INSTALLATION INSTRUCTIONS

MSD Power Grid System Controller
PN 7730/77303

ONLINE PRODUCT REGISTRATION: Register your MSD product online. Registering your product will help if there is ever a warranty issue with your product and helps the MSD R&D team create new products that you ask for! Go to www.msdperformance.com/registration.

Parts Included:

- 1 - System Controller, PN 7730 / PN 77303
- 1 - 4Gb SD Card
- 1 - Micro-USB Cable
- 1 - MSD View CD-Rom
- 1 - Fiber Optic Plug
- 1 - CAN Terminator Cap
- 1 - Power Cable-Loose
- 1 - Mag Cable
- 1 - 2-pin Legacy Cable
- 1 - Main Cable Loose
- 1 - Parts Bag

Accessories (Purchased Separately):

- Inductive Cam Sync Kit, PN 7555
- Hub Connector, PN 7740 / PN 77403
- Slew Rate and Time Based Rev Limiter, PN 7761
- Boost Retard Module, PN 7762
- Manual Launch Controller, PN 7751
- Racepak V-Net Tee
  - 9” - 280-CA-VM-T009
  - 18” - 280-CA-VM-T018
  - 36” - 280-CA-VM-T036

WARNING: During installation, disconnect the battery cables. When disconnecting, always remove the Negative cable first and install it last.

Note: Solid core spark plug wires cannot be used with an MSD Ignition Control.

Note: A crank trigger is recommended to supply the input signal to the Power Grid Ignition System to ensure the most precise timing and rpm control.

OPERATION

DIGITAL OPERATION

The MSD Power Grid System Controller uses a high speed RISC microcontroller to control the ignition’s output while constantly analyzing the various inputs such as launch, burnout, and step wires; trigger signals, rpm, and CAN-Bus data. The high speed controller can make extremely quick updates to the ignition output, timing, and rpm limits while maintaining +/- 0.1° timing and +/- 1 rpm resolution. The circuits and controller of this system have been designed for superior protection against Electro Magnetic Interference (EMI).

The Power Grid System Controller, PN 7730 / PN 77303, is designed to be used with the Power Grid-7 Ignition Control, PN 7720. This is a high output CD ignition control. The Ignition System allows for the System Controller to be mounted on top of the Power Grid-7 to save space and provide a neat, compact installation. The System Controller can also be used with other MSD Ignitions such as the 7AL-2, MSD 8-Plus, and the Pro-Mag series. In order to use the rev limiting features of the System Controller the paired ignition must have a built-in Soft Touch Rev Control that uses plug-in RPM modules. Pages 10-12 show wiring diagrams for a variety of different ignition options.

WIRING FEATURES

Leading Group	Wire Color	PIN	Function	Description
4-Pin Connector (to PN 7720 or Power Cable if not used with PN 7720)	BLACK	16	GROUND	Ignition supply Ground wire. Connect to battery negative (-) terminal or engine block.
	ORANGE	17	BATT POWER	Battery supply wire. Connects to battery positive (+) terminal or battery junction. **Note:** Do not connect to the alternator.
	YEL/WHT	33	TRIGGER OUT	Trigger output for electronic ignition amplifiers.
	RED	34	POWER OUT	On/Off switch wiring. This wire supplies switched 12V power to the 7720.
LOOSE WIRES	RED	15	IGN	12V switched (Ignition)
	GRAY	18	TACH	Tach output. This wire will provide a 12 volt square wave tach signal.
	WHITE	32	POINTS IN	Trigger input from electronic ignition amplifiers, an ECU's trigger or points.
	YELLOW	1	SHIFT LIGHT	Shift Light output wire. It can handle up to 3 amps continuous to ground when enabled.
	LT BLUE	4	BURN OUT	Burnout Rev Limit. When 12 volts are applied the Burnout Rev Limit is active. This disables the Slew Rate rev limits and overrides other rev limits. It is recommended to have this wire switched from an outside source, such as the crew chief before the burnout and while staging the car.
	DK BLUE	21	LAUNCH	This wire activates the Launch Rev Limit and is the main reset wire for several features of the Ignition. When 12 volts are applied to this wire it will activate the Launch Rev Limit. It also resets the shift light, the gear indicator to first gear, the Launch Retard curve and select Gear 1 curve. When 12 volts is removed, the Launch Time begins as does the Gear 1 curve. When 12 volts are applied the Slew Rate Rev limit will be disabled as well as the Time-Based Rev Limit curve.
	PINK	22	STEP 1	Step 1 retard enabled with +12 volt input AND above Step 1 Rpm value OR Gear 2 Select.
	VIOLET	5	STEP 2	Step 2 retard enabled with +12 volt input AND above Step 2 Rpm value OR Gear 3 Select.
	TAN	23	STEP3	Step 3 retard enabled with +12 volt input AND above Step 3 Rpm value OR Gear 4 Select.
	LT GREEN	6	STEP4	Step 4 retard enabled with +12 volt input AND above Step 4 Rpm value OR Gear 5 Select.
	GREEN	10	STEP5	Step 5 retard enabled with +12 volt input AND above Step 5 Rpm value OR spool rev limiter.
	BRN/WHT	19	RPM SW	RPM/Time switch output wire. It can switch up to 3 amps continuous to ground when enabled.
2-Pin Connector (Legacy)	YELLOW	7	RELAY LO	Network Ignition Mode: Cam sync output to Racepak systems for individual cylinder timing. **or**
	YELLOW	24	RELAY HI	Legacy Ignition Mode: Rev limiter output to legacy ignition..
3-Pin Connector	GREEN VIOLET BROWN	8 9 25	MAG- MAG+ SHIELD	This is a magnetic pickup, 2-pin connector. Plugs into an MSD Distributor or Crank Trigger pickup. Violet is positive, Green is negative. **Note:** When this connector is used, the white POINTS IN wire is not connected. Brown connects to ground.
Racepak Assembly	WHITE BLACK	11	VNET HI VNET LO	Communicates data acquisition information with RacePak system. Only used to plug into VNet.
6-Pin Connector (to Hub/ Modules)	RED BROWN RED BLACK BLACK	13 27 29 30 31	MSD CAN HI SHIELD POWER OUT MSD CAN LO MSD CAN GND	Supplies 12V switched power to add on module units. Also communicates between modules and Power Grid System Controller. This connector is only used with modules added onto the system. This is for the MSD CAN-Bus accessories. It is only used when adding Power Grid Modules to the system. The Hub Connector, PN 7769, is required.

