TRAQMATE

GPS DATA ACQUISITION SYSTEM

TRAQDASH USER MANUAL

VERSION 2.40

MARCH 27, 2013

TRACK SYSTEMS

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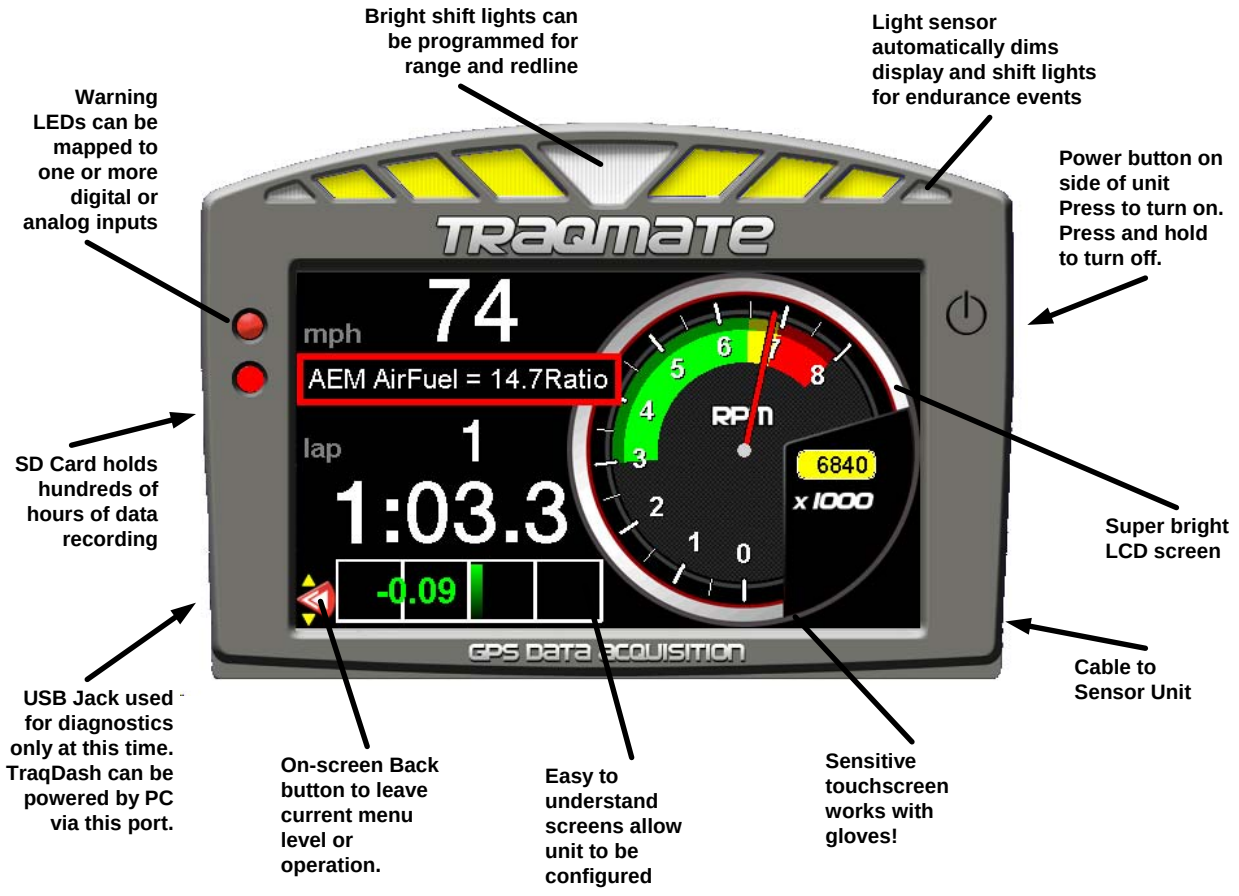
Quick Start

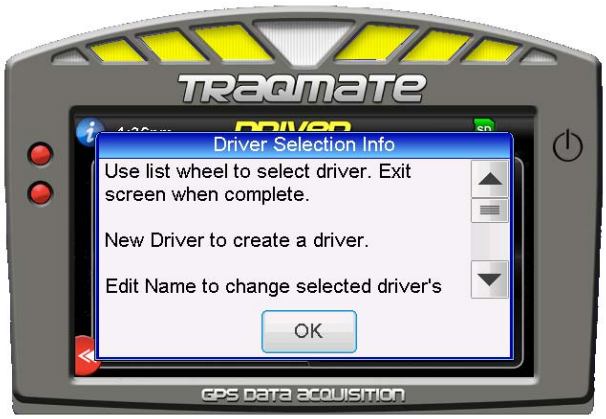
Unpack the TraqDash and follow the instructions on the Quick Install sheet that is in the box to install the Traqmate in your vehicle. TraqDash contains only one button. All other control is done with the color graphical LCD touchscreen. There is also a cable to connect to the Sensor Unit and a mini-USB port for connection for factory calibration and updates.

All of the TraqDash features are accessible through a graphical menu system. To access a feature use, simply touch the item you want on the screen. Some items actually perform a function while others go to other menus. The Menu Tree is shown in Appendix A.

Turn the TraqDash on using the button on the right side of the display. The Main Menu should appear. It has four main buttons and says 'TRAQMATE' at the top of the screen. Along the top of the screen are icons and buttons as shown here.



The blue '*i*' icon is found in the upper left corner of almost every screen in the TraqDash and provides context-sensitive help. Pressing the button will pop up a screen explaining what the screen does and what all the buttons will do. Here is an example of an Information Screen.



When GPS signal is available, the time is shown next to the blue '*i*' icon. If the time is not the correct local time, you need to set the time zone.

The center top of the screen is the descriptive screen name.

The three icons in the upper right show the camera status (if so equipped), the SD card status, and the GPS signal strength / Sensor Unit Connectivity.

To record some data, press Go Racing to bring up this screen.

If you are at a closed circuit race track such as a road course or oval, press Lap/Race and the Traqmate will recognize the track and start timing you. If you are not near a track you will be prompted to press the screen to mark a Start/Finish line for a new track. If you wish to try the AutoX or Drag Race Features press one of those buttons.

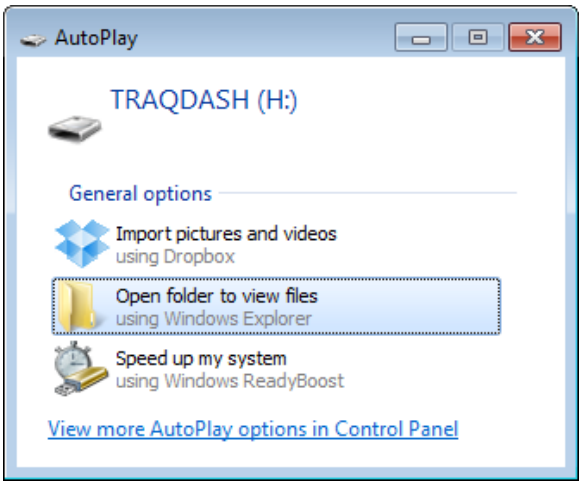
If you just wish to record some data, use the Drive button. The right side of the button will toggle recording on or off and the left side of the button will start the mode. Recording Off is useful if you just need to use TraqDash as an instrument, rather than a data recorder.

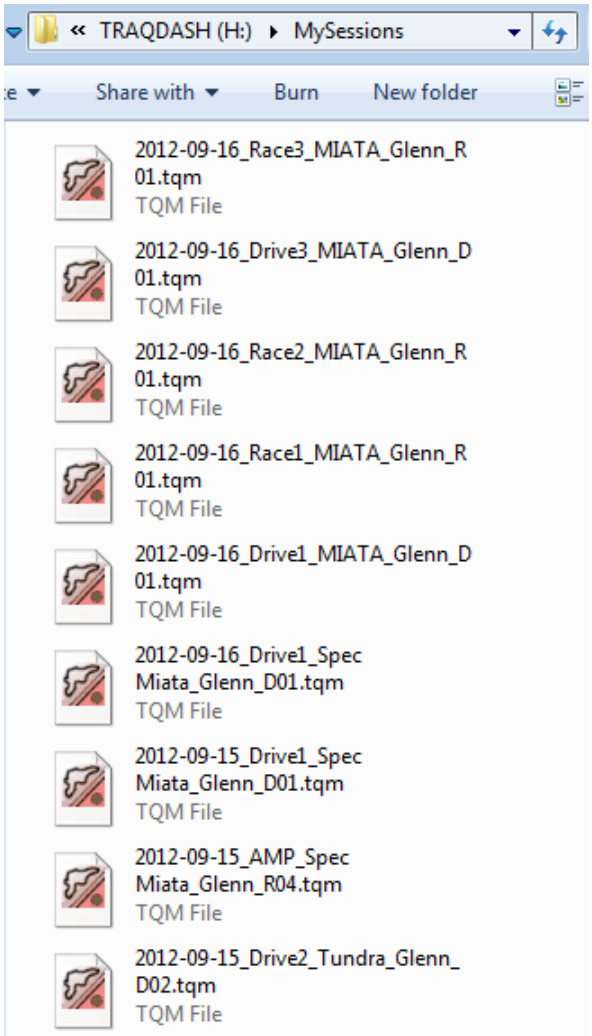
You can exit the recording mode by pressing the small red arrow in the lower left of the screen. This causes the data to be written to the SD card.

