DESCRIPTION

The Prop-1 Controller has simplified the automation of props and effects – the Prop-1 Trainer PCB makes monitoring and control of the Prop-1 even simpler. The Prop-1 Trainer provides six LEDs to monitor the output state of P0..P5, an active-high push-button (on P6) to trigger the prop, and a Prop-Pot circuit (on P7) that allows programs to read a variable parameter (e.g., timing value) at runtime.

PRODUCT APPLICATIONS

- Prop-1 Controller training
- Small-scale monitor/interface for Prop-1 control applications

FEATURES & BENEFITS

- Connects directly to the Prop-1 Controller without additional hardware
- Six LEDs to monitor outputs P0..P5
- Normally-open, active-high push-button input on P6
- Prop-Pot circuit on P7 for timing adjustments without reprogramming
- 3 x 8 female socket mates to Prop-1 pin headers without additional hardware
- Compact size: 1.1" x 1.3" (27.9mm x 33mm)

MECHANICAL
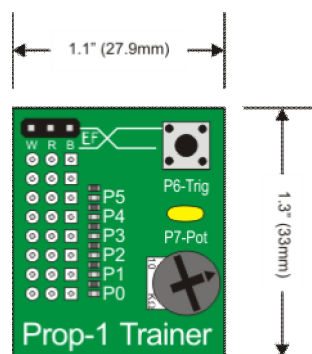
Prop-1 I/O Configuration

When using the Prop-1 Trainer, the Prop-1 I/O structure is configured as follows:

P7 Input, Analog (with POT circuit)
P6 Input, Active-high digital (push-button or remote sensor)
P5 Output
P4 Output
P3 Output
P2 Output
P1 Output
P0 Output

The P7 POT circuit is built right into the board and requires no external user connections. An onboard push-button serves as a local trigger input, and an external device may be connected to P6 via the extension header on the board. Note that the setup for the P6 input dictates active-high (see below), which allows an external trigger to be used with the local trigger push-button without conflict. You could, for example, connect an external mat switch to the Prop-1 Trainer PCB as shown below:
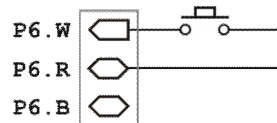
The outputs from P0..P5 are available at the OUT0..OUT5 terminals. These terminals will connect to ground when the corresponding pin is active. A typical use for these output terminals is to drive high-voltage, high-current devices like relays and solenoids. If the power provided to the Prop-1 controller is adequate to drive connected devices, the power switch can be moved to position 2 and the device connected as shown below:
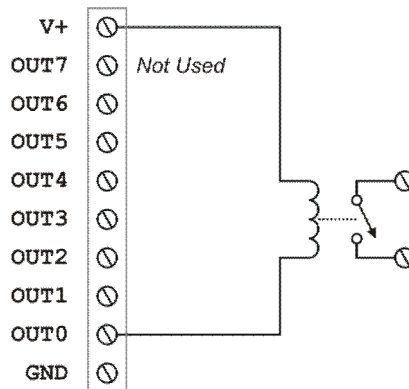
During program development and testing, keep the Prop-1 power switch in position 1; this will allow the Prop-1 Trainer LEDs to light, but prevent the activation of external devices.

Note that the OUT7 connection is not available when the Prop-1 Trainer is installed, and the OUT6 output will follow the status of the push-button (or external trigger); when the push-button is pressed the OUT6 terminal will be active (when the Prop-1 power switch is set to position 2).
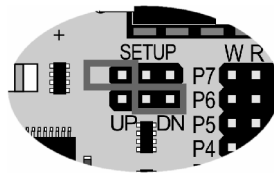
Prop-1 Setup

Due to the specific configuration of the I/O structure when using the Prop-1 Trainer, the P7 and P6 configuration jumpers must be placed as follows

P7   Disabled
P6   DN (for active-high input)

The illustration below shows the proper position of the P7 (disabled) and P6 (DN) configuration jumpers when using the Prop-1 Trainer.
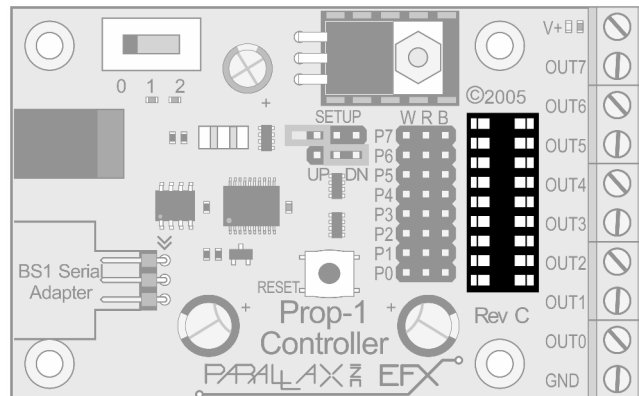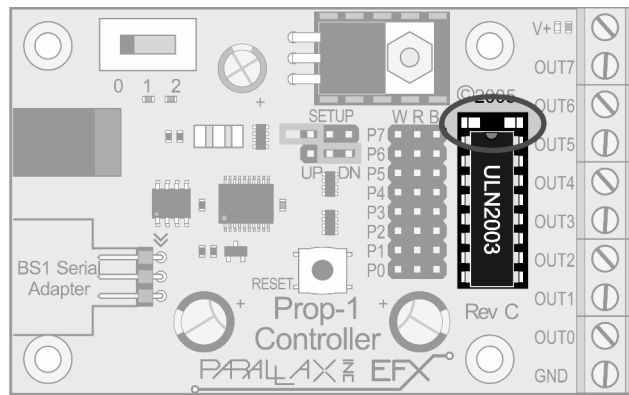

