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The MicroEDGE Nitrous Controller Installation Manual

The Harris Speed Works MicroEDGE Nitrous Controller is a Dual Stage RPM Window Switch, TPS Activation Switch with an integrated A/F Lean Shut Down Switch.

Please follow instructions thoroughly. Any Questions please contact Technical Support at http://www.harrisspeedworks.com/support for assistance.

Enclosed Items

The MicroEDGE Nitrous Controller	Pre-Made Wire Harness	Installation Manual

Installation of The MicroEDGE Nitrous Controller

The MicroEDGE Nitrous Controller is designed to be located in the passenger cabin, in a location where it can be easy accessed. Keep the main MicroEDGE unit away from direct heat and water. The harness connects to the MicroEDGE via the quick disconnect connector. On this harness there are eight wires. They are:

Black - Ground (Preferably using an engine ground or sensor ground point. If using a Wideband O2 Sensor with the MicroEDGE use the same ground point that the Wideband O2 Sensor system is using.)

Red - 12v Switched Power (MicroEDGE+ will be powered up when the vehicle is running, DO NOT CONNECT TO THE ARMING SWITCH!)

Orange - Narrowband or Wideband O2 Sensor/System

Green - Arming Switch (12v)

Blue - TPS Sensor or WOT Switch

White - RPM

Tan/Light Brown - Stage 1 Control

Grey - Stage 2 Control

Wiring

As with all wiring procedures, disconnect the battery before starting. Follow the attached wiring diagram for your application. Connect the **BLACK** wire to a good chassis ground. If you will be using a Wideband O2 Sensor system with your MicroEDGE Nitrous Controller use the same ground point as the Wideband O2 system. Connect the **RED** wire to a switched 12v source, so the MicroEDGE is powered up whenever the vehicle is running. The **ORANGE** wire will connect to the output on the wideband system, or if using with a narrowband O2 sensor consult Appendix B for the location of the wire. The **GREEN** wire will connect inline with the arming switch. Connect the **BLUE** wire to the TPS Sensor or to a WOT Switch. See Appendix C for TPS locations, if connecting to a WOT switch with a ground trigger turn on the Trigger Power setting by opening the case and turning on the dipswitch. Use the table in Appendix D for the location of the RPM signal and then connect the **WHITE** wire. If your application is not listed please consult your vehicles service manual. The **TAN/LIGHT BROWN & GREY** wires output a Ground and can be connected to the ground on the relay that controls the solenoids. **DO NOT HOOK THE MICROEDGE TAN/LIGHT BROWN & GREY WIRES DIRECTLY TO THE SOLENOIDS!**

Configuration of The MicroEDGE

The MicroEDGE uses a menu system for configuration. Within the menu system there are two modes; the Run Mode and the Programming Mode. The nitrous system can only be activated while in the Run Mode. All of the settings are configured in the Programming Mode.

Run Mode
The Run Mode will default automatically when the MicroEDGE is booted up. This mode can display 2 settings of your choice on the left hand of the screen, the five choices are: Trigger Voltage (TRIG), Arming Switch Voltage (ARM), Battery Voltage (VBAT), Air to Fuel (either A/F when used with a wideband O2 system or O2v when using narrowband O2 sensors), and RPM (RPM).

To change the display of the top left value simply press the **UP & DOWN ARROW** buttons to cycle through the 5 choices. To cycle through the bottom left value simply press and hold the **MENU** button while pressing the **UP & DOWN ARROW** buttons to cycle through the 5 choices.

On the right side of the screen there are two values that can not be changed. The Selected Gear (or current gear) is on the top right side, it displays what gear you will be starting off in. The bottom right side of the screen shows the status that the MicroEDGE is in: Standby, Armed, Trigger, Spray, and Lean.

Programming Mode
There are 4 buttons used for programming, they are the **MODE** button, **MENU** button, **UP ARROW** button, and **DOWN ARROW** button. The **MODE** button is used to toggle between the Run Mode and the Programming Mode. To enter the Programming Mode press the **MODE** button once. To exit the Programming Mode at any time press the **MODE** button again. Pressing the **MODE** button again will take you back to the last menu you were at in the Programming Mode. If you hold the **MODE** Button down while pressing the **UP/DOWN ARROW** buttons you can cycle through the Menu Layout (Setup, Delays, Windows, Triggers, and Files). While in a Menu press and hold the **MENU** button and the **UP/DOWN ARROW** buttons to cycle through the sub menus. Use the **UP/DOWN ARROW** buttons to make your selections while in the sub menus. Holding the **UP/DOWN ARROW** buttons down will cycle through the settings quickly. All of the Menu selections have the stages grouped together, a setting with 1 after it is for Stage 1, a setting with 2 after it is for Stage 2 (Example: **Min RPM 1** = Setting for Stage 1 while **Min RPM 2** = Setting for Stage 2). The MicroEDGE+ will auto save all the settings entered every 5 seconds. **DO NOT POWER DOWN (KEY OFF IGNITION) THE MicroEDGE+ UNTIL AT LEAST 5 SECONDS HAVE ELAPSED AFTER ANY BUTTON HAS BEEN PRESSED.**