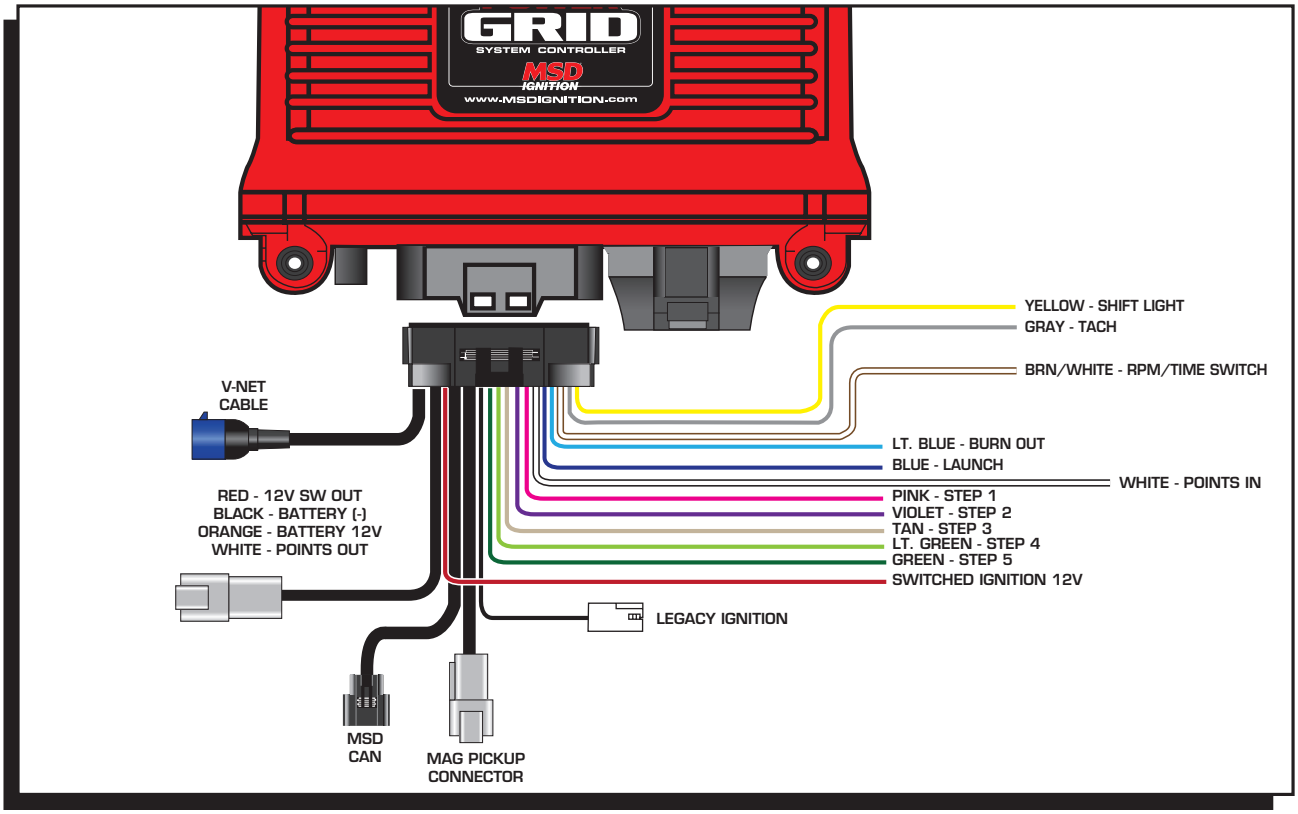

Figure 1 Wires of the Power Grid System Controller.

