Demo Manual

INDEX

G2X - Using GPS to Improve Performance:

Thank you for your interest in the G2X. Before the start of software installation, we would like to provide additional information, concerning the G2X.

Many race specialists agree that the ability to monitor four basic items is the key to increased performance:
  1. MPH
  2. Lateral and Accel G forces
  3. Vehicle location on the track
  4. Lap and segment timing

In order to obtain this information, most forms of closed course motorsports (circle track, road racing) and vehicle testing utilize expensive, hard wired data systems. In order to collect the above information, the hard wired data system requires an assortment of sensors, mounted in various locations throughout the vehicle. Typically, all sensor cables must be routed to the data logger through the front and rear firewall. The cost, installation and usage of this type of data system will prevent many racers and performance enthusiast from enjoying the performance gains associated with such information.

With the introduction of the G2X, the performance edge provided by large, expensive, hard wired data systems is now available at a fraction of the cost and time. Through the use of the GPS (global positioning satellite) system, Racepak has created a data logger that can provide accurate information, without the necessity of hard wired sensors.

The G2X utilizes the technology of our NASCAR GPS data logger, but offered in a price range suited for the sportsman enthusiast. The G2X can provide a multitude of useful data, strictly through the use of an externally mounted GPS antenna. The basic data provided by the G2X consists of:

- GPS MPH
- GPS Laptimes
- GPS Split (segment) times
- GPS Track Mapping
- GPS Driving Lines
- GPS Lap Distance
- Lateral G's (GPS and Inertia)
- Accel G's (GPS and Inertia)

The G2X Package:

1. G2X data logger & 128MB memory card
2. Power / RPM cable
3. Serial communication cable
4. GPS antenna and cable
5. Display Dash and Cable
6. Software and instruction manuals

A 128MB memory card allows the user to perform multiple test runs, without the necessity of downloading after each run. Larger memory cards (256MB or 512MB) may also be utilized, thus increasing the recording time of the logger.

The Display Dash provides the user the ability to view a variety of data, during test procedures. Lap time, lap number, +/- lap difference, gear indicator and sequential shift lights (for vehicles equipped with RPM input) are available.

Easy Installation of the G2X:

The time, expense and vehicle alterations required for installing a hard wired data system, capable of producing the same data available from the G2X, makes it impossible for many racers and performance enthusiasts to own a data system.

Therein is the practicality of the G2X data logger. To install the system:

1. Locate a suitable mounting location for the G2X logger.
2. Connect the power lead to a cigarette lighter power output (or other power source)
3. Place the magnetic GPS antenna on the roof (or other external, flat location).
4. Connect the GPS antenna cable to the data logger
5. Allow less than two minutes for the G2X to acquire the satellites. This is upon the first start-up of the day. The G2X typically takes only seconds to re-acquire the satellites, following the initial start-up
6. Once on the track, simply push the Set Start/Finish button at the desired location. This action sets the start/finish line in the G2X software, providing immediate laptimes upon each pass by the defined start/finish line.

Of course, following each run, data can be downloaded into our professional series software, for detailed analysis.

Data Accuracy of the G2X:

The GPS system was originally developed for use by the United States military. The accuracy of the system was brought to the public's attention during the first Gulf war. At that time, the GPS signals available for civilian use was intentionally distorted by the government and could only provide location accuracy within approximately 30 feet. Obviously, that type of accuracy was great for general position location, but not practical for race car data acquisition.

During the 1990's, government changes allowed the transmission of GPS signals, for civilian use. This change provided the accuracy necessary to create a GPS based data system. The internal GPS electronics, utilized in the G2X data logger, is of the latest design, thus providing very accurate data:

1. **GPS MPH:** Speed acquired through GPS is true speed, unaffected by tire growth and wheel spin with an accuracy of approximately .1 mph.
2. **GPS Laptime and Segment Time**: Start / finish and segment times derived from GPS data are accurately plotted points around the racecourse. As such, they are not subject to errors such as generated by beacon transmitter pulses. GPS lap and segment times can be utilized upon returning to a previously mapped location, thus providing the ability to compare lap and segment times between multiple vehicles and multiple test sessions.
3. **GPS Track Map**: Track maps created from GPS data are based on GPS plotted vehicle position, which allow for more precise mapping. Inertia based mapping relies on inertia and wheel speed sensors to locate the vehicle. Wheel spin can alter the perceived location of the vehicle, thus providing errors in data.
4. **GPS G forces**: GPS lateral and accel G forces are derived from vehicle change of position and are not affected by pitch or roll of the vehicle. Inertia based (accelerometer) G forces are affected by location of the data logger in the vehicle, along with pitch and roll of the vehicle. Use of GPS G force data allows for excellent comparison of data between multiple tests or multiple vehicles, without any effect from various G2X mounting position.
5. **Driving Lines:** Driving line data is created from GPS plotted vehicle location and can provide accuracy within the 12" range, when utilizing the vehicle location beacon.

Extensive track testing has proven the ability of the G2X to generate data that is comparable to hard wired systems, without the inconvenience associated with those systems. Obviously, hard wired data systems still provide excellent data, and is a necessity in many forms of motorsports. However, the cost, ease of installation and accuracy of data provided by the G2X will bring the benefits of data acquisition to the average racer and high performance enthusiast.

Software Installation Instructions:

Website or G2X Datalink II Install: If this demo was downloaded from our website or with the installation of the G2X Datalink II software, the necessary demo run information was included with the DatalinkII software download. Following installation of the Datalink II software, simply proceed to the following Screen Resolution Setting section. The Racepak software is designed to utilize a three button mouse. Before installation and review of this demo, it is highly recommended to obtain such a device. Usage of a three button mouse greatly reduces the number of keystrokes and allows for easier data review.

Step 1:

Insert the DataLink II CD in your computer. If Autorun is enabled, the DataLink Setup program will start automatically. If Autorun, on your PC is disabled, you will need to start the program manually. To start the program manually, do one of the following:

1. Click the **Start** button on your desktop and then the **Run** button. At the run dialog box type in **X: Setup** where X is the drive letter for your CD drive. Next click the OK button the DataLink Setup program will start.
   Or
2. Select **My Computer** on your Desktop. The My Computer dialog box will be displayed. The RacePak logo should be displayed next to your CD drive icon. Double Click on the logo. The RacePak Setup program will start.

Step 2:

Follow the instructions in the Setup dialog boxes and continue until the following dialog box is displayed. Insure the Demos is selected, as indicated by a check in the selection box as shown below.
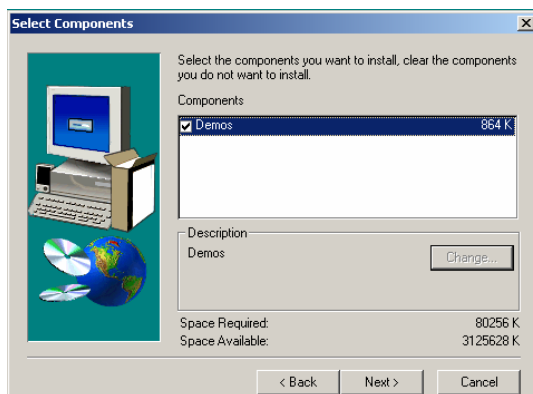

Follow the instructions in the remaining dialogue boxes to complete the installation.

