

# MSD INSTALLATION INSTRUCTIONS

## Pro Mag Power Grid Controller PN 8771

**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.msdisignition.com/registration/](http://www.msdisignition.com/registration/)

**Note:** The PN 8771 has a mandated NHRA Top Speed Limiter that is non-adjustable. This Speed Limiter retards the ignition timing at the NHRA authorized specifications for Top Fuel Dragster and Top Fuel Funny Car. This mandated speed limiter is not designed for higher rpm applications such as blown alcohol classes.

### Parts Included:

- 1 – Controller, PN 8771
- 4 - Vibration Mounts and hardware
- 6 - Gold Amp Terminals for Mag Pickup Trigger Cables
- 2 - Mag Pickup/Deutsch Connector Harness
- 1 – MSD View Software CD

### OVERVIEW

The Pro Mag Power Grid Controller (PGC) is designed specifically for use with the MSD Pro Mag 44 in top fuel racing applications. The Controller, PN 8771, provides racers the opportunity to control the ignition timing and rpm through the use of a PC. The PGC has dual outputs so it can be used with single or dual Pro Mag 44 Amp systems. It is recommended to use the Controller with a crank trigger system using non-magnetic pickups. (It will function with the Pro Mag's internal pickup, but is not recommended for the most accurate timing.)

Programming the Controller is achieved through proprietary MSD software called MSDView. The software can be installed on a Windows based PC with the supplied CD or can be downloaded at [www.msdisignition.com/support/ignition/](http://www.msdisignition.com/support/ignition/). This software allows users to create and store up to 12 different timing maps that can be loaded quickly as track conditions change. See page 2 for installation of the View software.



**Note:** A heavy duty micro-switch is required as a wide open throttle switch. The micro-switch should be mounted near the top of the pedal so it can react quickly. An air activated switch is not recommended unless it is a very fast responding design.

**IMPORTANT:** When the Power Grid Pro Mag Controller is installed, it is important to note that the ignition timing will be 5° retarded. This is due to the Controller's improved trigger pickup compensation circuit. The timing must be reset to your engine's specifications.

## MSD VIEW SOFTWARE INSTALLATION

The View Software is included and can be downloaded. It is also recommended to check [www.msddignition.com/support/ignition/](http://www.msddignition.com/support/ignition/) for any updates to the software by looking at the version number. To install the software follow the procedure below.

1. Insert the installation CD, MSD USB Flash Drive or download the software.
2. Click on the MsdView-4.X.X.exe file to install the software.
3. Once loaded, your desktop will have an MSD View and MSD Review icon. Click on the MSD View icon and accept the agreement. The installation will complete, select OK.
4. The View software will start automatically. The Controller does not need to be connected to run the software.
5. Plug your PN 8771 into your PC with supplied USB cable, MSDView will automatically find the PN 8771,
6. Click on PN 8771 to open the product interface.

## INITIAL CONNECTION - DRAGSTER OR FUNNY CAR

**IMPORTANT:** There is one important step that occurs when the software and unit are initially connected together. During the initial connection select either **Funny Car OR Dragster. (Figure 1)**

**Note:** Choose your application carefully because this setting will be locked into the unit and can only be unlocked by NHRA.

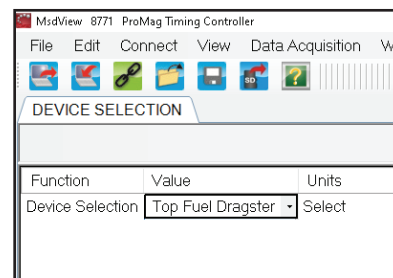


Figure 1 Product Selection.

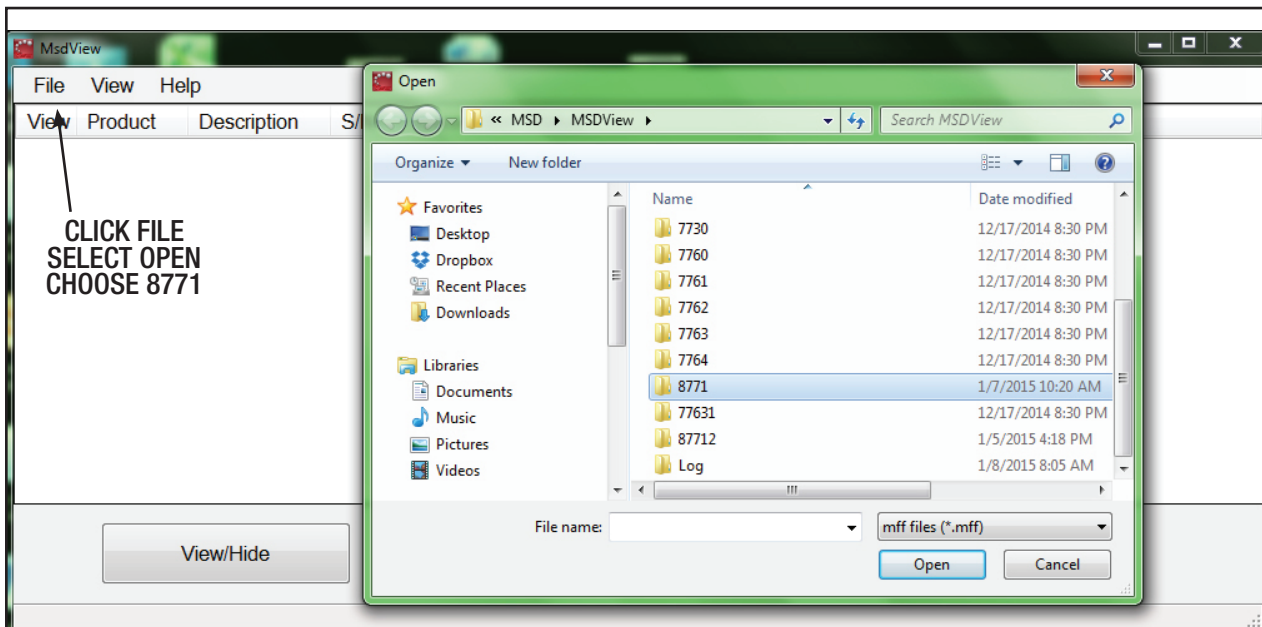


Figure 2 Open the View Program.

## PROGRAMMING

The View Software can be opened without having it connected to the Power Grid Controller. This is recommended to get comfortable with the navigation and menus before connecting the PC to the Controller.

