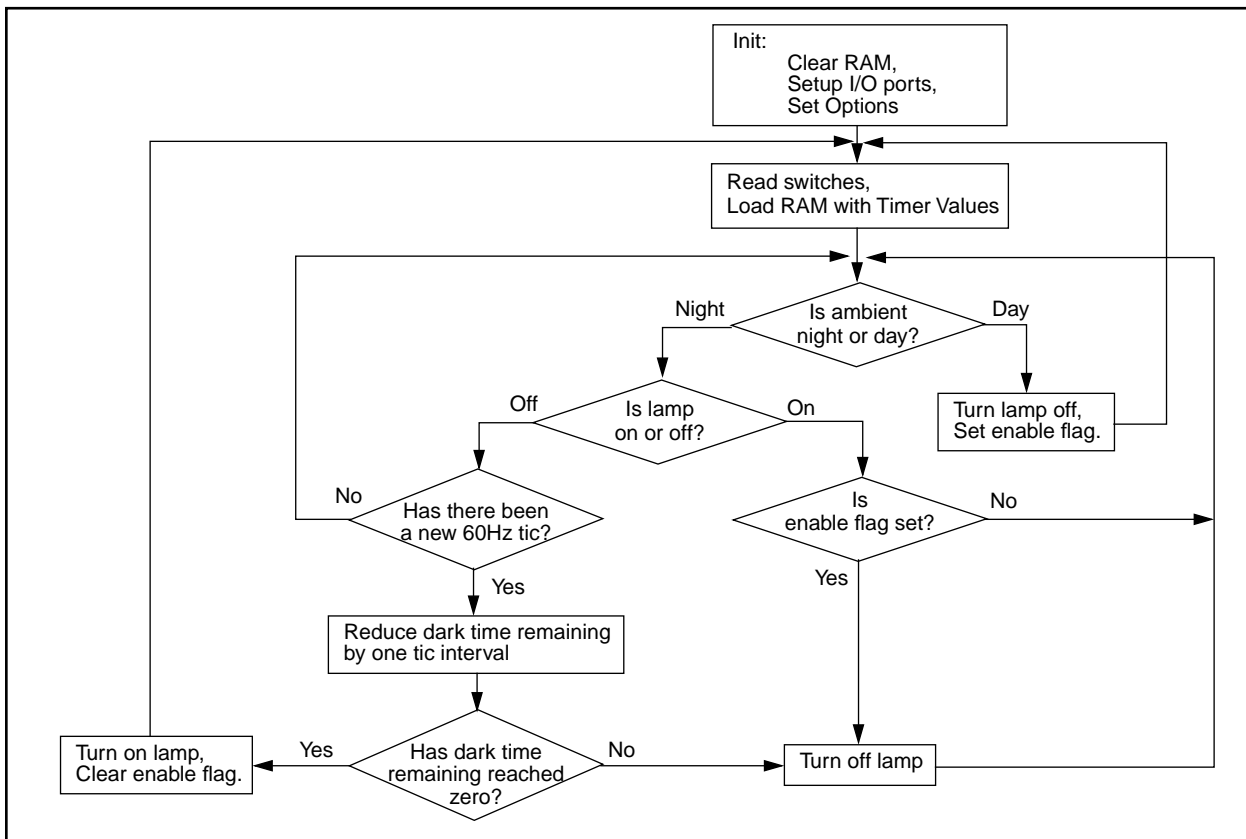
Most poultrymen use a simple synchronous motor-driven timer to put the lights on before dawn. This requires frequent adjustment if the hours of darkness

are to remain constant, since both the time of sunset and sunrise are constantly changing. An alternative is to leave the lights on all the time -- a waste of energy.

The subject of this application note is a "Darkness Controller" which senses the onset of twilight, delays for an amount of time, corresponding to the local shortest night, then switches on the lights in the poultryhouse. At dawn, the increase in natural light is sensed and the lights are turned off.

Line frequency is used as a time-base, since the controller may be subject to temperature extremes in an outdoor environment which may cause the internal oscillator to drift. A CdS photo-resistive cell in a voltage divider network is used to sense changes in the ambient light levels. (Must be shielded from the light being controlled). The light being controlled is switched by a Triac. Darkness duration is selected by dip switches. Four intervals are available, 7, 7.5, 8.0, and 8.5 hours.

