



2036 Fillmore Street  
Davenport, Ia. 52804  
563-324-1046  
[www.racedigitaldelay.com](http://www.racedigitaldelay.com)

# Digital Trim

Part # 1037

## WARRANTY AND DISCLAIMER

DIGITAL DELAY ELECTRONICS INC. WARRANTS THE PRODUCTS IT MANUFACTURES AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD LIMITED TO 1 YEAR FROM THE DATE OF SHIPMENT, PROVIDED THE PRODUCTS HAVE BEEN STORED, HANDLED, INSTALLED, AND USED UNDER PROPER CONDITIONS.

The company's liability under this limited warranty shall extend only to the repair or replacement of a defective product, at the company's option. DIGITAL DELAY ELECTRONICS INC. disclaims all liability for any affirmation, promise, or representation with respect to the products.

The customer agrees to hold DIGITAL DELAY INCORPORATED and DIGITAL DELAY ELECTRONICS INCORPORATED harmless from, defend, and indemnify DIGITAL DELAY INC. and DIGITAL DELAY ELECTRONICS INC. against damages, claims, and expenses arising out of subsequent sales of or use of DIGITAL DELAY ELECTRONICS INC. products, or products containing components manufactured by DIGITAL DELAY ELECTRONICS INC. and based upon personal injuries, deaths, property damage, lost profits, and other matters which BUYER, its employees, or sub-contractors are or may be to any extent liable, including without limitation, penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.

No warranties expressed or implied, are created with respect to the company's products except those expressly contained herein. The customer acknowledges the disclaimers and limitations contained and relies on no other warranties or affirmations.



2036 Fillmore Street, Davenport, Ia. 52804  
563-324-1046 www.racedigitaldelay.com

# Digital Trim Instructions

## Features and Specifications

### Features:

- Microprocessor controlled timing
- Discrete I/O (input - output) construction
- Retains all numbers even with power disconnected from unit
- Large illuminated display for easy reading of information day or night
- Dust & splash-proof backlit keypad with detent (positive feel)
- 2 separate 4 Stage Timers
- Scrolling on keypad for quick changes
- Timing can be set to thousandths on Stages 1 and 2

### Specifications:

- Input Voltage Range: 10 to 18 Volts DC (16 Volt compatible)
- Operating Temperature Range: 0 to 150 degrees F.
- Push-button Current: .1 AMPS at 12 VDC
- 4 Stage Timer Outputs: Rated for 15Amps.

## The Terminal Strip

**+12VDC Terminal:** Connect the +12VDC terminal to a switched +12 Volt source with enough amperage capable of driving all outputs at the same time.

**Timer 1 Terminal:** Connect any device to be controlled by the first 4-Stage Timer to this terminal.

**Timer 2 Terminal:** Connect any device to be controlled by the second 4-Stage Timer to this terminal.

**Ground Terminal:** Connect the Ground terminal to the Neg. terminal on the battery or to good steel ground, not aluminum.

**Trigger 1 Terminal:** Connect a wire from one side of a pushbutton to the Trigger 1 terminal and the other side of the Push-button to +12 Volts.

**Trigger 2/Arm:** Connect a wire from one side of a pushbutton to the Trigger 1 terminal and the other side of the Push-button to +12 Volts.

# The Keypad

The keypad is made up of numerical keys that are black and function keys that are blue. The numerical keys 1-7 are used to select what information is shown on the display. The numerical keys are also used in-conjunction with the function keys to enter new information. The CLEAR key is used to clear out old values before entering new values. The Up Arrow and Down Arrow keys are used for making small number changes quickly. The 2ND key is used to switch the selection arrows from side to side on the screen. The ENTER Key is used to store a change made to a value or a setting when less than 4 digits have been entered. Pressing the ENTER Key is not required if all 4 digits have been entered. The UNDO key is used to undo an error when entering a value. The UNDO key can also restore a value that has just been cleared by an accidental press of the CLEAR key.

## Function Keys:

The function keys are used when making changes to either values or settings.

## Example:

- 1) Select Stage 1 and 2 of Timer 1 by pressing the 1 key.
- 2) The Stage times will now be displayed with the selection arrows on the right side of the screen above Stage 2. The selection arrows are used to show what side of the screen is selected, to move the selection arrows use the 2<sup>ND</sup> key.
- 3) Next press the CLEAR key, this will clear out the value for Stage 2 making the Digital Trim ready for a new value.
- 4) Now using the numerical keys, enter a new value for Stage 2. As the numbers are entered they will appear on the display. Once a new value has been entered, press the ENTER Key to store the new value in memory.