PC Screen Resolution Setting:

Before reviewing the demo data, it is helpful to verify the PC screen resolution is set to the highest possible level. Doing so insures that all icons are visible. In addition, the greater the resolution, the better the graphed data will appear. For some users, higher screen resolution can create smaller Desktop Icons. This can also be adjusted, following the screen resolution change.

1. Close the Datalink II program
2. Place the mouse anywhere in the desktop area and right click
3. Select Properties in the dialog window
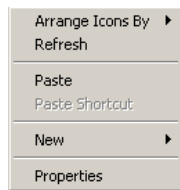
4. This action will open the Display Properties dialog window.
5. Select the Settings tab.
6. Place the mouse cursor over the Screen Resolution slider and move until a setting of 1024 x 768 or higher appears.
7. Select Apply
8. Select OK
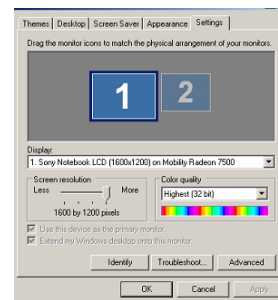
If the above settings create small desktop icons, it is possible to adjust the size of the icons. To do so:
1. Utilizing the above dialog window, select the Appearance tab.
2. The Font Size may now be adjusted to user preference, from within this area.
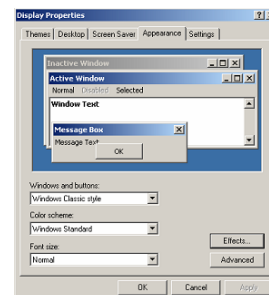
Opening the G2X_Demo Runfile:

In typical usage, the G2X starts the recording process when a pre-set number is obtained, for a given channel. For example, recording can start when the GPS MPH exceeds 25. All data gathered from that start point until the vehicle returns to the pit area is referred to as a Runfile.

Upon downloading of the new data, a Runfile is created. Each Runfile is identified by a group of letters and numbers that reflects the car number, track location, date and time of the data download. Within the Runfile is contained all the laps (if lap type testing was conducted) from that particular test outing. Remember, test data can consist of laps, acceleration tests, braking tests, lateral g and accel g tests, or any variety of information the user desires to obtain. Multiple files can be opened, in order to overlay and compare graphed data.

For demo purposes, the Runfile we will use for review will be called G2X Demo. To open this Runfile:

1. Open the Datalink II program

2. Select File and then select Open, in the main menu area at the top of the Datalink II page. It is also possible to open a file by utilizing the Open icon, located in the icon toolbar on the left side of the Datalink II software.
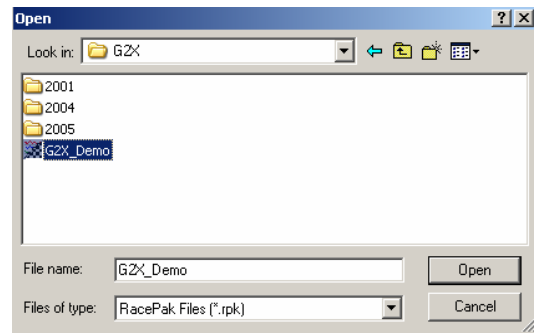
3. Locate the G2X folder.

4. Open the G2X folder. Within this folder will be located the G2X_Demo Runfile.
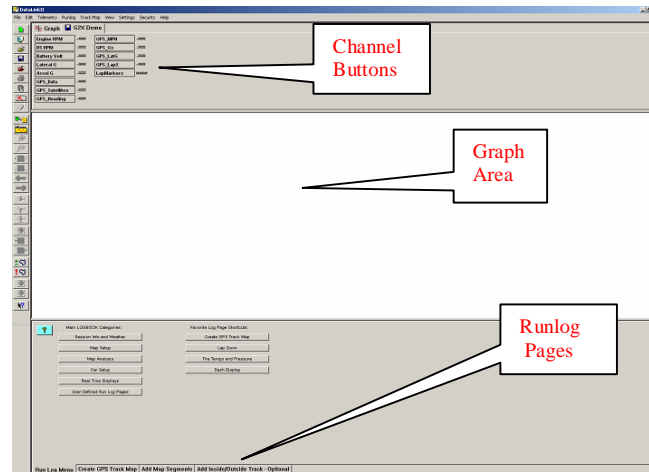
5. Place the mouse cursor over the G2X_Demo Runfile and left click.

6. This action will open the Runfile into the Datalink II software

Adjusting the Screen Sections:

Your PC screen should now display the following (less the callout boxes added for manual clarity):

Upon opening of the above Runfile, it will be necessary to adjust the horizontal size of the Channel Button, Graph and Runlog page area. To do so:

1. Place the mouse cursor on the border between any of the three areas. The mouse cursor will change to up and down arrows.

2. Next, hold down the left mouse button and drag the horizontal line separating each area either up or down, according to the need. The size of each area can be pre-set, according to the user s preference. That subject will be reviewed at a later time.

The screen is divided into three sections:
1. Channel Buttons: A Channel Button is a visual representation of every data channel with valid data and provides real time values for each data channel.

2. Main Graph: As data channels are selected, the graph will appear in the main Graph region, with the graph color corresponding to the Channel Button color box.

3. Runlog: This section is a combination logbook, spreadsheet, database and graphical analysis area. Each tab at the bottom of the screen represents a separate page. Runlog pages are factory designed analysis pages, charts, graphs and screens that eliminate the paper trail commonly found in all forms of motorsports

Adjusting On-Screen Font Size:

The on-screen font size of the Channel Button and Runlog areas may be enlarged or reduced, to suit the users needs. To adjust the size:

1. Select Preferences, then Settings from the Main Menu. The following dialog box will be displayed.
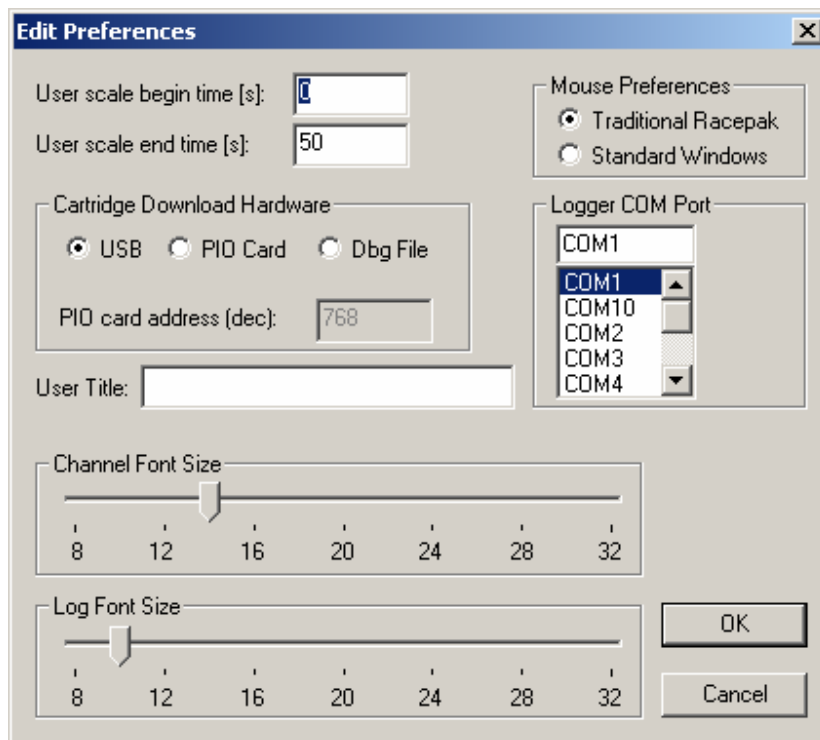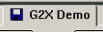