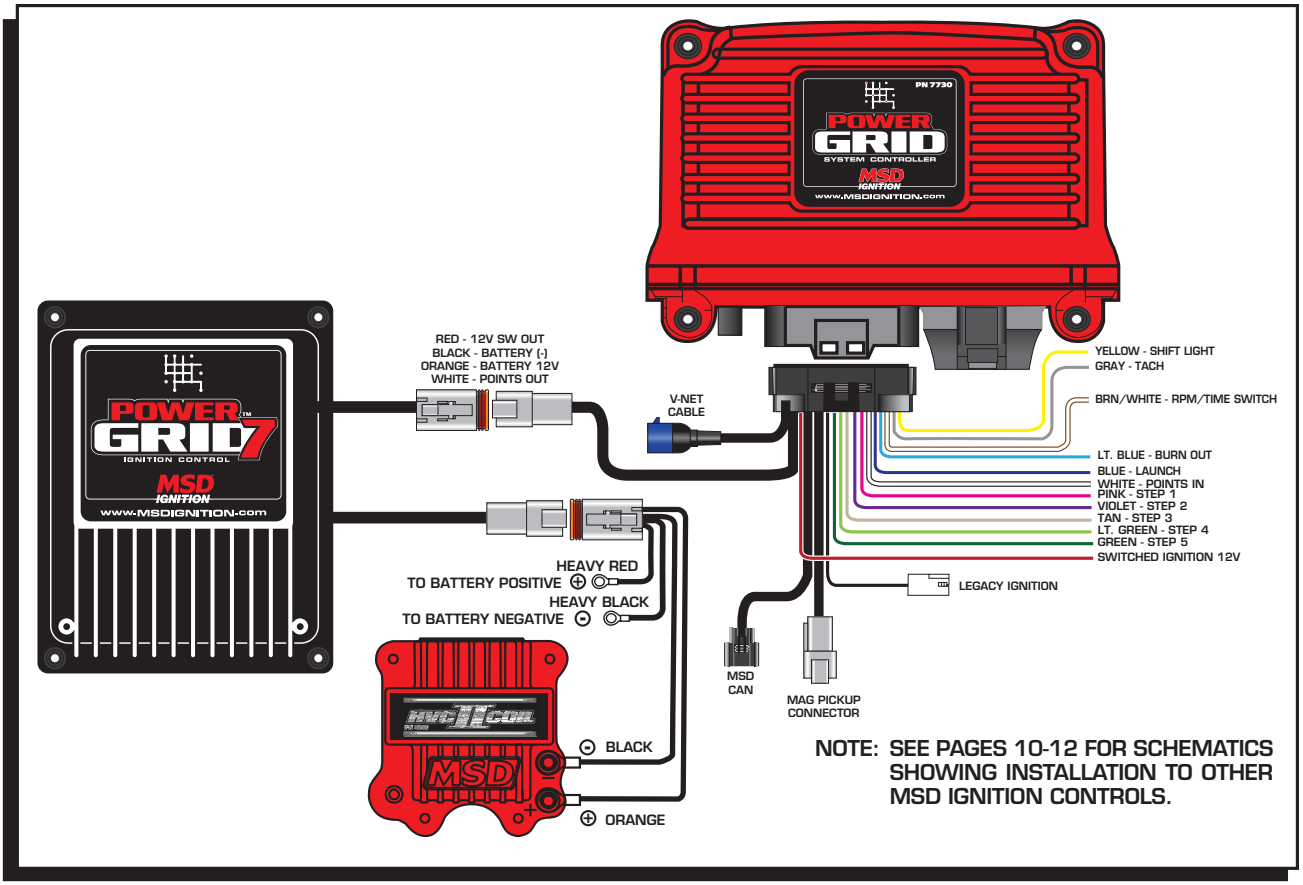

Figure 2 Wiring the Power Grid.

MOUNTING

The Power Grid System Controller should be mounted in a sturdy, dry location that does not expose the unit to extreme heat. It is designed to be mounted on top of the PN 7720 Power Grid Ignition. Be sure to mount the Power Grid System Controller so the USB connector and Micro-SD card are accessible. The unit comes with thread-turning (aka. Self-tapping) screws that will cut into the walls of the pre-drilled holes on the top corners of the Power Grid-7. If the Power Grid System Controller, PN 7730 / PN 77303, is not being mounted on top of the Power Grid-7 the unit should be secured with the supplied hardware.

Figure 3 Mounting

Note: Insecure or otherwise improper mounting of the unit could result in damage or failure. Always make sure the unit is dry, avoids unnecessary excess vibration, and is not exposed to extreme heat.

MSD VIEW

The MSD View software controls all of the functionality of the Power Grid System Controller. The following information gives a brief explanation of each function or feature in the system as well as the settings that control it. While using the program, hover the mouse over a Function to display a brief explanation.
When the system controller is connected to a PC via USB MSD View will automatically recognize it and load the settings stored in it.

Note: Ensure that MSD View is installed on the PC prior to connecting the Power Grid Ignition Controller.

INSTALLATION OF THE VIEW SOFTWARE

1. Insert the installation CD Rom into the CD drive, wait up to 30 seconds, the CD will auto run, IF THIS DOES NOT OCCUR:
   Locate and open the CD Drive.
   Double click on the Setup file.
2. Select “Click here to Install Version X.XX.”
3. Once loaded, your monitor will have an MSD View X.XX logo. Accept the agreement. Drive the installation to your program files folder, press the enter key. The installation will complete, select OK.
4. A window will be opened with two aliases, double-click on the MSD View alias to launch the software.
5. Connect the system controller via USB. If the software does not recognize the controller and auto-connect, manually select the Power Grid in the popup window and click Connect.

Note: The View Software can be downloaded from www.msdignition.com.

SAVES AND TRANSFERS

Using the Power Grid System Controller changes are in real time if the computer is linked to the ignition. You can create and save numerous files on your PC and transfer them for testing purposes or to use for various locations and conditions.

The following instructions will go through a general description of the use of the Power Grid System Control following the tab system that you will see in the software.

PROGRAMMABLE FEATURES AND SETTINGS:

GENERAL

These are the most basic settings of the system. They will need to be set the first time the system is installed in a vehicle.

Number of Cylinders: This tells the system the number of cylinders. Must be selected correctly for proper timing and rev limiting.

Maximum Timing Reference: This is the advance that is set with a locked distributor or crank trigger. The system controller will use this as its base for all timing marks and can never advance past the pre-set point. It is critical that this advance is set properly.

Note: When using EFI the max timing reference and the main timing must be the same number.

Number of Gears: This tells the system the number of gears used in the transmission. This information can be used a variety of ways depending on the functions and modules used in the system.

Ignition Type: Found under General Settings, this option allows a user to select between using the Power Grid Ignition, PN 7720, or one of the MSD legacy ignitions.

DIAGNOSTIC LED INDICATOR

The LED is located on the far right side of the Power Grid Controller, next to the USB/SD Card cover. This LED allows the user to quickly determine if; all systems are normal, data is being recorded or if there are any active Alerts.

OFF	– Unit is turned off
ORANGE for 1 Second	– Power ON LED test
ORANGE for 10 Seconds	– ARC Module (PN 7761) has been connected (*see notes below)
ORANGE - blinking	– Data recording in process
GREEN - blinking	– Input (crank pickup or Points wire) triggered; below 500 rpm, no active Alerts
RED - blinking	– Input (crank pickup or Points wire) triggered; below 500 rpm, 1 or more active Alerts
GREEN - solid	– Running; above 500 rpm, no active Alerts
RED - solid	– Running; above 500 rpm, 1 or more active Alertys

***NOTE:** Many racing organizations (NHRA, IHRA, etc.) use an MSD Power Grid test tool that can check for the following settings:

1. **ARC Module** - indicates if an ARC module (PN 7761) has been connected (Holds connection indicator for the next 60 minutes of engine run time after the ARC codule has been disconnected)
2. **Safety Limiter** - the RPM that the engine will be limited to if it exceeds the **Safety Run Time** limit.
3. **Safety Run Time** - the run time, in seconds, after the Launch input (Blue wire) has been released. Activates the **Safety Limiter** when timer reaches 0 seconds.
4. **Part Numbers** - lists the part numbers of any MSD compatible module connected to the Power Grid system.
5. **Over Boost** - Boost pressure ignition cut off value of the MSD Boost Controller (PN 7763). If connected.

CAMSHAFT SYNCHRONIZATION

This is used only in applications where the individual cylinder timing is going to be used. The fiber optic connector communicates when the #1 cylinder fires. With this information, the controller knows which cylinder is being fired allowing for the individual cylinder timing capabilities. Only the MSD Fiber Optic Inductive Pickup Kit, PN 7555 will work for this system. Cam-sync's cylinder #1 identification is also used in the data acquisition recordings.

GEAR SHIFT

In the Gear Shift selection the user can set items such as launch and shift delay so that the system will not have a false shift detected immediately after launch or a shift should there be an rpm drop for any other reason.