This installation guide is designed as more of an overview to get you into the software and programming. The View software has an easy to use Help menu, navigation tips and by hovering the cursor over an area will bring up a pop up window with a definition or tip.

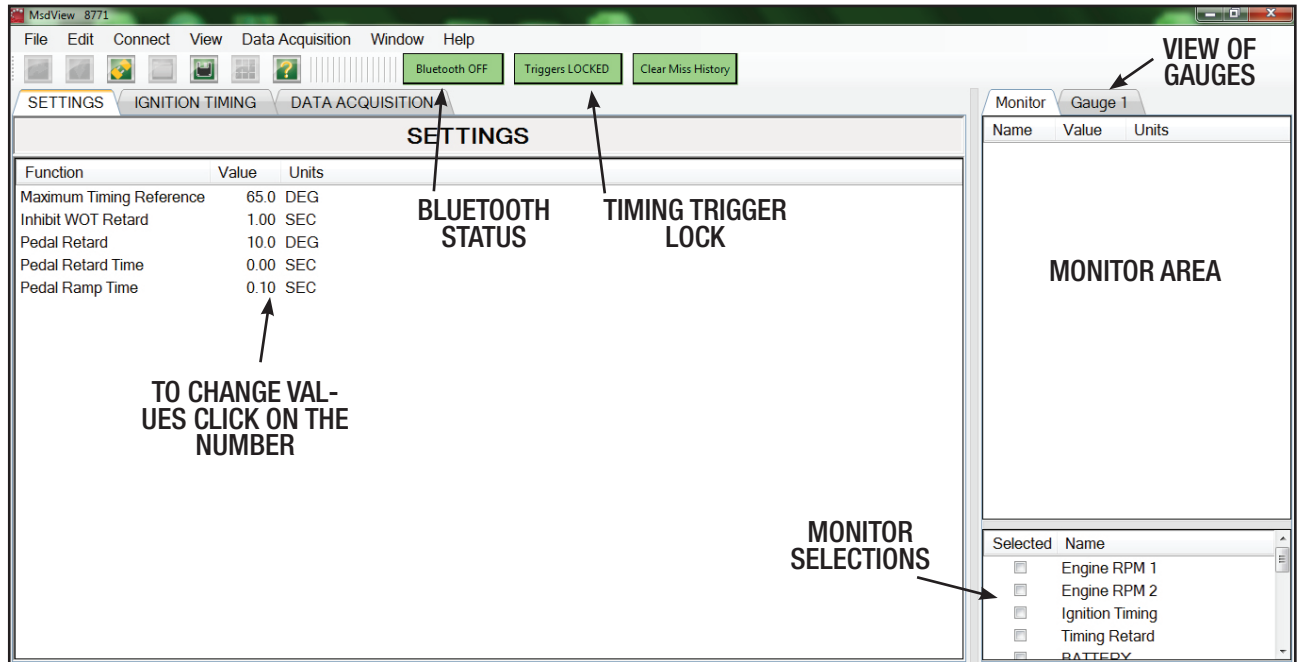


Figure 3 View Software Settings Screen.

The View Software has three tabs; Settings, Ignition Timing and Data Acquisition. Settings and Ignition Timing are used for programming the Controller. Data Acquisition details can be found on Page 12.

**SETTING TAB**

**Maximum Timing Reference:** This is the timing position of the crank trigger pickup. All timing adjustments are based on this value. It must match the timing light reading (when no retards are active).

**Inhibit WOT Retard:** This provides an amount of time to inhibit the Pedal Retard from occurring. This time is set from the launch point so the driver can pedal the car off the line without the timing being affected until the programmed inhibit time passes. Adjustable from 0-10 second.

**Pedal Retard:** Program a timing retard value that occurs when the pedal is lifted. Adjustable from 0°-30° in 0.1° increments.

**Pedal Retard Time:** Set the amount of time that it takes for the timing to ramp back to the timing curve. Adjustable from 0-2.50 in .01-second increments.

**Pedal Ramp Time:** Set an amount of time for the WOT retard to ramp back to 0° retard. Adjustable from 0-2.50 in .01-second increments.

## IGNITION TIMING TAB

This tab allows you to easily create, store, compare and activate timing maps. On the left there are up to 12 different timing maps that you can view on the timing chart which shows time horizontally (0-6 seconds) and ignition timing retard from 0° - 30° retard.

**Note:** When used on a **Top Fuel Dragster**, the timing chart has two red lines; Rate Limit and Max Limit. These limits are part of the NHRA mandated speed limiting setting and only pertains to dragsters. These indicators will limit the timing values that can be programmed.

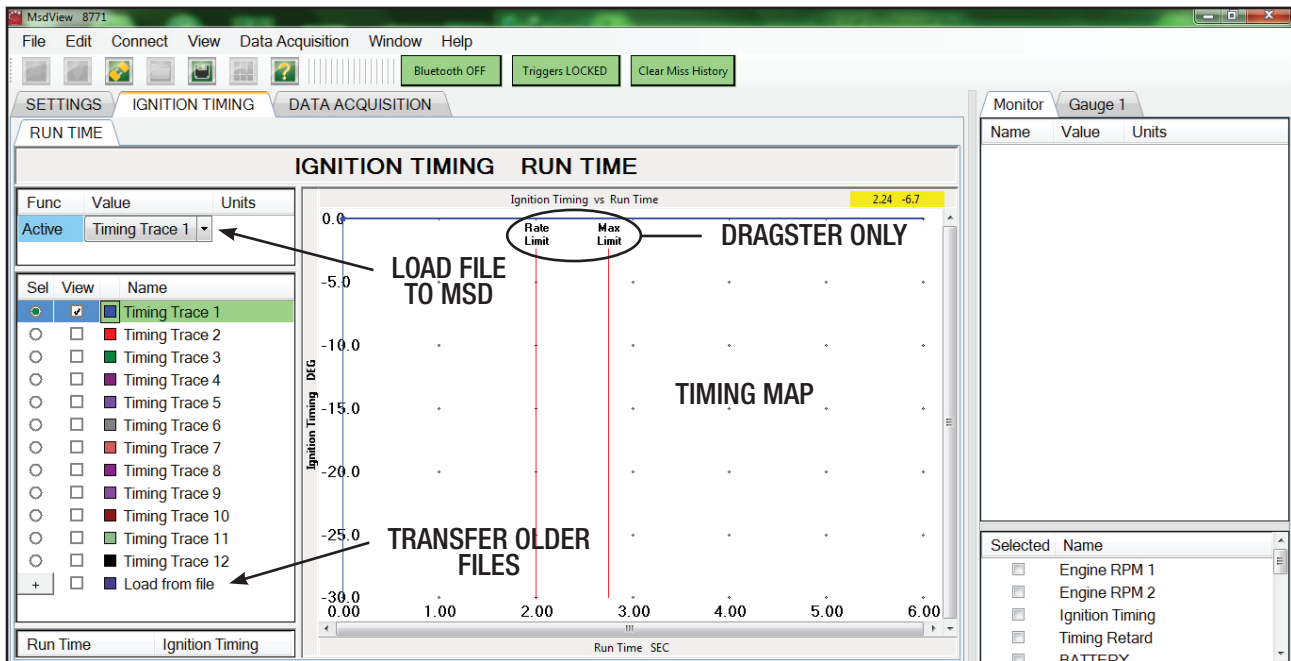


Figure 4 View Software Ignition Timing Screen.