2. Adjust the Channel Button font and Runlog font through use of the slider bar located below each heading, according to the user's preference.

Now that the initial on screen appearance changes are complete, we can now proceed to opening and reviewing data.

Opening a Lap:

At this time, the G2X_Demo Runfile should be open. The Datalink II software saves individual lap data, with corresponding laptimes (called a Lapfile) within the Runfile. Simply worded, a Runfile is a folder with all the laps placed inside.

To open a lap:
1. Place the mouse cursor over the G2X_Demo tab ⊞ G2X Demo and Right click. Doing so will open the Select Lap dialog window:
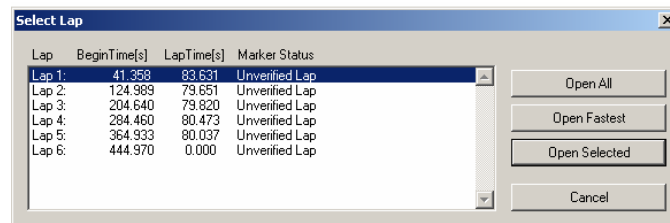
2. Left click the Open Fastest button. The fastest lap (2) will now be displayed, as shown below.
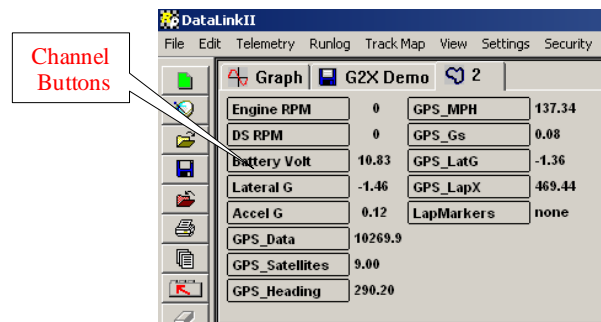
All of the data channels that were active during this test run are now in view in the Channel Button area. However, no graphed data will appear, until the user selects any of the Channel Buttons, as discussed in the next section.

Referring back to the above Select Lap dialog window, laps can be opened by three different methods:
1. Open All: This will automatically open all laps contained within the Runfile
2. Open Fastest: This will open only the fastest lap.
3. Open Selected: This will open one lap, as selected by placing the mouse cursor over the desired lap and left clicking.

A Runfile is indicated by the ⊞ blue disk icon and a Lapfile is indicated by the ♒ blue track map icon, along with the corresponding lap number.

Graphing a Data Channel:

The next step is to graph data on the Datalink II screen. We will begin by graphing a single channel, the GPS_MPH.

To graph a single channel:

   1. Place the mouse cursor over the GPS_MPH Channel Button.

   2. Left click the mouse button. The GPS_MPH Channel Button will now have a color box displaying the color of the data graph that is now in view in the main Graph window.

   3. To insure the entire lap is displayed, select the User Scale button in the DataLink toolbar.
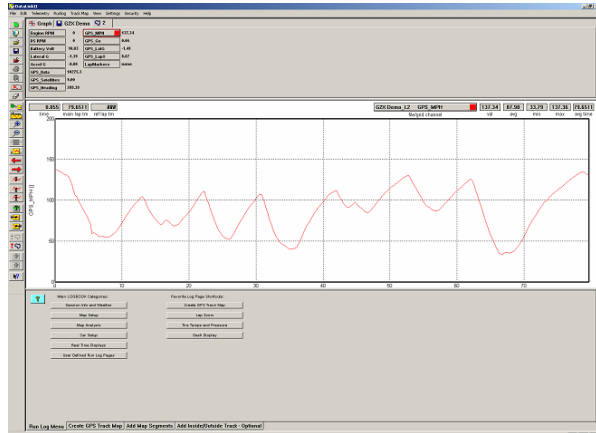
The data now in view represents the GPS_MPH as recorded for one lap. The numbers located at the bottom of the graph represent time, from the start / finish line. When a data channel is graphed, all of the values for the remaining data channels are now activated. To review the data:

   1. Place the mouse cursor in the main Graph window and click the left mouse button.

   2. With the mouse cursor in the main Graph window, click and hold the left mouse button and drag the curser left and right. Observe the Channel Buttons while dragging the cursor. Data is updated real time, relative to main Graph cursor location. The Left and Right arrow keys can also be used to move the cursor in a similar manner.

To graph additional channels:

   1. Place the mouse cursor over the GPS_LatG Channel Button and click the left mouse button.

   2. Add a third data channel by repeating the same process for the GPS_Gs Channel Button.

To remove a data channel from the graph, simply left click over that channel. To change the color of a channel, continue to left click until a desirable color is located.
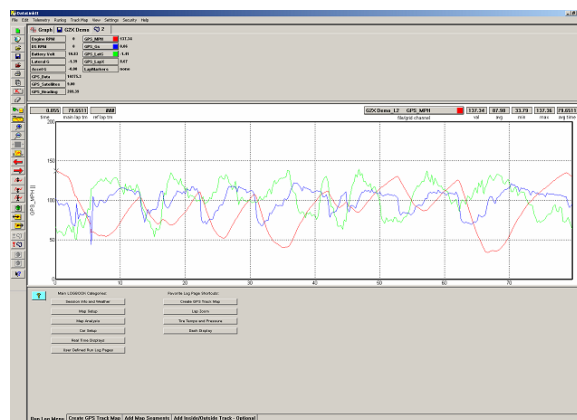
Viewing Data in Distance Mode:

In order to produce a graph, a comparison must take place. In the previous example, the GPS_MPH was compared to time, which begins and ends at the start / finish line. The time into the lap, according to the position of the mouse cursor in the Main Graph area is provided by the Cursor Position Box 9.1 . In certain applications, it is often more useful to compare the data to distance from the start / finish line.

To place the Main Graph area in distance mode:
1. Select View in the DatalinkII main menu selection and then select the Segment X Mode option.