FIGURE 1: FLOW DIAGRAM



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Two switches allow selection of four darkness durations:

7.0 hours=1,512,000sixty hertz tics (171240 hex)

7.5 hours=1,620,000sixty hertz tics (18b820 hex)

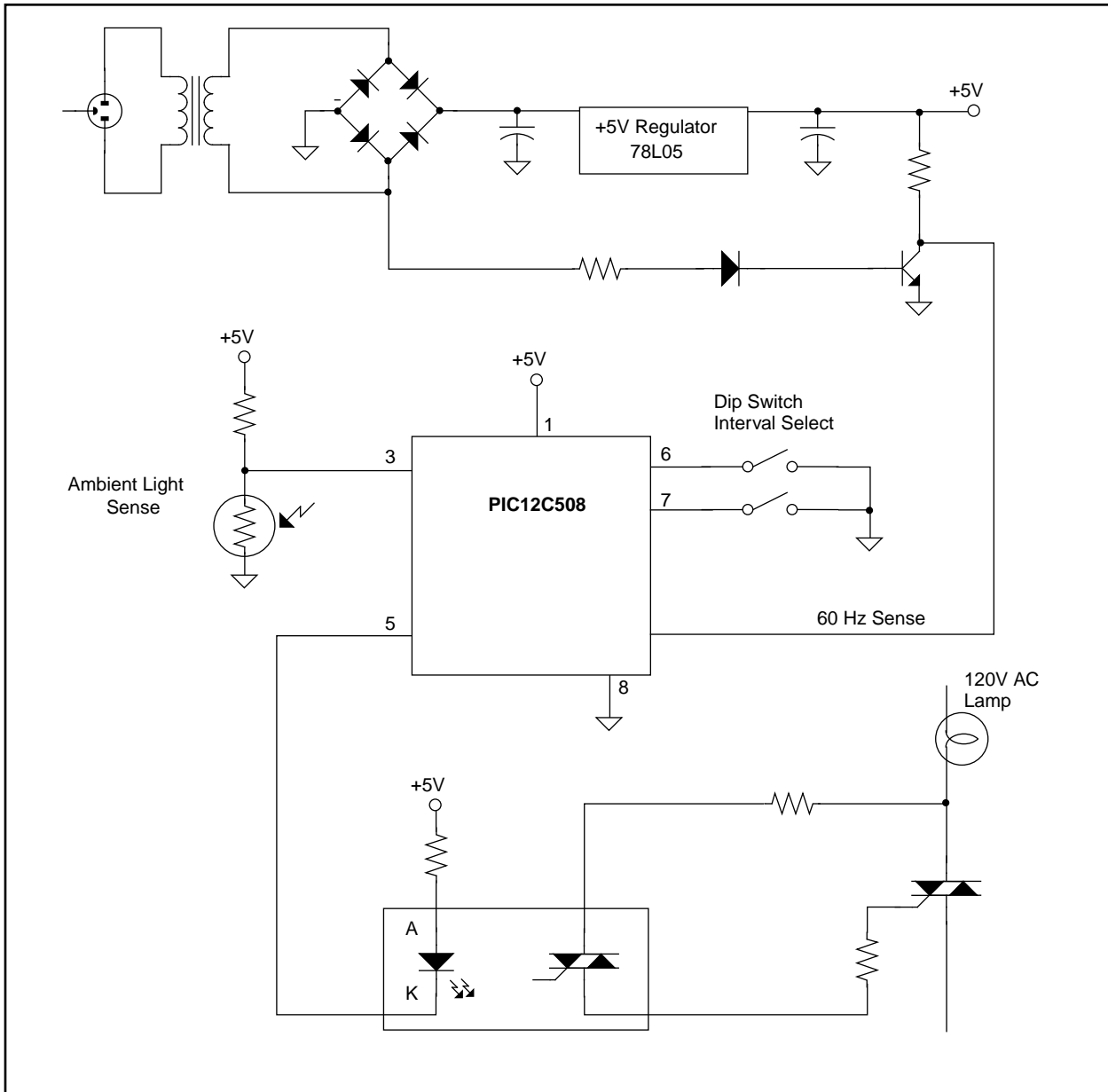
8.0 hours=1,728,000sixty hertz tics (1A5E00 hex)

8.5 hours=1,836,000sixty hertz tics (1C03E0 hex)

These hex values are loaded into 3 bytes of RAM and are decremented at each 60 Hz tic interval.

The enable flag prevents the lamp from being turned off. When it is still dark, nighttime after the required interval of darkness has elapsed.

FIGURE 2: SCHEMATIC DIAGRAM POULTRY DARKNESS CONTROLLER



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