Launch Delay: The amount of time in seconds after the launch that the system will ignore an rpm drop to prevent false shift detection. This can be set from 0.00 to 10.00 in .01 second increments.

Shift Delay: The amount of time in seconds after sensing a shift that the system will ignore an rpm drop to prevent false shift detection. This can be set from 0.00 to 10.00 in .01 second increments.

1->2 Shift: By setting the rpm drop the user tells the system how to sense when the car is being shifted during a run. The setting is controlled by a drop down list with rpm from 200 – 1,500 or can be set to be activated by a Step Retard wire instead. The number of shifts that is shown is controlled by the number of gears the system is set to in the Settings – General tab.

SHIFT LIGHT

Using the Shift Light controls opens a variety of options designed to help make sure the light is exactly as desired. The shift light setting can be set by single rpm increments. In this control tab, each value can be entered to the exact rpm desired and the light's intensity can be adjusted so that it is visible without blinding. The number of gears that appear on this tab will be auto-populated by the program after the number of gears is set in the general settings. This can also be used with a relay as a transmission shifter. The maximum current for this circuit is 3 amps.

Light Intensity: This percentage setting controls brightness of the shift light for easy use in both day and night racing. If being used for anything other than shift light control, the intensity must be 100%.

Power-On Test: Normally set to on but can be turned off if desired. The power-on test turns the shift light on as soon as the controller receives power to show that the circuit is complete and working.

Launch Light: The Shift Light will turn on if the engine rpm is between the launch low limit and the launch high limit. The light will blink if rpm is above the launch high limit.

Gear 1-5: A setting can be adjusted for each individual shift. To do this enter the engine RPM that should turn the Shift Light ON for each gear.

OUTPUT SWITCH

When the switch is activated it will supply ground to a circuit in order to turn an item on by time and/or rpm. The circuit can maintain up to 2 continuous amps. If more than 2 amps is needed a relay is recommended, PN 8961.

To activate or deactivate this circuit the system must see a programmed time and/or rpm setting which is programmed in the Settings – Output. Using both On and Off values will set a window to control the switch. The output will only be activated while within the set window and will be deactivated as soon as one or both sides of the windows are not met. All parameters must be met for the output switch to be activated. For example, if values are entered for both RPM On and Activation Point (timed on) then both of those values must be reached before the switch is activated. The rpm function becomes active and the time function begins counting after the Dark Blue launch wire is released.

Note: If using the time activation function a duration MUST be set above 0.00 or the switch will not be activated by time.

IGNITION TIMING

The user can set the timing from 0 - 60° BTDC. However, actual timing will never advance past the maximum timing reference nor will the timing retard more than 30° from the max timing reference. MAX and MIN timing lines will be displayed for convenient reference in the main engine timing tab. (Those lines can be turned off by unchecking them in the upper left column.)

Note: When using EFI the max timing reference and the main timing must be the same number.

Engine timing cannot exceed the maximum timing reference. In order to advance timing, the main timing map must be set below the maximum timing reference. I.E. If the crank trigger is at 40° and the main timing map is set to 35° there will be up to 5° of advance available.

ENGINE TIMING

Using MSD View software, an entire timing curve can be mapped. The map specifies the actual engine timing. The Power Grid will retard the input trigger to obtain the correct engine timing. The maximum timing reference must be set properly for correct engine timing. These maps include changes in 50 rpm increments and timing changes down to 0.1 degrees. A maximum of 30 points can be set per map.

This map will show all engine timing maps that are drawn based on rpm values such as timing curves per gear. The information for all of these maps is accumulative in the software. In order to edit a particular timing curve the user must go into the proper tab per function.

Start Retard: As part of the general engine timing curve, users can specify a start retard. While each engine responds differently, the typical recommendation for a start retard is to to pull out 10° from 0 - 600 rpm. A variety of other ideas can be applied to a start retard, including ramping timing in as engine rpm climbs. Use of such techniques is at the discretion of the user.

GEAR CURVES

This program provides the ability to modify the timing curve for each gear. One curve can be created for each gear, up to six, from 0 – 15,000 rpm in 0.1° increments for every 50 rpm. You can program up to 30 different points on each Gear Curve. The number of gears shown and how a shift is detected are dependent on the selected values in the Settings tab.

In the Ignition Timing – Gear Curves tab, an individual curve is plotted for each gear. Each change made for the gear curves references off of the Main Timing curve are set in the Engine RPM tab, not off of the max timing reference. Gear curves are NOT cumulative; i.e. Retarding 1° in 2nd gear does not affect 3rd gear settings.

Note: The gear curves are independent of each other. In order to make progressive changes, one gear's starting point must match the final timing of the previous gear's curve. Leaving a gear curve unedited will result in normal timing for that gear regardless of other gear curves ahead of or behind it.

INDIVIDUAL CYLINDER TIMING

Note: To control ICT an inductive pickup, PN 7555, is required.

To accomplish timing changes per cylinder the engine's firing order must be entered first. Firing order is programmed in the tab Ignition Timing – Individual Cylinder – Firing Order by numbering the order into the Value column. Many common firing orders can also be imported from a database within the software; to do so simply go to File Import and open the "firing_order" folder where an engine description can be selected. Similarly, if an engine uses a firing order not included in these options the settings can be exported to be saved in the same file.

After the correct firing order is entered individual cylinder timing can be created by editing rules. Up to 10 rules can be entered to control various aspects of timing for a single cylinder at a time. Each rule has six (6) values that can be controlled; Cylinder, Retard/Advance, Timing, From Gear, Delay, and Ramp Time. To make a rule the first four control values must be entered, Delay and Ramp Time may be left at the default of 0 if desired. When timing is changed on an individual cylinder, in order to bring the cylinder back to original timing an equivalent amount of timing must be used to offset (DO NOT use 0°). I.E. If cylinder two is retarded by 3° in RULE 1, in order to put the timing back in the cylinder must be advanced in a later rule by 3°.

Cylinder: Double click this value to select the cylinder for which timing is to be altered.

Retard / Advance: Enter whether timing will be Retarded or Advanced. After using this option timing changes will always be entered as a positive number.

Note: Engine timing cannot exceed the maximum timing reference. In order to advance timing, the main timing map must be set below the maximum timing reference. I.E. If the crank trigger is at 40° the main timing map is set to 35° there will be up to 5° of advance available.

Timing Change: Enter the amount of timing that is to be retarded or advanced. This value will always be a positive number, regardless of whether advance or retard is desired.