## TIMING TRACE BOX

The timing trace box on the left of the screen shows 12 Timing Traces. This allows you to program different files for use as track and weather conditions change. Each trace can be viewed on the timing map, but only one can be modified at a time. There are two columns, Sel for Select and View.

**Select:** This determines which Trace you want to modify on the map. Only one can be selected at a time.

**View:** When selected, this shows the Trace on the map. Multiple Traces can be viewed at one time to compare.

**Renaming:** The name of each file can be modified by right clicking on the name.

**Color:** The color of each trace can be changed by clicking on the color box and selecting a new color.

## GENERAL TIPS TO CREATING A TIMING MAP

The best way to familiarize yourself with the software is to use it and create different curves and changes but following are a few steps and tips.

- Select the Timing Trace to be modified.
- With the cursor positioned over the timing map, right click to add a dot to create the timing points.

Also note that when you right click, you have the ability to Copy, Paste, Zoom and Pan.

- When a dot is highlighted, the values are shown on the screen.
- A dot can be moved with the keyboard arrows as well as with the mouse.
- To input values manually, place the cursor in the Run Time or Ignition Timing columns under the Timing Trace menu. Note that any timing values MUST be entered with a negative (-) value.
- Any modifications to a curve are instantly saved as that Trace.

**TRANSFERRING A TIMING CURVE TO THE CONTROLLER**

To activate a Timing Curve, the Controller must be connected via the USB or through Bluetooth. Locate the area above the 12 Timing Traces that shows “Active” with a pull down menu next to it. Select the Timing Trace to be loaded and click on it. Notice that the bar at the bottom of the screen that is green with “On Line” changes to orange while the file transfers. Also, note that the Trace that is active in the Controller is now highlighted with a green bar in the list of timing traces.

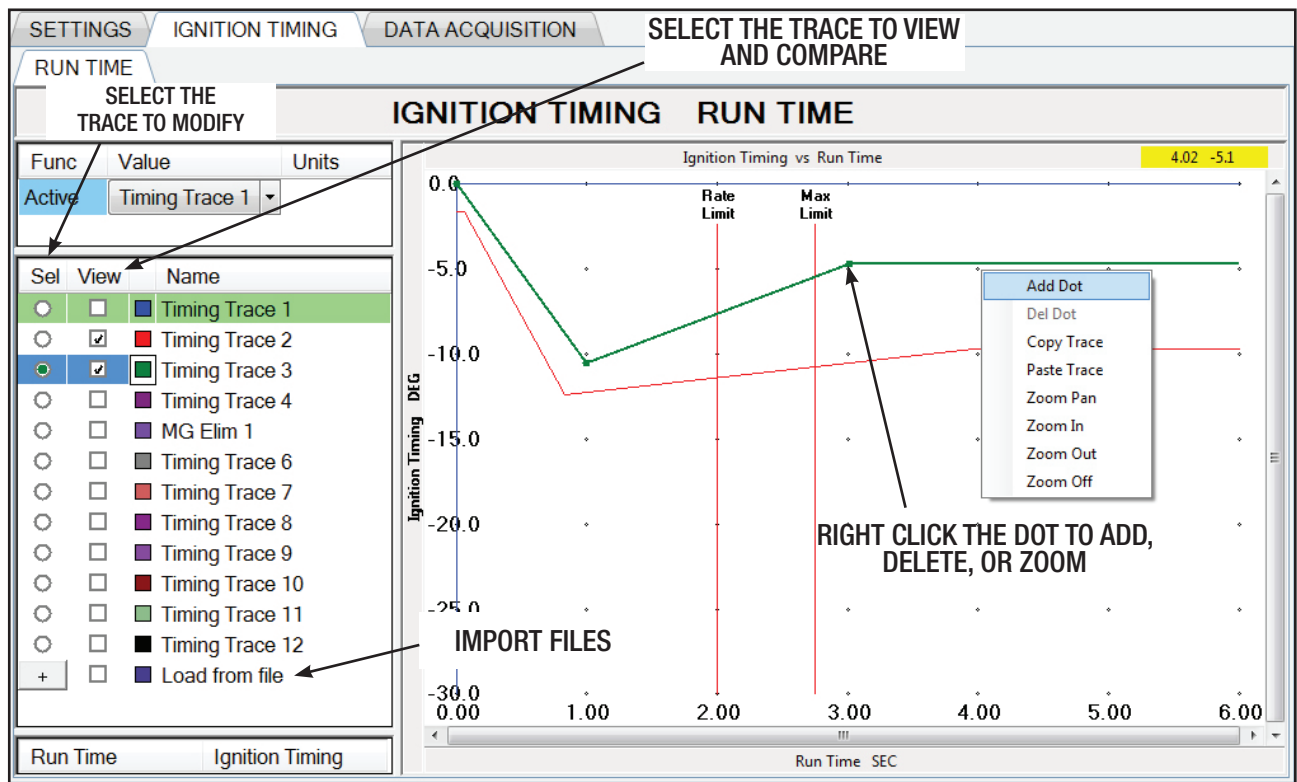


Figure 5 View Software Ignition Timing Screen.

