How to Choose the Correct Closed Course Data System
Performance Instrumentation
Mounting Solutions
Sensors










Closed / Open Course V1.0 –March 2009

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Introduction

Thank you for your interest in our products. The purpose of this manual is to provide answers for potential questions that might arise, concerning our line of closed/open course GPS based data systems, along with our sensors, digital displays, gauges and related components.

Racepak's 25 year history of designing and manufacturing data systems for a broad range of worldwide motorsports insures the customer will be receiving the finest data logging products available. The design of Racepak's GPS based data loggers is based on our professional series of GPS data loggers developed for NASCAR, beginning in the year 2000. This engineering background provided the perfect proving grounds for our hardware and software, thus resulting in our current line of GPS based data logger products.

As noted in the Racepak Product Comparison section of this manual, each of Racepak's GPS based data loggers offer excellent value vs. price, when compared to similar products from various data system manufacturers.

If you have questions concerning any information in this manual, please feel free to contact us, as we are always happy to provide assistance.

Racepak Data Systems
30402 Esperanza
Rancho Santa Margarita, CA 92688
Phone: 1-949-709-5555
Fax: 1-949-709-5556

Terminology

Before reviewing this manual, we have found it helpful to provide an overview of some of the most commonly referenced Racepak terms.

Analog: Data created by the reading of a voltage change sent from a sensor
Configuration File: Setup file for the data logger. Saved as a .rcg file
Canbus: The specific name of the technology utilized to create the Vnet sensor system. A method of transmitting multiple external inputs over two wires.
Channel: The input from one sensor, as defined by the data logger.
Data Logger: See Data Recorder
Data Recorder: The vehicle mounted hardware device that collects and stores data transmitted from the sensors
Digital: A sensor or signal that has only two values, off or on such as the measuring of ignition pulses to calculate Engine RPM
Download: The process of transferring data saved on the data logger memory card to the user's PC using the DatalinkII software, in order to graph and analyze data. Memory card data must be downloaded through the DatalinkII software and cannot be open directly from the memory card.
HZ: Number of times per second. Used to define logging or sample rate. Example: 4Hz represents data that is saved 4 times (every .250) per second.
KB: Abbreviation for kilobyte, which represents one thousand bytes of information.
Logger: See Data Recorder
Logging Rate: The number of times per second, which the data logger records incoming data from a sensor and is defined as Hertz, or Hz. Each sensors logging rate may be define by the user.
MB: Abbreviation for megabyte, which represents one million bytes of information.
Runfile: The file created when a run is transferred from the data logger memory card to the user's PC. A Runfile is saved as a .rpk file.
Sample Rate: See Logging Rate
microSD Memory Card: Micro Secure Digital compact flash memory card
Sensor: A device that converts a physical property, such as pressure, into a voltage signal
Start Logging Channel: The channel that is used to start the logging process
Vnet Channel: Any sensor that is connected to the Vnet port of the data logger
Vnet: Racepak exclusive that allows multiple sensors (analog or digital) to transmit their data over a single cable, back to the data logger.
Vnet Sensor: Any sensor that connects to the Vnet input. Factory programmed sensors are plug and play, with calibration, channel name and scale values automatically populated in the Racepak software, based on an Edit/Read software command.

Product Details

Racepak Data Logger Comparison Chart

Each Racepak GPS based data logger provides the same base information. The differences are found in price, the number of external sensor inputs and logging rate, as shown in the following chart.

	G2X	**IQ3 Logger Dash**	**G2X Pro**
Base Retail Price	$943.50 USD retail	$1395.00 USD retail	$1895.00 USD retail
External Sensor Inputs	12	32	71
Sensor logging rate	100Hz max per channel	100Hz max per channel	100Hz/1000Hz
Memory (from factory)	128MB SD (2GB max)	512MB microSD (16GB max)	128MB SD (2GB max)
Maximum Memory	2GB SD card	16GB microSD card	2GB SD card
Recording Time	128MB = 20+ hours User can install larger memory cards, up to 2GB	512 = 60+ hours User can install larger memory cards, up to16GB	128MB = 20+ hours User can install larger memory cards, up to 2GB
GPS Speed	Yes	Yes	Yes
Recording Process	Automatic, does not overwrite	Automatically, does not overwrite	Automatic, does not overwrite
Engine RPM Input	Yes	Yes	Yes
Accel G Meter	Yes	Yes	Yes
Lateral G Meter	Yes	Yes	Yes
Vertical G Meter	No	Yes	No
Battery Voltage	Yes	Yes	Yes
Lap Time & Number	Yes	Yes	Yes
Predictive Lap Time	Yes	Yes	Yes
Track Mapping	Yes	Yes	Yes
Download Method	SD card reader	SD card reader	SD card reader
Programming Method	Serial cable to user PC	Serial cable to user PC	Serial cable to user PC
Items included in base package	G2X Data Logger G2X Display Dash 128MB Memory Card PWR/GND/Engine RPM Harness Cigarette Adapter Programming Cable USB/SD Card Reader DatalinkII Software Install/User Manual	IQ3 Data Logger Dash 512microSD Memory Card PWR/GND/Engine RPM/External Warning/Programming Button Harness Programming Cable USB/SD Card Reader DatalinkII Software Install/User Manual	G2X Pro Data Logger 128MB Memory Card PWR/GND/Engine RPM harness Programming Cable USD/SD Card Reader DatalinkII Software Install/User manual

Feature Highlights by Data Logger

G2X

1. Includes cigarette power adapter. Very popular for easy, quick install situations
2. Includes digital display dash. Any 5 sensor inputs may be displayed on dash
3. GPS eliminates need for wheel speed sensor, beacon transmitter and receiver
4. GPS provides lap time, number, and predictive lap time
5. 12 external sensor inputs typically exceed needs of average customer
6. Large memory capacity

IQ3 Data Logger Dash

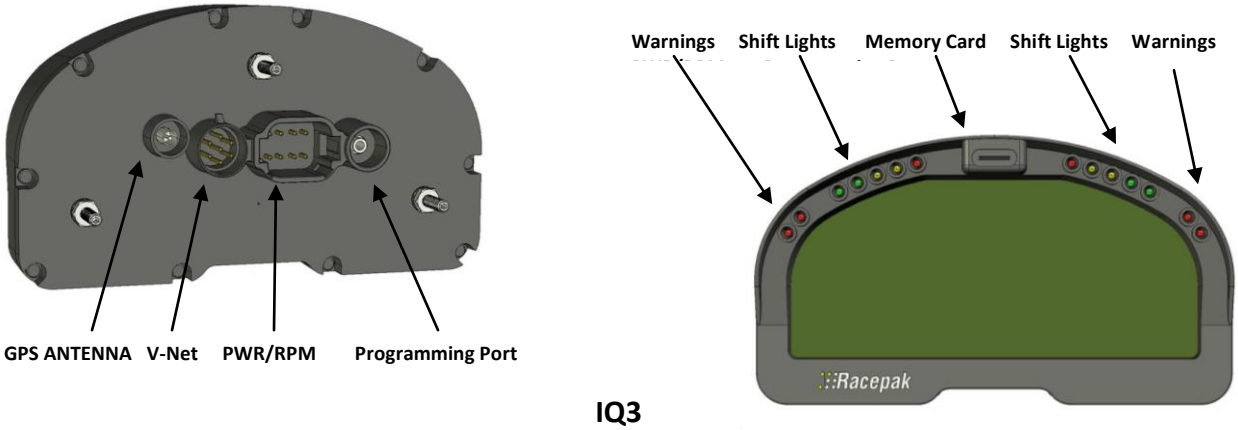
1. All in one design eliminates need for external data logger
2. GPS eliminates need for wheel speed sensor, beacon transmitter and receiver
3. GPS provides lap time, number, and predictive lap time
4. 32 external sensor inputs
5. Large memory capacity

G2X Pro

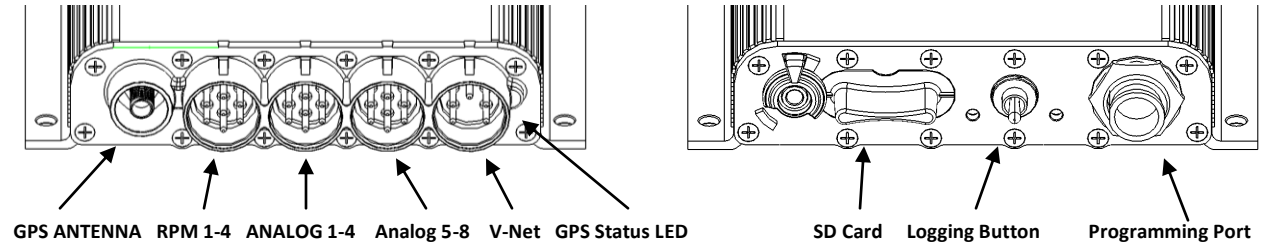
1. Professional level data logger
2. Does not include dash. Can utilize G2X mini dash, IQ3 Display or UDX dash
3. Popular sensors available in kit form
4. GPS eliminates need for wheel speed sensor, beacon transmitter and receiver
5. GPS provides lap time, number, and predictive lap time
6. 71 external sensor inputs typically exceed needs of average customer
7. Large memory capacity
8. Fast logging rate. Eight channels at 1000hz each

External Housing Connector Comparison by Data Logger

G2X



IQ3



G2X Pro

Details by Data Logger

G2X – Plug and Play Data System

The G2X was designed to be a Plug and Play data system. The use of GPS eliminates the necessity of wheel speed sensors, on board beacon receivers and trackside transmitters. Lap time, lap number, predictive lap time, speed and track mapping are all provided by the internal GPS board.

