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**MAXIMIZER<sup>3</sup>**  
*PLUS*  
**TRACTION CONTROL**

***Installation Instructions***

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**Nitrous Express 5411 Seymour Hwy Wichita Falls TX 76310**

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## INSTALLATION AND USER MANUAL

Read all Instructions before beginning!!!!

Caution – **EXTREME DANGER** – Caution

Do not use or mix any other manufacturer’s products with any Nitrous Express products.

Do not use or mix any Nitrous Express products with any other manufacturer’s products.

**THESE INSTRUCTIONS APPLY TO NITROUS EXPRESS PRODUCTS ONLY!**

**FOR SANCTIONED RACE USE ONLY - NOT FOR SALE OR USE IN CALIFORNIA**

## 1. Overview

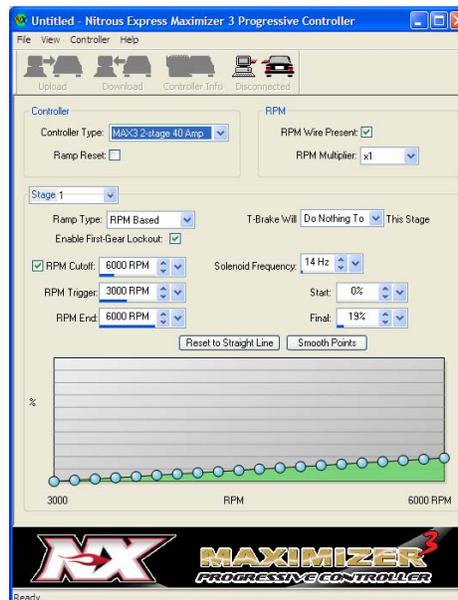
The MAXIMIZER-3 NITROUS CONTROLLER combines the functions of a throttle position switch, two RPM window switches, and a 2 stage progressive driver all into a very compact module. It can progressively drive two channels, each with a 40 amp load capacity (continuous duty) or as 1 channel with a 80 amp load capacity .The device supports low-voltage OEM, V10 or 3 cylinder TACH signals without the need for additional adapters and works with most OEM throttle position sensors including drive-by-wire vehicles. The MAXIMIZER-3, with its "real curve" ramp, allows you to create a progressive curve instead of just a linear ramp. The ramp can be Time based, RPM based or Throttle based. It also features traction controlled progressive nitrous when used with the Davis Technologies Traction Control module.

## 2. Software Installation

If you have the autorun feature enabled on your cdrom drive, wait for the navigation screen and follow the instructions to install the software. If the application does not auto-start, go to the cdrom directory and run "startpgm.exe"

## 3. Software

The following settings do not require that the controller be connected to the PC until you are ready to UPLOAD. All changes made to the set-up require that you UPLOAD to the controller. (See Upload/Download section).



### 3.1 Entering User Data

**Drag & Slide** – data fields that have this feature have a down arrow button to the right. Clicking and holding the button causes a slider bar to appear. Moving the mouse left or right while the slider is displayed will decrease or increase the value.

**Increment/Decrement buttons** - data fields that have this feature have up/down arrow buttons to the right. Click on either of these to increase or decrease the value accordingly.



**Menu pull-down** – data fields that have this feature have a down arrow button to the right. Clicking on the button will cause a pull-down menu to appear. To select, click on one of the displayed options.

**Typing** – clicking on the data field will highlight the value. You can then use the keyboard to enter the value.

**DO NOT connect the controller to your PC until you have installed the software.**

### 3.2 Controller



Controller type sets how the MAXIMIZER-3 will function.

- **MAX3 2-stage 40 Amp** allows you to control 2 stages independently. Blue is stage 1 and Red is stage 2.
- **MAX3 1-stage 80 Amp** is for a 4 solenoid single stage application. In this mode the controller drives both the blue and red channels from the stage 1 settings.
- **MAX3 Traction Control** is the same as MAX3 1-stage 80 Amp but it also turns on the traction control function. This setting requires the *Davis Technologies Traction Control module*. For more information on this function please refer to the traction control module's manual.

