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GETTING STARTED

"PLAN YOUR WORK & WORK YOUR PLAN"

The above quote is something my grandfather has always told me, and this holds true with the *DATAMAXX*. If you plan out where things will be installed and take care to avoid ignition components then your installation will be stress free and your signals will look clear and smooth. If you dive in without reading the manual, you will get frustrated and your end result may be noisy hard to read signals, so "Plan your work and work your plan."

1. Read the entire Getting Started section
2. Fill out the *DATAMAXX* configuration page
3. Install all modules
4. Install all sensors
5. Run wires while avoiding ignition components
6. Terminate wires into Main & Analog modules
7. Perform your "Initial Calibration"
8. Record a test run to confirm calibration

1. The first step would be to take stock of all the parts you have ordered and try to get a mental picture of where you want the main module, how your going to mount the sensors and where your going to run the wires in order to avoid ignition components. The more time you spend efficiently planning the better off your going to be.

2. The next step is to fill out the *DATAMAXX* configuration page. This is extremely important because you need to know exactly where the sensors are physically installed so that we can tell the software and calibrate them appropriately. Be sure to list what type of sensor it is and refer to the sensors specific instructions for RTD and GND dip switch settings.

3. It is now time to install the modules (Main, Analog, LCD, EGT). It is recommended that you locate the main and analog modules in a covered area that is relatively vibration free and not anywhere near an ignition component. Ignition components include ignition boxes, ignition coils, the wire from the ignition to coil, distributors, magnetos, solenoids and even ignition kill switches.

4. Now you can install your sensors. It is easier to mount and install all of your sensors before you run your wires, and will usually lead to a cleaner looking installation. Each sensor has an overview, part numbers, installation instructions, calibration, and testing associated with it and should be read over carefully.

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5. Once the modules and sensors have been installed we can wire the car. This is by far the most crucial and important part of the installation process. Sensor wires should be at least 8" away from any ignition component otherwise your signals will be erratic and hard to read. Ignition components include ignition boxes, ignition coils, the wire from the ignition to coil, distributors, magnetos, solenoids and even ignition kill switches. It is recommended to use MSD 8.5mm superconductor wires as these offer the best protection from ignition interference noise.
If possible you want to run all of your data wires together, on the opposite side of your ignition components. For more information on the importance of avoiding ignition noise, see "How to Wire Correctly" & "Avoiding RFI Noise" in the additional information section.

6. We are now ready to terminate the wires into the main and analog units. Use your *DataMaxx* configuration sheet as a guide to where each sensor should be plugged into and utilize the label on the inside of the lid to help identify the channels. Refer to the sensors individual instructions and "How to wire correctly" in the Additional Information section. After you are done wiring, confirm that your installation matches your *DataMaxx* configuration sheet.

7. It is now time to tell the software and the hardware what is actually installed on your system. You can either read the "Initial Calibration" in the Software section, or watch the instructional screen shot video that was included with your software. If you cannot find your disk then the instructional video is available on our customer web forum at www.ComputechRacing.com

8. Now that you have installed all of your modules, sensors, and wires as well as performed the initial calibration we need to test the system to ensure that everything is working properly. It is best to actually fire up the car at this point as we are looking to see if the pressure and temperature sensors react in the proper way. If possible put the car on jacks and allow the drive shaft to move enough to pick up a reading. If any problems occur at this point, refer to the troubleshooting guide, otherwise the system should be functional and your readings should be smooth and easy to read.

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DataMaxx Configuration

Main Module

Engine RPM: _____ Cylinders: _____
Mag RPM: _____ Cylinders: _____ PuP: _____ GND: _____
Driveshaft RPM: _____ Magnets: _____
Inputshaft RPM: _____ Magnets: _____ PuP: _____ GND: _____

Switch 1: _____ Light 1: _____
Switch 2: _____ Light 2: _____

Analog A1: _____ Sensor Type: _____ RTD: _____ GND: _____
Analog A2: _____ Sensor Type: _____ RTD: _____ GND: _____
Analog A3: _____ Sensor Type: _____ RTD: _____ GND: _____
Analog A4: _____ Sensor Type: _____ RTD: _____ GND: _____

Analog Module A

Analog A1: _____ Sensor Type: _____ RTD: _____ GND: _____
Analog A2: _____ Sensor Type: _____ RTD: _____ GND: _____
Analog A3: _____ Sensor Type: _____ RTD: _____ GND: _____
Analog A4: _____ Sensor Type: _____ RTD: _____ GND: _____

Analog Module B

Analog A1: _____ Sensor Type: _____ RTD: _____ GND: _____
Analog A2: _____ Sensor Type: _____ RTD: _____ GND: _____
Analog A3: _____ Sensor Type: _____ RTD: _____ GND: _____
Analog A4: _____ Sensor Type: _____ RTD: _____ GND: _____

Analog Module C

Analog A1: _____ Sensor Type: _____ RTD: _____ GND: _____
Analog A2: _____ Sensor Type: _____ RTD: _____ GND: _____
Analog A3: _____ Sensor Type: _____ RTD: _____ GND: _____
Analog A4: _____ Sensor Type: _____ RTD: _____ GND: _____

EGT Module Odd	EGT Module Even	Temp Module
Exhaust 1: _____	Exhaust 2: _____	Temp 1: _____
Exhaust 3: _____	Exhaust 4: _____	Temp 2: _____
Exhaust 5: _____	Exhaust 6: _____	Temp 3: _____
Exhaust 7: _____	Exhaust 8: _____	Temp 4: _____

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MODULES

MAIN MODULE:

Overview

The Main Module is the heart and brain of the *DATAMAXX* system. It serves as the communication hub and has the largest capacity for sensors. The Main Module also has 5 CAN Bus ports that act as the communication medium to LCD, Analog, and EGT modules.

Capabilities

4 RPM Channels
4 Analog Channels
5 CAN Bus Connections
2 Switch inputs
2 Light outputs
1 SD Card slot

Installation

The Main Module should not be mounted where it is exposed to rain, or excessive engine, exhaust, or transmission heat. If you are not using an LCD Dash unit then you will need to mount the Main Module where you can easily access the SD memory card slot. For more information on avoiding ignition interference refer to "Avoiding RFI Noise" in the Additional Information section.

The Main Module is the only part of the system that receives a power connection. The best Main Module power connection is the same place you power the majority of your electronics and tachometers. The next best connection is directly to the positive and negative terminals on your battery.

Connect the positive wire to the Main Module red color-coded terminal labeled "POWER 11-25V" (id #36), and connect the negative (ground) wire to one of the shield terminal screws.

When installing any sensor with a supplied shield wire, connect to the 4 posts labeled "Braided shield wires and Chassis/ Battery Ground". For more information on correctly wiring your *DATAMAXX* refer to the "Additional Information: Advanced Wiring Techniques"

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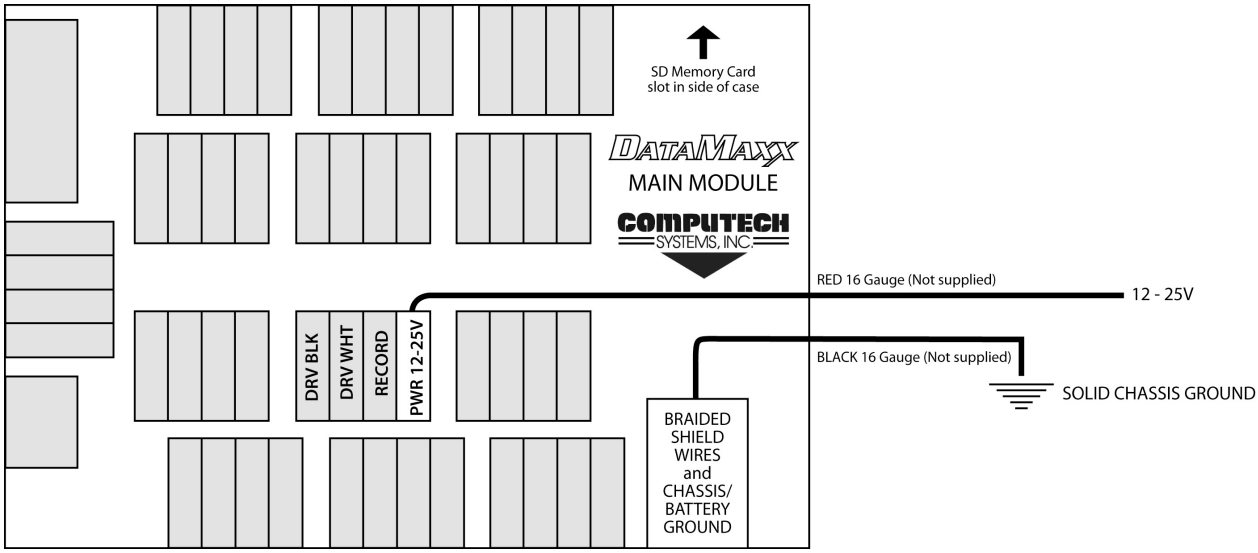

Light Scheme

Blinking Pattern for GREEN LED	**Meaning**
Equal time on and off (or bright and dim)	**Normal**, samples being created
Short single blips separated by long pause	**Idle**, waiting for system process. This normally occurs for a second or two whenever recording is stopped. It also occurs during playback on the LCD Module.
[*Main Module Only*] Pulsating (actually a combination of equal time on and off, with fast blips)	**Recording Normal**. The equal time on and off means that samples are being generated by the Main Module inputs. The fast blips superimposed on top mean that the module is also recording to the Main Module's SD card. Note that the Main Module green LED will only pulsate like this when recording to its own card. It will not pulsate like this when you're recording to an SD card in the LCD Module!
[*Main Module Only*] Fast blips	**Recording but Broken**. The fast blips mean that the module is recording to the SD card. However, the lack of equal time on and off (to create the pulsating effect) means that the sensor inputs are not generating samples. Contact customer support.
Always off	**No Power**. If there's power, the green LED will at a minimum blip every few seconds.
Always on	This should never happen. If it happens repeatedly, contact customer support.

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Blinking Pattern for RED LED	Meaning
Always off	**Normal**, everything's great
[*Main Module Only*] Three blips separated by long pause	**SD Card Missing or Full**. This is a Normal condition when (A) you remove the SD Memory Card, or (B) if it's inserted but already contains the maximum of 99 log files, or (C) you have inserted a card that has NOT been initialized yet by the PC software. If this error indication persists even after you make sure to insert an initialized card with fewer than 99 log files, then there may be a problem with the card or the *DataMaxx* Module. Try a different card. If the error indication persists, contact customer support.
Two blips separated by long pause	**CAN bus problem**. This can be caused by an open wire not reaching this module, or by a short anywhere on the CAN bus. (It's OK if this error occurs immediately after recording is stopped, but then goes away shortly thereafter.)
Other blip patterns	Contact customer support

Default Dip Switch Settings

A:	MAG PuP	OFF	E:	A1 RTD	OFF
B:	MAG GND	OFF	F:	A1 GND	ON
C:	INP PuP	ON	G:	A2 RTD	OFF
D:	INP GND	ON	H:	A2 GND	ON
			I:	A3 RTD	OFF
			J:	A3 GND	ON
			K:	A4 RTD	OFF
			L:	A4 GND	ON

Additional Information

Recording: The Main Module has a dedicated terminal for a record switch. Connecting a switch to this terminal (id #35) will automatically enable recording without any additional configuration.

Wiring: Strip back the insulation for each wire, place into appropriate terminal and screw terminal to tightly connect to the *DataMaxx*. Be sure to connect all shield wires to one of the four ground / shield drain screws. For more information on wiring correctly, refer to the "How to Wire Correctly" in the Additional Information section.

