INSTALLATION INSTRUCTIONS

MSD LS-1/LS-6 Controller for Carbureted and EFI Gen III Engines
PN 6010

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 – Ignition Controller, PN 6010
1 – Pro-Data+ Software CD
1 – Harness
1 – Parts Bag
6 – Timing Modules

Optional Accessories
Hand Held Monitor, PN 7550
Harness for Intake Mounting, PN 60101
Factory EFI Harness, PN 8886

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 or non-resistor spark plugs cannot be used with an MSD Ignition Control.

CARBURETOR
The PN 6010 Ignition Controller is designed for GM Gen III engines that have been retro-fit with an intake manifold and carburetor. The Controller can also be used in stock, EFI applications, by using accessory Harness PN 8886. The factory coils or MSD Coil, PN 8245, must be used. The Controller is supplied with a wiring harness that connects to the factory connectors for a simple installation. A shorter harness designed for mounting the unit on the intake manifold is available as PN 60101.

EFI
This Controller can also be used in stock, EFI applications, by using accessory Harness PN 8886. This Harness allows the PN 6010 Controller to tap into the sensor signals without interrupting the OEM ECU. The ECU and coils operate as normal while the PN 6010 controls the timing and rpm.

OPERATION
The MSD Controller offers several programmable features that allow rpm and timing adjustments. This can be achieved through the supplied Pro-Data+ software via a PC or with the optional Hand Held Programmer, PN 7550. Timing adjustments and selections can also be made with plug-in modules. Software installation, operation and the programmable features of the Controller are explained in detail in this document. More information can be found in the Pro-Data+ Software Help section.

MOUNTING
The Controller is designed to be mounted under the hood or on the firewall. Do not mount the unit near exhaust, upside down or seal the base as that leaves no way for any moisture to escape the unit. Four vibration mounts are supplied to mount the unit. Find a suitable location, confirm that all of the wires reach their connections. Mark the mounting hole locations using the unit. Drill the holes with a 3/16" bit.

WIRING
All of the wiring, except four wires, are routed into factory style connectors to ensure an easy installation. The wire descriptions follow in the chart on pages 2 and 3.

		LOOSE WIRES
BLACK/GRAY	Pin-A/B	Ground. Connect to a ground source, such as the engine or battery negative.
PINK	Pin-C	On/Off wire. Connect to a switched 12 volt source.
YELLOW		Tach Signal. Provides a 12 volt square wave signal.
		CRANKSHAFT SENSOR, 3-PIN
ORANGE/YELLOW	Pin-A	Crank Sensor Signal
BROWN	Pin-B	Sensor Ground
PINK	Pin-C	12 Volt Supply
		CAMSHAFT SENSOR, 3-PIN
BROWN/WHITE	Pin-A	Cam Sensor Signal
BROWN	Pin-B	Sensor Ground
PINK	Pin-C	12 Volt Supply
		MAP CONNECTOR, 3-PIN (OPTIONAL)
BROWN	Pin-A	Sensor Ground
LT. GREEN	Pin-B	MAP Sensor Signal
ORANGE	Pin-C	5 Volt Supply
		COIL CONNECTOR, CYLINDERS 2, 4, 6, 8
BLACK	Pin-A	Ground
RED/GREEN	Pin-B	Coil-2
BROWN/GREEN	Pin-C	Coil-4
BROWN	Pin-E	Sensor Ground
WHITE/BLUE	Pin-F	Coil-6
VIOLET/BLUE	Pin-G	Coil-8
PINK	Pin-H	12 Volt Supply
Note: Pin-D is not used		
		COIL CONNECTOR, CYLINDERS 1, 3, 5, 7
BLACK	Pin-A	Ground
RED	Pin-B	Coil-7
GREEN	Pin-C	Coil-5
BROWN	Pin-E	Sensor Ground
LT. BLUE	Pin-F	Coil-3
VIOLET	Pin-G	Coil-1
PINK	Pin-H	12 Volt Supply
Note: Pin-D is not used		

2-PIN CONNECTOR, ACCESSORIES		
PINK	Pin-A	Step Retard. When 12-volts are supplied, the Sw Retard is activated.
BLUE	Pin-B	Two-Step. When 12-volts are supplied, the RevLO rpm value is active.
16-PIN CONNECTOR WIRE LOCATION		
GRAY	Pin-A	Ground
PINK	Pin-B	12 Volt Supply
BROWN/WHITE	Pin-C	Cam Sensor Signal
RED/GREEN	Pin-D	Coil-2
BROWN/GREEN	Pin-E	Coil-4
WHITE/BLUE	Pin-F	Coil-6
VIOLET/BLUE	Pin-G	Coil-8
YELLOW	Pin-H	Tach
BROWN	Pin-J	Sensor Ground
LT. GREEN	Pin-K	MAP Sensor Signal
RED	Pin-L	Coil-7
GREEN	Pin-M	Coil-5
LT. BLUE	Pin-N	Coil-3
VIOLET	Pin-P	Coil-1
ORANGE/YELLOW	Pin-R	Crank Sensor Signal
ORANGE	Pin-S	5 Volt Supply

