

Appendix 10 New Features in v4.2 B

The Dyno DataMite Analyzer has had many updates since this user manual was written for the original v3.2 for Windows. Here is a brief listing of some of the features released in Version 4.2 B.

Here's a list of the most notable features which have been added or changed. For a complete list of changes, check the readme.doc file on the website right below the demo program download option (with the spinning disk). Some of the features listed here apply to only the Professional or Enterprise Edition, and it will be noted. Anything which applies to the Professional "Pro" version also applies to the Enterprise Edition.

The website will have the most up-to-date information. This can be found under Support, then FAQs, then Dyno DataMite..., or Support, then User Manuals, or Programs, then Data Loggers, then either Dyno DataMite or Dyno DataMite – Enterprise Edition.

New Controller Features and Hardware Enhancements

There is a new "Hybrid" control option, where the controller (Figs 10.01, 10.02, 10.03):

- Starts in RPM control mode. This way you can easily open the throttle to full power and the RPM stays low, at the starting RPM you have dialed in with the knob.
- Then when you press the Start switch, the controller switches to load control during the acceleration to the maximum RPM you have programmed. Load control is typically smoother than RPM control during the acceleration.
- Once maximum RPM is reached, it reverts back to RPM control to bring the engine back to the starting RPM.

There is a new option of "Stand Alone Control". In this mode, the controller does not need to communicate with the PC for doing a test. The controller knows the type of control you want to perform, the ramp rate, and the maximum RPM. This ensures more reliable testing because the controller's communication with the PC is not needed. NOTE: This mode works only for doing accelerating tests, not for decelerating tests. (Figs 10.01, 10.02)

- If you are doing an accelerating test in PC Control mode, the PC watches for the maximum RPM and sends a command to the controller to return to the starting RPM when maximum RPM is reached. You will see a Max RPM number on the controller screen which is slightly greater than maximum RPM as a safety backup. If the controller sees this maximum RPM, it will also ramp back to the starting RPM. Therefore it is critical that the PC is reading a correct RPM signal and the Max RPM on the PC screen is correct.
- If you are doing an accelerating test in Stand Alone mode, the controller watches for the maximum RPM and returns to the starting RPM when maximum RPM is reached. Therefore it is critical that the controller is reading a correct RPM signal and the Max RPM on the controller screen is correct.

There is now a controller "Control Panel" on the Current Readings screen. This way you can make simple changes to the controller settings without having to do a full tune through the DataMite screen. The Control Panel also has features not found elsewhere in the program, like (Figs 10.04, 10.05):

- Change Ramp Rate: Here you can change the typical Ramp Rate for doing an accelerating test. You can also set this to 0 and when you start recording, the controller does not start ramping the RPM either up or down. This is great for recording data for some custom type test.
- Keep Recording at End of Run: Use this feature to keep the Current Readings screen open and continue recording after the acceleration test is done. You will then have to stop recording manually by pressing the Record switch, or clicking on the yellow "Stop Recording" button with the mouse.

You can now program in a controller schedule for doing testing. The schedule lets you program various times to be at certain RPMs and throttle openings if you have the Auxiliary throttle control. You can select to have this schedule repeat a certain amount of times, should you want to run a particular schedule, like for a break in. Enterprise Edition only. (Figs 10.06, 10.07)

When running a Controller Schedule, here are suggestions for it to work well:

- The controller must be set to PC Control and "Water Brake w RPM Control".
- The Schedule should have some Segments where the start RPM and ending RPM are the same. This is where the controller is not ramping the RPM (which is less precise), but is commanding an exact RPM which is precise.

- Segments should be about 2 seconds or longer. Ramping segments are more accurate if they are longer than 2 seconds.
- Segments 1 and 2 should have the same RPM and the last 2 segments should have the same RPM. This ensures a stable, exact RPM at the start and end of the test.
- The Schedule is controlled by the PC so the USB communications to the controller must be very reliable. Suggestions to ensure good communications include:
 - Slow down the recording rate in the DataMite specs screen, down from say 50 samples/second to 10 samples/second.
 - Slow down the update rate of the Current Readings screen, down from say 10 updates/second to 5 or less. This is done under Options at the top of the Current Readings screen.
 - Do not maximize the Current Readings screen, but leave it at its default (smaller) size. The bigger the gauges, the more computer time it takes to update them and the less time for USB communications to the controller.

When you are in the controller settings screen and you make significant changes to the type of control, the program will warn you that you should probably click the “Defaults” button to load reasonable default settings before doing a “Tune” on the controller. This will prevent you from loading very wrong settings.

The program better ensure that Max RPM in Controller Screen matches 'Max RPM in Test Conds screen. If they are different, it can create some problems.

An option for not allowing F1/F2 to start/stop recording has been added. If this feature is turned Off, it can help when the controller is Stand Alone, and only the Record button on the hand held controller is used to start and stop recording. (Fig 10.00)

The Dyno Controller now has an option for Averaging the RPM signal. This can create better control for 1 cylinder dynos, where 1 revolution (the 'power stroke) is faster than the other rev (overlap stroke).

If you are doing Load Control, now you can have 2 ramp rates for doing accelerations. Some users have found that if there is only one ramp rate, the acceleration rate can slow down on the way to the maximum RPM. This option lets you set an RPM at which a 2nd ramp setting will take over to allow the acceleration rate to keep more constant.

You can now temporarily disable the Accel or Decel ramp from the Current Readings screen by entering a Ramp Rate of 0. This only works with the controller in PC control mode. This way you can record data for a custom test without the controller ramping the engine up or down.

There is a new feature “Shutdown Rate after Test” so you can tell the controller how quickly to return to the starting condition after doing an accelerating test. For most engine dynos with low inertia, you probably want this to be Fast. For chassis dynos with more inertia and a vehicle, you may want this to be Medium or Gentle.

The screen for setting up the Auxiliary Controller (typically throttle) has been simplified.

Check your controller’s Quick Start for more complete and up-to-date features.

New Program Operation Features

Now the program stores preference settings and critical config settings with each data file. This way if you have an old data file, you can more completely restore all the program’s settings to what they were when this test was run. You have to request this file to be opened in a special way to accomplish this. (Fig 10.08)

Program now has a Preference setting for "Starting a New Test" where the default is a "new method" started in version 4.2 B. Now you can start a new test with new settings, comments, DataMite calibrations, etc. *before* running the actual test. If you do not run a test after making these changes, there will be no data file for this test. This was not allowed in previous versions and made it difficult to make changes *before* running a test. As always, you can still make changes after a test and the data will refigured based on your changes. You can also set this Preference to “Old Method” if you wish.

Program now has a Preference to graph 1 additional data channel to the main screen. This could be A/F, Boost, most anything you are measuring. This graph will also appear on printouts of the main screen. Obviously the full Graph features let you graph most anything you want, up to 8 channels. Pro and Enterprise version only. (Fig 10.09)

Program now has a Preference to allow choosing the color of the graph lines on the Main Screen. (Fig 10.09)

After running the first test, the program will connect to the DataMite III or DataMite 4 faster.

Program now has a Preference to allow you turn on the Test Method of "Measure TqHP from Accel/Decel". Many users got this test type confused with the *much* more typical test type "Measure TqHP from Accel". Obviously the preference lets you turn on the ability to choose the Test Method of "Measure TqHP from Accel/Decel".

You can now set a Min RPM and Max RPM (starting and ending RPM) for automatically recording dyno data in Test Conditions. Here are some notes about this option Enterprise Edition only. (Figs 10.14, 10.15):

- This option is not available if you are using the Controller, or do not have the Enterprise Edition.
- The RPM that is monitored for recording is Engine RPM, whether it is actually measured, or calculated from dyno RPM.
- Recording will actually start slightly before and end slightly after these RPMs. That is to better ensure the Min and Max RPMs are included in the data.
- The software will very precisely measure the time between these 2 RPMs and display it on the Main Screen, and also in the History Log. For example, it may say "2000->6000 7.561" meaning it took 7.561 seconds to accelerate from 2000 to 6000 RPM. It may also say something like "2239->6000 7.561" which means the data set did not include 2000 RPM, and 2239 RPM was the lowest RPM recorded.
- If you choose this option, and you are doing accelerating tests like with an inertia dyno, you should enter the Current Readings screen with the RPM less than the Min RPM. Otherwise recording will start immediately. If the RPM is above the Max RPM, recording will also end immediately.

Now you can position the report columns in different orders. For example, if you want Boost PSI and A/F to come before Corr Tq and Corr HP, now you can. (Fig 10.10)

Program now has fixed bug where the last data point of an inertia dyno run could jump up. Now the last data point is based on more than just 1 data point.

If the DataMite logger is encountering severe electrical noise, it can affect the sampling rate, or the time stamps between data readings. For example, if you are sampling 50 times per second, the time stamps should be 20 milliseconds apart. If the program finds time stamps different than expected in a data set, it warns you how badly the data set is corrupted. For inertia dynos where acceleration rate is critical, bad time stamps can introduce significant errors measuring torque and HP. Warning you of these errors can be very useful for trying to troubleshoot the source of the noise. We've seen electric motors (especially VFD motors), light fixtures, ultra-sonic cleaners, and more produce electrical noise producing this problem. Repositioning the logger or sensor cables typically fixes it. Additionally, if bad time stamps are found, the program asks if it should try to fix the data. At this point, the software appears to do a very good job of correcting data for this problem. (Fig 10.11)

The software now has a Preference setting which tells the program what to do if electrical noise is encountered. With the correct choice, the noise can be handled automatically if it is found. (Fig 10.21)

Digital Outputs for *Analog Channels* now work with firmware v 313 DataMite 4. The program now also has a message about powering down and powering up the DataMite after loading Digital Output info to properly activate the settings.

The Main graph(s) now better fill all the available screen area. The data grid on the left side has also been enlarged as needed to avoid possible problems where the slide bar could flicker and be disabled. (Fig 10.09)

There are new Graph options to temporarily slide graphs up or down for better comparisons, Dyno Enterprise Edition, or Pro versions of Road Race/Circle Track or Drag Race software only. (Fig 10.12)

There's a new Preference for "Allow Back-to-Back Dyno Tests very Quickly" under "Calculations, cont" tab. This setting loosens up the requirements for a dyno test to allow for them to happen more quickly back to back, and not require as much RPM change to be called a dyno test. These looser tolerances work better for finding beg and end of dyno runs that happen very rapidly, back to back.

Inertia dyno runs should now produce data closer to the ending RPM for tests where the acceleration continues through the last RPM recorded. The software was originally designed to work best when there was a short deceleration after the maximum RPM was reached.

You can now specify a "red line" marker on both of the round gauges in Current Readings. (Fig 10.17)

Program now limits or let you permanently hide many info messages with Preference settings. You now have a “Don’t Show This Again” option for the Warning message which appears on program startup. A new Preference has been added to allow choosing Make Assumptions to Eliminate Messages and messages which appear at the end a dyno run will now be answered by the program, and not show you the choices. This will eliminate most all messages after the test, and works well if your data has no problems. If this is set to No, you will see options and notes about your test. These can help explain what your test looks like and why. If you keep this setting at No, you can just press the Enter key for these messages to accept the standard default choice. As with most all messages, if you just press Enter, the default choice is made. You do NOT have to click a button with the mouse.

If you set all the new and old Preferences to No for showing warning messages after a test, you should be able to click the Start Dyno Run button to start a new test with no messages at all.

There are 2 new Print options for Graph History to eliminate some columns for less cluttered printouts. (Fig 10.17)

You can click on the “Save?” label for the “Save?” column in the History Log and the program gives you the option to set most all the entries in this column to Yes or blank them out. This action will start on the top line displayed in the log. For example, let’s say you want to keep the first 40 lines of the history log but delete all the rest. If you scroll through the History Log so line 1 is the top line displayed, you can set most all the lines to Yes. Then scroll so line 40 is the top line displayed, you can blank out all lines starting at 40 through 100. If you choose to “Clear History Log”, the top 40 lines are marked with a Yes to save and will not be cleared. (Fig 10.16)

Now if you select a combination of Report specs which are not allowed, the program will offer you a correct combination.

The option to Turn Off Fan for USB loggers work faster.

The program has fixed some issues so printouts now better space things out when 'pictures are included in the printouts.

The program is more reliable for not writing a corrupt config file.

The program now has enhanced Preferences for sending emails under the Emailing tab. (Fig 10.20)

New Sensor Options

Now you can more accurately re-zero the Performance Trends BlowBy sensor.

Now when you re-zero or adjust most any sensor, the program presents a small, blue progress bar so you know things are happening, and how much longer it will take. This also occurs when you click on the “Read” button when calibrating an analog sensor like torque.

Program now has 2 new types of temperature sensors. These sensors can also be assigned to be used for Engine Intake Air temperature to be used for weather correction factors.

- Standard GM temperature sensor, typically used in intake manifolds, with a range from about 40 to 180 deg F..
- The RTD temperature sensor we use with our flow bench data loggers, with a range from about 35 to 200 deg F.

The program has enhanced method to make formatting SD card work better in Win 10 and Win 11 for vehicle data loggers.

The Circle Track/Road Race DataMite version allows Shock Dyno Data to be used to calculate shock and spring force on the track. Pro version only.

