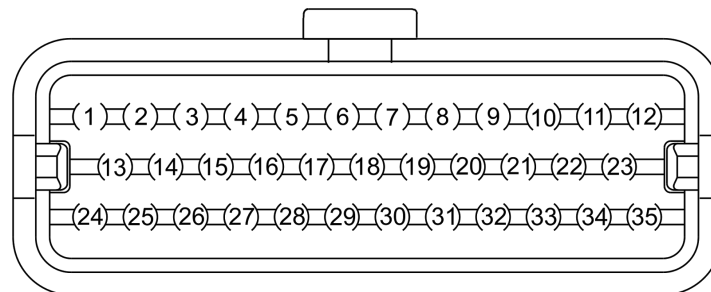


**CONTROLLER REQUIRES THE USE OF OUTPUT DRIVERS TO
POWER THE SOLENOIDS
DO NOT CONNECT SOLENOIDS DIRECTLY TO UNIT!**

Please Read First!

- The Nitrous and Fuel Progressive Outputs on the AMS-2000 are designed to be used in conjunction with Holley PN# 554-111 Drivers, do not connect the outputs directly to your solenoids! In order to progress N2O and Fuel Output independently, minimum of 2 drivers are required (one for N2O, and one for Fuel).
- To insert, or remove connectors to the 35 Pin AMPSEAL connector, the red locking wedge must be unlocked. It should not be removed completely or you may break the little clips on the red wedge retainer. Watch this Amp Seal video for instructions to avoid breaking the connector when adding or removing wires - goo.gl/kAnnk9



35 Pin Female AMP-SEAL 776164-1 Connector Pin Out Orientation

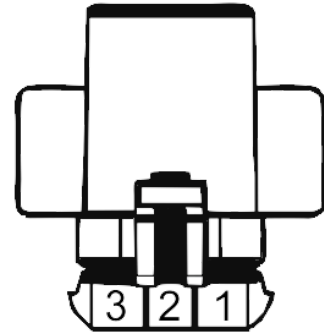
PIN	COLOR	FUNCTION	DESCRIPTION
1	RED	POWER +	Switched +12vdc Main Power Supply (Use a 10 amp Fuse)
2	BLACK	GROUND -	Battery Ground
3	ORANGE	ERPM	Engine RPM/Tach Signal Input
4	GREEN	DSRPM +	Drive Shaft RPM + Input
5	BLACK	DSRPM -	Drive Shaft RPM - Input
6	BLACK	AIR TEMP -	Air Temperature Sensor Ground
7	WHITE	AIR TEMP SIGNAL	Air Temperature Sensor Signal Input (0-5 volts +)
8	PINK	AFR1 SIGNAL	Air Fuel Sensor #1 Signal Input (0-5 volts +)
9	TAN	AFR2 SIGNAL	Air Fuel Sensor #2 Signal Input (0-5 volts +) or Optional 0-5 volt Nitrous Percentage Output #3 for Auxiliary Output Pair
10	GREEN	REDUCE +/-	Reduce Power Input (momentary button) - The Reduce Power Input allows the user to decrease programmed output amount when triggered with this input. The Reduce function will activate even if the Activation Input is OFF. The amount of %N2O reduction is always subtracted from the current target N2O output percentage. Signal can be either 12vdc positive or negative as configured in Input Polarity settings.
11	BLACK	SCRAMBLE +/-	Increase Power Input (momentary button) - The Scramble Input allows the user to increase or "Scramble" the N2O percentage output by a programmed amount. The Scramble function will function even if the Activation Input is OFF. The amount of Scramble increase is always added to the current target %. This input can be used as a N2O Bang Button function if desired. Signal can be either 12vdc positive or negative as configured in Input Polarity settings.
12	PURPLE	ACTIVATION +/-	N2O Ramp Activation Input - The Activation Input controls the start of the ramp and all timers. The Activation Input input is ignored when the Trans Brake/Clutch (PIN 33) is on. Signal can be either 12vdc positive or negative as configured in Input Polarity settings. Avoid using any LED indicators or diodes in the circuit for the Activation input IF you are using the Ground Activation Method - they can cause a backfeed to ground and may false trigger unit.
13	CABLE BLACK	N2O DRIVER - OUTPUT1	N2O DRIVER Output (GROUND) - This output connects to the Holley 554-111 Driver Black ground wire for your N2O solenoids. <u>DO NOT CONNECT DIRECTLY TO SOLENOID!</u>
14	CABLE WHITE	PROFILE	5 Position Profile Switch
15	CABLE BLACK	PROFILE	5 Position Profile Switch
16	BLACK	SENSOR -	5 volt Ground Supply for Auxiliary Sensors