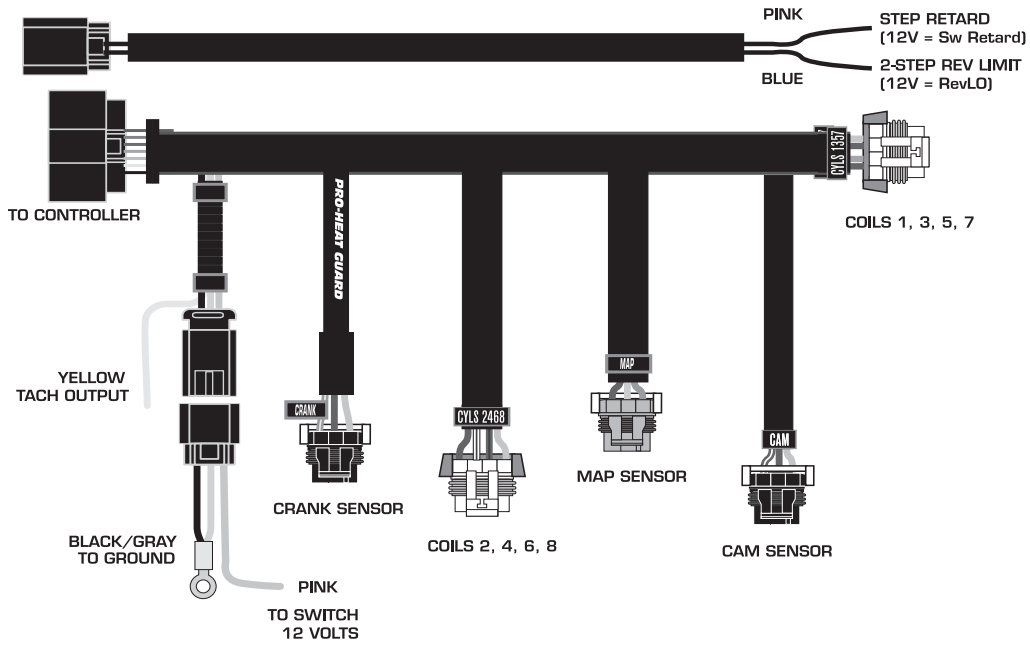

Figure 1 Wiring the MSD Gen III Controller.

PRO-DATA+

Installation of the Pro-Data+ Software

1. Insert the installation CD into your PC.
2. In Windows, click on Start then select Run.
3. In the box type, “D: Setup” and press Enter (or corresponding drive).
4. The screen will walk you through several steps.
5. Once loaded, your monitor will have an MSD Graph View logo. Click on it to open the software.
6. A program will open. Go to the upper left corner of the screen and click on File, then Open.
7. This will open a menu of part numbers. Select “6010”.
8. This will open another menu of versions. Highlight and open the “6010vxx.IGN” (xx determines the versions, such as 02). This will open the Pro-Data+ software for the Ignition Controller.

Saves and Transfers

Whenever a change is made to a program, it either must be saved to a file in your PC or it needs to be transferred to the Controller. You will notice that whenever you make a change to a program, the bullet next to the modified value will turn red. It will remain red until you save it to a file or to the MSD. There are two ways to save your files.

Save to MSD: This step will save any changes directly into the Controller. If you are only making one or just a couple modifications this works well.

Save to PC: This will save your changes to only show on the PC screen (indicated by a red bullet point next to any altered values). These modifications will not be active or saved until you save the file or transfer the information to the MSD.

You can create numerous files on your PC and download them for testing purposes or save programs you used at different races or events.