You can now specify a Fuel Table for the calibration of fuel turbines. This will allow for more accurate fuel flow and BSFC readings. Enterprise Edition only. (Fig 10.13)

You can now calculate Volumetric Efficiency from A/F and Fuel Flow. (Fig 10.19) There are some limitations to this calculation:

- There must not be any channel for measuring Air Flow. Otherwise this channel will be used for measuring air flow.
- You must have only 1 fuel flow channel measuring all fuel to the motor.
- The A/F channel must use one of the built in calibrations for A/F systems provided in the DataMite Calibrations, or if it is a user supplied calibration, it must have the name of the channel start with either the 3 characters of "A/F" or "AFR".
- The program must have accurate weather data recorded by the logger or entered in the Test Conds screen.

Figure 10.00 Turning Off F1 and F2 Keys

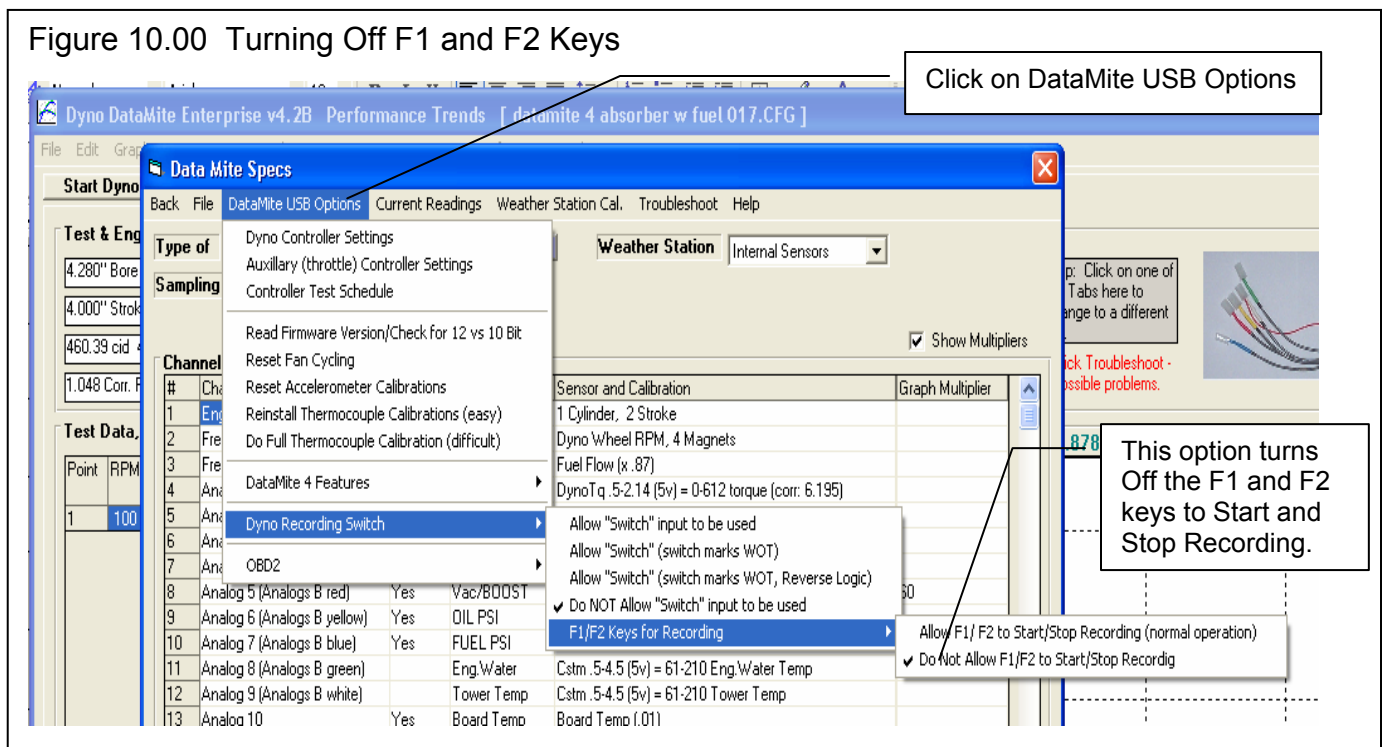
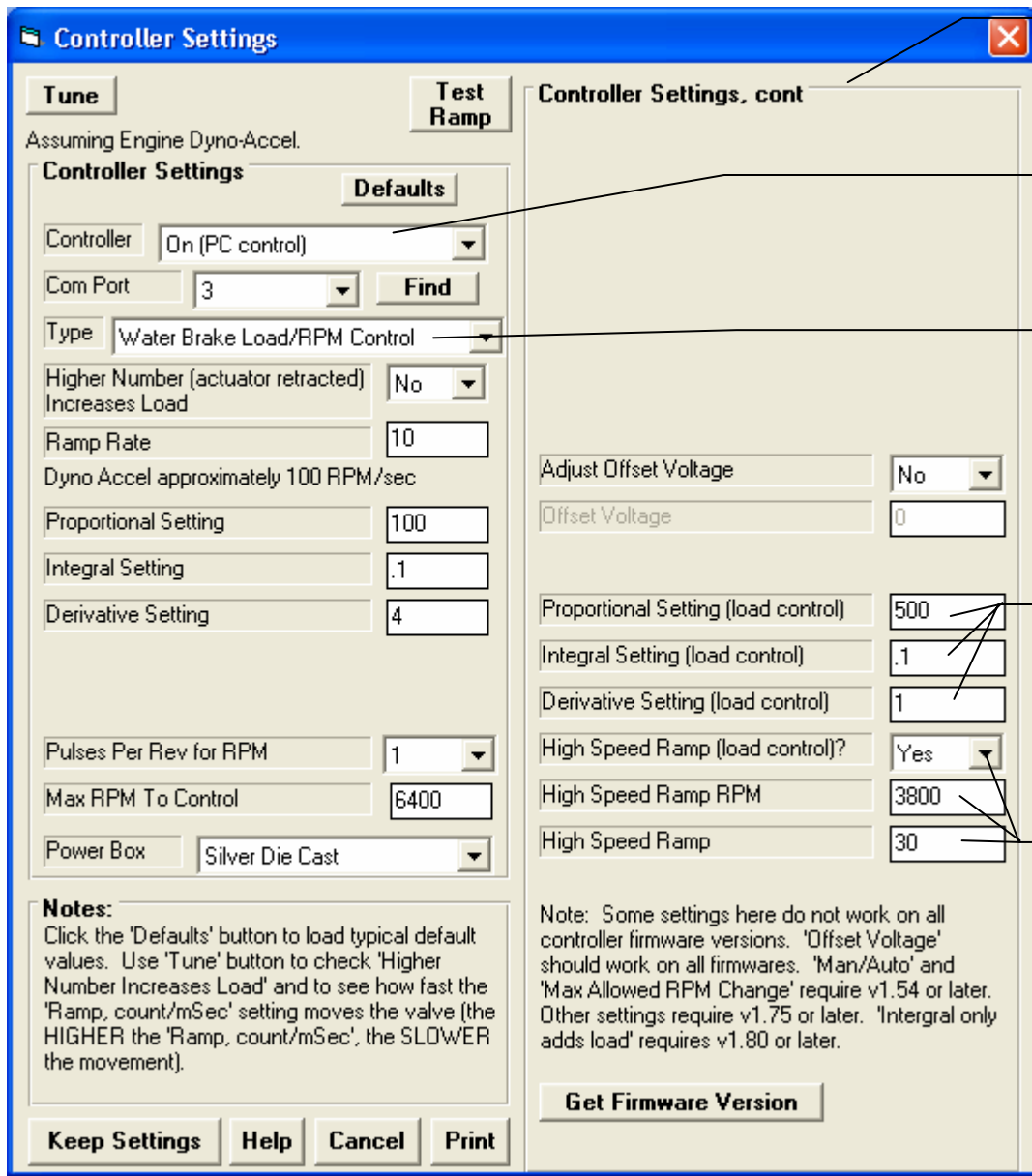
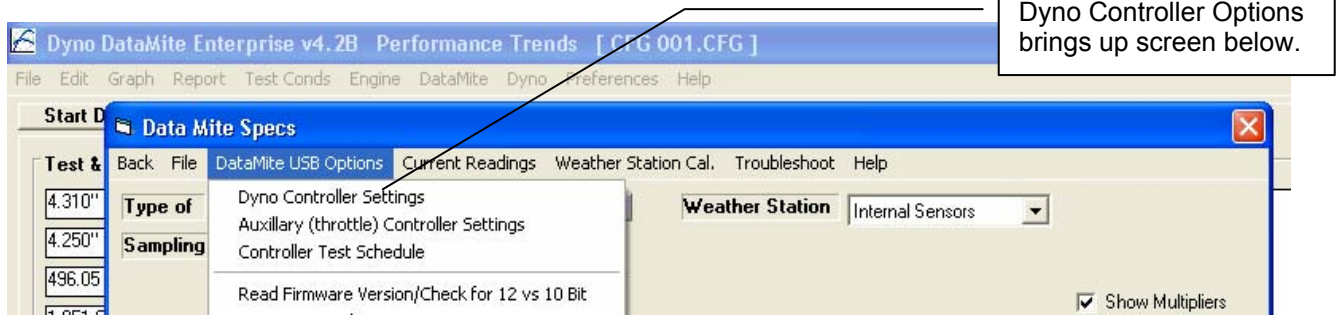


Figure 10.01 New Controller Options



Dyno Controller Options brings up screen below.

There are many new options in this new section.

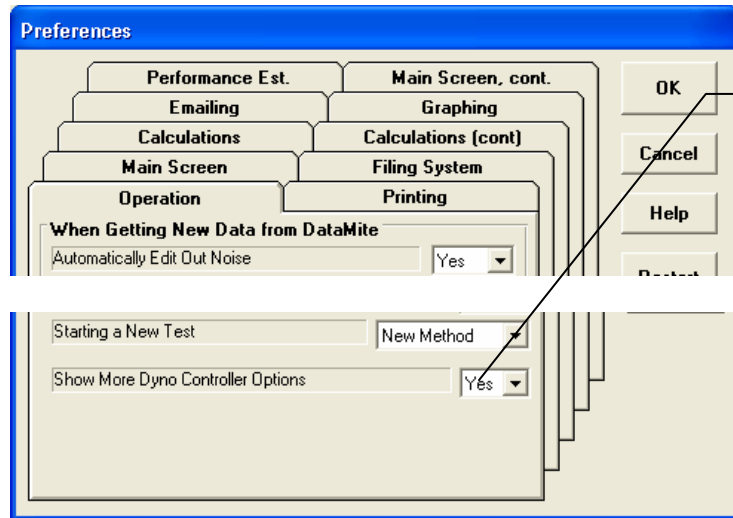
There's a new Controller option called "Stand Alone".

Now there are 4 control options, with the newest "hybrid" shown here "Water Brake Load/RPM Control"

These are the settings for the Load Control portion of the new "hybrid" load control.

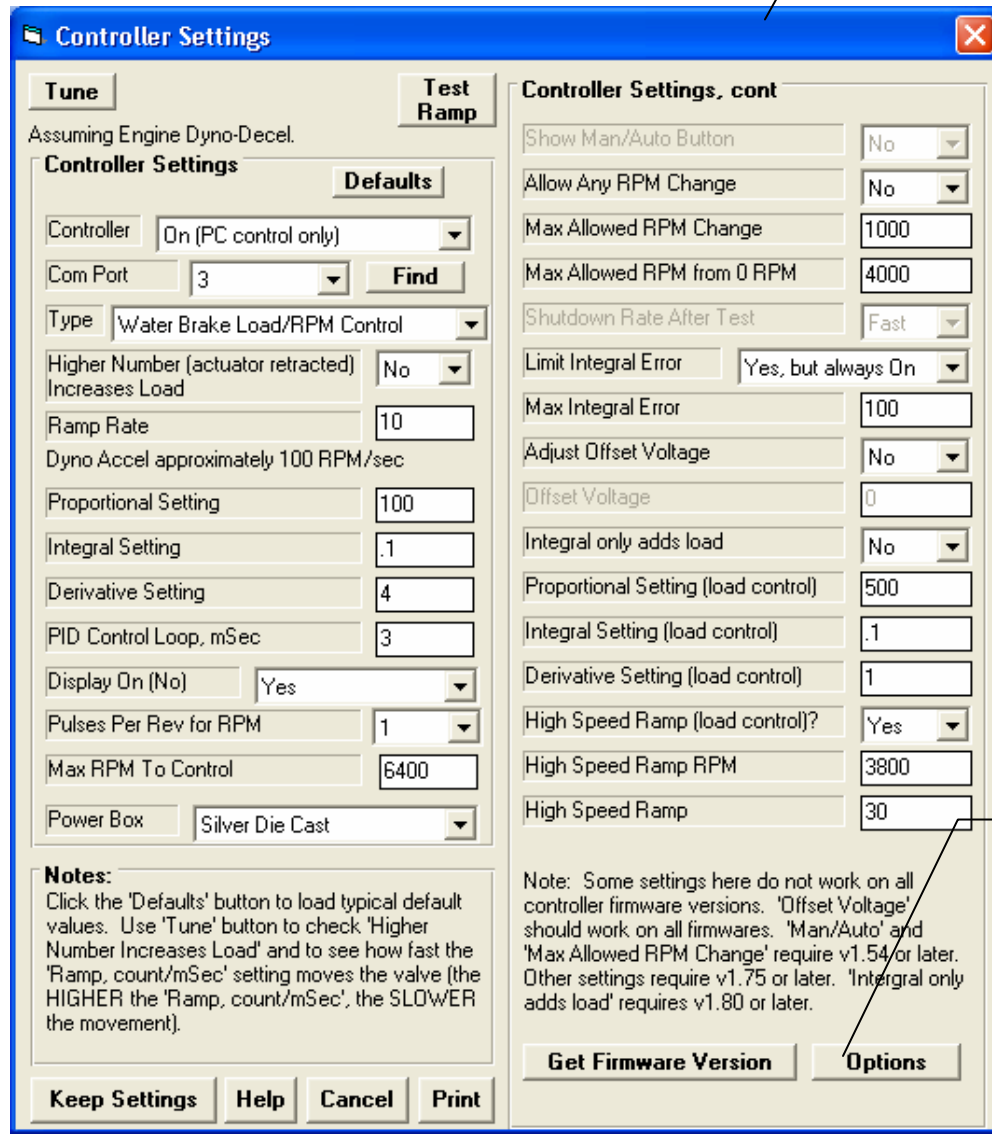
These 3 inputs let you add second ramp to load control, that will start at a particular RPM.