Programming Example 1: Setting TPS Trigger Pressing the **MODE** button at any time will take you back to the Run Mode. Pressing the **MODE** button again will take you back to the last menu you were at in the Programming Mode. So, to set the TPS trigger you could be in the Run Mode and have the TRIG voltage displayed in the left hand corner of the screen. With the vehicle set to acc press the gas pedal all the way down and note the voltage that is displayed. Press the mode button to enter the Programming Mode, and then hold the **MODE** button and while pressing the arrow button scroll through until you get to the Trigger Menu. For trigger 1 take the voltage that you saw while in the Run Mode with the gas pedal pushed all the way down.

Programming Example 2: Setting RPM Pulse Setting the RPM pulse can be done the same way as the TPS in Example 1. While in the Run Mode set the MicroEDGE so the RPM is displayed in the upper portion of the screen. Press the **MODE** button to enter the Programming Mode and then hold the **MODE** button and use the **UP/DOWN ARROW** buttons to go to the Setup Menu. You can now quickly go through the different RPM set ups while quickly going back and forth using the **MODE** button.

Main & Sub Menus

SETUP:

RPM Pulse - Sets the number of cylinders. Coil/Plug setting is to be used when connecting directly to a coil or fuel injector. 1-8 p/rev setting for use on some applications when connecting to a tach out signal, like a GM LSX series vehicle. 24-60 p/rev setting for use on some GM vehicles when hooking up to the crank position sensor for RPM.

RPM Sens - Sensitivity setting for voltage level of the RPM signal. High sensitivity is used for low voltage RPM pulses. Low sensitivity is used for higher voltage RPM pulses. Mid is the best setting for most vehicles.

Trig Mode - Sets the input trigger type. When using a rising voltage TPS set to Positive. When using a falling voltage TPS set to Negative. If using a WOT switch with a ground set to Negative (you may need to turn on the Trigger Power setting dipswitch located inside the case). If the WOT switch will have a 12v set to Positive. If set to On the MicroEDGE will activate when ever the system is armed and within the RPM Window, if used. To automatically trigger set to On. To not allow the system to trigger set to Off.

Wideband - Allows the Narrowband or Wideband system to be set. If not using a narrowband or wideband system this input (orange wire) can be used as an arming switch for stage 2. This feature is set to OFF by default, see the Leanout feature under the Delays Menu to activate.

Stags Gr1 - Allows first gear to be configured for nitrous use. Can be set to none so first gear is locked out or Stage 1, Stage 2, or both.

Stags Gr2 - Allows second gear to be configured for nitrous use. Can be set to none so second gear is locked out or Stage 1, Stage 2, or both.

Stags Gr3 - Allows third gear to be configured for nitrous use. Can be set to none so third gear is locked out or Stage 1, Stage 2, or both.

Stags Gr4 - Allows fourth gear to be configured for nitrous use. Can be set to none so fourth gear is locked out or Stage 1, Stage 2, or both.

Use File - Selects the setting file to use. Up to 3 separate settings files are available.

Backlite - Allows the LCD backlight to be adjusted between off, low, mid, high.

Sys Mode - Sets the MicroEdge software. Leave in Standard Mode unless you have the MicroEDGE+ hardware installed. **Failure to do so under nitrous system activation can result in unexpected results and/or damage to the nitrous system/vehicle.**

DELAYS:

Launch 1 - Initial Delay for Stage 1 (Tan/Light Brown Wire) while in gear 1.

Launch 2 - Initial Delay for Stage 2 (Grey Wire) while in gear 1. Can be used to correct an already present lean spike by using stage 1 for the fuel solenoid and stage 2 for the N2O solenoid and adding a slight delay to Trigger 2.

Shift 1 - Delay for if the MicroEDGE is inactivated and then reactivated and the MicroEDGE detected a gear shift. If this delay is used the system will not reactivate until the delay is met.

Shift 2 - Delay for if the MicroEDGE is inactivated and then reactivated and the MicroEDGE detected a gear shift. If this delay is used the system will not reactivate until the delay is met.