From Gear: This setting determines from which gear the timing change will become active. If gear one is selected the timing change will be active at all times unless a delay is used.

Delay: This is the time, in seconds, that will pass prior to initiating the timing change after the proper gear change. This setting defaults to 0.0 but can be taken up to 5.0 seconds. If a timing change is desired during an entire run, but not other times the engine is running, this setting should be entered as 0.1 sec.

Ramp Time: The amount of time it takes for the Individual Cylinder Timing to be fully engaged. During this time the controller will ramp the timing change from the starting point to full timing.

Note: Changes made in Individual Cylinder Timing are cumulative. If a cylinder's timing is to be altered for a duration of time two rules must be made, one to initiate the change and another to reverse the change at the appropriate time.

LAUNCH RETARD (TIMING BY TIME)

This function allows a user to set an engine timing curve based on the run time from launch (release of the dark blue wire). It can be programmed from 0° to 20° in 0.1° increments. Up to 30 trace points can be set per 0.01 sec. across the available 10 seconds. When the Launch wire is active, the retard value is the placement of the first dot. When 12 volts are removed from the Dark Blue wire the engine timing will follow the prescribed curve added to the base timing set at the engine RPM map.

STEP RETARDS

There are five step wires that control each of the corresponding step retards. These retards can be set so that they are not active until a specified rpm is reached even if the wire receives voltage. Using this system a step can activate as soon as the trigger wire receives 12 volts or after the engine reaches a specific rpm with 12 volts at the trigger wire. Once the retard is activated, timing can be changed in a single step or be ramped in over a period of time. The retard can also be turned off in a single step or ramp after a prescribed time after power is removed.

Step Retard Activation Wires

Step 1	Step 2	Step 3	Step 4	Step 5
Pink	Violet	Tan	Light Green	Green

Note: These wires can also be used as Gear Select Indicators. See page 5.

Note: The Step-5 wire may be used as a Spool Rev Limiter. When using this wire for a retard and not a Spool Rev Limiter, the rev limit setting must be set above the max rev setting.

Activation through Wiring: Each step is activated by applying 12 volts to the corresponding wire. When multiple step retards are enabled at the same time the retard amounts are added together. The maximum retard allowed by the system is a total of 30° (including other retard amounts from a launch, boost, gear retard, etc).

Activation through RPM: Each step retard can also be activated through rpm. In order to achieve this, 12 volts must still be applied to the corresponding step retard, and an rpm must be entered in the respective step retard control. When 12 volts is applied, the retard will not activate until the rpm value is reached. Note that the retard will remain active until the rpm drops back below the set value. The step retard is added to all other retards in the system, including other active steps until it is deactivated.

Each of the five step retards has its own tab under the Ignition Timing – Step Retard tab. Within the individual tabs there are controls for the step retard.

Timing Retard: This is the amount of timing that will be retarded while this step is active. The timing can be adjusted in 0.01° increments.

Engine RPM: When this setting is used the engine must be above the prescribed RPM before the step retard will be activated.

On Ramp: The amount of time it takes for the step retard to retard the full amount. During this time the controller will ramp the timing retard from the starting point to full step retard.

Off Delay: This feature will set a time based delay to deactivate the step retards. The Off Delay is designed to keep the timing retarded after the wire is deactivated. This setting defaults to 0.0 sec but can be taken up to 5.0 sec by the user.

Off Ramp: The amount of time the system takes to turn the step retard off once power is removed from the step wire and any delay is complete. During this time the controller will ramp the step retard out.

Note: If you prefer to activate the step retards through the activation wires alone without considering rpm the setting for rpm should be left at the default of 0.

SHIFT RETARD

Using MSD View, a retard can be implemented momentarily to help maintain traction immediately after a shift. To do this, simply enter the amount of timing retard desired and the length of time the retard should be active for each shift. Whether using an rpm drop or a step retard activation wire for a trigger, as soon as the system detects a shift it will retard the timing for the prescribed amount of time.

REV LIMITER

A variety of different rev limits can be programmed per individual vehicle needs. The actual rev limiter will never exceed the maximum rev limiter.

Burnout Rev Limiter: This limit is activated when 12 volts are applied to the Light Blue wire. It is adjustable from 1,000 to 15,000 rpm. Note that the Slew Rev Limiter is disabled by the Burnout Limit.

Launch Rev Limit: This limit is activated when 12 volts are applied to the Dark Blue wire. It is adjustable from 1,000 to 15,000 rpm.

Latching: When this setting is enabled engine rpm must be below 7/8 of the launch limit setting while 12 volts is applied to the Dark Blue wire to engage the Launch Limiter. This allows clutch cars to wire the Dark Blue wire directly to the clutch switch without the need to use a relay. If Latching is disabled, the Launch Rev Limiter will be engaged anytime the Dark Blue wire receives 12 volts (such as during each shift) regardless of engine rpm.

Maximum Rev Limiter: This is the overrev limit to help protect the engine from damage.

Spool/Step 5 Rev Limiter: This program gives turbo cars a fourth rev limit to help the engine spool the turbo prior to the launch. It is active when 12 volts is applied to both the Light and Dark Blue wires at the same time or when using the Step 5 retard wire. (The Step 5 wire can allow for activating the Spool rev Limiter without activating the line-lock.) It is adjustable in 50 rpm increments from 1,000 to 15,000. Default is 12,000 rpm.

Safety Run Time Rev Limiter: Using two settings a safety limiter can be activated in case of incident. If for any reason the engine is still revving after the set amount of time since the launch limiter is released, this feature will lower the rev limit to a user specified rpm over 2 seconds. This will help anytime the throttle is open much longer than it should be, such as a stuck throttle linkage or an accident.

Users have two options to activate the Safety Run Time countdown; the Launch limiter, or the Safety RPM Start. In either case the Dark Blue wire must be activated so that time down can start upon its release. Many users will activate the Safety countdown by bringing the engine up on the limiter. Users who do not wish to use the launch rev limiter can activate the safety run time countdown by taking the engine rpm equal or higher than the Safety RPM Start setting. This setting act only as a countdown activator and has no rev limiting ability.

DATA ACQUISITION

The data recorder on the Power Grid System Controller comes with a 2GB micro SD card which will easily hold more than an entire event's worth of data. Within the settings for data acquisition on the system controller there are four tabs that provide options for when and what data is recorded. If a new micro-SD card is needed or wanted for any reason it is important to get a Class 6 or higher at the minimum, NOT all micro-SD cards will work. If there is question as to whether an SD card will work test recording should be done prior to a run.