Figure 10.02 More Controller Options if you Change Preferences



Under Operation tab, set Show More Dyno Controller Options to Yes, then click OK to keep this change.

You now have more setting to change to "fine tune" a controller. Typically changing these from the default settings is not needed.

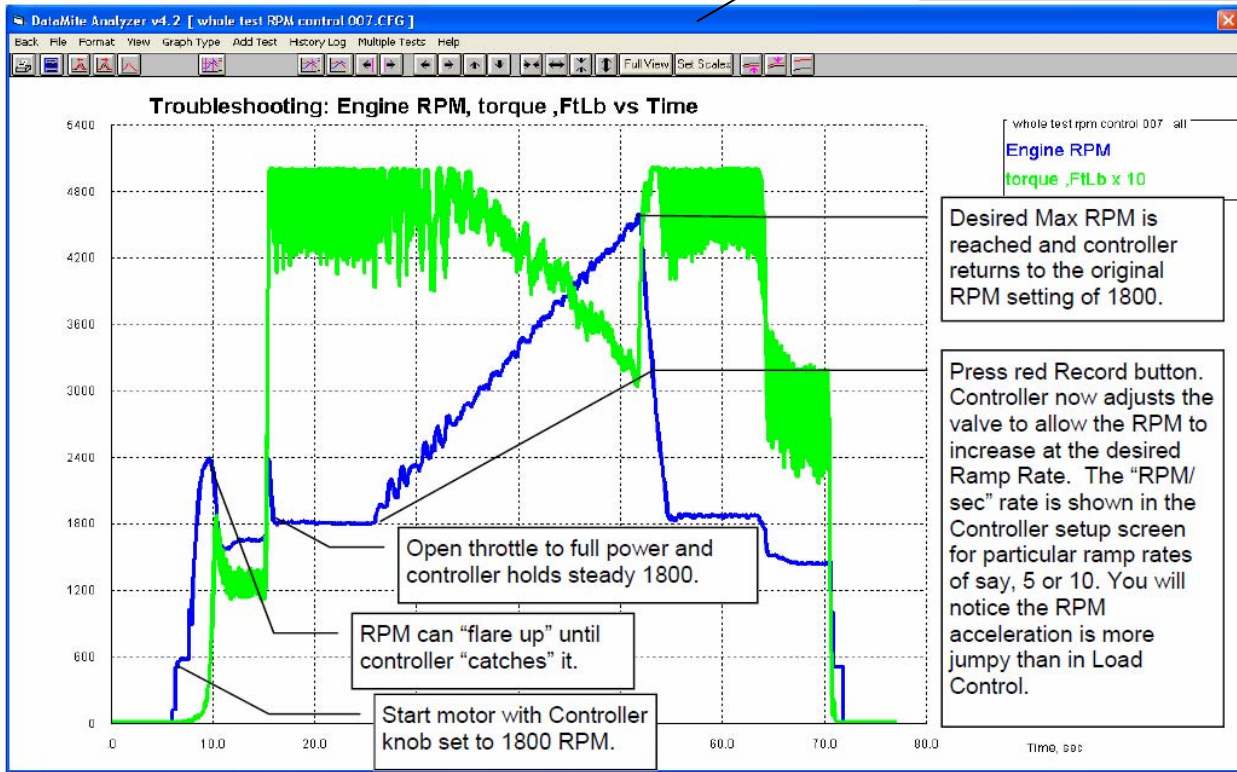


Even more options are available here, by clicking this button.

Figure 10.03 RPM and RPM/Load Control Modes

RPM Control

Improved RPM Control



RPM/Load Control

New hybrid RPM/Load Control Process

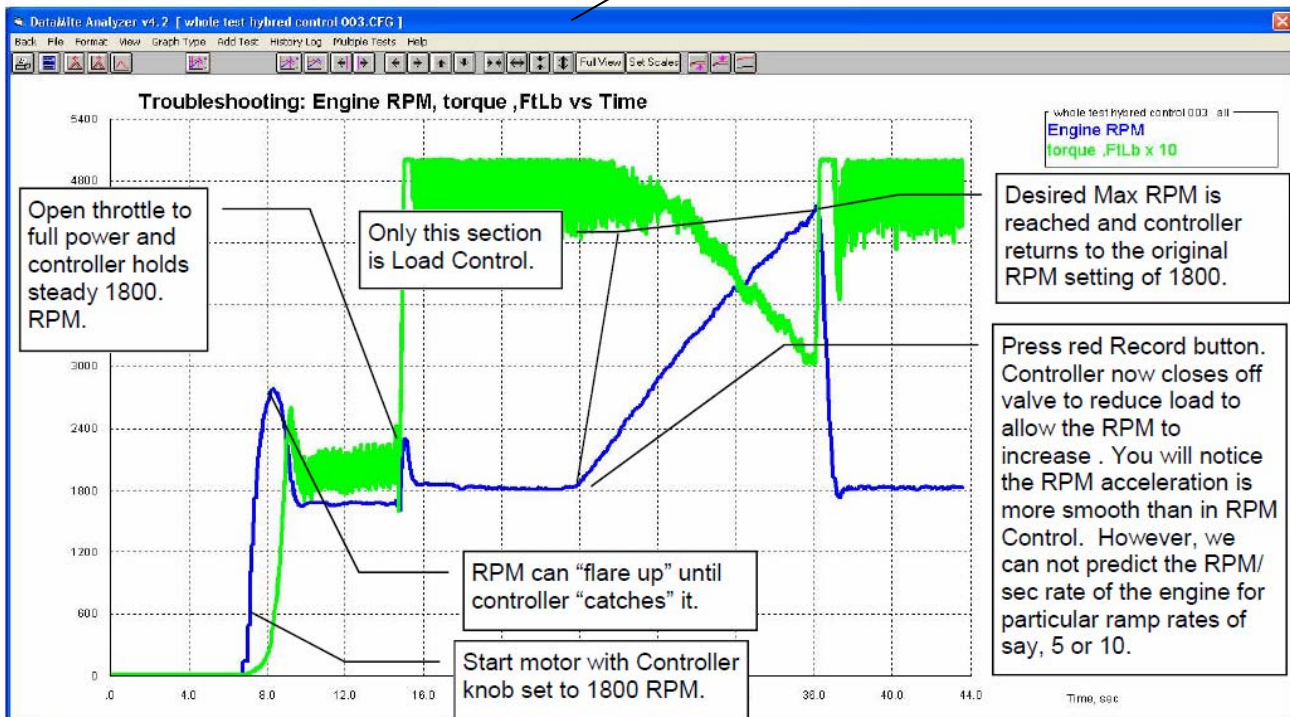
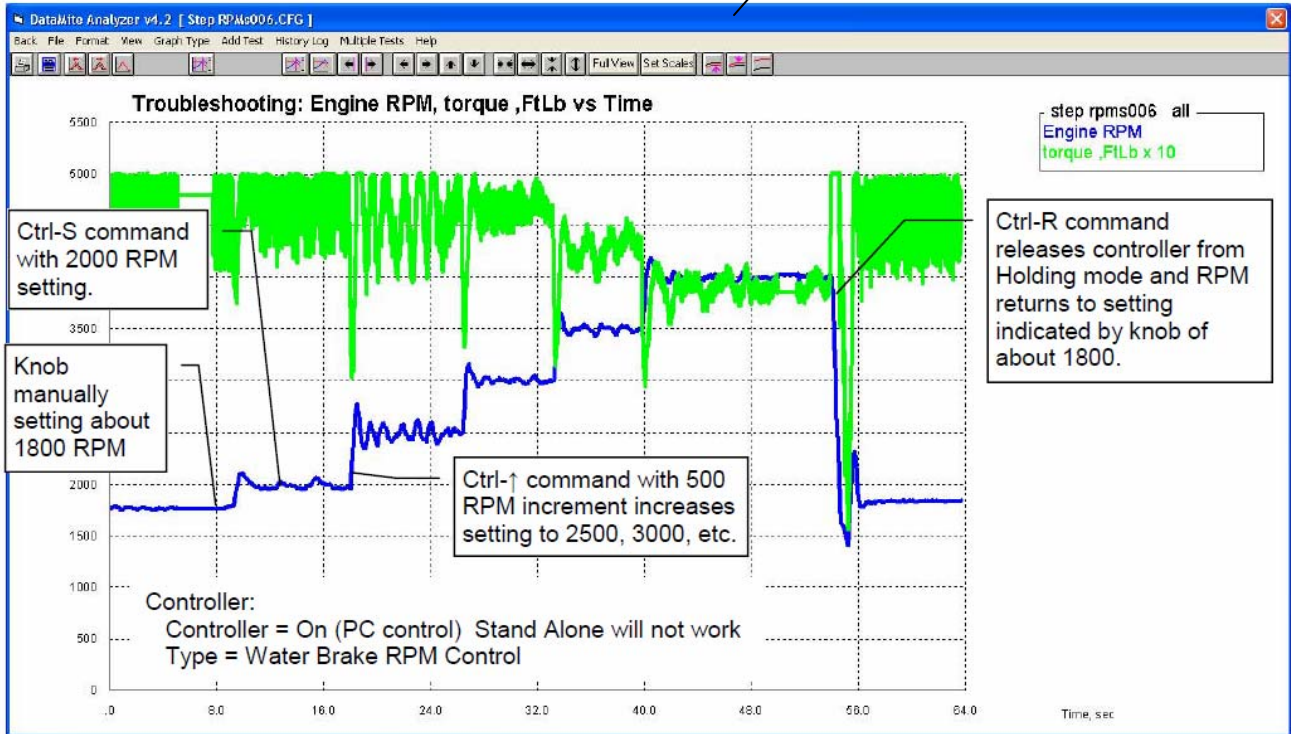


Figure 10.04 RPM Holding and Decel Control Modes

Water Brake RPM Control in Hold Mode

New Hold RPM options



Water Brake Load Control for Decel Testing

Doing Decel tests in PC Control Mode

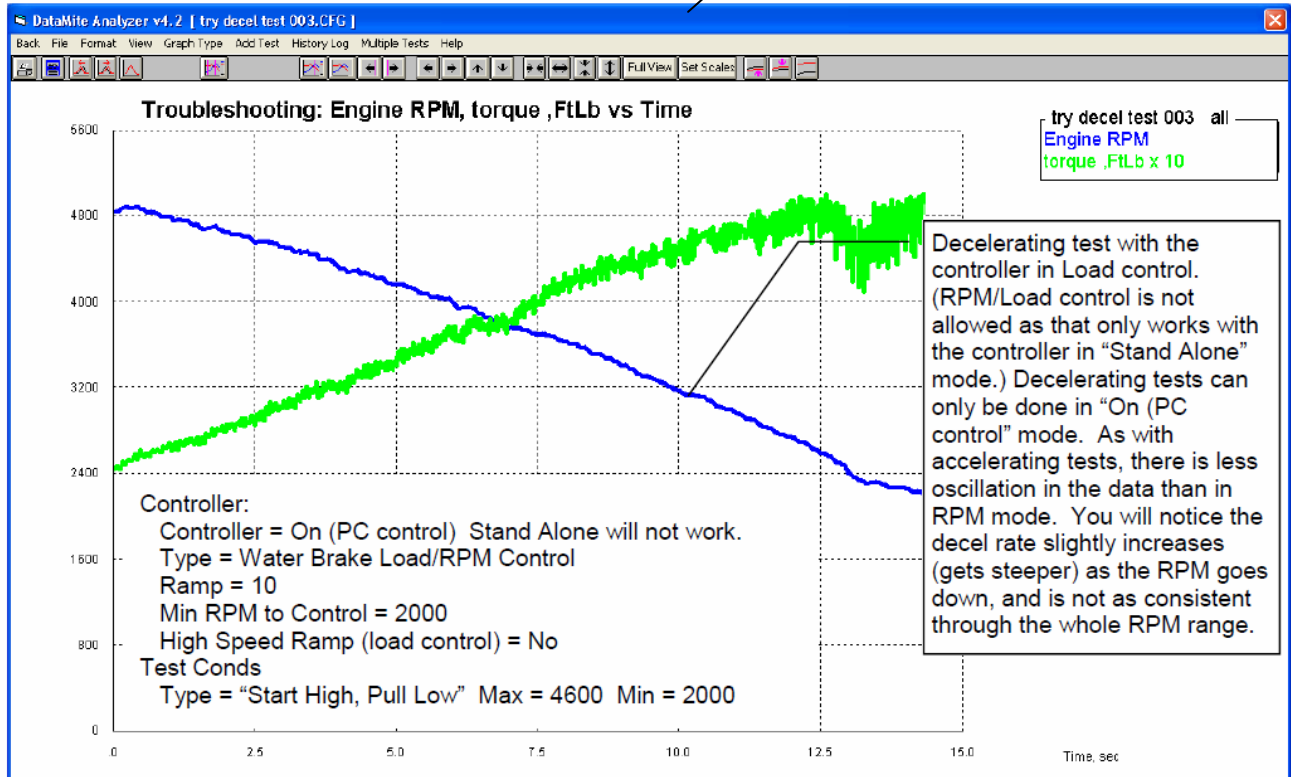


Figure 10.05 New Control Options in the Current Readings Screen

Click on "Set" button for these new options.

