



V300SD, V500SD DATA RECORDERS

INSTALLATION MANUAL



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Introduction

This manual will guide you step by step through the installation, setup, and operation of your new V300 or V500 data logger system. During this process the manual will refer you to a set of System Worksheets and individual instruction sheets supplied with the sensor modules and devices.

The system worksheets describe in detail your complete data logger system, including how and where each device in your system is connected and the lengths of each of the cables supplied with your system. Individual instructions sheets will be inserted with each of the devices included with the system. After you have installed the particular device in your system you will be asked to insert the instruction sheet in one of the Appendixes in this manual. It is extremely important that you do so. These instruction sheets will complete the documentation of your new system. You will need instruction sheets as you add to or modify you data logger system.

To get the most out of your data logger system, it is high recommended that you thoroughly read the entire manual before getting to the race track. This will ensure you fully understand how to operated and maintain your system and in turn avoid frustrating days at the track.

In addition, make sure you completely test the data logger and PC before getting to the race track. The race track is a bad place find out something is not working properly!

Installing a V Series Data Logger

In this section we will take you step by step through the installation of your new data logger. We will begin by giving you a brief tour of a sample data logger system. Please read through the following section as you will need to know items discussed below during the installation process.

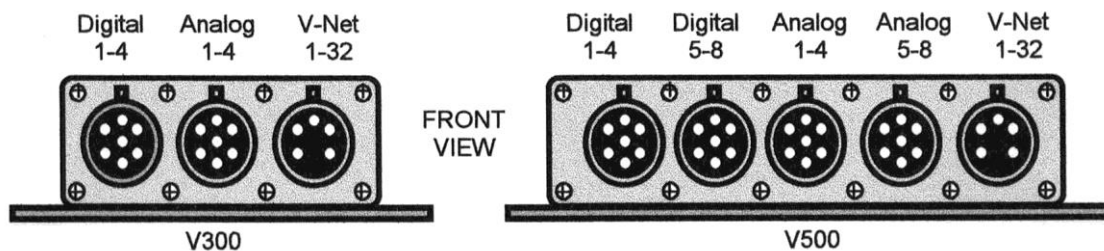
Getting acquainted with your V Series Logger System

Before you can begin the installation of your new data logger system you will need to become familiar with the terms used to describe the various components used in your data logger system. You will also need to find the location of various elements such as the digital input connectors on your data logger. We will begin by reviewing the V300 and the V500 data loggers.

The Data Loggers

The design of the V300 and V500 data loggers is basically the same. The only difference between the two loggers is the number of hardwired sensor channels that can be monitored and the amount of memory that is available to record data from the monitored channels. The V300 is capable of monitoring 4 digital and 4 analog channels and comes standard with 1 megabyte of memory. The V500 is capable of monitoring 8 digital and 8 analog channels and comes standard with 2 megabytes of memory expandable to 4 megabytes. Both data loggers can also be connected to up to 32 V_Net devices for monitoring additional sensors.

Each digital or analog input connector on the V300 or V500 data loggers can be used to connect up to 4 digital or analog sensors. A single V_Net connector is used to connect all V_Net devices. The drawings below illustrate the location of the input connectors on the V300 and V500 data loggers.



You probably noticed we just mentioned four new terms, digital inputs, analog inputs, hardwired sensors and V_Net devices. You may already know what they represent but lets take a quick review.

Digital Inputs:

Digital inputs and digital sensors refer to devices that can be described as having two states. For instance a switch is either on or it is off, a contact closure is either open or closed, a tach output is either high or low. These type of sensors are used for a variety of applications, such as monitoring if the throttle is wide open or if a transmission brake solenoid is closed. They also are used to measure various Rpm's, such as engine rpm or drive shaft rpm. In these applications the data logger measures the number of transitions from off to on (or pulses) that occur in a given time period. This information is then used to calculate the rpm.

Analog Inputs:

Analog inputs and sensors refer to devices that have numerous levels. For instance an oil pressure sensor could indicate 0 PSI or 100 PSI or anywhere in between. Temperature, pressure, position, and torque sensors are all examples of analog sensors.

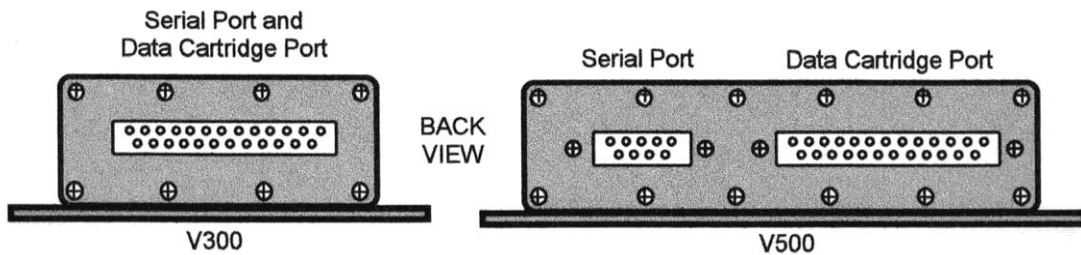
Hardwired Sensors:

Hardwired sensors simply refer to those sensors that are connected (wired) directly to the data logger via the data logger's digital and analog input connectors.

V_Net Devices:

V_Net (short for on-board vehicle network) is an exciting new technology developed by RacePak for use in implementing onboard electronics. This technology allows a variety of devices such as data loggers, gauges, sensors, and actuators to be connected together with a single cable (bus) and to share their information with each other. All devices compatible with the technology are referred to as V_Net Devices. We will discuss these devices in more detail as we continue.

On the other end of the data loggers are the serial communications connector and the download cartridge connectors. On the V300 data logger the serial communications connector and the download cartridge connector are combined into a single DB25 connector. The V500 data logger has separate connectors for each of these functions. The locations of the connectors are shown below.



The serial communications connector (or serial port) is used to connect the data logger to your PC computer. When connected, your PC can be utilized to setup or program the data logger, download the information recorded by your data logger, or be used to view and record real time data from the data logger. Each of these functions will be discussed in detail later.

The download cartridge connector is used to connect a RacePak data cartridge. This data cartridge allows the recorded data to be rapidly downloaded from the data logger with out the use of a PC. The data cartridge is then in turn connected to your PC and uploaded for data viewing and analysis.

The System Components

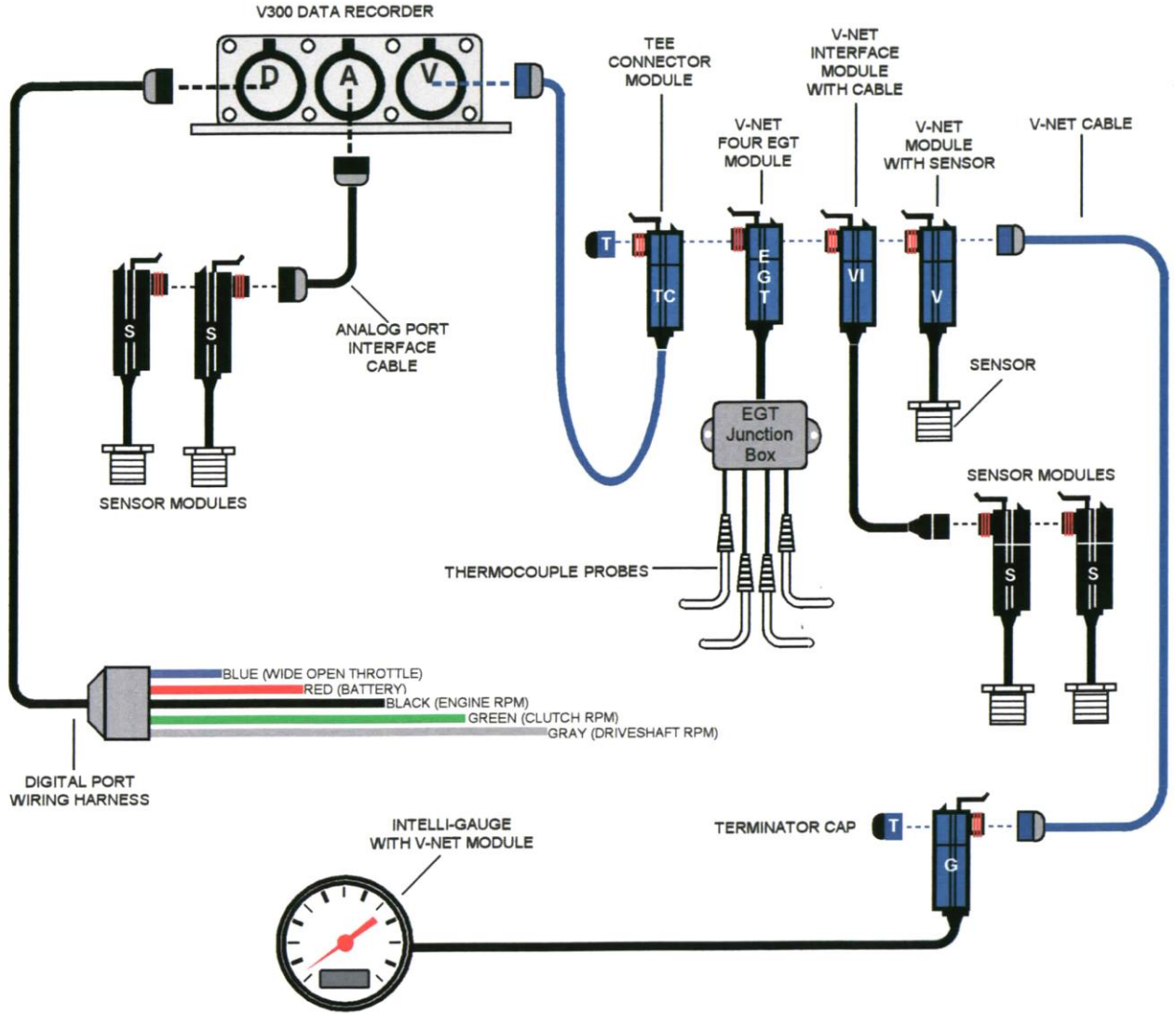
The next step in getting familiar with your new system is to review the various components that make up the overall data logger system. The drawing on the following page illustrates a typical data logger system using a V300 data logger. We have labeled the various components on the drawing. Each of the components is described below.