Pedal 1 - Delay used for gaining traction for stage 1. Example: N2O System is activated and tries break free due to traction. Foot is taken off the gas for a second and then reapplied for WOT. If this delay is used the system will not reactivate until the delay is met.

Pedal 2 - Delay used for gaining traction for stage 2. Example: N2O System is activated and tries break free due to traction. Foot is taken off the gas for a second and then reapplied for WOT. If this delay is used the system will not reactivate until the delay is met.

Leanout - Used with the A/F Shut Down feature. If the system has an initial lean spike this delay can be used so the system does not shut down until the lean spike is over. With this setting set to OFF the A/F Shut Down switch will be disabled. To enable the A/F Shut Down Switch a delay of 0.05 seconds or higher is required.

WINDOWS:

Min RPM 1 – RPM turn on point for stage 1.

Max RPM 1 - RPM turn off point for stage 1.

Min RPM 2 - RPM turn on point for stage 2.

Max RPM 2 - RPM turn off point for stage 2.

Shift RPM - Used for the gear detection, this is the RPM that must be passed before the shift point.

Drop RPM - Used for the gear detection, this is the RPM drop that must be seen by the MicroEDGE when shifting between gears at WOT, after the Shift RPM RPM point has been seen.

Reset RPM - This is the RPM that will re-set the MicroEDGE after a run.

Lowest Gr - Lowest gear when starting out. If starting from a stop this will be set to 1. If starting from a roll this will be set to the gear that you are starting from. Up to 3 set up files can be saved in the MicroEDGE so you could have 1 file for going from a stop and another from a roll and so on.

TRIGGERS:

Trigger 1 - Trigger 1 is the voltage level required to activate or 'trigger' stage 1. (If using a falling TPS signal see the Tips & Tricks section for more info)

Trigger 2 - Trigger 2 is the voltage level required to activate or 'trigger' stage 2. If not used set to the same value as Trigger 1.
Both trigger levels have .25 volts of "hysteresis", which means that once triggered, the input must drop .25 volts below the trigger setting before the stage will "un-trigger". This is done to keep signal jitter and electrical noise from causing an unstable trigger.

Reset - This is the TPS/WOT Switch voltage that will re-set the MicroEDGE after a run.

Min O2v - Turn off set point for use with narrowband O2 Sensors. See Appendix E for more info.

Max AFR - Turn off lean set point for use with wideband O2 Sensors. See Appendix E for more info.

Min AFR - Turn off rich set point for use with wideband O2 Sensors. See Appendix E for more info.

FILES:

Copy - Allows all of the data from 1 file to be copied to another. To use this feature press and hold the **MENU** button along with the **UP/DOWN ARROW** buttons to select the desired operation. Release the **MENU** button and then press the **UP ARROW** button to start the copy process.

Tips & Tricks

To reset all the settings back to the factory defaults push the **MENU & UP ARROW** button while powering the MicroEDGE up.

If using both stages and traction is sometimes an issue try setting the TPS triggers to different voltages. Set the first stage voltage a little lower then normal, with the second stage TPS voltage where you would normally set it to. What you can do is if traction becomes an issue with the second stage you can ease a little off the pedal and deactivate the second stage while allowing the first stage to still remain active until you think the second stage can be brought back in, which you can activate it again by giving it a little more pedal.

All of your settings are saved inside the three files. For a quick visual reference you can set the backlight at different intensities for the different files. An example would be file 1 could have the backlight off; File 2 could have it set to high and so on.

When using the MicroEDGE with a Wideband O2 Sensor system there is both a Lean turn off set point (Max AFR) and a Rich turn off set point (Min AFR). The Rich turn off point serves two purposes, the first being that the N2O system will deactivate if the A/F Ratio goes too rich, like if your nitrous bottle was empty. The second purpose is to catch a sensor failure. When a wideband O2 sensor starts to fail it will display an overly rich condition that is not present. The MicroEDGE will pick that up and disable the nitrous system until the sensor is replaced. This way the MicroEDGE will only activate the nitrous system if it is seeing a good signal from the wideband O2 system.

The File Copy System can be used to make small changes between files. If there are only a few changes that need to be made copy over the finished file from one to the other, select the newly copied file and make the changes to that.

After installing the MicroEDGE you can test the wiring of the nitrous system by setting the RPM turn on to 0, turning off the Leanout Delay to disable the A/F Shut Down and arm the N2O kit. Close the Nitrous bottle and make sure there is no nitrous in any of the hoses. You will only want to do the next step for a second as there will be nothing cooling the coils of the solenoid(s). With the vehicle in accessory mode push down the gas pedal and the solenoid(s) should activate. If the TPS needs to be bypassed it could be set to “ON” under the Setup menu and the system would then activate as soon as it was armed. Verify that 1st gear is not locked out and you are set to a Gear 1 Run (using the **Lowest Gr** setting).