The Power Grid System Controller will also easily send the data it records to compatible Racepak data acquisition systems. To connect the two systems simply plug the included VNet connector into an available space on the on the Racepak system. To be compatible the user must have a Racepak Data VNet Logger using DatLink Software v3.7.4 or higher. Default settings will send 13 channels of data to the RacePak system.

Settings:

This tab has two possible adjustments. The first setting allows a user to turn the data recording off, if desired. The second control tells the system what to do if the SD card is full. This setting allows the system to either stop recording or begin to write over data with the lowest recording name. By default the system is on and will overwrite once the memory is full.

Channels:

Each available data trace within the PN 7730 / PN 77303 is listed in this tab. Each trace can be disabled individually in order to remove unneeded traces and generate smaller files. The Ignition In channel and the Ignition Out channel are high resolution and they generate the most amount of data at high engine rpm.

Start Recording:

The settings here tell the controller when to start recording data so that only useful information is stored. The recorder can be started by RPM alone or by adding a function to the RPM. For example, the default setting starts recording as soon as the Launch Rev wire is activated and the RPM is above 3,000.

Stop Recording:

In this tab the user controls when to stop recording. The recording can be stopped by reaching a lower rpm limit or a trigger such as a step wire signal. When stopping recording only one of these setting values must be triggered. There is also a setting to keep recording for some time after the trigger to ensure that all useful data is captured. Finally, there is a user set maximum recording time limit to ensure recording stops even if the system is not triggered for any reason.

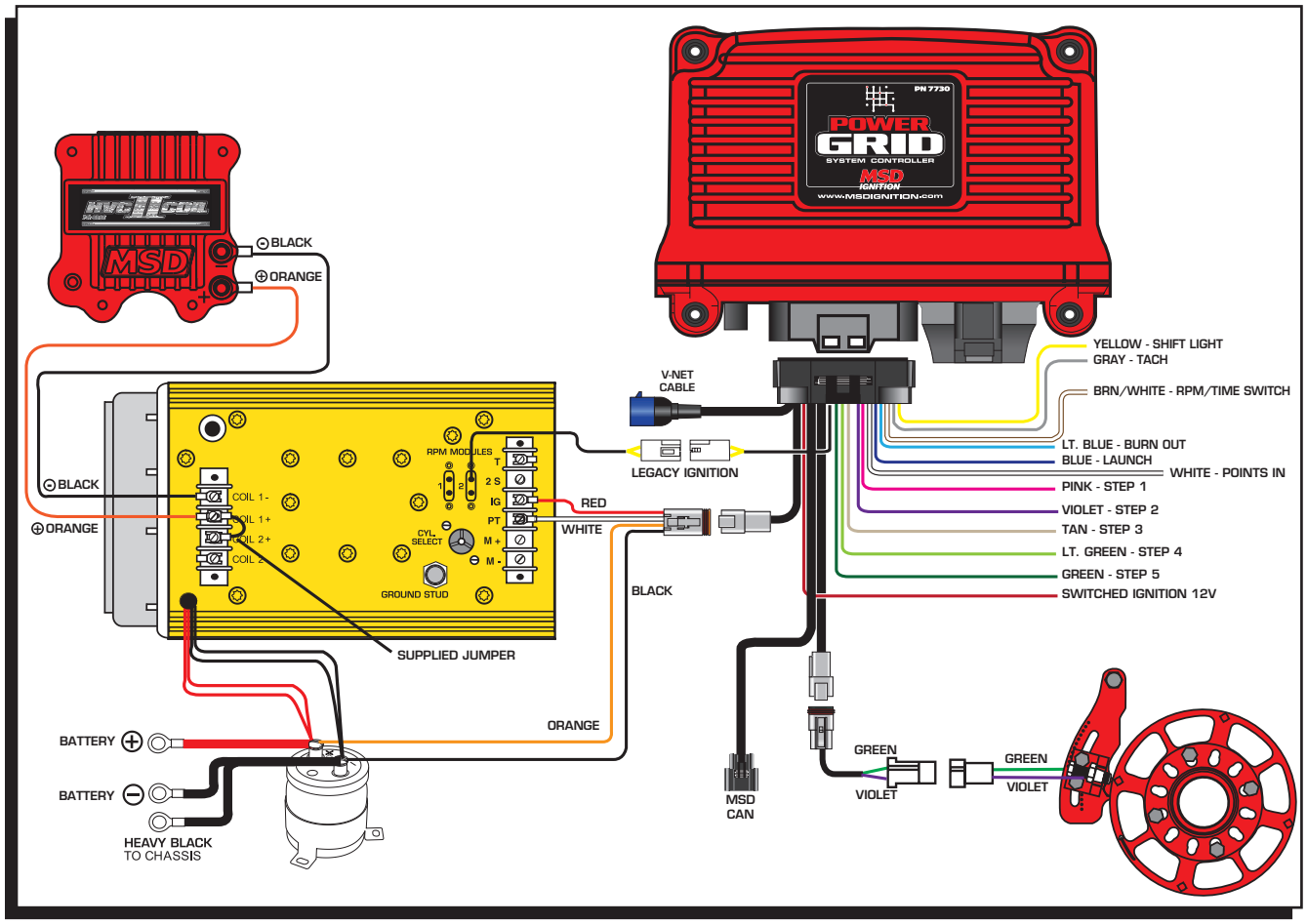

Figure 4 Wiring the Power Grid Controller to MSD 8-Plus.