17	RED	SENSOR +	5 volt Power Supply Output to Auxiliary Sensors
18	GREEN	AUX SENSOR SIGNAL	Auxiliary Reference Sensor Signal Input (0-5 volt)
19	GREEN	PRIMARY SENSOR SIGNAL	Primary Reference Sensor Signal Input (0-5 volt)
20	BLACK	5V SENSOR -	5 volt Sensor Ground Output
21	RED	5V SENSOR +	5 volt +Power Supply Output
22	YELLOW	SHIFT +/-	Shift Input (momentary input) - A signal applied to this input will increment the Gear Position Counter when the Activation Input is ON. The gear counter can be reset each time a Trans Brake/Clutch Input signal is recognized. Normal operation is that the Gear Counter is only reset when the activation signal is removed. Signal can be either 12vdc positive or negative as configured in Input Polarity settings.
23	BLACK	NITROUS DRIVER OUTPUT3	AUX #3 Nitrous Driver Output (GROUND) - This output connects to the Holley 554-111 Driver Black ground wire for your Nitrous solenoids. Can also be optionally configured as a relay driver - <u>DO NOT CONNECT DIRECTLY TO SOLENOID!</u>
24	CABLE WHITE	FUEL DRIVER - OUTPUT2	Fuel Driver Output (GROUND) - This output connects to the Holley 554-111 Driver Black ground wire for your Fuel solenoids. <u>DO NOT CONNECT DIRECTLY TO SOLENOID!</u>
25	RED	12V SENSOR+	12 Volt + Sensor Supply
26		CAN BUS +	FUTURE USE
27		CAN BUS -	FUTURE USE
28		CAN LOW	FUTURE USE
29		CAN HIGH	FUTURE USE
30	BROWN	ANALOG 1	Selectable Analog Output (0-5 volt +) or Input 0-5 Volt + Depending on selection on output function page. Can be used as Nitrous Percentage Output for Primary Output Pair or as an input for offset functions. Can be data logged. For EFI setups, this is the output wire to connect to your EFI ECU indicating nitrous output percentage.
31	GREY	MANIFOLD PSI SIGNAL	Manifold Pressure Sensor Signal Input (0-5 volt +). You can use Pins 16 & 17, or Pins 20 & 21 for Power and Ground for this sensor input.
32	WHITE	TPS	Throttle Position Sensor Input (0-5 volt +) for EFI applications - Connect to TPS Signal Wire. Make sure to Calibrate TPS settings in SYSTEM > TPS CALIBRATION for EFI use. Alternative use as a data record switch +12 Volt input to start data recording for Carb Applications. When used as Data Log ON/OFF Switch, you must turn off BEFORE main power at end of pass to save data.
33	BLUE	TRANSBRAKE +/-	Trans Brake or Clutch Input Signal - When signal is applied to this input the N2O activation will be ignored preventing the N2O to come on while on the transbrake. The N2O ramp will not begin until this input is turned off even if

			the Wide Open Throttle Switch input is on. Signal can be either 12vdc positive or negative as configured in Input Polarity settings.
34	RED	12V SENSOR+	12 Volt + Sensor Supply
35	GREEN	FUEL DRIVER OUTPUT4	AUX #4 Fuel Driver Output (GROUND) - This output connects to the Holley 554-111 Driver Black ground wire for your Fuel solenoids. Can also be optionally configured as a relay driver - <u>DO NOT CONNECT DIRECTLY TO SOLENOID!</u>