Here's the list of new items you can change on the Current Readings screen. Note the shortcuts, like Ctrl+X to change the Maximum RPM for finishing the run. Shortcut keys are typically more reliable than clicking through the menu options while the DataMite is communicating.

Controller Frame gives a summary of the controller's current settings, like 4400 RPM for max RPM at the end of an Accelerating test. The "?" means that is the last Max RPM loaded to the controller from the PC software. You should check that this is the Mx RPM on the controller's screen.

A new feature is you can set Ramp Rate to 0 to disable ramping. Now when you start to record data, the controller does NOT start a ramp, but just follows whatever you do with the knob, or with the Hold Steady commands.

Typically you want to stop recording at the end of the run. But for some custom types of test you may want recording to continue until you click the yellow "Stop" button, or press the F2 key if it is activated.

Hold options work for holding RPM constant.

- Ctrl+S (hold the Ctrl key down and press and release the S key) lets you enter an RPM you want to hold constant.
- Ctrl+↑ and Ctrl+↓ let you step up or down the constant RPM by the RPM Increment.
- Ctrl+C lets you specify the increment for the arrow keys.
- Ctrl+R lets you "resume" normal testing, not holding RPM constant.

These Hold options only work with the controller in PC Control mode, because the PC must send commands to the controller.

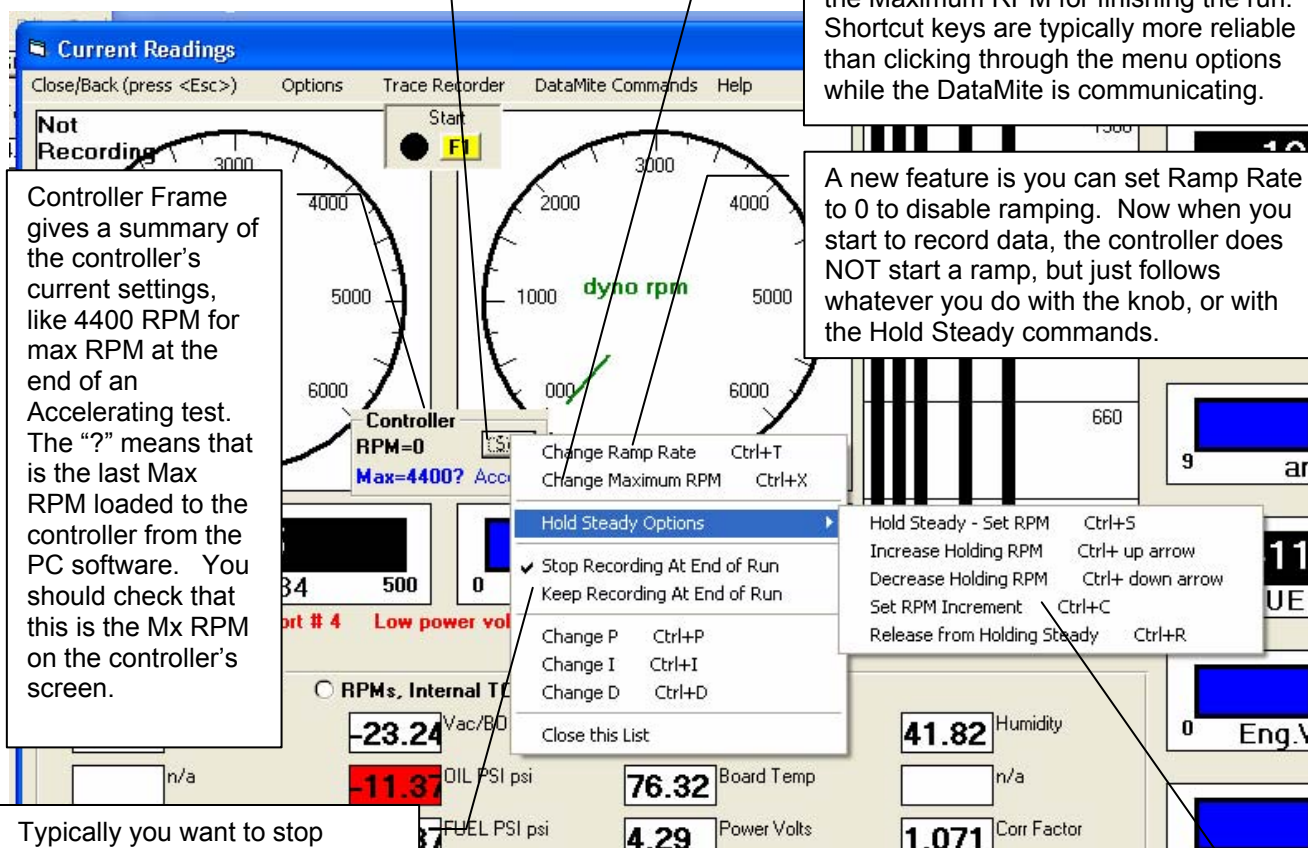
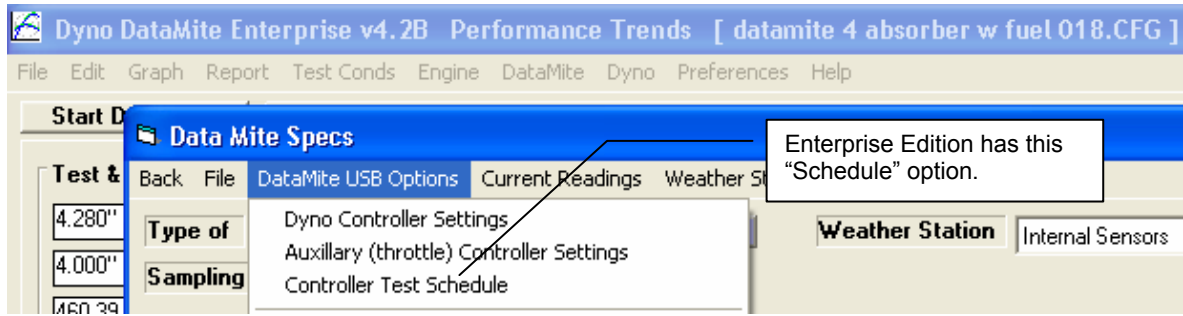


Figure 10.06 Controller Test Schedule, Enterprise Edition Only



Schedule Specs [Untitled]

Back (OK) Edit File

Choose "Yes" to turn on this schedule. Now when you enter the Current Readings screen and Start Recording, the controller will follow this schedule.

Test Schedule

Test with This Schedule: Yes

Number of Test Segments: 10

Repeats: 3

From Step: 8

Back to Step: 4

Segment	Starting RPM	Starting % Throttle	Segment Time, sec
Segment 1	2000	0	2
Segment 2	2000	80	2
Segment 3	4500	100	2
Segment 4	4500	100	2
Segment 5	3000	100	4
Segment 6	3000	100	2
Segment 7	4500	100	2
Segment 8	4500	100	2
Segment 9	2000	80	2
Segment 10	2000	0	2

Choose how many times you want to repeat certain steps. It is best if these 2 steps have the same RPM and Throttle conditions. Steps that are repeated are graphed in brighter colors.

Help

Enter the Starting RPM for this particular test segment.

Comments

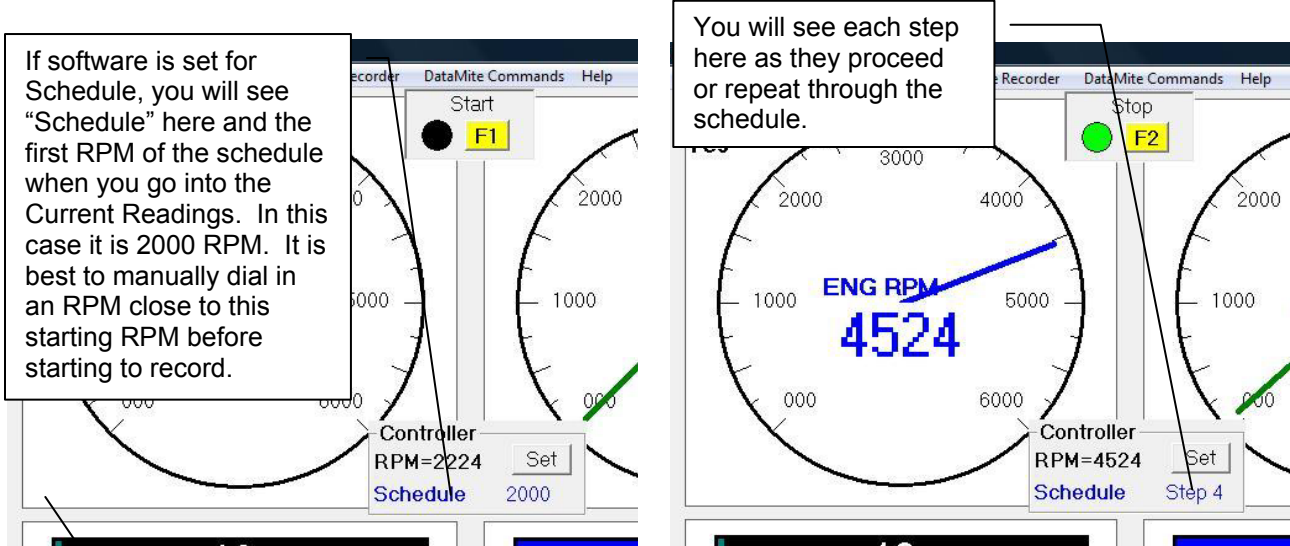
Try break-in schedule with 3 repeat cycles

It is best to have flat RPM sections, with the same starting and ending RPM. Only in these flat sections does the controller set an exact RPM, like 2000, 4500, and 3000 in this example.

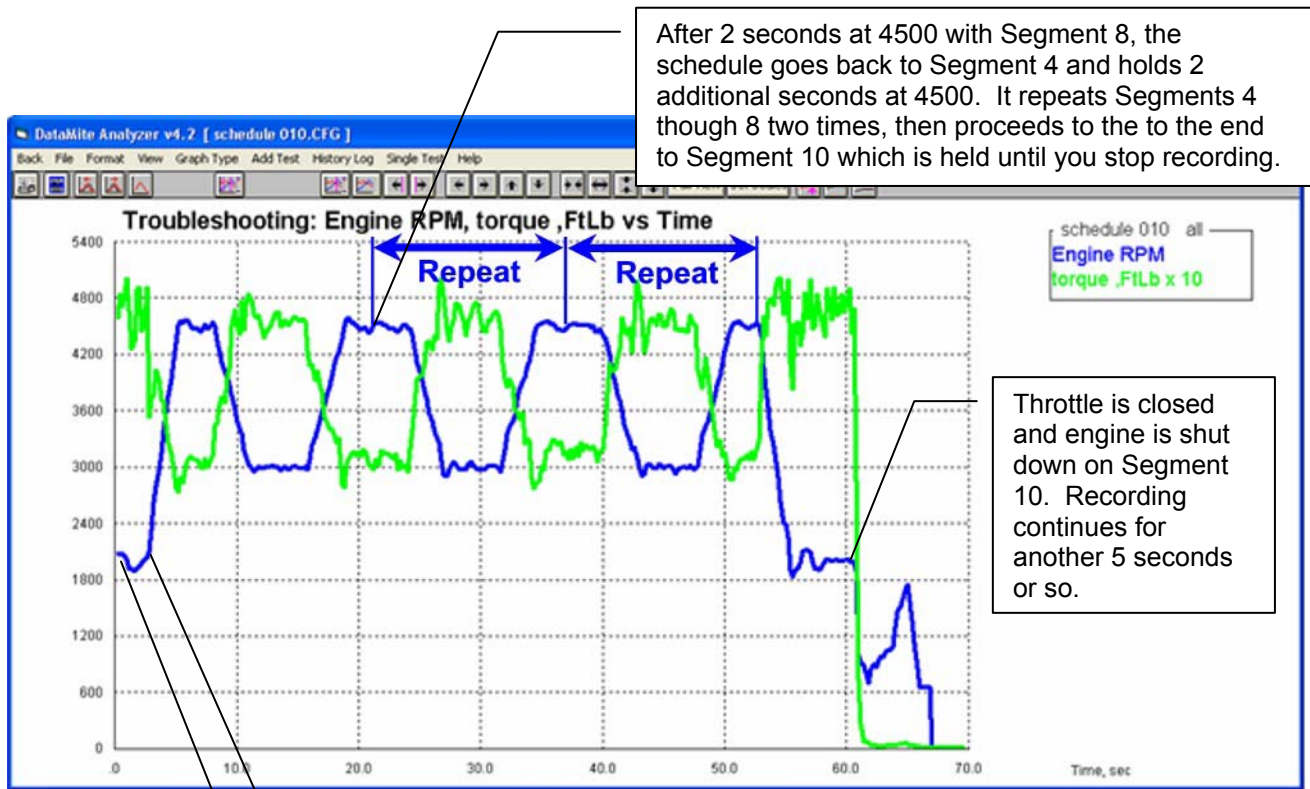
The sections with "ramps" of a different starting and ending RPM are less precise. You may want the ramp from 2000 to 4500 to end at 4500, but it could be different. Only when you specify the starting and ending RPM the same are you somewhat sure of the RPM that will be set.