To view your data on your PC, press and hold the On/Off button on the right side of the display. When the unit is off, push the lower edge of the SD card in and release. The SD card will pop out so that you can grab and extract it.

If you have not done so, install Traqview or TraqStudio from the CD that came with the Traqmate. Now place the SD card into your computer. Usually, a window will pop up asking what you would like to do with the SD card.

Choose Open folder to view files. Then click on the MySessions folder. You should see your sessions listed there. Double click on the session you wish to view and the Traqview program will open with your data displayed.





Instructional Videos

Here are links to some videos that demonstrate TraqDash operation.

TraqDash Operation Video

http://youtu.be/KEXxtWZ05ao

Transferring Data to PC

http://youtu.be/A505XBgVh58

Updating TraqDash firmware

http://youtu.be/4x0cen6of8I

General Operation

The TraqDash operates differently from the Traqmate Display Unit. The TraqDash never needs connection to your PC so you can permanently mount it in the vehicle. The data is recorded on the included SD card in the MySessions folder. To open data on the PC for analysis, insert the SD card into the PC and either transfer the data files to the PC or open them right on the card using Traqview or TraqStudio.

All configuration of drivers, vehicles, and sensor inputs is done from the TraqDash using the color touchscreen. This configuration is stored on the SD card so that you can make backup copies, move from car to car, and share them with friends.

Precautions

Kill Switch

DO NOT test a kill switch when TraqDash is operating. If you are using the TraqDash as the primary instruments in the vehicle and you need to test the vehicle kill switch in order to pass racing inspection, unplug the Sensor Unit before running the test. Revving the engine creates a large amount of energy in the vehicle alternator that must be dissipated when the battery is disconnected. That energy can flow through the Traqmate system causing damage.

Water Intrusion

The TraqDash is designed to be resistant to occasional dust and light water spray and has internal gaskets to prevent contaminants during normal usage. There are openings in the case for access to the SD card and ports so care should be taken to avoid allowing dirt or water into those openings. If the TraqDash is to be used in the rain, avoid direct rain contact and cover the SD card, and USB port openings with tape.

The Sensor Unit can withstand water spray but it should not be placed in a location where standing water can accumulate such as the floorboard of a car during the rain.

Using the Touchscreen

In order to operate with gloves and be as reliable as possible in the racecar environment, the TraqDash has a resistive touchscreen. This requires slightly more pressure than some cell phones or other devices using a capacitive touchscreen. Press firmly to activate on-screen buttons and slider controls.

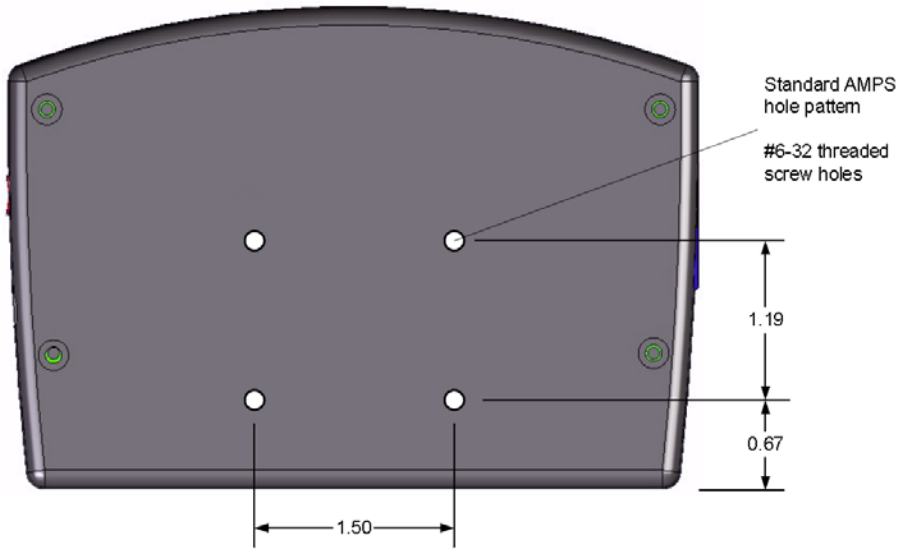
TraqDashPC

The TraqDash SD card ships with a PC program called TraqDashPC. If you insert the SD card into your PC, open it, and double click on TraqDashPC, a TraqDash simulator program will run. You can use this to enter configuration information, practice use of the TraqDash, review laps and sessions, and explore all the features.

Mounting

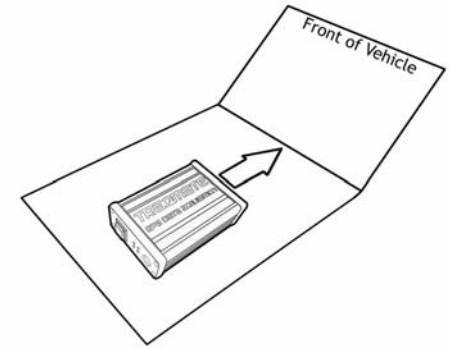
TraqDash

The TraqDash has 4 AMPS pattern screw bosses on the rear of the unit for mounting. There is a drill template available on the Traqmate website. The TraqDash can be mounted permanently with screws or removable using the Traqmate Display Unit Mounting Bracket.



Sensor Unit

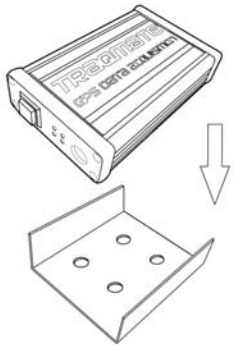
The Traqmate sensor unit may be mounted using a variety of methods depending on the following factors: 1) How permanent is the desired mount, 2) where is the preferred mounting point, 3) will the SU be connected to a Display Unit (DU).



CHOOSE A LOCATION WHERE THE UNIT WILL NOT BE SUBJECTED TO WATER. EXCESSIVE MOISTURE EXPOSURE WILL DAMAGE THE UNIT.

The Sensor Unit must be mounted as flat as possible in the vehicle and such that the arrow on the top label points in the direction of travel. This is to ensure the accelerometers are the most accurate and have the best range for making measurements. It is also a good idea to place the unit as close to the vehicle's center of gravity as possible. While not required, especially with connection to the DU, it may be desirable to mount the SU in a location that allows the indicator lights to be viewed easily by the driver. Given these considerations, a position on the floor of the front passenger footwell may work well. Other good locations include the trunk floor and on the transmission tunnel.

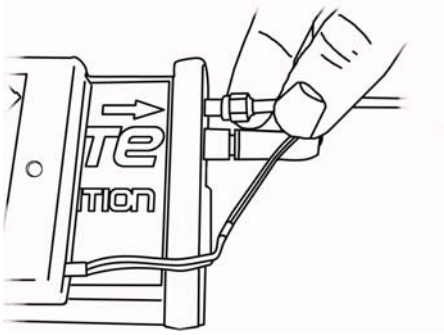
The mounting of the SU may be accomplished in a variety of ways, but the most desirable and secure method is to use the Sensor Unit Mounting Tray (shown here), offered as a separate accessory from Track Systems. The mounting tray can be attached permanently to the vehicle, and by placing Velcro on the SU enclosure, and the mounting tray, the SU is securely fastened, while at the same time being easily removable. Once the mounting tray is aligned in the vehicle, the SU can be easily placed in the mounting tray and the alignment is set.



Another method for mounting the SU is to apply Velcro directly to the SU and the mating piece directly to the vehicle. Care should be taken when placing the SU on the Velcro that it is properly aligned in the vehicle and that the SU is securely attached.

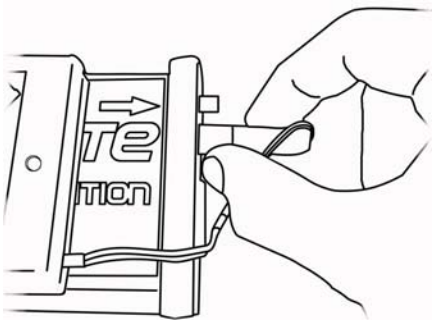
GPS Antenna Placement and Installation

The supplied GPS antenna has a magnetic mount, which allows a variety of mounting options to the metal body of the vehicle. In the case where the desired location is not metal, double stick tape is a viable option for mounting the antenna. The placement of the antenna can have a great effect on the performance of the data collection system. Ideally, the antenna should be placed on the highest part of the exterior of the vehicle. Placing the antenna inside the vehicle can cause “blind spots” where the antenna is not able to see as many of the GPS satellites that may be available to it. The system works best when the antenna has the least restricted view of the sky. Once a location has been determined for the antenna placement, the wire connecting the antenna and the SU should be routed in a manner such that it is not placed under stress, and the wire will not be exposed to frequent bending or crimping. After routing the wire to the SU, connect the antenna to the SU by screwing the antenna wire to the GPS connector indicated on the end panel of the SU.