Holley Driver Part# 554-111

Holley 554-111 High Current Solid State Drivers are recommended to handle the high current loads for nitrous and fuel solenoids on this system. The AMS-2000 controller has a 7 amp maximum output current capacity and the Holley solid state drivers are necessary to protect the controller from overcurrent situations. We recommend mounting the drivers close to your solenoids, such as your firewall area to minimize voltage drop from the driver to the solenoid. The Trigger wire for the driver can be much longer, allowing you to easily mount your AMS-2000 on your roll cage or other easy to access location.



Note that a pair of big nitrous solenoids can easily pull 50 amps or more, so use adequate wire sizes. On a single stage nitrous system, we recommend using minimum one driver for the two nitrous solenoids and one for the fuel solenoids which will allow you to control percentages for fuel and nitrous independently.

CAUTION - The failure mode for a solid state driver is to fail closed, or active. For example, if for some reason the driver fails, it may keep the solenoids active even if the control signal is OFF. For this reason, we recommend incorporating a relay to power these drivers where the relay would be wired so that it will remove power to the Holley drivers when the throttle switch is lifted and/or nitrous system power is off.

HOLLEY 554-111 SOLID STATE DRIVER WIRING		
TERMINAL	WIRE COLOR	FUNCTION
1	Blue	High Amperage 12vdc + Output to Solenoid
2	Black	Ground Trigger - Control Input to AMS-2000
3	Orange	High Amperage 12vdc + Input (Battery)

Driveshaft Sensor Wiring

The screenshot shows the 'Configure' tab of the AMS-2000 software. The 'Global Settings' sub-tab is active, and the 'MPH / Shaft RPM' section is selected. The 'Shaft Input Sensor Type' is set to 'Hall Effect/Square wave' with a 'Divider' of 8. The 'Primary Measurement' is set to '180,000 RPM'. The 'Velocity Calibration' section shows 'Shaft Revolutions Per Mile' set to 2,687, with 'Calibration Wizard' and 'Manual' buttons. The 'Shaft RPM Calibration' section shows 'Pulses Per Shaft Revolution' set to 8.00, with a 'Calculator' button.

Standalone Magnetic Sensor Connection - Use Driveshaft + Green (Pin 4) and Driveshaft - Black (Pin 5)

Standalone Hall Effect Sensor Connection - Use 5 Volt Sensor Supply (PIN 17), 5 Volt Ground Sensor Supply (PIN 16) and Driveshaft Signal + (PIN 4)

Shared Racepak Driveshaft Hall Effect Sensor - The Racepak PN#800-SS-MS5 Driveshaft Sensor that connects to the Racepak Datalogger can be used to acquire your Driveshaft signal. Connect the MSD Green (Ground) wire to the AMS-2000 Driveshaft - Black (Pin 5) wire and the MSD Purple / Blue Wire (Signal) wire (Center wire in 3 wire Plug) to the AMS-2000 Driveshaft + Green (Pin 4) wire. Do not make a connection to the MSD Red (Power) wire.

Racepak does offer a new "Y" cable to split the Driveshaft sensor signal out to two devices, the PN is 800-CA-3PY for reference. The signal wire is the center wire on both of the Y-cable output plugs.

Note: You may not need to hook the ground (Pin 5) wire to the driveshaft sensor, we have reports just hooking the signal wire (Pin 4) up works fine.