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LCD Module

Overview

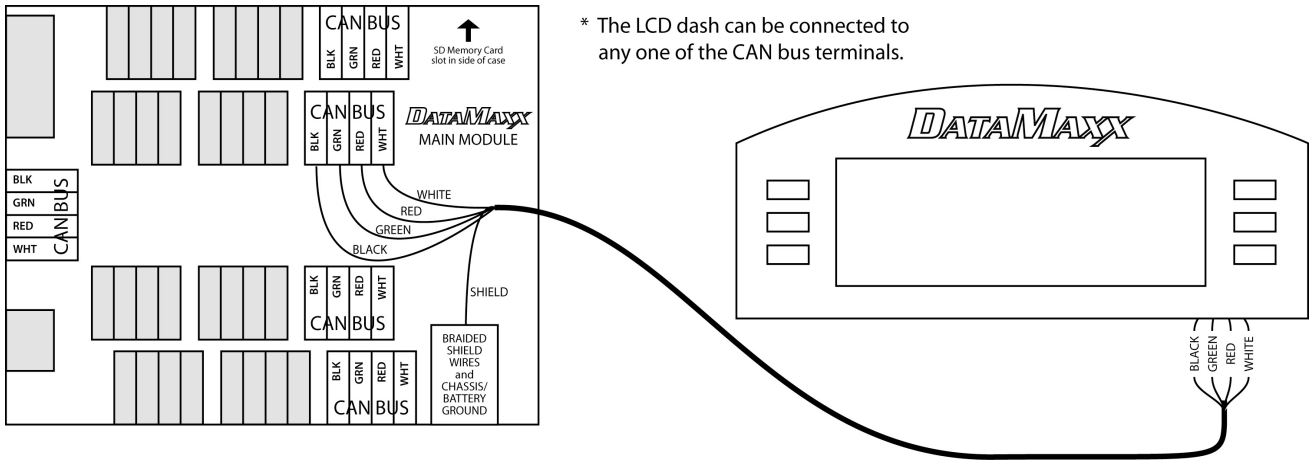
The LCD Module is an optional feature that allows live data to be displayed right in your vehicles dash. It is completely customizable and shows 9 separate channels of data per page, with an unlimited amount of pages. The LCD has customizable warning and shift lights, playback features, night/day mode.

Capabilities

9 Channels of data per page
Customizable warning and shift lights
Variable speed playback
Night and Day mode
SD card slot

Installation

Your LCD Dash came with a paper cut out that is to scale, which will allow you to drill the necessary holes with ease. The rubber shock absorbers that act as the mounting bolts should not be removed, and removal will void your warranty. To connect your LCD to your Main module, use the supplied CAN cable, put appropriate wire colors into the green LCD connector and connect the other end into any CAN Bus section within the Main module.
After the module has been mounted, connect the CAN bus cable to the green connector supplied with your LCD. You can then run the wire from the LCD module to the Main module. Cut to length, strip back the insulation so the four colored wires can reach a CAN bus port and so the bare shield wire can be wrapped around one of the four ground posts. Strip a small section of insulation of each of the four colored wires and place into the appropriately colored terminal, then connect the shield wire to a ground post.



Additional Information

Customizing: You must use the *DataMaxx* viewer software to customize the LCD. Simply open the Channel Properties screen and choose the "Configure LCD Module" button. This will open a screen that allows you to choose which sensors you want displayed and the orientation you want them displayed on the LCD. You can create multiple pages and combine different data depending on your needs. After making changes, send the configuration to the *DataMaxx*.

Record: Press and release the Record button in order to start recording. The "Recording" icon will be displayed above-right of the round RPM graph. To stop recording, simply press and hold the button for 2-3 seconds, releasing after seeing the appropriate response on the LCD. For more information on recording, refer to "Recording a Log file" in the Additional Information section.

Menu: In the menu there are options to toggle between day and night, set the clock, and modify the intensity of the back light, button, contrast, playback rate, and both yellow and red LED's.

Channels: The channels button will allow you to toggle through multiple pages that can be customized through the software, allowing an unlimited combination of information to be displayed.

Max Recall: Hitting the Max button will display the maximum data from the last log file that was recorded to the SD card. If there are no runs on the card then a log file not found message will be displayed.

Run #: Hitting the Run button allows you to toggle thru all the runs currently on your SD card. After finding the run you want, you can choose either Max or Playback to view the desired information.

Playback: Hitting the Playback button allows you to play back the data from you last log file at half the speed (0.5X). To pause the screen during playback, simply press the Playback button and press again to resume. If you would like to change the rate of playback, enter the menu options, display adjust, and toggle to the Play Rate and adjust the speed. If you would like to play back a different run, toggle through the different runs using the Runs button and then press Playback.

Clock: You can manually set the clock through the menu option or use the software. When sending a configuration change to the *DataMaxx*, if using an LCD, you will be prompted with a message asking if you would like to set the hardware clock. If you choose yes, your computers current time will be stamped on the SD card. You will then want to quickly insert the card into the *DataMaxx*, turn on power and allow the configuration to take place, also changing the clock.

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ANALOG MODULE

Overview

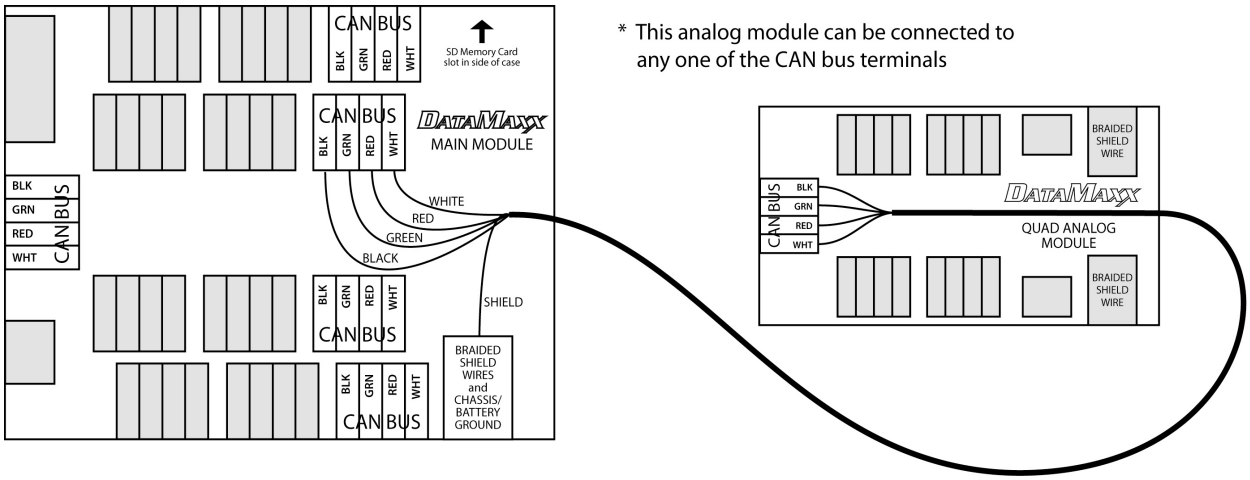
The Analog Module allows you to expand your system capabilities by adding 4 analog channels.

Capabilities

4 Analog Channels

Installation

Install the module in a convenient place away from ignition components and connect your Analog CAN Bus to any Main module CAN Bus terminal.



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Light Scheme

Blinking Pattern for GREEN LED	Meaning
Equal time on and off (or bright and dim)	**Normal**, samples being created
Short single blips separated by long pause	**Idle**, waiting for system process. This normally occurs for a second or two whenever recording is stopped. It also occurs during playback on the LCD Module.
Always off	**No Power**. If there's power, the green LED will at a minimum blip every few seconds.
Always on	This should never happen. If it happens repeatedly, contact customer support.

Blinking Pattern for RED LED	Meaning
Always off	**Normal**, everything's great
Two blips separated by long pause	**CAN bus problem**. This can be caused by an open wire not reaching this module, or by a short anywhere on the CAN bus. (It's OK if this error occurs immediately after recording is stopped, but then goes away shortly thereafter.)
Other blip patterns	Contact customer support

Default Dip Switch Settings

A: A2 RTD OFF
B: A2 GND ON
C: A1 RTD OFF
D: A1 GND ON
E: A3 RTD OFF
F: A3 GND ON
G: A4 RTD OFF
H: A4 GND ON

Additional Information

Multiple Analog Modules: If you have chosen to expand your capability to multiple Analog modules, then you will notice that the serial number of your primary analog will start with an 'A' and your secondary will start with a 'B' (Serial numbers can be found on the underside of the case).

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Remote SD Module

Overview

The SD Remote Mag Module is designed specifically for use in magneto cars but can also serve as a convenient SD card location. Magneto ignition systems output a wide radius of ignition noise that can cause the SD circuit to stop writing, typically causing the log file to end prematurely. We can solve this issue by simply mounting the SD Remote Mag Module physically far away from the magneto system.

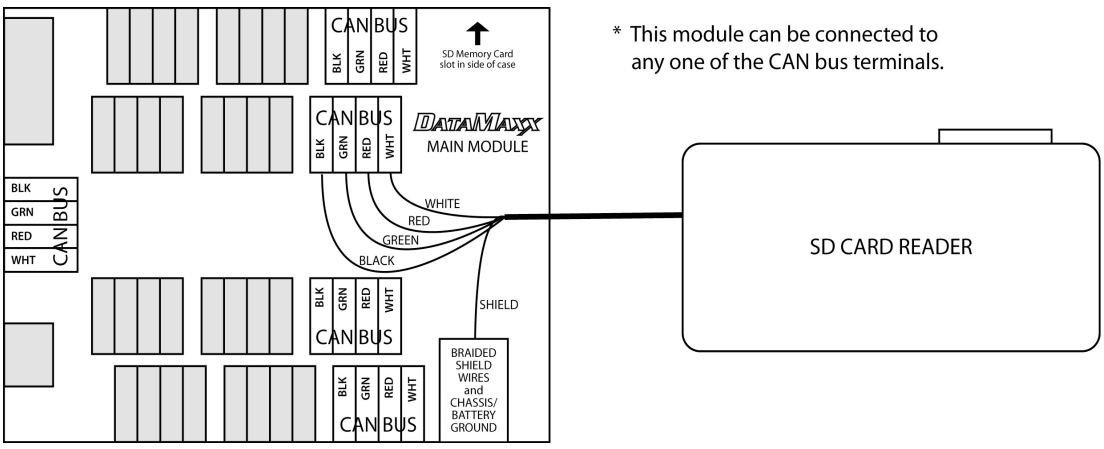
We also recommend changing your mag kill switch from a "lightning wire" kill switch to a conditioned relay kill switch. When using a hot wire kill switch you are running the full load of your ignition system up to the cockpit to the switch and then all the way back to the magneto. This creates a magneto antenna that significantly expands your ignition noise radius. By using a clean 12V or ground signal to trigger a relay that will cut the magneto off, you successfully keep all of your ignition noise centered around the engine.

Capabilities

1 SD Card Slot

Installation

Find a mounting location that is conveniently located and as far away from ignition sources as possible. Attach using the supplied Velcro. After the module has been mounted, you can run the wire from the SD module to the Main module. Cut to length, strip back the insulation so the four colored wires can reach a CAN bus port and so the bare shield wire can be wrapped around one of the four ground posts. Strip a small section of insulation of each of the four colored wires and place into the appropriately colored terminal, then connect the shield wire to a ground post.



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Exhaust Gas Temperature Module

Overview

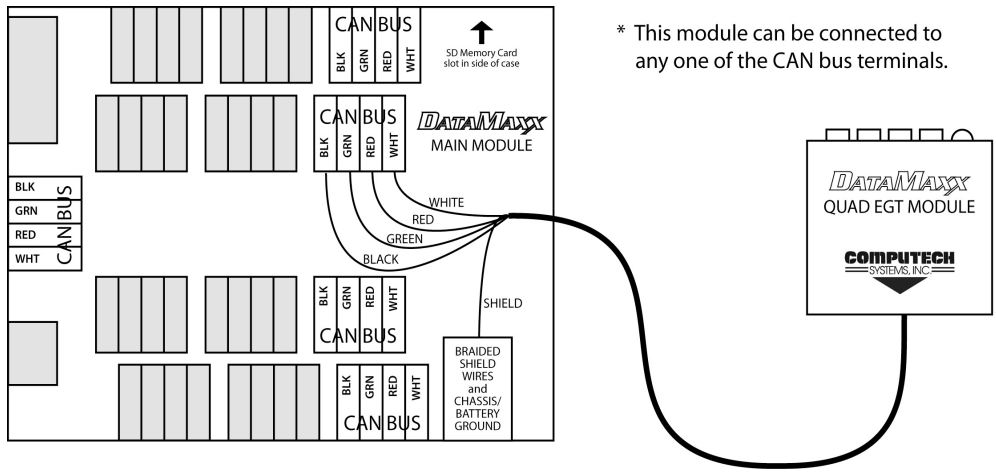
The EGT Module is designed to eliminate the need for multiple wires running to the main module. It utilizes an analog to digital converter that allows you to run a single wire back to the Main module.