Main Power/Digital Input Wiring Harness:

The main power/digital input harness is a molded wiring harness assembly used to provide power and connect the more common digital inputs such as engine rpm, drive shaft rpm and wide open throttle switches to the data logger. The main power/digital input wiring harness connects to the digital input 1-4 connector on both the V300 and V500 data logger.

Sensor Modules:

The sensor modules are composed of a sensor, electronic signal conditioning, a selector switch and a stacking connector with housing. In many ways they can be thought of as electronic adapters. Each module connects to the sensor element, converts the electronic signal from the element into the standard signal required by the data logger. The standard signal is then routed by the selector switch to one of the four input channels on the 7-pin stacking connector used to connect to the data logger.



A variety of different types of digital and analog sensor modules are available. The connector housing on the sensor modules are color-coded black.

Sensor Interconnect Cable:

The sensor interconnect cable is a 7 conductor molded cable assembly used to connect analog and digital sensor modules to the analog and digital input connectors on the data logger. Each cable has a male and a female connector design allowing multiple cables to be daisy chained together. The connector housing on the sensor interconnect cables are color-coded black.

V_Net Sensor Module:

A V_Net sensor module is in many respects a single channel data logger. Each module allows the data from a single sensor to be placed on the V_Net data bus. This data can then be used by other modules or can be recorded by the V300 or V500 data loggers.

Each module contains a 5-pin connector system that allows multiple modules to be stacked together or to be connected to each other via a V_Net Cable as shown on the previous page. The housing on the V_Net sensor modules is color-coded blue for easy identification.

4 Channel V_Net EGT Module:

The 4 channel V_Net exhaust gas temperature module is a special purpose V_Net module designed to measure and transmit over the V_Net bus the exhaust gas temperature of up to four cylinders on an engine. The transmitted data can be used by other modules or can be recorded by a V300 or V500 data logger. Multiple modules can be used to accommodate engines with more than 4 cylinders.

The module is attached to the V_Net bus using the same connector system as used by the V_Net sensor modules. The connector housing is color-coded blue identifying the module as a V_Net compatible module.

Intelli-Gauge Analog Gauge:

The Intelli-Gauge is a new product manufactured by RacePak. Intelli-Gauges offer both analog and digital readouts as well as programmable warning indicators. The gauges connect directly to the V_Net data bus and obtain the information they display from the bus.

V_Net Cable:

V_Net cables are 5 conductor molded cable assemblies used to connect V_Net modules to other V_Net modules and to the V series data loggers. The cables are specially designed for the high-speed data transmission required by the V_Net modules. Each cable has one male and one female connector allowing multiple cables to be daisy chained together. The connector housing on the V_Net cables is color-coded blue for easy identification.

V_Net Cable Tee:

The V_Net Cable Tee is used to connect the data logger to the V_Net cables or modules in the remainder of the system. The design of the tee allows modules to be located in both directions from the data logger or to allow a V_Net terminator cap to be used to terminate the data bus. As with all V_Net devices, the connector housings are color-coded blue for easy identification.

V_Net Terminator Caps

The V_Net network containing the various V_Net modules must be terminated at both ends with a V_Net Terminator Cap as shown on the drawing on the previous page. These caps contain a terminating resistor that is required by the V_Net data bus. The V_Net system will not function without the terminating caps properly installed. A male and a female cap are required. Both caps are color-coded blue for easy identification.

By now you probably noticed we keep mentioning color-coded. Your V series data logger uses two connector systems. A seven pin connector system for connecting hardwired digital and analog sensor modules and a five pin connector system for connecting V_Net Devices. These connector systems are color-coded black for the hardwired sensors system and blue for the V_Net devices. Only plug connectors of like colors into each other. Never plug a blue connector into a black connector.

Planning the Installation of your Data Logger.

Before you actually begin to install your data logger hardware you should take some time to plan where you will be installing the various components in your system and how you will be routing the cables to connect the various devices together. There is a good chance you will have already done most of the planning before you purchased the hardware, but now is a good time to check to see if things are the way that you expected them to be.

To assist in your installation, staff at RacePak will have prepared several worksheets of your system showing how all of the components in your system are connected to the main data logger. Two copies of these worksheets are included in this manual, one stuffed inside the front cover for your use during installation, and one in Appendix I to remain with this manual to document your system for future reference. Locate the diagrams and check your installation.

A good place to start is to decide where you will be mounting the main data logger. Remember that all of the cables connecting the various components in your system will have to route to this location. Next look at the locations where the individual sensors will attach on your vehicle. Most of the sensor elements are fairly rugged and can withstand the severe conditions anywhere in your vehicle. The sensor connector modules and/or the V_Net sensor connector modules with their internal electronics, however, are not quite as rugged with respect to operating temperature. These components should be mounted where the temperature does not exceed 185 degrees F. This will insure proper operation.

Once you have decided on a mounting location, visualize how you will be routing the various cable used to connect the devices to your data logger. Be sure you can route these cables where they will not interfere with the safe operation of your vehicle. Also be sure the cables are routed such that they are not exposed to high temperatures that could cause the cable jacket or connector housing to melt. In addition, be sure to route the cables such that the cable will not be pinched between sections of the vehicle causing damage to the cable.

When you have a good idea as to how you will be installing the system you are ready to begin the actual installation.

Installing the Main Data Logger and Wiring Harness

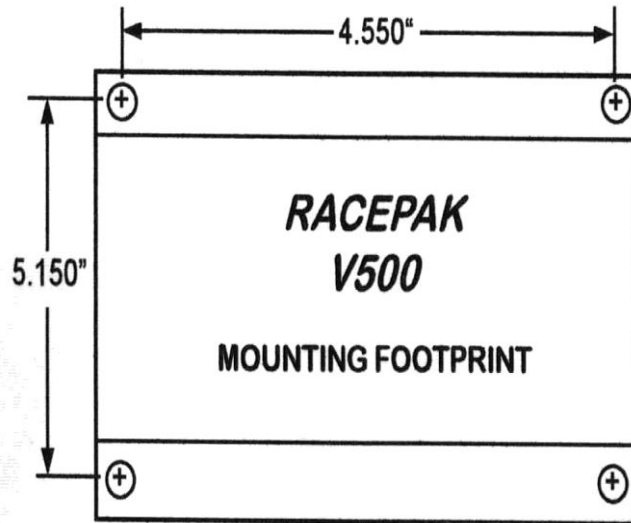
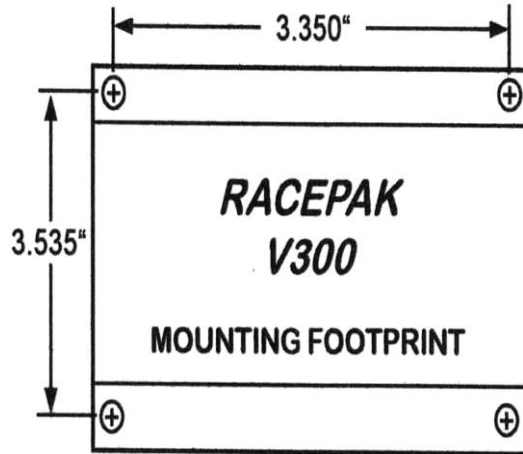
As we discussed in the Introduction to this manual we will be installing the data logger hardware in small sections. The first section of hardware we will install is the main data logger and the main wiring harness. We will also install the digital sensors connected to the main wiring harness.

Mounting the main Data Logger

The most important consideration in mounting the data logger is choosing the proper location. Several issues were covered in the section above on planning the installation of your data logger. The following additional requirements should be taken into consideration.

1. Choose a mounting location that allows easy access to the download and/or serial port and the input ports located on both ends of your data logger.
2. Avoid mounting the recorder directly on or near a heat source, such as hot oil lines or on the floor near the exhaust system.
3. Avoid mounting the recorder directly near the ignition box or any other electronic ignition components. Try to maintain a minimum of 18 inches of clearance between the recorder and any of these items.
4. Choose a location that will allow easy routing of the interconnecting cables. Care must be taken to prevent the cables from interfering with the driver, safe operation of the vehicle, or any maintenance or repair services.
5. If your recorder contains an internal G_Meter (all V300 recorders contain an internal G_Meter) it is important that it be mounted FLAT with the output connector for the download cartridge facing in the direction on travel. If you cannot mount the data logger in this direction contact RacePak for further instructions.
6. Be sure to mount the data logger using the four rubber shock isolators or “feet” which protect the data logger from shock and vibration damage.