To use the TPS activation with a falling TPS signal set the Trig Mode under the SETUP Menu to negative. Then lower both Trigger 1 & Trigger 2 voltage values. In some cases a SES light will trigger when using the falling TPS signal, if it does verify the battery is holding the charge and then disconnect the positive side of the battery overnight. This will force the PCM/ECU to re-learn the voltage offset from the rising/falling signals.

Walk Throughs

Example 1: Setting The MicroEDGE for Starting From a Stop With the MicroEdge installed we’ll do a full walk through. The vehicle in this example is a street/strip set up with an automatic trans using both nitrous stages. Let’s start with setting RPM, while in the Run Mode use the **UP/DOWN ARROW** buttons to display RPM. Press the **MODE** button to go into the Programming Mode. If not in the Setup Menu RPM Pulse go there now. On this vehicle the RPM was hooked up to a single coil, so we set the MicroEDGE to Coil/Plug. Press the **MODE** button again to go back to the Run Mode and start the vehicle. The RPM displayed on the MicroEDGE should be what is seen on the tach. If it is not leave the vehicle running and press the **MODE** button again to go into the Programming Mode. Notice that we are back on the Setup Menu RPM Pulse, the MicroEDGE remembers what screen you were on last and takes you back to it. So all we have to do now is change the RPM setting to another and push the **MODE** button again to go back the Run Mode to verify the RPM. This can be done until the correct setting for RPM is found.

Next step will be setting the TPS activation. Go back to the Run Mode and this time let’s set the TPS trigger voltage to show in the lower left side, press and hold the **MENU** button while pressing the **UP & DOWN ARROW** buttons to cycle through until the TRIG is displayed. Put the key in and put the vehicle in accessory, but don’t start the vehicle. Press the gas pedal all the way down and take a look at the voltage value next to the TRIG. On this vehicle we see 3.80. This will be the value we enter. To do so press the **MODE** button to go into the Programming Mode. Now we can press and hold the **MODE** button and use the **DOWN ARROW** button to get to the Triggers Menu. Since this will be the trigger voltage for stage 2, we will enter 3.55 for Trigger 2. Press and hold the **MENU** button and press the **DOWN ARROW** button to get to Trigger 1. We are going to set Trigger 1 to be a little higher in voltage, that way if we get traction issues when the second stage kicks in we can pedal back a little to deactivate it but keep stage 1 going. On this vehicle we set Trigger 1 to 3.35.

Now the remaining settings can be set, let’s go back to the Setup Menu by pressing and holding the **MODE** button and use the **UP ARROW** button. Skip ahead to the Wideband setting, as the previous RPM setting have been set already (some did not need to change from their factory settings). Since this car uses a LC-1 Wideband we’ll set this now. Next well move onto the Stgs Gr settings, these will tell the MicroEDGE which stages should be active in what gears. To get there press and hold the **MODE** button and use the **DOWN ARROW** button. This vehicle already has traction issues naturally aspired, so for Stgs Gr1 we will set it to None, so neither the 1st or 2nd Nitrous stages will activate in 1st gear. Press and hold the **MENU** button and use the **DOWN ARROW** button to go to Stgs Gr2, this is for 2nd gear, we will want to activate the 1st stage of Nitrous in this gear, so we will set it to Stage 1. Press and hold the **MENU** button and use the **DOWN ARROW** button to go to Stgs Gr3, this is for 3rd gear, we will want to activate the 1st & 2nd stages of Nitrous in this gear along with 4th gear, so we will set it to Both and then do the same setting for Stgs Gr4

Press and hold the **MENU** button and use the **DOWN ARROW** button to get to the Backlite Menu. Since we are going to end up saving multiple files we are going to set this to High. This will help when flipping through the 3 files as a visual reference that we have unloaded one file and loaded in another. Now that we are finished setting up the Setup menu we can go on to the Delay Menu, to do so press and hold the **MODE** button and use the **DOWN ARROW** button. From this point forward you should be familiar with how to navigate the MicroEDGE, so there will no longer be any step by step instructions in regards to the buttons.
With this particular vehicle we are not using the nitrous until second gear, so we will not be using the Launch delay, we could use this delay if we were activating the system in 1st gear and wanted to let the suspension settle after the launch, before hitting it with the first stage of nitrous. We will set the Shift 1 & Shift 2 delays to 0.25 sec. This setting will allow the nitrous system to be delayed before it is reactivated if we get out of a run due to a traction issue and the MicroEDGE detects a gear change. Pedal 1 & Pedal 2 will both be set to 0.50 sec. This delay will occur when ever we lift due to traction and then go WOT again.