Typical Application

- Track/driving days
- Road(circuit) racing (automotive or motorcycle)
- Autocross
- Boat / Watercraft Racing
- Snowmobile Racing

Advantages

1. **Quick Installation:** Included cigarette power adapter and use of GPS allows for installation time under 5 minutes. Once logger is secured in vehicle (hard mounted or Velcro) customer simple connects power (by included cigarette power adapter or including power/ground harness) and mounts magnetic antenna in or on vehicle. Dash is not required for data logger to function
2. **No Wiring Harness for Sensor Inputs:** All Racepak GPS based data loggers utilize a canbus (what we call Vnet) sensor input. Unlike other systems, inputs can be RPM, thermocouple, travel, air/fuel, temperature, pressure or event. See Sensor section for additional details
3. **Automated Start and Stop Recording Process:** From the factory, the G2X starts recording data when the vehicle exceeds 25 mph. When the vehicle drops below 25 mph for longer than 30 seconds, the data file is numbered, saved and closed out. When the vehicle exceeds 25 mph again, a new file is created. Start recording channel and value, along with stop recording time can be programmed by customer
4. **Cost:** The data provided by the G2X is highly accurate and highly dependable and comparable to systems costing substantially more
5. **Results vs. Cost:** Typical users report immediate reduction in lap times, following a basic review and understanding of data. Few race car components related purchases equal the reduction in lap times, when compare to a G2X data logger

IQ3 Data Logger – All in One Design

The IQ3 Data Logger was designed to be All-In-One data system. Housed inside the fully programmable dash are a GPS board, 3 axis G meter, 32 channel data logger and 512MB memory card. The use of GPS eliminates the necessity of wheel speed sensors, on board beacon receivers and trackside transmitters. Lap time, lap number, predictive lap time, speed and track mapping are all provided by the internal GPS board.

Typical Application

- Road(circuit) racing
- Boat / Watercraft Racing
- Snowmobile Racing
- Truck/Tractor Pulling
- Performance Instrumentation (IQ3 Logger Dash and IQ3 Display Dash)

Advantages

1. **Reduced Installation Clutter:** The all-in-one design means there is no external data logger, GPS module or memory module
2. **No Wiring Harness for Sensor Inputs:** All Racepak GPS based data loggers utilize a canbus (what we call Vnet) sensor input. Unlike other systems, inputs can be RPM, thermocouple, travel, air/fuel, temperature, pressure or event. See Sensor Section for additional details
3. **Programmable Display:** Along with fully programmable shift lights and warning lights, information can be display on 4 pages, toggled through by optional external buttons
4. **Replace Up to 24 Gauges:** When compared to the cost of performance gauges, the IQ3 provides the ability to display a vast amount of information at a cost effective price
5. **EFI Interface:** When utilized with one of Racepak's optional EFI modules (as seen in the EFI section of this manual) the IQ3 becomes a fully integrated part of the vehicle, while the cost of the EFI module vs. the sensor data available is vastly improved, when compared to standard external sensors

G2X Pro Data Logger – Professional Level

The G2X Pro is our professional level data logger. The ability to input up to 71 total sensor inputs, along with the capability to record data on 8 of 71 channels at 1000 Hz maximum logging rate separates the G2X Pro from the IQ3 and G2X.

Typical Application

- Circle Track (Oval) Racing
- Road(circuit) racing (automotive or motorcycle)
- Boat Racing
- Multi-Engine Applications (pulling, etc)

Advantages

1. **71 External Sensor Inputs:** This feature insures professional level teams of adequate sensor inputs
2. **High Speed Logging Rates:** Analog 1-4 and Analog 1-8 ports of the G2X Pro provide the ability to log 8 sensor inputs up to 1000HZ each. Typical uses include shock, ride height or accelerometer inputs, for use with 7 post rigs or other motorsports simulation programs
3. **No Wiring Harness for Sensor Inputs:** All Racepak GPS based data loggers utilize a canbus (what we call Vnet) sensor input. Unlike other systems, inputs can be RPM, thermocouple, travel, air/fuel, temperature, pressure or event. See Sensor Section for additional details
4. **Sensor Kits:** Some of the most commonly requested sensor items are available in pre-packaged kit form, simplifying the ordering and stock process. See additional information in the Sensor section of this manual
5. **Cost:** A G2X Pro, with the addition of our Four Shock and Steering/Throttle/Brake/Brake Package, retails for approximately $5000.00 US Dollars. This offers a substantial savings over comparable systems
6. **Multiple Display Dash Choices:** The G2X Pro can utilize one of three dash products offered by Racepak:
    a. G2X Mini Display
    b. IQ3
    c. UDX

How to Select the Correct Data Logger

With three different data loggers, a multitude of sensors and 3 display dash choices, the selection of a data logger can at first glance appear to be intimidating. However, with just a few questions, the correct data logger/dash combination can quickly be determined.

What Type of Motorsport is the Data Logger to be Utilized?

a. The G2X is best suited for entry level, with a basic display dash. Easy install and removal is the key. Customers looking for basic lap time, speed, track mapping, g meter data and downloaded data will find this to be an excellent product.
b. The IQ3 is best suited for use when a digital dash will be utilized as the primary method of instrumentation, along with the information provided by the data logger. Since the IQ3 contains internal G meters, the IQ3 is not a "quick" install type of product, but rather design for permanent installation as orientation of the G meters is important
c. The G2X Pro is typically utilized in Circle Track (oval)/ Road Racing due to available sensor kits designed specifically for the G2X Pro, truck/tractor pulling with multiple engines and multiple engine boat racers

How Many External Sensors will be Added?

a. The G2X is limited to 12 sensor inputs. While this is more than adequate for many customers, it is important to insure future sensor needs will not exceed the capability of the G2X.
b. The IQ3, with 32 sensor inputs, will meet the need of many customers looking for an integrated digital display / data logger solution.
c. The 71 sensor input of the G2X Pro is more than adequate for most any type of motorsports. The cost difference between the G2X Pro and IQ3 / G2X must be balanced by the need for high speed logging rates on the 8 analog inputs of the G2X Pro (typically utilized for shock and ride height travel sensors)

Will Shock Sensors be Utilized?

a. If so, the G2X Pro is currently the data logger to be utilized, as the 8 high speed Analog inputs are required in order to obtain valid high speed logging data, such as Shock Velocities.

Essentially, once the above three questions are answered, the correct data logger can then be selected.

Racepak Data Loggers vs. Other Manufacturers

The following section provides comparisons charts between each of Racepak's GPS based data loggers and offerings from competing data acquisition manufacturers. Each comparison is based on the product that most resembles the Racepak product, in terms of cost and features.

G2X vs. Traqmate vs. AIM Micron3 Gold

	G2X	**Traqmate**	**AIM Micron3 Gold**
MSRP	$943.50 USD retail	$999.00 USD retail	$999.00 USD retail
Memory	128MB up to 2GB	Unsure?	8MB internal
Included Internal Sensors	Engine RPM Battery Voltage Accel G Lateral G GPS Speed	Accel G Lateral G GPS Speed	Engine RPM Lateral G Wheel Speed Sensor Beacon Receiver
Total External Sensor Inputs	16	7	4
Total Dash Pages	2	1	1?
Total Warnings	0	0	4
Sequential Shift Lights	Yes	No	Yes
Sampling Rate	100hz per channel		200hz
GPS	Included	Yes	No
Gear Indicator	Yes	No	Yes
Sweep Tach	No	No	Yes
Predictive Lap Time	Yes	Yes	No
Best Lap Time	Yes	Yes	No
Lap Time Provide By	GPS		
Split Time Provided By	GPS	GPS	Beacon Transmitter (not included)
Download Method	SD Memory Card		USB cable to PC
Integrated Video	Yes - Free	Yes - $199..00 upgrade	No
Items Included	Data Logger Display Dash GPS antenna PWR/Ground/EngineRPM harness Cig lighter adapter 128MB memory card USB card reader Programming cable User Manual	Data Logger Display Dash GPS Antenna Power Cable Cig Adapter Software User Manual	Dash Logger Beacon Receiver Wheel RPM Sensor Software User Manual