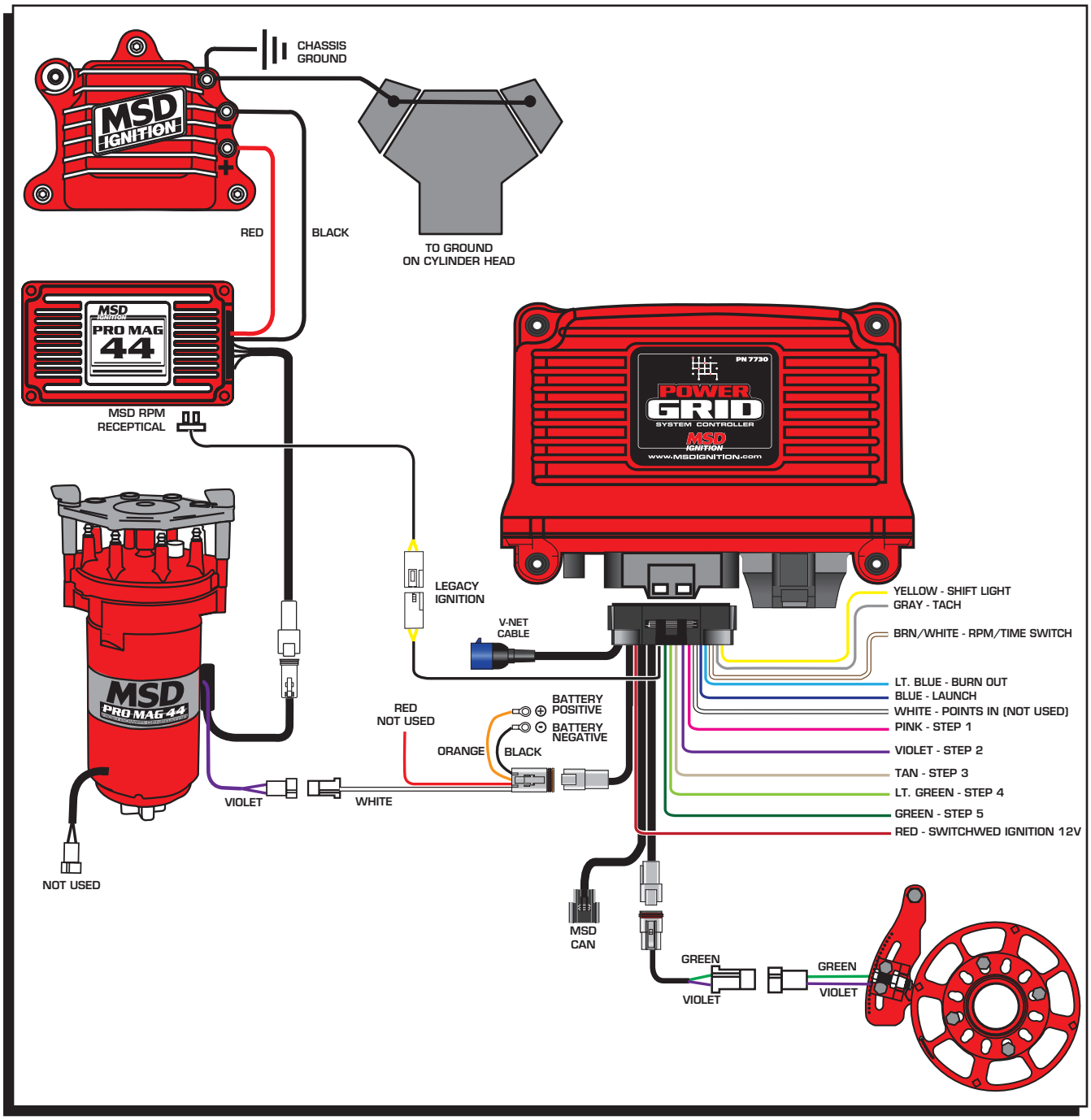

Figure 5 Wiring the Power Grid Controller to Pro-Mag.

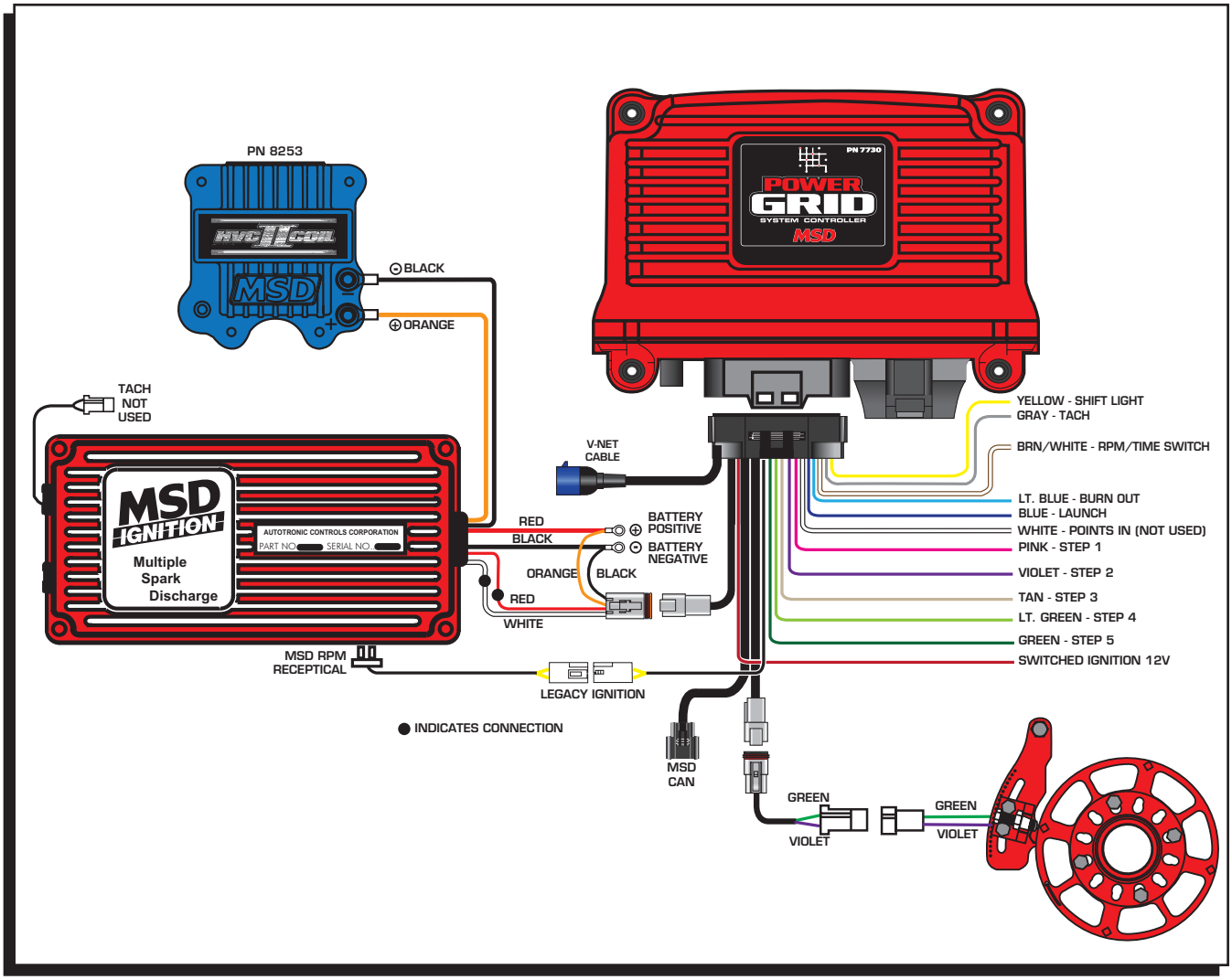

Figure 6 Wiring the Power Grid Controller to MSD 6AL.