Connecting a Sensor Unit to the TraqDash

With Traqmate Complete a 6’ connection cable is provided. This is a male-to-female locking cable, which allows a great deal of flexibility in the placement of the SU and DU. 6’ extension cables can add additional length if necessary. The cable should be routed to be securely protected from damage during normal vehicle operation.

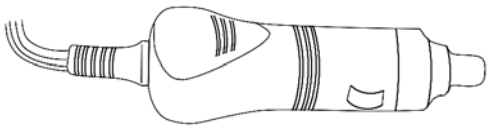


Power Connection

In all installations, the SU must be supplied with a power source at all times it is in operation. For Traqmate Complete, the DU can receive power via the SU-DU connection cable from the SU or via the USB cable when connected to a PC for uploading sessions.

The SU was designed to be powered from a +12 VDC battery supply in four different ways; a permanent wiring harness in the vehicle, a cigarette lighter adapter, a battery pack, and a wall charger. Each of these will be discussed separately.

Cigarette Lighter Adapter



For installations where a permanent power supply connection is not required or desired, the cigarette lighter adapter offers a quick and convenient solution. This adapter can be secured to the SU by inserting the plug into the power connector (PWR) on the SU and tightening the threaded nut to the power (PWR) socket. Once the SU and the power connector have been secured, the cigarette lighter adapter can be plugged into one of the cigarette lighter sockets located in the vehicle. It should be noted that many automobiles have cigarette lighter sockets that are always ON and do not turn the power off when the ignition switch has been turned to the OFF position. The cigarette lighter adapter has a RED LED to indicate that vehicle battery power is presented to the adapter. During extended vehicle idle periods, the cigarette lighter adapter should be removed from the vehicle socket to prevent vehicle battery drain.

TraqPaq Rechargeable Li-ion Battery Pack

The TraqPaq Rechargeable is very convenient and has the advantage of reusability. The TraqPaq Rechargeable Battery Pack is capable of powering a Traqmate for 7-10 hours on a full charge.

If not handled properly **Li-ion batteries can be dangerous**. Traqmate Li-ion packs have a protection circuit for overcharge and excessive discharge and should provide years of service under normal circumstances. **If the pack ever starts to overheat or swell, discontinue use immediately.**

To recharge the pack, just plug it into the Traqmate Li-ion charger. It will recharge in approximately 2 hours, at which time the LED on the charger will change from red to green.

Only use the Traqmate charger with Traqmate Li-ion Rechargeable battery packs. **Never charge any other types of batteries using the Li-ion charger**. This includes alkaline or NiCd or NiMH batteries in a non-rechargeable TraqPaq.

Permanent Wiring Harness Installation

The power cable is a 13 foot, two conductor, red and black zip cable that has a plug on one end and is not terminated on the other end. The power plug contains a threaded nut

for securing the plug to the power jack (PWR) on the Traqmate Sensor Unit (SU). The other end of the cable is intended to connect to either the automobile battery or a junction box. Since the SU mounting location can vary widely (trunk, under seat, floorboard, etc.) the required cable length will also vary. Consequently, the cable can be cut to an appropriate length suitable for your automobile, once the mounting location is selected.

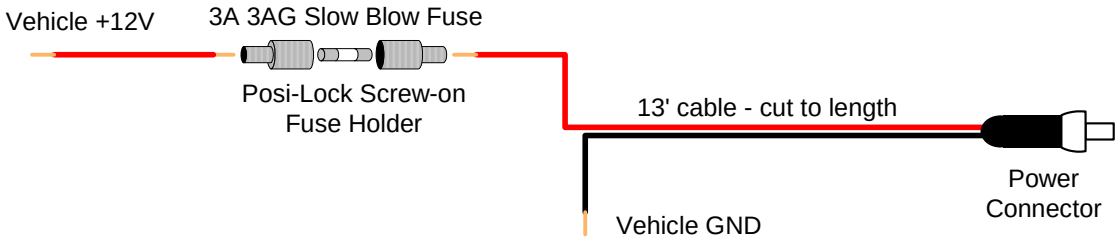


Figure 1 - Permanent Wiring Harness

The red wire is to be connected to the positive (+) side of the battery and the black lead to the negative (-) or chassis side. A fuse holder has also been included with the power cable. The red conductor of the zip power cable should be cut and stripped about ¼ inch on both ends. Each end should be inserted into the Posi-Lock fuse holder and screwed down tight. The bare end of the wire should be inserted / crimped into a crimp lug or other suitable connector (not included). The lug should be connected to the positive (+) battery terminal or a switched positive (+) terminal.

If the SU is connected directly to the positive (+) battery terminal, the SU will continue to be powered when the ignition switch has been turned to the OFF position. Extended vehicle idle periods may drain the vehicle battery if the unit is not turned off using the front panel button. If this is a concern for your installation, efforts should be made to connect the positive (+) terminal to a switched supply.

The black conductor should be stripped and a crimp lug or other suitable connector applied (not included). The lug on the black conductor should then be connected to the negative (-) battery terminal or chassis ground.

Using the TraqDash

How to Record Data

Data can be recorded in one of several modes, depending on what type of driving you are doing. To record data, first press the Go Racing button on the Main Menu screen. At that point you will be presented with four selections, Lap/Race, AutoX/Rally, Drive, and Drag.

For closed racing circuits such as road courses or ovals you would choose Lap/Racing. This will activate the GPS timer and suggest the closest tracks from the pre-programmed and user-created lists on the SD card.

For open racing circuits where the Start and Finish are in different places, choose AutoX/Rally. The next screen allows you to select the type of timing screen desired. This mode will allow you to stage the vehicle and automatically start timing and record the Start Line location when the vehicle launches. When you reach the finish line, touch the display to manually activate and remember the Finish line. This information will be stored with the track name so that you can do subsequent runs over the same course without having to set the Finish Line.

For drag racing, select the Drag option. Then stage the vehicle while choosing the desired timing screen and drag race length, either 1/8 mile, 1/4 mile, or 1000 feet. This mode will allow you to stage the vehicle and automatically start timing and record the Start Line location when the vehicle launches. Timing will stop automatically when the selected distance has been traversed.

How to Enter Drivers

The TraqDash can be used by several drivers, either by sharing the device or the vehicle. It is a simple operation to create and select different drivers. The data includes the driver name when recorded to minimize storage and analysis.

To create or change drivers, choose Race Setup and then Driver. The system comes with Driver A through Driver E as placeholders. You can create a new driver or change the name of one of the placeholders. You can also delete drivers that are no longer needed.

To change drivers, drag the scroll wheel up or down until the desired driver is highlighted.

How to Enter Vehicles and Configure Inputs

The TraqDash can be used in several vehicles and will create a database for each that includes tach settings, gear and differential ratios, tire sizes, data inputs, weight, and attached cameras. This allows the TraqDash to be moved quickly between vehicles and change all the relevant settings with one screen selection.

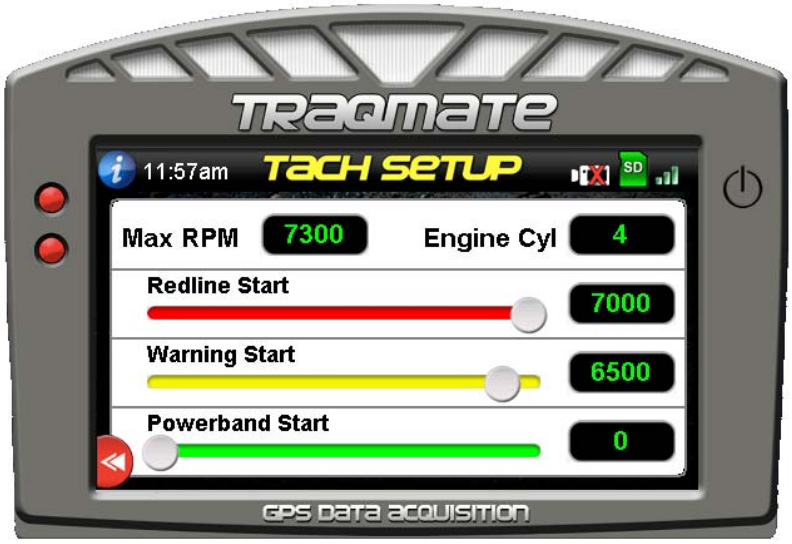
To create or change vehicles, choose Race Setup and then Vehicles. The system comes with several popular sports cars. If your vehicle is one of these, just choose it and then customize the settings. You can create a new vehicle or change the name of an existing vehicle. You can also delete vehicles that are no longer needed.

Vehicle Settings

To change vehicle settings, press the Vehicle Settings button. This will present the Vehicle Settings screen with choices for Tach, Aero/Grip, Gear Ratio, Inputs, Weight, and Camera.

Tach

The tach screen accepts all relevant settings for the on-screen tach display and the shift lights.



Max RPM - This button sets the maximum range of RPM that the vehicle engine can achieve. This is used to scale the gauges on the TraqDash and the graphs in Traqview.

