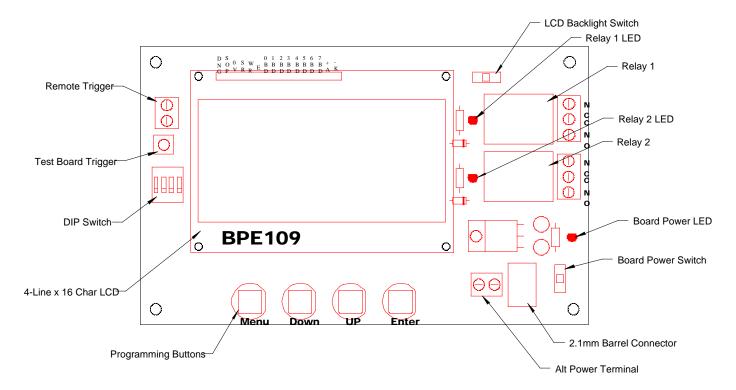**Operation Notes for Blue Point Engineering - BPE109 Board**

Description:
This board is designed to allow the timed-control of two 10A relays in several fashions. Timing is entered via menu-driven LCD and stored in non-volatile memory. Operational modes are set using a 4-position DIP switch. Relays have LEDs to indicate activity. Board can be triggered by dry contact closure at the Remote Trigger terminal block or by pressing the small tactile switch adjacent to it. The LCD is a 4-line x 16 character display that will prompt for user input or display event timing and relay status. A small switch at the upper right corner of the board turns on and off the backlighting for the LCD.

Main Board Programming:
The operation of the Main board is in 2 modes – Program Mode and Run Mode. When the Main board is first powered up, board will be in Run Mode. If DipSw2 is in the up, or Auto position then the board will start the timed event using the previously stored Event and Relay On times. The LCD will display the Event Time and the relay status at this time. If DipSw2 is in the down position (Trigger Mode), the board will wait for a trigger event (dry contact closure at trigger terminal) to start the event. The LCD will display that it is waiting for a trigger event, in this case. If the board is in Auto Mode, switch DipSw2 to the down position and press the Menu button. This will stop the event and put the board in Trigger Mode. At this point, pressing the Menu button will place you at the Main Menu Level. Board must be in Trigger Mode to access the Program Mode. You will see the following display on the LCD:

    "Use Up/Dn Btns"
    "To Select, Then"
    "Press Enter:"
    " >Event Time< "

At this menu level, you will have 2 selections: Event Time and Relay On Time that will toggle on the bottom line of the display by using the Up or Down buttons. Pressing the Enter button when either one is displayed will take you to the respective time entry screen. You will use the Up and Down buttons to enter the desired times and then press the Enter button to store them. Note: Short presses on the Up and Down buttons will increment / decrement the time slowly. Pressing and holding down the buttons will change the
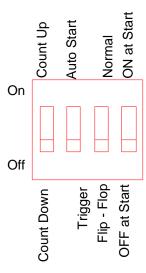
time quickly. The time limits for the Event Time is 1 second to 8 hours and for the Relay On Time, it is 1 second to 30 minutes.

After entering in the times, you will be taken back to the top menu level by pressing the Menu Button. At this level, the board will return to the power-up state and will either start the timed event (if DipSw2 is in the up, or Auto position) using the previously stored Event and Relay On times, or, if DipSw2 is in the down position, will wait for a trigger event (dry contact closure at trigger terminal) to start the event.

When either timing sequence is running, pressing the Menu button (>1 Sec) will abort the sequence and return the board to the power-up state. Note that you will have to make sure DipSw2 is in the down (Trigger) position or it will immediately auto-start the next sequence.

Mode Descriptions:
Modes of operation are controlled by the 4 position DIP switch on the left side of the board. These switches tell the board how it will operate.

DipSw1 (Count Up/Down)
When the board is triggered, DipSw1 will tell it to either count up or down.

DipSw2 (Auto / Trigger)
If DipSw2 is up, board will immediately start program event and when event is finished, automatically starts over. If DipSw2 is down, board will wait for trigger at Trigger Terminal Block or press of the adjacent test button.

DipSw3 (Normal / Flip-Flop)
If DipSw3 is up, this will signal Normal Mode where both relays operate simultaneously based on the position of DipSw4. If DipSw3 is down, when the board is triggered (or auto-started), Relay 1 (only) comes on and stays on until the time expires. It then turns off and Relay2 turns on for the amount of time programmed for the Relay On Time (1 sec to 30 min). If DipSw3 is down (Flip-Flop Mode), then DipSw4 is ignored.

DipSw4 (On / Off at Start)
If DipSw4 is up, both relays will come on at start of event, stay on until time expires and then turn off. If DipSw4 is down, both relays will come on at end of event time and stay on for the programmed Relay On

Time (1 sec to 30 min). If DipSw3 is down (Flip-Flop Mode), then DipSw4 is ignored.

<u>Examples:</u>
Event Time = 2 hours
Relay On Time = 15 minutes

Example1:
DipSw1 = Up
DipSw2 = Up
DipSw3 = Up
DipSw4 = Up

When board is powered up, both relays come on (Auto Mode) and timing starts counting up. When 2 hours is reached, relays are turned off (Relay On Time is ignored). Board immediately starts over (relays on and count up time).

Example2:
DipSw1 = Down
DipSw2 = Down
DipSw3 = Up
DipSw4 = Down

When board is powered up, both relays are off and board waits for board to be triggered. Once triggered, timing starts counting down.   When Time 0 (2 hours) is reached, relays are turned on and they stay on for 15 minutes, then turn off and board waits for next trigger event.

Duo Rotation

CW Rotation

CCW Rotation

Motor

12 Volt DC
Permanent
Magnet Motor

Motor Logic

Relay 1 ON
Relay 2 OFF = Motor CCW Rotation

Relay 1 OFF = Motor CW Rotation
Relay 2 ON

Relay 1 and 2 ON = Motor All Stop
Relay 1 and 2 OFF = Motor All Stop

Com

Com

BLACK Wire **–Gnd**

RED Wire **+V**

**MOTOR
POWER**
(12Vdc)

NC C NO   NC C NO

Relay   **Relay**