When you have selected your mounting location you will need to locate and drill 4 – 3/16 inch diameter mounting holes to match the location of the mounting feet on your data logger. The mounting Feet locations are shown below for the V300 and for the V500:



Installing the RPM/Digital Input Harness

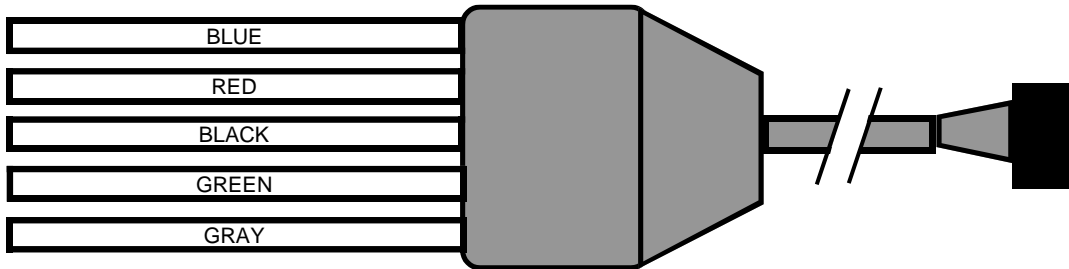
The digital inputs are used to measure such items such as engine rpm, drive shaft rpm, clutch rpm, front wheel rpm or a wide open throttle event.

Installing the Hardwired Digital Sensors to Digital Inputs 1-4

There are two types of RPM/ Digital input harness methods listed below. Follow the instructions for the type of wire harness provided with your system. If you are not sure which type you have, turn to Appendix 1 for a drawing containing the details of your specific system.

5 Cable Wiring Harness:

Most systems will use a power and RPM wiring harness containing 5 color coded cables. In addition to supplying power to your unit, this harness provides connection to up to four digital inputs. The main power harness connects to the RPM 1-4 input connector on your V300 or V500 data logger. This is the left most connector when viewing the data logger from the front. Each cable in the main wiring harness is color coded as to its function.



RED:	Cable is used to connect to a switched power source (12-16 volts).
BLACK:	Connects to digital input #1 (Engine RPM Tach signal)
GREY:	Connects to digital input #2 (Normally Drive Shaft RPM)
GREEN:	Connects to digital input #3 (Normally Clutch RPM-V300 ONLY)
BLUE:	Connects to digital input #4 (Normally Record Enable)

The wiring harness included with your system has been prepared for your specific system as shown on the Main Wiring Harness Worksheet included in Appendix 1.

Interface Modules:

Interface modules are used when special signal conditioning is needed to interface with certain types of sensors. They also have the advantage of being compact and light weight. Interface modules are most commonly used in motorcycle applications but are occasionally utilized on cars and boats. Interface modules can be installed in any order. If needed, extension cables can be used to bridge the gap between modules that cannot plug directly in to each other. If using the interface module system, you will be provided with a blue module containing a black and red wire with a fuse. This module is used to power the system. **DO NOT PLUG THE BLUE POWER MODULE IN TO THE INTERFACE MODULES.** The blue power module must be connected to the V-Net port. Since these are individual modules that can be combined to create many different combinations you will need to refer to the diagram included in the interface module bag for more detail installation instructions regarding your specific system. There is also a copy of this diagram include in Appendix 1 at the back of this manual.



Installing the Hardwired Digital Sensors to Digital Inputs 5-8

If you have a V500 data logger the next step is to install the hardwired digital sensors connected to your data logger via the digital inputs 5-8. The digital 5-8 input sensors connect to your V500 System via the seven-pin connector second from the left on your data logger (next to the main wiring harness you just installed). To begin, locate the **Digital Input 5-8 Worksheet** provided with your system. This worksheet describes how many and which digital sensors will be connected to your data logger via digital inputs 5-8.

Locate the digital input 5-8 connector on the diagram. The schematic will show up to four sensor modules that are connected to your data logger. The lines on the diagram represent the sensor interface cables used to connect the sensor modules to the data logger. The lengths of each of the sensor interface cables as shipped with your system are indicated on the diagram. A length of 0 inches indicates the two sensor modules are plugged (stacked) into each other and no cable is required.

Locate each of the sensor interface cables and each of the digital sensor modules as laid out on the diagram from your installation kit.

Start with the sensor module connected closest to the data logger. Remove the module from the package and locate the installation instructions included with the sensor module. Install the sensor module per the instruction sheet. Next connect the first interface cable to the data logger's digital 5-8 connector and route the cable to the sensor module. Be sure to avoid routing the cable where it is exposed to high temperatures or areas where the cable can be pinched between two surfaces. In addition, be sure the cable does not interfere with the operation on the vehicle. Connect the sensor module to the cable and secure the cable to the vehicle.

After you have installed the sensor module save the installation instructions by placing the instructions in Appendix II of this manual.

Repeat the above process for each of the sensor modules.

Installing the Hardwired Analog Sensors to Analog Inputs 1-4

The next step in your installation is to install the hardwired analog sensors connected to analog inputs 1-4 on your data logger. Begin by locating the **Analog Input 1-4 Worksheet** included with this manual. This worksheet describes which and how the analog sensors will be connected to your data logger via the analog input 1-4 connector on your data logger.

Two different methods are used to connect analog sensors to your data logger's analog 1-4 connector. The first method uses the RacePak Modular Sensor Connector System. The second uses the RacePak Pro Series Four Transducer Mount Box System. The method used for your system will be indicated at the top of the Analog Input 1-4 Worksheet. Continue to the appropriate section below.

Using the RacePak Modular Sensor System

Locate the analog input 1-4 connector on the diagram on the worksheet. The schematic will show up to four sensor modules that are connected to your data logger. The lines on the diagram represent the sensor interface cables used to connect the sensor modules to the data logger. The lengths of each of the sensor interface cables as shipped with your system are indicated on the diagram. A length of 0 inches indicates the two sensor modules are plugged (stacked) into each other and no cable is required.

Locate each of the sensor interface cables and each of the analog sensor modules as laid out on the diagram from your installation kit. Start with the sensor module connected closest to the data logger. Remove the module from the package and locate the installation instructions included with the sensor module. Install the sensor module per the instruction sheet. Next connect the first interface cable to the data logger's analog 1-4 connector and route the cable to the sensor module. Be sure to avoid routing the cable where it is exposed to high temperatures or areas where the cable can be pinched between two surfaces. In addition, be sure the cable does not interfere with the operation on the vehicle. Connect the sensor module to the cable and secure the cable to the vehicle.

After you have installed the sensor module save the installation instructions by placing the instructions in Appendix III of this manual.

Repeat the above process for each of the sensor modules.

Using a Pro Series four Transducer Mount Box with Sensors

The Pro series transducer mount box assembly allows four plug-in sensor modules to be mounted in a single enclosure. The enclosure in turn is connected to the data logger via a single seven-pin interface cable. The Analog 1-4 Worksheet will show which plug-in analog sensor modules (up to four) are installed in your transducer mount box assembly. The worksheet will also show the length of cable supplied to connect the mount box assembly to your data logger.

Locate the mount box assembly and interface cable shipped with your installation kit. The mount box assembly and cable will be in a separate package marked Analog 1-4 Mount Box Assembly. Any additional required components such as shock travel sensors will also be included in the package. In addition to the hardware, you will find individual instruction sheets for each of the sensor modules installed in the mount box assembly. Review each of the sensor module instruction sheets to determine the mounting requirements of each of the sensor modules.

The next step is to select the mounting location for the mount box assembly. This will vary depending on the type of sensor modules installed in the assembly. You should read the installation instructions included with each of the plug-in modules to determine the requirements of each of the sensors and select a mounting location accordingly. Normally the mounting location will be somewhere central to the four measured parameters.

If a hot or flammable liquid must be routed to a sensor module located in the mount box assembly be sure to mount the assembly outside of the driver's compartment. In these instances the mount box assembly is normally mounted inside the engine compartment on the firewall.

The normal method of mounting the transducer mount box is to secure the mount box to a flat surface using the two screws attached to the bottom of the mount box assembly as shown below. An alternative method is to order the frame tube mount attachment that allows the module to be attached to a tubular frame member.

After you have mounted the transducer box, connect the mount box interface cable to the analog 1-4 connector on your data logger and route the cable from the data logger to the mount box assembly and secure the cable to the vehicle. Be sure to avoid routing the cable in areas where it can be damaged mechanically or by heat. Connect the cable to the mount box assembly.

The final step is to connect the sensor modules in the transducer mount box to your vehicle. To perform this step follow the installation instructions included with each of the plug-in sensor modules. After you have completed the installation, insert the installation instructions for each of the plug-in modules in the appropriate section in Appendix III.

Installing the Hardwired Analog Sensors to Analog Inputs 5-8

If you have a V500 data logger the next step in your installation is to install the hardwired analog sensors connected to analog inputs 5-8 on your data logger. Begin by locating the Analog Input 5-8 Worksheet included with this manual. This worksheet describes which and how the analog sensors will be connected to your data logger via the analog input 5-8 connector on your data logger.

Two different methods are used to connect analog sensors to your data logger's analog 5-8 connector. The first method uses the RacePak Modular Sensor Connector System. The second uses the RacePak Pro Series Four Transducer Mount Box System. The method used for your system will be indicated at the top of the Analog Input 5-8 Worksheet. Continue to the appropriate section below.

Using the RacePak Modular Sensor System

Locate the analog input 5-8 connector on the diagram on the worksheet. The schematic will show up to four sensor modules that are connected to your data logger. The lines on the diagram represent the sensor interface cables used to connect the sensor modules to the data logger. The lengths of each of the sensor interface cables as shipped with your system are indicated on the diagram. A length of 0 inches indicates the two sensor modules are plugged (stacked) into each other and no cable is required.