**Note:** If an error is made while entering, press the UNDO key to erase the last digit. This can be repeated as many times as necessary until the display is blank. Pressing the UNDO key one more time restores the original number.

## Numerical Keys 1-7

The Numerical keys 1-7 are used to select what information is shown on the display. For example, if the Dial-Ins are being displayed and the Delay times are wanted, press the number 2 key.

<u>Displays using 1-7</u>	<u>Left side of screen</u>	<u>Right side of screen</u>
<u>1</u>	<u>Stage 1 of Timer 1</u>	<u>Stage 2 of Timer 1</u>
<u>2</u>	<u>Stage 3 of Timer 1</u>	<u>Stage 4 of Timer 1</u>
<u>3</u>	<u>PB Mode</u>	<u>Blank</u>
<u>4</u>	<u>Stage 1 of Timer 2</u>	<u>Stage 2 of Timer 2</u>
<u>5</u>	<u>Stage 3 of Timer 2</u>	<u>Stage 4 of Timer 2</u>

## Special Function Keys:

**CLEAR Key:** If the CLEAR key is pressed while the Digital Trim is either armed or during a timing cycle, the CLEAR key will function as an abort, canceling both.

**ENTER KEY:** If the ENTER Key is pressed while both displays have full 4 digit numbers, the ENTER Key will arm the Digital Trim.

**Number 6 Key:** If the 6 key is pressed while both displays have full 4 digit numbers, the Timer output mode will reverse for the Timer being displayed.

## Setting Timer 1 Stage 1 and 2 Times

The Stage Time values are used to control when the Digital Trim will turn on and off the output. Stage 1 is a delay from when the Trigger switch is activated until when the output is activated. Stage 2 is how long, or the duration, the output is active.

To set a new Stage 1 or 2 time for Timer 1, press the 1 key. Stage 1 is shown on the left side of the screen, while Stage 2 is shown on the right side of the screen. Next select which side of the screen is to be changed. This is done by using the 2ND key to move the selection arrows to either the left or the right side of the screen. Then press the CLEAR key and the selected side of the display will go blank indicating the Digital Trim is ready to accept the new time. Enter a new time using the numerical keys. If a mistake is made while entering the number, pressing the UNDO key will erase the last digit entered. The UNDO key can be repeatedly pressed as necessary until the display is blank. Pressing the UNDO key while the screen is blank will restore the original number. If all 4 digits are entered the change is complete. If less than 4 digits are entered, pressing the ENTER Key will fill in the leading zeros and store the time in memory.

## Setting Timer 1 Stage 3 and 4 Times

The Stage 3 and 4 time values can be used as a repeat of Stages 1 and 2. To have the output activate a second time the Stage 3 time must be greater than the Stage 1 and 2 times combined. Just like for Stage 1, the Stage 3 time is a delay from when the Trigger switch is activated until when the output is activated the second time. While the Stage 4 time is how long, or the duration, the output is active the second time.

To set a new Stage 3 or 4 time, press the number 2 key. Then follow the same procedure for entering a new number as explained in setting new Timer 1 Stage 1 and 2 Times.

## Setting Timer 2 Stage 1 and 2 Times

The Timer 2 Stage times function just like Timer 1. To set a new Stage 1 or 2 time for Timer 2, press the 4 key. Then follow the same procedure for entering a new number as explained in setting new Timer 1 Stage 1 and 2 Times.

## Setting Timer 2 Stage 3 and 4 Times

To set a new Stage 3 or 4 time, press the number 5 key. Then follow the same procedure for entering a new number as explained in setting new Timer 1 Stage 1 and 2 Times.

**Note: Entering zeros in any Stage turns that Stage off.**

## Setting the Output Mode

Above each Stage time is the Output Mode, either ON or OFF for that Stage. An ON for any Stage means that the Digital Trim will send out +12 Volts for that Stage. While an OFF for any Stage means no voltage will be sent out for that Stage. To change whether the Timer output on the terminal strip will put out +12 Volts or remove +12 Volts, first press the 1 key for Timer 1 or the 4 Key for Timer 2. Next, **press and release the 6 key** to change the Output Mode.