## MONITOR AND GAUGES

The View Software allows you to monitor the engine in real time during warm up or anytime the PC is connected. On the right of the screen there are two tabs, Monitor and Gauge. At the bottom there is a selection of parameters to view. By selecting one, or all of the choices, the engine parameter will show up in the top window. (Figures 6 & 7)

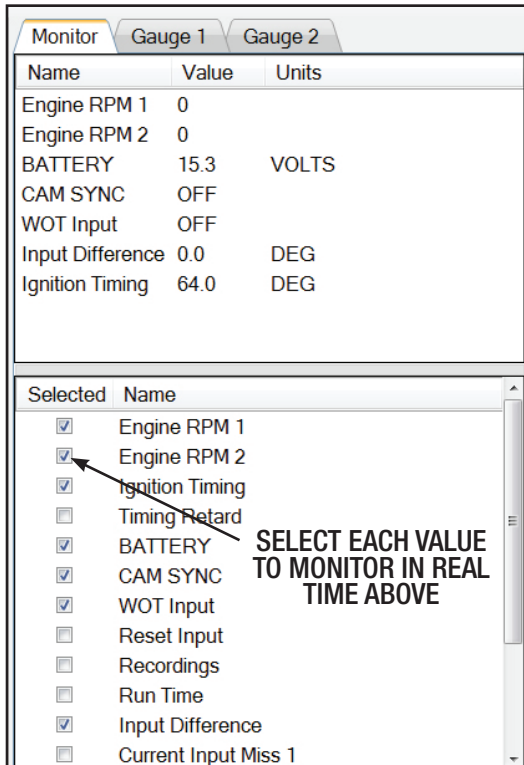


Figure 6 View Software Monitor.

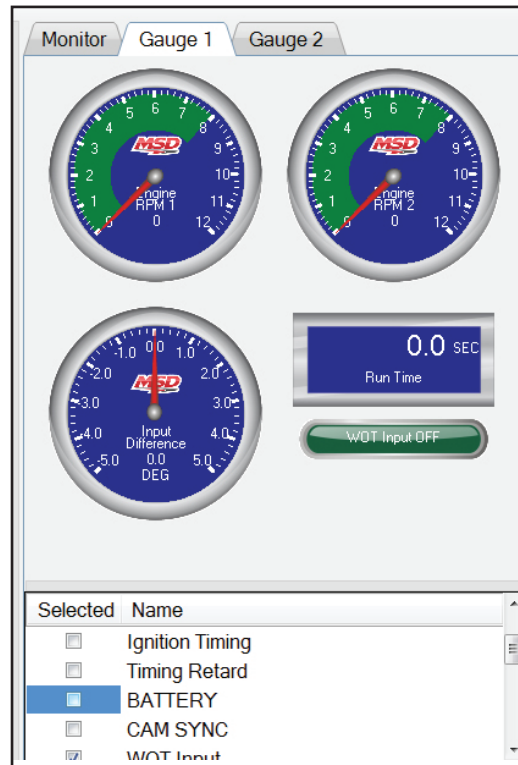


Figure 7 View Software Gauges.

## INITIAL START UP

Once the Power Grid Controller is installed and ready to fire, there are a few items to take into consideration. We've outlined a couple of the key items.

### Reset Jumper

A connector is supplied that jumps the Brown/Green and White/Blue wires together that should be installed during engine warm up and burnouts. This keeps the timer of the Power Grid from starting and running through the timing settings. Once the car is poised to make a pass, this connector should be removed. It can also be wired through a switch.

### Pickup Input Difference

During warm-up in the pits, it is required to check the input difference of the two crank trigger pickups (on dual mag setups). The PC needs to be connected with the engine running. This will help you 'zero-in' on the pickups being at exactly the same timing. It is important to note that if there is a failure to one pickup circuit, the Power Grid will use the other pickup to trigger both channels. If the two pickups are not equal, the change in timing could affect the engine's performance.

With the View software open, go to the Monitor window and select "Input Difference" from the menu in the bottom window (Figure 8). In the gauge window, a gauge will show up and will display the timing difference between the two pickups when the engine is running. Note that the button on top must be selected as "Triggers Unlocked". This can be verified with a timing light.

**WIRING**

SYNC OUT 2-PIN SOCKET			
PIN	Color	GA	Function
1	LIGHT BLUE	18	SIGNAL
2	BROWN	18	REF GROUND
CAM - 3-PIN SOCKET			
1	RED	18	12V
2	VIOLET/BLUE	18	SIGNAL
3	GREEN	18	REF GROUND
TACH - 3-PIN DEUTSCH			
A	GRAY	18	TACH A
B	WHITE	18	TACH B
C	BLACK	18	GROUND
8-PIN DEUTSCH CONNECTOR			
1	RED	18	SW 12V Via PN 8830 Capacitor
2	BROWN/GREEN	18	GROUND OUT
3	BROWN/GREEN	18	GROUND OUT
4	WHITE/BLUE	18	TIMER RESET SW
5	BLUE	18	SIGNAL INPUT - Controller Timer begins when ground is supplied
6	WHITE	18	LED - Ground, Alerts when Timer begins
7	GRAY	18	LED - Ground, Alerts when Timer reset and armed.
8	BLACK	18	GROUND - Battery Negative through PN 8830 Capacitor
MAG PICKUP, 4-PIN DEUTSCH			
1	GREEN	18	MAG-
2	VIOLET	18	MAG+
3	YELLOW	18	TRIGGER OUTPUT WIRE
4	BLACK	18	SHIELD
CAN, 4-PIN DEUTSCH			
1	WHITE	18	CAN HI
2	BLACK	18	CAN LO
3	RED	18	12V
4	GREEN	18	GROUND

**WOT SWITCH**

When ground, BROWN/GREEN, is applied to the BLUE wire, it indicates a Wide Open Throttle (WOT) condition.

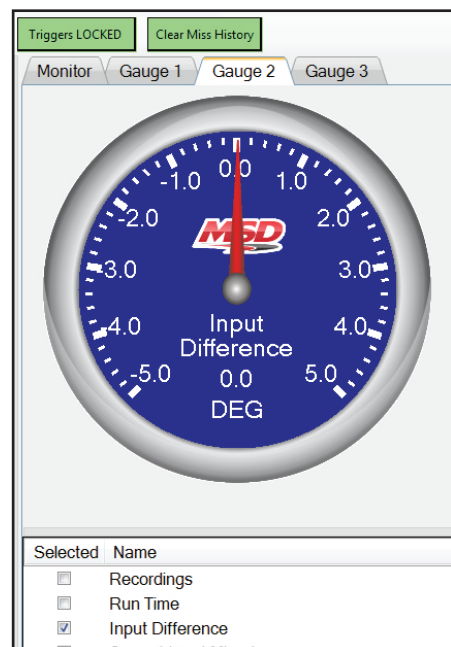
The Controller Timer begins when ground is applied to the BLUE (WOT) wire, if not in RESET mode.