The Leanout feature needs to be set to a value if you will be using the MicroEDGE with either a Narrowband O2 or a Wideband O2 System. This particular vehicle does not see a lean spike when the kit is first activated, so we will set this to the lowest value, 0.05 sec. If the vehicle did have a pre-existing lean spike you could set the Leanout setting so that the MicroEDGE does not turn off the nitrous kit during the lean spike, but only after if it sees a lean condition.

For the next step the RPM Window settings will be set. Under the Windows Menu the Min RPM 1 will be the turn on point for the 1st stage. We'll set this to 3000 RPM and the Max RPM 1 will be set to 6300 RPM for the turn off point. When setting the turn off point you will want to target 200 RPMs below what the rev limiter is set to on the vehicle. For the Min RPM 2 we'll set the 2nd stage to come on at 4000 RPM and use the same turn off RPM as we did with on stage 1, so Max RPM 2 will be set to 6300 RPM. Both of the next two settings are used with the gear diction feature of the MicroEDGE. The MicroEDGE knows what gear you are in by how many times it has seen the Shift RPM value & the Drop RPM value. For this setting we will leave the 4500 value, remember this is not the value that you actually shift at, just a value that the MicroEDGE will need to see to know what gear you are in. For the Drop RPM setting we will set this to 1000 RPM. This value may vary a bit depending on the transmission. So a quick run down on this, the way we have the controller configured so far is for multiple stages, but not active in 1st gear. So we go WOT with the system armed, the system will not activate as we are in 1st gear and the Lowest Gr setting is set to 1 (more on this setting later). As long as the MicroEDGE sees 4500 RPM & the 1000 RPM drop the after the transmission shifts and we are above the 3000 RPM Window setting the 1st nitrous stage will then activate.

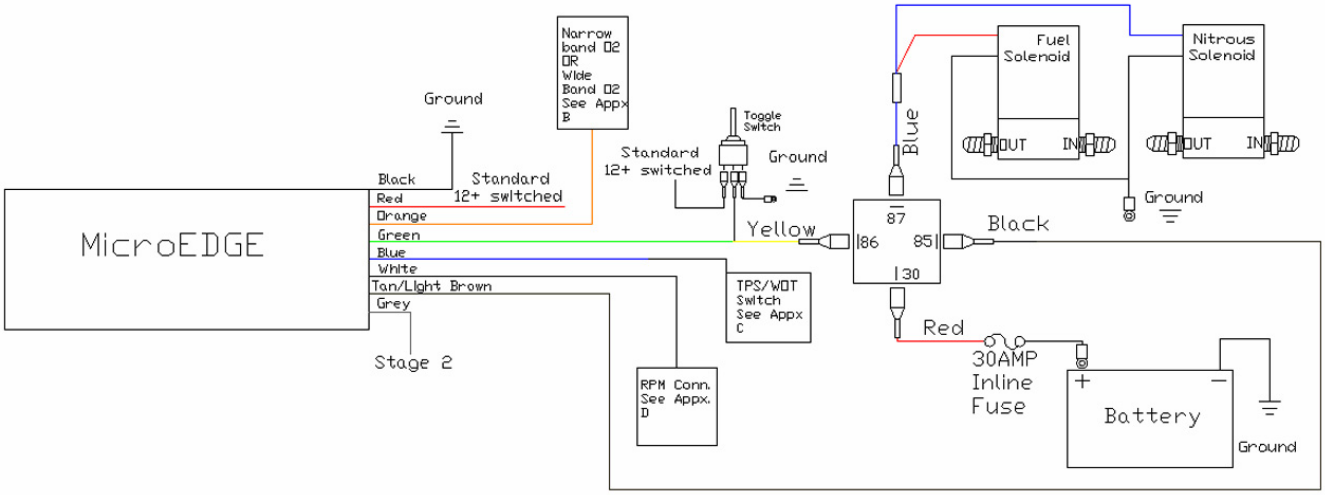
Now getting back to that Lowest Gr setting under the Windows Menu, this setting tells the MicroEDGE what gear we will be starting off in. So since this program file is being set up for going from a stop we will be always starting off in 1st gear, so this setting will be left alone for now. The Reset RPM is the RPM value that when the MicroEDGE sees after a run which re-sets it. So in this case after the pass the MicroEDGE sees this low RPM value and re-sets itself ready to go from 1st gear again. There is also a TPS value under the Triggers Menu that works in conjunction with this feature.