Also, it is best if the first 2 segments and last 2 segments also have the same RPM, for predictable results.

Figure 10.07 Controller Test Schedule, Enterprise Edition Only, cont



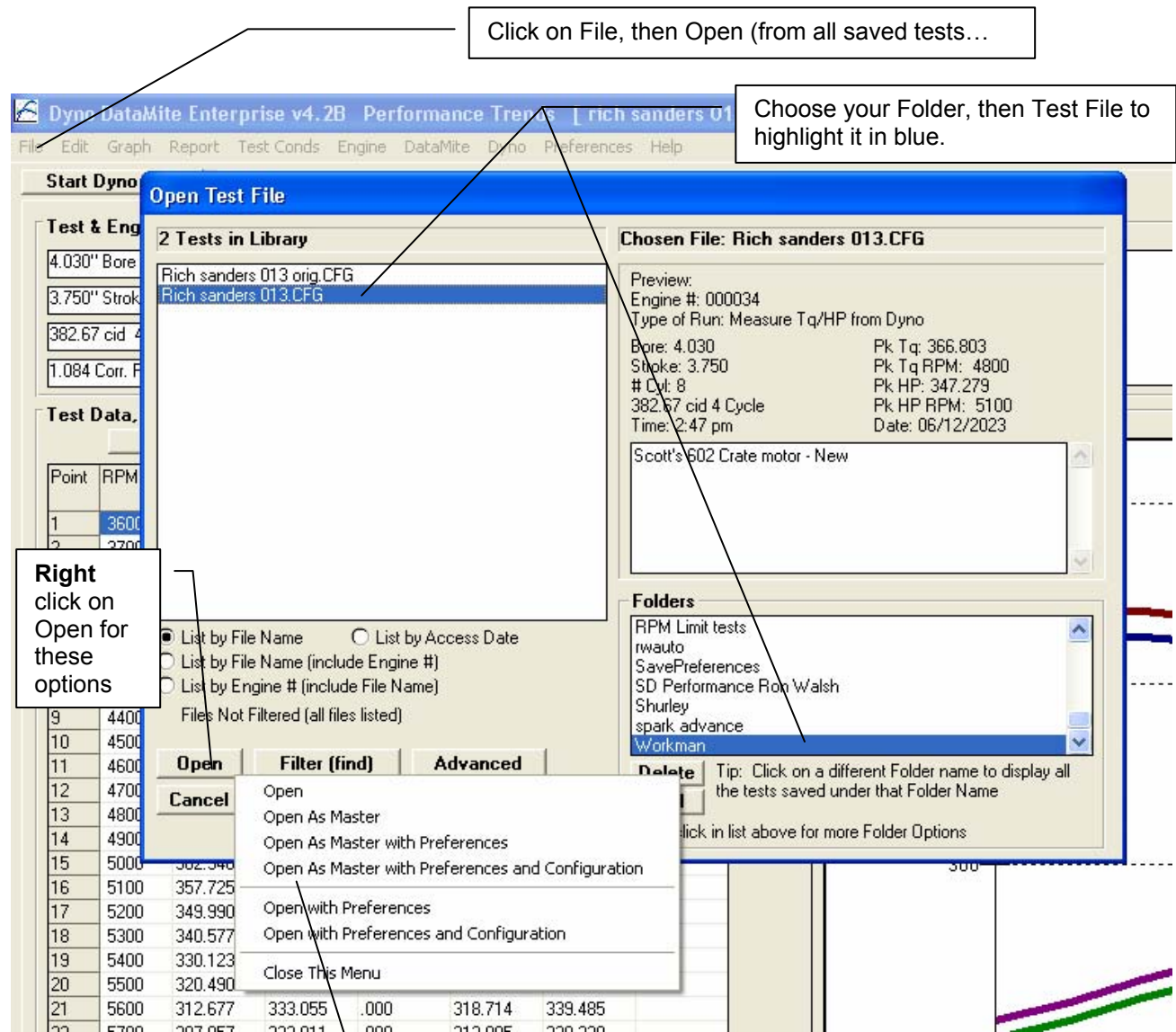
It is critical to have good USB communications to run a Schedule. Read the suggestions at beginning of this Appendix.



Schedule holds 2000 for 2 seconds, then starts ramping up to 4500.

When recording starts (Record button press, F1 key, etc) the schedule starts, controller commands first RPM, 2000 RPM in this case. It is best to manually set an RPM close to this starting RPM with the controller knob before starting to record.

Figure 10.08 New Features for Opening Tests

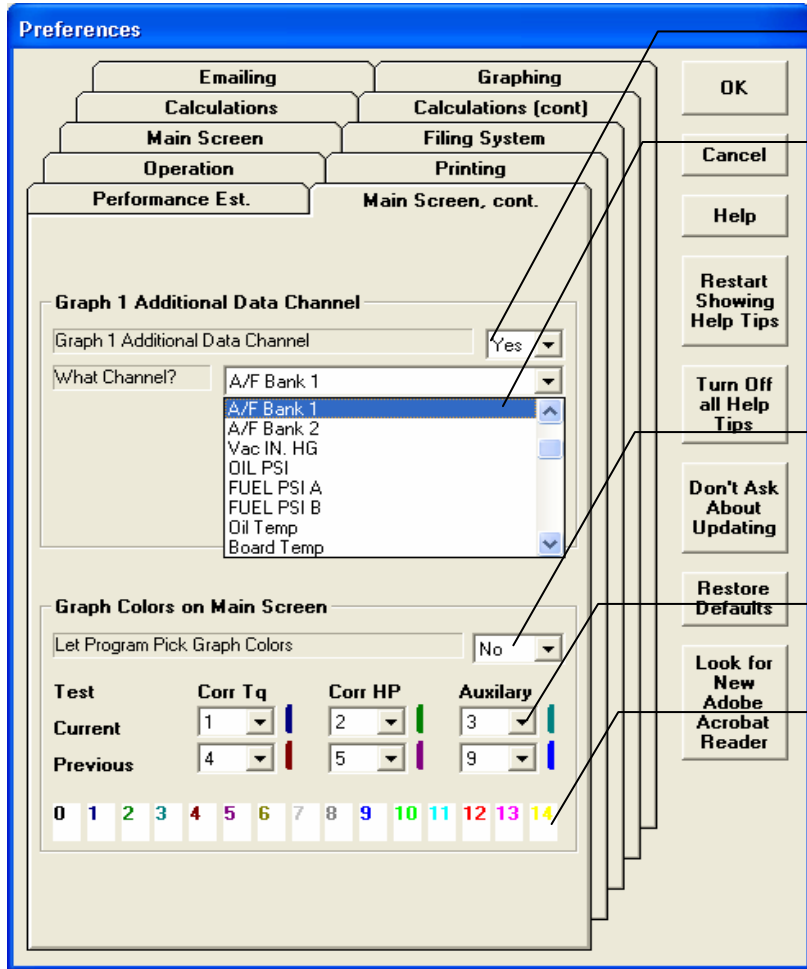


The "Open as Master" options will open the file you have chosen AND load that file's DataMite and Dyno settings as the Master settings. Master settings describe your DataMite and Dyno as they are today, and what you will use for new tests.

The "Open with Preferences" and "Open with Preferences and Configuration" options will set these settings to what they were when this particular file was saved. This can be very handy to restore you settings should you think something got corrupted. This is also very handy to copy these settings to a new computer.

BUT, this depends on the old computer still working so you can copy files, OR you made backup copies of some of your tests.

Figure 10.09 New Features for Graphs on Main Screen



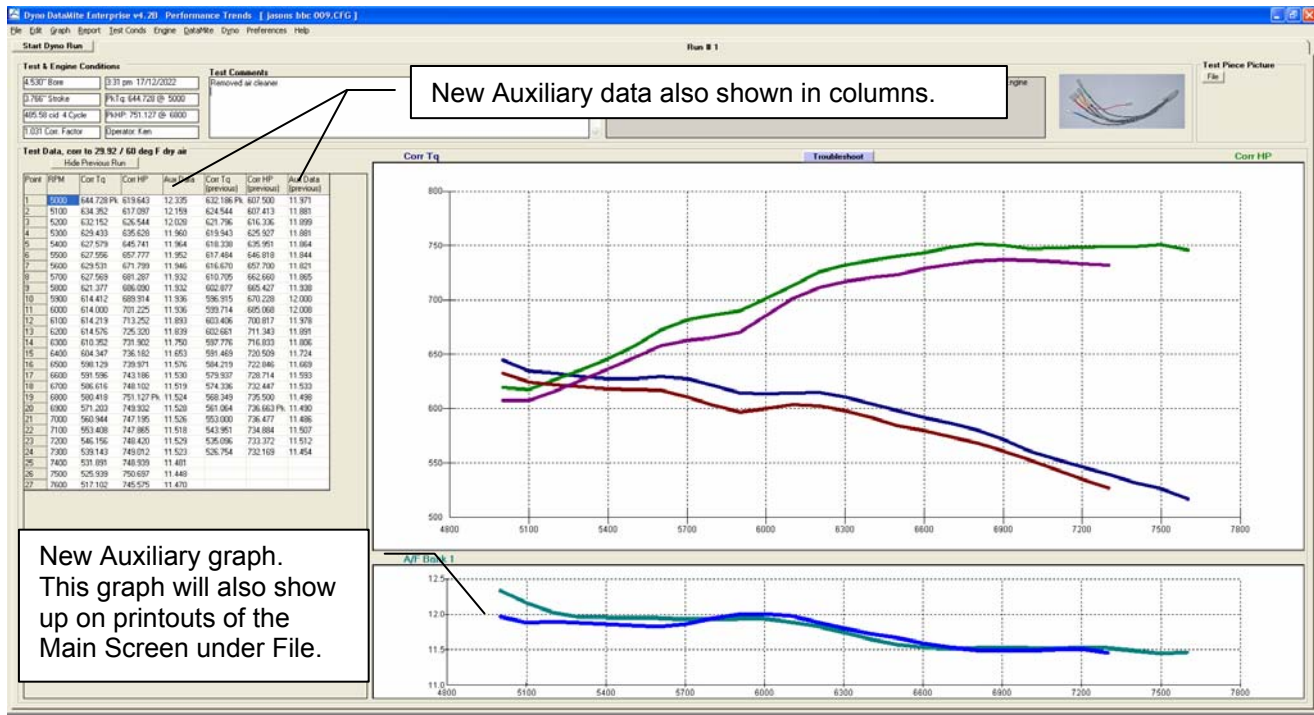
Click Yes here to add another graph to the main screen.

Pick what channel's data to want graphed in this additional graph. If you click on Graph at upper left of main screen you have **many more** graph options. Check Section 3.3 in the users manual for more info.

Set this to No and you can choose the colors for the graph lines on the Main Screen and when the Main Screen is printed.

Choose the Color Number for each graph.

The colors for the different numbers are shown here, a number from 0 to 15.



New Auxiliary data also shown in columns.

New Auxiliary graph. This graph will also show up on printouts of the Main Screen under File.

Figure 10.10 Reorganize Column Order in Reports

Dyno DataMite Enterprise v4.2B Performance Trends [jasons bbc 009.CFG]

Back Print Report Types File History Log Single Test Multiple Tests Help(F1)

Comments Operator: Ken 3:31 pm 17/12/2022 Pk Tq 644.728 @ 5000 4.530" Bore Test Time: 6.48 sec
 Eng #: 00062 Corr. To: 29.92/60 dry Pk HP 751.127 @ 6800 * 3.766" Stroke
 Customer: Ron Walsh Corr. Factor 1.031 485.58 cid 4 Cycle 8 Cylinders Dens.Alt. 1362 ft

RPM	Boost PSI	A/F Bank 1	Fuel A lbs/hr	Fuel B lbs/hr	A/F Bank 2	Corr Tq	Corr HP
5000	-.41	12.34	139.13	132.67	12.51	644.728 Pk	619.643
5100	-.41	12.16	137.38	131.99	12.40	634.352	617.097

Example default order of columns in a report.