Ramp Reset determines if the controller restarts the ramp and/or delay when it is untriggered. A check mark means that the controller starts over every time it is triggered. NO check mark means the controller will continue the ramp from where it left off when it is retriggered. If it is not retriggered within 20 seconds, it assumes the race is over and resets.

### 3.3 RPM



RPM Wire Present turns on the window switch function of the MAXIMIZER-3. NO check mark removes all RPM related configuration options and tells the controller to ignore RPM.

RPM Multiplier selects the correct pulse count for the RPM counter. Use the following as a guide to determine the correct setting:

- a) **Using a TACH signal** - TACH signals will typically have 1 pulse per cylinder during 2 revolutions of the crankshaft (1 full cycle) and therefore the correct setting would be  $\div(\frac{1}{2} \text{ the number of cylinders})$

*Example: When using a TACH signal*

- 4 cylinder setting would be  $\div 2$
- 6 cylinder setting would be  $\div 3$
- 8 cylinder setting would be  $\div 4$

*Note: for LS1 tach signals set the multiplier to  $\div 2$*

- b) **Using a trigger signal from a coil** - first determine how often it fires per revolution of the crankshaft. The correct setting would be:

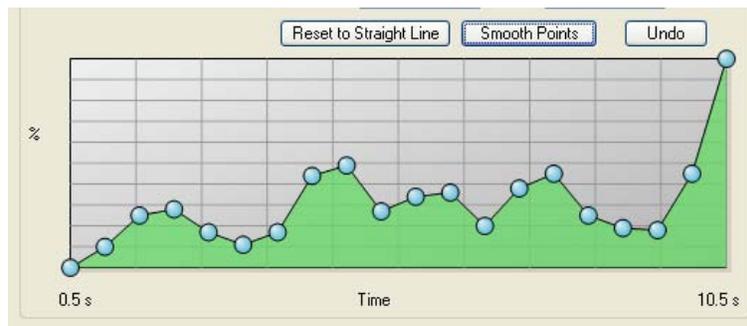
- **x1** for a waste-spark since it fires each revolution of the crankshaft
- **x2** for a full-sequential since it fires every other revolution.

**This setting must be verified prior to operation. Verifying this setting will require the unit to be installed on the vehicle – see installation instructions later in the manual.**

### 3.4 Stage Set-up

The following applies to both Stage 1 and Stage 2, however each stage can be individually configured.

“**Real Curve**” technology allows you to drag and drop any dot on the ramp between 0-100%. The controller will extrapolate between the dots thus creating a nitrous curve instead of the traditional ramp. We have provided some additional tools to help smooth the overall curve, which we discuss in the following sections.



Reset to Straight Line allows you to set the curve to a straight line between the Start and Final targets. (to simulate a simple ramp)

Smooth Points will apply a smoothing algorithm to your curve. This button can be pressed multiple times until the desired curve is achieved

Undo is an undo button. If you applied the smooth points feature or dragged a dot, this feature will undo the change. It has multiple levels so you can undo several changes

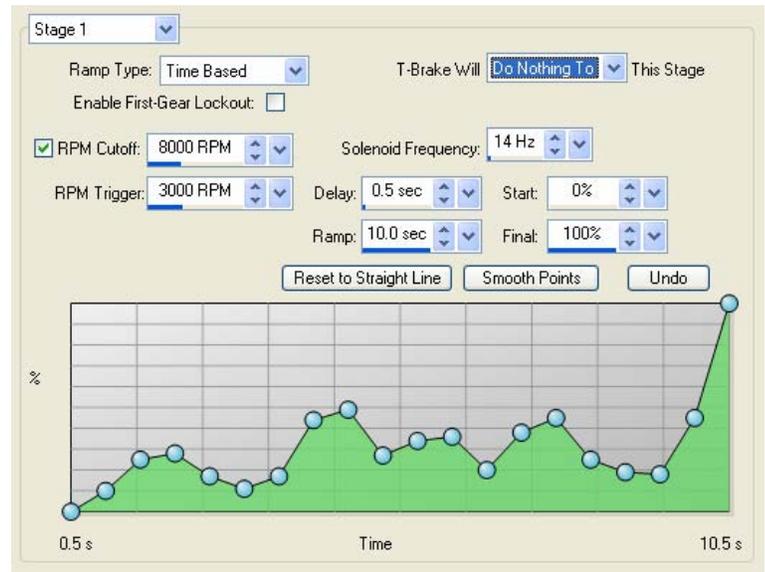
### 3.4.1 Time Based Curve

Enable First-Gear Lockout disables the stage until the RPM has exceeded the RPM Cutoff at least once since it was powered on.