The last settings we have to set are under the Triggers Menu, they are the Max AFR & Min AFR settings for the lean shut down. We are using these two settings since the vehicle has a LC-1 Wideband installed in it, if we were going to use the narrowband O2 sensor we would use the Min O2V setting. On this vehicle we set the Max AFR to 12.5 and the Min AFR to 10.5.

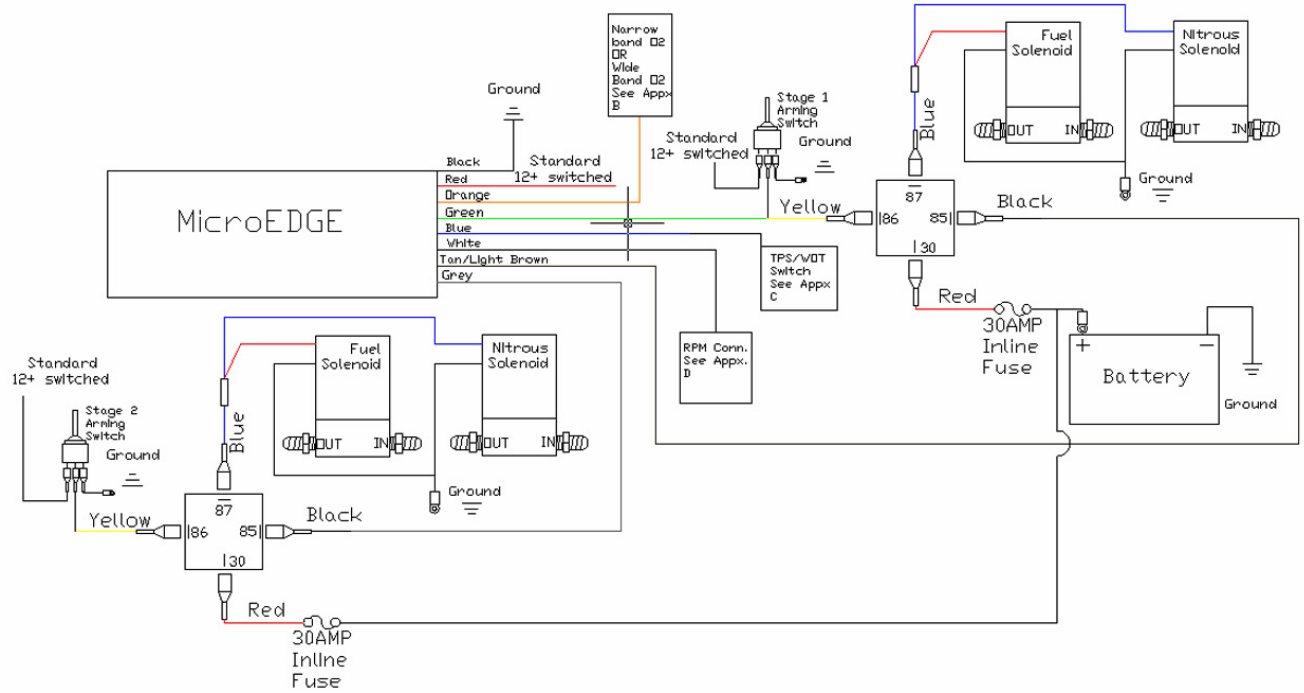
Example 2: Setting The MicroEDGE for Starting From a Roll This example leaves off from the end of example 1. We will base this new program file off the already programmed one. So let's start by copying the program from example 1 into file number 2. To do so go to the Files Menu. Press and hold the **MENU** button and use the **DOWN ARROW** button to get to the Copy 1->2 entry. Let go of all the keys and press the **UP ARROW** button, the display will show the status and when finished press the **MENU** button again and then navigate to the Setup Menu. Under the Setup Menu go to the Use File setting and press the **UP ARROW** button to load in the File 2 Cfg. We just copied all of the settings from the File 1 Cfg into the 2nd file configuration. We can always tell what File Configuration we are in by looking at the top right portion of the screen for the status. Since we are basing this new file on the last one there are not many settings that need to be changed. We will be using the same TPS trigger points, RPM Window settings, A/F Shut Down settings and so on. There is only 1 setting we will want to change. Since we are setting this up to go from a roll we will want both stages to be active right away if they are both armed, since we will have the momentum, so traction will not be a problem. The setting to change will be under the Windows Menu and it is the Lowest Gr setting. Set this to 3. The reason why is that we have the Stgs Gr1 set to None, Stgs Gr2 set to Stage 1, Stgs Gr3 set to Both and Stgs Gr4 is also set to Both. So setting the Lowest Gr to 3 is basically telling the MicroEDGE to start off in the 3rd gear settings, allowing use of both stages. If you go back to the Run Mode you will now see in the upper right hand side of the display Gear 3 Run is displayed. If you load in the File 1 Cfg you will see Gear 1 Run as we start off in first gear in that set up. Now that the MicroEDGE has been set up for these two different situations you can go back into the Programining Mode under the Setup Menu and go to the Use File Feature. Hit the **MODE** button again to go back into the Run Mode. You can now quickly toggle back and forth to load different file in a moments notice for what ever situation you are in.