*Note: Prices as of March 2009

** Every attempt was made to provide accurate comparison information, as provided by competitor's online websites.

IQ3 vs. Race Technology DL1&Dash2 vs. Aim MXL Pista vs. Stack

	IQ3	**DL1 with Dash2**	**AIM MXL Pista Pro 05 With GPS Module**	**Stack ST8812S Logger Dash**
MSRP	$1395.00 USD retail	$1399.00 USD retail	$2600.00 USD retail	$3195.00 USD retail
Memory	512MB microSD-user can install up to 12 GB	2GB	8MB	2MB Upgrade to 16MB for fee
Included Internal Sensors	Accel G Lateral G Vertical G Battery Voltage Engine RPM	Accel G Lateral G Vertical G	Accel G Engine RPM	Engine RPM Lateral G Battery Voltage Beacon Receiver Wheel Speed
Total External Sensor Inputs	32	13	10-not including EFI	9 Upgrade to 22 for a fee
Total Dash Pages	4	5	2	Unsure. At least 5 items on one page
Total Warnings	4	6	6	Yes - unsure
Sequential Shift Lights	10	6	10	No. Can be added as optional module
Sampling Rate	100hz	Unsure	50/100/500hz	50hz / 250hz
GPS	Included	Included	Optional - $599.00 MSRP	No
Gear Indicator	Included	Included	Included	No
Sweep Tach	Included	Included	Included	No
Predictive Lap Time	Included	Included	Requires install of wheel speed sensor/beacon receiver	No. Requires module upgrade
Best Lap Time	Included	Included	Requires install of wheel speed sensor/beacon receiver	Included
Lap Time Provide By	Included – GPS	Included – GPS	Beacon Receiver or Optional GPS $599.00	Wheel speed sensor and beacon
Split Time Provided By	Included – GPS	Included – GPS	Beacon Receiver or Optional GPS	Wheel speed sensor and beacon
Download Method	microSD memory card to PC	Compact Flash card to PC	USB cable	USB Cable
Integrated Video	Included - Yes	No	No	No. Upgrade for fee
Odometer	Included-Yes	Included – Yes	Included - Yes	Yes
Items Included	IQ3 PWR/GND/RPM harness 512mb micro SD memory card USB card reader Programming Cable User Manual Software	DL1 Dash 2	Dash Logger Harness Beacon Receiver Wheel RPM Sensor Software User Manual	Dash Logger Harness Beacon Receiver Beacon Transmitter Wheel Speed Sensor User Manual Software

*Note: AIM MXL Pista Pro 05 with optional GPS module is $2600.00. Prices as of March, 2009

G2X Pro vs. Pi Club vs. Motec vs. CDS vs Stack

	G2X Pro	**PI Delta Lite**	**Motec ADL2 Dash Logger**	**CDS CP 300C**	**STACK**
MSRP	$1895.00 USD retail	$4425.00 USD retail	$6569.00 USD retail	$1795.00 USD retail	????
Memory	128MBSD Up to 2GB can be utilized	4MB Upgrade to up to 8MB for a fee	8mb Upgrade to 16MB for a fee	Base 112K?? Upgrade to 4MB	
Included Internal Sensors	Engine RPM Battery Voltage Accel G Lateral G GPS	Battery Voltage Accel G Lateral G Temp	Battery Voltage Accel G Lateral G Temp	Engine RPM Accel G Lateral G	
Total External Sensor Inputs	71 standard	14 included Upgradable to 24 for a fee	22 standard Upgrade to 32 for a fee	Base of 3? Upgrade to 33	64 Requires use of expansion modules
Sampling Rate	8@1000hz 63@100hz	500hz	1000hz	500hz	200hz
GPS	Included	No	No	No- $595.00 option	No
Predictive Lap Time	Included	?	Yes	Yes	Yes
Download Method	SD card to PC	USB Cable	USB Cable	Serial Cable	USB Cable
Integrated Video Software	Yes - Free	No Upgrade only	With upgrade to I2 Pro	No	No Upgrade only

*Note: Prices as of March, 2009

** Every attempt was made to provide accurate comparison information, as provided by competitor's online websites.

Adding External Sensors, Dash or Gauges

Referring back to the previous External Features section of this manual, notice that while each of our GPS based data loggers can input anywhere from 12 to 71 external items, there are no terminals strips, array of multi-pin connectors or other methods to connect all those external inputs. Instead, we utilize two methods of connecting external inputs to the data loggers:

Vnet Port (canbus inputs)

The G2X, G2X Pro and IQ3 are each equipped with a 5 pin Vnet connector. Vnet is Racepak's terminology for a method of transmitting all data from external inputs over 2 small wires. As can be seen in the Vnet image to the right, the 5 pins are Power, Ground, Shield, Can1 and Can2. The technical term for this design is Canbus.

How Does It Work

Much the same way in that television, internet and telephone data are all transmitted on a single cable. External sensor data is converted from voltage, ohm, pulse, rpm etc signals into coded bits of information by a Vnet "module" connected to the sensor, then transmitted over the two wires back to the data logger. The remaining 3 pins are for power/ground/shield.

Advantages

- Eliminates bulky wiring harness. Since all data is transmitted on two of the five Vnet wires, a single Vnet cable is routed through the vehicle
- Smart Sensors: Vnet modules can be factory programmed with sensor information, such as channel name, calibration values, etc
- Sensors, Racepak Intelli-Gauges and or Racepak Digital dash all connect to the same Vnet cable
- Multiple sensor types, such as voltage, ohm, rpm, event, temperature can all transmit on the Vnet cable
- Software is automatically populated with sensor setup specifications, with Edit / Read function in Racepak DatalinkII program. No manual setup of sensors.

Analog Port

Vnet sensors are limited to 100 Hz (times per second) logging per sensor channel. When monitoring movement sensors (such as shock travel) higher logging rates are required. The G2X Pro is equipped with 2 "analog" ports, Analog 1-4 and Analog 5-8 in order to accommodate this need. Each analog port can input the data from up to four analog sensors, while logging up to 1000 Hz for each input. Detailed information concerning the analog inputs along with available sensor packages is provided in the G2X Pro manual, which can be downloaded at www.racepak.com.

The following section defines each type of external input (sensor, gauge, dash) that can be connected to the Vnet cable, along with providing a basic system diagram.

Vnet Sensors/Cables

Vnet Cable

A Vnet cable routes the data from external sensors, gauges or dash back to the data logger

- Factory terminated with a male 5 pin Vnet connector on one end, female 5 pin Vnet connector on the opposite end
- Single or multiple Vnet cables (connected end to end, much like extension cords) can be utilized
- Available in 12" (30cm) increments. Vnet cables cannot be cut and terminated

Individual Vnet Sensor Modules

As previously discussed, Vnet sensors require the use of a Vnet "module" in order to connect the sensor to the main Vnet cable routed back to the data logger. Each module contains a male/female 5 pin Vnet connector, along with a pigtail leading to the sensor, as show to the right.

- Modules contain all programming functions of the sensor making for a smart sensor
- Can be connected anywhere there is a junction on the Vnet cable (between two Vnet cables, at the end of a single Vnet cable)
- Multiple Vnet modules can be daisy chained together

Preprogrammed Vnet Module & Sensor

Each module and sensor arrives with all functions of the sensor factory install in the module such channel name, calibration values and scaling values. Any value can be changed by the user, but this feature provides for an easy installation by the customer.

Non-Programmed Vnet Modules & Sensors

Each item can be ordered as a "generic" non-programmed Vnet module and sensor. The customer then programs as desired.

Sensor Specifications

- Temperature or Pressure: 1/8" NPT
- EGT: ¼" NPT male bung – welded to header
- Air Fuel: 18 x 1.5 mm female bung – welded to header

Sensors are not "unique" for the module, but must be in the same sensor "family". For example, a variety of different rated pressure sensor can be used with a Vnet pressure module, but a pressure sensor cannot be attached to a temperature Vnet module.

USM 4 Sensor Input Module

As noted in the previous section, Vnet modules are equipped with a sensor cable that is factory terminated with the appropriate mating sensor connector. While it is possible to shorten the sensor cable, an alternative method is to use a USM module.