When ground is removed from the BLUE (WOT) wire, it is in PEDAL MODE.

**CAM SYNC**

The CAM Sync signal indicates that the upcoming crank input corresponds to cylinder number 1.

Locate the CAM Sync Hall-Effect sensor to trigger 20 to 60 degrees of engine rotation before the Crank trigger of cylinder 1 triggers.



**Figure 8 Input Difference Gauge.**

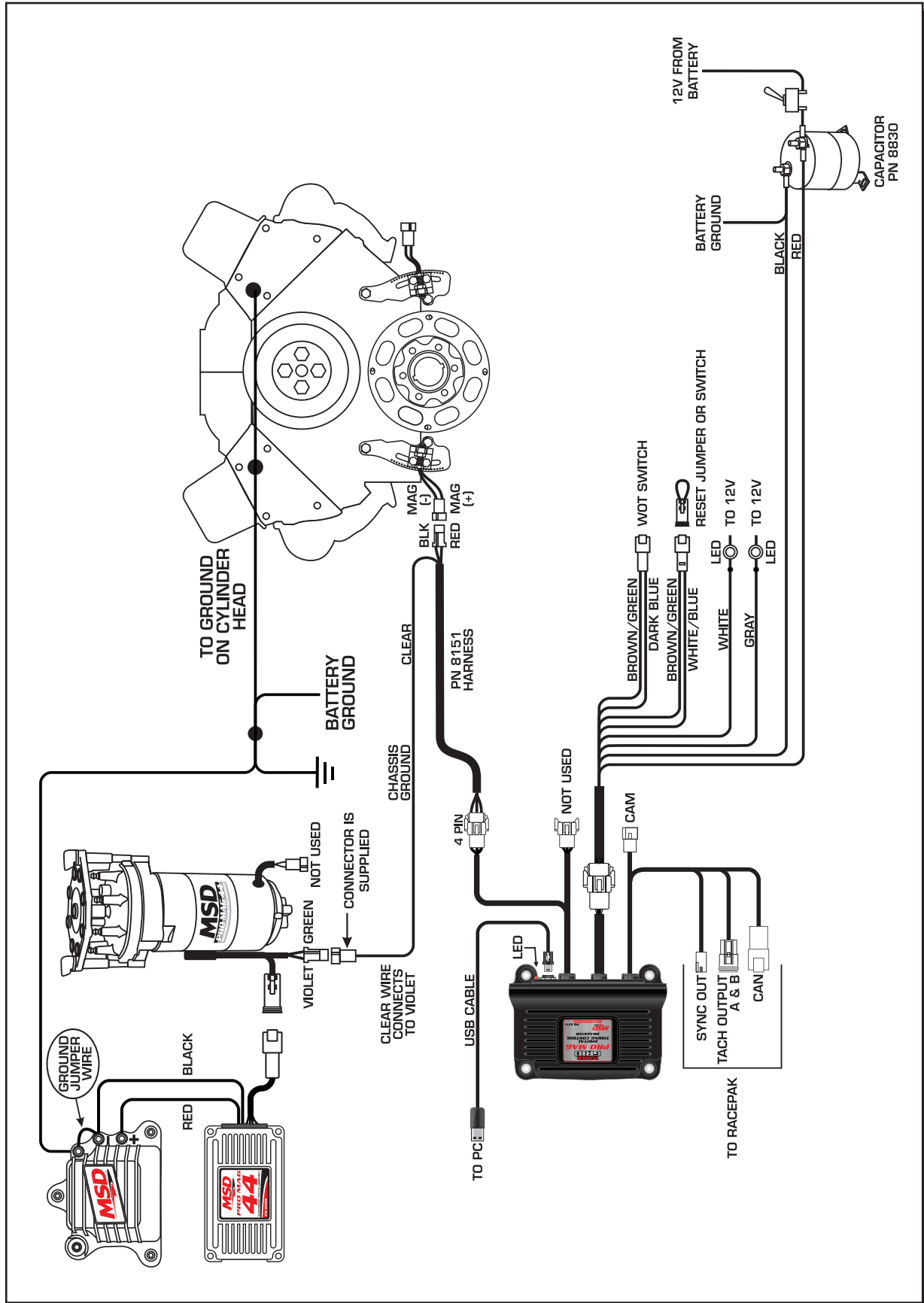


Figure 9 Wiring the Power Grid Pro Mag Controller with a Single Mag.