Appendix A: Wiring Diagrams

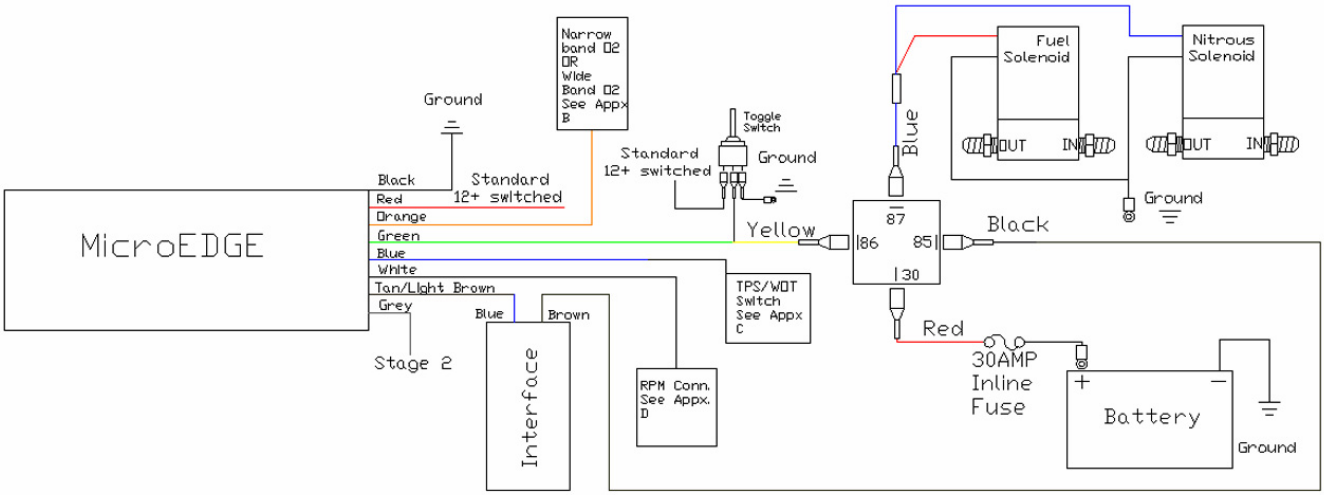
Single Stage Nitrous Kit Wiring Diagram



Dual Stage Nitrous Kit Wiring Diagram



Single Stage Nitrous Kit with Interface Nitrous Controller Wiring Diagram
(When using the below diagram set the Interface Trigger + - to "-" & Trigger Pwr to "on")



Appendix B: Narrowband O2 Wire Location

NUMBER OF WIRES ON SENSOR	COLOR WIRE
1 Wire Sensor	One (1) wire on the sensor to Orange wire on MicroEDGE.
2 Wire Sensor	While the engine is off determine which of the 2 wires has a low resistance between the wire and the sensor body, this is the heater power for the sensor. Connect the other wire to the Orange wire on the MicroEDGE.
3 Wire Sensor	Typically the 3 wires are: Heater Power, Ground, and Sensor Element Connection. Generally they have 1 black wire and 2 white wires. Usually it's the Black wire that you want to connect to the Orange wire on the MicroEDGE. Before making a connection test the wire with a multi-meter while the engine is running. The wire showing 12V or more is the heater power. The sensor element connection voltage fluctuates around 0.45V when the car is warmed up. Wire the Orange wire on the MicroEDGE to this sensor element wire. The Ground connection has low resistance to chassis ground (less than 1 Ohm).
4 Wire Sensor	Typically the 4 wires are: heater power, heater ground, sensor ground, and sensor element connection. Usually it's the Black or Purple wire that you want to connect to the Orange wire on the MicroEDGE. Before making a connection test the wire with a multi-meter while the engine is running. The wire showing 12V or more is the heater power. The sensor element connection voltage fluctuates around 0.45V when the car is warmed up. Wire the Orange wire on the MicroEDGE to this sensor element wire. The Ground connection has low resistance to chassis ground (less than 1 Ohm).