Capabilities

4 Temperature Probes

Installation

First we want to mount the EGT module in a place that is at least 10" from any ignition component, especially the spark plug wires. The best mounting location is on the firewall or closer to the outward chassis member. Do NOT mount the EGT module directly to the engine block. Installing the EGT modules can be somewhat tricky as there are no bolt holes. One way that has proven successful is mounting to a flat surface using strong Velcro or securing via wire ties.
After the module has been mounted, you can run the wire from the EGT module to the Main module. Cut to length, strip back the insulation so the four colored wires can reach a CAN bus port and so the bare shield wire can be wrapped around one of the four ground posts. Strip a small section of insulation of each of the four colored wires and place into the appropriately colored terminal, then connect the shield wire to a ground post.
When installing the probes, be sure to make the probe wires "run away" from the spark plug wires and if you need to cross over a spark plug wire then do so with the probe wire underneath and have them cross at a 90 degree angle.



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Light Scheme

Blinking Pattern for GREEN LED	Meaning
Equal time on and off (or bright and dim)	**Normal**, samples being created
Short single blips separated by long pause	**Idle**, waiting for system process. This normally occurs for a second or two whenever recording is stopped. It also occurs during playback on the LCD Module.
Always off	**No Power**. If there's power, the green LED will at a minimum blip every few seconds.
Always on	This should never happen. If it happens repeatedly, contact customer support.

Blinking Pattern for RED LED	Meaning
Always off	**Normal**, everything's great
Two blips separated by long pause	**CAN bus problem**. This can be caused by an open wire not reaching this module, or by a short anywhere on the CAN bus. (It's OK if this error occurs immediately after recording is stopped, but then goes away shortly thereafter.)
Other blip patterns	Contact customer support

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Sensors

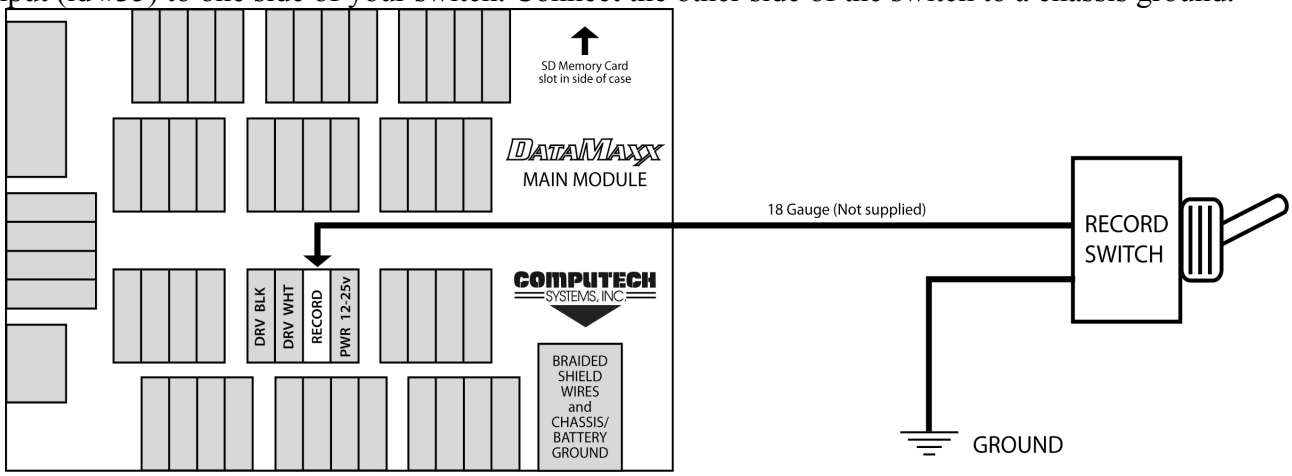
Record Switch

Overview:

The record switch has a dedicated terminal in the Main module and is actually treated as a sensor that is either open or closed to ground. You are not required to use this record switch terminal as you have the option of using the LCD record button or utilizing the software to automatically turn on/off recording (See Software: Recording)

Installation:

To install a record switch, using the switch supplied by Computech, connect a wire from the Record input (id #35) to one side of your switch. Connect the other side of the switch to a chassis ground.



Calibration:

The *DataMaxx* unit is pre-configured to start recording whenever the record terminal is connected to ground (which the switch does). If for some reason your record switch does not trigger recording you will need to open the 'Calibration/Configuration' window, click on the configure button for the 'Record' channel. In the Basic Settings tab, the type of sensor should be "Switch (Ground is 'On')". Under the 'Lights + Record' tab, select 'below' in the Record Automatically section for Warn Level 1 (level should be zero).

Testing:

If you believe your switch is faulty, connect a wire from the record terminal to the chassis ground screw and recording should begin. If it does not, double check your calibration settings.

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Engine RPM

Overview:

The *DataMaxx* can read your engine rpm by taking a signal from a tachometer or the ignition system. It also has a separate channel dedicated to reading rpm from magnetos.

Installation:

Electric Tachometer:
If you have an electronic or mechanical tachometer, the easiest method to obtain engine rpm would be to simply tap into the tachometers signal wire. On most tachometer manufacturers the signal wire should be the green one. Simply plug this signal wire into the 'RPM ENG' terminal (id #32).

Ignition Systems:
Many CDI, electronic, and computer ignitions (such as MSD) have a dedicated tachometer output. Simply plug this signal wire into the 'RPM ENG' terminal (id #32).

Ignition System with External Coils:
If your ignition system does not have an electric tachometer or dedicated tachometer output, but does have an external coil, then that coil will have one high tension spark plug type wire (typically plugged into the top center) and two low tension smaller wires (typically screwed onto posts near the top). One of the two low tension wires will be a suitable rpm signal. If the two wires or terminals are labeled "+" and "-", use the "-" side for your rpm signal. Otherwise choose one side arbitrarily. It is safe to connect to the wrong one and you'll realize you've done this if you get a very poor rpm reading. In that case, try the other terminals.

Magneto Ignitions:
We recommend using a mag tach adapter that will accept the noisy magneto signal and condition it into a clean tach output. Mounting the tach adapter close to the magneto will prevent you from making a magneto antenna and reduce the amount of problems a magneto can cause to a data logger.

We also recommend changing your mag kill switch from a "lightning wire" kill switch to a conditioned relay kill switch. When using a hot wire kill switch you are running the full load of your ignition system up to the cockpit to the switch and then all the way back to the magneto. This creates a magneto antenna that significantly expands your ignition noise radius. By using a clean 12V or ground signal to trigger a relay that will cut the magneto off, you successfully keep all of your ignition noise centered around the engine.

> **WARNING:** Connecting the magneto directly to the DataMaxx will result in a failure and void your warranty.

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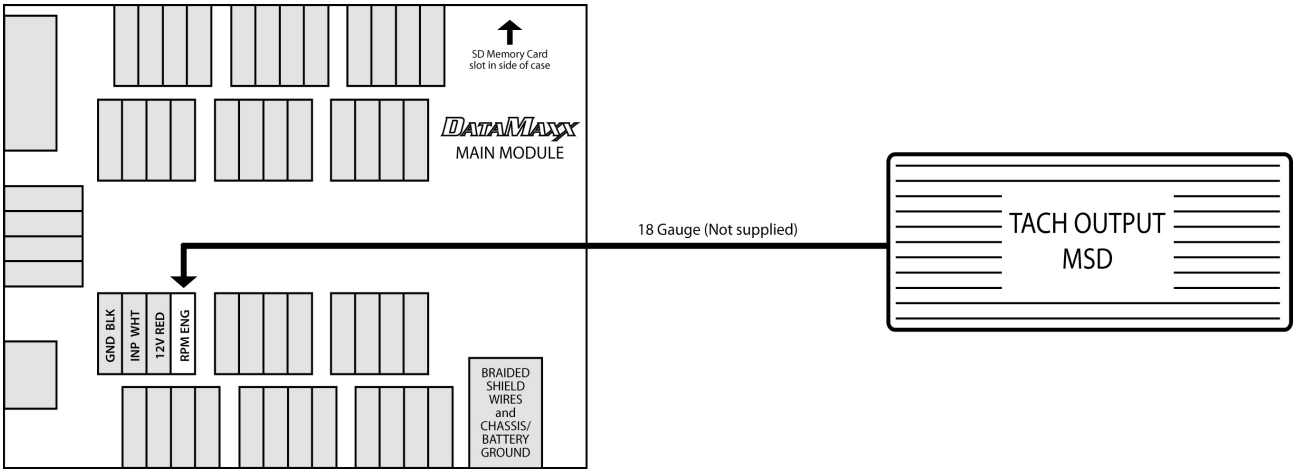

Calibration:

The *DataMaxx* engine rpm channel is pre-configured to an 8 cylinder, four stroke engine for both normal engine rpm and magneto. You can however change the number of cylinders and switch between four and two stroke engines. To change, open the Calibration/Configuration window, and click on the "configure" button for the engine rpm or magneto channel. You can now change the type of sensor and the red line value.

Testing:

To test your RPM signal, crank the engine and let it idle. If you have an LCD module, the display should indicate the correct rpm. Your graph should be smooth in general, but be aware that most readings will bounce very rapidly within a 25 to 100 rpm range. Keep in mind that many race ignition systems generate a great deal of radio frequency interference, and that the ignition noise can cause erratic rpm readings. If you believe you are a victim of this interference noise, then make sure that all *DataMaxx* components, including wires, are as far away from ignition components as possible. Also refer to Avoiding RFI Noise in the Additional Information section.

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Drive shaft RPM

Overview:

The drive shaft rpm will tell you how many revolutions per minute your drive shaft is spinning.

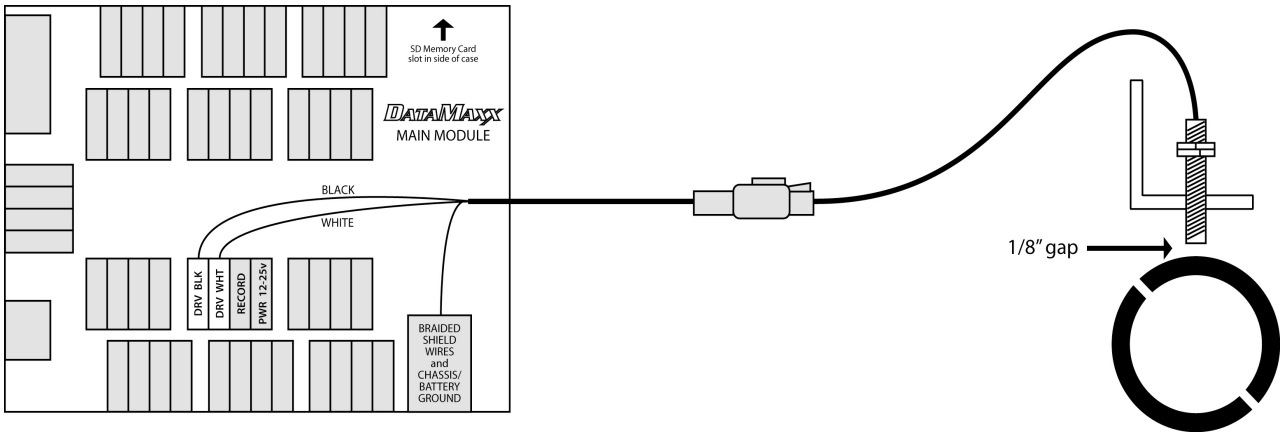
Part Numbers:

#8010	9" Ford Small Pinion Drive shaft RPM Monitor Kit	1.878"
#8015	9" Ford Large Pinion Drive shaft RPM Monitor Kit	2.190"
#8020	Universal Drive shaft RPM Monitor Kit	

Installation:

First verify that the collar (if ordered) fits your drive shaft. The drive shaft sensor is to be passed through the hole in the bracket and then held in position by the two plastic jam nuts. The sensor should be pointed directly at the outer edge of the collar and toward the center of the rotating shaft. The exact position of the sensor in the bracket should be adjusted to achieve a gap of approximately 1/8". If your collar is slightly too large, you can shave a small amount off of each end until it fits well.

Connect the white wire to the Main module "DRV WHT" terminal (id #34) and the black wire to "GND BLK" terminal (id #33).



Calibration:

The *DataMaxx* drive shaft rpm channel is pre-configured for use with a 2 magnet collar. You have the option of a 1, 2, and 4 magnet configuration. To change, open the Calibration/Configuration window, and click on the "configure" button for the drive shaft rpm channel. You can now change the magnet configuration by selecting the correct type of sensor from the drop down menu.

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Testing:

Testing the drive shaft input can be dangerous. The safest method is to wait until you're on the track. Nevertheless, it is possible to test this input by putting the car on stands. Again for the sake of safety it is not recommended that you run the engine in order to turn the drive shaft and tires. Instead, spin the tires by hand as fast as you can while the transmission is in neutral. The drive shaft should turn fast enough to get a very small reading. If you can't get a reading, you may not be able to turn the tires fast enough, and should wait until you get to the track.