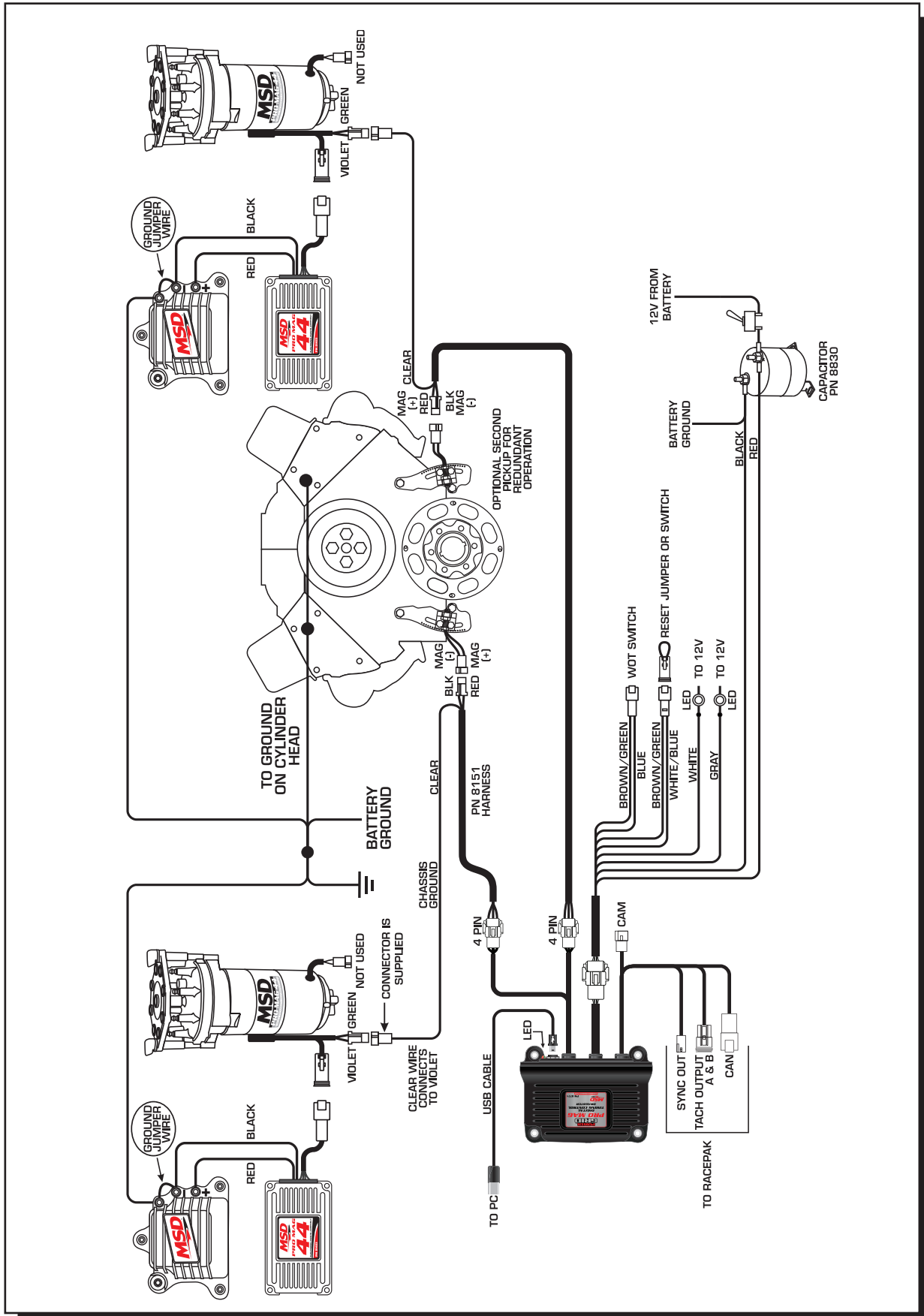


Figure 10 Wiring the Power Grid Pro Mag Controller with a Dual Mag.

## BLUETOOTH

The Power Grid Controller is equipped with Bluetooth technology so a PC does not need to be connected through a cable. Once the Power Grid is paired with a PC, it will always search for that PC first. The connection is password enabled and will not allow a connection from a different PC (more than one PC can be configured).

**IMPORTANT:** Program changes cannot be made via Bluetooth when the engine is running, however, you can still monitor the engine's variables. There will be no communication when the engine is running over 3,000 rpm.

### PAIRING THE MSD

1. Start MSDView / Connect PN 8771 via USB cable. **(Figure 11)**



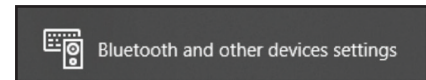
**Figure 11 Click on MSDView Icon.**

2. On PC, open "Bluetooth& other devices settings" by typing **Bluetooth** in the Windows search bar.

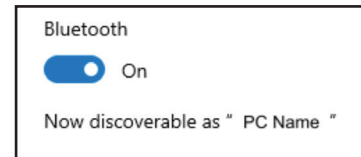
Click to open Settings. **(Figure 12)**

In the Settings window. **(Figure 13)**

- a. Verify Bluetooth is on.
- b. Note your Window device name.



**Figure 12 Bluetooth Settings.**



**Figure 13 Bluetooth Status.**

3. In MSDView:

Click on the Bluetooth button. **(Figure 14)**

The Bluetooth Devices box will open.

Select your Device, (PC) name found in the "BlueTooth Devices window". **(Figure 15)**

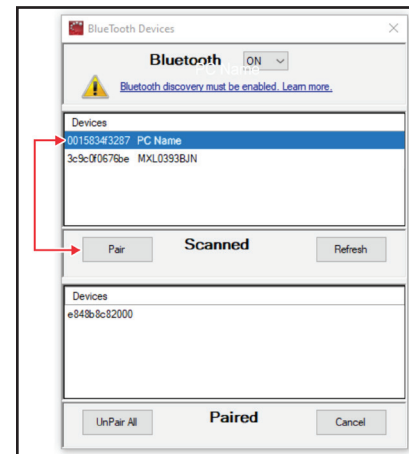
Click the "Pair" button AFTER scanning is complete.

Scanning is complete when status states "Scanned".

**Note:** If your device is not discovered after scanning, try removing paired Bluetooth device that could interfere with the discovery.

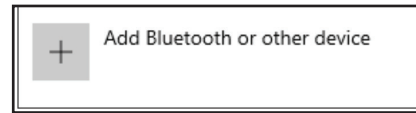


**Figure 14 Bluetooth Button.**



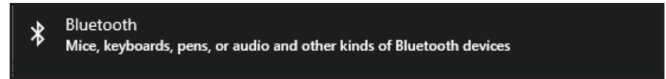
**Figure 15 Bluetooth Settings.**

4. In the Settings window, click on "Add Bluetooth or other device". **(Figure 16)**



**Figure 16 Add Bluetooth Device.**

5. Select Bluetooth. **(Figure 17)**



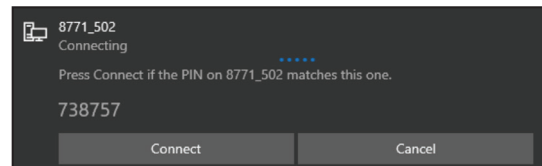
**Figure 17 Select Bluetooth Device.**

6. Next, select MSD PN 8771\_XXX, the "XXX" is the product serial number. **(Figure 18)**



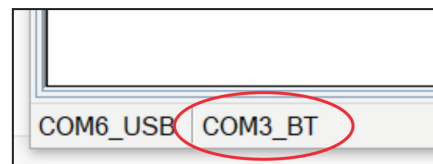
**Figure 18 Select MSD.**

7. Once pairing is ready, click "Connect". You may need to scroll to see the "Connect" button. **(Figure 19)**



**Figure 19 Connect MSD.**

8. In MSDView, verify the MSD is connected by checking the bottom left corner status bar by showing the COM# with BT. **(Figure 20)**



**Figure 20 Status Bar.**

**Trouble Shooting:**

Remove the MSD from the Paired list of devices on you PC and repeat the Pairing to Device and MSD PN 8771 on Step 3.

MSD does not connect or MSDView starts the connection but ends with 'Disconnected'.  
 Cycle the power on the MSD and Turn Device (PC) Bluetooth Off and On.  
 Restart MSDView and connect to the product.

**DATA ACQUISITION**

The ignition data from each run is saved on an 8M internal flash memory chip that will hold approximately 30 minutes of data recording. After saving events to your PC, erase the files from the Power Grid to ensure new recordings will be available.

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 5 channels of data to the RacePak system.

