MMR PRO Heel Toe
Professional Throttle Rev Match System

Users Guide

v0.91

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Table of Contents

Introduction

The MMR PRO Heel Toe is a system that will ‘blip’ the throttle order to aid in rev matching during downshifts.

The system is simple to install, requiring minimal connections and configuration. The system utilizes a ‘plug and play’ harness that requires no splicing of any factory wires. The system is connected to the throttle, brake, and clutch pedals using the supplied harness. The system functions by monitoring each of the pedals, when a specific sequence of pedals has been pressed, the ‘blip’ will be triggered.

Quick Start

To quickly install the MMR PRO Heel Toe, follow the steps below. For additional details, see the installation and configuration sections of this guide.

1) Disconnect the negative battery cable
2) Install the PRO Heel Toe harness, connect each of the PRO Heel Toe harness connectors to the throttle, brake and clutch pedals.
3) Connect the factory harness connectors into the PRO Heel Toe harness
4) Locate the PRO Heel Toe device to a suitable installation area where the button can be accessed and the LED can be easily observed.
5) Be sure that the area around the pedals is clear from any obstruction from the PRO Heel Toe harness. Zip tie the harness out of the way when necessary
6) Reconnect the negative battery cable, the PRO Heel Toe should now have a blinking status LED.
7) Connect to the PRO Heel Toe wifi hotspot with a wifi capable device (cell phone, laptop etc). The hotspot name begins with 'MMR'.
8) Open a browser and go to http://192.168.4.1
9) Test each of the pedals and make sure that the respective pedal status display changes.
10) Select the 'Configuration' option at the bottom of the screen
11) Select the 'Calibrate Throttle' option and follow the displayed instructions in order to calibrate the throttle.
12) Select the "Exit Configuration Mode" option.
13) Your MMR PRO Heel Toe is now installed and calibrated. Fine tuning of the 'blip' parameters can be done at any point by putting the system into configuration mode and adjusting the duration and delay settings.

Installation

The MMR PRO Heel Toe system includes a plug and play harness that is compatible with all manual transmission 2015 – 2023 Mustangs.

To install the harness, first disconnect the negative battery cable. Once the battery has been disconnected, route the harness so that each of the connectors is located close to the appropriate pedal (clutch, brake and throttle). The plug and play harness has two connectors for each pedal, one that goes to the pedal sensor, and the other goes to the factory harness connector for the pedal.

Connector Color	Pedal	Description
Black	Throttle	Connect to the factory harness throttle connector and the throttle position sensor (located on the throttle pedal)
White	Brake	Connect to the factory harness brake connector and the brake on/off pedal switch.
Gray	Clutch	Connect to the factory harness clutch connector and the clutch bottom of travel pedal switch. Note that there are two connectors on the clutch pedal, you will be replacing the one that *lowest* on the clutch pedal.

Clutch, Brake and Throttle Connector Locations

Throttle Pedal Connector

Clutch Pedal Connector

Brake Pedal Connector (viewed from below)

Once the harness has been routed, disconnect the factory harness connector from each pedal, and plug it into the plug and play harness and it's mating connector into the factory pedal connector.

Finally, route the device and harness to a location that you can access the button and can see the status LED.

Once the harness has been routed, it should be secured so that it does not interfere with access to any of the pedals. MMR recommends using zip ties to fasten the harness to the factory harness and away from the pedals and footwell.

Reconnect the negative battery cable, the PRO Heel Toe should now have a blinking status LED indicating that it is in configuration mode.

Calibration

Once the electrical connections have been made, you'll need to calibrate the system to your throttle pedal.