You will note the numbers along the bottom of the graph now display distance (feet) around the track and the top of the graph is now broken into track segments as defined by the track map. Track map segments provide a quick view of vehicle location, as defined by the track map. To view the GPS track map created for this test session:

1. Locate and left click the Map Analysis button located in the Run Log Menu page
.
2. Select the Lap Zoom Runlog tab, at the bottom of the screen.

3. Insure all data is in view. If necessary drag the area between the Graph and Runlog area upward, as reviewed in the Adjusting Screen Settings section.
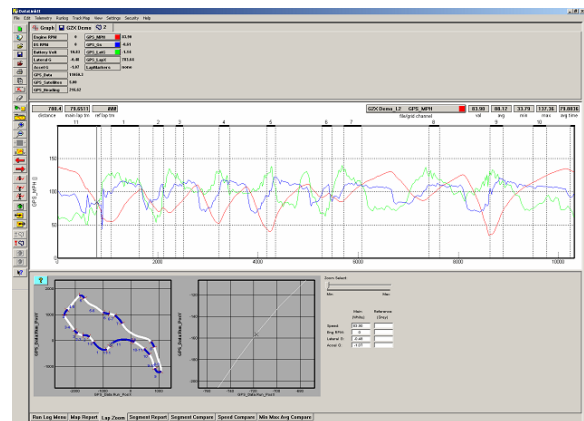
In addition the Cursor Position Box 1027.0 located in the upper left hand corner of the main Graph region now displays the cursor position in feet into the lap rather than time.

Graphing Multiple Files (Overlay):

At this point, we have reviewed the basics of how to open and graph a single file. We will now review how to open, graph and compare two files. Multiple files can be viewed simultaneously using the DataLink II software.

The G2X_Demo Runfile should still be in view, with Lap 2 open. To open another lap for review:
   1. Place the mouse cursor over the G2X_Demo tab and right click.
   2. Select Lap 1 by left clicking over Lap 1.
   3. Left click the Open Selected button.
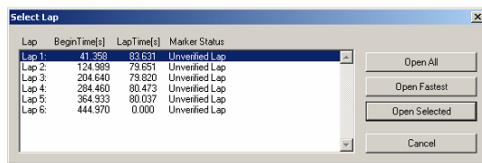
Since we previously had graphed GPS_MPH, GPS_LatG and GPS_GsAccel from Lap 2, that data will remain graphed. However, no data from Lap 1 will appear in the Main Graph area, until selected. In order to activate Lap 1 for graphing:

   1. Place the mouse cursor over the Lap 1 tab and left click.
   2. Now graph the GPS_MPH, GPS_LatG and GPS_Gs.

In essence, that is all that is required to overlay graphed data. To graph data from multiple laps, simply continue opening Lapfiles, and graphing data. To graph data from multiple test runs, open the desire Runfile, open the desired Lapfile and graph the data. The only limit to the number of files that can be opened and graphed depends on the memory capabilities of the users PC.

Remember, to change the graph color of a particular channel, keep the mouse cursor over the Channel Button and continue to left click, until a desired color is obtained.

Remove a Data Channel from the Graph Area (Erase):

To remove all of the graphs currently displayed, double left click on the Clear All Graphs
icon (white eraser) in the Datalink II toolbar.
(Do not erase the currently graphed data, as we will use it in the following sections)

Data Comparison in Report Format (Runlog Pages):

When the Datalink II software was created, one of the goals was to provide the ability to compare data in a report format. Users not familiar with studying data graphs will appreciate data presented in a report format.

We currently have the same three channels (GPS_MPH, GPS_LatG and GPS_Gs) graphed from Lap 1 and Lap 2 and the LAP ZOOM page in view. By selecting the Min Max Avg Compare Runlog tab, notice the Minimum, Maximum and Average data now in view.

This information reflects the minimum, maximum and average of the current "active" file. Remember, a file is made "active" by placing the mouse cursor over that particular file tab and left clicking.

Place the mouse cursor over the Lap1 file tab and left click. The min, max and average data is displayed, for Lap 1. Now, place the mouse cursor over the Lap 2 file tab, and left click. The min, max and average for Lap 2 is in view, replacing the data for Lap 1.

Suppose we would like to compare the minimum, maximum and average data, or maybe view a comparison of segment times between two laps. This is possible, by assigning Reference and Main status for two files. Runlog pages were designed to compare the data from two files and present it to the user, for evaluation. Remembering that we can have many files open at one time, the question of how to "tell" the software which two files we wish to compare is answered through the use of Reference and Main files. This solution is extremely easy to use and take just seconds to perform.

The following section provides details concerning the assigning of Reference and Main files.

Assigning Main / Reference File Setting:

At this time, we have Lap 1 and Lap 2 open, with GPS_MPH, GPS_LatG and GPS_Gs from both runs, graphed. To compare the min, max and average of Lap 1 and Lap 3, simply:

1. Select Lap 1 as the Reference by placing the mouse cursor over the Lap 1 tab and clicking the center button on the mouse. If you are not using a three button mouse, it will be necessary to go to the File Command in the Main Menu and select the Set Reference File / File command.
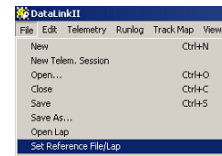
2. Select Lap 3 as the Main file by placing the cursor over the Lap 3 tab and left clicking.

Notice the file tab for Lap 1 is now red. This indicates a Reference file has been selected. Now, look again at the min, max and average data located below the track map. The above action should activate the comparison between Lap 1 and Lap 3.

There is no set method for selecting Reference / Main files. It is at the users discretion to determine which files will receive the Reference and Main settings. Either selection can be assigned to any open file, by using the above instructions. The only item that must be remembered is to always make the Main file active, by left clicking on the file tab AFTER selecting the Reference file.

While it is not necessary to select Main and Reference settings to graph and view data, it is necessary to perform the above actions in order to compare data in the Runlog pages. Now that we understand the above procedures, we can see the benefit of this procedure, by reviewing the remaining Runlog pages.

Segment Time Data Comparison:

The G2X_Demo file contains two Segment and one Speed related Runlog pages:

1. Segment Compare
2. Segment Report
3. Speed Compare

We previously assigned Reference and Main lap file settings to Lap 1 and Lap 2. Therefore, in order to review the segment data from Lap 1 and Lap 2, simply place the mouse cursor over any of the three Segment Runlog pages and left click.

Speed Compare provides a comparison of segment/speed data for two laps as determined by the Main and Reference settings.

Segment Report provides a breakdown of segment times for all laps contained within the G2X Demo Runfile.

Segment Compare provides segment comparison data between two laps. Any two laps designated as Reference and Main will be compared.

Remember, all of this data was created strictly through the use of GPS signals. As can be seen, the simplicity of the system installation compared to the data acquired is a tremendous value to the user.

Closing a File:

In order to close a file, simply select the file, then select the Close icon , located in the Datalink II toolbar.

This concludes the basic introduction to the capabilities of the G2X data logger and Datalink II software. The previous information was designed to provide the user with the capabilities of opening and graphing data in the DatalinkII software.

There are many additional features of the DatalinkII software, available to the user. The following section provides an advanced review of those features.