Installation

The Prop-1 controller uses the ULN2803 to drive outputs OUT0..OUT7 when the power switch is set to position 2. Regardless of the power switch setting, ULN2803 connection to P7 interferes with the POT circuitry on the Prop-1 Trainer.

Installation for Training: When the Prop-1 Trainer is installed just for training and will be removed later, simply remove the ULN2803 from its socket before mounting the Prop-1 Trainer as shown below.

Permanent Installation: When the Prop-1 Trainer is to be integrated into the prop control circuitry, the best thing to do is remove the ULN2803 and replace it with the ULN2003. The ULN2003 has seven circuits and can be aligned such that it does not interfere with POT circuitry on P7. Correct alignment of the ULN2003 is shown below – note that the top two pins of the ULN2803 socket are not used.

With the removal, replacement, or modification of the ULN2803 completed, the Prop-1 Trainer can be installed onto the 3-pin headers as shown below.
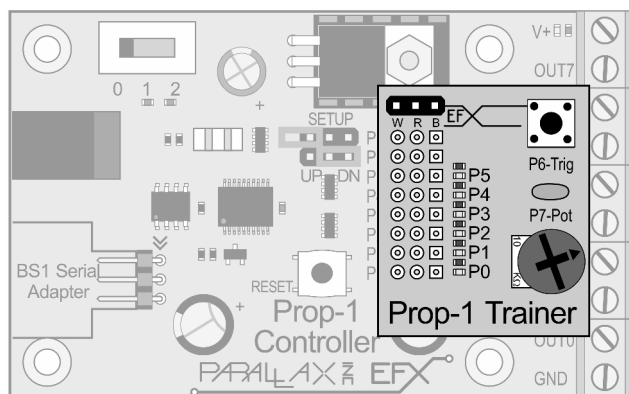
Testing

The following program can be used to demonstrate and test the Prop-1 Trainer. The program will "bounce" the LEDs back and forth, updating the LED speed when the P6 trigger button is pressed.

```
' ================================================================================
'
'   File....... Prop-1_Trainer_Test.BS1
'   Purpose.... Demonstrate and test the Prop-1 Trainer board
'   Author..... EFX-TEK
'   E-mail..... teamefx@efx-tek.com
'   Started....
'   Updated.... 01 JUN 2006
'
'   {$STAMP BS1}
'   {$PBASIC 1.0}
'
' ================================================================================


' -----[ I/O Definitions ]--------------------------------------------

SYMBOL  Leds            = PINS                    ' on P0 - P5
SYMBOL  Trigger         = PIN6                    ' active-high button
SYMBOL  Speed           = 7                       ' POT input circuit


' -----[ Constants ]--------------------------------------------------
```

```
SYMBOL   Pressed          = 1
SYMBOL   NotPressed       = 0

' -----[ Variables ]-------------------------------------------------------

SYMBOL   stpIdx           = B2                    ' step index
SYMBOL   rawSpeed         = B3                    ' raw speed input
SYMBOL   delay            = B4                    ' calculated delay

' -----[ EEPROM Data ]-----------------------------------------------------

Pattern:
  EEPROM (%000001, %000010, %000100, %001000, %010000)
  EEPROM (%100000, %010000, %001000, %000100, %000010)

' -----[ Initialization ]--------------------------------------------------

Reset:
  DIRS = %00111111                               ' make P0 - P5 outputs
  Leds = %00000000                               ' clear outputs
  stpIdx = 0                                      ' reset pointer

' -----[ Program Code ]----------------------------------------------------

Main:
  IF Trigger = NotPressed THEN Reset             ' wait for trigger button
    POT Speed, 100, rawSpeed                     ' read speed POT
    rawSpeed = rawSpeed MAX 250                  ' fix upper limit
    delay = 250 - rawSpeed MIN 10                ' calculate delay

Cycle_Leds:
  READ stpIdx, Leds                              ' move step pattern to LEDs
  PAUSE delay                                    ' hold
  stpIdx = stpIdx + 1 // 10                       ' point to next step
  GOTO Main
```

Accessories

805-00002   14-inch, 3-pin extension cable; *used to connect external devices to the P6 trigger input header*

Additional Applications

For additional ideas and application notes for the Prop-1 Trainer, be sure to visit our web site at the following link:

www.efx-tek.com