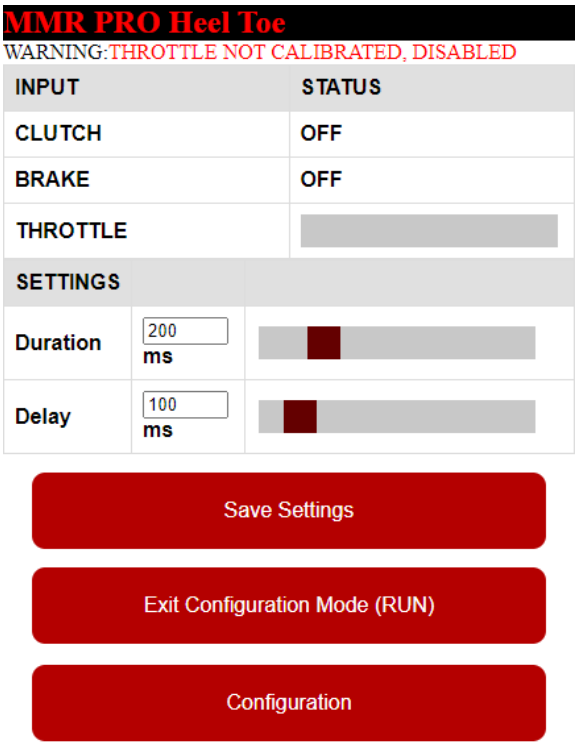
From the factory, the throttle is not calibrated, and the device will automatically enter configuration mode so that you can calibrate the throttle. Upon initial power up, the status led will be flashing in a single blink pattern indicating that the system is in configuration mode.

When the system is in configuration mode, you can connect to it using any WIFI enabled device (cell phone, laptop, tablet etc.) Go to your device WIFI configuration screen and connect to the MMR-???? (where ???? is a combination of letters and numbers) systems WIFI connection.

Once you have connected to the WIFI connection, open a web browser (chrome, safari etc) and go to the following address:
http://192.168.4.1 (alternately, if you are using a cell phone, you can point your camera at the QR code on the located front of the PRO Heel Toe system, and open the link)

It is recommended that a browser bookmark is created to simplify future access to the configuration page.

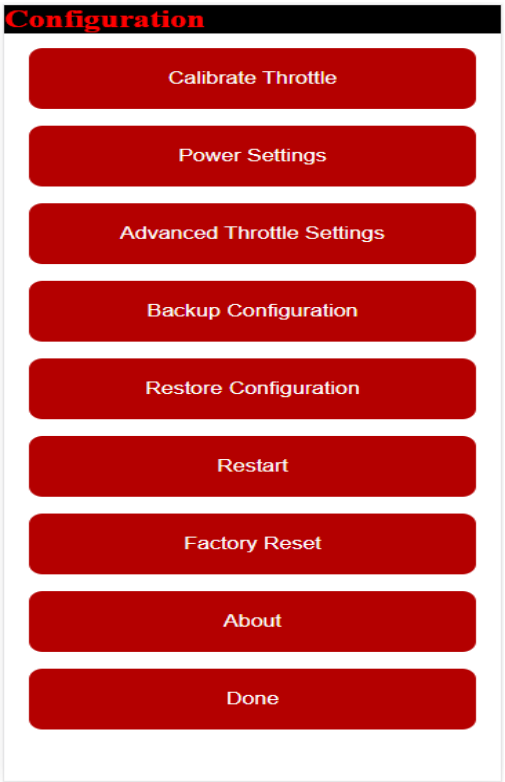
The main screen, which shows status and configuration options will be displayed. When the system is initially installed, a warning will be displayed at the top of the screen indicating that the throttle has not been calibrated, and the system is disabled.



This main screen allows you to verify the status of each of the pedals, and calibrate the system for your style.

Each of the inputs is displayed allowing you to verify that the harness has been correctly installed and there are no problems with any of the pedal sensors/connectors. Pressing the brake or clutch will change the respective status to ON or OFF. Depressing the throttle pedal will cause the throttle gauge to move. (Note that until the throttle has been calibrated, the throttle gauge will not correctly show the full range of the throttle travel).

After verifying that each of the pedals are being correctly detected, you should calibrate the throttle pedal. This is done by selecting the "Configuration" option at the bottom of the screen, then select the "Calibrate Throttle" option at the top of the Configuration screen.