Input Shaft RPM

Overview:

The input shaft RPM will tell you how many revolutions per minute your input shaft is spinning.

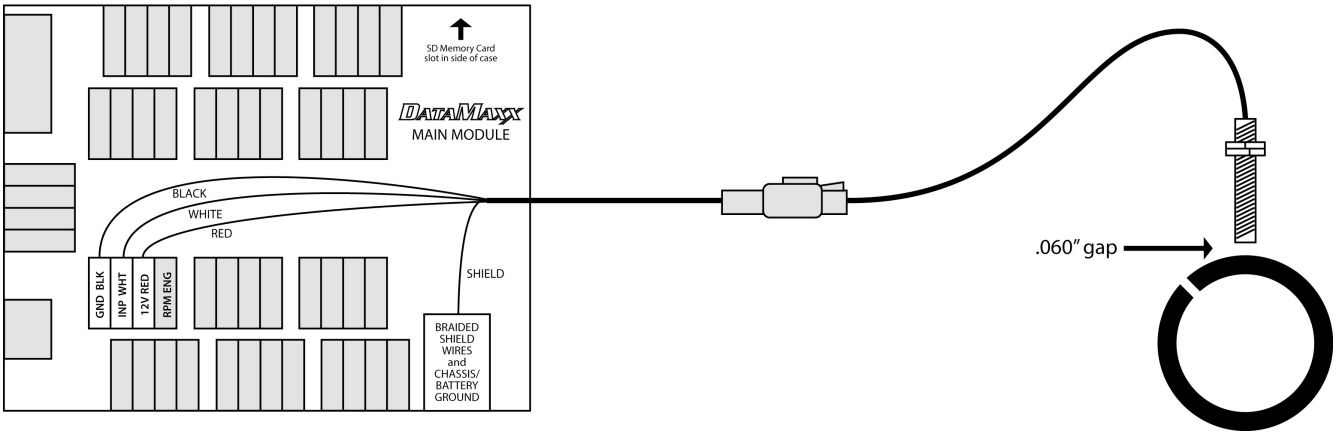
Part Numbers:

#8021 Universal Input Shaft RPM Monitor Kit

Installation:

For the input shaft sensor and trigger installation, please get specific details from your transmission supplier. The typical sensor gap required for most input shaft installations is approximately .060". The use of the Computech supplied pick-up magnet and alignment of the magnet and sensor are critical for proper operation.

Connect the white wire to the Main module "INP WHT" terminal (id #30), the black wire to "GND BLK" terminal (id #29), and the red wire to "12V RED" terminal (id #31).



Calibration:

The *DataMaxx* input shaft rpm channel is pre-configured for use with 1 magnet. You have the option of a 1, 2, and 4 magnet configuration. To change, open the Calibration/Configuration window, and click on the "configure" button for the input shaft rpm channel. You can now change the magnet configuration by selecting the correct type of sensor from the drop down menu.

Testing:

Crank the engine while the transmission is in neutral so that the input shaft safely turns.

Pressure Sensors

Overview:

Pressure sensors are an analog style sensor that produces a voltage from 0V to 5V depending on the amount of pressure applied and the range of the sensor. If you are using a pressure sensor, you can install it into any available analog channel.

Part Numbers:

#8023	-14.7 to 30 Vacuum Pressure Kit
#8025	0 to 30 Pressure Kit
#8030	0 to 150 Pressure Kit
#8031	0 to 500 Pressure Kit
#8033	0 to 2000 Nitrous Pressure Kit
#8026	Economy Oil Pressure Kit

Installation:

You can install the pressure sensor directly to the engine or selected application or use a type of cushioned clamp. The cushioned clamp is the better alternative as it helps reduce the amount of vibration and can extend the life of your pressure sensor.

If using the standard *DataMaxx* pressure sensor (black, round, will have a *DataMaxx* label on it) insert the white wire into an available "A- WHT" terminal, the black wire to the "GND BLK" terminal, and the red wire to the "5V RED" terminal.

Note: When using a standard pressure sensor, the dip switch settings for that channel need to be as follows: "A- RTD" terminal OFF and "A- GND" terminal ON

If using the economy oil pressure sensor, mount the sensor directly to the engine. There is a screw post on the other end of the sensor that you will need to connect a wire to, and run to a *DataMaxx* module.

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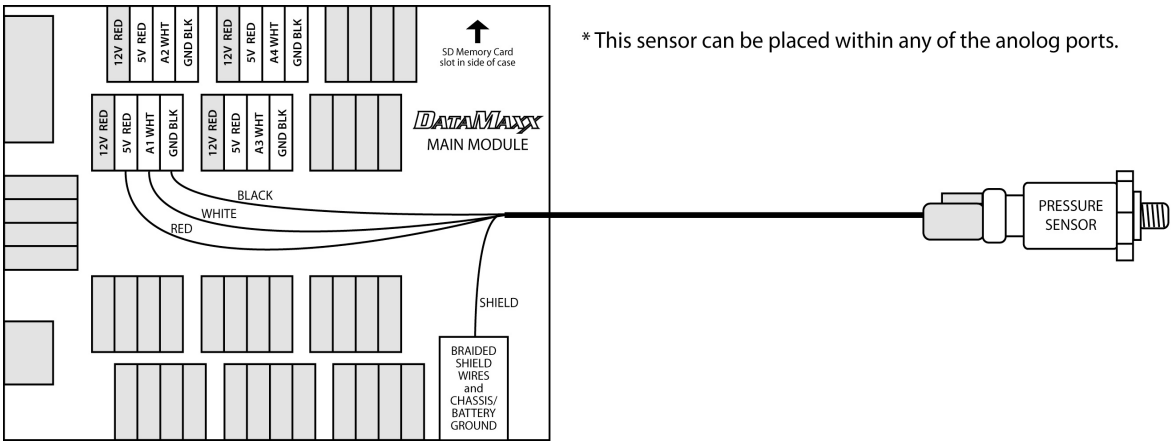
This wire will be plugged into an "A- WHT" terminal and will not need a ground wire connected as the sensor housing itself acts as the connection to chassis ground.

> **Note:** When using the economy sensor, you must make a change to the dip switch settings. Both the "RTD" and "GND" dip switches must be in the ON position for the specific channel that you installed the economy sensor on. Failure to do so will result in erratic readings.

If using any different pressure sensor, refer to the sensor's manufacturer to determine the reference voltage range. If the range is higher than 5V then the 12V reference voltage needs to be used. Note that this sensor will also require a custom calibration.



* This sensor can be placed within any of the anolog ports.

Calibration

After installing your pressure sensor you will need to tell the computer and the *DataMaxx* what type of sensor it is. You will also need to know which Module and analog channel that you have plugged it into.

To configure, open the Calibration/Configuration window, and click on the "configure" button for the specific channel that you have plugged the sensor into. You can now change the type of the pressure sensor by choosing the correct range from "Type of Sensor" drop down menu.

> **Note:** If using the economy pressure sensor, the name listed in the type of sensor drop down menu is "Autometer Oil"

Testing:

All pressure sensors should read approximately zero when there is no pressure applied. The only way to truly test a pressure sensor is to apply pressure to it and watch for a reaction.
If for some reason a sensor is consistently reading a value other than zero at rest, you can add a line to the calibration to get it closer, but this requires slightly more expertise than the standard configuration. For more information go to "Custom Calibrations" in the Additional Information section.

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EXHAUST GAS TEMPERATURE PROBES

Overview:

Using exhaust gas temperature probes can be a valuable tool for tuning and as a warning system to prevent engine damage. Your *DATAMAXX* is designed for use with K-type thermocouple probes for measuring exhaust gas temperature, with a maximum reading capability of approximately 1800°F. Special K-type extension cable must be used, without exception.

Part Numbers:

#8035	Single Exhaust Gas Temperature Kit
#8036	Custom 8 Cylinder Thermocouple Kit

Installation:

This cable contains two wires, color coded yellow and red. When connecting to an EGT Module, wire the cable into a yellow thermocouple plug, connecting the yellow wire to the "+" terminal and the red wire to the "-" terminal. Yes, this does seem backward, but that's how the color code on thermocouple wire is defined! When connecting to a *DATAMAXX* module using screw terminals, connect the yellow wire to the "A- WHT"signal terminal and connect the red wire to a nearby "GND BLK" terminal.

Follow the appropriate instructions below for installing your sensor probes.

1. Measure a spot 1 ¼" from the header flange. If more than one probe is to be mounted, it is important that all probes be located the same distance from the header flange. This will allow for comparison from cylinder to cylinder.
2. Once the spot has been located, drill a 5/16" diameter hole in the header pipe.
3. Center the weld-in weldment around the hole and weld to the header pipe a full 360°.
4. Coat the 1/8" pipe threads on the compression fitting liberally with anti-seize and install the male connector portion of the compression fitting into the weldment and tighten.
5. Now, using a marker or pencil, make a mark on the probe that is half the diameter of the header pipe ***plus*** 1" (the length of the weldment and the compression fitting) from the exposed tip of the probe. Verify this depth by visual inspection into the pipe. The tip of the probe should reach to the center of the pipe. (For example, for a 1 1/2" header pipe, the mark on the probe should be half of this diameter plus 1" from the tip, which amounts to 1 3/4" from the tip. For a 2" header pipe, the mark should be 2" from the tip.)
6. Slip the nut (with the cup side to the exposed tip of the probe) and the ferrule onto the probe.
7. Insert the probe into the compression fitting base to the point where the ferrule and the line on the probe come together. This will insure that the probe is in the middle of the exhaust stream and will

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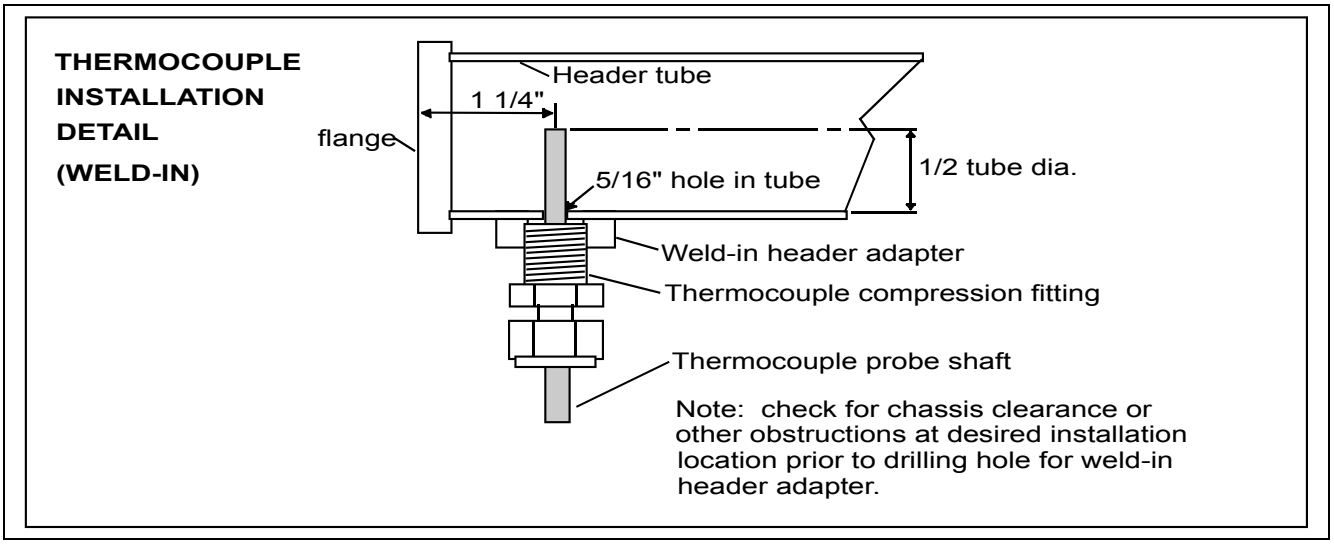
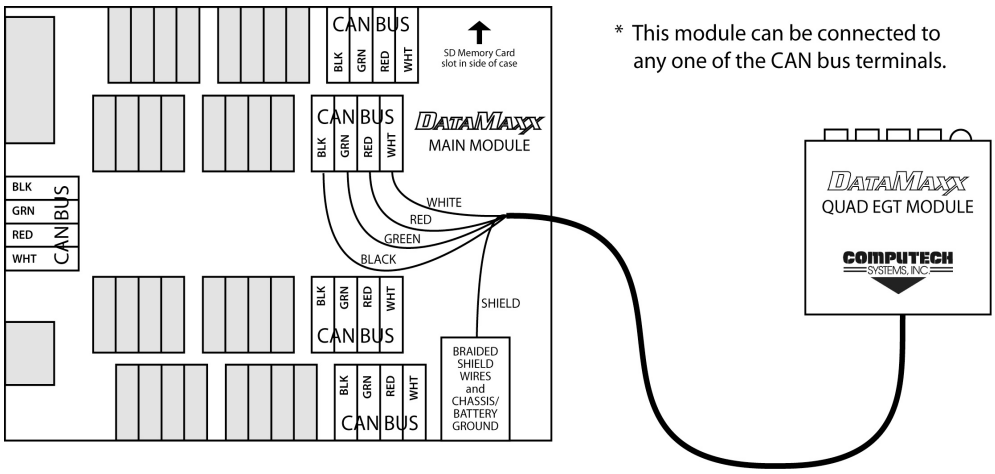
set the ferrule on the probe sheath.