### Push-button Mode

The Digital Trim has two Push-button Modes. Push-button Mode 1 allows one button to start both Timers. This functions as follows, first the Digital Trim must be armed. The arming of the Digital Trim can be done in two ways. First, by using the ENTER Key or second, by using an external arm switch connected to the Trigger 2/Arm terminal. After the Digital Trim has been armed, a button is used to apply +12 Volts to the Trigger 1 terminal which starts both Timer 1 and Timer 2.

Push-button Mode 2 allows each Timer to be started independently of the other. This functions as follows, first the Digital Trim must be armed. The arming of the Digital Trim in Push-button mode 2 can only be done by using the ENTER Key. After the Digital Trim has been armed, a button is used to apply +12 Volts to the Trigger 1 terminal which starts Timer 1. A second button connected is used to apply +12 Volts to the Trigger 2/Arm terminal to start Timer 2.

# Explanation of the 4-Stage Timer

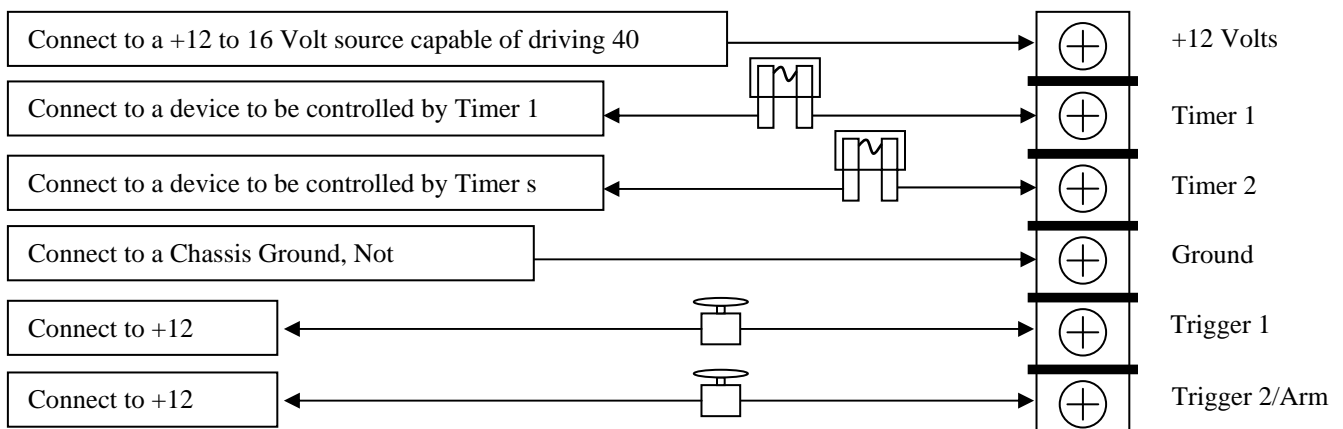
This is to help the racer understand the 4-Stage Timer. For this example the Digital Trim is set in one button mode. This means both Timers will start when the Trigger 1 input receives +12 Volts.


Before either Timer 1 or Timer 2 can cycle the Digital Trim must be armed. When in Push-button mode 1 the arming of the Digital Trim can be done in two ways. First, by using the ENTER Key or second, by using an external arm switch connected to the Trigger 2/Arm terminal. To show that the Digital Trim has been armed, the display will show four dashes. While the Digital Trim is armed, if the Trigger 1 button is activated, a 1 and a 2 will be displayed between the dashes indicating the timers are running. After both Timers have completed, the screen will return to the original screen.


Once a timing cycle is started, the Stages for each Timer start counting down. The Stage times are counted down sequentially starting with Stage 1 and ending with Stage 4. Stage 1 is a delay from when the Trigger switch is activated until when the output is activated. Stage 2 is how long, or the duration, the output stays active. After Stage 2 completes, the output can be activated a second time using Stages 3 and 4. If this is desired, enter times in Stage 3 and 4. Just like for Stage 1, the Stage 3 time is a delay from when the Trigger switch is activated until when the output is activated the second time. While the Stage 4 time is how long, or the duration, the output is active the second time. The only restriction for the Stage 3 time is it must be greater than the Stage 1 and 2 times combined.

Each time a Stage times out the respective Timer output for that Stage will change states. This means if the output was putting out +12 Volts while the Stage time is being counted down, the output will switch to zero Volts when the Stage time being counted down reaches zero.

## Wiring the Unit



 ← Symbol for Push-button

 ← Symbol for 15 Amp fuse