You will now be guided through the throttle calibration procedure. Follow each of the steps as directed, and once complete, you will be returned to the main screen. Once calibrated, the throttle display should correctly show the full range of the throttle travel.

After calibration is complete, configuration of the system parameters can be set, refer to the "Configuration" section of this users guide for details on setting the parameters.

Configuration

In order to put the system into configuration mode, turn the car to ACC or RUN (do not start the engine), press and hold the devices on/off button for 5 seconds, and then release it.

After releasing the button, the status led will flash in a single blink pattern to indicate that the system is in configuration mode.

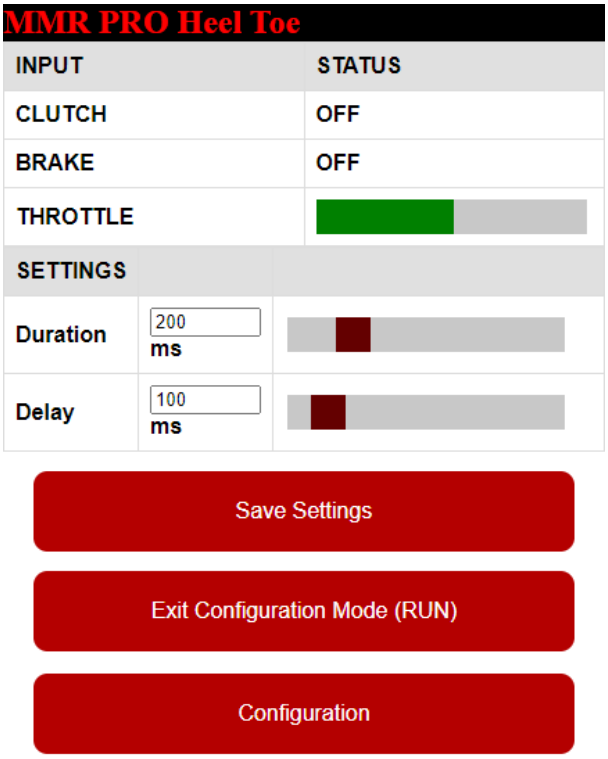
Once the system is in configuration mode, you can connect to it using any WIFI enabled device (cell phone, laptop, tablet etc.) Go to your device WIFI configuration screen and connect to the MMR-???? (where ???? is a combination of letters and numbers) systems WIFI connection.

Once you have connected to the WIFI connection, open a web browser (chrome, safari etc) and go to the following address:

http://192.168.4.1 (alternately, if you are using a cell phone, you can point your camera at the QR code on the located front of the PRO Heel Toe system, and open the link)

This link can be bookmarked in your browser for more convenient access to the configuration mode in the future.

Operational parameters can be adjusted from the main screen:



Below the input status display on the main screen, settings are displayed which can be used to adjust the system operation. First is the “Duration”. This is the amount of time, specified in milliseconds

(1/1000 of a second) that the system will hold the throttle open once a blip has been initiated. The value can be changed by either entering a new value into the number field, or by dragging the duration slider left/right. For example, setting this value to 100 would hold the throttle open for 1/10 of a second.

Next is the “Delay”. This is the amount of time, specified in milliseconds, that the system will wait after detecting the blip has been triggered before opening the throttle. The value can be changed by either entering a new value into the number field, or by dragging the duration slider left/right.

IMPORTANT: Any time a configuration change has been made, be sure to select the “Save Settings” button so that your settings are saved. If you don’t save the settings, they will be lost when you exit configuration mode and the system will return to the prior settings.

NOTE: It is recommended that you exit configuration mode when you have finished making changes to the settings. This can be done by selecting the “Exit Configuration Mode” button. When the device has exited configuration mode, the status led will be turned on to indicate that it is in ‘run’ mode.

You can also exit configuration mode by tapping the power button, but note that **this will discard all unsaved settings** and return the system to run mode.