Engine Cylinder – Use this button to adjust the tach readings. If your tach is not correct, this parameter is probably incorrect. If the tach wire is connected to the negative side of the coil, set the engine cylinders to actual number of cylinders. It the tach wire is connected to an ignition box or the engine ECU, set to ECU / 1.

Redline Start – the slider will set the RPM where the large center red shift light will illuminate. For fine tuning, press the button to the right of the slider.

Warning Start – the slider will set the RPM where the first amber shift light will illuminate. The rest of the amber shift lights will appear in even steps between the first amber light and the redline. For fine tuning, press the button to the right of the slider.

Powerband Start – the slider will set the RPM where the green band appears on the tach display. It does not affect the shift lights. For fine tuning, press the button to the right of the slider.

Aero / Grip

This screen accepts information on the aerodynamic drag coefficient and rolling resistance of the vehicle. This will be used in a future release of TraqDash to assist in horsepower calculations.

Gear Ratio

Use this button to enter information about the transmission gear ratios, tire size, and differential ratio. This is used to calculate the current gear for display on the screen and in Traqview.

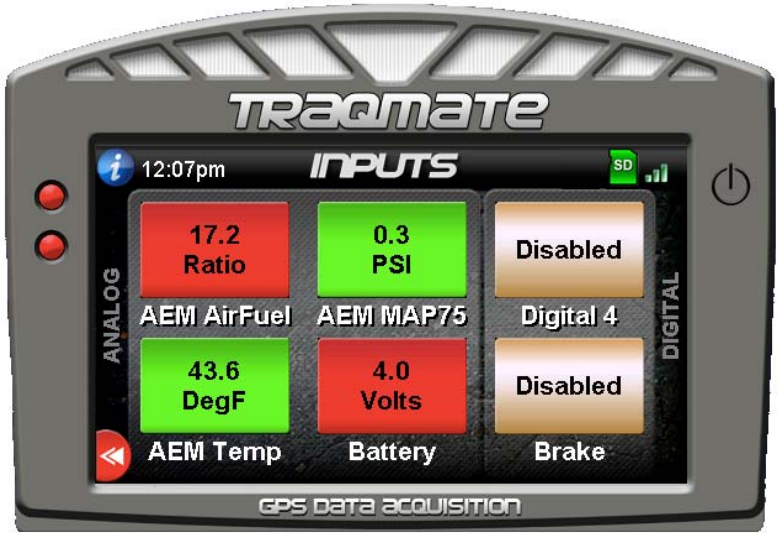
Tire Size – information can be entered in one of two ways, by measuring the circumference of the drive tire or by entering the DOT tire size.

Diff Ratio – Rotate the dials to display the differential ratio down to the nearest hundredth. If the ratio is expressed as a ratio of two numbers, divide the large number by the small number and enter the result.

Transmission Ratios – touch each gear number in order and enter the ratio. If the ratio is expressed as a ratio of two numbers, divide the large number by the small number and enter the result. Enter 0 for any gears that are not present.

Inputs

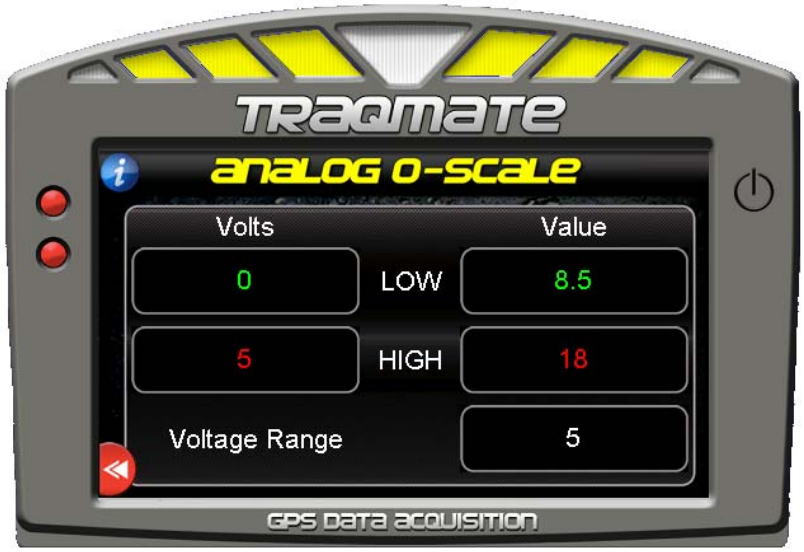
Use this button to configure the analog and digital inputs for the vehicle. Traqmate systems are expandable with TraqData input modules that allow the connection of cameras, analog and digital inputs, and RPM signals. For information on the physical connection of TraqData modules, please see the TraqData Application Guide.



Analogs – the 4 analog inputs come pre-configured for popular AEM sensors but can be changed to accept any compatible sensor.

Touch an analog button and then Enable it to show the current value. The reading in volts at the input will be shown, along with the range and the scaling and alarm settings.

Edit scale will accept the scaling factors between raw voltage and the desired. For example, if the voltage of a temperature sensor reads 4.2V at 50 degrees F and 0.4V at 250 degrees F, you would select a 5 Volt range and enter 0.4V LOW, 4.2V HIGH. Then you would enter 250 Value as the corresponding LOW and 50 Value as the corresponding HIGH. For more information on configuring Analogs, see the TraqData User Manual.



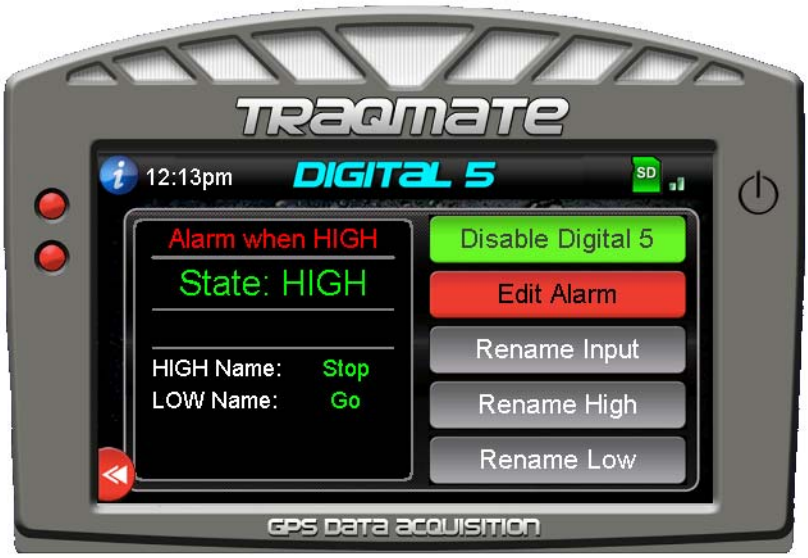
Edit Alarm sets an alarm value for on-screen and Traqview display. You can select none, one, or two alarm ranges per analog. This allows you to, for example, have ana alarm for Water Temperature if the coolant is too cool or too hot. For the Lower and Upper Alarm Levels, choose Above, Below or Off for the alarm and the value in the actual units (e.g. degrees for Temperature, PSI or Bar for pressure). To assign this analog to one of the front panel warning LEDs, toggle the LED to Enabled. Note that

more than one alarm can be assigned to an LED. If one or multiple inputs are in an alarm state, all will be noted on the color LCD display with a pop-up indication showing the actual current value.

Rename Inputs to tag an analog input with a relevant name such as Oil Pressure, Boost, AirFuel, or Water Temp.

Rename Units to tag the units that the analog will read in with an appropriate name. For the examples above that could be PSI, Bar, Ratio, or DegF.

Digitals - There are 2 digital inputs that can be used to detect an ON/OFF condition. **NOTE: DO NOT USE DIGITAL 4 IF YOU HAVE A CAMERA CONNECTED.** Digital 5 comes pre-configured for use to detect Brake application. This will only work for brakes with light bulbs. It will not work with LED brakes. This input is normally high so it should be connected to the 12V side of the brake lamp.



Weight – Enter the vehicle weight with driver and fuel load using the scroll wheels. This parameter is used for Traqview horsepower and torque.

Camera – If a camera is connected through a TraqData or TraqSync interface, select the camera on the scroll wheel. If no camera is connected or if you do not wish to use the camera, select NONE.

How to Enter Tracks

TraqDash comes pre-configured with over 340 tracks world-wide so it is unlikely that you will ever need to enter a track. Just select Go Racing and Lap/Race and TraqDash will suggest the closest tracks. Just confirm the correct one.

If you do want to create your own track, select Race Setup and Track. You can show the tracks within a certain distance by pressing the top button to change the search range.

Settings will let you select Track Type, enter or view the Start/Finish coordinates, clear the Predictive Lap data or set the Lap Hold Time. The Lap Hold Time is the number of seconds that the lap time is held on the screen after passing Start/Finish before the running timer resumes.

The rightmost button on the second line shows the type of track that is being highlighted. Pressing this button will change the tracks in the list to the type of track shown on the button face. The choices are Road (for closed circuit tracks), Drive (for point-to-point recordings), AutoX (for autocross and rally stages with launch to start and

a separate finish line), and Drag (for drag races of various lengths with launch to start and finish at the prescribed distance).