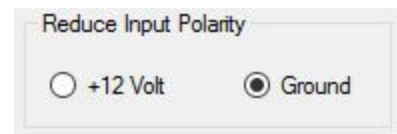
Shared MSD 7761 ARC Driveshaft Output - MSD's 7761 ARC Module has a White/Blue loose Output Wire which is intended to supply the driveshaft + signal to a Racepak or other data

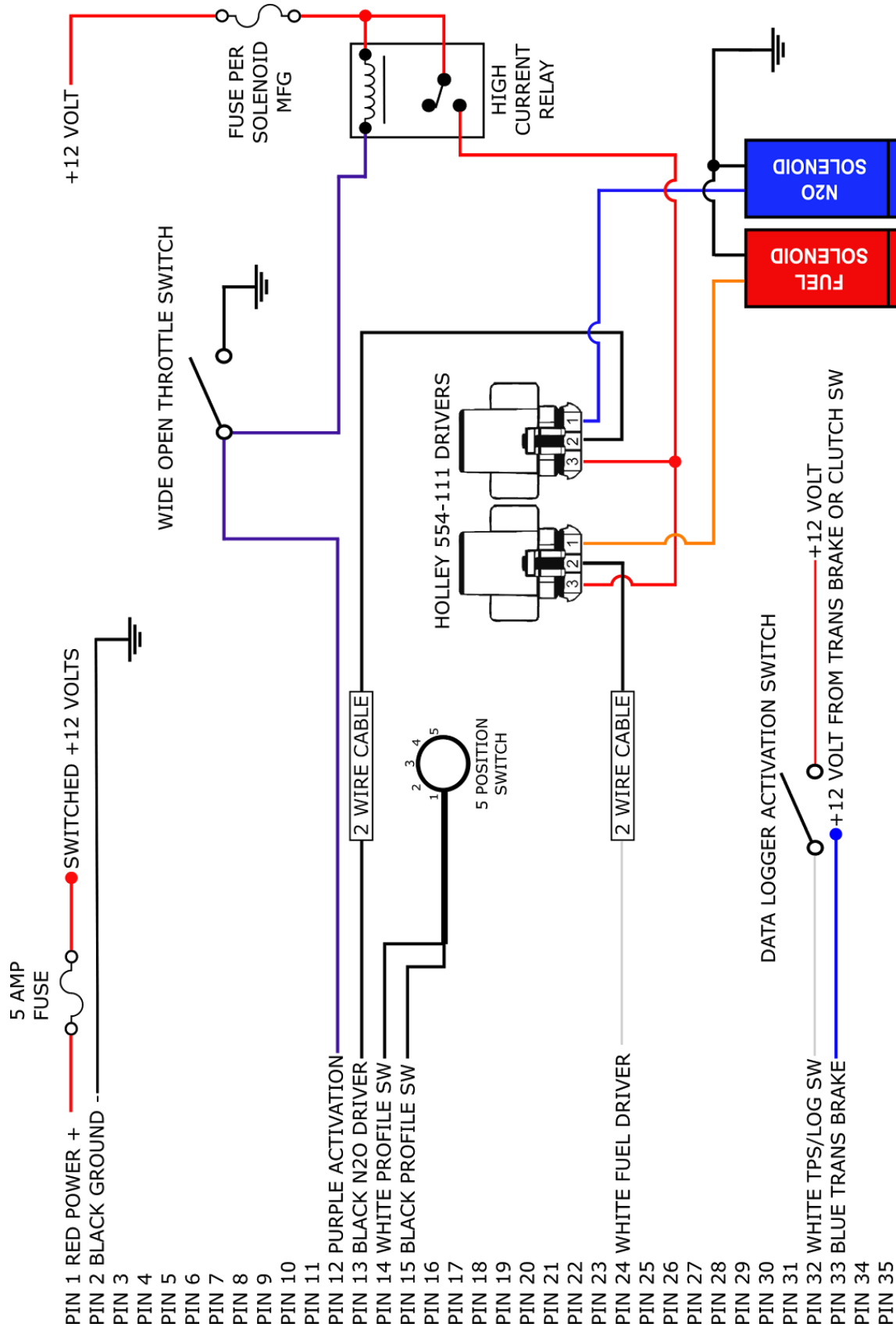
logger. Early versions of the MSD 7761 also have a loose Brown signal ground wire, later versions do not have this wire.