Operation

The system is triggered by the brake pedal being pressed, followed by the clutch pedal being pressed (while the brake pedal is still depressed). The blip will *not* be triggered if the clutch pedal has been pressed prior to pressing the brake pedal.

Once the system has been triggered, it will wait for the ‘delay’ time that was specified in the configuration. Once the delay time has elapsed, the throttle will be opened for the ‘duration’ time specified in the configuration. Once the duration time has elapsed, the throttle will be closed.

The button on the front of the device can be used to quickly enable/disable the blip feature. By default, the system is disabled after starting the car. Pressing the button will enable the system (the status led will illuminate to indicate that the system is in run mode).

The system can be disabled at any time by pressing the button (the status led will turn off to indicate that the system is disabled).

The system will automatically turn itself off when the ignition is turned off.

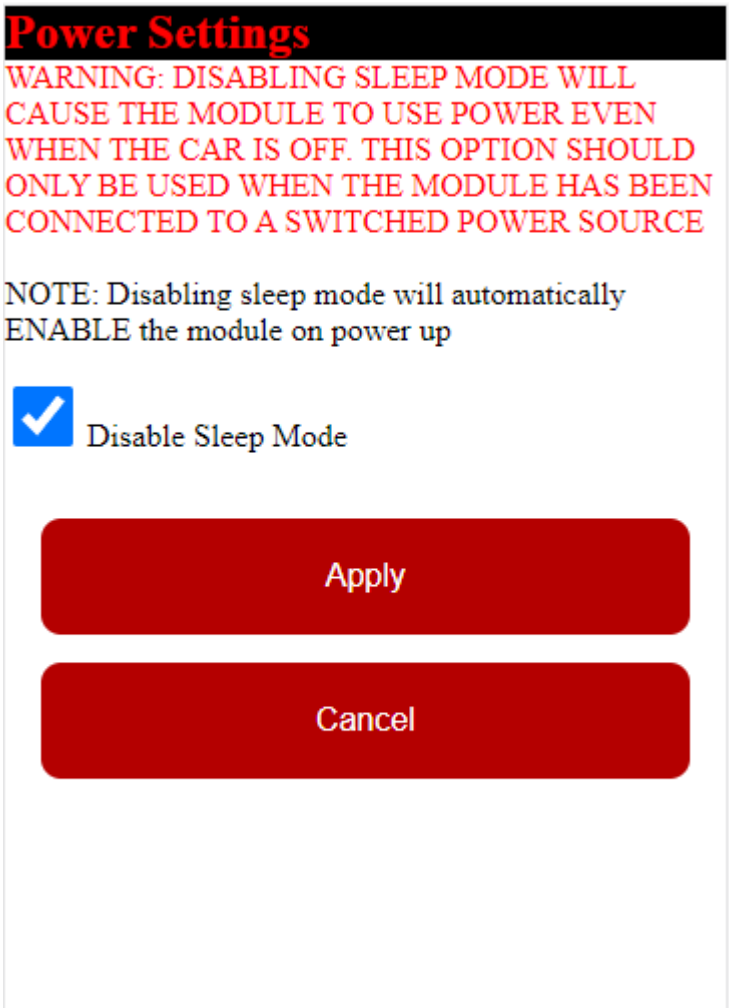
The status led on the front of the device indicates the current mode. The following blink modes are defined:

LED Status	Mode
OFF	The system is disabled. Press the button to re-enable the system.
ON	The system is functioning normally and is in RUN mode, system is enabled. Pressing the button will disable the system.
1 blink	The system is in configuration mode. (Pressing and holding the button for 5 seconds will switch the system to configuration mode)
2 blinks	The device has an internal hardware error.

Power Settings

The power settings menu allows you to disable the modules ‘Sleep Mode’. By default, when the module senses that the ignition has been turned off, it will power down. Selecting the “Disable Sleep Mode” option will disable that functionality. Disabling sleep mode should only be used when the module is being powered by a switched power source, otherwise, the module will continue to draw power, even when the ignition is off.