The New Track button will create a New Track of the type shown in the track type button. You can enter the name of the track and choose other parameters.

Edit Name lets you change the name of a track. Note that if you change the name of one of the pre-programmed tracks it will make a copy of the track with the new name but the original track will remain. This is a good way to create variations of a track or to create tracks for two drivers or vehicles so that each will have its own predictive lap information.

The Delete Track button will erase a user-created track. If you attempt to delete a pre-programmed track, you may get an error 'Cannot delete this track'. If you have changed the parameters for the pre-programmed track such as putting in a new start/finish or creating a predictive lap time, the Delete Track button will restore that track to factory settings.

How to Change Predictive Lap Operation (Laps / Qualifying)

Under Race Setup you will find the Laps / Qualify button. This will allow you to change between Laps mode where the predictive lap times will be compared with your best ever lap at this track and Qualifying mode where the predictive lap times will be compared against your best lap of the current session.

How to Configure the TraqDash

TraqDash has many settings to allow you to tailor the operation to your location, preferences, and situation. These include managing the LCD screen, SD card, setting time zones, changing units between US standard and metric, and adjusting the Predictive Lap scale.

To change the settings, press System Setup

Display – Change the backlight brightness and LED intensity by dragging the sliders left and right. Auto-Adjust will attempt to match the brightness to the ambient light level.

Units switches between US (Miles, Pounds) and Metric (Kilometers, Kilograms).

Time/GPS allows the selection of time zone and current Daylight Savings Time status. Also can be used to place the system into GPS Simulation mode. This is useful for testing camera operation or recording a dyno session in situations where it is not possible to get GPS signal.

Startup provides control over two functions, Auto On and Auto Start.

When Auto On is enabled (available on Sensor Unit 2 systems only), the Traqmate system will power up when power is applied to the Traqmate Sensor Unit. Depending on wiring, this could be with the ignition system or a kill switch. This function will also disable the On/Off button on the TraqDash. NOTE: while you cannot turn off the Traqmate if Auto On is enabled, you should still turn off recording before power is lost to ensure that data is saved.

Auto Start determines which menu the system will start. Normally, the TraqDash will return to the last menu used when turned off and back on. The alternate setting will allow TraqDash to return to a gauge screen if power is lost or the unit is turned off. This is intended for when the TraqDash is used as a dashboard (Drive mode with recording off) and should not be used for recording modes because you should not drop power to the Traqmate while recording.

Storage provides several SD card functions

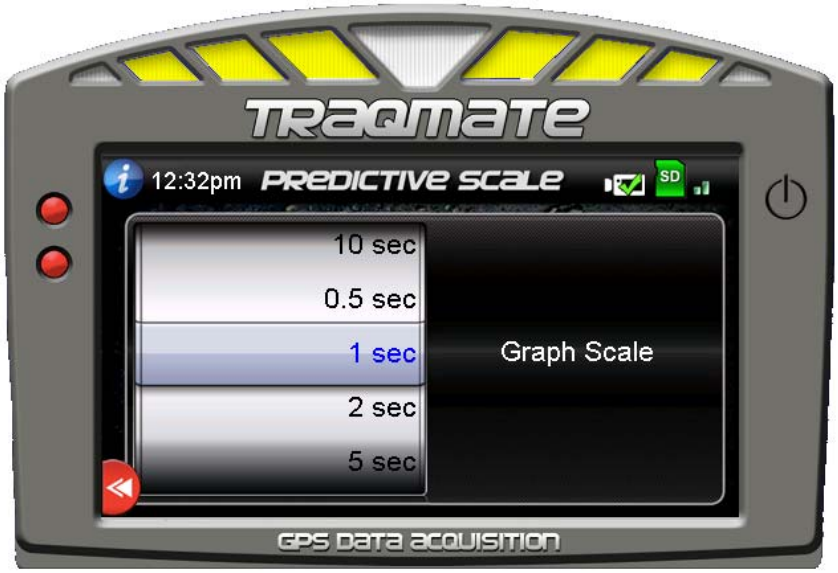
Erase All Sessions will do exactly that. It will not erase vehicles, tracks, or drivers.

Factory Defaults will erase sessions and user-created vehicles, tracks, and drivers.

Format SD Card will wipe out the entire SD card and return it to fresh condition. Use this option if you are getting error messages such as ‘Cannot Read SD Card’ which could indicate the card has become corrupted. It is a good idea to back up your SD card to your PC periodically.

Personalize options allow you to enter your name that appears on TraqDash startup as well as some contact information in case the TraqDash is lost or sent in for service.

Predictive Scale changes the range of the Predictive Lap display on the Race Mode timing screens. For example, choosing 2 sec will cause the graph to display changes from -2 second to +2 seconds. This can be used for fine tuning. Generally more consistent drivers or shorter tracks will prefer a smaller number.



TraqDash Recording Screens

When you select Go Racing and then Laps / Race you will be presented with an operating screen. There are several screens to choose from and you can select the one you wish to use by pressing at the top or bottom of any operating screen. After exiting the recording mode by pressing the red << Back button, the system will remember your last chosen operating screen.

Here are pictures of the Operating Screens. Not all of them will be in the rotation depending on your recording mode and whether you have analog inputs configured.

Sweep Tach Screen

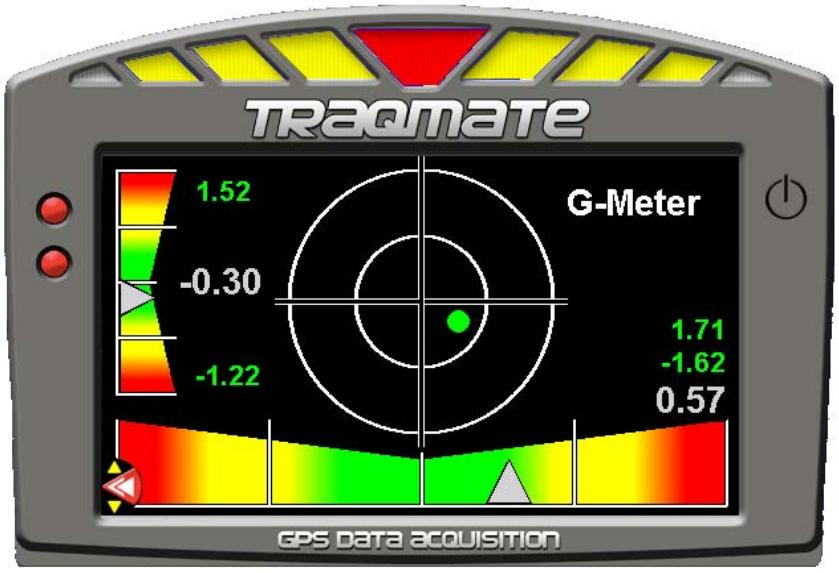
This screen shows RPM, MPH, vmax straightaway speeds, vmin cornering speeds, predictive lap time, gear, lap number, and current lap time. A checkered flag icon will appear if the best lap of the session is being displayed. A trophy icon (shown) will appear if the best lap ever is being displayed.

Timing Screen

This screen shows predictive lap time, gap, lap number, session elapsed time, and current lap time. A checkered flag icon (shown) will appear if the best lap of the session is being displayed. A trophy icon will appear if the best lap ever is being displayed.

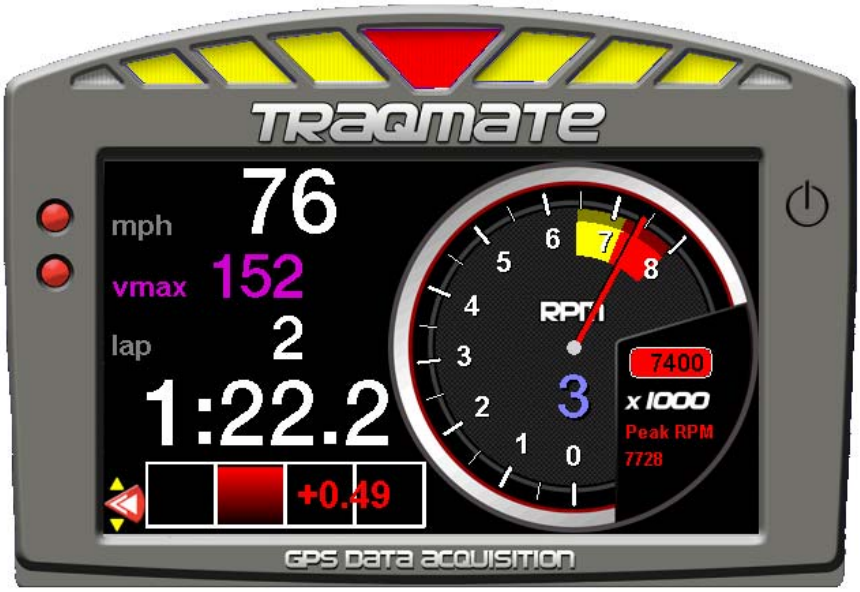
G Meter Screen

This screen is shown only in Drive mode. It shows braking and acceleration G forces, along with left and right lateral Gs. It has a friction circle representation and shows the maximum values.