Connect the AMS-2000 DSRPM + Green (Pin 4) wire to the loose MSD White/Blue wire, and the AMS-2000 DSRPM - Black (Pin 5) wire to the loose MSD Brown Ground Wire (if one is available). If you have a noisy driveshaft signal, you might try unhooking the Brown ground wire.

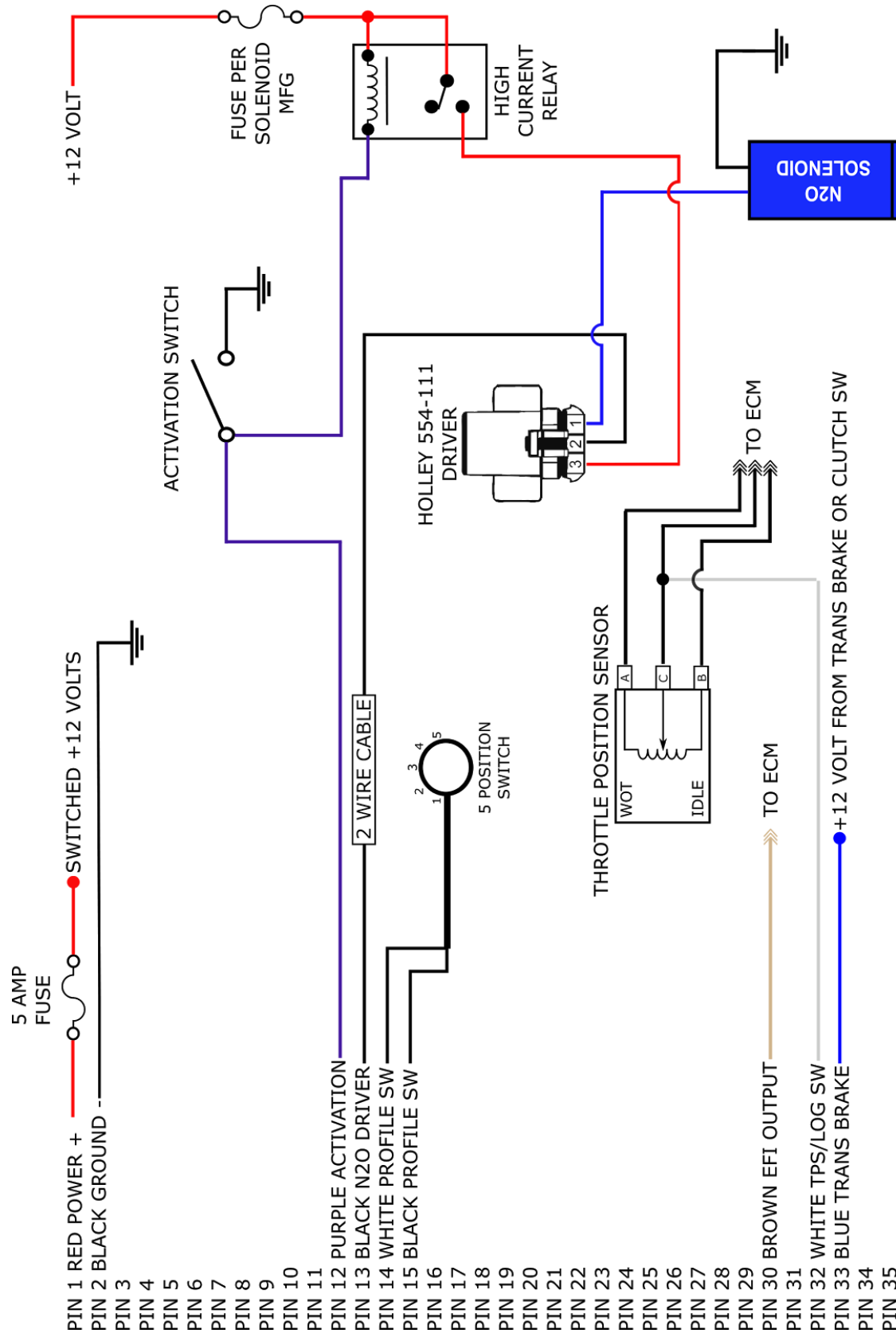
MSD ARC 7761 Active Connection - MSD's 7761 ARC Module turns on the Yellow loose Wire (ground output) when the ARC Module is active. You can connect the Yellow loose wire to the AMS-2000 Reduce Input Green wire (PIN 10) to tell the AMS-2000 to trigger the reduce power input when tire spin is detected.