8. Holding the probe in place, tighten the compression nut down tight. **Make certain that the thermocouple probe is in its proper position prior to tightening the compression nut.**
9. Loosen the nut to the point that the probe will turn and, if room permits, align the transition spring and the lead wire at a 90 degree angle from the exhaust pipe. This will position the sender tip correctly in the exhaust stream.
10. Tighten the nut back down to secure the probe.
11. Route the probe's cable to the junction box, using tie wraps along the way, but leaving sufficient slack to easily insert the connector into the appropriate junction box jack. **Do not harness the cable tightly, being sure to use sweeping bends and loosely guiding the cable to the junction box.** This will allow the cable to absorb vibrations along its length
12. The male connector on the end of the probe's cable should properly mate with any of the thermocouple jacks coming from the junction box, so pay attention to the labels on the junction box lid in order to associate the correct cylinder with the correct channel. Insert the male connector into the appropriate jack. It will only go on one way.
13. The cable may be shortened if required. Cut the cable to the desired length (plus some spare) and carefully cut the stainless steel overbraid back approximately 1". Shrink tubing should be used over the cable where it exists the connector to make for a neater installation. Make certain that the overbraid in no way comes in contact with the wire terminals in the connector. Strip the RED wire back approximately ½" and connect to the minus (-) terminal in the connector. Repeat the process for the YELLOW wire and connect to the positive (+) terminal. NOTE: Only this wire can be utilized. Substitution of a different wire ***will*** affect the operation of the sensor. **REMEMBER - The RED wire must be connected to the MINUS (-) terminal and the YELLOW wire must be connected to the POSITIVE (+) terminal.**





Calibration:

If you have ordered the custom 8 thermocouple kit, then your kit came with two EGT modules. These modules convert 4 analog thermocouple signals into one digital wire that then plugs into a CAN Bus port on the Main module. To calibrate your system, simply plug your EGT modules into available CAN Bus ports on the Main module, record a quick test run, and download the SD card to your PC. The Main module will sense the presence of the EGT module and will automatically set the calibration for thermocouples.

If you have ordered a single thermocouple and are using an analog channel to monitor, you will need to adjust the calibration setting for that analog channel. To configure, open the Calibration/Configuration window, and click on the "configure" button for the specific channel that you have plugged the thermocouple into. You can now change the type of the "Type of Sensor" to "EGT (1800 degree range) from the drop down menu.

Testing:

If the engine is off and cold, the readings should be within 20 degrees Fahrenheit of room temperature. If the engine is warm, appropriate readings should be seen. If your probes are reading close to 30 degrees, then there is very likely an accidental reversal of wires somewhere. If your probe is reading a maximum or close to 1800 degrees, then there is an open circuit, and most likely a wire unplugged. Check all connections between the actual probe and the *DataMaxx* module.

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LOW RANGE TEMPERATURE KIT

Overview:

Liquid temp kits can be used to measure water temp, oil temp, trans temp, and cylinder head temp.

Part Numbers:

#8037	Liquid Temperature Monitoring Kit
#8039	Economy Liquid Temperature Monitoring Kit
#4118	Cylinder Head Temperature Kit

Installation:

If using the standard liquid temp kit, you can use the supplied compression fitting to install and adjust the depth of the probe. Connect the supplied extension cable to the probe and run to an analog channel. Then connect the yellow wire to the "A- WHT" and the red wire to the "A- GND" (yes, this may seem backwards but it is the way thermocouples work). The corresponding RTD dip switch should be OFF and the GND dip switch should be ON.

If using the cylinder head temp kit, place the probe around a cylinder head bolt or spark plug. Then connect the supplied extension cable to the probe and run to an analog channel. Then connect the yellow wire to the "A- WHT" and the red wire to the "A- GND" (yes, this may seem backwards but it is the way thermocouples work)

If using the economy liquid temp kit, simply install the sensor into the engine block or other application, and run a wire from the sensor terminal to an analog channel. Connect that wire to "A-WHT" and the ground signal is derived from the sensor physically touching the engine or chassis ground.

Note: For Economy Water, both the corresponding RTD and GND dip switch should be ON

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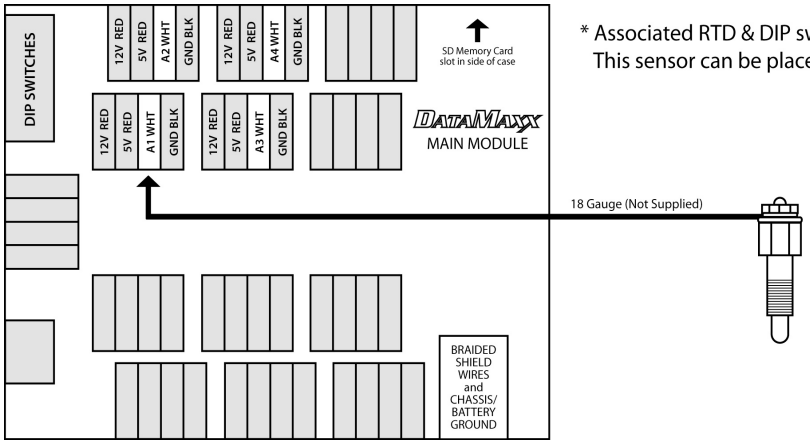

* Associated RTD & DIP switch must be turned on.
This sensor can be placed withing any of the analog ports.

Calibration:

If using the standard liquid temp kit and cylinder head temp kit, open the Calibration/Configuration window, and click on the "configure" button for the specific channel that you have plugged the sensor into. You can now change the type of the sensor to "TEMP (470 degree range)".

If using the economy liquid temp kit, open the Calibration/Configuration window, and click on the "configure" button for the specific channel that you have plugged the sensor into. You can now change the type of the sensor to "Datcon 02022-00 Temp".

Testing:

If the engine is off and cold, the readings should be within 5 to 10 degrees Fahrenheit of room temperature. If the engine is warm, appropriate readings should be seen. If your probes are reading close to 30 degrees, then there is very likely an accidental reversal of wires somewhere. If your probe is reading a maximum or close to 470 degrees, then there is an open circuit, and most likely a wire unplugged. Check all connections between the actual probe and the *DATAMAXX* module.

ACCELEROMETER

Overview:

An accelerometer can deliver a wealth of information regarding your cars launch.

Part Numbers:

#8040 Single Axis 3.5 G Accelerometer

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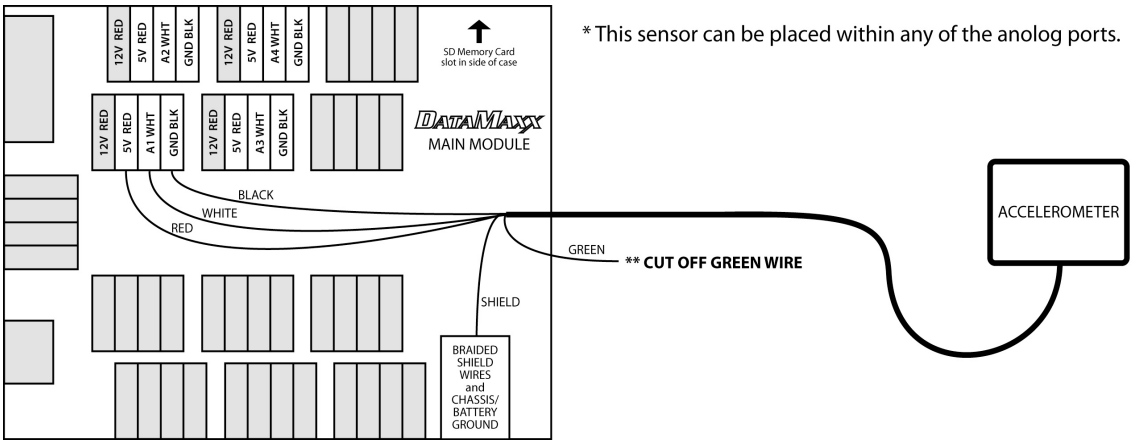
Installation:

For accurate readings, it is important to properly mount your accelerometer. For single axis accelerometers in drag racing applications, simply make sure that the arrow on the accelerometer points exactly straight forward. Mounting the accelerometer away from the center of gravity of the car will introduce false readings because "yaw" (mere rotation or spinning) is misperceived as acceleration (changing direction of motion or cornering).

Find a suitable mounting location where the sensor will not be supseptable to excessive vibration. It is also helpful to use 3M foam tape to securely adhere to a surface. Now run the wire to either the Main or Analog module, and connect to a free Analog input. Connect the white wire to "A- WHT", black wire to "GND BLK", and the red wire to "5V RED." The green wire is not used and can be cut off.



Calibration:

To configure, open the Calibration/Configuration window, and click on the "configure" button for the specific channel that you have plugged the sensor into. You can now change the type of sensor to "Accelerometer". Note that if you want the accelerometer to be zero when you launch, open the channel properties, select the filter for your accelerometer channel, and select the check box for "Automatically zero reading just before launch."

Testing:

With the accelerometer wired but not mounted, tilt it so that the arrow points straight up toward the sky. A reading close to one should result. This indicates one earth gravity or one "g" of acceleration. If you point the arrow straight down toward the earth, the reading should be minus one. If you hold the sensor level, the reading should be close to zero. Now, permanently mount the sensor. It is OK if the reading is not perfectly zero, as the software will automatically set it to a zero value at the appropriate place.

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Oxygen Sensor

Overview:

An alternative tuning device to the EGT is the Oxygen sensor. The *DataMaxx* unit can not directly interface to a standard automotive oxygen sensor and needs a separate oxygen sensor controller.

Part Numbers:

#8041	Wego III Wide Band O2 Sensor
#8042	Dual Wego III Wide Band O2 Sensor

Installation:

1. The oxygen sensor should be located on the header pipe about 6-8 inches from the header flange. Ideally the sensor tip should face down to avoid accumulation of condensation.
2. A 18 x 1.5 mm weld nuts must be welded onto the exhaust pipe. After welding, run an 18 x 1.5 mm tap through the threads. Failure to clean the threads may result in sensor damage. Always use an anti-sieze lubricant on the sensor threads
3. Install the Wego IIID unit. The unit is fully sealed but should be mounted away from sources of engine or exhaust heat. The unit can be secured by means of two #8 screws through the mounting flanges.
4. Connect the Bosch sensors to the 6 pin mating connectors on the Wego wire harness. Connect the black wire to chassis ground, the red wire to a switched +12 volt power.
5. The white wire is the signal for the first O2 sensor and should be plugged into a selected “A- WHT” terminal. The blue wire is the signal for the second O2 sensor and should be plugged into a selected “A- WHT” terminal.

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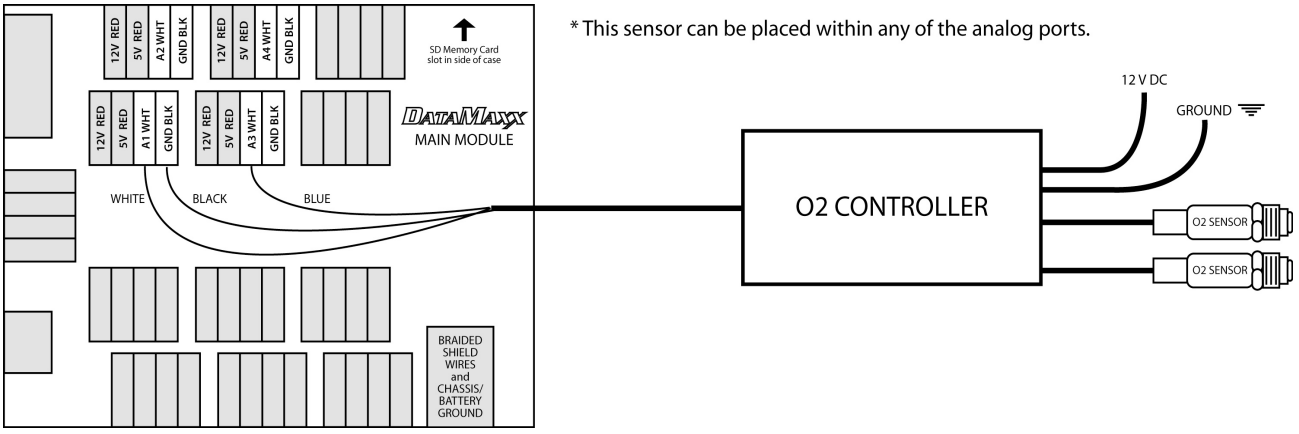

Calibration:

After installation, the Wego IIID requires free air calibration. This should be done with the sensors dangling in free air. The environment must be free of hydrocarbon vapors. We suggest that you perform the free air calibration outdoors. Turn the free air calibration trim pots on the Wego full counterclockwise. Turn on power and wait for 60 seconds so the system can fully stabilize. Then slowly turn each free air calibration trim pot clockwise until the corresponding LED starts flashing at a rapid rate. Try to set each trim pot at the point where its LED just starts to flash.