Within the Data Acquisition Tab of the View software, there are three sub-tabs; Settings, Channels and Racepak.

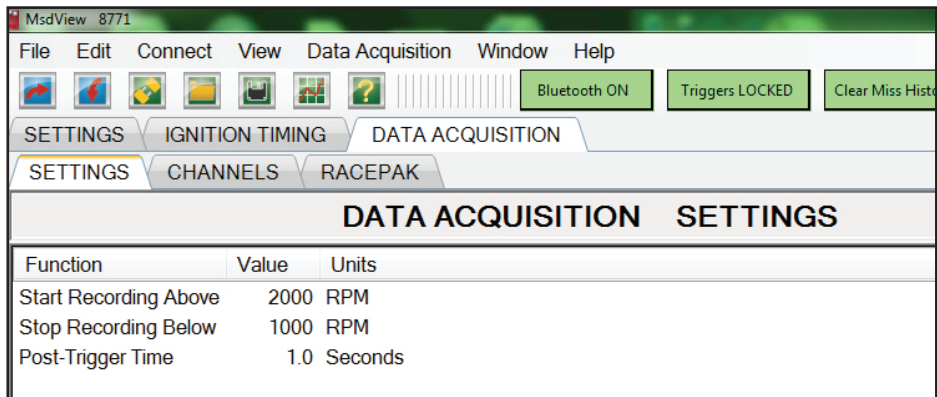
**SETTINGS**

This tab has three settings controlling when to start and stop a recording.

**Start Recording Above:**  
Select an rpm value to start the recording of data when the reset jumper is removed.

**Stop Recording Below:**  
Select an rpm value that stops the recording.

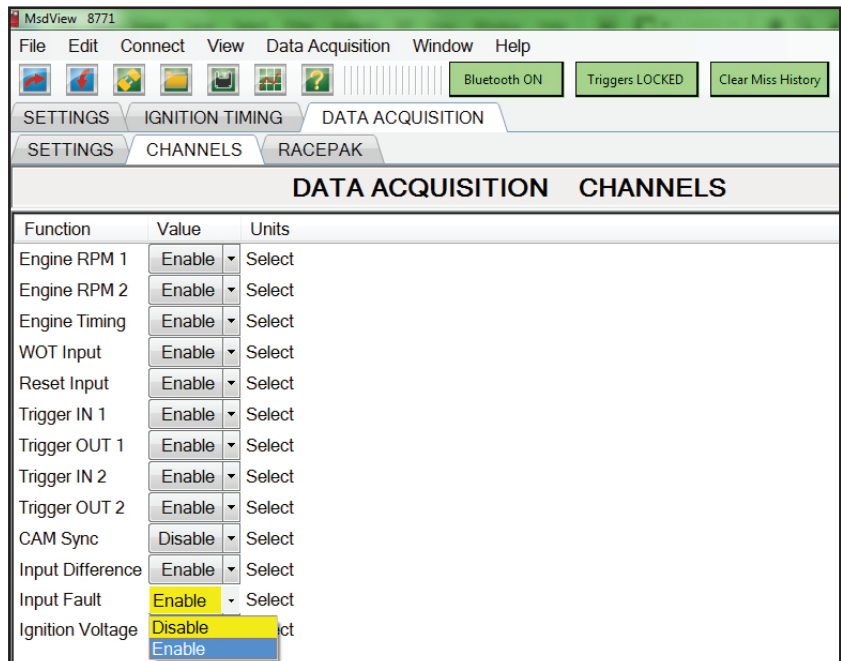
**Post Trigger Time:** Add more recording time after the Stop Recording condition has been met.



**Figure 21 Recording Parameters.**

**CHANNELS**

Each available data trace within the Power Grid is listed on the Channels tab. Each trace can be disabled individually in order to remove unneeded data and generate smaller files. The Ignition In channel and the Ignition Out channel are high resolution and they generate the most data at high engine rpm. For definitions of each channel, hover the cursor over the function.



**Figure 22 Data Acquisition Channels.**

**RACEPAK**

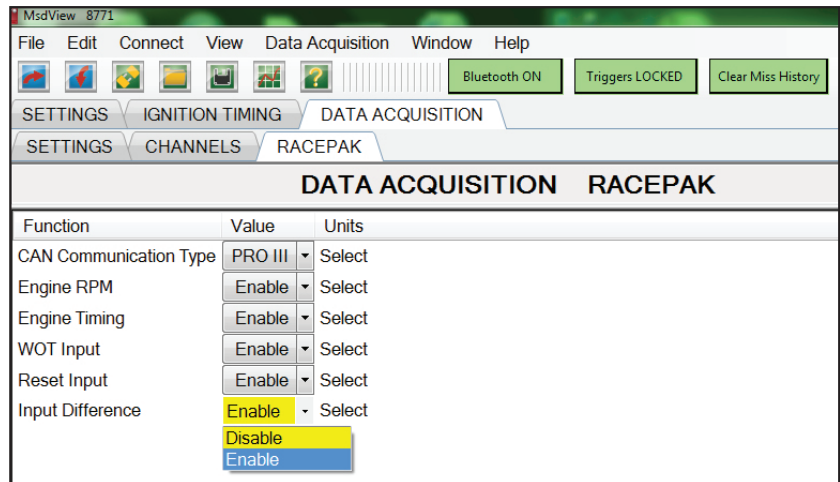
The Racepak tab allows the user to configure the Power Grid to their Racepak. There are five values that can be recorded directly to a Racepak system: Engine RPM, Ignition Timing, Wide Open Throttle (WOT), Reset Input and Input Different. The type of Racepak system being used must be selected, either VNet or Pro III systems.

**OPEN A DATA FILE**

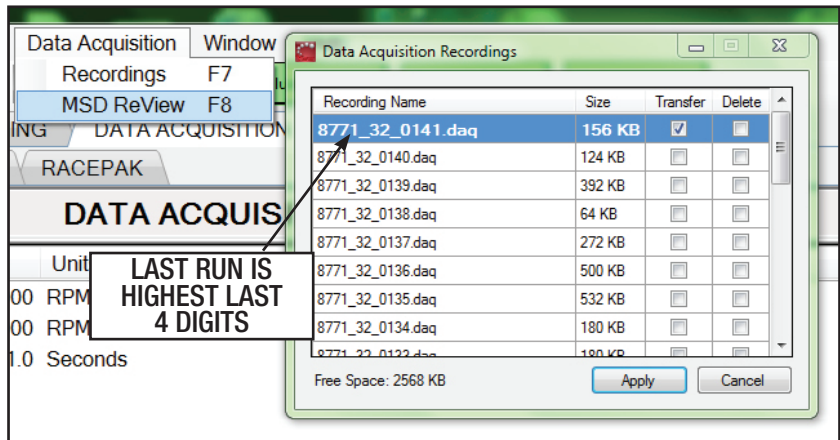
To open a data file after a pass, click on Data Acquisition on the top menu bar of the View screen and select Recordings (Figure 24). The latest run will always have the highest four digits in the file.