In the AMS-2000 software, select the System Input Polarity Settings tab. Set the Reduce Input Polarity option to **Ground** polarity.





BASIC CARB NITROUS WIRING DIAGRAM
AMS-2000 NITROUS CONTROLLER
REVISED 9/27/16



BASIC EFI NITROUS WIRING DIAGRAM
AMS-2000 NITROUS CONTROLLER
REVISED 9/27/16

Important Racer Notes

- Follow all recommended safety guidelines from this and other manufactures installation guides.
- Must use Static Suppression Ignition Wires with this Controller. The AMS-2000 Nitrous Controller contains High Frequency Digital Electronics and will NOT function correctly without Suppression Wires!
- Caution - Do NOT submerge Controller in liquid or directly wash unit with liquid of any type! (Do NOT spray when washing vehicle!)
- The Nitrous and Fuel Progressive Outputs on the AMS-2000 are designed to be used in conjunction with Holley PN# 554-111 Drivers, do not connect the outputs directly to your solenoids! In order to progress N2O and Fuel Output independently, minimum of 2 drivers are required (one for N2O, and one for Fuel).
- The datalogger function has 512k of memory and will record one pass at a time, you must download the data from the AMS-2000 to your Laptop, then delete the AMS-2000 log data from the unit after each pass or you will not be able to record the data from the next run.
- All inputs have input protection diodes. All outputs have integrated noise suppression diodes.
- Outputs are short circuit and overcurrent protected (7 amp maximum).
- Reverse Battery Protection is built in.
- Memory and user settings are retained in unit for up to 20 years with no power applied. No back up batteries needed.
- All inputs are sampled at 100hz.
- PN for terminals we use in the 35 pin connector housing is AMPSEAL# 776164-1, the crimp terminal contacts are AMPSEAL# 770520-3.

Warranty

NLR, LLC warrants to the original purchaser that the AMS-2000 shall be free from defects in parts and workmanship under normal use for 90 days from the date of purchase.

NLR, LLC obligation under this warranty is limited to the repair or replacement of any component found to be defective when returned postpaid to NLR, LLC. The Controller must be returned with evidence of place and date of purchase or warranty will be void. The warranty will not apply if the AMS-2000 has been installed incorrectly, repaired, damaged, or tampered with by misuse, negligence or accident.

Product Disclaimers

It is the responsibility of the purchaser to follow all guidelines and safety procedures supplied with this product and any other manufacturer's product used with the AMS-2000. It is also the responsibility of the purchaser to determine compatibility of the AMS-2000 with the vehicle and other components.

NLR, LLC assumes no responsibility for damages resulting from accident, improper installation, misuse, abuse, improper operation, lack of reasonable care, or all previously stated reasons due to incompatibility with other manufacturer's products.

NLR, LLC assumes no responsibility or liability for damages incurred from the use of products manufactured or sold by NLR, LLC on vehicles used for competition racing.

NLR, LLC neither recommends nor approves the use of products manufactured or sold by NLR, LLC on vehicles which may be driven on public highways or roads, and assumes no responsibility for damages incurred from such use.

NLR, LLC does not recommend nor condone the use of its products for illegal street racing.

Document Revision History

Version	Revision Date	Revision Description
1.0	9/29/16	Original Released Document
1.1	9/30/16	Added Revision History, Corrected Pin #'s for reference pressure sensor inputs and Manifold Sensor Inputs.