The free air calibration procedure should be performed at reasonable intervals (every 250-500 hours if using unleaded gas or every 2-5 hours if using leaded racing gas) or whenever a sensor is replaced. If you cannot get an LED to flash when its trim pot is turned full clockwise, you either have a damaged sensor or very high hydrocarbon levels in your environment.

To calibrate the *DataMaxx* to an oxygen sensor, open the Calibration/Configuration window, and click on the "configure" button for the specific channel that you have plugged the sensor into. You can now change the type of sensor to "O2 (Daytona WEGO II) Gas or Meth AFR."

Testing:

If the sensor is mounted in the collector, you are not likely to get a legitimate reading at idle due to air recursion. There is however a convenient way to test that the sensors are working before going down the track. Turn on the power to the system, and let the oxygen sensors heat up for approximately 2 minutes. Then using a Bic butane lighter, force butane into the tip of the sensor BUT do not light. When the sensor feels the butane it should go from a reading of 18-20 down to a reading of 10-12.

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Suspension Position Sensor

Overview:

The suspension position transducer is designed to measure suspension movement during the entire data acquisition recording period, however for drag race purposes we are primarily interested in the suspension movement immediately following the initial launch.

The transducer can be used to measure either the front or rear suspension travel. There would normally be two transducers for the front of the vehicle and or two transducers for the rear of the vehicle. It is possible to use only one transducer on the rear suspension centered above the rear axle housing, but it is decidedly better to utilize two transducers in this application, one on the left rear and one on the right rear. As the suspension moves either up or down relative to its static at rest position, the data recorder will record these movements.

Part Numbers:

#8050 Shock Travel Sensor Kit

Installation:

Proper installation requires considerable thought to provide repeatable results without causing potential damage to the transducer.

Determine a suitable mounting location directly above the desired suspension member. The transducer has two mounting holes which will accommodate ¼" bolts. Be careful to locate the transducer exactly above the desired suspension member. An example of this would be to mount the transducer to the underside of the upper frame rail, cross member, or floor pan directly above the axle housing. Make certain you will be able to mount the transducer for the opposite side of the suspension (i.e.: one on the left rear and one on the right rear) the same distance from the center line of the vehicle so that the difference in readings between the transducers will truly represent actual suspension movement differences and not skewed readings caused by differing mounting locations.

The overall wire rope travel of the transducers string potentiometer is approximately 10.5 inches. The distance between your transducer mounting location and your axle housing/suspension location will likely be greater than 11 inches. To accommodate this you will need an extension attached to the wire rope eyelet of the transducer. To determine the length of the required extension you must first install the transducer in the desired location as described above. With the vehicle in a race ready state, sitting on a level pad, measure the distance from the eyelet on the transducer to the mounting location you have chosen on the axle housing/suspension location. Subtract 5 inches from this measurement to determine the actual length of the required extension. By subtracting 5 inches from the static at rest distance as describe above, when the extension is connected to the transducer it will pull the transducers wire rope to its mid-range. This will allow actual suspension movement measurements either up or down approximately 4 inches, which should accommodate most drag race suspension

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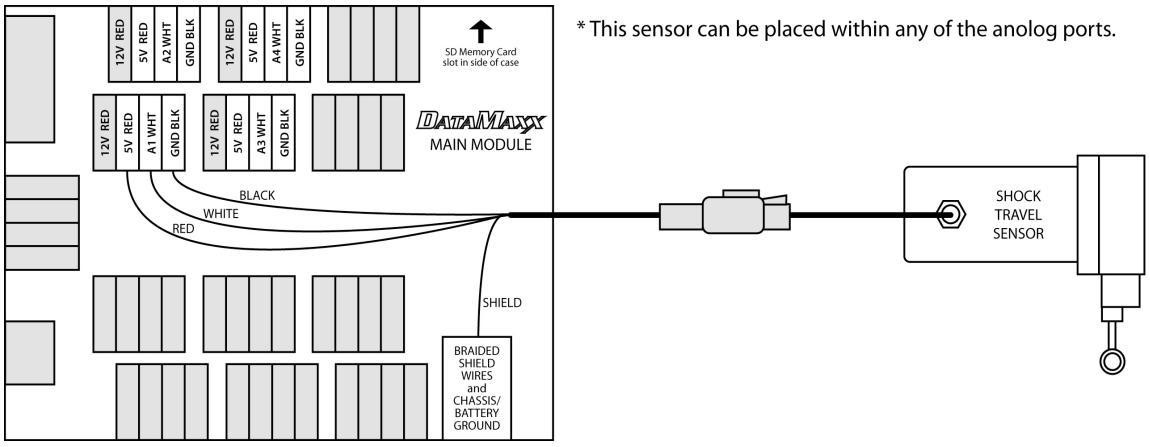
travel limits. The extension can be as elaborate or a simple as you wish. Lightweight stainless steel wire rope with a means of quickly disconnecting it from the transducers wire rope eyelet will work well.

After installing the sensor on the vehicle, you will need to wire it to a *DataMaxx* analog channel. Insert the white wire into an "A- WHT", the black wire into "BLK GND", and the red wire into the "5V RED".

CAUTION! Do not jack up the vehicle with the transducers wire rope connected to the suspension! This may cause the wire rope to be pulled out of the transducer as the suspension reaches its fullest travel length. This will not only ruin the transducer, but it will probably also ruin your day. Always disconnect the wire rope eyelet from the suspension before jacking up the vehicle or performing any maintenance on the vehicle suspension.



Calibration:

To configure, open the Calibration/Configuration window, and click on the "configure" button for the specific channel that you have plugged the sensor into. You can now change the type of sensor to "10" Strpot".

Testing:

To test the suspension position sensor, bounce the suspension up or down and verify that the reading changes.

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Switches

Overview:

Your *DataMaxx* system has the capability to monitor multiple switched on / off events. You can monitor switches that connect to ground or 12 volts. There are two designated switch inputs and any of the rpm channels can also be converted into switch inputs. If you are monitoring a solenoid or another "nasty" signal, it is recommended to the optically isolated channels of Input shaft or Magneto.

Installation:

To install a non-powered switch with a common ground, simply connect the switch wire to the SW1 or SW2 input. If not using a common ground connect the ground wire to the ground terminal near the switch signal.
To install a switch that will monitor a 12V signal, you must first decide if it's a "nice" or "nasty" signal. Nasty signals produce high voltage spikes, such as solenoids, and can actually damage your *DataMaxx* if not installed properly. In order to protect the main module there are two optically isolated inputs, the input shaft and magneto channel, both of which can be calibrated to be switch inputs. Any nasty signals should use the optically isolated channel and nice signals can use either.

Warning: Both NHRA and IHRA frown upon attaching any electronic device to your trans brake besides a delay box. Check with your local official before installing any trans brake switch. Also, connecting a trans brake to an input that is not optically isolated will cause a power surge to your *DataMaxx*, possibly destroying it and voiding your warranty.
If you choose to monitor your trans brake, connect the trans brake signal wire to the magneto signal (terminal id #42) and connect a separate ground to the magneto ground (terminal id #41). Place both the Mag PuP (A) and Mag Gnd (B) dip switches to the OFF position in order to isolate the noisy trans brake signal from the rest of the system. Finally change the magneto channel calibration to "Switch (Ground is Off).

Calibration:

To configure, open the Calibration/Configuration window, and click on the "configure" button for the specific channel that you have plugged the switch into. You can now choose either "Ground is On" or "Ground is Off".

Testing:

By default the LCD will show both switch 1 and 2. Changing the switch should change the display. If you are not using an LCD then recording a log file should display the switches at the top of the screen in zone one. If you are not getting any reaction from your switched input, test by touching a ground input to the switch signal, a change should appear.

If you are trying to monitor a powered switch yet no change is apparent, it is most likely due to the fact

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that a 0V reading is not occurring. In order for a powered switch to change it must alternate between a 0V reading and a voltage reading higher than 1.5V. Note that an open circuit is not the same as a 0V reading.

Lights

Overview:

The *DataMaxx* has two 12V light outputs that can be triggered by any of the sensors you have installed. This allows you to set multiple values to activate the light, such as turning on a warning light when the oil pressure drops below a certain value.

Installation:

Both L1 and L2 produce a 12V signal when prompted by pre-determined values that you have set in the software. Connect either L1 or L2, to the positive end of your light and the ground side to a convenient chassis ground.

Calibration:

The lights do not have a separate calibration line in the Channel Properties because the lights are triggered by all of the other sensors. To activate a light through a sensor, click on the desired sensors calibration button and select the “Lights + Record” tab. You can now choose a warn level for both main module lights and LCD lights. If you would like a switch to activate the light then choose the “below” option with a warn level of ‘0’.

Testing:

The easiest way to test if a light is reacting correctly, would be to use the switch to activate the light. To do so open the channel properties, choose either switch 1 or 2 and click on the calibration button, then the “Lights + Record” tab. Choose “below” and a warn level of zero, then send the configuration to the *DataMaxx*. Your unit should now be set to turn on a light when a switch is thrown. Quickly throw the switch by connecting the switch signal to ground.

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SOFTWARE

INSTALLING THE DATAMAXX VIEWER

Overview:

The *DataMaxx* Viewer software allows you to customize your unit, download your runs, and manipulate the recorded data. This software will work with any Windows 98, 2000, XP, and Vista.

Installation:

Your *DataMaxx* unit comes standard with the *DataMaxx* Viewer CD and is available online at www.computechracing.com . To install, simply insert the disk and it will automatically start installing or click on the setup.exe file.

INITIAL CALIBRATION

Overview:
This step is one of the most important and difficult to understand, but following the instructions will allow for a smooth and quick calibration. The initial calibration tells your *DataMaxx* unit which modules and sensors you have installed. Without doing this the *DataMaxx* would not know what type of sensor is in which channel, and your data would not be accurate.

Instructions:

1. After all modules and sensors have been installed, place the supplied SD card into the slot, and turn on power.

2. Make a short 10 second recording while the engine is off. (This allows the software to determine if you have any additional modules such as EGT or LCD)

3. Remove the SD card, place it in your computer, and open the *DataMaxx* software. Then press the "SD" button to download the test log file.
    a. *Note: Initially the software does not know where your SD card is and you must choose yes to the prompt asking to search another location for log files, and then choose your SD drive (should only have to do this initially).*

4. When looking at the run, the background should be black and the sensor names should be listed to the left. Click on any of the sensor names and choose "Properties" to bring you to the channel properties.

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5. In the Channel Properties screen you can change the name, type of sensor, graph color and zone, and lights and record options by simply clicking on the picture of a finger pushing a red button. Change each sensor to reflect your custom application.

6. After making all the necessary changes, we need to send this information back to the *DATAMAXX*. To do so, click on the "Send Configuration to *DATAMAXX*" and then insert the card into your powered up *DATAMAXX*.

7. After your *DATAMAXX* has been configured, it is wise to confirm that the changes you have made took place. To do this, simply record another quick test run and download to your PC. The sensor names and type should now reflect the changes.