Round Tach Screen

This screen shows RPM, MPH, Max RPM, vmax straightaway speeds, vmin cornering speeds, predictive lap time, gear, lap number, and current lap time.



Dual Analog Screen

If one or two analog inputs are enabled, this screen shows those inputs in scaled units as both an analog gauge and digital value. If no analogs are enabled, this screen is skipped in the rotation.

Quad Analog Screen

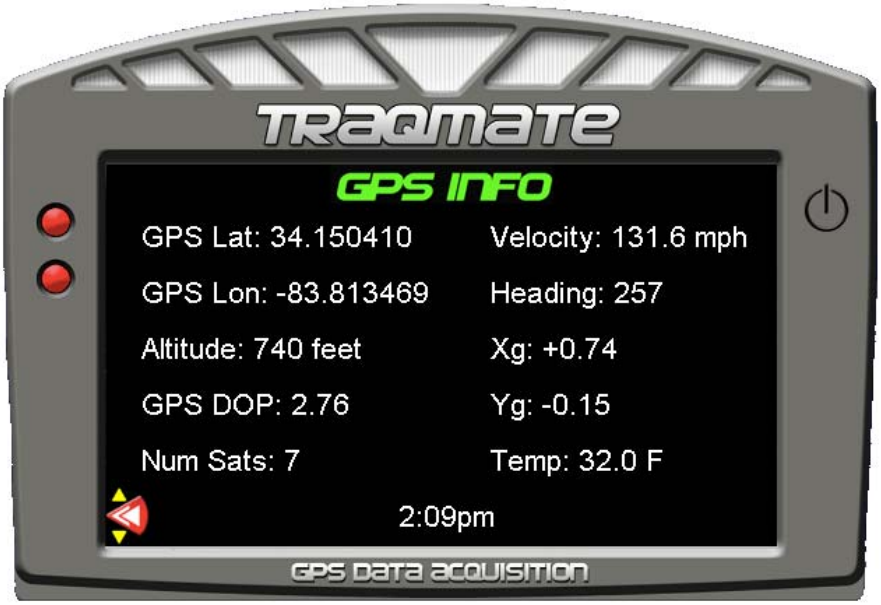
If three or four analogs are enabled, this screen shows those inputs in scaled units as both an analog gauge and digital value. If less than three analogs are enabled, this screen is skipped in the rotation.

Drive Screen

This screen is only shown in the Drive mode. It can be used as an general trip computer showing speed, time of day, direction, max speed, trip distance, elapsed time of session, braking, acceleration, and lateral G forces.

GPS Info Screen

This screen is only shown in the Drive mode. It can be used as a diagnostic screen and shows GPS location, attitude, GPS signal strength and number of satellites, speed, heading, X and Y G forces, time of day, and temperature or Z axis G forces, depending on Sensor Unit.



Screen Control Panel PopUp

At any time during an operating screen, you can press the right edge of the touchscreen to open up a slide-out screen control panel. This panel will show the status of the Sensor Unit, the Camera, and the GPS signal strength. It also allows you to adjust the intensity of the shift lights and the screen backlight.

Pressing anywhere off of the control panel will cause it to retract. It will automatically retract after a few seconds of inactivity.

How to Review Lap Times and Data

Immediately after completing a recording session (Race / Laps, AutoX, Drag, or Drive modes), the Session Detail screen will be displayed showing the information about the session. The scroll bar will allow you to go up and down in the lap list to view all lap times. The Best Lap is highlighted in green.

There is more session information available by pressing the blue button. This screen shows the Timing screen.

Pressing the blue button will change to the Timing, General, Performance, Inputs, and Config screens in succession. The information displayed is dependent on the racing mode in which the data was collected. Here is a Drag Race Timing Slip.

Session Details General

This screen will show the session duration, distance driven, range of GPS satellites monitored during the session, satellite signal strength range during the session (DOP), and the range of track elevation above sea level.

Session Details Performance

This screen will show the maximum values for speed, braking Gs, Acceleration Gs, and left and right lateral Gs.

Session Details Inputs

This screen will show the maximum and minimum values for any analog inputs that are enabled as well as engine RPM information for the session. High Revs, is the number of times the RPM exceeded the Red Line value in the Tach Settings. Over Revs is the number of times the RPM exceeded the Max RPM value in the Tach Settings.

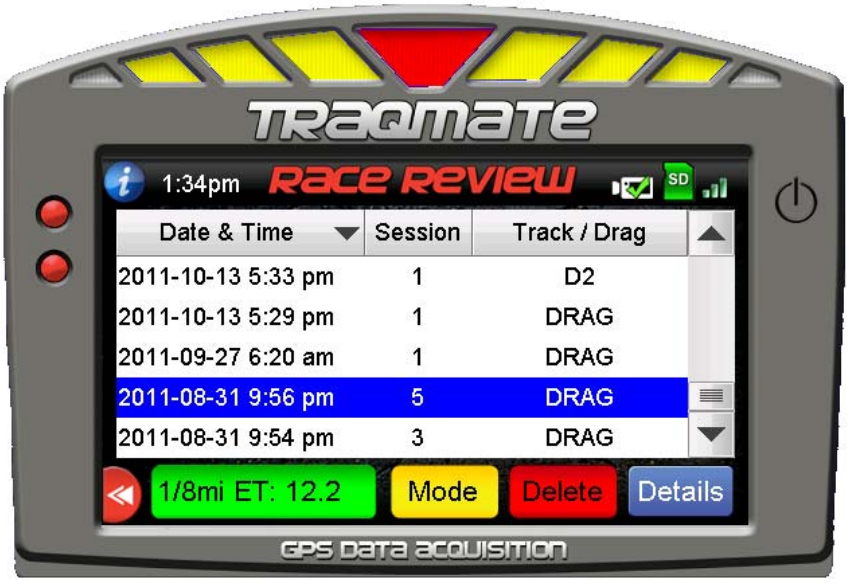
Session Details Config

This screen lists the analog and digital inputs that were enabled for the session.

Race Review

Pressing the Back button from the Session Details screen will transfer to the Race Review Screen where the sessions stored on the SD card are listed. The scroll bar will move up and down in the list. Touch a session to highlight it.

The colored areas along the bottom of the screen are buttons that will show more information. Pressing the green Lap Time button will show sequentially Lap Time, Driver, and Vehicle. The yellow Mode button will select the types of sessions to display in the Track Column. It will change between Race, Drive, AutoX, and Drag sessions. The red Delete button will delete the currently selected session. The blue Details button will transfer into Session Details for the selected session.



System Maintenance

There are a few tasks that if performed regularly will help ensure the best possible user experience.

Cleaning

The touchscreen has a tough low-glare protective film that should last for a long service life. Racing is a tough environment and the LCD can get covered in fingerprints and dirt. Never wipe off the LCD when it is covered in a gritty substance or you risk scratching the protective film. Blow off the dust and then wipe grease and fingerprints clean with a microfiber cloth.

The Sensor Unit can be cleaned with alcohol or a damp cloth. It should not immersed.

Firmware Updates

Periodically, Traqmate will publish firmware updates for both the Sensor Unit and TraqDash. These are posted on the Traqmate website and notifications are sent by email. Firmware Updates perform two functions, bug fixes and new features and should be applied as soon as practical to do so. Ideally they would be performed in a controlled environment (not at the track) where time is not pressed. If this procedure, known as "reflashing" is not performed successfully, the unit will be rendered not functional and will have to be returned to Traqmate for a new factory firmware load.

You can determine the firmware level of your TraqDash and Sensor Unit by pressing the "*i*" button in the upper left of the startup screen. Then scroll to the bottom of the help text. There you will see this information. Shown are firmware versions, serial numbers, hardware revisions, and build date as month / year.

A Sensor Unit firmware file will have a name such as sufirm340.tqm where 340 is the release level, in this case 3.40. A TraqDash firmware file will have a name such as tdfirm240.tqm where 240 is the release level, in this case 2.40. Here is a link to the firmware update page at traqmate.com.

http://store.traqmate.com/Latest-Software-Firmware-Downloads-s/286.htm

To update your TraqDash system, download the appropriate file or files from the Traqmate website to your computer and then copy them to the top level folder on the SD card. After copying, the file should be listed alongside the MySessions and ConfigFiles folders.

Insert the SD card into the TraqDash and power on. You will see a message stating “NEW FIRMWARE FOUND”. The message will state whether the firmware is for the Sensor Unit or TraqDash, the old and new revision numbers, and allow you to Reflash the unit or Skip.

Reflashing the Sensor Unit will result in the entire system powering off. Do not do anything else until the system powers down. This includes attempting to reflash the TraqDash.

Reflashing the TraqDash will cause the system to reboot. No data or configurations should be lost during this procedure but it is recommended that you make a copy of your SD card contents to your PC before reflashing.

Error / Warning Messages

Error messages will appear as a pop-up over top of a normal screen. They generally give you some information

TraqDash Pop-up screens are color-coded. Blue screens are information screens that are reached by pressing the 'i' icon. Warning screens are yellow. These generally indicate that something is incorrect and needs correction. Firmware update screens are green. Fatal error messages are shown with a red border. Here is an example.