Advanced Features of DatalinkII Software

Channel Grid Display:

Multiple channels from multiple files may be graphed at the same time, in the Main Graph area. However, the scaling of the Main Graph area can only reflect one channel. To change the Main Graph scaling to reflect the values of other graphed channels:

1. Place the mouse cursor over the Channel Grid Display, located above the Main Graph area.

G2X Demo_L2 GPS_MPH		137.33	88.12	33.79	137.36	79.8836
file/grid channel		val	avg	min	max	avg time

2. Left click the mouse button. This action will change the Main Graph scaling to reflect the values of the channel shown in the Channel Grid Display. Continue left clicking to toggle through all graphed channels. The TAB key on the keyboard will also perform the same function.

Average / Minimum / Maximum Channel Values:

The Channel Grid Display will automatically display the min / max / avg of a channel, over the course of one lap.

G2X Demo_L2 GPS_MPH		137.33	88.12	33.79	137.36	79.8836
file/grid channel		val	avg	min	max	avg time

To determine the average of a channel between two points other than start / finish:

1. Move the graph cursor to the desired starting point and press the [key on the keyboard. A vertical bar will be displayed on the graph.
2. Move the graph cursor to the desired ending point and press the] key on the keyboard.   A second vertical bar will be displayed on the graph.

To view the average values of other graphed channels simply press the Tab key or move the mouse cursor over the Channel Grid Button and click the left mouse button as described above. If no additional channels are graphed, no additional values will be displayed.

To remove the averaging cursors from the display simply press the [key and then the] key without moving the graph cursor. The Averaging cursors will be removed.

Understanding Graph Scaling:

Each channel is assigned a default minimum and maximum graph scaling value. As shown, GPS_MPH is set to graph data between 0 and 200 MPH.

As is often the case when testing at multiple race tracks, different MPH values are obtained. For example, the MPH obtained on a ½ mile track would be much slower than the MPH obtained on a 1 mile track. If the MPH scaling was set to graph between 0-100 MPH, but 150 MPH was obtained during the test session, the MPH graph would go off scale.
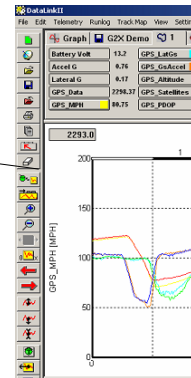

The Datalink II program provides two methods to change scaling. The first method will change the scaling within one file. The second (and preferred method) involves the creation of Scaling Sets. A Scaling Set has the ability to override all current scaling values and insert a pre-defined channel value. The Scaling Set applies the values to all files, until de-selected by the user.

Changing Scaling Per Channel:

To change individual channel scaling:
1. Place the mouse cursor over the desired Channel Button and right click the mouse button. For this example, we selected GPS_MPH.
2. The Edit Dialog Box for that channel will be displayed.
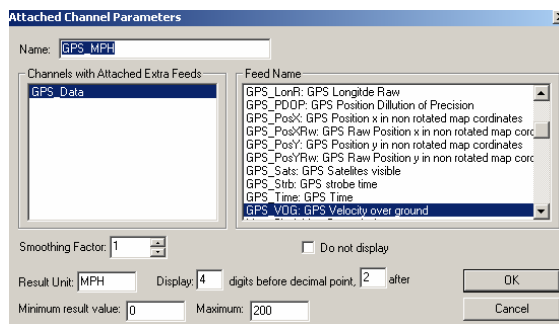
The Minimum and Maximum result values correspond to the minimum and maximum values displayed in the Main Graph area, for that channel.

3. To set the graph to display from 0 to 100 MPH, simply enter the minimum and maximum values accordingly.
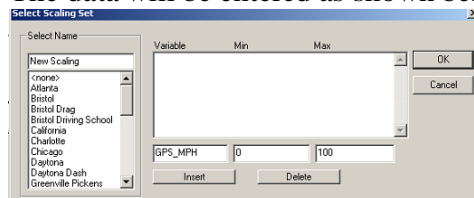4. Select OK

Creating Chart Scaling Sets:
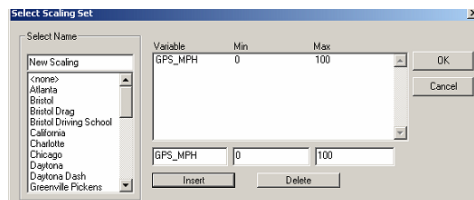
To create a Chart Scaling Set:
1. Select Settings, then Select Chart Scaling Set from the main menu selection.
   The following dialog box will be displayed.
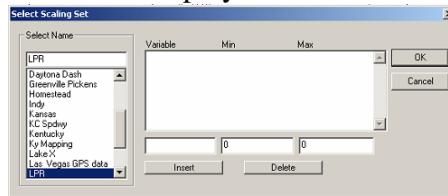
2. Enter the name you wish to call the new scaling set into the text entry box located directly below the Select Name heading.   For the purpose of our example, we will use the name   New Scaling .”
3. Enter the name of the channel and the minimum and maximum graph values to be displayed. For this example we will rescale the GPS_MPH data channel to graph from 0 to 100 MPH. The data will be entered as shown below.

4. Select the Insert button to accept the rescaling values. The dialog box will appear as shown below:

5. Enter the remaining data channels to be rescaled in the same manner.
6. When you are finished, select the OK button.

To select a Chart Scaling set for use:
1. Select Settings, then Select Chart Scaling Set from the main menu selection.
2. Select the name of the desired scaling file to use by positioning the mouse cursor over the name of the scaling set and click the left mouse button.
3. Select OK.

As can be seen, this is an easy method to quickly change scaling values, with a few simple mouse clicks.
NOTE: When entering channel names, remember you must enter the channel name exactly as it appears in the Channel Button area.

Predefining Graph Sets for Display:

Previously, we graphed data by placing the mouse cursor over the desired data channel and left clicking. Often times, users will find the need to graph the same set of channels, each time data is reviewed. It is possible to ̈build ̈graph files that, when selected, will automatically graph the desired information. These files are called Quick Graphs.

To create a Quickgraph from the G2X_Demo:

    1. Erase all graphs by double clicking the Clear All Graphs icon
    2. Graph GPS_MPH for Lap 1 and Lap 2

At this time, we have pre-set the channels and colors we wish to save, as a Quick Graph. To name and save the Quick Graph:

    1. Select the Quick Graph icon in the DataLink toolbar.
    2. Enter a name for the Quick Graph. For this example, we used GPSMPH.
    3. Next, click on the Save button to save for later use.
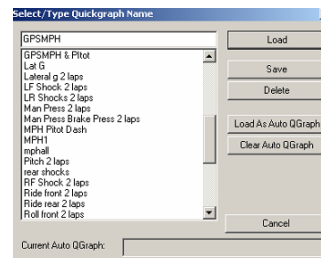
We have now created and saved a Quick Graph. Any time we have a Main and Reference file selected, we can recall this Quick Graph.

To recall a graph set for use:

    1. Double click the Clear all Graphs icon in order to remove all graphed data from the Main Graph area.
    2. Select the Quick Graph icon in the DataLink II toolbar.
    3. Select the GPSMPH name.
    4. Select the Load button.