Locate each of the sensor interface cables and each of the analog sensor modules as laid out on the diagram from your installation kit. Start with the sensor module connected closest to the data logger. Remove the module from the package and locate the installation instructions included with the sensor module. Install the sensor module per the instruction sheet. Next connect the first interface cable to the data logger's analog 5-8 connector and route the cable to the sensor module. Be sure to avoid routing the cable where it is exposed to high temperatures or areas where the cable can be pinched between two surfaces. In addition, be sure the cable does not interfere with the operation on the vehicle. Connect the sensor module to the cable and secure the cable to the vehicle.

After you have installed the sensor module save the installation instructions by placing the instructions in Appendix IV of this manual.

Repeat the above process for each of the sensor modules.

Using a Pro Series four Transducer Mount Box with Sensors

The Pro series transducer mount box assembly allows four plug in sensor modules to be mounted in a single enclosure. The enclosure in turn is connected to the data logger via a single seven-pin interface cable. The Analog 5-8 Worksheet will show which analog sensor modules (up to four) are installed in your transducer mount box assembly. The worksheet will also show the length of cable supplied to connect the mount box assembly to your data logger.

Locate the mount box assembly and interface cable shipped with your installation kit. The mount box assembly and cable will be in a separate package marked Analog 5-8 Mount Box Assembly. Any additional required components such as shock travel sensors will also be included in the package. In addition to the hardware, you will find individual instruction sheets for each of the sensor modules installed in the mount box assembly. Review each of the sensor module instruction sheets to determine the mounting requirements of each of the sensor modules.

The next step is to select the mounting location for the mount box assembly. This will vary depending on the type of sensor modules installed in the assembly. You should read the installation instructions included with each of the plug-in modules to determine the requirements of each of the sensors and select a

mounting location accordingly. Normally the mounting location will be somewhere central to the four measured parameters.

If a hot or flammable liquid must be routed to a sensor module located in the mount box assembly be sure to mount the assembly outside of the driver's compartment. In these instances the mount box assembly is normally mounted inside the engine compartment on the firewall.

The normal method of mounting the transducer mount box is to secure the mount box to a flat surface using the two screws attached to the bottom of the mount box assembly as shown below. An alternative method is to order the frame tube mount attachment that allows the module to be attached to a tubular frame member.

After you have mounted the transducer box, connect the mount box interface cable to the analog 5-8 connector on your data logger and route the cable from the data logger to the mount box assembly and secure the cable to the vehicle. Be sure to avoid routing the cable in areas where it can be damaged mechanically or by heat. Connect the cable to the mount box assembly.

The final step is to connect the sensor modules in the transducer mount box to your vehicle. To perform this step follow the installation instructions included with each of the plug-in sensor modules. After you have completed the installation, insert the installation instructions for each of the plug-in modules in the appropriate section in Appendix IV.

Installing the V_Net Devices

The final step in installing your data logger is to install the V_Net devices in your system. To begin the installation, locate the V_Net Installation Worksheet. This worksheet describes each of the V_Net devices that will be connected to your data logger. The lines on the diagram represent the V_Net cables used to connect the V_Net devices to the data logger. The lengths of each of the V_Net cables as shipped with your system are indicated on the diagram. A length of 0 inches indicates the two V_Net devices are plugged (stacked) into each other and no cable is required.

Before you begin the actual installation of the devices you should verify the devices can actually be installed as laid out on the V_Net Installation Worksheet. You may want to lay out the devices in the vehicle where they will be mounted and route the cables between the data logger and the devices as per the worksheet. As you are laying out the V_Net portion of your system there are some important considerations to keep in mind. These are:

1. The V_Net modules (blue connectors) and the four channel EGT modules contain electronic components. The temperature of these components cannot exceed 180 degrees F. Select a location that minimizes the temperature they are exposed to.
2. Ignition systems generate a large amount of electrical noise (EMI). This noise can cause the V_Net modules to malfunction. Avoid routing or mounting any of the V_Net cables or components near the high voltage ignition wires.
3. The V_Net components are designed to be water-resistant. They are not waterproof. Avoid mounting components where they are continually exposed to water and/or high pressure sprays.

When you are satisfied the devices can be installed as laid out on the worksheet follow the steps below to install the V_Net devices.

Step #1: Install the V_Net Cable Tee

The first step is to connect the V_Net cable tee to the V_Net connector on your data logger. The V_Net cable tee allows V_Net devices to be located in both directions from your data logger. If

the devices are located in one direction only, insert a V_Net Terminator cap on the unused side of the tee connector as shown below.

Step #2: Install a V_Net Device

Referring to the V_Net Installation Worksheet, locate the V_Net device closest to your data logger to be installed in the system. If you have devices located in both directions from the data logger simply chose one direction to install and when you have completed the first direction, repeat the process for the second direction.

Remove the V_Net device from its package and locate the installation instructions included with the device. Located on the V_Net devices will be a serial number and module description.

Write this serial number on the appropriate location on your V_Net Installation Worksheet and on the first page of the installation instructions included with the V_Net Device. If the device is a V_Net sensor module also write on the installation instructions how the sensor will be used. For instance water temperature. In most case this will have already have been filled out for you. This information will be used in setting up your data logger.

Next follow the installation instructions included with the V_Net device and install the device. After you have completed the installation of the device, insert the installation instructions in the V_Net section of Appendix V.

Step #4: Route the V_Net Cable and connect the V_Net device.

If the V_Net device you installed in the step above is to be connected to the remainder of the system with a V_Net cable refer to the V_Net Installation Worksheet and locate the appropriate cable. Connect the cable into the previous V_Net device (if this is the first device into the V_Net cable tee) and route the cable to the V_Net device you just installed. Secure the cable and the V_Net device to the vehicle.

If the device you just installed is to be plugged directly into the previous device, plug in the device at this time.

Repeat steps 2 through 4 for each of the V_Net devices to be connected to your system. After you have finished connecting all of the V_Net devices, plug a V_Net terminator cap into the open connectors on each end of the V_Net cables. If you do not install these terminator caps the V_Net devices will not function.

You have just completed the hardware installation of your V series data logger and devices.

Setting UP your PC Computer

After you have completed the installation of your data logger and hardware, the next step is to install the DataLink software in your PC computer. The DataLink software is used to setup your data logger, view real time data and upload run data from your data logger, and analyze the run data.

In addition to installing the software, if your V300 or V500 system uses a data cartridge to upload data from the data logger to your PC you will also need to install USB reader in your computer. The USB reader allows your PC computer to talk to the RacePak data cartridge. Most V300 and V500 systems will be configured to use a data cartridge for uploading as this allows the data to be uploaded in seconds rather than the several minutes required when using a serial port to upload your data.

Installing the DataLink Software and Hardware

The DataLink software manual will guide you through the installation of both the software and the PIO expansion board if required. Before you begin, please read the following notes. The notes cover changes and/or important issues concerning using the DataLink software with the V300 and V500 systems.

DataLink Software Versions supporting V Series Data Loggers

Before you install the DataLink software, check the revision level of the software on the front of the software CD supplied with your system. You will need version 4.2 or later for your V300 or V500 and to access the V_Net modules. If you have an existing version of the DataLink software you should install the new version of the software over your existing version. This will insure you have the latest data files required by the V series data loggers.

Installing the License Disk

A software license disk (a 3.5-inch floppy) will have been supplied with your new system. This disk contains a default configuration file for your new system configured by the staff at RacePak and the security keys required to use the DataLink software with your new data logger. In addition, the disk may contain updates to the data files used by the V series data loggers.

Be sure to install the license disk as described in the DataLink software manual. The DataLink software should ask you for a license disk the first time you start the program after a new installation. If it does not or you are adding a new logger to an existing DataLink installation you will need to select Read License Disk for the Security main menu item. When the **Select Items to Copy** dialog box appears make sure you check the **Copy Configuration Files** and **Copy License Keys** boxes before proceeding. This will add the new logger security keys, folder structure and configuration file to the existing DataLink installation.

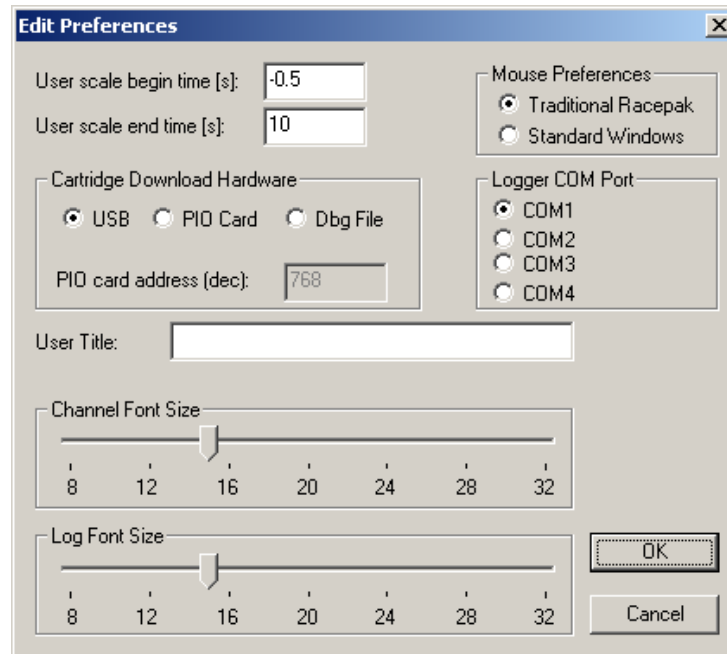
You are now ready to begin the software and hardware installation. Turn to chapter II in your DataLink manual and follow the instructions for installing the software. Complete steps 1-7 in the DataLink Pro manual or steps 1-5 if you are using the DataLink Lite manual. You may also want to read Chapters III and IV just to get a brief introduction to the DataLink software. When you have completed these steps continue with the installation as described below.