T-Brake will determines what effect the trans-brake will have on the applicable stage. *Arm* allows the stage to function normally while *Disarm* turns the stage off. If you are not using this input set it to *Do NothingTo*.

RPM Cutoff allows you to set the upper RPM threshold above which the nitrous will be turned off. If you remove the check mark the nitrous will not turn off at the cutoff.

RPM Trigger allows you to set the minimum RPM required before the Nitrous can be triggered.



Delay sets the time that the controller will delay starting the ramp once a stage has been triggered

RAMP TIME sets the build time for the ramp

Start sets the start percentage of the stage.

Final sets the final percentage of the stage. The ramp will maintain this level until the RPM cut-off is reached or the stage is deactivated by the TPS or RPM window.

Solenoid Frequency sets the rate at which the controller will pulse the solenoids. 14 hz works with most solenoids.

### 3.4.2 RPM Based Curve

Enable First-Gear Lockout disables the stage until the RPM has exceeded the RPM Cutoff at least once since it was armed.

T-Brake will determine what effect the trans-brake will have on the applicable stage. *Arm* allows the stage to function normally while *Disarm* turns the stage off. If you are not using this input set it to *Do NothingTo*.

RPM Cutoff allows you to set the upper RPM threshold above which the nitrous will be turned off. If you remove the check mark the nitrous will not turn off at the cutoff.

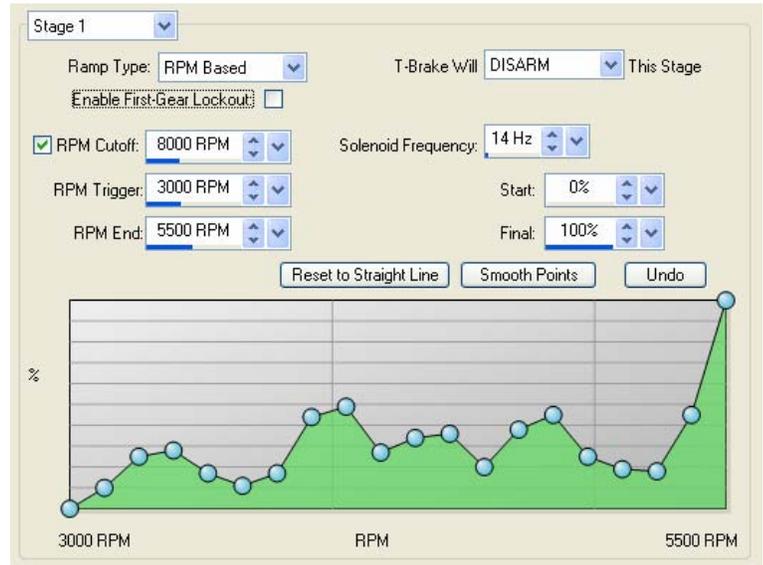
RPM Trigger allows you to set the minimum RPM required before the Nitrous can be triggered.

RPM End sets the end of the ramp window only. Between *RPM End* and *RPM Cutoff*, the nitrous level will remain at the % set in *Final*. (see below)

Start sets the start percentage of the stage.

Final sets the final percentage of the stage. The ramp will maintain this level until the RPM cut-off is reached or the stage is deactivated by the TPS or RPM window.

Solenoid Frequency sets the rate at which the controller will pulse the solenoids. 14 hz works with most solenoids.