Here are some of the more common error messages and what they mean.

SD Card Not Ready - No SD Card or Write Protected – Either the SD card is not inserted into the TraqDash or the tiny lock switch on the side of the SD card in in the LOCK position.

SD Card Removed – Cannot record further data without card – The SD card has been removed from the system while it was operating. At this point it is best to Power Off, insert the card, and then power on again.

New Firmware Found – The SD card contains updated firmware for the TraqDash or Sensor Unit. See the section on Firmware Updates for instructions on how to proceed.

Settings Warning

Gear Ratios, Diff Ratio, Vehicle Weight, Tachometer Settings, Weight, Start/Finish. The value chosen is not correct and will not allow correct operation of the Traqmate. Review the data entered and try again.

Camera Change. The new camera information needs to be sent down to the Sensor Unit which is done at power-up so this function requires the unit to be power cycled.

Voltage Outside Range. The voltage chosen for a sensor is larger than the voltage range (5, 10, or 20) selected.

Check your Settings

The following files were set to defaults: System, Vehicle, Track, or Driver. This message indicates that one or more of the configuration files on the SD card was missing or unreadable and that setting was returned to the factory default. This can happen if a new SD card is inserted, after a ReFlash operation, or if the SD card is corrupted. When this happens, you should check the setting specified in the warning message. For example, if Vehicle was listed, check to make sure the vehicle selected is correct and that the Vehicle Settings are correct for that vehicle.

Cannot delete this track

This indicates that you have attempted to delete one of the 330 factory pre-programmed tracks. This can be confusing because if you have recorded data at one of the factory tracks, a user file will be created for that track with the predictive lap information or alternate Start/Finish information. Those user settings will take precedence over the factory settings and can be deleted which will return the track back to factory defaults. If you attempt to delete it a second time (when it is already at factory settings), you will receive the error message.

Troubleshooting Guide

Problem	Solution
Can't get GPS signal or Patchy GPS Reception	This is most likely antenna placement or the antenna has failed. The antenna should be placed OUTSIDE THE VEHICLE with a good view of the sky. Double-sided Velcro can be used to attach the antenna to a non-steel body shell. If the antenna is over 2-3 years old or the wire has been wound tightly or kinked, it might be time to replace the antenna.
	No GPS Signal can also be caused by a bad connection or cable between the TraqDash and Sensor Unit. Check to make sure the cable is plugged into the Sensor Unit all the way. Replacement locking cables are available at the Traqmate web store. If the pigtail cable attached to the TraqDash has failed this is a moderate cost or warranty repair item.
Won't Turn On	If the ON button is held and all 4 LED lights on the front of the Sensor Unit light dimly, the Sensor Unit has failed and must be returned to the factory for repair. Otherwise, it could be a bad pigtail cable or button.
Until Starts Recording, Then Stops	SD card might be corrupted. Put it in PC and see if you get a warning. If so, copy the files off the SD card and then allow Windows to repair the SD card.
Losing Data	Make sure you press the small red << Back button on the lower left of the screen to exit recording mode and save the data before shutting off power to the Traqmate.
Power Button is Too Hard	The first 100 units shipped with a very stiff power button. A new design was implemented and this is a free warranty repair.
Case is Separating	If the two halves of the TraqDash case are no longer secure, this could cause premature failure of the unit. There is a service bulletin on this fault. Please return the unit for a new case under warranty.
Display is Too Dim	Adjust brightness under System Setup / Display

Display Dims During Use	In hot weather, TraqDash will dim to protect the temperature of the internal circuitry. This should only happen during extreme conditions. If it is happening frequently, make sure the unit is running the latest firmware as a software update changed the operation. Also make sure the tach shift light is not set so low that the amber LEDs are on a significant portion of the time. If this fails to solve the issue contact customer service for instructions on recalibrating the temperature sensor.
Unit Turns Off By Itself	This may be caused by a bad power cable, a faulty TraqDash power button, TraqDash pigtail cable, or Sensor Unit to TraqDash cable. This is a moderate cost or warranty repair.

There may be other tips that are posted on our web forum at this link:

http://store.traqmate.com/TraqTips-and-FAQ-s/283.htm

Scheduling a Repair

If a failure requires a return to factory repair, you may start a repair ticket by visiting traqmate.com and choosing Support / Service & Repair.

Warranty Information

Track Systems warrants to the owner of this Traqmate GPS Data Acquisition System that it is free from defects in materials and workmanship for a period of 180 days from the original date of consumer purchase. This warranty does not cover damage to the product as a result of misuse or accident, including but not limited to shock or water damage.

Remedies shall be limited to repair or replacement of the defective unit at Track Systems discretion. IN NO EVENT SHALL TRACK SYSTEMS BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. Some states do not allow for limitation of incidental or consequential damages, so this limitation may not apply to you.

For technical support, call 1-877-289-0312 (9 AM to 5 PM EST M-F).

About GPS Data Acquisition

Several events converged recently to make GPS Data Acquisition viable. First, the US government removed the artificial errors in the GPS signal to improve accuracy. Second, the advent of high-speed single-chip GPS receivers made the technology both affordable and even more accurate. Third, the power of portable PCs increased to the point where they can process a large amount of mathematical and graphical data quickly. And finally, the popularity and increasing sophistication of racing and track enthusiasts created a market for the product.

The primary advantages of GPS Data Acquisition over more traditional sensor-based systems are:

Easy Installation – Using just the GPS positioning and accelerometers, you can collect an incredible amount of information, enough to compare drivers and cars. This makes the system accessible to street cars, vintage cars, and racecars that run in classes that do not permit sensor-based systems. It also makes it easy to swap the unit between vehicles. This is ideal for driving instructors and people with multiple vehicles. Of course, adding sensors is always an option if you wish to collect even more in-depth information.

Easy to Use – By starting with the track map and placing one or more vehicles on it, you have a visual reference for all the rest of the data that can be examined. This makes data analysis faster and much easier.

Driving Line Comparisons – By mapping each run, comparisons can be made of driving lines, braking points, and other track-dependent points.

Cost – There is no installation cost and no expensive sensors are required.

GPS Frequently Asked Questions

What is GPS?

The Global Positioning System is a constellation of 24 satellites that orbit the earth twice a day, transmitting precise time and position (latitude, longitude and altitude) information. With a GPS receiver, users can determine their location anywhere on the Earth. The complete system consists of 24 satellites orbiting about 12,000 miles above the Earth, and five ground stations to monitor and manage the satellite constellation. These satellites provide 24-hour-a-day coverage for both two-and three- dimensional positioning anywhere on Earth.

Development of the $10 billion GPS satellite navigation system was begun in the 1970s by the US Department of Defense, which continues to manage the system, to provide continuous, worldwide positioning and navigation data to US military forces around the globe. However, GPS has an even broader civilian, commercial application. To meet these needs, GPS offers two levels of service, one for civilian access and the second encrypted for exclusive military use. The GPS signals are available to an unlimited number of users simultaneously, and there is no charge for using the GPS Satellites.

How Does GPS Work?

The basis of GPS technology is precise time and position information. Using atomic clocks and location data, each satellite continuously broadcasts the time and its position. A GPS receiver receives these signals, listening to three or more satellites at once, to determine the users position on earth.

How Accurate is GPS?

Traqmate is equipped with a form of differential GPS known as WAAS. A WAAS-capable receiver can give you a position accuracy of better than three meters (10 feet) in absolute terms over a large span of time. In product testing on racetracks, which typically have a good view of the sky, **recordings done close together in time were shown to be repeatable to under one meter accuracy**.

Under normal conditions, the GPS signal will provide a civilian user an accuracy of better than 15 meters (50 feet). However, using a technique called differential GPS (DGPS), the user can increase the overall accuracy of the GPS receiver to approximately 1-3 meters. With DGPS, one GPS receiver unit is placed in a known location and the position information from that receiver is used to calculate correction in the position data transmitted to other GPS receivers in the area. The resulting real-time accuracy is in the 10 foot range. Sub-meter accuracy can be obtained by using DGPS and post-processing calculations in static positioning.

WAAS stands for Wide Area Augmentation System, which is a system of satellites and ground stations that provide GPS signal corrections, giving you even better position accuracy. A WAAS-capable receiver can give you a position accuracy of better than three meters, 95 percent of the time. Currently, WAAS satellite coverage is only available in North America.