Connecting the Data Logger Serial Communications Cable

The next step is to connect the data logger's serial communication cable (supplied with your data logger system) to the serial communications port on your PC. You will be connecting the DB9 female connector

end (marked PC) of the logger serial communication cable to the mating connector on your PC. In most computer systems the mating connector will be labeled “Serial 1” or “COM 1”. If you already have another device connected to this port you will either have to connect the logger serial communications cable to the “Serial 2” or “COM 2” port on your computer or remove the device currently connected to the first port. In most computers, unfortunately, the second serial port is connected via a DB25 connector. If this is the case you will need to purchase an adapter from a DB25 PC serial connector to a DB9 serial connector to use this port. These adapters are available at most computer stores including Radio Shack.

The next step in the software installation is to tell the DataLink software to which serial communications port on your PC you just connected the serial communications cable. To tell DataLink software which port, turn on your PC and start the DataLink program by clicking on the ICON on the Window’s desktop. Next select the *Preferences* menu item found in the *Settings* main menu selection. The following dialog box will be displayed.



Locate the **Logger Com Port** selection box and select the communications port to which the serial communications cable is connected. Next select **OK** to accept your selection.

If you use the serial port for other applications such as a hot sync to a palm top computer or for connecting a serial mouse, you may have to disable the other application to allow access to the serial port by the DataLink software. Please refer to the other applications user guide for instructions. If possible you should use a different serial port that is not being used to avoid problems.

Configuring your Data Logger and V_Net System

When you purchased your data logger system, the staff at RacePak will have pre-configured your data logger and V_Net system ready for you to use without any additional setup. The staff will also have created a car configuration file that matches the configuration of your system. This file will have been copied onto your PC when you loaded the license disk during the DataLink software installation. The configuration file contains the setup information for your data logger and each of the V_Net modules connected to your system as supplied by RacePak. You will use this file any time you wish to modify the setup of your system, upload run data from your data logger, or view real time data on your PC.

When you installed the DataLink program you will have been guided through the process of setting the supplied car configuration file as the default configuration file. If you performed this step, the car configuration file will be opened each time you start the data link program and will be pre-selected each time you upload new data from your data logger system to your PC or start a new telemetry session.

If you selected not to set the car configuration supplied by RacePak as the default configuration file, you will need to open the car configuration file each time you wish to modify the setup of your data logger. You will also need to select the car configuration file each time you upload data to your PC or start a telemetry session.

Modifying the Configuration of your System

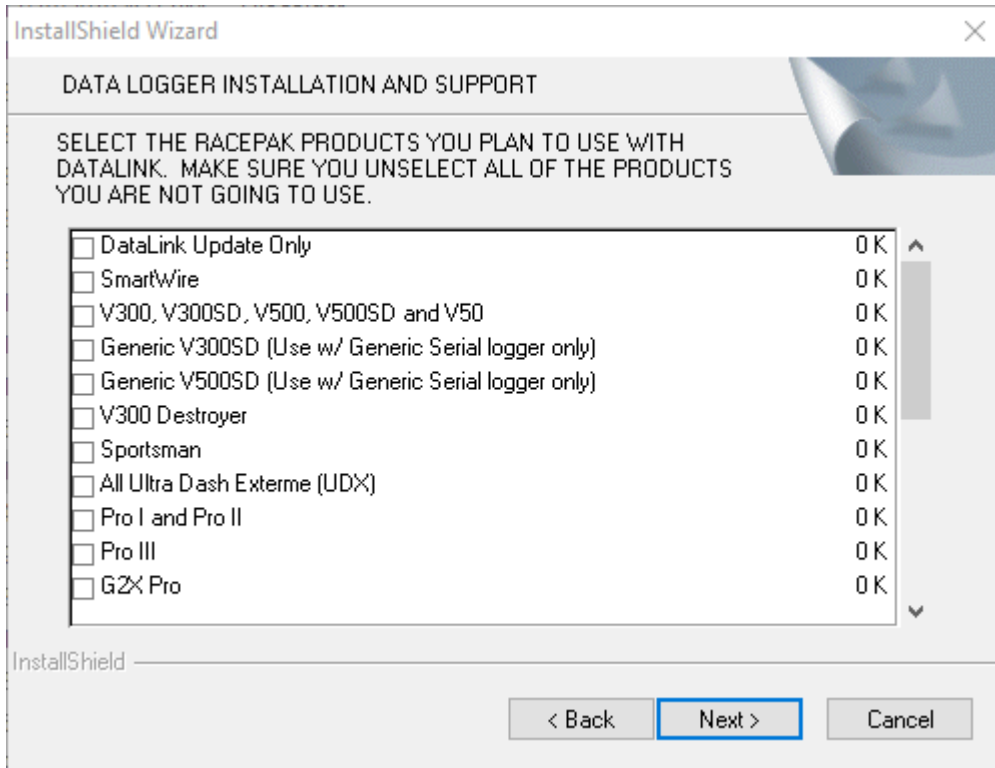
Each time you wish to modify the setup of your data logger system you will need to perform the following steps;

1. Connect your PC to your data logger via the serial interface cable.
2. Start the DataLink program on your PC and open the car configuration file created for your system
3. Select the device/channel to be modified
4. Make the desired modifications to the device/channel
5. Apply power to your data logger system
6. Send the modified setup to the device
7. Save the modified car configuration file

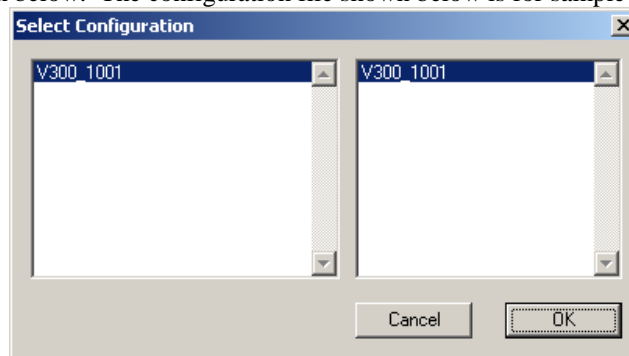
The first step is to connect your PC to your data logger using the serial interface cable supplied with your data logger system. You will have connected the cable to your PC and set the proper communication port in the section on 'Setting up your PC'.

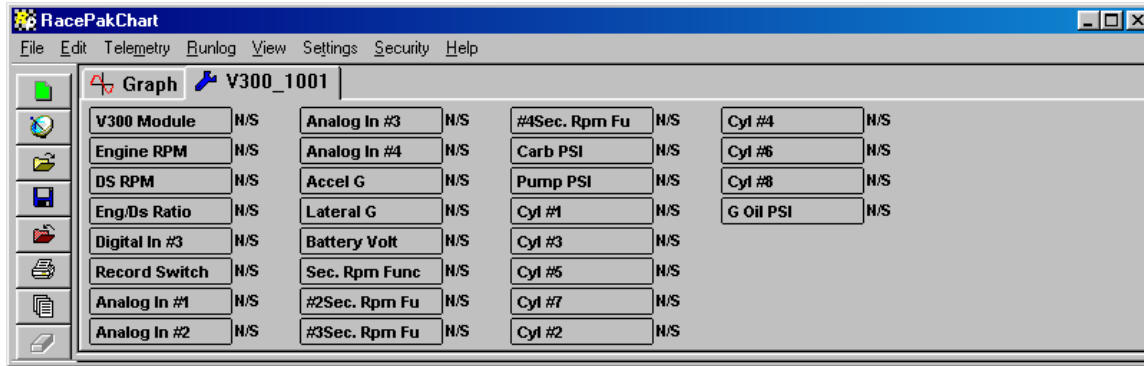
The next step is to start the DataLink program by clicking on the DataLink icon located on the Windows desktop on your PC. If you selected your car configuration file as the default configuration file, the DataLink program will automatically open your car configuration file. If you did not select the car configuration file for your system as the default car configuration file you will need to open the car configuration file manually. To open your car configuration file select the **Open Car Configuration** menu item located in the **File** main menu selection. The dialog box on the top of the following page will be displayed.

The list on the left-hand side of the **Select Configuration** box will display all of the file folders in your RacePakData subdirectory that contain valid configuration files. Select folder with the name that contains your serial number, for instance V300_1001, by left clicking on it with the mouse. The list on the right will now contain the list of configuration files contained in this folder. The configuration file created for you it will be located here. The configuration file will be named using the data logger serial number. For example a configuration file created for a V300 with the serial number 1001 would be named V300_1001. For users with the generic V300 or V500, select the generic version from the list below.



Locate your car configuration file in the right hand list and highlight it by clicking on it with the mouse and select the OK button to open the configuration file. Your screen will be updated and your configuration file will be displayed as shown below. The configuration file shown below is for sample purposes.





The wrench icon in the run file tab is used to indicate that this file is a car configuration file. Each of the buttons represents one of the devices/channels in your system. For instance the V300 Module button represents your data logger, the Engine Rpm button represents the engine rpm channel, and the G Oil PSI button represents an oil pressure gauge in your system.

After you have opened the car configuration file the next step in modifying the setup of your system is to select the device/channel to be modified. To select a device/channel position the mouse cursor over the desired button, for instance DS RPM in our sample, and click the right mouse button. An edit dialog box as shown on the following pages will be opened to allow you to edit the parameters for that specific device/channel.