Report Data

Basic Report Specs

Type Assigned Order of Columns

Time or F

What to

Filtering

Range of

Starting I

Ending R

RPM Inc

Use MM:

Include A

Start Ave

Stop Ave

Make R

Channel 37 (na)

3 (na)

3 (na)

cel, RPM/sec

l RPM

ratio

verter slip, %

lywheel torque

lywheel HP

lywheel torque

lywheel HP

el not used

Clear All

Reset

Set Order

Click Set Order button for the light blue section to appear. Here you can reassign a new order for the data columns.

6 Fuel A lbs/hr

7 Fuel B lbs/hr

5 Boost PSI

3 A/F Bank 1

4 A/F Bank 2

1 Corrected flywheel torque

2 Corrected flywheel HP

Data to Graph

A/F Bank 2

Order to Graph

4

Assign this Order

Use Assigned Orders

Yes

OK

Cancel

Click on data type in large text box, or select from drop down.

Set the order for the data type you selected. Then click the Assign... button. You will see the new order number appear in the large text box.

Set to Yes to use the new order.

Open/Edit/Save These Settings

To obtain comparison reports of 2 or more files, click on History Log or 'Multiple Tests' at the top of the upcoming Report Screen.

Dyno DataMite Enterprise v4.2B Performance Trends [jasons bbc 009.CFG]

Back Print Report Types File History Log Single Test Multiple Tests Help(F1)

Comments Operator: Ken 3:31 pm 17/12/2022 Pk Tq 644.728 @ 5000 4.530" Bore Test Time: 6.48 sec
 Eng #: 00062 Corr. To: 29.92/60 dry Pk HP 751.127 @ 6800 * 3.766" Stroke
 Customer: Ron Walsh Corr. Factor 1.031 485.58 cid 4 Cycle 8 Cylinders Dens.Alt. 1362 ft

RPM	Corr Tq	Corr HP	A/F Bank 1	A/F Bank 2	Boost PSI	Fuel A lbs/hr	Fuel B lbs/hr
5000	644.728 Pk	619.643	12.34	12.51	-.41	139.13	132.67
5100	634.352	617.097	12.16	12.40	-.41	137.38	131.99
5200	632.152	626.544	12.03	12.24	-.41	138.27	133.01

Report with new column order.

Figure 10.11 Fixing “Unseen” Electrical Noise Issues

DataMite Analyzer

NOTE: There are about 1.05 seconds of data missing from this data set. This is likely caused by electrical noise getting into the logger via one or more of the sensors.

Electrical noise could be coming from sensor wires or the logger box itself being close to ignition components, or electrical components like motors, certain electric lights, machine tools, welders, etc. For an Inertia Dyno, it is especially important to have Time recorded correctly. Missing data typically makes the acceleration rate, torque, and power read too high.

OK

If electrical noise is found to affect sampling rate, this message is given. A second message will ask if you want the program to fix the problem.

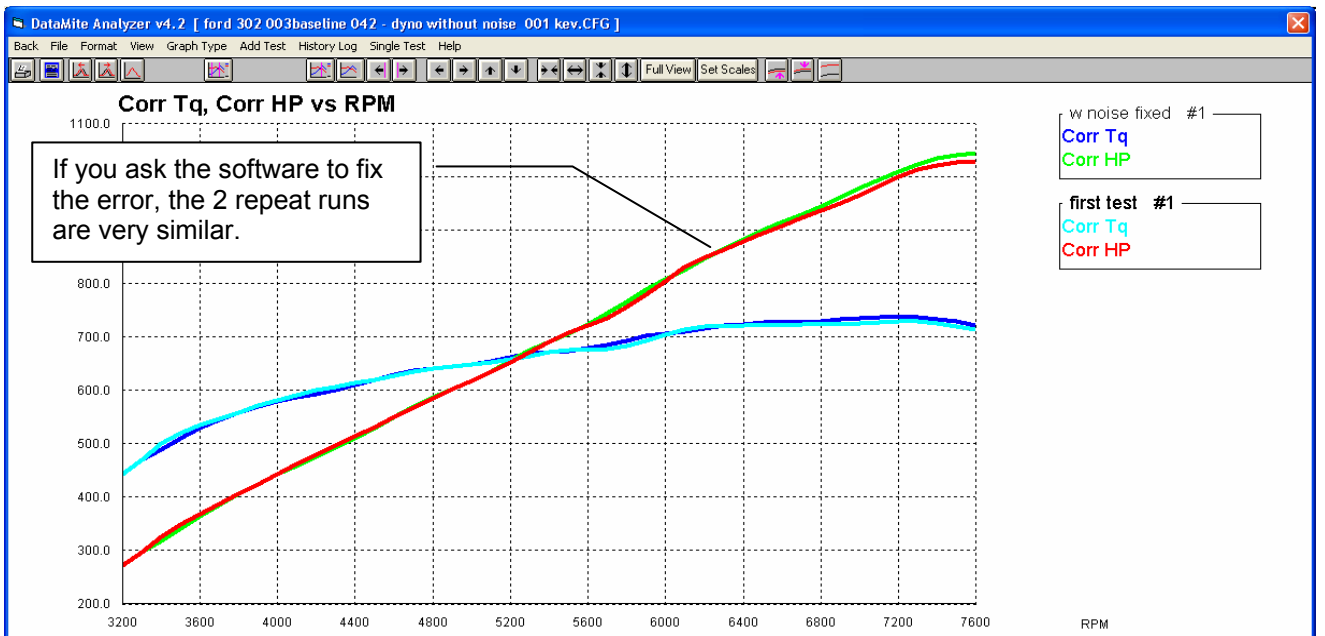
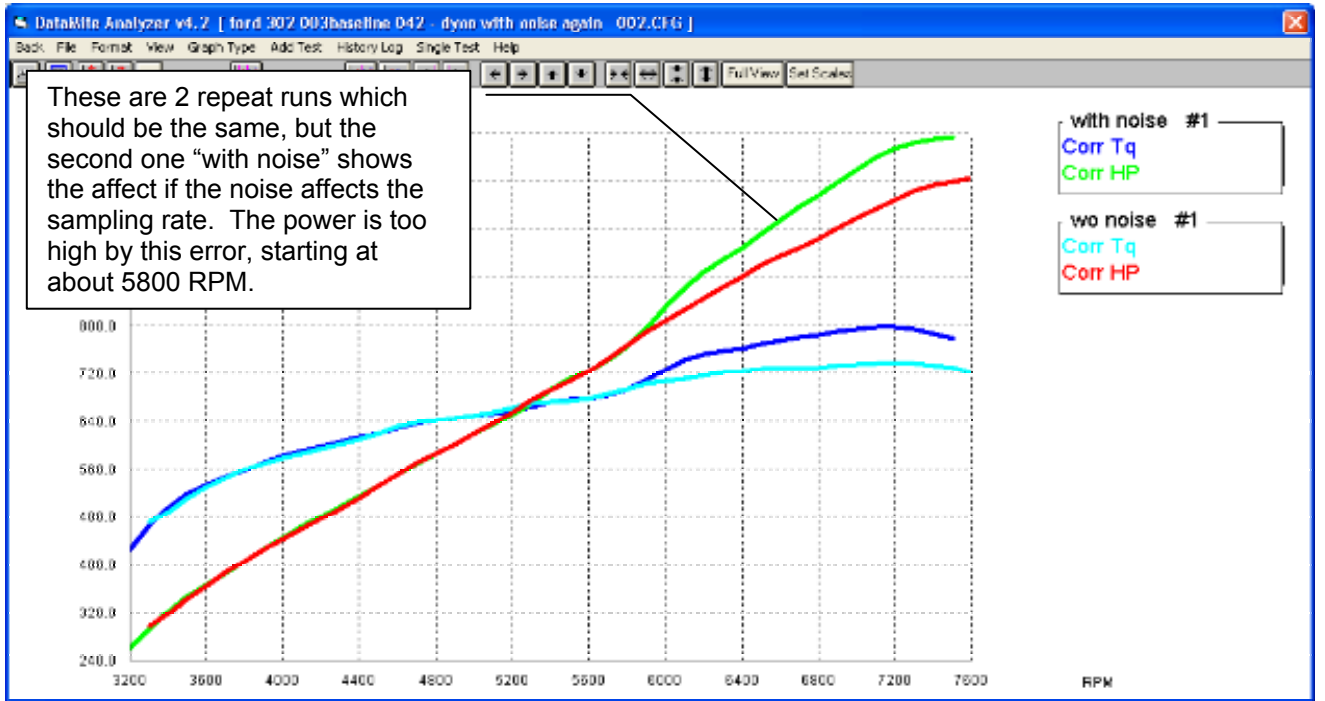
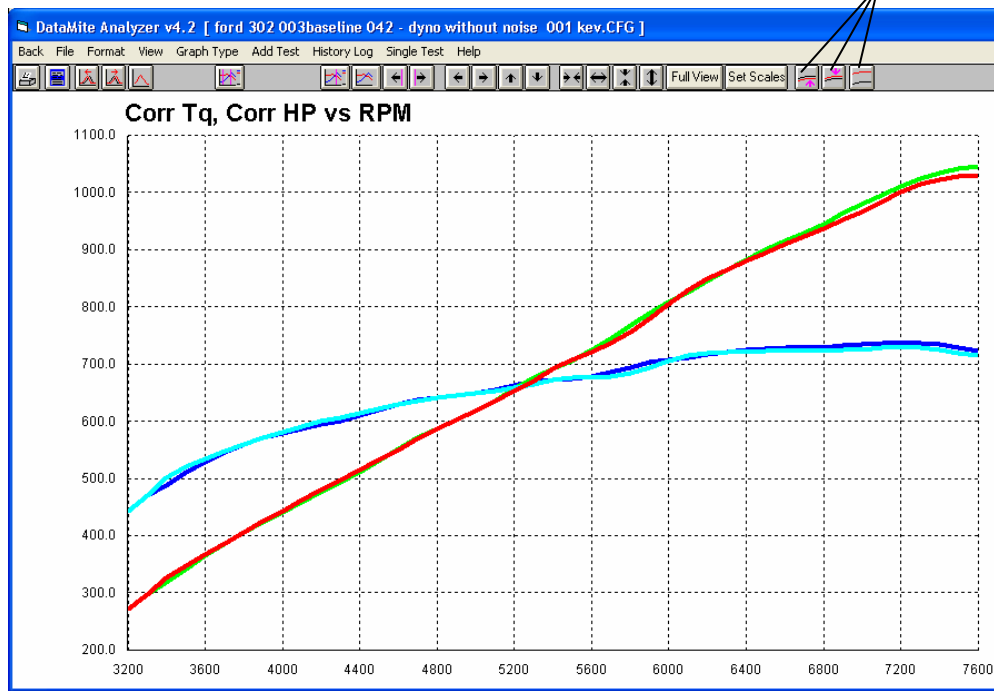


Figure 10.12 Shifting Graphs Vertically



New Graph buttons to move graphs up or down with respect to other graphs. The first button shifts the chosen data up, the second button moves the data down, and the third restores the data to its original scaling. This graph shows the original scaling.

Although it does not show it in this example, this can be handy for doing comparisons when the data lines are offset from each other.

The data you are shifting is identified with a pink outline. The amount it has been shifted is identified in the legend. In this case, the data has been shifted up 140 ft lbs and 140 HP. If you click on other file's legends, that will be the data that gets shifted. This feature is very similar to the "time align" feature discussed in Section 3.3 Graphs.