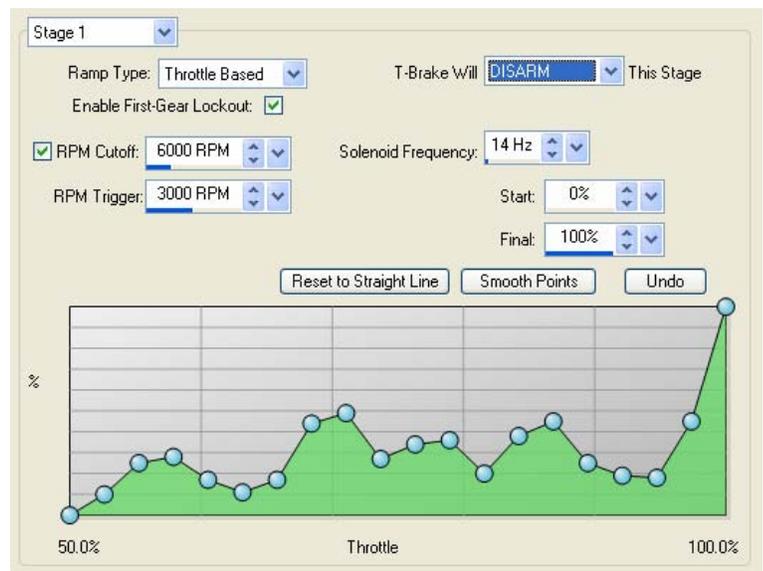


### 3.4.3 Throttle Based Curve

Enable First-Gear Lockout disables the stage until the RPM has exceeded the RPM Cutoff at least once since it was armed.

T-Brake will determines what effect the trans-brake will have on the applicable stage. *Arm* allows the stage to function normally while *Disarm* turns the stage off. If you are not using this input set it to *Do NothingTo*.

RPM Cutoff allows you to set the upper RPM threshold above which the nitrous will be turned off. If you remove the check mark the nitrous will not turn off at the cutoff.



RPM Trigger allows you to set the minimum RPM required before the Nitrous can be triggered.

Start sets the start percentage of the stage at 50% throttle.

Final sets the final percentage of the stage at 100% throttle.

Solenoid Frequency sets the rate at which the controller will pulse the solenoids. 14 hz works with most solenoids.

### 3.5 Upload / Download Configuration

**DO NOT connect the controller to your PC until you have installed the software.**

Before programming the MAXIMIZER-3, it must first be installed in your vehicle because it requires 12-volt power. To connect the MAXIMIZER-3 to your PC, use the USB cable supplied with the kit. Plug the USB cable into an available port on your PC.



Once the software has identified the MAXIMIZER-3, the buttons will become fully visible and the connected ICON will be green.

Clicking on the UPLOAD button will store your settings in the controller. The "Config Uploaded" window will appear following a successful upload.



Clicking on the DOWNLOAD button will read your settings from the controller. The "Config Downloaded" window will appear following a successful upload.

The PC program will remember the current MAXIMIZER-3 settings when you close it.

## 4. Hardware Installation

The MAXIMIZER-3 is designed to be installed almost anywhere on the vehicle. Select a location that is away from heat sources that can damage the wires. Before permanently installing the device, we recommend that you complete the installation procedure below, as you will need access the push button and have a clear view of the LEDs for the final steps. Using the wiring diagram applicable to your application, connect the harness as illustrated.

**Power Input** (white) should be connected to the arming switch and fused for 5 amps

**Controller Ground** (black 18awg) should be connected to chassis ground as close as possible to the battery. **Never disconnect this wire while the controller is connected because you will damage the electronics.**

**Solenoid Ground** (black 12 awg) should be connected to a separate chassis ground and not the same one as used for the controller ground.

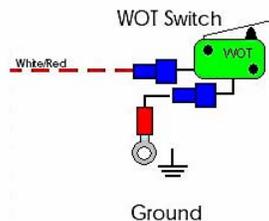
**Blue Driver Wire** (blue 12 awg) connects to the ground side of your stage 1 solenoids (fuel and nitrous) or the first 2 solenoids of a 4 solenoid single stage

**Red Driver Wire** (red 12 awg) connects to the ground side of your stage 2 solenoids (fuel and nitrous) or the second 2 solenoids of a 4 solenoid single stage

**TACH Input** (green) is designed to work with most Tachometer signals (down to 3 Volts), without the need for a separate adapter. It can be connected to a tach signal, coil trigger signal, or fuel injector. DO NOT connect it to a high voltage wire.