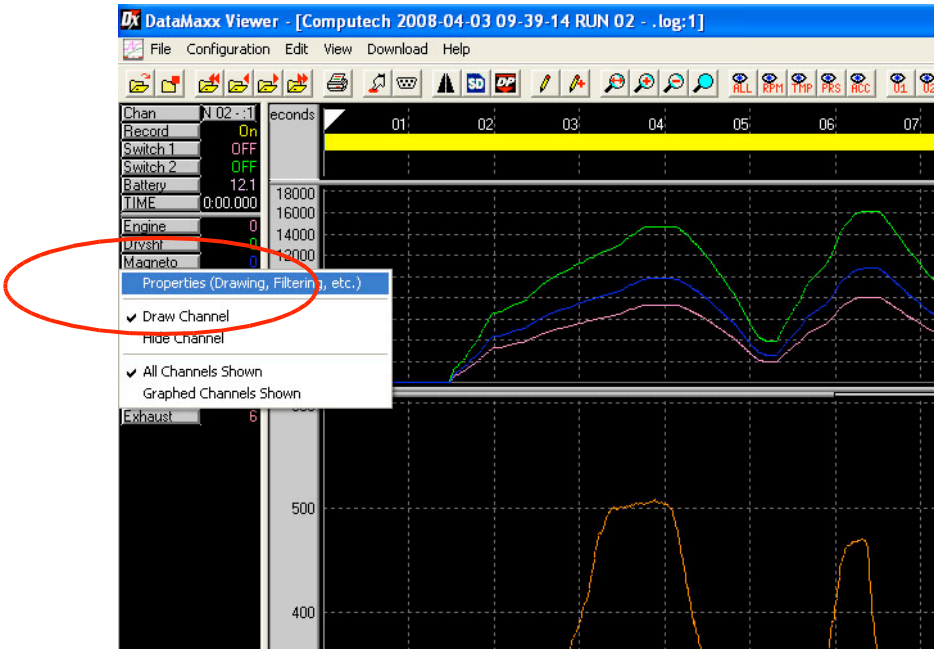

Figure 2: Click on any sensor name, and then click on "properties"

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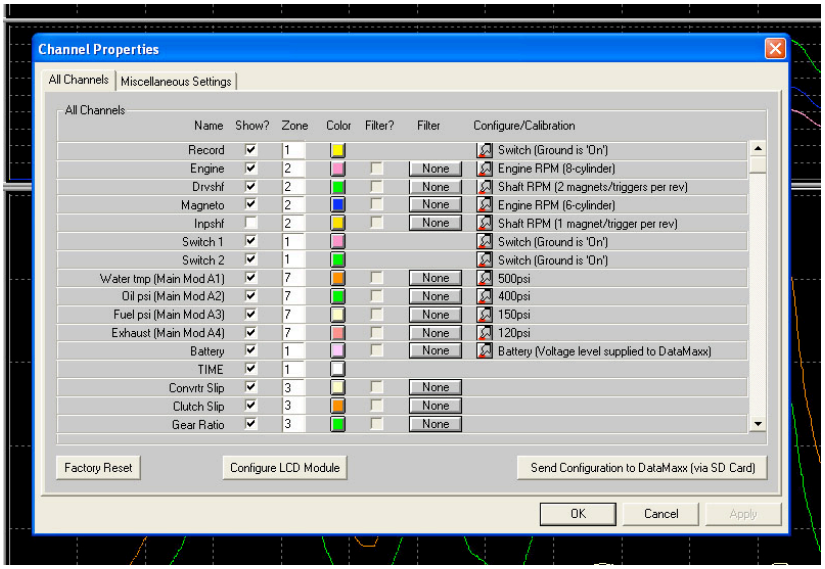

Figure 3: Channel Properties allow you to change the name and type of every sensor

LIGHTS & RECORD

The *DATAMAXX* system includes customizable lights and log file recording. The Main module is equipped with two light outputs that produce a 12V signal and the LCD has a yellow and red light built in. You can set any sensor to trigger any of these lights to turn on when it gets below or above a certain value. You can also use any sensor value to automatically trigger recording, such as drive shaft movement.

To change, open the Calibration/Configuration window, and click on the “configure” button for the channel you would like to change. Now click on the “Lights + Record” tab to adjust.

OVERLAYING RUNS

To overlay multiple runs, simply open a log file, and when that graph is displayed, open another log file and they will sit on top of each other. You can overlay multiple runs, however you cannot remove an individual run from the overlay and closing the run will close all of the overlaid files.

CUSTOMIZING VIEWS

When looking at your log file's you may find that you prefer to see certain channels in the same graph or prefer a certain zone section to be larger or smaller. You can accomplish this through the software with ease.

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To change the graph zone that a sensor is displayed, simply right click on the sensor name and choose "Properties." In the "Channel Properties" window you will see a text box next to each sensor's name that marks the specific zone the graph will be displayed in. In general you want sensors with a similar range to be in the same zone that way you can see the specific graph in full range (putting a 2000 psi sensor in the same graph zone as a 30 psi sensor will make the 30 psi look like a straight line regardless of change because the range is 0 – 2000 instead of 0-30.)

To customize views, simply modify the view as you like and choose "View" and "Save View as Custom View" and choose the specific number you would like associate the view to.

Shortcut Keys

I	=	Zoom In
O	=	Zoom Out
W	=	View Whole Run
Z	=	Set Zero Time

Zones

When viewing your runs on the *DataMaxx* viewer software, each sensor is displayed in a specific zone. To get the most out of your data, it is recommended to place channels that have similar ranges in the same zone. Ex. A 30 psi sensor will look like a flat line in the same zone as a 2000 psi sensor because their ranges are so drastically different. The zones can be changed in the channel properties screen.

Default Zone Settings:

1. Switches
2. Main RPM (engine, drive, input)
3. Derived RPM (converter slippage, gear ratio)
4. Low Temperature
5. Exhaust Gas Temperature
6. Accelerometer
7. Pressure

Truncating Log files

If you find that you have extra data at the end of the run that is not needed, you can truncate (delete) the unwanted data. To do so, open the log file, place the cursor at the point you want to delete information and choose View, then "Truncate Log file after Cursor."

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Creating Custom Calibrations

The *DataMaxx* has the ability to monitor any analog sensor that produces a variable voltage from 0V – 5V. The first step is gathering information on the sensors output voltage and actual sensor value. At least two points are needed in order to create a range, a low voltage point and a high voltage point. Then open the channel properties, select the channels specific calibration that you would like to change, select custom from the type of sensor and then select the button to the right of the sensor type. You should then clear out the current values in the calibration table. Now on the first line we want to put our low voltage reading in milliVolts followed by a semicolon and what that voltage means to use, followed by another semicolon. Continue to do this for all the data points you have then send the new calibration to the *DataMaxx* and test your new sensor.

Ex. Measured: 2.5V = 25 psi Calibration: 2500;25;

Software Upgrades

From time to time Computech will release new versions of the *DataMaxx* Viewer software. To download the latest version go to www.ComputechRacing.com and choose the "All Software" option from the menu.

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Additional Information

How to Wire Correctly

How you wire your *DataMaxx* unit is one of the most critical and important steps in the installation process. Sensor wires should be at least 8" away from any ignition component otherwise your signals will be erratic and hard to read. Ignition components include ignition boxes, ignition coils, distributors, magnetos, and even ignition kill switches. If possible you want to run your data cables together back to the main and/or analog module as this will reduce the amount of noise we are susceptible to.

Almost every cable provided with your *DataMaxx* has a shield (drain) wire. On the *DataMaxx* Module end of the cable, trim your cable insulation back about 3", leaving all the wires and aluminum foil and shield wire. Next, untwist and cut off the aluminum foil. You should have left the insulated wires plus the bare shield wire.

Prepare the ends of each insulated wire and affix each under the appropriate screw terminal, leaving the shield wire loose. Tinning each wire with solder before screwing it into the terminal will improve reliability.

As the last step, loop the shield wire under one of the shield screws (near the cable entry). Pull the shield wire so as to drag the sheathed cable right up against the screw terminal. Tighten the screw then cut off the excess shield wire.

It is helpful to connect several cables without connecting the shield wires. Then, gather multiple shield wires at once, twist them together, and pull the whole assembly under a shield screw.

When wiring an economy sensor that did not have a supplied cable, it is recommended to use a wire between the gauges of 18 to 22.

Avoiding RFI Noise

You may also need to worry about ignition noise affecting your main *DataMaxx* unit. If you have a *hot* ignition with no resistance (solid core) in the coil or plug wires, then it is advisable to keep as great a distance as possible between those wires and your *DataMaxx*. In full bodied cars, if you can mount the unit on the opposite side of a firewall, do so. In open bodied cars, the unit can be mounted in the very rear or the very front. If using solid core wires, and noise is apparent, it is advisable to use MSD 8.5mm

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superconductor ignition wires that are designed to suppress RFI.

Consider the following tips for avoiding radio frequency ignition (RFI) interference:

1. Always mount your *DATAMAXX* equipment on the OPPOSITE side of the firewall as the motor and ignition system. The firewall will serve as a barrier to radio frequency interference.

2. If possible, mount your *DATAMAXX* equipment near the dash of your car, and pick up power, ground, and RPM signal DIRECTLY from the back of your tachometer. Use short length wires if possible and bind all three wires together.

3. Always minimize wire loops. Any loop whatsoever, even between totally different wires, can act as an antenna. The larger the area of the loop, the more likely it will pick up radio frequency interference. Instead of coiling up excess wire, cut it to length and re-terminate as necessary. Furthermore, in all cases, try to bind your wires and cables directly to and parallel to metal chassis members (especially for tube frame cars.

4. Keep as much distance between ignition components and computer components as possible. Ignition components include spark plug wires, coil wires, the ignition box itself, and most of the wires running to that box. Computer components include the *DATAMAXX* module cases, all wires connecting to those cases, as well as all thermocouple probe cables. One potential problem area is where the thermocouple probe leaves the header pipe, in the vicinity of the spark plug wires. If the probe has a 90-degree bend in it, loosen the bung and turn the probe so that it immediately turns AWAY from the nearest spark plug wire. Then, run the thermocouple cable away from all of the spark plug wires, as much as is practical.

5. Be sure to connect the sensor cable shield wires as described in the two upcoming documentation sections.

DIP SWITCH SETTINGS

The dip switches on the Main and Analog module are used to specify the type of sensor being used.

If you are using a magneto: Turn both dip switches A and B to the OFF position (Mag pup and Mag gnd). The lightning / kill wire needs to be plugged into the mag rpm slot (42) and the mag ground needs to be plugged into the mag gnd slot (41). The mag ground is a separate wire that you run from terminal 41 to a convenient mag or chassis ground location, as close to the magneto as possible.

If you are using an input shaft sensor: Turn both dip switches C and D to the ON position (Inp pup and Inp gnd). Connect your white input shaft wire to the Inp Wht (#30), black input shaft wire to GND BLK (#29), and the red input shaft wire to 12V RED (#31). If for some reason you seem to be getting spikes or noise in your readings then turn dip switch D to the OFF position.

If you are using an economy pressure or economy temperature sensor:
An economy sensor will be a brass colored sensor that must be connected using a screw on terminal. Turn the corresponding analog RTD and GND switches to the ON position.

If you are using a standard analog sensor:
Standard sensors include any pressure sensor that has a supplied connector, any temperature sensor with a K-type connector and red/yellow wires, or any sensor that needs to be connected to a power connection inside the *DATAMAXX*. If using one of these sensors, turn the corresponding analog RTD to the OFF position and the GND to the ON position.

RECORDING A LOG FILE

Recording a log file can be done multiple ways.

Record Switch: The first and easiest is to connect a switch to the record terminal (id #35). One side will be connected to the *DATAMAXX* and the other to a convenient chassis ground. The software is already pre-calibrated to trigger recording.

LCD: If you are using an LCD Module, there is a built record button that will automatically trigger recording. To turn off recording, it is necessary to press and hold the record button. The software is already pre-calibrated to trigger recording.

Software: The *DATAMAXX* software is extremely customizable and allows you to use any sensor and multiple values to trigger an automatic recording. Some of the more popular triggers are engine rpm above a certain value or any drive shaft movement. To calibrate a sensor to trigger recording, simply open the Channel Properties window and click on the "configure" button. Then choose the "Lights + Record" tab at the top to automatically trigger recording.

SD CARD INFORMATION

Downloading run information is done via an SD memory card. After recording a run, place the SD card in your computers digital media slot, open the *DATAMAXX* Viewer software and click on the "SD" button at the top of the screen. This will automatically save the runs to your computer and delete them from the SD card.

If you are prompted with the message "No log files found. Search for another location?" it means that you either do not have any runs on your SD card or you are looking in the wrong location. If you

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choose yes to the prompt, it will open a browser window that will allow you to find your SD drive and select it for download.

When using a Main and LCD Module, it is recommended to use the Main module for any calibration purposes. For recording a log file, you can use either the Main or LCD, whichever is more convenient.