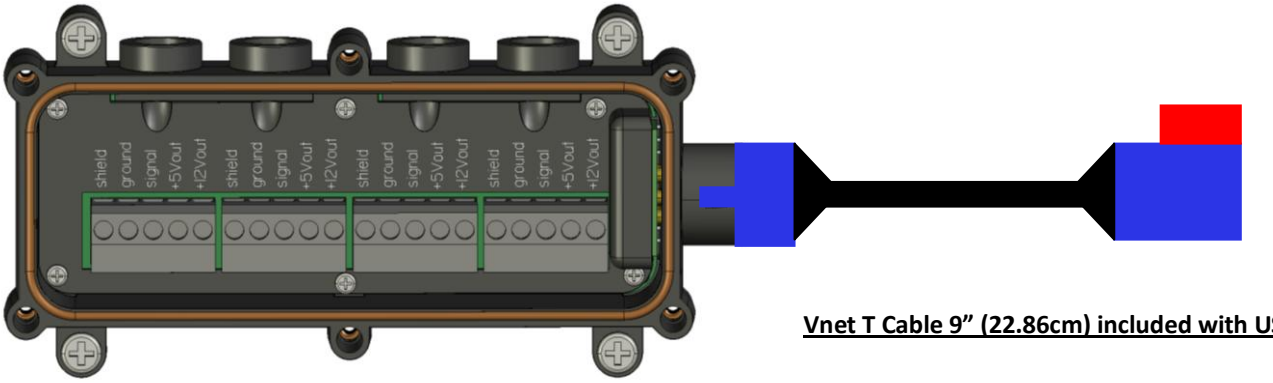
- Equivalent of 4 Vnet modules, contained inside a single housing
- Provides the ability to modify sensor cable lengths to suit installation requirements
- Each of four inputs can be programmed as rpm, event, analog, resistive temperature thus broadly expanding the use of the module
- Multiple USM modules may be utilized, up to the total number of sensor inputs. For example, an IQ3 provides 32 inputs. 8 USM @ 4 inputs each = 32 inputs
- Sensor cables available with factory install mating sensor connectors

USM temperature sensor cable with factory installed mating connecter – 144” (3.65M) long	PN: 680-CA-A144
USM pressure sensor cable with factory installed mating connector – 144” (3.65M) long	PN: 680-CA-P144
USM rpm sensor cable with factory installed mating connector – 144” (3.65M) long	PN: 680-CA-M144

Each USM is connected to the main Vnet cable by means of a Vnet T cable that exits the end of the housing.

Each Channel can be programmed for any of the below inputs. Calibration and scaling values for the listed temperature and pressure sensors are pre-loaded, in the Racepak software.

Channel 1	Channel 2	Channel 3	Channel 4
0-5V Sensor Input	0-5V Sensor Input	0-5V Sensor Output	0-5V Sensor Output
Racepak Coolant Temp	Racepak Coolant Temp	Racepak Coolant Temp	Racepak Coolant Temp
GM Air/Coolant Temp	GM Air/Coolant Temp	GM Air/Coolant Temp	GM Air/Coolant Temp
Square Wave RPM	Square Wave RPM	Square Wave RPM	No Square Wave RPM
Voltage Event	Voltage Event	Voltage Event	Voltage Event
Ground Event	Ground Event	Ground Event	Ground Event



USM (with cover removed)

Vnet T Cable 9” (22.86cm) included with USM

Racepak Intelli-Gauges

As previously discussed, Vnet sensors, Racepak gauges and Racepak digital displays can all be connected to the Vnet cable routed back to the data logger.

Much the same as sensors, Intelli-Gauges are connected to the Vnet cable by means of a Vnet T connector exiting from the rear of the gauge. Multiple gauges are daisy chained together by means of “jumper cables” with the last gauge in line containing the Vnet T connector.

Intelli-Gauges “borrow” the signal from the Vnet sensor, using it to active the gauge, before sending the information on to the data logger. Most any sensor offer by Racepak has a corresponding gauge. Complete gauge information can be found in the Performance Instrumentation section of this manual.

Racepak Digital Dash Products

While the G2X is equipped with a small display dash and the G2X Pro does not include a dash, it is possible add an IQ3, G2X or UDX display only dash to any of our stand alone data loggers. Again, each dash contains a Vnet port, providing the ability to simply connect the dash to the Vnet cable routed to the data logger.

- Any sensor information recorded by the data logger can be displayed on the dash
- The G2X can utilize a G2X dash, IQ3 display dash or UDX display dash
- The G2X Pro can utilize a G2X dash, IQ3 display dash or UDX display dash

Complete dash information can be found in the Performance Instrumentation section of this manual.

EFI Vnet Modules

Racepak's Vnet EFI modules provide the ability to connect a single Vnet module to the output of selected aftermarket EFI systems, with the Vnet module then connecting to the Vnet cable. EFI data is transmitted to the data logger or stand alone dash, which can then be recorded and/or viewed on the display dash. EFI sensor data is considered the same as Racepak external sensors, by the data logger or dash.

AEM	**Autronic SMC SM2**	**Autronic SM4 V107 V109**	**Big Stuff 3**	**Corvette C6 2006 later**	**Accel DFI**	**Omnitek**
EFI Engine RPM EFI Engine Load EFI TPS EFI Intake Temp EFI H2O Temp Custom 11/12/13 EGT Cyl 1/2/3/4 EFI Voltage EFI AF 1 and 2 EFI Speed EFI Gear	EFI Engine RPM EFI MAP PSI EFI TPS EFI AF/1 EFI Voltage EFI H2O Temp EFI Intake Temp EFI Speed Ex Back P Inj Pulse W Timing Ign 1 Custom 1/2/3/4	EFI Engine RPM EFI MAP PSI EFI TPS EFI AF/2 EFI Voltage EFI H2O Temp EFI Intake Temp TB1 RPM Wheel Speed Man Temp Ex Back P Cam Angle 1/2 Inj Pulse W Timing Ign ½ Knock Retard Custom 1/2/3/4	EFI Engine RPM EFI Speed EFI Voltage EFI A/F 1 EFI Boost PSI EFI TPS EFI H2O Temp EFI Gear Timing Ign 1 Boost Stage Fuel PSI EFI Pan Vac TB1 REPM EFI Oil PSI	EFI Engine RPM EFI Pedal Pos EFI TPS Oil Temp Trans Temp EFI H2O Temp EFI Intake Temp EFI Boost PSI LF Wheel RF Wheel LR Wheel RR Wheel EFI Gear Torque Yaw X Brake Pos	EFI Engine RPM EFI Map PSI EFI TPS EFI A/F 1 EFI Voltage EFI H2O Temp EFI Intake Temp Timing Ign 1 Knock Retard Inj Pulse W Inj Duty Cycle Control Flags O2 Correction EFI Error Code	EFI Engine RPM EFI Engine Load EFI Boost PSI EFI Map PSI Inj Pulse Width Inj Duty Cycle Timing Ign EFI TPS EFI Intake Temp EFI Water Temp EFI A/F 1 EFI Voltage IAC Position E1 Knock

Haltech	**Holley EFI**	**MEFI 4B**	**Motec M400 M600 M800**	**ViPec**	**FAST EFI CAN**	**FAST Serial**
EFI Engine RPM EFI TPS EFI Oil PSI EFI H2O Temp EFI Speed EFI Gear EFI MAP PSI EFI Intake Temp EFI Fuel PSI EFI A/F 1 Inj Duty Cycle Timing Ign 1 Custom 1/2/3	Engine RPM Man PSI Throttle Pos AF/Ratio H2O Temp Charge Temp Timing Ign Idle Air Control Inj Pulse Width	Engine RPM MAN ABS PSI Throttle Pos Man Temp Battery Voltage Water Temp Oil PSI Oil Temp Pump PSI AF/Cyl ½ Speed E1 Knock Man PSI	EFF Engine RPM EFI MAP PSI EFI TPS EFI A/F ½ EFI Voltage EFI H2O Temp EFI Intake Temp Timing Ign 1 Engine Load Injector Pulse W Injector Duty C EFI Gear EFI Speed Custom 1/2	EFI Engine RPM MAN ABS PSI EFI TPS Inj Duty Cycle Inj Pulse W EFI H2O Temp EFI Intake Temp EFI Voltage Wheel Speed Inj Timing Ing Timing E1 Knock Custom 1/2/3/4	EFI Engine RPM MAN ABS PSI EFI TPS EFI A/F1 EFI H2O Temp EFI Intake Temp EFI Voltage Fuel Flow Timing Ign 1 Inj Duty Cycle Inj Pulse Width EFI Speed Power Add Cor O2 Correction	EFI Engine RPM EFI MAP PSI EFI TPS EFI A/F 1 EFI Voltage EFI H2O Temp EFI Intake Temp Timing Ign 1 Knock Retard Injector Pulse W O2 Diagnostic O2 Correction Power Add Ena Power Adder

EFI Technologies X3 X5	EFI Engine RPM EFI Voltage EFI TPS Airbox PSI EFI Pan Vac EFI Fuel PSI EFI Oil PSI EFI Intake Temp EFI H2O Temp EFI Oil Temp EFI A/F 1/2

How to Configure and Order a Data System

Determine the Data Logger: G2X or IQ3?

The "building" of a Racepak data system is an easy process, which can be determined by answering a few simple questions, as shown below.