Additionally, when the ‘Disable Sleep Mode’ option is selected, the module will automatically enable the blip feature at power up, this can be useful if you are powering the module from a switched power source and need the module to be enabled when it is turned on.



Firmware Updates

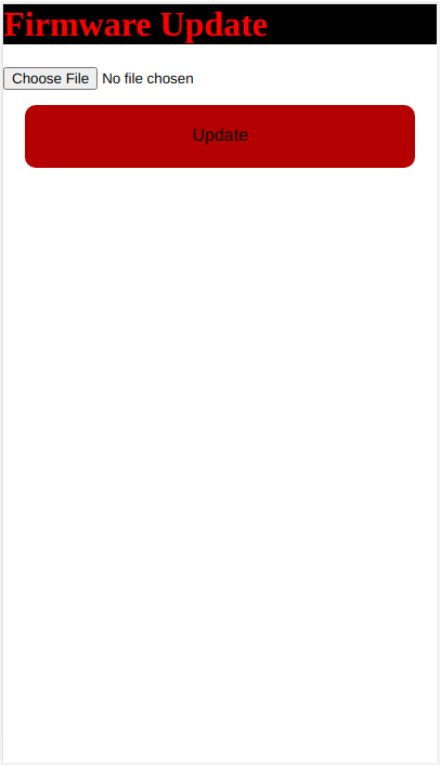
The system provides the capability of OTA (over the air) firmware updates. In the case that new firmware is released, you can use the following steps to update your device:

In order to put the system into firmware update mode, first put the system into configuration mode (see the Configuration section of this manual for details on entering configuration mode).

In firmware update mode, you can connect to the system using any wifi capable device (cell phone, laptop, tablet etc.) Go to your device WIFI configuration screen and connect to the MMR-1234 (where 1234 is a combination of letters and numbers) systems WIFI connection.

Once you have connected to the WIFI connection, open a web browser (chrome, safari etc) and go to the following address:
http://192.168.4.1/update

The Firmware update screen will be displayed



Select the “Choose File” option and select the firmware update file (supplied by MMR). (Note that flashing an incorrect file can permanently damage your device!) Once you have selected the firmware file, select the ‘Update’ option. Once the update has completed, you will be disconnected from the systems wifi connection and the device will restart in run mode.

Technical Information

Wiring Harness Wire Colors

Wire Color	Function
Red	+12v
Black	Ground
White	Brake Signal (+12V when brake applied)
Blue	Clutch Signal (GND when clutch depressed)
Yellow	Throttle-APPS1 (0-5v)
Green	Throttle-APPS2 (0-5v)

Troubleshooting

Following are solution to some common issues you may encounter with your device:

Symptom

Unable to connect to the systems configuration mode using WIFI

Solution

Check that the system is in configuration mode by observing the status LED. The LED should be flashing in a single blink pattern, indicating that the system is in configuration mode. If the status LED is not blinking, press and hold the button for 5 seconds and release it. The status LED should now be flashing in a single blink pattern. Attempt to re-connect to the systems WIFI.

Symptom

My configuration settings were lost or not saved.

Solution

Be sure to select the “Save Settings” button any time you make changes that you’d like to be saved, otherwise these settings will be lost the next time the system is restarted.

Symptom

The ‘blip’ functionality is not working.

Solution

1) Ensure that the throttle has been calibrated, if the throttle has not been calibrated, the system will be disabled.

2) Enter configuration mode and check that each of the pedals is being correctly detected using the ‘status’ screen. Depress each of the pedals and confirm that it’s status changes. If one or more of the pedal statuses do not update, check that the harness is correctly connected to each of the pedals and connectors.

3) Make sure that the system is in run mode. The ignition should be on and the button should be pressed to enable the system. If the LED is off, the device is currently disabled, to re-enable the system, press the button and the status LED should turn on.

Technical Support

To obtain technical support for your device, please contact:

Modular Motorsports Racing

Phone: 805-383-4130
8AM – 5PM PST

Email: info@modularmotorsportsracing.com

Website: http://www.modularmotorsportsracing.com