Appendix C: TPS Wire Location

VEHICLE MAKE	COLOR WIRE	PCM / ECU PIN NUMBER
LS1 F & Y Body	Dark Blue Wire	Pin 24 on PCM, Red Connector, Dark Blue Wire
LS1 - 98 ONLY -	Dark Blue Wire	Pin 12 on PCM, Dark Blue Wire
LT1	Dark Blue Wire	Pin 22 on PCM, Dark Blue Wire
LS1 GTO	Blue Wire on TPS	Pin 24 on PCM (Green Seal)
LS2 GTO	Purple Wire on TPS	N/A
Ford Cobra ('03 – '04)	Grey Wire on DJWBC	Pin 89 on PCM
Ford Lightning ('99 – '04)	Grey Wire w/ White Stripe	Pin 89 on PCM
Ford Mustang ('05+)	Yellow Wire on TPS	N/A
Dodge Hemi Vehicles	Brown Wire w/Red Stripe on TPS	N/A
LS2 Y-Body	Purple Wire on TPS	Pin 63 Blue Connector

Appendix D: RPM Wire Locations

VEHICLE MAKE	COLOR WIRE	PCM / ECU PIN NUMBER	ALTERNTIVE CONNECTIONS
LS1 F & Y Body	White Wire	Red Connector on PCM, pin 10, White Wire	Crank Position Sensor, Individual Coil, Fuel Injector
LS1 - 98 ONLY -	White Wire	Blue Connector on PCM, Pin 35, White Wire	Crank Position Sensor, Individual Coil, Fuel Injector
LT1	White Wire	Pin 13 on PCM, White Wire	N/A
LS1 GTO	Brown Wire	Green Seal Connector, Pin 10	Crank Position Sensor, Individual Coil, Fuel Injector
LS2 GTO	Brown Wire with Red Tracer Stripe	Blue Connector on ECU, Pin 48	Crank Position Sensor, Individual Coil, Fuel Injector
Ford Cobra ('03 – '04)	Orange Wire on DJWBC	Pin 26 on PCM	Individual Coil, Fuel Injector
Ford Lightning ('99 – '04)	White Wire w/ Red Stripe	Pin 79 on PCM	Individual Coil, Fuel Injector
Ford Mustang ('05+)	Tan Wire on Fuel Injector	N/A	N/A
Dodge Hemi Vehicles	Cylinder #1 Coil, Blue Wire	N/A	N/A
LS2 Y-Body	White Wire	Blue Connector on ECU, Pin 48	Crank Position Sensor, Individual Coil, Fuel Injector

Appendix E: A/F Ratios & Narrowband O2 Voltages

Below is a table showing rough Narrowband O2 Voltage to Wideband O2 A/F Ratios. The MicroEDGE is preset to .400 mV that can be used as a starting point, with the mV being adjusted. Most Narrowband O2 readings while using nitrous is between .750 mV - .999 mV. When using a Wideband O2 sensor the MicroEDGE is preset to 13.5 for the lean shut off and 10.0 for the rich shut off, which can be used as a starting point and adjusted accordingly. Most Wideband O2 readings while using nitrous is between 12.5 - 10.8 A/F.

NARROWBAND O2 VOLTAGE	WIDEBAND O2 A/F RATIO	SCALE
.00 mV	16.0	LEAN
.25 mV	15.9	
.50 mV	15.8	
.75 mV	15.7	
.100 mV	15.6	
.125 mV	15.5	
.150 mV	15.4	
.175 mV	15.3	
.200 mV	15.2	
.225 mV	15.1	
.250 mV	15.0	
.275 mV	14.9	
.300 mV	14.8	
.325 mV	14.7	
.350 mV	14.6	
.375 mV	14.5	
.400 mV	14.4	
.425 mV	14.3	
.450 mV	14.2	
.475 mV	14.1	
.500 mV	14.0	
.525 mV	13.9	
.550 mV	13.8	
.575 mV	13.7	
.600 mV	13.6	
.625 mV	13.5	
.650 mV	13.4	
.675 mV	13.3	
.700 mV	13.2	
.725 mV	13.1	
.750 mV	13.0	
.775 mV	12.9	
.800 mV	12.8	
.825 mV	12.7	
.850 mV	12.6	
.875 mV	12.5	
.900 mV	12.4	
.925 mV	12.3	
.950 mV	12.2	
.975 mV	12.1	
.1000 mV	12.0	RICH