The graphed data should automatically load, into the Main Graph area.

To create a Quick Graph for one file only, without the use of Main and Reference files:

    1. Double click the Clear all Graphs icon to remove all graphed data from the Main Graph area.
    2. Graph the desired channels in the desired colors.
    3. Next, simply repeat steps 1 and 2, from the first paragraph in this section.

Graphing Runfile vs. Lapfile Data:

There are occasions where it is necessary to review all of the data created during one test outing on the track (Runfile). Data from a Runfile may be graphed the same as data from a Lapfile.

Often times, changes that occur are often easier to detect when reviewing the entire Runfile, as opposed to looking at only one lap of information.

To graph Runfile data:

1. Double click the Clear all Graphs icon [icon] in order to remove all graphed data from the Main Graph area and return to distance mode.
2. Left click over the G2X_Demo Runfile tab.
3. Left click over the GPS_MPH channel, in order to graph the data.
4. Left click the Autoscale icon, located in Datalink II icon list [icon]
5. The screen should appear as below.
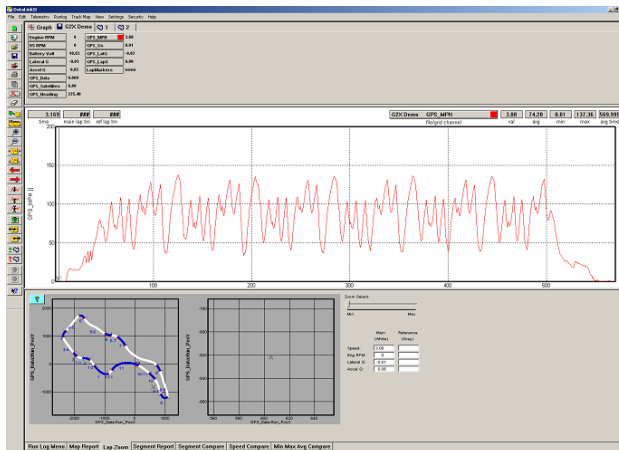
As can be seen, the entire GPS_MPH, from start of logging until end of logging, can now be reviewed.

Zoom Command:

The Main Graph area as previously described displays an entire lap on the display screen. In many instances you may wish to zoom in on a particular area for a detailed analysis. Two methods are available.

The first method is to create a zoom box using the right mouse button. To do so:
1. Determine the desired zoom area of the Main Graph.
2. Place the mouse cursor in the upper right corner of the desired zoom area
3. Hold down the right mouse button and drag the zoom box over the desired zoom area. Release the right mouse button.
4. Time / distance or data channel scaling is zoomed according to what portion of the graph is included in the zoom box.

The second method is as follows:
1. Place the mouse cursor at the center of the graph region to be zoomed.
2. Left click the Zoom In [icon] icon or the Zoom Out [icon] icon in the vertical toolbar. The graph region will zoom in or out accordingly.

Once you have zoomed in on a section of data, you may also want to shift either to the left or right to view additional data without changing the current zoom settings.

1. Click on the Shift Left [icon] or the Shift Right [icon] icon in the RacePak Chart data toolbar to move the displayed graph region left or right.

To reset the main Graph region back to displaying an entire lap, click on the User Scale [icon] button in the RacePak Chart data toolbar.

Runlog Pages:

The Runlog pages at the bottom of the Datalink II screen are a general-purpose data analysis section. These pages offer a combination of graphics display, logbook, database, spreadsheet, and mathematical analysis capability.

The purpose of the pages is to provide real time data analysis of the run data. By doing so, this reduces the technical expertise required for data analysis.

The G2X_Demo Runfile included with this demo includes a set of standard Runlog pages. The following section provides detailed information concerning each Runlog page.

Session Page:

The Session page is automatically opened when new data is uploaded into the PC, from the onboard data logger. The purpose of the Session page is to generate the specifics of each run, such as vehicle, track location, date, and test type / number.

Weather Page:

Weather data can be entered utilizing one of two methods. The first method is to manually enter the weather conditions, either during or after the data is downloaded. The second method requires the use of the appropriate Altalab weather station. The user simply *left* clicks the "Get ALTACOM Weather on COM 1" (or COM 2, dependant upon the port utilized by the weather station) button. If the Altalab weather station is connected to the user's computer, weather data will automatically download into the appropriate areas of this page.

Create GPS Track Map:
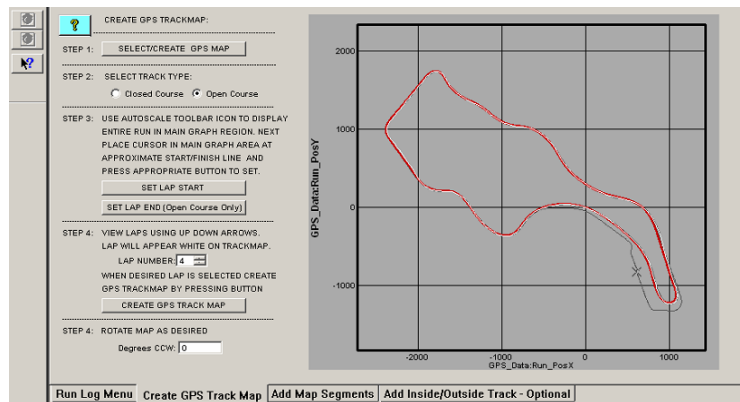
The Create GPS Map page is utilized to create a GPS based track map. Following the numbered steps, a GPS track map can be created in a matter of seconds.

Add Map Segments:
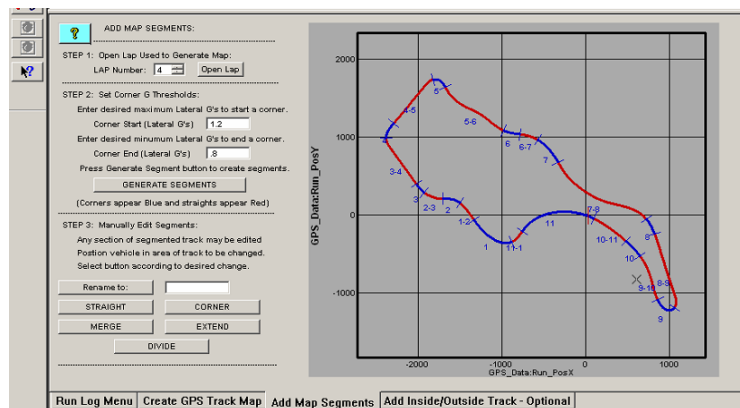
The Add Map Segment page is used to divide a track map into timing segments for data analysis. The track map can be broken into segments automatically utilizing lateral acceleration or can be divided manually by the user. GPS based segment times are based on GPS plotted points, and are therefore as accurate as trackside segment beacons.