If you would like to purchase an additional SD card, the only SD cards that will work with the *DataMaxx* are ones that are labeled as 150X times faster than the standard card. These cards are available through Computech and at many retail stores, but having the faster than average speed is essential for correct operation.

Event Description

The event description is designed to help in the organization of your run data. At the end of every log file an event description is appended. The *DataMaxx* Viewer software will prompt you for an event description at the beginning of each day, and if desired can be left blank. If you would like to change the event description, you can do so at any point by pressing the button to that looks like a road (to the left of the SD button)

CAN Bus

The *DataMaxx* modules communicate with each other using a CAN (Controller Area Network) cable. This CAN system works very similar to the way the internet works, it sends packets across the line with a packet title so the Main Module can tell which module it came from. Because of this it does not matter which CAN Bus terminal you connect your extra modules.
The cable must be 4-conductor twisted pair and shielded, as provided with your unit. The individual colored wires should be connected to the matching color terminal in each module.

Analog –vs- Digital

There are two different signal types that can be used with the *DataMaxx* system, analog and digital. An analog sensor will take a specific voltage and vary the voltage depending on pre-set conditions. The *DataMaxx* software will then convert the voltage into a useful number in the form of a pressure or temperature. A digital signal is simply either on or off, and is associated with RPM signals and switches.

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TROUBLESHOOTING

DATA HAS NOISE OR SPIKES ON GRAPH

There are two different types of ignition noise that can cause spikes or noise in your readings; airborne and line noise. Airborne noise is a result of noisy solid core spark plug wires that can spread “garbage noise” as far as 10’ depending on your ignition type. Airborne noise usually infects a large number of channels at the same time and can easily be rectified by purchasing MSD 8.5mm Super Conductor Noise Suppression Wires. These wires have been designed to work with data acquisition systems and have been proven to clear up airborne noise in the DATAMAXX application.

If only one or two of your signals are noisy, then the culprit is most likely a line noise problem. Determine which channel has the most noise or spikes in it and trace the wire from the DATAMAXX to the sensor itself, noting any components that are within 8” of the wire. If there are any ignition boxes, spark plug wires, ignition coils, magneto kill wires, or solenoids within 8” then the wire should be relocated if possible.

It is also possible that your shield wires are not connected correctly. Every sensor should use a shielded cable. Every sensor cable has a shield wire that should be connected to one of the ground screws inside of a *DataMaxx* module. Doing otherwise will increase the chance of radio frequency (ignition) interference (RFI) affecting your system and the quality of your data.

Finally, the CAN bus cables connecting each *DataMaxx* module should also have the shield connected on both ends, as well as the ground signal.

AVOID IGNITION COMPONENTS AND CONNECT YOUR SHIELDS!!!!!!

LCD MODULE DISPLAY DATA IS BLANK OR APPEARS FROZEN

Your LCD module shows both channel names and data. If it shows channel names, but the data is either blank or appears frozen, and there’s no assistance with a message at the bottom center of the LCD display, then please wait a few seconds to see if the situation resolves itself. If it does not, completely remove power from the system, wait 5 seconds, and then restore power.

If the problem persists, it is likely due to a problem with the Main module. You should have wired all of your modules from the Main module, especially your LCD module. If you used some alternate wiring, it’s possible that your LCD module has power while your Main module does not. Check that

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the Main module has power by confirming that, sooner or later, the green LED blinks.

If you're sure that your Main module has power, and the temporary removal of power did not clear up the problem, then you probably have a problem with your Main module. Contact Computech technical service for more information.

A module's red LED is blinking

First, refer to the modules blinking light section at the beginning of the manual.

Second, note that it's OK for the red LED to blink every once in a while. It's only really a problem if the red LED blinks continuously. If you see a red blink every once in a while, but your data looks fine on the PC, then don't worry about it. (The most likely time to get spurious red blinks is immediately after recording. The module with the SD Memory Card does some housekeeping at this time. During the housekeeping interval, some of the other modules may get anxious about sending data. They may blink their red LED a few times because of this. Once the housekeeping is complete, however, the red blinking goes away and everything is fine again. If you have an LCD Module, you may see the equivalent response on the LCD message area. It may say "CAN bus fail" for a moment after recording. This can be ignored if it doesn't persist and if your data looks fine on the PC.)

If you get a red blinking LED frequently, or if you get error messages on the PC when you open a log file, then contact Computech customer support.

"CAN bus fail" message on LCD

You may from time to time get a "CAN bus fail" message on your LCD. It's only really a problem if you get this message almost continuously. If you see the message every once in a while, but your data looks fine on the PC, then don't worry about it. (The most likely time to get spurious "CAN bus fail" messages is immediately after recording. The module with the SD Memory Card does some housekeeping at this time. During the housekeeping interval, some of the other modules may get anxious about sending data. They may blink their red LED a few times because of this. Once the housekeeping is complete, however, the red blinking goes away and everything is fine again. You may also notice that one of the modules blinks its red LED at this time as well. That's the same indication, and that's most likely the module sending the failure message to the LCD. This can be ignored if it doesn't persist and if your data looks fine on the PC.)

Otherwise, if you get the "CAN bus fail" message frequently, and not associated with the end of recording, or if you get error messages on the PC when you open a log file, then contact Computech customer support.

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A module's green LED is blipping but not blinking

Remember, the green LED blinking with equal on and off times is an indication that samples are being created by the module and transmitted over the CAN bus. During the housekeeping after recording, and also during playback, the modules are told to cease these transmissions temporarily. During this time, the green LED will blip for just a moment every few seconds. The module does this so that you can tell the difference between this state and the module having no power at all.

If you see the blipping instead of blinking, make a note of what's happening. If the blipping stops and the green LED returns to blinking, then everything is fine. If you're playing back a run on the LCD Module, then you won't see blipping until you exit playback mode, which is done by pressing and HOLDING the "RUN# / EXIT" button.

If the blipping continues after all of this, then it might be a rare case where the blipping module failed to hear the signal (coming from the module with the SD Memory Card) that it was OK to start sending samples again. Turn the power off to the system for three full seconds and then turn the power back on. Things should return back to normal, with all the modules having green LEDs blink with equal on and off times, and no red LED indications. If this hard-of-hearing situation occurs rarely, then don't worry about it. If it occurs repeatedly, then contact Computech customer support.

LCD Display is Blank

First, make sure that the *DataMaxx* system is properly powered. If any of the modules are illuminating any of the LEDs, then you know there's power somewhere.

Second, make sure that the CAN bus cable is properly wired from the LCD Module's green connector to the Main Module. In the Main Module, each wire should be connected to a CAN BUS terminal color coded to match the wire insulation. At the LCD Module's green plug, the color code should also match.

DataMaxx requires a DC power source between 11 and 25 volts. If the display shows no signs of power, then maybe the power source may be off or too weak.

Engine RPM is Zero – Not a Magneto

First, make sure that your tachometer signal is wired into the correct position in your Main Module. If the engine is running and the RPM displayed is still zero, then you must diagnose the wiring of the tachometer pickup. Remove the signal wire from the Main Module and put a test wire under the Main

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Module Engine RPM terminal. Then short this test wire to +12V by repeatedly tapping the wire to +12V. (All the other digital inputs require tapping to ground to test, but the RPM input requires tapping to +12V) This tapping should cause a jump in RPM. If it does not, then call Computech for customer support.

Engine RPM is Zero – Using a Magneto

First, make sure that you included the 100Kohm isolation resistor somewhere between the Main Module and the Magneto kill (or lighting) wire. If you omitted this resistor, then it's very probable that the Main Module has been damaged inside.

Second, make sure that you have not only wired the Magneto RPM to the Magneto (via the 100Kohm isolation resistor), but that you have also wired a dedicated ground wire from the "MAG GND" terminal to the chassis or ground post of the magneto itself. (The ground is isolated internally because "MAG GND" in the OFF position, therefore, this dedicated ground is required in order to form a complete circuit for the magneto RPM. Note that the word "circuit" in electronics really does come from the idea of a loop or a circle, based on the origin of the word "circuit".)

Third, test the Magneto RPM input by removing the wire that goes to "MAG RPM" and replacing it with a short test wire. Temporarily switch the "MAG GND" (switch C) and "MAG PuP" (switch D) switches both to the ON position. Now short this test wire to ground by repeatedly tapping the wire to ground. (There are many convenient ground terminals nearby in the Main Module.) This tapping should cause a jump in RPM. If it does not, then call Computech for customer support. REMEMBER TO RETURN THE TWO SWITCHES TO THE OFF POSITION WHEN YOU'RE DONE!

Engine RPM is Erratic or Noisy

If you have erratic or noisy RPM readings, contact Computech for customer support.

Drive shaft RPM or Input shaft RPM is Zero

First, make sure that your sensors are wired into the correct position according to the instructions for individual sensors. Also, for the Input shaft RPM, make sure that both isolation switches are in the ON position. That's "INP GND" (switch A) and "INP PuP" (switch B).

Your Input shaft RPM sensor may have a green body with a small LED on the side. When the power is

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on, the LED should illuminate.

You can test either of these inputs by temporarily tapping the input to ground. Remove the signal wire from the Main Module first, replacing it with a test wire connected to the input terminal. Then short this test wire to ground by repeatedly tapping the wire to ground. (There are many convenient ground terminals nearby in the Main Module.) This tapping should cause a jump in the RPM reading. If it does not, then call Computech for customer support.

If the tapping test above works, but you still don't get a Drive shaft (Input shaft) RPM reading in motion, then try adjusting the sensor so that the gap to the magnet is as small as possible without touching the magnet or balancing weights. Next, turn the drive shaft (input shaft) until the magnet moves from more than 2" away from the sensor to closer than 1/4" to the sensor. The LCD display should show a small nonzero number for a moment. If you can't move the drive shaft (input shaft), then you may remove the sensor from the bracket and then move the sensor from far away to nearby the magnet. If you do get an LCD display reading, then the Drive shaft (Input shaft) RPM input is working properly.

If Drive shaft (Input shaft) RPM remains zero, unplug the sensor and work with the connector on the cable coming from the junction box. Short a screwdriver or wire between the two conductors of the connector. An LCD display reading should result. If it does not, call for customer support.

Drive shaft RPM is Erratic or Noisy

You may find yourself in the following situation. Your in the shop and your car stationary. The Drive shaft RPM reads zero on the LCD display with the engine off, but registers random values when the engine is on. If you find this to be the case, then your Drive shaft RPM sensor circuit is picking up ignition noise. The Main Module includes a Drive shaft RPM sensor circuit that is already filtering much of your ignition noise out. Evidently, your ignition system generates such strong electromagnetic noise that the filter cannot eliminate all of it.

You have a few options at this point. First check the location of your ignition module and your ignition coil relative to your Drive shaft RPM sensor, wiring, *DataMaxx* Main Module. If it is possible to put more distance between them, then do so.

If you still can't eliminate the noise on your Drive shaft RPM sensor, then inspect your ignition wiring. Most likely, you have a zero resistance (solid core) wire from your coil to your distributor, a zero resistance rotor button, and zero resistance spark plug wires. You will need to replace these wires with a higher quality radio noise suppression type wire. Contact Computech customer support for details.

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SWITCH STATUS IS BACKWARDS

If the LCD indicates the opposite of the desired switch position, then you have the switch status configured backwards. See the help documentation for the PC software.

SWITCH IS ALWAYS ON OR OFF

If the switch status does not react to the switch, then remove the wire and put a test wire under the Main Module terminal. Short this test wire to ground. If the switch status does not respond, call Computech for customer support. If the switch status works, replace the original wiring and then try shorting the signal to ground at the other end of the cable near the switch. If the switch status now fails, the problem is in the cable. If the switch status works, then the problem is with the switch.

RECORD SWITCH DOESN'T WORK

First, make sure that you can start recording by holding down the "RECORD" button on the *DATAMAXX* LCD Module. If this doesn't work, call Computech for customer support.

If you can initiate recording with the LCD Module, then the problem is with your switch configuration. Use the PC software and see the accompanying help for making sure you've configured the switch correctly.

CANNOT FIND YOUR LOG FILES

When downloading a run using your "SD" button, you may have to point the computer to the correct SD card location. If you have a run on your SD card, hit the "SD" button to download the run and received the message that "No log files found, would you like to search another location." Select yes to search another location, click on the drop down menu associated with "Look In" and select the correct drive for your SD card.

When trying to open a log file, it's possible to be looking at the wrong folder. To find the correct folder choose "Open log file" and click on the drop down menu associated with the "Look In" and select C: Hard Drive ☾ Program Files ☾ Computech ☾ DataMaxx and you should see all of your files. If you only see a select few, then hit the arrow right button to view the rest.

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