The DF-224 Timer is part of HMT's Auto Pack product line. It is a dual input/output pattern control with four events per channel. DF Timers come standard with six storable programs and four preprogrammed stitch patterns which can be applied to any “ON” event. DF timers also feature a “Pump Off Delay” which allows the user to adjust the time that the pump remains on after the initial input signal concludes.
DF Timer Programming Example

This document illustrates the methods used to program a DF Timer.

Example: The substrate is moving at 50 ft/min and the pattern required is illustrated in the diagram below. The following measurements are necessary to determine the On/Off times needed to program a pattern:

1. Converting Distances into On/Off Times
   Using the length of Bead 1 as an example see the equation below:

   
   \[
   \text{On/Off Time ms} = \frac{5000 \times (\text{Bead or Gap Length in.})}{\text{Line Speed ft/min}}
   \]

   \[
   \text{On/Off Time ms} = \frac{5000 \times (6.0 \text{ in})}{50 \text{ ft/min}} = 600 \text{ ms}
   \]

   All measurements were converted to On/Off times using the above equation (A = 1 s, B = 300 ms, C = 600 ms, D = 600 ms, E = 400 ms).

2. Getting Started/Selecting a Program:
   DF Timers can store up to six different programs.
   a) This example requires the timer to operate in LATCH MODE. To set the timer to LATCH MODE place the jumper in the LATCH position on the Microprocessor Board. For more information please refer to the Jumper Configuration Page.
   b) Connect the timer to an appropriate power source and turn the timer on.
   c) Press the MODE button to initiate PROGRAM MODE (the Program LED will illuminate).
   d) Using the +/- buttons (shown on the right) select a program 1 – 6.

3. Programming the Delay:
   The Delay represents the time required for the leading edge of the substrate to pass between the photoeye and the automatic valve plus the time between the leading edge and Bead 1.
   a) Make sure the timer is in PROGRAM MODE (timer will revert to RUN MODE after 10 sec. of inactivity in PROGRAM MODE).
   b) Press the EVENT SELECT button. The DELAY LED will illuminate.
   c) Using the +/- buttons adjust the DELAY to 1.30 s (A+B).
4. Programming Bead 1:
   DF Timers can store up to six different programs.
   a) Make sure the timer is in PROGRAM MODE.
   b) Press the EVENT SELECT button until the first ON LED illuminates.
   c) Using the +/- buttons adjust the first ON to 600 ms = .600.

5. Programming the Gap between Beads:
   a) Make sure the timer is in PROGRAM MODE.
   b) Press the EVENT SELECT button until the first OFF LED illuminates.
   c) Using the +/- buttons adjust the first OFF to 600 ms = .600.

6. Programming a Stitch:
The time allotted for a stitch must be greater than 1 second.
Since the lengths of Bead 2 and Bead 3 are equal to the length of the
Gap between the two Beads a stitch can be programmed. DF Timers can
be programmed for a stitch containing up to four beads and three gaps
of equal length (#4 Stitch Pattern), or no stitch at all (#1 Stitch Pattern).
This particular example requires a #2 stitch pattern. The available pre-
programmed stitch patterns are displayed on the right and on the
DF Timer decal.
   a) Make sure the timer is in PROGRAM MODE.
   b) Add the ON Times for Bead 2 and 3 along with the Gap between
      Bead 2 and 3. In this example the value is 1.20 sec.
      \( E + F + G = 1.20 \text{ s} \).
   c) Press the EVENT SELECT button until the second ON LED illuminates.
   d) Using the +/- buttons adjust the second ON to 1.20 s.
   e) Press the STITCH button until the second ON LED illuminates.
   f) Using the +/- buttons select Stitch pattern 2.

7. Programming the Pump Off Delay:
If the input does not sense an event for the duration of time programmed
for the Pump Off Delay the Pump/Motor will shut off.
   a) Make sure the timer is in PROGRAM MODE.
   b) Press the PUMP OFF DELAY button.
   c) Using the +/- buttons select a setting between 0–30 seconds.

8. Pattern Testing and Run Mode:
   a) Make sure the timer is in RUN MODE.
   b) Press the TEST to run one program cycle.
   c) If the program is correct and the timer is in RUN MODE,
      begin operation.
DF-224 Timer 120/220 VAC Electrical Components with Fuse and Relay Chart

Motor Control Board

<table>
<thead>
<tr>
<th>FUSE</th>
<th>DESCRIPTION</th>
<th>REPLACE WITH</th>
<th>PART NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>Pwr Sup Fuse</td>
<td>300 mA</td>
<td>214-063</td>
</tr>
<tr>
<td>F2/F2B</td>
<td>Logic Pwr Fuse</td>
<td>1 A</td>
<td>214-101</td>
</tr>
<tr>
<td>F3/F3B</td>
<td>Main Pwr Fuse</td>
<td>5 A</td>
<td>214-105</td>
</tr>
</tbody>
</table>