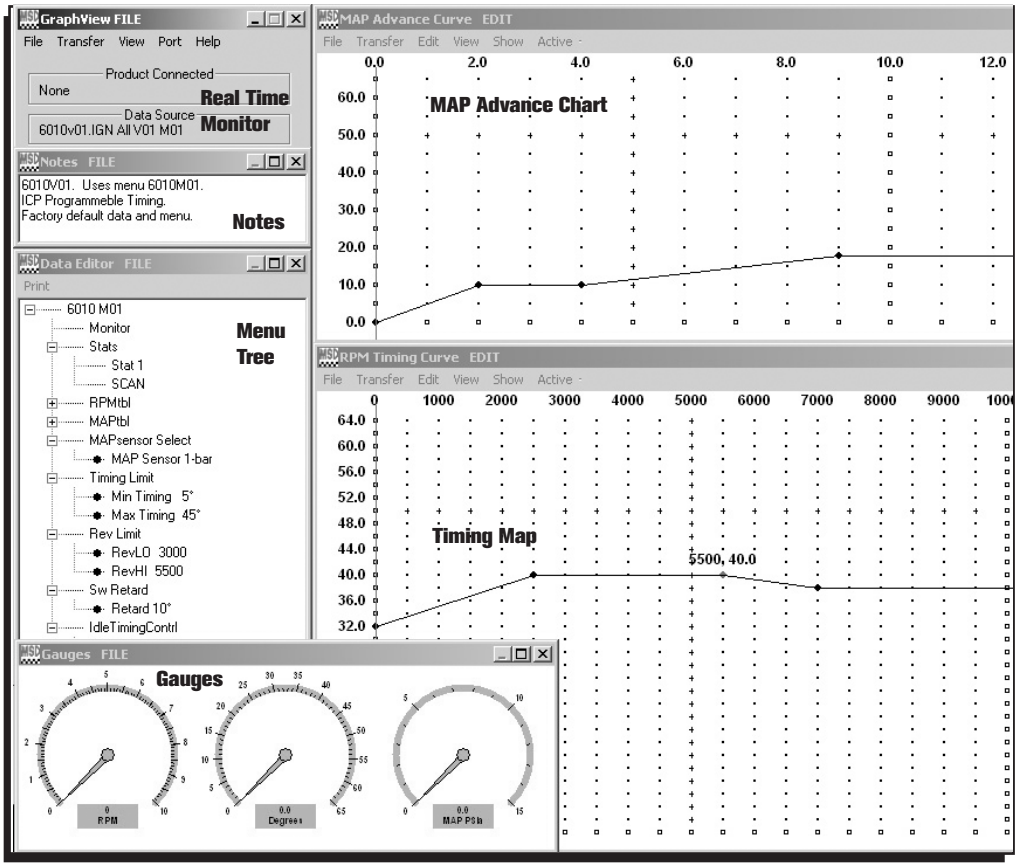

Figure 2 Pro-Data+ Screen and Programming Windows.

PROGRAMMABLE FEATURES

The following explains the programmable features of the PN 6010 Controller. The features are listed in the same order shown on the Data Editor list in the software. Note that the Help pull down menu of the software offers explanations of all the features

Note: STATS Stat 1 or SCAN are display features only used with the Hand Held Monitors, PN 7550, PN 7553.

RPM TABLE (RPMtbl)

Note: When plotting a timing curve by using the RPM Table or MAP Table through your PC, there must NOT be a Timing Module installed. Power-up with a module installed will override the saved timing plot.

This setting can only be modified from the RPM Timing Curve edit graph on the lower right of the screen. It can also be set with the Hand Held Monitor. The chart allows you to map out an entire timing curve, much like the centrifugal advance of a mechanical distributor.

To create a map, simply position the mouse at a point on the chart and right click to add a dot. By moving the mouse over this point and a left click, the dot changes to red (active) and you can move it around the map.

Note: The timing has minimum and maximum limits that are set in the Data Editor Menu. These settings include the cumulative value of any vacuum advance or retard as well as the Switch Retard if used.

MAP TABLE (MAPtbl)

Note: In order to take advantage of a vacuum advance or retard, a MAP sensor is required.

Note: When plotting a timing curve by using the RPM Table or MAP Table through your PC, there must NOT be a Timing Module installed. Power-up with a module installed will override the saved timing plot.

This is a Manifold Absolute Pressure (MAP) chart. It gives you the capability of modifying the timing curve based on manifold pressure (vacuum or boost). A curve can be created from the MAP Advance Curve graph on the upper right of the screen. It can also be set with the Hand Held Monitor. The chart allows you to map out an advance curve based on manifold vacuum (much like the vacuum advance on a mechanical distributor).

To create a map, simply position the mouse at a point on the chart and right click to add a dot. By moving the mouse over this point and a left click, the dot changes to red (active) and you can move it around the map.

Note: The timing has minimum and maximum limits that are set in the Data Editor Menu. These settings include the cumulative value of any vacuum advance or retard as well as the Switch Retard if activated.