Lap Zoom:

The Lap Zoom page provides a both a GPS track map and GPS track map with zoom features. The zoom feature allows the user to zoom into any area of the track map, for detailed data analysis.
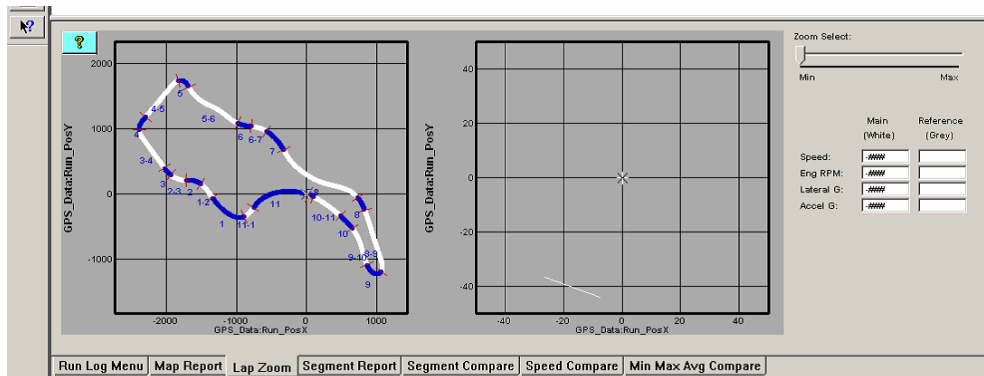
Map Report:

The Map Report page provides detailed speed analysis for each track segment. This information is automatically produced, upon opening of a lap.
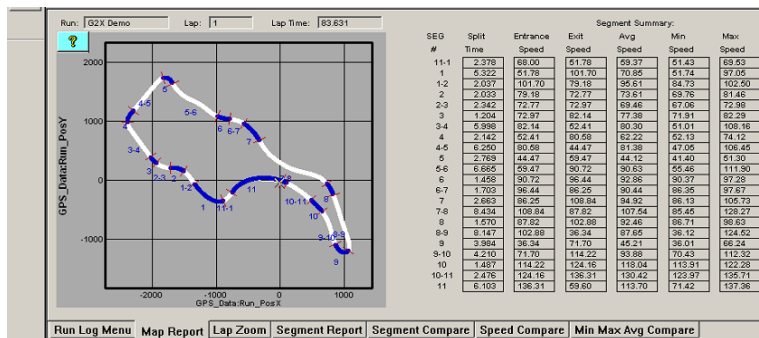
Segment Report / Segment Compare / Speed Compare:

Each page provides detailed segment timing information. Segment Report provides a review of all segment times, for all laps contained within one Runfile. Speed Report provides an analysis of segment / speed for two laps. Segment Compare provides the ability to compare segment times from two selected laps.

Segment Report

| Lap #	Start Time	Lap Time	11-1	1	1-2	2	2-3	3	3-4	4	4-5	5	5-6	6	6-7	7	7-8	8	8-9	9	9-10	10
1	41.358	83.631	2.378	5.322	2.037	2.033	2.342	1.204	5.998	2.142	6.250	2.769	6.665	1.458	1.703	2.663	8.434	1.570	8.147	3.984	4.210	1.487
1	41.358	83.631	2.378	5.322	2.037	2.033	2.342	1.204	5.998	2.142	6.250	2.769	6.665	1.458	1.703	2.663	8.434	1.570	8.147	3.984	4.210	1.487
2	124.989	79.651	2.265	5.227	2.034	2.026	2.317	1.184	5.707	2.187	6.104	2.821	6.601	1.454	1.724	2.641	8.228	1.534	7.745	4.010	4.217	1.490
3	204.640	79.820	2.137	5.269	2.006	1.936	2.343	1.204	5.914	2.144	6.155	2.772	6.665	1.443	1.689	2.594	8.146	1.513	8.148	3.958	4.194	1.482
4	284.460	80.473	2.180	5.291	2.054	1.695	2.389	1.277	6.330	2.379	6.227	2.806	6.671	1.425	1.708	2.631	8.089	1.514	8.082	3.948	4.210	1.482
5	364.933	80.037	1.996	5.350	1.996	1.953	2.295	1.208	5.947	2.177	6.221	2.798	6.730	1.495	1.727	2.681	8.119	1.540	8.139	3.940	4.256	1.494
Theoretical Fast Lap:		78.676	1.996	5.227	1.996	1.695	2.295	1.184	5.707	2.142	6.104	2.769	6.601	1.425	1.689	2.584	8.089	1.513	7.745	3.940	4.194	1.482

Run Log Menu | Map Report | Lap Zoom | Segment Report | Segment Compare | Speed Compare | Min Max Avg Compare

Segment Compare

Ref Run: G2X Demo

Lap #	Start Time	Lap Time	11-1	1	1-2	2	2-3	3	3-4	4	4-5	5	5-6	6	6-7	7	7-8	8	8-9	9	9-10	10
2	124.989	79.651	2.265	5.227	2.034	2.026	2.317	1.184	5.707	2.187	6.104	2.821	6.601	1.454	1.724	2.641	8.228	1.534	7.745	4.010	4.217	1.490

Run: G2X Demo

Lap #	Start Time	Lap Time	11-1	1	1-2	2	2-3	3	3-4	4	4-5	5	5-6	6	6-7	7	7-8	8	8-9	9	9-10	10
1	41.358	83.631	2.378	5.322	2.037	2.033	2.342	1.204	5.998	2.142	6.250	2.769	6.665	1.458	1.703	2.663	8.434	1.570	8.147	3.984	4.210	1.487

Run Log Menu | Map Report | Lap Zoom | Segment Report | Segment Compare | Speed Compare | Min Max Avg Compare

Speed Compare

Run: G2X Demo   Lap: 1   Lap Time: 83.631

SEG #	Split Time	Entrance Speed	Exit Speed	Avg Speed	Min Speed	Max Speed
11-1	2.378	68.00	51.78	59.37	51.43	69.53
1	5.322	51.78	101.70	70.85	51.74	97.05
1-2	2.037	101.70	79.18	95.61	84.73	102.50
2	2.033	79.18	72.77	73.61	69.76	91.46
2-3	2.342	72.77	72.97	72.97	67.06	72.98
3	1.204	72.97	82.14	77.38	71.91	82.29
3-4	5.998	82.14	52.41	80.30	51.01	108.16
4	2.142	52.41	80.58	62.22	52.13	74.12
4-5	6.250	80.58	44.47	81.38	47.05	106.45
5	2.769	44.47	59.47	44.12	41.40	51.30
5-6	6.665	59.47	90.72	90.63	55.46	111.90
6	1.458	90.72	96.44	92.86	90.37	97.28
6-7	1.703	96.44	86.25	90.44	86.35	97.67
7	2.663	86.25	108.84	94.92	86.13	105.73
7-8	8.434	108.84	87.82	107.54	86.45	128.27
8	1.570	87.62	102.88	92.46	86.71	98.63
8-9	8.147	102.88	36.34	87.65	36.12	124.52
9	3.984	36.34	71.70	45.21	36.01	66.24
9-10	4.210	71.70	114.22	93.88	70.43	112.32
10	1.487	114.22	124.16	118.04	113.81	122.28
10-11	2.476	124.16	136.31	130.42	123.97	135.71
11	6.103	136.31	59.60	113.70	71.42	137.36