1. **Which Data Logger to Use?**
    a. G2X: Simple installation. Great for track day cars, use in multiple vehicles, road (circuit) racing, watercraft, autocross. etc. Dash does not have to be installed with data logger, perfect for customers requiring quick and easy track data. Data logger can simply be attached in vehicle, power connected, antenna mounted
    b. IQ3: Preferred when a digital dash / data logger solution is required. Since G meters, data logger and GPS are inside dash, requires permanent mounting of dash in correct orientation

2. **How Many External Sensors Will Be Added?**
    a. G2X: 12 or less sensors
    b. IQ3: 13 or more sensors

    Note that EFI inputs can total greater than 12 and still be utilized with the G2X.

3. **Tach Input Type:** The G2X, IQ3 and G2X Pro are equipped to accept a 5-18V, square wave tach signal. If this is not available, the options are:
    a. GMR Sensor: Converts the trigger signal from a coil on plug, coil pak or injector, converting to a square wave tach signal. Available from Racepak
    b. Tach Signal Adapter: For use with single coil, points type ignition. Racepak PN 810-SN-TACHDRV
    c. None of the above. If necessary, an external RPM sensor can be utilized to source RPM from a location such as the crankshaft pulley. Consult the Racepak catalog for RPM sensor information

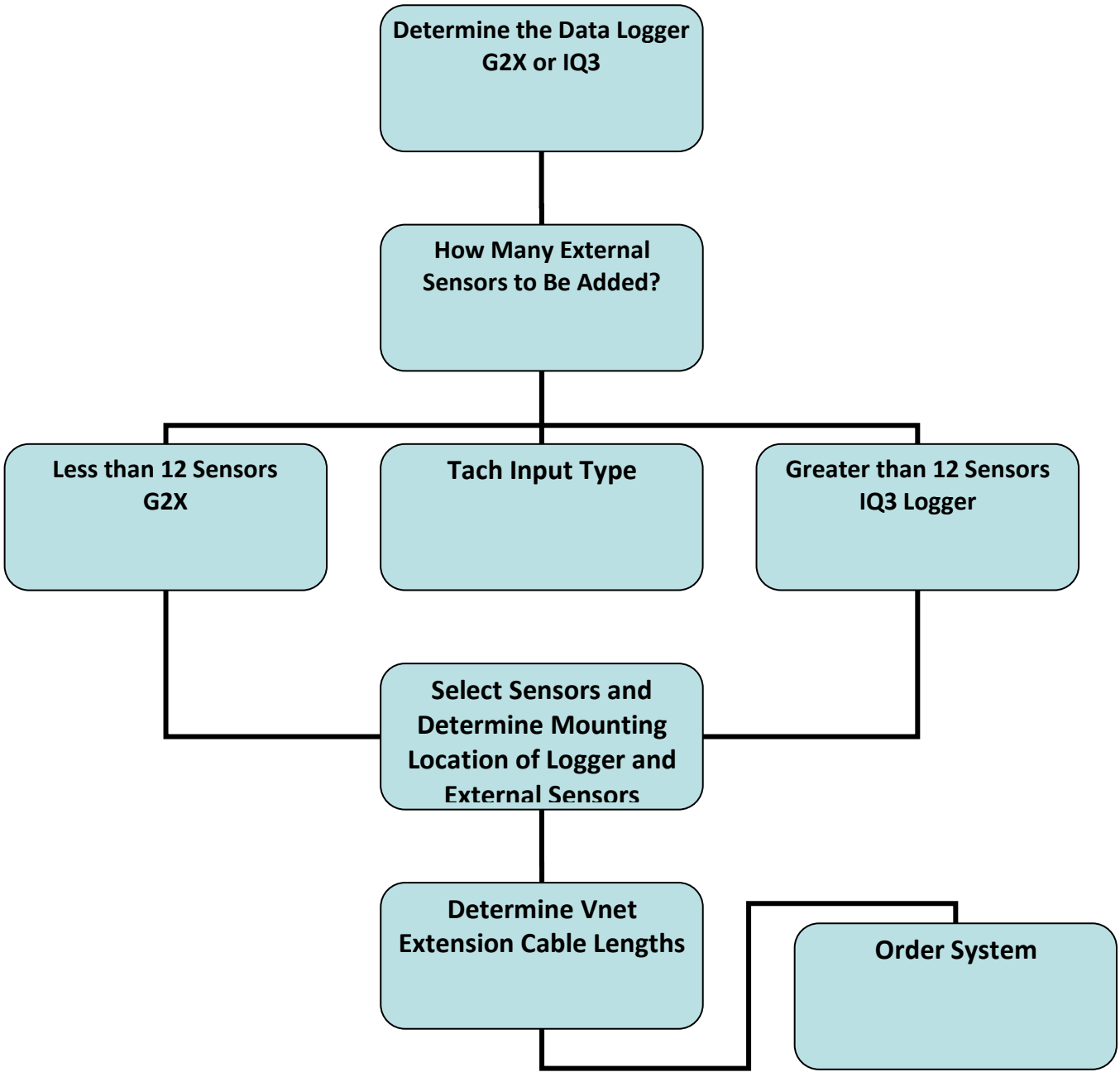
Sensor Selection

If sensors are to be added, it will be necessary to decide the best method for adding sensors (individual Vnet, USM, etc). The following provides basic tips for sensor selection.

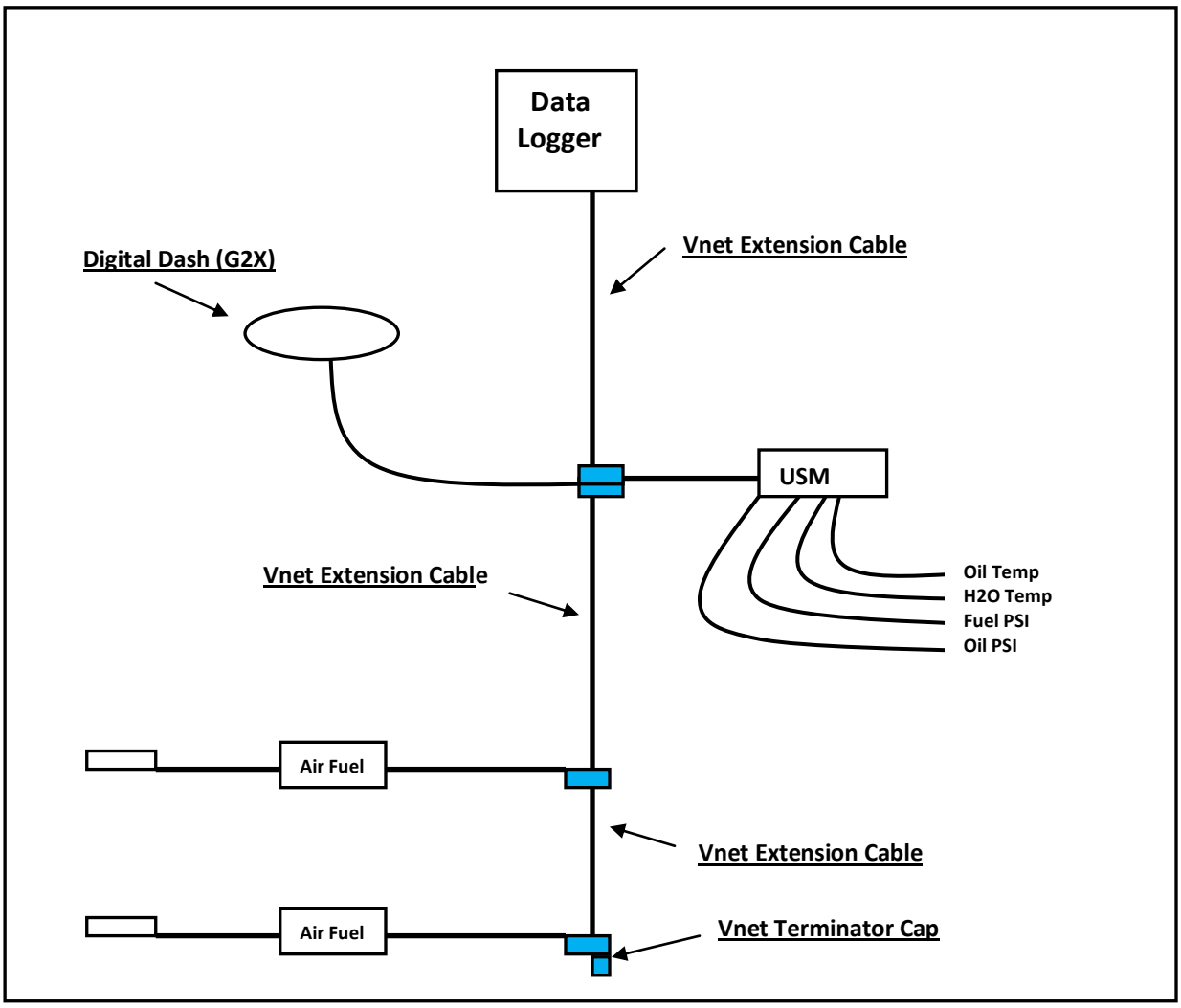
1. **Temperature / Pressure / Event / Travel / RPM**: Utilize the USM module. This allows the customer to select the appropriate sensor, purchase the mating sensor cable/connector, cut the cable to length and connect the sensor cable to the USM
2. **EGT (thermocouple)** / Air Fuel: Utilize Racepak's pre-configured Vnet module/sensor combinations

Any Vnet sensor currently offered by Racepak may be utilized. For a complete listing, visit www.racepak.com. Customer supplied sensors may also be utilized by the USM.