ALERTS:

There are a variety of alerts that can arise in the Power Grid System Controller. If there are any errors or other causes of alert, the LED on the front of the controller will show red. Any time the red light shows the alerts should be checked so that errors can be corrected. By default, a pop-up box will appear as soon as an alert is registered. The pop-up window has a check box to disable the pop-ups if desired.

The alerts window can also be opened manually two ways. On the bottom bar of the program window pane there is an alert counter that will show the number of alerts present. A single click on the alert counter at any time will open the alert window. The alert window can also be opened by going to the View menu on the task bar.

Alert ID	Alert Text	Alert Activation Conditions	Description
1	Low Battery Voltage	EngineRPM > 500 AND Vbatt < 9.0 for 5 seconds	This alert activates when there is low battery voltage with engine RPM. Make sure the 7730/77303 is properly connected to battery voltage.
2	High Battery Voltage	Vbatt > 18.0	This alert activates when there is high battery voltage. Make sure the 7730/77303 is properly connected to battery voltage
3	Crank Sensor Voltage Low	Weak Crank Sensor	This alert activates due to weak crank sensor signal. Make sure the crank sensor is properly located according to the installation instructions.
5	No CAM Sync	Engine RPM > 300 AND Individual Cylinder Timing Rule Enabled AND no CAM Sync pulse detected	This alert activates when individual cylinder timing has been configured and no optical CAM sync signal is detected. Make sure the optical CAM sync cable is properly connected to the 7730/77303.
6	12V Output Shutdown	Current > 3A for 10 ms	This alert activates when there is too much load on the 12V bus that is used to power accessory modules. Make sure there are no short circuits and the 12V bus is not overloaded.
13	Low SDcard Storage	SDcard present AND SDCard Free Storage < 100 MB	This alert activiates when an SDCard is present and there is less than 100 MB of storage available on the card. Remove some data from the SDCard to remove this alert.
14	SDcard Initialization Error	SDcard present AND Error Initializing SDCard	This alert activates when the 7730/77303 cannot initialize the SDCard. Make sure you are using the MSD factory supplied SDCard.
15	SDcard Write Error	SDcard present AND Error reading to SDcard	This alert activates when the 7730/77303 is unable to write to the SDCard. Make sure you are using the MSD factory supplied SDCard.
16	SDcard Read Error	SDcard present AND Error writing to SDcard	This alert activates when the 7730/77303 is unable to read the SDCard. Make sure you are using the MSD factory supplied SDCard.
17	SDcard Missing	SDcard not present AND data acquisition enabled AND EngineRPM > 0	SDcard not present AND data acquisition enabled AND Engine is running.
18	Data Acquisition Memory Overflow	DAQ memory buffer overflow	This alert activates if the interal data acquisition memory buffer overflows. This will cause a recording to end prematurely. Try deactivating some data acquisition channels. Make sure you are using the MSD factory supplied SDCard.
19	12V Output Overcurrent	Current > 2A for 10 ms	This alert occurs when there is too much load on the 12V bus that is used to power accessory modules. Make sure the 12V bus is not overloaded.
20	EEPROM CRC Error	Unable to read MFF data at startup after 3 attempts	This alert occurs if the 7730/77303 is unable to recover configuration data from its internal EEPROM memory. The 7730/77303 will attempt to recover a back-up stored in its internal Flash memory. Verify your configuration settings are correct. If this error occurs frequently, contact MSD tech support for an RMA.
21	EEPROM Write Error	Unable to write any data to EEPROM after 3 attempts	This alert occurs if the 7730/77303 is unable to write data to its internal EEPROM memory. If this error occurs frequently, contact MSD tech support.
22	Data Acquisition Memory Protection	DAQ memory buffer reaches 90% utilization	This alert activates if the internal data acquisition memory buffer reaches a critical limit. This will cause some data acquisition channels to be automatically disabled. Try deactivating some data acquisition channels. Make sure you are using the MSD factory supplied SDCard.

TECH NOTES

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Service

In case of malfunction, this MSD component will be repaired free of charge according to the terms of the warranty. When returning MSD components for warranty service, **Proof of Purchase** must be supplied for verification. After the warranty period has expired, repair service is based on a minimum and maximum fee.

All returns must have a Return Material Authorization (RMA) number issued to them before being returned. To obtain an RMA number please contact MSD Customer Service at 1 (888) MSD-7859 or visit our website at www.msdperformance.com/rma to automatically obtain a number and shipping information.

When returning the unit for repair, leave all wires at the length in which you have them installed. Be sure to include a detailed account of any problems experienced, and what components and accessories are installed on the vehicle. The repaired unit will be returned as soon as possible using Ground shipping methods (ground shipping is covered by warranty). For more information, call MSD at (915) 855-7123. MSD technicians are available from 7:00 a.m. to 5:00 p.m. Monday - Friday (mountain time).

Limited Warranty

MSD warrants this product to be free from defects in material and workmanship under its intended normal use*, when properly installed and purchased from an authorized MSD dealer, for a period of one year from the date of the original purchase. This warranty is void for any products purchased through auction websites. If found to be defective as mentioned above, it will be repaired or replaced at the option of MSD. Any item that is covered under this warranty will be returned free of charge using Ground shipping methods.

This shall constitute the sole remedy of the purchaser and the sole liability of MSD. To the extent permitted by law, the foregoing is exclusive and in lieu of all other warranties or representation whether expressed or implied, including any implied warranty of merchantability or fitness. In no event shall MSD or its suppliers be liable for special or consequential damages.

*Intended normal use means that this item is being used as was originally intended and for the original application as sold by MSD. Any modifications to this item or if it is used on an application other than what MSD markets the product, the warranty will be void. It is the sole responsibility of the customer to determine that this item will work for the application they are intending. MSD will accept no liability for custom applications.

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