Reference Run: G2X Demo   Lap: 2   Lap Time: 79.6511

SEG #	Split Time	Entrance Speed	Exit Speed	Avg Speed	Min Speed	Max Speed
11-1	2.265	73.42	55.10	61.13	55.54	75.77
1	5.227	55.10	101.76	72.13	54.43	97.58
1-2	2.034	101.76	80.18	98.79	85.60	104.75
2	2.026	80.18	75.33	74.66	69.82	81.92
2-3	2.317	75.33	76.63	71.86	68.78	75.90
3	1.184	76.63	87.40	79.84	76.60	83.22
3-4	5.707	87.40	52.20	84.83	53.30	110.73
4	2.187	52.20	79.26	61.70	52.07	75.71
4-5	6.104	79.26	44.59	82.83	46.86	107.49
5	2.821	44.59	58.95	43.89	39.92	54.11
5-6	6.601	58.95	91.60	92.53	58.82	111.66
6	1.454	91.60	95.05	93.73	91.10	97.81
6-7	1.724	95.05	85.39	89.74	84.90	95.93
7	2.641	85.39	110.51	95.56	85.19	106.78
7-8	8.228	110.51	91.17	110.18	86.88	130.73
8	1.534	91.17	104.96	95.19	89.74	100.40
8-9	7.745	104.96	34.79	91.54	33.79	125.98
9	4.010	34.79	71.46	43.44	33.96	64.24
9-10	4.217	71.46	113.86	92.41	68.57	111.06
10	1.490	113.86	123.85	116.81	112.84	121.16
10-11	2.482	123.85	133.31	129.60	122.83	135.26
11	5.825	133.31	78.92	116.84	93.23	134.38

Run Log Menu | Map Report | Lap Zoom | Segment Report | Segment Compare | Speed Compare | Min Max Avg Compare
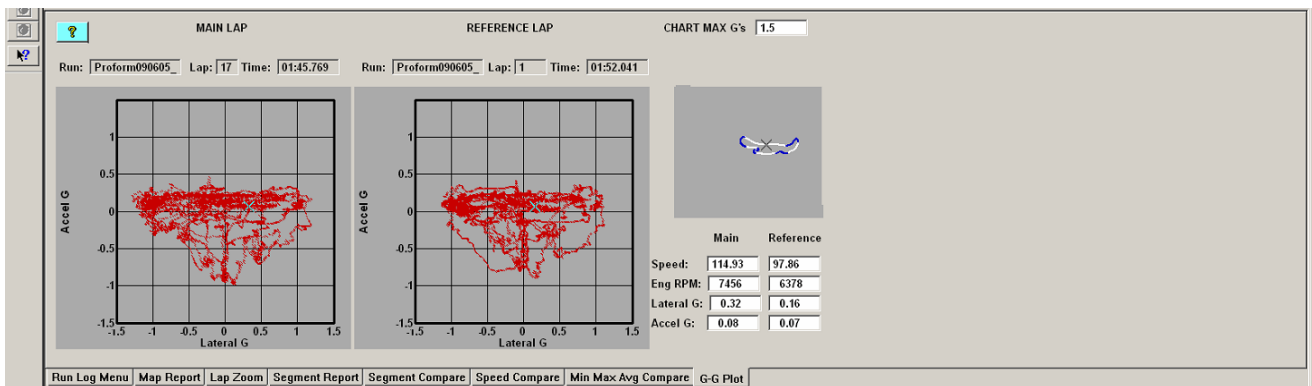
Min Max Avg Compare:

The Min Max Avg Compare Runlog page allows the user to compare minimum, maximum and average data between any two selected Main and Reference laps.

G-G Plot:

The G-G Plot Runlog page provides plotted accel and lateral G force data, compared between any two selected Main and Reference laps.

Gauges:
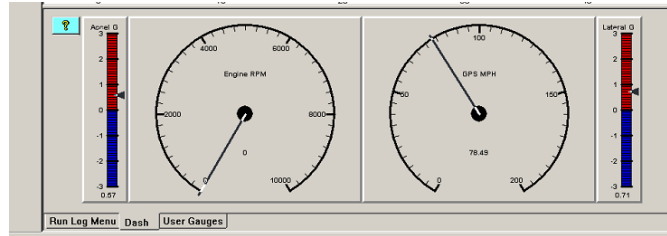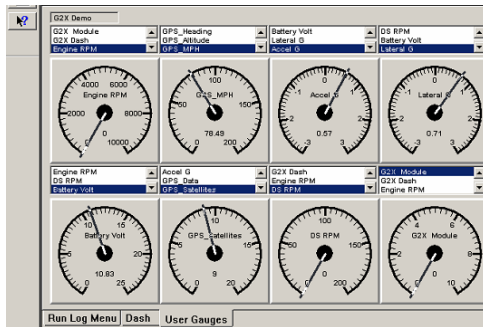
The Gauges page provides a "dash panel" view of graphed data. User Gauges page provides the ability to select the input of each gauge as defined the user, according to the data under review. The Dash page is pre-defined and provides RPM / Speed and G force data. As the mouse cursor is moved through the graph area, the gauge movement corresponds to the data channel associated with the gauge.

Tire Temperature / Pressure Calculator Page:

The Tire Temperature & PSI page provides the user a means of logging tire temperatures, following each run. Upon insertion of all tire temperature data, the page will calculate average per tire, along with front and rear average, thus eliminating the time consuming manual calculation of data. In addition, this page provides the user a quick visual to assist in determining chassis setup changes.

The Pressure area provides the means to monitor tire pressure gains, with each run. The user simply inserts the Cold and Hot pressure readings for each tire, and the system will calculate pressure gains, per tire.
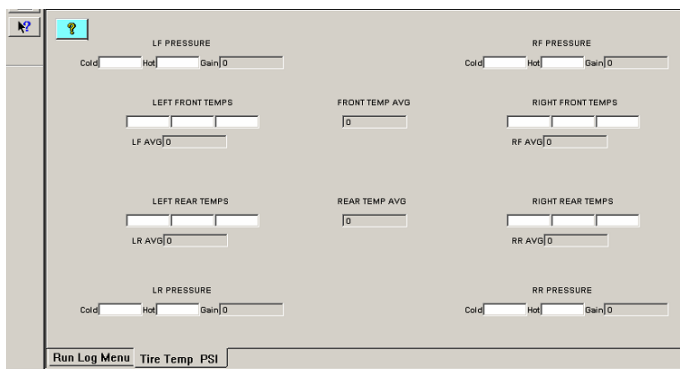
Conclusion:

Thank you for taking time to review the G2X demo. At Racepak Data Systems, our goal is to provide the best data analysis hardware and software available, along with unparalleled customer service. We hope this demo has provided an insight into our commitment to this goal. If you have any questions, please feel free to contact one of our technical representatives.

Thank you,

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

www.racepak.com

www.g2xtreme.com