Glossary

Accelerometer	A sensor that measures the G-forces on the vehicle
Analysis	The effort of examining recorded data for useful information or the results of such an examination
Analysis File	File with extension of ".tqs" that contains an analysis. May contain one or more sessions
AutoOn	Feature to allow Traqmate to automatically turn on with power
AutoStart	Feature to designate automatic starting mode for Traqmate
AutoPan	A Traqview feature that causes the AutoPan Vehicle to remain in the Track window regardless of Zoom level
AutoPan Vehicle	The vehicle selected in Traqview menu to be followed during AutoPan
Data Acquisition	Measuring and recording of information
Display Unit	Lap Timer component of the Traqmate Complete System
DU	Display Unit
Firmware	Software that is embedded into the SU and DU that controls their operation
GPS	Global Positioning System, a satellite-based location method
Post Roll	Video recorded after the selected Laps
Predictive Lap Timer	Display Unit timer that compares current lap progress with a stored reference lap
Pre Roll	Video recorded before the selected Laps
Reference Vehicle	In Traqview, first vehicle selected for map display
Segment	portion of the track that is being analyzed in Segment Analysis
Segment Separator	bent line on Track Map that separates segments
Sensor Unit	Silver box containing GPS receiver and accelerometers
Session	One group of continuous recording, typically a single trip or series of laps
Session File	File with extension of ".tqm" that contains one recorded session
Slider	Slide control at bottom of screen for positioning vehicle on track
Start/Finish Line	Place on track where a lap starts
SU	Sensor Unit
Theoretical Best Lap (TBL)	Best combinations of segment times from a session
TraqData	Analog, Digital and RPM input module
TraqData II	Analog, Digital and RPM input module with 4-wire ChaseCam interface
TraqData HD	Analog, Digital and RPM input module with LANC camera interface
TraqData PRO	Analog, Digital and RPM input module with GoPro Camera interface
TraqData HD2	Analog, Digital & RPM input module w/ GoPro or Replay Camera (charging) interface
TraqPaq	Traqmate Battery Pack
Traqmate Basic	GPS Data Acquisition system without a Display Unit (Sensor Unit only)
Traqmate Complete	GPS Data Acquisition system with both Sensor Unit and Display Unit
TraqSync	RPM input module with 4-wire ChaseCam interface
TraqSync PRO	RPM input module with GoPro or Replay Camera (non-charging) interface
TraqTach	RPM input module
Traqview	Windows data playback and analysis program
TraqStudio	Windows data and video playback and analysis program

Appendix A – TraqDash Menu Tree

- Main Menu
  - Info
  - Go Racing
    - Info
    - Lap/Race
      - Info
      - Change Screen Up
      - Change Screen Down
      - Back
      - Sweep Tach
      - Timing
      - G-Meter
      - Round Tach
      - Analog 0-1
      - Analog 2-3
    - Auto-x/Rally
    - Drive
      - Change Screen Up
      - Change Screen Down
      - Back
      - Compass
        - Reset Trip
        - Reset Max
      - Sweep Tach
      - GPS Info
      - G-Meter
      - Round Tach
      - Analog 0-1
      - Analog 2-3
    - Instruments
      - Change Screen Up
      - Change Screen Down
      - Back
      - G-Meter
      - Round Tach
      - Analog 0-1
      - Analog 2-3
      - Compass
        - Reset Trip
        - Reset Max
      - Sweep Tach
      - GPS Info
  - Race Review
    - Info
    - Choose Session Spinner
    - Check Times
    - Delete Session
      - Yes
      - No
    - Back
  - Race Setup
    - Info
    - Driver
      - Info
      - Select Driver Spinner
      - New Driver
        - Driver Name Keyboard
          - A-Z and space
          - 0-9 and symbols
          - Shift Key
          - Del
          - Cancel
          - Save
      - Edit Name
        - Edit Name Keyboard
          - A-Z and space
          - 0-9 and symbols
          - Shift Key
          - Del
          - Cancel
          - Save
    - Track
      - Info
      - Select Track Spinner
      - Within 100 miles
      - Within 200 miles
      - Within 500 miles
      - Within 1000 miles

- Within 2000 miles
- All Tracks
- New Track
  - Track Name Keyboard
    - A-Z and space
    - 0-9 and symbols
    - Shift Key
    - Del
    - Cancel
    - Save
- Edit Name
  - Edit Name Keyboard
    - A-Z and space
    - 0-9 and symbols
    - Shift Key
    - Del
    - Cancel
    - Save
- Track Settings
  - Info
  - Track Type
    - Info
    - Spinner
  - Lap Hold Time
    - Info
    - Spinner
  - Start/Finish
    - Info
    - Clear
    - Lat
      - Numeric Keypad
        - 0-9 and symbols
        - Shift
        - Key
        - Del
        - Cancel
        - Save
    - Lon
      - Numeric Keypad
        - 0-9 and symbols
        - Shift
        - Key
        - Del
        - Cancel
        - Save
    - Heading
      - Numeric Keypad
        - 0-9 and symbols
        - Shift
        - Key
        - Del
        - Cancel
        - Save
  - Reset Predictive
    - Info
    - Reset Time

Vehicle

- Info
- Select Vehicle Spinner
- New Vehicle
  - Vehicle Name Keyboard
    - A-Z and space
    - 0-9 and symbols
    - Shift Key
    - Del
    - Cancel
    - Save
- Edit Name
  - Edit Name Keyboard
    - A-Z and space
    - 0-9 and symbols
    - Shift Key
    - Del
    - Cancel
    - Save
- Vehicle Settings
  - Info
  - Tach
    - Info
    - Warning
      - Spinner
    - Redline
      - Spinner
    - Engine Cyl

- Spinner
- Pwr Start
- Spinner
- Pwr End
- Spinner
- Max RPM
- Spinner

Aero Grip
- Info
- Drag Slider
- Friction Slider

Gear Ratio
- Info
- Enter Tire Size
  - Info
  - Tire Size
    - Info
    - Width Spinner
    - Aspect Spinner
    - Height Spinner
  - Tire Circumference
    - Numeric Keypad
      - 0-9 and symbols
      - Shift Key
      - Del
      - Cancel
      - Save
- Diff Ratio
  - Info
  - Digit 1 Spinner
  - Digit 2 Spinner
  - Digit 3 Spinner
- Trans Ratio
  - Info
  - Gear 1-8
    - Numeric Keypad
      - 0-9 and symbols
      - Shift Key
      - Del
      - Cancel
      - Save
- Gearing Help

Inputs
- Info
- Analog 0-3
  - Info
  - Disable
  - Enable
  - Edit
  - Scale
    - Info
    - Volt
    - Low
      - Numeric Keypad
        - 0-9 and symbols
        - Shift Key
        - Del
        - Cancel
        - Save
    - Volt
    - High
      - Numeric Keypad
        - 0-9 and symbols
        - Shift Key
        - Del
        - Cancel
        - Save
    - Value
    - Low
      - Numeric Keypad
        - 0-9 and symbols
        - Shift Key
        - Del
        - Cancel
        - Save
    - Value
    - High
      - Numeric Keypad
        - 0-9 and symbols
        - Shift Key

- Del
- Cancel
- Save
- Volt
- Range
  - 5
  - 10
  - 20
- Edit
- Alarm
  - Info
  - LED 1 Enable
  - LED 1 Disable
  - LED 2 Enable
  - LED 2 Disable
- Alarm Level
  - Above
  - Below
  - Equal
  - To
  - Off
- Alarm Value
  - Numeric Keypad
    - 0-9 and symbols
    - Shift Key
    - Del
    - Cancel
    - Save
- Rename Input
  - Rename Input Keyboard
    - A-Z and space
    - 0-9 and symbols
    - Shift Key
    - Del
    - Cancel
    - Save
- Rename Units
  - Rename Units Keyboard
    - A-Z and space
    - 0-9 and symbols
    - Shift Key
    - Del
    - Cancel
    - Save
- Rename Input
  - Rename Input Keyboard
    - A-Z and space
    - 0-9 and symbols
    - Shift Key
    - Del
    - Cancel
    - Save
- Rename Units
  - Rename Units Keyboard
    - A-Z and space
    - 0-9 and symbols
    - Shift Key
    - Del
    - Cancel
    - Save

Digital 4-5

- Info
- Disable
- Enable
- Edit
- Alarm
  - Info
  - LED 1 Enable
  - LED 1 Disable
  - LED 2 Enable
  - LED 2 Disable
  - State
    - On
    - Off
- Rename Input
  - Rename Input Keyboard
    - A-Z and space
    - 0-9 and symbols
    - Shift Key
    - Del
    - Cancel
    - Save
- Rename High
  - Rename High Keyboard

- A-Z and space
- 0-9 and symbols
- Shift Key
- Del
- Cancel
- Save

Rename Low

Rename Low Keyboard

- A-Z and space
- 0-9 and symbols
- Shift Key
- Del
- Cancel
- Save

Weight

- Info
- Thousands Spinner
- Hundreds Spinner
- Tens Spinner

Camera

- Info
- Camera Spinner

Lap/Qualify

- Info
- Lap
- Qualify

System Setup

- Info
- Display
  - Info
  - Backlight Slider
  - LED Slider
  - AutoAdjust On
  - AutoAdjust Off
- Units
  - Info
  - Std
  - Metric
- Time
  - Info
  - Time Zone Spinner
  - DST On/Off
- AutoStart
  - Info
  - Launch G Spinner
  - Auto Start Enable / Disable
- Storage
  - Info
  - Erase All Sessions
    - Confirm
      - Yes
      - Cancel
  - Factory Defautls
    - Confirm
      - Yes
      - Cancel
  - Format SD
    - Confirm
      - Yes
      - Cancel
  - AutoOn
    - Enable
      - Yes
      - Cancel
    - Disable
      - Yes
      - Cancel
- Predictive Scale
  - Info
  - Scale Spinner