In addition to allowing you to edit the device/channels parameters the dialog box also contains online help to instruct you on the procedure for configuring the device and the options available for each of the parameters that can be modified. Although each of the dialog boxes for the different devices are slightly different, all of the dialog boxes have the same overall structure.

The first section to note is the **Channel Description** area. This area includes important information about the channel that you are editing. You should always check this area to be sure you are editing the correct channel. When you are sure you are editing the proper channel go to the **Online Help Scroll Box**. Read this section. It will give you step by step instructions on configuring the specific device/channel you are editing.

The following two pages describe the basic sections of the edit dialog box and their locations.

Channel Description Area

The channel description area contains several fields that describe the channel that is represented by the button and the edit dialog box. The fields in order of importance are as follows:

Type: The type field describes the type of device being edited, for instance a Logger_Analog input or an Oil Pressure Gauge

Unit Serial #: This field displays the serial number of the device being edited.

Input Number: In devices such as a four-channel EGT module this field displays the channel number in the device being edited.

V_Net ID: The box displays the ID of the parameter measured by this device i.e. Drive Shaft Rpm

Sensor Type: This field indicates the type of sensor connected to the channel

Name: This is the user assigned name for the channel

Online Help Box

The online help box is a scrollable text area containing detailed instructions on how to configure this device. You should always read this section before editing any of the device parameters.

Channel Scaling

This section is used to enter the calibration factors for the sensor connected to this channel. These factors are entered automatically by the system any time the Sensor type is selected. They must be entered manually only when a custom sensor calibration is required.

Graph Setup

These fields are used to define how the DataLink program charts the data obtained by this channel. Please refer to the online help box for details.

Options List Box

The options list box displays all of the user settable options for the device being programmed. To select an option to be edited, place the mouse cursor over the desired option and click the left mouse button. The options help box and the options edit box will be updated with appropriate information for the selected option.

Options Help Box

The options help box displays detailed information on the option currently selected for editing.

Options Edit Box

The option edit box will display an appropriate edit box for the option currently selected in the options list. The edit box will display the name of the option being edited, the current value of the option, and the range of values that can be entered for the option is appropriate. Enter the new value for the option here.

Typical Device/Channel Edit Dialog Box

Channel Description ==>

Online Help Box ==>

Option List Box ==>

<==Channel Scaling

<==Graph Setup

<== Option Edit Box

<== Option Help

CAN Input Channel Parameters

Name: Type:

Unit Serial #: Vnet ID:

Input Number: Sensor:

Specify Linear Conversion

Raw data value A: will become

Raw data value B: will become

Minimum result value: , maximum:

Display: digits before decimal point, after

Result Unit: Do not display

Smoothing Range [points]: to

LOGGER RPM CHANNEL INPUT SETUP INSTRUCTIONS:

This channel is linked to one of the RPM channels connected directly to your data logger . The Input Number displayed above identifies which of the RPM inputs this channel represents.

A logger RPM channel reads data from a sending unit (such as a drive shaft rpm sensor) and transmits the value over the V_Net bus using the selected V_Net ID. The V_Net ID identifies to the other components in the V_Net system (such as gauges) what the information represents so

Channel Options

Channel Mode	2
VNet Update Rate	10
Logger Sample Rate	100
Pulses Per Revolution	2
Odd Fire Pulse	0
Trigger Edge code	0
Reference Channel	0

Channel Mode:

Enter Channel mode:

SEND Configuration

READ Configuration

After you have read the online help and have modified the setup parameters as desired, the next step is to send the new setup from the PC to the actual device being programmed. Be sure your data logger is connected to your PC using the serial interface cable supplied with the system. Next apply power to your data logger system and wait for approximately 10 seconds for your system to enter normal operation. Next select the **Send Configuration** button in the channel edit dialog box to send the information to the device being programmed. A progress box will be displayed to indicate whether the transfer is successful.

When you have successfully sent the new information to the device being programmed select the **OK** button to exit the dialog box. As a final step save the car configuration file to your disk by clicking on the save icon in the DataLink Toolbar or select the Save menu item located in the Files main menu selection.

You have completed the programming of the device/channel. Repeat the above process for each of the devices you wish to modify.

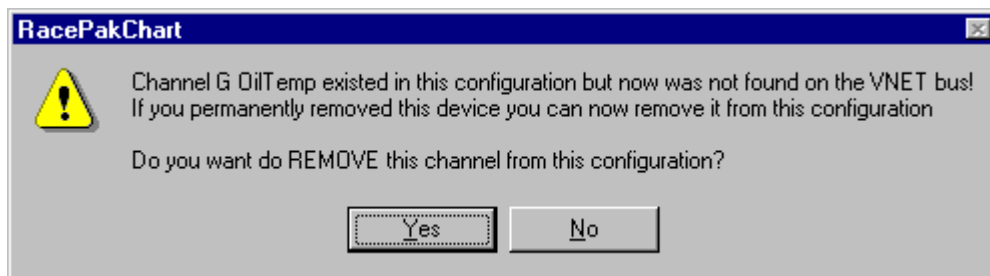
Adding or Removing V_Net Devices to your System

If you add or remove modules from you system, you will need to update your configuration file to match the configuration of your onboard system. If the changes are permanent you should edit your existing configuration file to match the new setup. If the change is temporary you may want to create a new configuration file by copying the existing configuration file and then make the changes to the new configuration file. (see the DataLink Manual for details)

In either case, to update the configuration file load the configuration file by using the **Open Car Configuration File** menu selection located in the **File** main menu selection. Make sure the configuration file is the active file by positioning the mouse cursor over the file tab for the file and click the left mouse button.

Connect your PC to your data logger using the serial communication cable and power up your system. Next select the **Read V_Net Configuration** selection located in the **Edit** main menu selection. The DataLink software will now query the V_Net modules in your system and will read in the current configuration of the system. During this process a message log dialog box will be displayed. The progress of the read will be displayed in the message log box.

If a V_Net module that is included in the current configuration file is not found in the System, the following message will be displayed.



If you have removed the module from the system you should select **Yes** to remove the module from the configuration file. If you have not removed the module from the system you should select **No** and then inspect your system to be sure the module is properly installed. When you have corrected the problem you should repeat the process above.

If you have added modules to the V_Net system the DataLink software will automatically insert new channel buttons for the new modules. You should review the programming of the new modules as detailed above and change the setup of the new modules as required.

Operating your V Series Logger and V_Net System

Now that you have completed the installation and programming of your new data logger system you are ready to begin using your system to display, record and analyze the run data. The following section will take you through each step in the process. We will also review the various setup parameters used to control the operation of the logger.

Displaying Operating Data on your Gauges and Shift Lights

Anytime power is applied to your system the devices begin monitoring the sensors connected to the system and begin sending data over the V_Net data bus to the various Intelli-Gauges, tach modules, shift lights modules, and other devices such as fan controllers. No operator action is required.

Recording Data with your Data Logger

Anytime power is applied to your system the data logger is ready to record data from the various sensors connected to the system. When the recording process actually begins and how much data is recorded is determined by how you program the setup features in your data logger. Staff at RacePak will have setup your data logger to start recording in a manner typical to your form of racing. The **Record Setup Worksheet** included in the front of this manual and in Appendix I details how your system was configured from the factory. If you wish to modify how the data is recorded read the following information.

The start of the recording can be programmed to occur by three different methods. These are;

Start Recording Immediately

In this mode the data logger begins recording immediately after power up and records data until the maximum record time is reached. You must use a data cartridge to transfer information to your PC as the cartridge has special interlocks to prevent the data logger from overwriting the recorded data. Special care must be taken to avoid turning the power off and then back on before transferring the data to the data cartridge, as this will erase the run data.

Start Recording Manually on Operator Input

In this mode a momentary push button switch is connected to one of the digital inputs on the data logger. Each time power is applied to the data logger the logger monitors the input and will begin recording only when the switch button is pushed. Once the recording is started it will continue until the maximum record time is reached.

Start Recording Automatically when threshold is exceeded.

In this mode the logger is programmed to begin recording only after one of the monitored data channels exceeds a preset threshold. For instance, the logger can be programmed to begin recording any time the Engine RPM exceeds 3000 rpm. Once the recording is started it will continue until the maximum record time is reached.

Once the recording is started all previously recorded run data is erased and the new recording is initialized. Please note approximately 5 seconds elapses from the time the recording is triggered and the time the first data point is recorded. This is the time required to initialize the recording. The following section will guide you through the setup of your data logger.

Configuring your Data Logger's Record Parameters

The first step in programming the record parameters in your data logger is to connect your data logger to your PC using the serial communications cable supplied with your data logger. Once the logger is connected turn on power to your data logger.

Next start the DataLink program and open the car configuration file for your system. If you selected your car configuration file as the default car configuration file during the software installation the DataLink program will have automatically opened the configuration file when you started the program. Click on the file tab of the car configuration file to select the file for editing. Next position the mouse cursor over the V300 Module or the V500 Module channel button and click the right mouse button. The logger edit dialog box will be displayed on your video screen.

Located in the lower left-hand corner of the dialog box is the Systems Options section. Several options and their present value will be listed on the left-hand side of the Systems Options section. To select an option for editing simply position the mouse cursor over the option and click the left mouse button. The option will become highlighted and the options edit box and option help box located to the right of the list will be updated with appropriate information for the selected option. Read the help information and enter the new value for the selected option. The options for setting the record parameters are discussed in detail below.

Setting the Record Length

Locate the **Number of Seconds to Record** option and select it as described above. The options edit box will now display the currently programmed number of seconds to record. Enter the new desired value in the edit box.