System Order Flow Chart



Example System Schematic – G2X or IQ3 Data Logger Dash



Vnet Cable Lengths

In the above example data system, one USM module, two Air Fuel Sensors and a digital dash have been added to the data logger. In order to complete this system, all that needs to be known is:

a. Distance from data logger to first sensor or sensors
b. Distance from first sensor or sensors to remaining sensors

Vnet extension cables are available in 12” (30.48cm) increments. Simply measure the approximate distance from the data logger to each external sensor or item, round up to the nearest 12” increment and order as needed. Remember that Vnet items can be connected back to back and do not necessarily need Vnet extension cables.

A Vnet terminator cap completes the system and is included with the IQ3 and G2X Pro, but will need to be ordered with a G2X, when adding external sensors.

Ordering a Data System- G2X Pro

The difference between the G2X Pro and the G2X and IQ3 Logger dash is the addition of two Analog ports, located beside of the Vnet port. The Analog ports provide the ability to record each Analog sensor input up to 1000 Hz per channel.

The most common utilized sensors for the Analog ports are:

1. Shocks
2. Ride Heights
3. Infrared Tire Temperatures
4. Strain Gauge
5. Load Cells

To simplify the ordering process, Racepak has designed a number of sensor packages, intended for use with the G2X Pro, as shown below:

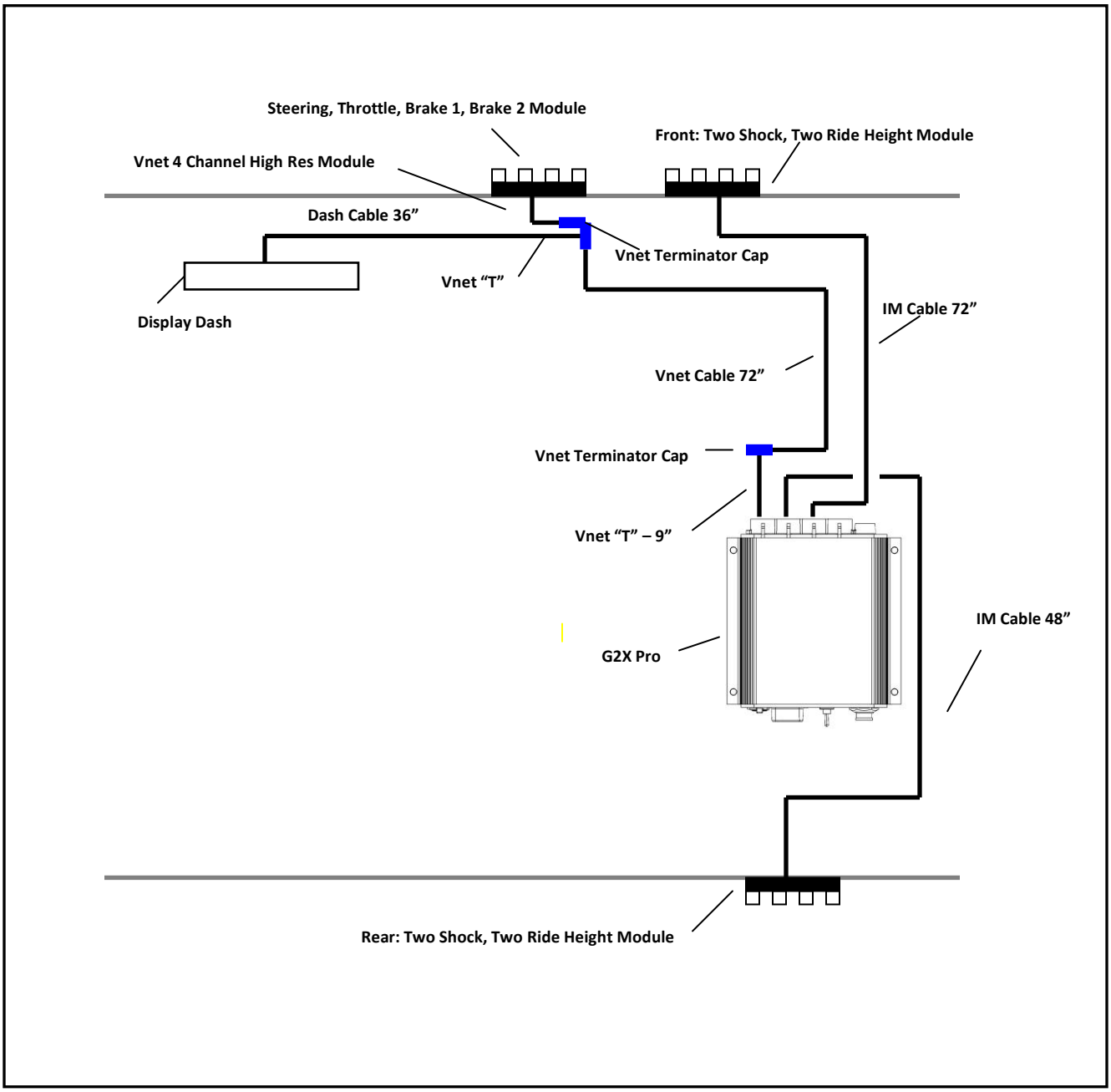
Packages	**Asphalt (circle or road race)**	**Dirt Circle Track (oval)**
Steering, Throttle, Brake Front & Brake Rear	620-KT-STBB	620-KT-STBB-DT
Four Shock Travel Package	620-KT-4SHOCK	620-KT-4SHOCK-DT
Four Ride Height Sensor Package	620-KT-RIDEHT	
Infrared Tire Temperature Package	Contact Racepak	

Much the same as the previous system schematic, the G2X Pro utilizes Vnet extension cables for the Vnet channels. However for the Analog channels, IM cables are utilized. While appearing much the same as a Vnet cable, an IM cable contains 7 pins and black male and female connector ends (as opposed to the blue Vnet connector ends).

IM cables are measured and ordered the same as Vnet extension cable, and as such are available in 12” increments.

The following page provides an example G2X Pro schematic, with a Steering, Throttle, Brake, Brake package, 4 Shock package and Ride Height package.

Example System Schematic – G2X Pro



Software

Each type of motorsports places different requirements on the software. As such, Racepak has created three data logger setup files, designed to cover a variety of motorsports.

Road Racing (circuit) / Circle Track (oval) / Auto Cross Features

1. Track Mapping with Segment Times
2. Lap Time & lap Number
3. Predictive Lap Time
4. Fastest Lap Time
5. Accel G, Lateral G, Vertical G (IQ3)
6. Battery Voltage
7. Engine RPM
8. GPS Speed

When utilized in closed course racing (circle track, road racing, boating) the data logger obtains GPS data to provide speed and lap time information to the driver. Track mapping with segment (split) times are derived from GPS and accelerometer data and is available for review upon downloading to the user's PC.

Boat Racing Features (requiring lap time and mapping data)

While boat racing utilizes the same above features, Racepak has added additional features specifically for the boat competitor:

1. Prop Slip & Prop Speed: Allows display of Prop Slip on dash. Requires input of prop diameter, prop pitch and final gear ration, along with a tach signal input
2. User Defined Start / Finish Distance: Dash lap time data is available to the driver upon marking of the start / finish location while on the course. By providing the ability to define the distance this GPS point "looks" across the course, lap time data will be available regardless of the varying width the boat takes as it passes the start finish location

Tractor / Truck Pulling Features

When utilized for motorsports that do not require timing and track mapping information (such as pulling) the IQ3 functions as a standard 32 channel data logger, but with the unique ability to provide an accurate method of obtaining ground speed without the use of vehicle mounted sensors.

Demo Runs

Each setup file is available for selection, when Racepak's DatalinkII software is installed. A variety of demo runs are also available in the DatalinkII software, available for online download. In addition, a demo manual is available online in the Downloads section of the Racepak website found at: http://www.racepak.com/Downloads.php

PC Requirements for Racepak Software

Hardware Requirements

- USB Port
- Serial Communications Port or USB to Serial Port Adapter
- CD/DVD drive
- 3 Button Mouse

Note: The use of a mouse with a center button is highly recommended

If your PC does not have a CD drive please contact Racepak and request the optional DataLink II USB Flash Drive Installation Kit. This kit allows the DataLink II software and license disk to be installed directly through the computers USB port. The DataLink II software does not require a CD or Floppy Disk Drive for normal operation.