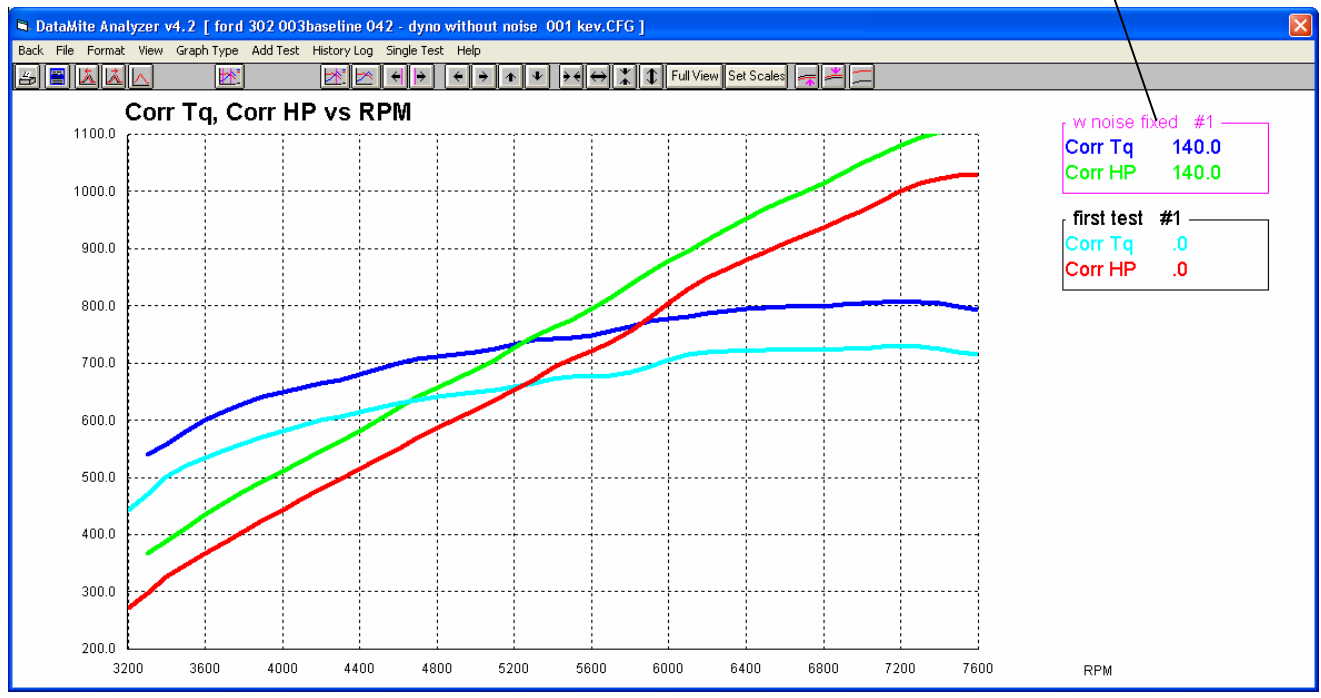


Figure 10.13 Using a Fuel Table for Fuel Flow Sensor Calibration

Choose one of the "Table" options for fuel flow for the table on the right to appear.

If you request a special multi-point calibration for your fuel flow sensor, Performance Trends will provide a table of frequency in Hz and Multiplier data for you to enter here.

The screenshot shows the 'Other RPM Specs' window with the following components:

- Calib:** Cstm Table (Fuel) 0/3.31 50/3.49
- RPM Sensor Specs:**
 - Sensor: Fuel Flow
 - Flow: Fuel To Engine - Table
 - Data Name: Fuel
- Analog Sensor Specs:**
 - 1st Value, Engineering Units: []
 - 1st Value, freq (hz): [Read] []
 - 2nd Value, Engineering Units: []
 - 2nd Value, freq (hz): [Read] []
- Note:** Pick the location of the sensor and # of magnets (or 'targets' if a different type of sensor is being used) on the rotating component.
- Sensor Calibration Table:**

	Hz	Data		Hz	Data
A	0	3.31	F		
B	50	3.49	G		
C	100	3.49	H		
D	1000	3.45	I		
E			J		
- Graph:** A line graph showing the relationship between Hz (x-axis, 0 to 1000) and Data (y-axis, 3.31 to 3.49). The data points from the table are plotted, showing a sharp rise from 0 Hz to 3.31, a peak at 3.49 for 50 Hz, and a gradual decline to 3.45 at 1000 Hz.
- Buttons:** Resort Rows, Read DataMite, Clear Row, Insert Row, Delete Row, Clear All Rows, Keep Specs, Help, Cancel, Print.

Graph of your data entries is shown here so you can easily spot mistakes.

Click here to keep your Fuel Flow Calibration Table.

These buttons make changing your data with 1 click easier.

Figure 10.14 Setting Max/Min RPM for Automatic Recording in Test Conds Screen, Enterprise Edition Only

Test Conditions/Options

Back Help

Type of Test

Dyno Conditions

Water Temperature, deg F: 188

Oil Temperature, deg F: 177

Fuel sp.g.: .073 Fuel: 104

Correction Factor

Correct To: Std Race Dyno 29.92/60 deg f

Correct for Eng Inertia Effects: Yes

Help

Enter most any description of the fuel being used. This entry is for information only. No entry is required. p 34

Dry Density Altitude, ft: 1936

Inertia Dyno Recording Options

Engine RPM Limits More Info

Max RPM: 6000 Min RPM: 2000

Use These Limits to Start/Stop Recording: Yes

Set this to Yes to invoke automatic recording of data.

IMPORTANT: If you set this to Yes, remember in the Current Readings screen that if at any time the RPM goes above "Min RPM" recording will start. So be sure to be less than "Min RPM" when you go into that screen. Also, if you do not get to "Max RPM", recording will continue until you manually stop it by pressing the Record Switch or F2.

Set the Max and Min RPMs. Min will be the starting RPM and Max will be the ending RPM for automatic starting and stopping of recording data.

Test Conditions/Options

Back Help

Type of Test

Type: Measure Tq/HP from Dyno

Test Room Weather Conditions

Method of Reading Weather Data: Copy

Recorded by Weather Station

Obs. Barometer, "Hg: 29.53

Air Temperature, deg F: 74.1

Dew Point, deg F: 54.8

Elevation, Feet: 3450

Click here for info on how Elevation is used

Density Altitude, ft: 1627

Dry Density Altitude, ft: 1936

Absorber Dyno Test Specs

Type: Start Low RPM, release to high RPM

Engine RPM Limits More Info

Max RPM: 6000 Min RPM: 2000

Use These Limits to Start/Stop Recording: Yes

The screen above was for an Inertia Dyno, where all tests are accelerating tests. This Test Conds screen is for an absorber brake dyno. For Brake Dynos, it also lets you specify if the test is accelerating or decelerating. If you select a decelerating test (typically brake dynos only), recording will start at the Max RPM and end at the Min RPM.

Figure 10.15 Setting Max/Min RPM for Automatic Recording in Test Conds Screen, cont.

Recording will start automatically when the RPM goes above the "Start:" RPM of 2000 as shown in this screen. It will stop when RPM goes above "Stop at:" RPM of

The Controller section is replaced by this "RPM Recording" screen, to show the Start and Stop RPM for data recording.

HP	Bore	Stroke	#cyl	CID	Sweep Time
0.045 @ 5900	4.280	4.000	8	460.35	2000->6000 2.878 sec
1.289 @ 6400	4.280	4.000	8	460.35	2035->6000 2.023 sec
1.630 @ 6000	4.280	4.000	8	460.35	2000->6000 6.347 sec
3.870 @ 7600	4.187	4.500	8	495.67	
1.761 @ 7500	4.187	4.500	8	495.67	
5.067 @ 7600	4.187	4.500	8	495.67	
18.852 @ 7600	4.187	4.500	8	495.67	
1.279 @ 5100	4.030	3.750	8	382.6E	

Last column of History Log shows the Starting and Ending RPM (Max and Min), and the Sweep Time. Note that the 2nd run started at 2035 seconds, not at the desired 2000 RPM. This will occur if the Starting RPM is at a point where the engine and dyno are accelerating quite quickly.

These times are for a brake dyno, so the sweep time does not indicate changes in torque and HP. If these were done on an inertia dyno, generally the shorter the sweep time the higher the torque and

Sweep Time and RPMs are shown here on Main Screen Graph.

Point	RPM	Corr Tq	Corr HP
1	2000	46.626	18.063
2	2100	61.084	24.734
3	2200	53.743	25.167
4	2300	58.660	25.721
5	2400	65.535	30.245
6	2500	85.685	41.592
7	2600	112.180	56.646
8	2700	133.925	69.955
9	2800	146.942	79.153
10	2900	147.961	81.822
11	3000	139.078	79.403
12	3100	132.961	78.361
13	3200	135.460	82.599
14	3300	144.670	91.207
15	3400	156.634	101.941
16	3500	170.222	114.107
17	3600	186.186	128.559
18	3700	206.493	146.607
19	3800	228.866	166.839
20	3900	249.126	186.246
21	4000	265.870	203.785
22	4100	278.408	218.582
23	4200	286.597	230.049
24	4300	290.952 Pk	238.285
25	4400	289.275	242.273
26	4500	281.898	241.198
27	4600	268.953	235.005
28	4700	252.234	224.981
29	4800	235.620	214.580
30	4900	224.088	208.438
31	5000	221.479	210.440
32	5100	226.605	220.007
33	5200	235.008	233.078
34	5300	242.124	244.897
35	5400	248.704	255.000

Figure 10.16 New History Log Save Features

Test History

Close History Log Clear (erase) History Print Help

Test File and Path	Graph?	Std Graph Title	Runs	Graph Runs	Save?	Engine #	Test Date	Peak Tq	Peak HP	Bore	Stroke	#cyl	CID	Sv
V4.2b for manual full tests and holding tests\whole test hybrid		whole test hybrid	1	1		00007	06/04/2023	487.136 @ 2000	228.178 @ 2900	4.280	4.000	8	460.3	nc
V4.2b for manual full tests and holding tests\whole test hybrid		whole test hybrid	1	1		00007	06/04/2023	441.804 @ 2800	237.222 @ 2800	4.280	4.000	8	460.3	nc
V4.2b for manual full tests and holding tests\hybrid control 2.60		Hybrid control 2.60	1	1		00007	06/04/2023	476.587 @ 3000	298.647 @ 3900	4.280	4.000	8	460.3	2C
V4.2b for manual full tests and holding tests\hybrid control 2.60		Hybrid control 2.60	2	1		00007	06/04/2023	488.213 @ 2500	266.282 @ 3600	4.280	4.000	8	460.3	2C
V4.2b for manual\try decel test 003.cfg		try decel test 003	1	1		00007	05/30/2023	503.573 @ 2600	301.897 @ 3500	4.280	4.000	8	460.3	nc
V4.2b for manual\try decel test 001.cfg		try decel test 001	1	1		00007	05/30/2023	506.455 @ 2700	294.469 @ 3700	4.280	4.000	8	460.3	4E
V4.2b for manual\final\rpm decel control 002.cfg		rpm decel control	1	1		00007	05/23/2023	493.951 @ 2200	280.397 @ 3400	4.280	4.000	8	460.3	nc
V4.2b for manual\final\rpm decel control 001.cfg		rpm decel control	1	1		00007	05/23/2023	484.524 @ 2200	289.097 @ 4400	4.280	4.000	8	460.3	nc

Click on the "Save?" column title to be presented with the question below.

Notice that we have scrolled down in the History Log, so this action will not start at the very top row of the History Log.

Mark entire 'Save?' Column with Yes?

Did you want to mark 'Yes' in the 'Save?' column for all rows, starting at the first row displayed, row 15 ?

Choose 'No' to clear out all 'Yes' marks.

Choose 'Cancel' to leave all marks unchanged.

Tip: If you scroll through the history log and put the first row you want to mark Yes (or unmark Yes) at the top, marking (or unmarking) will start on this row and all rows below it.

Yes No Cancel

Test History

Close History Log Clear (erase) History Print Help

Test File and Path	Graph?	Std Graph Title	Runs	Graph Runs	Save?	Engine #	Test Date	Peak Tq	Peak HP	Bore	Stroke	#cyl	CID	Sv
V4.2b for manual full tests and holding tests\whole test hybrid		whole test hybrid	1	1	Yes	00007	06/04/2023	487.136 @ 2000	228.178 @ 2900	4.280	4.000	8	460.3	nc
V4.2b for manual full tests and holding tests\whole test hybrid		whole test hybrid	1	1	Yes	00007	06/04/2023	441.804 @ 2800	237.222 @ 2800	4.280	4.000	8	460.3	nc
V4.2b for manual full tests and holding tests\hybrid control 2.60		Hybrid control 2.60	1	1	Yes	00007	06/04/2023	476.587 @ 3000	298.647 @ 3900	4.280	4.000	8	460.3	2C
V4.2b for manual full tests and holding tests\hybrid control 2.60		Hybrid control 2.60	2	1	Yes	00007	06/04/2023	488.213 @ 2500	266.282 @ 3600	4.280	4.000	8	460.3	2C
V4.2b for manual\try decel test 003.cfg		try decel test 003	1	1	Yes	00007	05/30/2023	503.573 @ 2600	301.897 @ 3500	4.280	4.000	8	460.3	nc
V4.2b for manual\try decel test 001.cfg		try decel test 001	1	1	Yes	00007	05/30/2023	506.455 @ 2700	294.469 @ 3700	4.280	4.000	8	460.3	4E
V4.2b for manual\final\rpm decel control 002.cfg		rpm decel control	1	1	Yes	00007	05/23/2023	493.951 @ 2200	280.397 @ 3400	4.280	4.000	8	460.3	nc
V4.2b for manual\final\rpm decel control 001.cfg		rpm decel control	1	1	Yes	00007	05/23/2023	484.524 @ 2200	289.097 @ 4400	4.280	4.000	8	460.3	nc

Clicking Yes filled all rows from here down with "Yes" to "Save?"