Setting the Record Enable Channel

The record enable channel is the data channel used to start or trigger the recording process. If you want the data logger to begin recording immediately you should select the **Disabled = x0** value below. If you want to start the recording manually you should select the input to which you connected the sample on/off switch above. To start the recording automatically when a selected parameter exceeds a preset threshold select the desired parameters name from the list displayed in the edit box as described below.

To program the record enable channel locate the **Can ID for Record Enable channel** option and select it as described above. The options edit box will be updated with the names and ID's of all of the currently parameters measured by your system. To enter a new value click on the down arrow located on the right end of the option edit box as shown below.



A list of the valid channel names and IDs will be displayed. Use the scroll buttons to display all of the values included in the list. When you have located the desired selection position the mouse cursor over the selection and click the left mouse button to accept the selection. The top line of the edit box will be updated with the newly selected value.

Setting the Record Start Threshold

The record threshold option is used in conjunction with the record enable channel to determine when the recording is started. If you have decided to begin the recording immediately after power up and have selected **Disabled** for the record enable channel, the record option threshold is ignored.

If you have selected any other channel the recording will start any time the value of the selected channel exceeds the value of the record threshold. If you are using an on/off switch connected to a digital input on your data logger to manually start the recording you will need to set the record threshold to 0. A digital input channel in event mode only has two values, 0 when the switch is off and 1 when the switch is on. In this case a value of 1 is greater than 0 and the recording will start.

If you have selected a channel such as Engine Rpm enter the desired rpm above which to start the recording. For instance 3000 rpm. The recording will begin any time the engine rpm exceeds 3000 rpm.

To program the record threshold select the **Start recording when channel exceeds value** option as described above and enter the desired value in the option edit box.

Sending the Record Parameters to your Data Logger

The final step in programming the record parameters on your data logger is to send the configuration you just edited to from your PC to your data logger over the serial communication cable connected above. To send the information click on the **Send Configuration** button located in the lower left-hand section of the logger dialog box. A progress box will be displayed showing the information being transferred to your data logger. When completed the last line in the progress box should read **Devices Programmed Successfully**. You have completed the programming of your data logger. The new programming will become effective the next time you turn your data logger on.

Recording Data

After you have programmed the recording parameters as described above, you are ready to record run data using your new data logger. To record run data simply turn on power to your system. The recording will begin any time the conditions as programmed above are met. The recording will end when the number of seconds, as set in the number of seconds to record, has been recorded or power to the data logger is removed.

If a the recording process has started and you wish to stop the recording and then restart the recording process again you will have to remove and then reapply power to the data logger to reset the recording start sequence.

If you have selected to automatically start the recording when a data channel exceeds a programmed threshold, be sure the data channel is functioning properly or the recording will not start. In addition, if you are trying to take a warm up recording in the pits, be sure the data channel exceeds the start threshold or no recording will be taken.

After you have recorded your data you are ready to upload the data into your PC.

Uploading Data to your PC

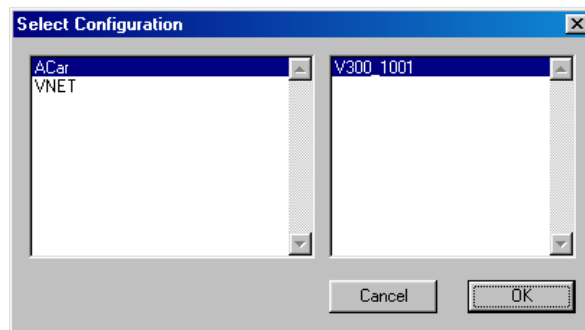
Data from your V300 or V500 data logger can be uploaded to your PC for data viewing and analysis using the RacePak DataLink program. Two different methods can be used to upload the data to your PC. In the first method a serial communications cable is connected directly between your data logger and your PC. The data from your data logger is uploaded directly to your PC.

The second method is through the use of a RacePak Data Cartridge. In this method the data from your data logger is downloaded into a small data cartridge. The data from the data cartridge is then uploaded into your PC.

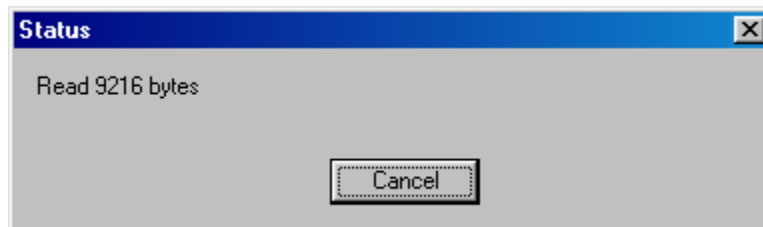
In most cases your system will be configured to use a data cartridge to download the data from your data logger. This method is preferred as the data can be transferred from your logger to your PC in a matter of seconds as compared to several minutes when using the serial download cable. In addition, as no direct connection between the PC and data logger is required, your PC can be located remotely from your vehicle in an area more conducive to viewing and analyzing your data.

Using the Serial Communications Port to Upload Data to your PC

To upload data from your data logger to your PC using the serial port, connect your PC to your data logger system using the serial communications cable provided with your system and turn on the power to your data logger. Next select the **New** file icon in the program taskbar or the **New** menu item selection located in the **File** main menu. The following dialog box will be displayed and you will be asked to select which configuration file to use. Select the configuration files as created above.



The system will upload the data from your data logger. While the data is being uploaded the following progress box will be displayed to inform you of the systems progress.



When the download process is completed select the OK button to proceed. To finish the upload processes skip the following section and continue with the section on naming and storing your run data file.

Using the Data Cartridge to Upload Data to your PC

If your system uses a data cartridge to transfer information from your data logger to your PC you will perform the data transfer in two steps. The first step is to download the data from your data logger to the data cartridge.

To download the data from your data logger into the data cartridge perform the following steps.

Step #1: Be sure the power to your data logger is off.

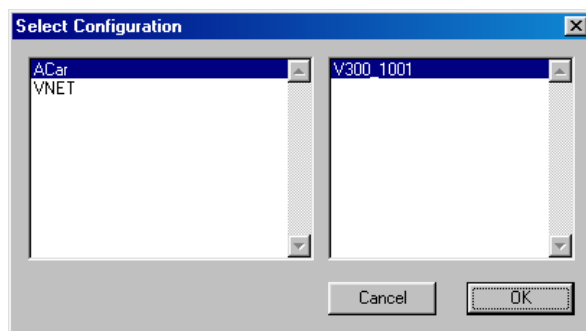
Step #2: Plug the data cartridge into the data cartridge connector on the end of your data logger.

Step #3: Turn the power to your data logger on. The LED on your data cartridge will glow red for

several seconds and will then flash and go out. After 15 to 30 seconds the LED will begin to flash at a steady rate. This indicates the data transfer to the cartridge is complete.

Step #4: Turn off the power to your data logger and remove the cartridge.

The next step is to upload the data from the data cartridge to your PC. Connect your data cartridge to the upload cable connected to the RacePak PIO board installed during the DataLink software and hardware installation. Next select the **New** file icon in the program taskbar or the **New** menu selection located in the **File** main menu. The following dialog box will be displayed and you will be asked to select which configuration file to use. Select the configuration files as created above and select OK.



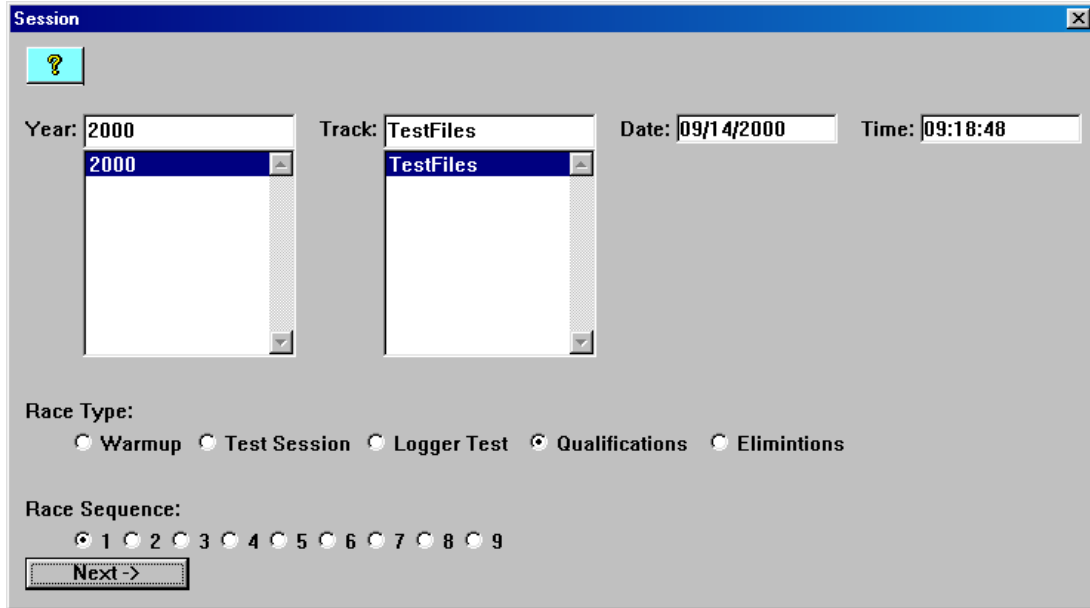
The system will upload the data from your data logger. While the data is being uploaded the progress box will be displayed to inform you of the systems progress.

When the upload process is complete the program will ask you to enter the session data as described in the following section.