Click Apply. A small window will appear that allows you to input useful data from the run, or can be canceled. From there, the ReView program will launch.

Once a file is opened, you'll notice a chart in the middle with the data menu on the left. These are all the items that the Power Grid records. By double clicking on each file, the data will open in the screen for your review (Figure 25).



**Figure 23 Racepak Settings.**



**Figure 24 Transferring a Data File.**

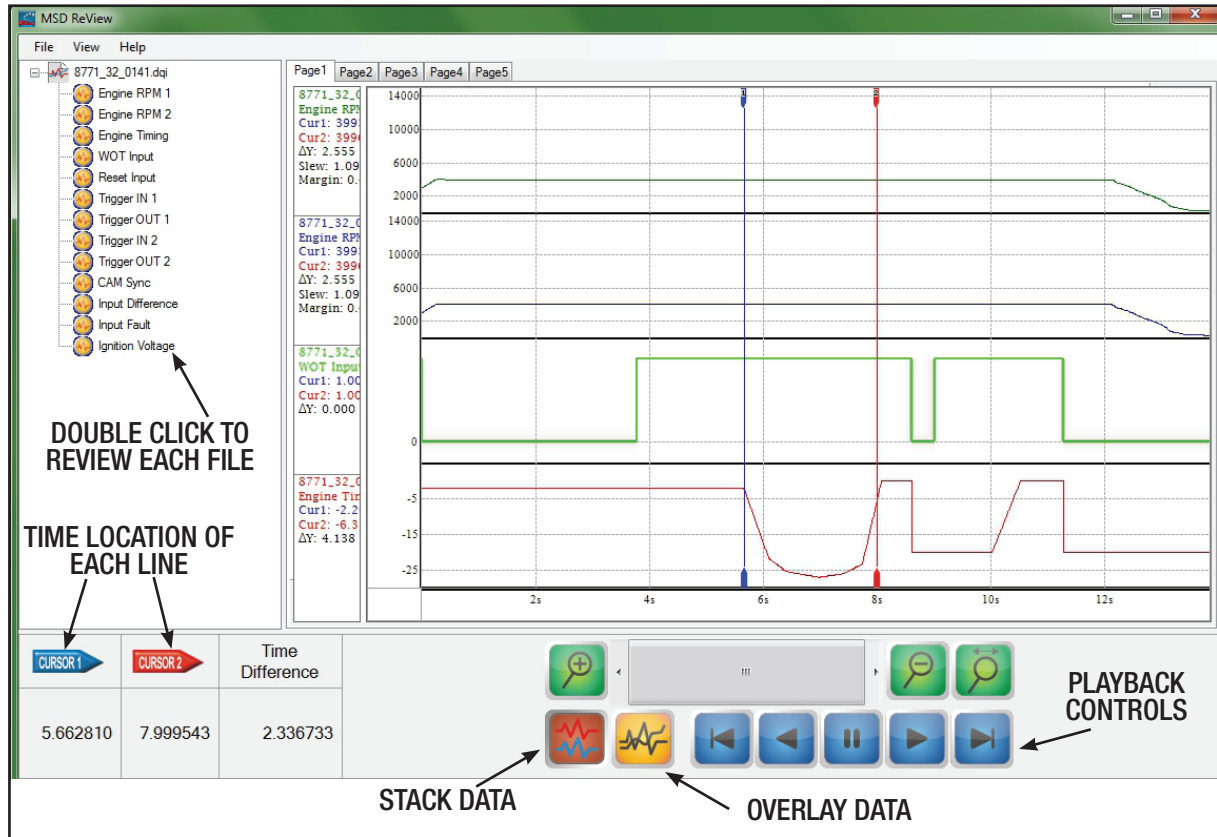


Figure 25 MSD ReView Data Acquisition Files.

## LED

There is an LED on the end panel of the Power Grid that will display Orange, Green or Red. There are also two external wires that can be used to have two cockpit mounted LEDs.

**ORANGE:** During the first 0-1 second of power, the LED will glow Orange when input voltage is greater than 5 volts.

**GREEN:** Once powered up and when the reset wire is 'inactive', the jumper is removed and the inputs are locked, the LED will be a steady Green. If there are any Alerts active, the LED will blink Green.

**RED:** The LED will be a solid RED during the run when the reset wire is 'active'. If there is an Alert, the LED will flash RED. After the run, the LED will be off (when no Alerts are present).

There are two wires that can be connected to 12 volts to power an externally mounted LED to put into the cockpit or a panel for viewing:

**LED 2:** This is controlled by the White wire. It will be on when the reset wire is active.

**LED 3:** This is controlled by the Gray wire. It will light when the system is armed and the reset wire is not active with the run-time at zero.

**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.

Low Battery Voltage	Alert becomes active when battery voltage is less than 5V, and engine speed is greater than 50RPM, for 5 seconds consecutively.
High Battery Voltage	Alert is active if battery voltage is greater than 20V.
No Cam Sync	Remove!
Data Acq. Memory Overflow	Alert becomes active when the data-acquisition event queue overflows.
EEPROM CRC Error	Alert becomes active if the calculated EEPROM data checksum doesn't match with the value stored in EEPROM.
EEPROM Write Error	Alert becomes active if attempting to write to EEPROM failed 3 times.
Data Acq. Memory Protection	Alert becomes active when the data-acquisition queue has 90% of pending events or more.
Flash Write Error	Alert becomes active if attempting to write a flash page failed 20 times.
Bluetooth Configuration Fail	Active if the Bluetooth module could not be initialized correctly.
Trigger 1 Input Fault	Active when 2 or more consecutive Trigger 2 inputs occurred without a trigger 1 input.
Trigger 2 Input Fault	Active when 2 or more consecutive Trigger 1 inputs occurred without a trigger 2 input.
Flash Free Space Error	Active if the number of stored recordings is greater than 100 or the Flash chip is running out of usable memory.
Flash Error	Active if the flash chip could not be initialized correctly.