Test History

Close History Log Clear (erase) History Print Help

Test File and Path	Graph?	Std Graph Title	Runs	Graph Runs	Save?	Engine #	Test Date	Peak Tq	Peak HP	Bore	Stroke	#cyl	CID	Sv
\workman\vich sanders 013 orig.cfg		Rich sanders 013	1	1		000034	06/12/2023	373.885 @ 4800	353.984 @ 5100	4.030	3.750	8	382.6	nc
V4.2b for manual full tests and holding tests\whole test rpm		whole test RPM	1	1		00007	06/04/2023	425.577 @ 3600	298.497 @ 3800	4.280	4.000	8	460.3	2C
V4.2b for manual full tests and holding tests\whole test rpm		whole test RPM	1	1		00007	06/04/2023	471.461 @ 3000	270.760 @ 3000	4.280	4.000	8	460.3	nc
V4.2b for manual full tests and holding tests\recording start of		recording start of	1	1		00007	06/04/2023	500.991 @ 2000	280.992 @ 2800	4.280	4.000	8	460.3	nc
V4.2b for manual full tests and holding tests\changing p		Changing P	1	1		00007	06/04/2023	473.457 @ 2900	301.272 @ 3600	4.280	4.000	8	460.3	nc
V4.2b for manual full tests and holding tests\whole test hybrid		whole test hybrid	1	1		00007	06/04/2023	496.485 @ 2000	289.948 @ 3600	4.280	4.000	8	460.3	nc
V4.2b for manual full tests and holding tests\whole test hybrid		whole test hybrid	1	1	Yes	00007	06/04/2023	487.136 @ 2000	228.178 @ 2900	4.280	4.000	8	460.3	nc
V4.2b for manual full tests and holding tests\whole test hybrid		whole test hybrid	1	1	Yes	00007	06/04/2023	441.804 @ 2800	237.222 @ 2800	4.280	4.000	8	460.3	nc

Scrolling up some shows that rows above this one are not marked "Yes". This feature lets you mark or unmark several tests to Save in the History Log with just a few clicks.

Figure 10.17 New History Log Print Features

New Print options when you click Print

The screenshot shows the 'Test History' application window. The menu bar includes 'Close History Log', 'Clear (erase) History', 'Print', and 'Help'. The 'Print' menu is open, showing options: 'Print History', 'Print History without Graph Columns', 'Print History without Graph or Engine Size Columns', and 'Windows Printer Setup'. Below the menu is a table of test results with columns: 'Test File and Path', 'Runs', 'Save?', 'Engine #', 'Test Date', 'Peak Tq', 'Peak HP', 'Bore', 'Stroke', '#cyl', 'CID', and 'Sv'. The table contains several rows of test data.

Portion of printout for "Print History without Graph Columns"

DataMite Analyzer v3.7	Performance Trends (C) 2018	Date: 06-17-2023									
Eng: datamite 4 absorbe	ST Heikkilä OY	Time: 9:28:14 am									
Test History	050-3225510 KALAJOKI	Page: 1									
Log of Most Recent Test Results plus Saved Tests Results (if any)											
Test File and Path	Runs	Save?	Engine #	Test Date	Peak Tq	Peak HP	Bore	Stroke	#cyl	CID	Sweep Time
imes\datamite 4 absorber w fuel 017.cfg	1		00007	05/08/2023	.0 @ 0	.0 @ 0	4.280	4.000	8	460.4	2000->6000 2.878 sec
imes\datamite 4 absorber w fuel 019.cfg	1		00007	05/09/2023	375.1 @ 5800	432.3 @ 6400	4.280	4.000	8	460.4	2035->6000 2.023 sec
imes\datamite 4 absorber w fuel 021.cfg	1		00007	05/09/2023	111.7 @ 6000	127.6 @ 6000	4.280	4.000	8	460.4	2000->6000 6.347 sec

Portion of printout for "Print History without Graph or Engine Size Columns"

DataMite Analyzer v3.7	Performance Trends (C) 2018	Date: 06-17-2023					
Eng: datamite 4 absorbe	ST Heikkilä OY	Time: 10:55:59 am					
Test History	050-3225510 KALAJOKI	Page: 1					
Report Comment: Sweep Times							
Log of Most Recent Test Results plus Saved Tests Results (if any)							
Test File and Path	Runs	Save?	Engine #	Test Date	Peak Tq	Peak HP	Sweep Time
4.2b for manual accel times\datamite 4 absorber w fuel 017.cfg	1		00007	05/08/2023	.0 @ 0	.0 @ 0	2000->6000 2.878 sec
4.2b for manual accel times\datamite 4 absorber w fuel 019.cfg	1		00007	05/09/2023	375.1 @ 5800	432.3 @ 6400	2035->6000 2.023 sec
4.2b for manual accel times\datamite 4 absorber w fuel 021.cfg	1		00007	05/09/2023	111.7 @ 6000	127.6 @ 6000	2000->6000 6.347 sec
Vord 302 003baseline 042 - dyno with engine size first test.cfg	1		003	01/14/2023	729.973 @ 7200	1029.870 @ 7600	

Figure 10.18 Setting Red Lines on Round Gauges

Choose which gauge to set the Redline.

Choose to Show or Hide the Redline, or to set the Redline RPM.

Enter the Redline RPM, then click OK.

Under Options, you can also set Color Warning Settings, so the round gauges (or the bar gauges) change color when you get to a particular RPM or reading. Check page 78 in the full User Manual.

Red Line Value

Enter the value where you want the Red Line marked on round Gauge 1, a number between 1 and 60000.

5300

OK Cancel

Recording RPM
Start: 2000 Set
Stop at: 6000

Redline set at 2200

Redline set at 5300

Current Sensor Readings

<input type="checkbox"/> RPMs, Internal TCs, more	<input checked="" type="checkbox"/> Std Analog Channels
0.00 FUEL PRESSURE	48.59 Humidity
0.00 OIL PSI	91.62 Board Temp
0.00 PAN PRESURE	12.02 Power Volts
0.00 BOOST	28.91 Baro Pres "Hg
	4079 Dry Dens Alt

Figure 10.19 Calculating Volumetric Efficiency from A/F and Fuel Flow

Data Mite Specs

Back File DataMite USB Options Current Readings Weather Station Cal. Troubleshoot Help

Type of: DataMite 4 USB Com 6 Find Weather Station Internal Sensors

Sampling Rate, samples/sec: 50

Show Multipliers

#	Channel	Used?	Data Name	Sensor and Calibration	Graph Multiplier
1	Engine RPM (RPMs A, 1)	Yes	ENG RPM	1 Cylinder, 4 Stroke	
2	Frequency 2 (RPMs B, 1)	Yes	Fuel 1	Fuel Flow (x 4.13)	
3	Frequency 3 (RPMs B, 2)		Fuel 2	Fuel Flow (x .87)	
4	Analog 1 (Analog A green)	Yes	torque	DynoTq .5-2.14 (5v) = 0-612 torque (corr: 6.195)	
5	Analog 2 (Analog A white)	Yes	A/F 1	DT3-AF1 A/F Sensor-Gasoline	
6	Analog 3 (RPMs A)		an 3	Std 0-5 Volts	

Calculation needs just 1 Fuel Flow channel and A/F channel.

Graph Data

- Corrected flywheel torque
- Corrected flywheel HP
- Brake Spec Fuel Cons.
- Fuel Gallons per minute
- Total Fuel
- Total Fuel Gal/Min
- Volumetric Efficiency %

(na) = channel not used Clear All

Other Graph Properties

Time or RPM Graph: RPM

Request "Volumetric Efficiency" from close to the bottom of the Data List

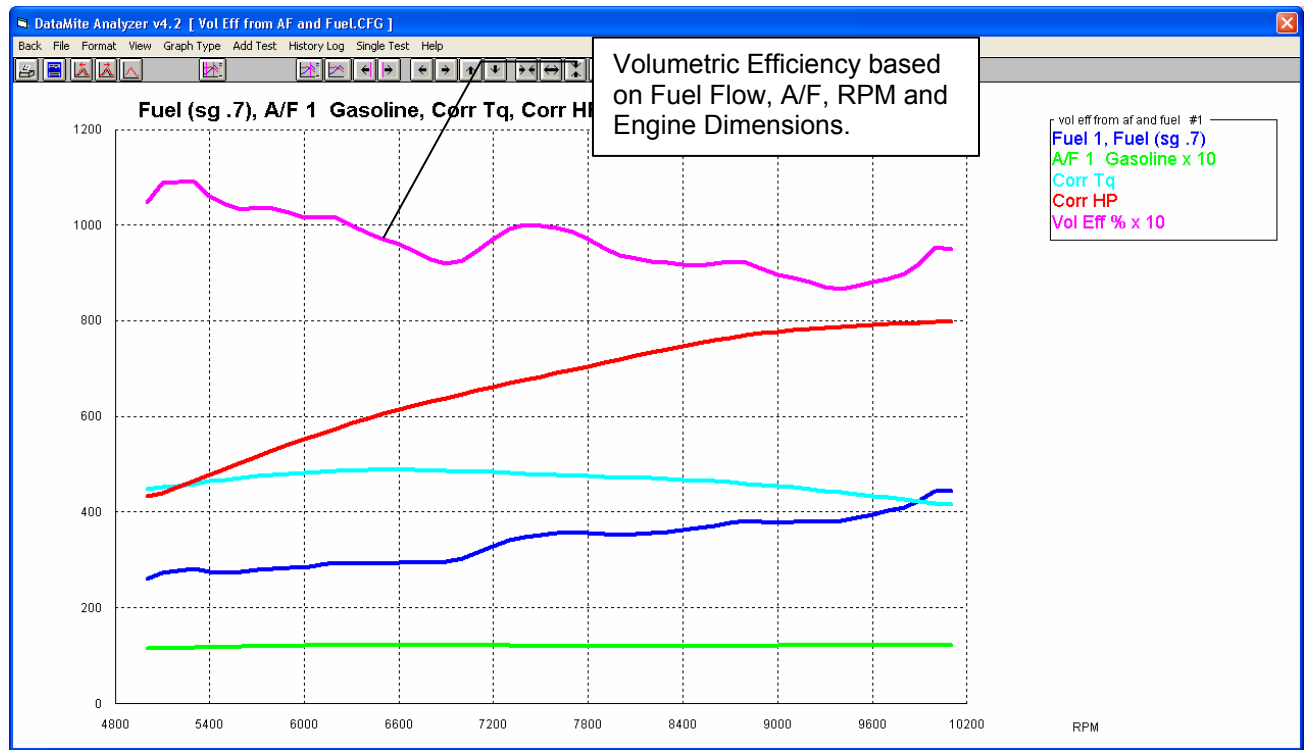


Figure 10.20 New Emailing Preferences

Choose this option "New Methods in v4.2B" and several new inputs are enabled. The new inputs allow the DataMite to more easily email from newer email services like gmail, hotmail, etc.

The screenshot shows the 'Preferences' dialog box with the 'Emailing' tab selected. The 'My Email Program' dropdown menu is set to 'New Methods in v4.2 B'. Below this, there are several input fields: 'IP Address' with a 'Find' button, 'Email Info' set to 'Default GMail', 'SMTP Server' set to 'smtp.gmail.com', 'Port Number' set to '465', 'Use Secure Socket Layer' set to 'Yes', 'Password' (masked with asterisks) with an 'Enter/Edit PW' button, 'Sender Email Address' set to 'performancetrendsinc@gmail.com', 'Path to MS Paint' with a 'Find' button, and 'PDF Printer' with a 'Find' button. At the bottom of the dialog are two buttons: 'Send Test Email' and 'Emailing Help'. On the right side of the dialog, there is a vertical column of buttons: 'OK', 'Cancel', 'Help', 'Restart Showing Help Tips', 'Turn Off all Help Tips', 'Don't Ask About Updating', 'Restore Defaults', and 'Look for New Adobe Acrobat Reader'.

You may have to modify your gmail, hotmail, etc settings to allow a 3rd party app (like the DataMite software) to be able to send emails. Click here for more info on setting up your email account.

Figure 10.21 New Preference for Electrical Noise

Click on Calculations tab

Preferences

Main Screen
Operation
Performance Est.
Emailing
Calculations
Filing System
Printing
Main Screen, cont.
Graphing
Calculations (cont)

OK
Cancel
Help
Restart Showing Help Tips
Turn Off all Help Tips
Don't Ask About Updating
Restore Defaults
Look for New Adobe Acrobat Reader

Torque/HP # Decimals 1 (ex 431.1 HP)
Torque/HP Output Ft Lbs and HP
Allow for very low RPMs Yes
Allow Correction in Calibration of Selected Channels No
Chassis Dyno Calculated Torque (not power) Is...
Tq at engine flywheel (corr for eng/dyno speed ratio)
Chassis Dyno - Allow for Losses Yes
Engine RPM is Calculated RPM No

Keep the 4 Preference Settings below set to NO unless told otherwise by Perf Trends.

Use Higher Resolution Dyno RPM No
Allow Engine RPM up to 60000 No
Config DataMite II for Engine PPR No
Using 'Divide by 2' IPU No

RPM Data New Method Click for Info

Electrical Noise that Affects Data Sampling Rate Click for Info

Always fix, do NOT ask (but do NOT fix if caused by controller commands)
Always show noise issue and ask to fix for each occurrence
Always fix, do NOT ask (but ask if noise caused by controller commands)
Always fix, do NOT ask (but do NOT fix if caused by controller commands)

Click on this button for details on these 3 options.

There are 3 options which tell the program how to automatically handle any electrical noise issues which affect the data sampling rate.