Naming and Storing the Run Data File

After the data has been uploaded from your data logger or from the data cartridge, a dialog box will be displayed to allow you to enter the session information. Enter the appropriate year and track by selecting the correct value from the selection lists. If the desired year and/or track is not on the corresponding selection list enter the new year or track by typing the name directly into the top selection box. The new year and/or track will be added to the selection list. Select the race type, and race sequence information by clicking on the desired radio button. The system will enter the date and time.

This information will be used to name the data file. The dialog box is shown below. If you need help on filing out the dialog box click on the help icon in the upper left hand corner of the dialog box.



Select **OK** or **Next** depending on your configuration file. Additional dialog boxes may be displayed. These are part of the Run Log sections that are user programmable to allow test information to be entered during the download process. Fill out the information as appropriate. The file save dialog box will then be displayed as shown below.



To save and view the file, select the **Save** button. To view the file only, select the **Cancel** button. If you select cancel you can save the file later if desired. A new file tab with the channel data will be opened. You are now ready to view the data.

Refer to the DataLink instruction manual for information on viewing the run data.

Viewing Real Time Data on your PC

Data from your V300 or V500 data logger can be displayed and recorded real time on your PC computer using the DataLink program. Before you can view the data, however, you must first setup the real time parameters in your data logger. To setup your data logger's real time configuration, open your configuration file and right click on the V300 or V500 channel button. An edit dialog box will be displayed. In the center of the dialog box will be a Real – Time Telemetry Section.

Setting up the Logger Real Time Telemetry Parameters

This section will contain two lists. The list on the left-hand side of the telemetry section will include all of the data channels currently being monitored by your data logger. The list on the right-hand side of the telemetry sections includes all those channels that will be displayed during a real time telemetry session.

To add a channel to the telemetry list highlight the name of the channel in the left-hand list and click on the right arrow → button to add the selected channel to the real-time channel list. To remove a channel from the real-time channel list highlight the name of the channel in the right hand list and click on the left arrow ←. Remember that only channels in the right hand list will be displayed during a real time telemetry session.

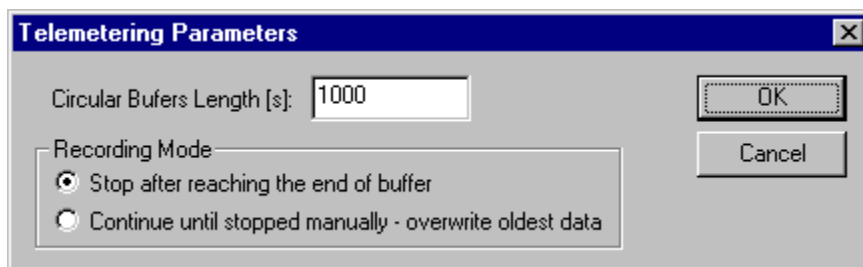
Next select the **Real Time Sample Rate** from the options list in the lower left-hand corner of the dialog box and select the desired real time sample rate. Note: the V_Net Sample rate of each of the modules to be monitored should be equal to or greater than the real time sample rate. If they are not the last data points will be repeated during the sample process.

Next select the **Real Time Communications Port** option and type in the name of the serial communications port on your PC you will be using to receive the real time data from the V_Net system. Normally this is the same as the default Logger Com Port set in the initial software installation. Normally this is COM1.

After you have edited the options use the **Send Configuration** button to transmit the setup data to your data logger. Next select **OK** to exit the edit box. You will need to turn the power to your data logger off and then back on to allow the changes to take effect. When you have completed the edit, save the configuration file.

Entering the DataLink Telemetry Parameters

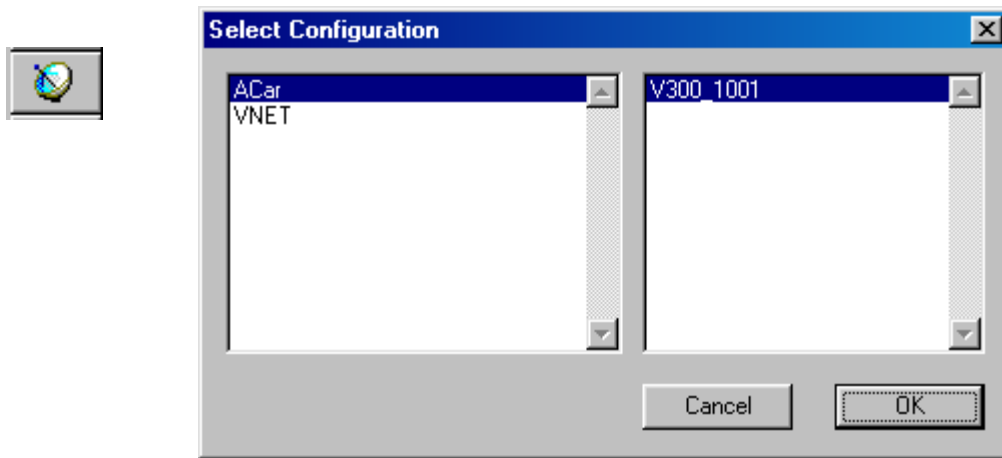
The final step in setting up the real time telemetry session is to set the DataLink real time recording parameters. These parameters are set by selecting the **Recording Parameter** menu item found in the **Telemetry** main menu selection. The following dialog box will be displayed.



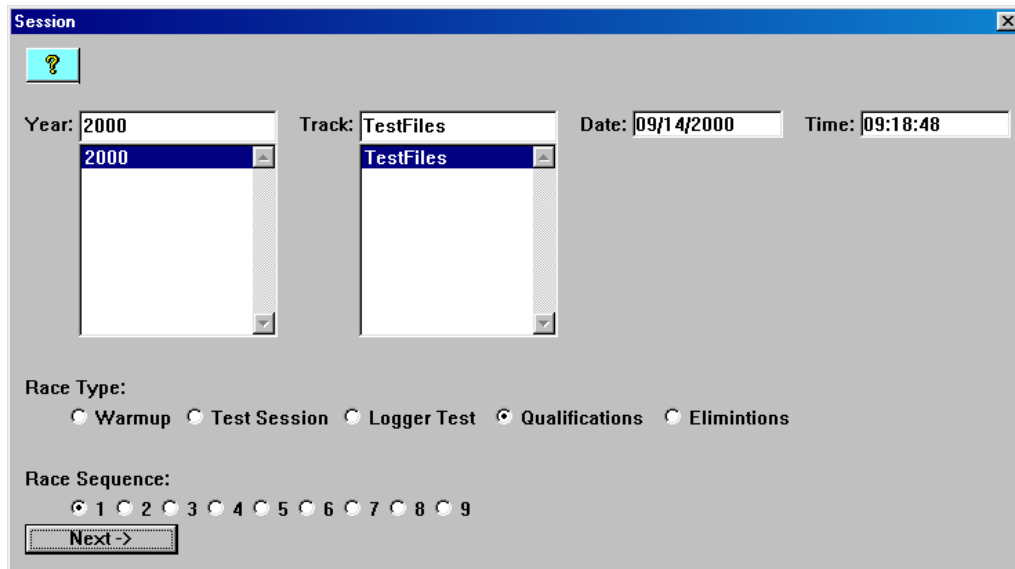
The first parameter **Circular Buffer Length** is used to set the amount of data to record in seconds. The **Recording Mode** is used to determine whether the recording will stop when the maximum record time is reached or whether the oldest data will be overwritten. For example if a Circular Buffer Length of 1000 seconds is entered and stop after reaching end of buffer is selected, the program will record data for 1000 seconds and stop. If continue until stopped manually-overwrite oldest data is selected the program will continuously record until stop by the operator. Only the last 1000 seconds of data will be stored.

Starting a Telemetry Session

The next step is to start a telemetry session. Select the **Telemetry** icon shown below or the **New Telem Session** menu item located in the File main menu selection. A dialog box, as shown below will be displayed and you will then be asked to select the configuration file to use for this session.



Select the configuration file as setup above. A dialog box will then be displayed to allow you to enter the session information (the same as when uploading run data). Enter the appropriate year, track, race type, and race sequence information as shown below. The system will enter the date and time.



If you need help in filling out the dialog box click on the help icon located in the upper left-hand corner of the dialog box.

Select **OK** or **Next** depending on your configuration file. Additional dialog boxes may be displayed.

These are part of the Run Log sections that are user programmable to allow test information to be entered during the download process. Fill out the information as appropriate.

The file save dialog box will then be displayed. Select the **Cancel** button. A new file tab with the channel data will be opened. Your real time data session is now ready.

The real time session is controlled via two icons located below the context sensitive help icon in tool bar. Only one icon will be active at a time depending on the status of the telemetry session. The Start Data Acquisition icon is shown active on the left. The Stop Data Acquisition icon is shown active on the right.



Start Data Acquisition - Green Light



Stop Data Acquisition - Red Light

To start the real time data acquisition left click on the **Start Data Acquisition** Icon at the bottom of the tool bar. The data acquisition will start at time 0. Once the real time data acquisition has been started the value of the data channels will be displayed next to the channel button in the top portion of the display area. To display the data from a channel on the graphics screen simply select the channel by left clicking on the channel button in the same manner you display data from a recorded file.

To stop the data acquisition left click on the **Stop Data Acquisition** icon located at the bottom of the tool bar. The real time data acquisition session will be suspended.

If you wish to continue the real time data acquisition simply click on the **Start Data Acquisition** icon. The telemetry session will restart at the same point it was suspended. If you wish to restart the session from the beginning select **Erase** from the **Telemetry** main menu. All previously recorded data will be erased from the file.

If you wish to save the data, stop the data acquisition and use click the **Save** icon located in the tool bar or select **Save** located in the **File** main menu.