Screen Resolution

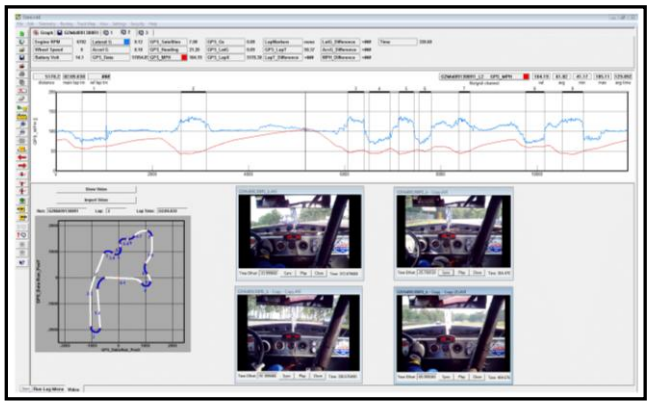
The DataLink II software requires a minimum screen resolution of 1024 x 768. We recommend the use of the largest and highest resolution monitor that meets your installation and budget requirements. If your PC is configured with dual monitor support, the DataLink II software has special features to take advantage of the capabilities. A flat panel (1280 x 1024 resolution) narrow outline monitor such as those manufactured by Dell and Fujitsu is optimum for high-end applications.

PC Software Requirements

The DataLink II software is compatible with Windows 98 Second Edition, ME, 2000, XP and Vista 32. If you have a Windows operating system other than those listed above please contact Racepak for additional installation assistance. DatalinkII is not compatible with Apple. There are practical limits below which the software will not operate satisfactory. The minimum PC requirements for the DataLink II software are as follows.

- IBM PC or clone with 400 MHz Pentium Processor and 32 Mbytes Ram
- Windows 98/ME/2000/XP/ Vista 32 Operating System
- 200 Mbytes free disk space
- CD-ROM drive
- Video card and monitor with a minimum resolution of 1024 x 768 pixels
- Keyboard and 3 button mouse
- Serial Communication Port or USB Serial Port Adapter

Integrated Video



Turning 2 dimensional data acquisition into a 3 dimensional learning experience, Racepak's Integrated Video Software provides two excellent methods of merging video and data.

Video in Data: Provides the ability to merge and sync customer supplied video from one up to four individual video cameras, with a Racepak data file. A simple two step process captures and syncs the video with the graph cursor position and vehicle position on the track map.

Data over Video: This method provides the ability to place exported Racepak data over video, resulting in a video file that that can be viewed online or saved to storage media. Developed in conjunction with Trackvision (www.trackvision.net), the ability to launch customers Trackvision program from within Racepak software greatly simplifying the merge and sync process.

Utilizing the popular Windows Media Player and recognizing a number of video formats provide seamless operation across a variety of computer systems. Video file formats that can be utilized are:

- MPEG2
- MPEG 4
- AVI

Racepak's Integrated Video Software upgrade is included FREE with all Racepak GPS based data loggers (G2X, IQ3 Logger Dash and G2X Pro) shipped April 1, 2009 and later, while upgrades for existing customers is available online at http://www.racepak.com/Downloads.php.

DatalinkII V3.4.1 or later is required for use with the integrated video software.

Performance Instrumentation – Digital Dash & Intelli-Gauges

In addition to offering a complete data acquisition product line, Racepak also offers a great selection of Performance Instrumentation digital dash products. The design and technology behind each of our dash products is based on our high performance racing dashes, thus insuring reliable performance in any environment.

UDX Street Rod Display Dash

The UDX Street Rod Dash is a complete dash panel replacement. Containing all the amenities required on a street driven vehicle, this product provides all the information necessary for highway use. Providing the ability to display up to 21 sensor inputs on four pages, the UDXSR provides a great dash solution for a variety of vehicles.

Through a combination of existing vehicle sensors and those included with the UDXSR kit, the dash provides the ability to display:

- Engine RPM
- Speedometer / Odometer
- Water & Oil Temperature, Oil Pressure
- Battery Voltage
- Fuel Level

Indicator lights are included for items such as:

- Low Oil Pressure
- High Water Temperature
- Turn Signals
- High Beam
- Parking Brake

Just like the G2X, IQ3 Logger Dash and G2X Pro, additional sensors can be connected to the rear of the dash, through the 5 pin Vnet port.

Specifications:

- Display 21 sensor inputs via 4 pages
- Adjustable backlighting / User define warning lights
- 4” high x 10.2” wide x .750” deep (10.16cm x 25.90cm x 1.90cm) / 21 oz (.58 kg)
- “10 mounting studs

Includes:

- UDXSR dash
- Water / Oil Temp sensor / Oil Pressure sensor
- Wire loom and connectors for supplied sensor inputs

UDX Replay Dash

Much like a reply and recall gauge, but offering many more features, the UDX Replay Dash provides the ability to reply up to 10 minutes of data, while also functioning as a functioning as a full feature LCD display dash.

The sensors included with the UDX Replay Dash provide the following information:

- Engine RPM
- Water & Oil Temperature
- Oil Pressure
- Battery Voltage
- Fuel Level

Just like the G2X, IQ3 Logger Dash and G2X Pro, additional sensors can be connected to the rear of the dash, through the 5 pin Vnet port.

Specifications:

- Display 21 sensor inputs via 4 pages
- Adjustable backlighting
- Six User define warning lights
- 4” high x 10.2” wide x .750” deep (10.16cm x 25.90cm x 1.90cm)
- 21 oz (.58 kg)
- #10 mounting studs

Includes:

- UDX Replay Dash
- Water / Oil Temp sensor / Oil Pressure sensor
- Wire loom and connectors for supplied sensor inputs

IQ3 Display Dash

The IQ3 Display Dash can be utilized with Racepak's line of Vnet sensors, EFI Vnet modules or customer supplied sensors (dependent upon sensor type) to create a modern, high tech digital display dash for a variety of vehicles.

Up to 24 sensors can be displayed on a total of four programmable pages. The blue backlight provides excellent viewing for both daylight and night usage, while the low luster screen guards against reflection and scratches.

Progressive shift lights, eight warning lights and all inputs are easily programmable through the DatalinkII software supplied with each IQ3 display dash.

Specifications:

- Display up to 28 inputs via 4 pages
- Blue backlight
- Gear indicator
- Eight programmable warnings with on-screen warning text
- User defined shift lights
- Shielded, low luster display for sunlight viewing
- English and Metric capable
- 7.25' L x 4.00" W x 1.1.25" deep (18.41cm x 10.16cm x 5.39cm)
- 1 lb (453g)
- #10 mounting studs
- Turn signals / parking / high beam (requires addition of USM and Vnet extension cable)

The IQ3 display can be added to the following data loggers, as a digital display:

- G2X
- G2X Pro

In addition, the IQ3 display can be utilized on any type of vehicle that desires to replace standard dial gauges. When used as a standalone dash (without a data logger) the four warnings may be programmed for use as turn signals, high beam indictors and parking brake, on street legal vehicles. This requires the use of a USM module and Vnet extension cable.

Tuners

Racepak's standalone digital dash products are proving to be popular dash panel replacement solutions, especially when mated with one of our EFI Vnet modules. Providing a less cluttered, lower cost alternative to multiple gauge installations while simplifying the installation process is just some of the many benefits.

Intelli-Gauges

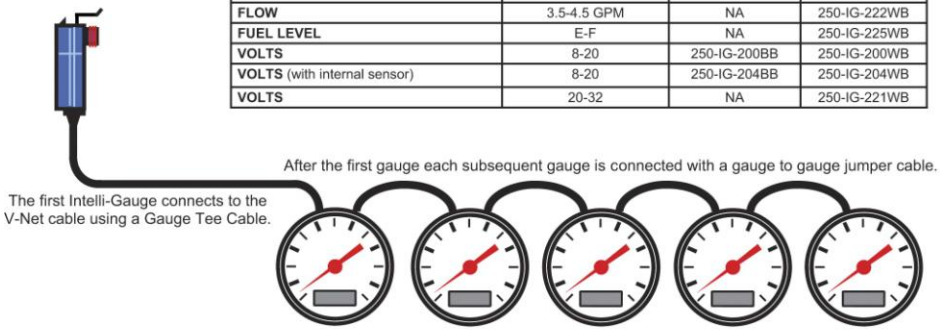
Using the same 5 pin Vnet cable technology, Racepak's Intelli-Gauges are connected to the main Vnet cable routing information back to the data logger. If a sensor is connected to the main Vnet cable, simply connect the mating Intelli-Gauge anywhere on the Vnet cable and the gauge shares the information from the sensor, before sending on to the data logger.

Multiple gauges are simply daisy chained together, using gauge to gauge jumper cables, with the last gauge in line containing a Vnet T connector.

Gauges are "read" into the data logger setup, and programmed the same as any other sensor or digital dash.