**Throttle Input** (white/red) is designed to work with most *throttle-position-sensors* (TPS) and *wide-open-throttle* (WOT) switches. Connect it directly to the signal wire from your TPS. For use with a **WOT switch** we recommend it be connected as shown in the diagram below:

*Note:* DO NOT connect other devices such as relays to the WOT switch.



**T-Brake Input** (red 18awg) can be used with either a 12-volt or ground signal to activate it. (see Input #2 in the software section) Example: use this input as a secondary arm switch for applications that use a trans-brake.

**USB Connector** should always be sealed with the dust cap when the extension cable is not connected. If you want to leave the extension cable connected permanently, seal the connection to prevent water and dirt from getting into the contacts.

## 4.1 Wide-Open-Throttle Setup

The mini-controller will not turn on until the following steps are completed successfully:

- 1) Disconnect the solenoids from the relays to prevent them from firing.
- 2) Arm the MAXIMIZER-3.
- 3) With the throttle in the idle position, press and hold the TPS learn button until the RED, YELLOW and GREEN LEDs begin to flash. DO NOT change the throttle position until the GREEN LED stops flashing and goes out. If the GREEN LED begins to flash quickly, you have a bad TPS signal.

*NOTE: The green LED on a new controller will flash when powered up. This indicates that the TPS is not programmed.*

- 4) Once the GREEN LED is out, open the throttle all the way by pressing the gas pedal to the floor and then release it. Repeat this step twice.
- 5) Now verify that the GREEN LED goes off at IDLE and on at WOT.

### 4.1.1 Wide-Open-Throttle Setup (Drive-by-wire)

*Note: It is recommended that you perform this on a test track or dynamometer*

- 1) Disconnect the solenoids from the relays to prevent them from firing.
- 2) Start the car and arm the MAXIMIZER-3.
- 3) With the engine idling, press and hold the TPS learn button until the RED, YELLOW and GREEN LEDs begin to flash. DO NOT change the throttle position until the GREEN LED stops flashing and goes out. If the GREEN LED begins to flash quickly, you have a bad TPS signal.

*Note: For drive-by-wire it is recommended that you use the falling TPS signal*

- 4) Once the GREEN LED is out, open the throttle all the way while driving the car and then release it. Repeat this step twice. If the GREEN LED is flashing quickly after this procedure the controller did not learn the TPS correctly. Power off the controller and start again.
- 5) If step 4 completed successfully, verify that the GREEN LED goes off at IDLE and on at WOT.

### 4.2 RPM Setup Verification

The following steps assume that you have completed the software install and have uploaded your configuration successfully.

- 1) Disconnect the solenoids from the MAXIMIZER-3 to prevent them from firing.
- 2) Turn on the ignition power and start the engine.
- 3) Arm the MAXIMIZER-3.
- 4) Verify that the RED / YELLOW / GREEN LEDs are off with the throttle in the idle position.
- 5) Slowly increase the throttle until you reach the Turn On At RPM setting that you downloaded for stage 1.
- 6) Watch the YELLOW LED. If you set the correct RPM multiplier it will come on just as you reach the target RPM.
- 7) Now repeat steps 5 and 6 and watch the RED LED and use the Turn On At RPM setting that you downloaded for stage 2.
- 8) If the LEDs come on at the right RPM, then you selected the correct multiplier.
- 9) If the LEDs come on too late then the RPM multiplier is **too high** and you need to set the multiplier to  $\frac{1}{2}$  the previous setting and repeat the RPM set-up verification.
- 10) If the LEDs come on too soon then the RPM multiplier is **too low** and you need to set the multiplier to **2x** the previous setting and repeat the RPM set-up verification.