MAP SENSOR SELECT

Allows the selection of a 2, 3, or 4-bar MAP sensor. This setting should be set to match the MAP Sensor in use: 2-bar (2-20 psia), 3-bar (2-30 psia) or 4-bar (2-45 psia). GM Part Numbers 12615136 and 12580698 are 2-bar sensors that connect to the MSD harness.

TIMING LIMIT

There are two adjustments that set the limits of ignition timing. These settings are meant as safety targets to keep the timing in check. Both the Minimum and Max values include any timing retards or advancements.

Min Timing This is minimum amount of timing advance. It is adjustable from 0°-20° BTDC with a default of 5°.

Max Timing This is the maximum amount of timing advance. It is adjustable from 25°-65° BTDC with a default of 45°.

REV LIMITS

The Controller allows you to program two rev limits; one for an over-rev safety and another that provides a low limit for use as a hole-shot, or two step limit.

RevLO This is the low rpm limit that is designed to be used while staged at the starting line. It is activated when the Blue wire is connected to 12 volts. When there is no 12 volts on this wire, the High Rev Limit is active. It is adjustable in 100 rpm increments from 2,000 - 12,500 rpm.

RevHI This is the high, or over-rev rpm limit. It is active whenever the Blue wire (RevLO) is **not** connected to 12 volts. It is adjustable in 100 rpm increments from 2,000 - 12,500 rpm.

STEP RETARD (Sw Retard)

A step retard will provide an adjustable amount of retard at a specific moment. This is ideal when using nitrous oxide. The amount of retard is adjustable from 0° - 15° in 1° increments. The retard is activated when the Pink wire is switched to 12 volts. Default is 10°.

IDLE TIMING CONTROL

This is defaulted at Control DISABLE. When switched to ENABLE, the controller will alter the ignition timing constantly to search for the best idle qualities.

Note: This is a function of an ECU controlled system and should be enabled when used with an OEM EFI application.

TIMING CURVE MODULES

The PN 6010 Controller is supplied with six modules that plug into the side of the housing (Figure 3). The modules are labeled Curve 1, Curve 2, etc. By plugging in one of the modules, the timing curve will be set with a pre-programmed curve upon power-up of the Controller. (Removing the module while the engine is running will not affect the timing curve.) Figure 4 shows each of the timing curves.

Note: Any updates that are made using the PC software will be overridden if a module is left plugged in during power-up of the Controller.

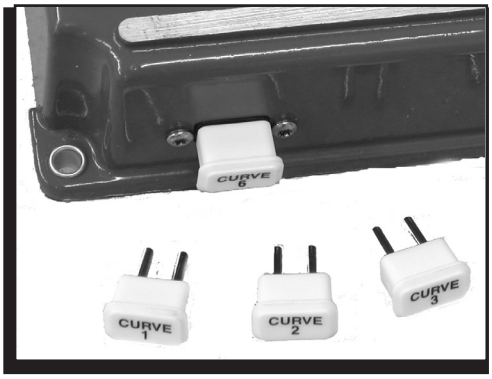

Figure 3 Timing Curve Modules.

Curve 1		Curve 2		Curve 3		Curve 4		Curve 5		Curve 6	
RPM	DEG	RPM	DEG	RPM	DEG	RPM	DEG	RPM	DEG	RPM	DEG
0	12°	0	12°	0	12°	0	15°	0	15°	0	22°
1000	20°	1000	22°	500	20°	1000	28°	800	30°	800	32°
2000	26°	1700	27°	1700	28°	2000	29°	2000	32°	4500	32°
4200	33°	4300	29°	4300	29°	4300	29°	4200	34°	6700	36°
6000	35°	6000	36°	6000	36°	6000	36°	6000	36°	6800	36°
6100	35°	6100	36°	6100	36°	6100	36°	6100	36°	6900	36°
PSIa	DEG	PSIa	DEG	PSIa	DEG	PSIa	DEG	PSIa	DEG	PSIa	DEG
0	6°	0	6°	0	6°	0	6°	0	6°	0	4°
6	6°	6	6°	6	6°	6	6°	6	6°	6	4°
7	6°	7	6°	7	6°	7	6°	8	6°	9	4°
8	0°	8	0°	8	0°	9	0°	10	0°	10	0°
29	0°	29	0°	29	0°	29	0°	29	0°	29	0°
32	0°	32	0°	32	0°	32	0°	32	0°	32	0°

Figure 4 Timing Curves from the Modules.

TECH NOTES

MSD INSTALLATION INSTRUCTIONS

TECH NOTES

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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