INTELLI-GAUGE SELECTION CHART
(Gauge includes connector cable. Sensor and modules available on page 24-30)

INTELLI-GAUGES	RANGE	BLACK FACE	WHITE FACE
RPM, TACHOMETER	1,000-10,500 RPM	250-IG-100BB	250-IG-100WB
RPM, TURBINE PERCENTAGE, N1	0-120%	NA	250-IG-218 WB
RPM, TURBINE PERCENTAGE, N2	0-120%	NA	250-IG-219WB
TEMPERATURE, WATER (Street)	100°-280°F	250-IG-110BB	250-IG-110WB
TEMPERATURE, WATER (Race)	60°-200°F	250-IG-120BB	250-IG-120WB
TEMPERATURE, OIL	140°-280°F	250-IG-130BB	250-IG-130WB
TEMPERATURE, EXHAUST GAS	600°-1,600°F	250-IG-140BB	250-IG-140WB
TEMPERATURE, EXHAUST GAS #2	600°-1,600°F	250-IG-145BB	250-IG-145WB
TEMPERATURE, EXHAUST GAS	0-1000°C	NA	250-IG-220WB
TEMPERATURE, CYLINDER HEAD	100°-600°F	250-IG-150BB	250-IG-150WB
TEMPERATURE, TRANSMISSION	50°-350°F	250-IG-135BB	250-IG-135WB
PRESSURE, OIL	0-100 psi	250-IG-160BB	250-IG-160WB
PRESSURE, OIL	0-250 psi	NA	250-IG-162WB
PRESSURE, FUEL	0-15 psi	250-IG-170BB	250-IG-170WB
PRESSURE, FUEL	0-100 psi	250-IG-165BB	250-IG-165WB
PRESSURE, FUEL	0-250 psi	NA	250-IG-167WB
PRESSURE, FUEL	0-500 psi	NA	250-IG-226WB
PRESSURE, BRAKE	0-1,500 psi	250-IG-180BB	250-IG-180WB
PRESSURE, NITROUS	0-1,600 psi	250-IG-175BB	250-IG-175WB
PRESSURE, Generic	0-200 psi	250-IG-190BB	250-IG-190WB
PRESSURE, Generic	0-300 psi	250-IG-193BB	250-IG-193WB
PRESSURE, Generic	0-500 psi	NA	250-IG-223WB
PRESSURE, Generic	0-1,000 psi	250-IG-197BB	250-IG-197WB
BOOST / VACUUM	30 psi-0-30 In. hg	250-IG-215BB	250-IG-215WB
BOOST	0-60 psi	NA	250-IG-217WB
VACUUM	0-30 In. hg	250-IG-210BB	250-IG-210WB
AIR/FUEL RATIO	10-18	NA	250-IG-224WB
FLOW	3.5-4.5 GPM	NA	250-IG-222WB
FUEL LEVEL	E-F	NA	250-IG-225WB
VOLTS	8-20	250-IG-200BB	250-IG-200WB
VOLTS (with internal sensor)	8-20	250-IG-204BB	250-IG-204WB
VOLTS	20-32	NA	250-IG-221WB



Gauge Cables	Length	PN#
Gauge to Gauge Jumper Cables Used to connect each gauge in series after the first gauge. Each end of the cable has the small round connector that plugs directly into the back of the Intelli-Gauges.	8"	280-CA-RGG-008
	16"	280-CA-RGG-016
	24"	280-CA-RGG-024
	48"	280-CA-RGG-048
	288"	280-CA-RGG-288
Gauge Tee Cables Connects first gauge to V-Net cable or another V-Net module.	8"	280-CA-RGG-T008
	16"	280-CA-RGG-T016
	24"	280-CA-RGG-T024

Specifications:

- Warning: Each gauge contains a user programmable digital display below the sweep hand. This display doubles as a programmable warning.
- 2 5/8" diameter
- 270 degree sweep
- Black or White face
- 49 grams

Intelli-Gauges are designed to be utilized with a Racepak data logger. As such an Intelli-Gauge cannot function as a free-standing item but require connection to a Racepak data logger.

Digital Dash Installation Solutions

Much the same as our G2X, G2X Pro and IQ3 data loggers, our series of UDX and IQ3 display dashes also utilize the same 5 pin Vnet connector to perform the following functions:

- Connect to the Vnet cable routing data back to the data logger
- Or transmit external sensor data back to the dash, when the dash is utilized as a standalone display (for example in place of gauges on a street vehicle)

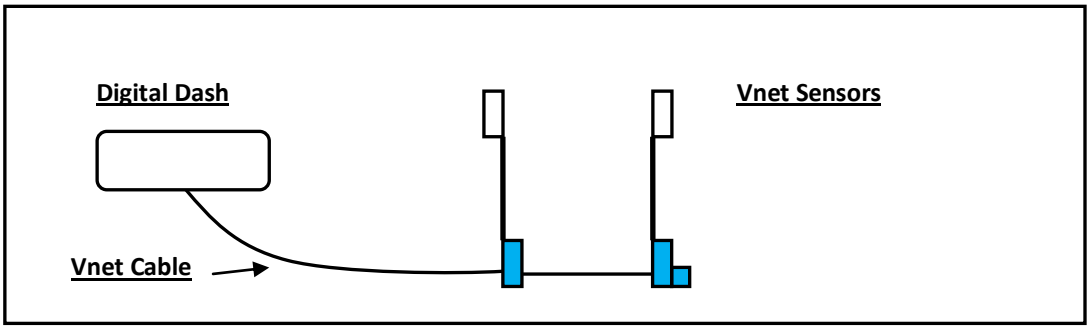
Digital Display for G2X or G2X Pro Data Logger

A digital dash is viewed by the Racepak hardware and software as just another item added to the main Vnet cable, no different than a Vnet sensor or gauge. As such, a Vnet cable can be utilized to connect the dash to the Vnet cable routing data back to the data logger. Information is shared by the dash, and then transmitted to the data logger.

See schematic under Example System Schematic in the previous section

Standalone Digital Display Dash

When utilized as a standalone digital display, the UDX or IQ3 can receive the data from external sensors via the same type of Vnet cable utilized by Racepak's data loggers. EFI Vnet modules, USM modules and individual Vnet sensor modules may all be utilized with a stand along Vnet dash.



Dash Mounting Panels and Cover

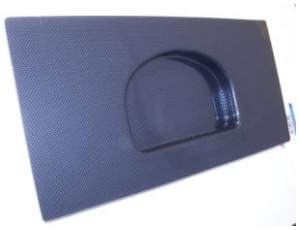
Racepak offers a number of vacuum formed dash panels, to facilitate and simplify the installation process. These oversized panels, measuring approximately 20” w x 10” tall (50.8cm x 25.4cm) can be cut and fitted for a custom dash panel installation, in a variety of vehicles.

Each panel includes a precise recess with pre-cut dash stud mounting holes and are available in the follow finishes:

- Faux Carbon
- Black
- Silver

G2X

IQ3



UDX

IQ3 Cover

Designed to easily attach to the IQ3 dash, this cover protects the dash when utilized in extreme environment situations.

Orders / Returns / Warranty

Placing an Order

Items can be ordered direct from Racepak, at the following number:
1-949-709-5555
Fax: 1-949-709-5556
www.racepak.com

Returns

Racepak makes every effort to insure each product functions as designed. In the event that a product has an issue, it is advisable to first contact Racepak tech support as many issues can be resolved by our tech support department without the need to return an item. In the event a product or item needs to be returned, it is necessary to obtain an RMA number, issued by the Racepak office. An RMA can be obtained by calling the number below:
1-949-709-5555
When returning, please include the following information:

- Shipping address to which repairs items should be returned
- Detailed explanation of issues encountered along with any problem solving actions suggested by Racepak's tech support department and tech personnel name
- Daytime contact phone number

Warranty

Competition Systems, Inc/Racepak warrants all merchandise manufactured by Competition Systems, Inc/Racepak against defects in workmanship or material for a period of six months after the data of purchase. This warranty applies to the first retail purchaser and covers only those products exposed to normal use or service. It does not apply to those products used for a purpose for which said products were not designed, or which has been altered in any way that would be detrimental to the performance or life of the product, or misapplication, misuse, negligence, or accident. Any part or product found to be defective after examination by Competition Systems, Inc/Racepak will be repaired or replaced. Competition Systems, Inc/Racepak assumes no responsibility for diagnosis, removal and/or installation labor, loss of vehicle use, loss of time, inconvenience or any other consequential expenses.

This warranty is in lieu of any other expressed or implied warranties, including any implied warranty or merchantability or fitness, and any other obligation on the part of Competition Systems, Inc/Racepak, or selling dealer.

If you have any questions regarding warranty, please contact customer service at Competition Systems, Inc/Racepak at **949-709-5555.**

Conclusion

Thank you for your interest in Racepak's products and for taking the time to review this information. If you have any questions, please feel free to contact us as we are always happy to assist you.

Racepak Data Systems
30402 Esperanza
Rancho Santa Margarita, CA 92688
1-949-709-5555
www.racepak.com