***Note: DO NOT use the half-step multipliers unless this is a 3 or 10 cylinder application.***

The installation is complete!

## 6. Traction Control

The Nitrous Express MAXIMIZER-3 introduces the first traction controlled progressive nitrous controller. This progressive controller can be configured to accept commands from the Davis Technologies module allowing it to scale back your nitrous ramp. The MAXIMIZER-3 will run its profile normally, but if the traction control module detects tire spin, it will instruct the MAXIMIZER-3 to reduce the ramp. How much and how long the ramp is reduced is set by the configuration in the

traction control module. For more details on this feature please refer to the Davis Technologies manual.

## 7. LED Indicators and Operation

The LED's, GREEN, YELLOW, RED are used to display the status of your MAXIMIZER-3 and are very useful in diagnosing problems.

### **GREEN:**

*FLASHING* – indicates that the TPS WOT has not been programmed. In this case the unit will not fire any of the channels. Refer to the WOT set-up section for details on how to configure the box.

*ON* – indicates that the controller thinks it is at WOT. In this case the unit is ready but may still not fire due to RPM status, T-Brake, or first gear lockout.

*OFF* – indicates that the controller does not see WOT. In this case the unit will not fire any of the channels.

### **YELLOW:**

*ON* – indicates that channel 1 [**BLUE** wire] is inside the RPM window or RPM has been disabled.

*FLASHING* – indicates that the unit is getting a noisy tach signal. This condition will prevent the unit from firing.

*OFF* - indicates that stage 1 is outside of the RPM window. In this case the unit will not fire channel 1.

### **RED:**

*ON* – indicates that channel 2 [**RED** wire] is inside the RPM window or RPM has been disabled.

*FLASHING* – indicates that the unit is getting a noisy tach signal. This condition will prevent the unit from firing.

*OFF* - indicates that stage 2 is outside of the RPM window. In this case the unit will not fire channel 2.

### 7.1 Normal Operation

The MAXIMIZER-3 requires the following conditions to be satisfied before it will fire the solenoids:

WOT – green LED must be on, not flashing

RPM WINDOW – for channel 1, the yellow LED must be on, not flashing; for channel 2 the red LED must be on, not flashing. If you disable the RPM function these LED's are automatically turned on.

T-BRAKE Input – conditions must be met as you configured them.

FIRST GEAR LOCKOUT - disables the stage until the RPM has exceeded the RPM Cutoff at least once since it was armed.

## 8. Software and Firmware Updates

Free updates are available for the MAXIMIZER-3 and related software at [www.nitrousexpress.com](http://www.nitrousexpress.com)

## 9. Limited Warranty

Nitrous Express (the warrantor) hereby warrants its product to the original purchaser thereof (the consumer) against any and all defects in workmanship and material under the following terms and conditions: The Limited Warranty is specifically limited to the original purchaser of the products and is enforceable only by such original purchaser. In the event of a defect in workmanship or material of the products, the Warrantor will repair or replace the product, or any defective part or parts thereof, at the election of the Warrantor, without charge to the consumer for such repair or replacement. This Limited Warranty shall not apply to labor charges, freight, material or other incidental expenses in connection with removal and/or replacement of such defective product on the Consumer's vehicle. This Limited Warranty shall extend for a period of ninety (90) days, commencing from the date of the original purchase by the Consumer. The only exception to this limited term is for the NX "Lightning" series solenoids, which have a limited lifetime warranty (does not include electrical components, labor, or freight). The maximum liability of Nitrous Express in connection with this warranty shall not under any circumstances exceed the contract price of the product claimed to be defective.

## Printing Errors

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As our technology expands, we may find it necessary from time to time to make changes in some of the items offered in our catalog. Nitrous Express reserves the right to make, without notice, changes in design, material and specifications or to make product changes without liability.

## 10. Technical Assistance

Trained experienced technicians are available to provide any information you may need between the hours of 9:00 a.m. to 12:00 p.m. and 1:00 p.m. to 4:00 p.m. CST. Call **(940) 767-7694** for technical assistance.

# 11. Wiring Diagram: MAXIMIZER-3

