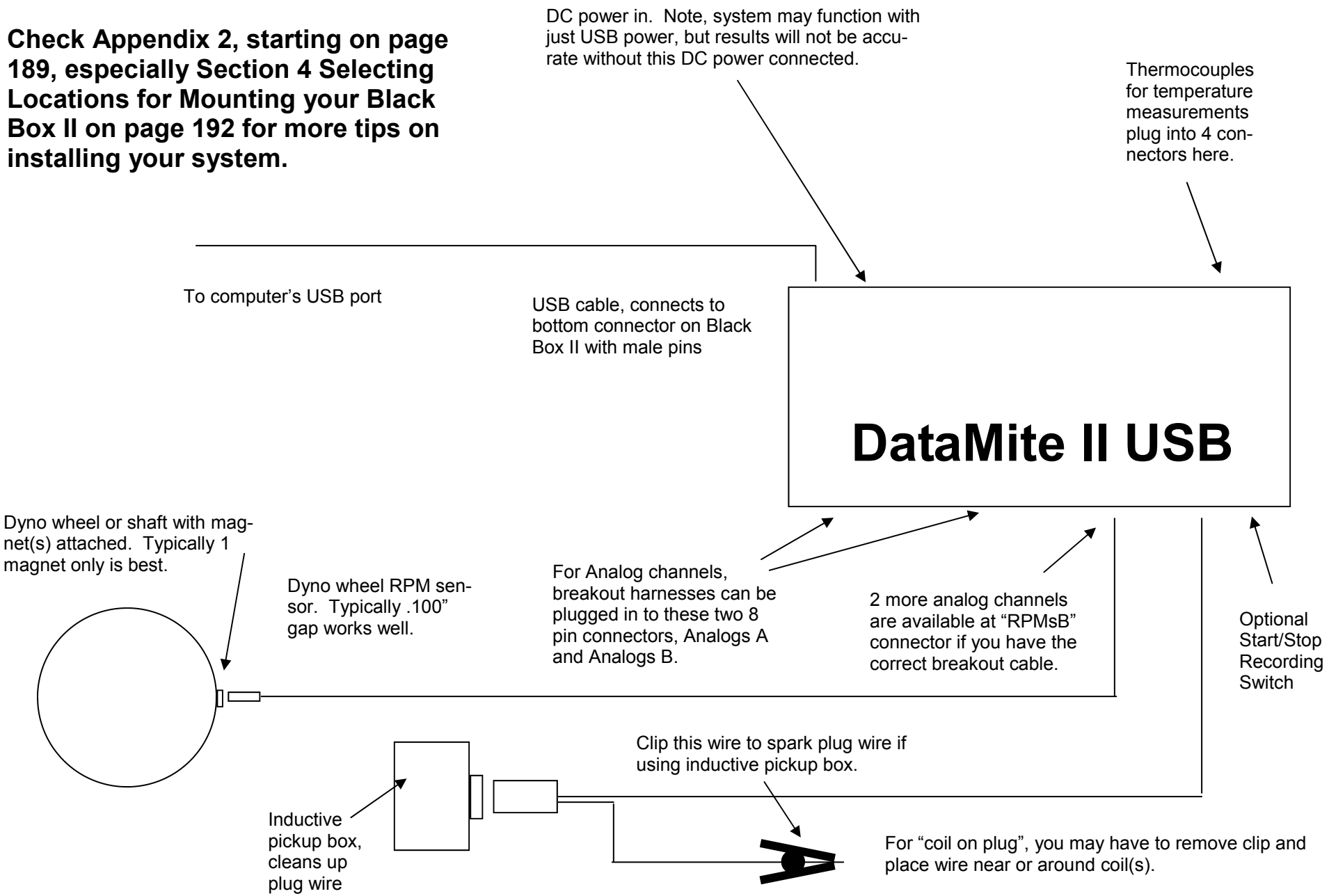
DataMite Hardware Installation Notes

These DataMite Installation instructions cover most all optional sensors. Typically the appropriate printed sheet is included with the DataMite hardware when it is shipped from the factory, to avoid confusion. Here, they are not organized in any particular fashion, and many of these notes can be outdated, or could be meant for internal build instructions within Performance Trends. They are provided here as general information, and to anynone not very well versed with the DataMite options, it would be easy to use the wrong instructions with a sensor. It is therefore recommended you email Performance Trends at feedback@performancetrends.com for the appropriate page number for your sensor or situation.

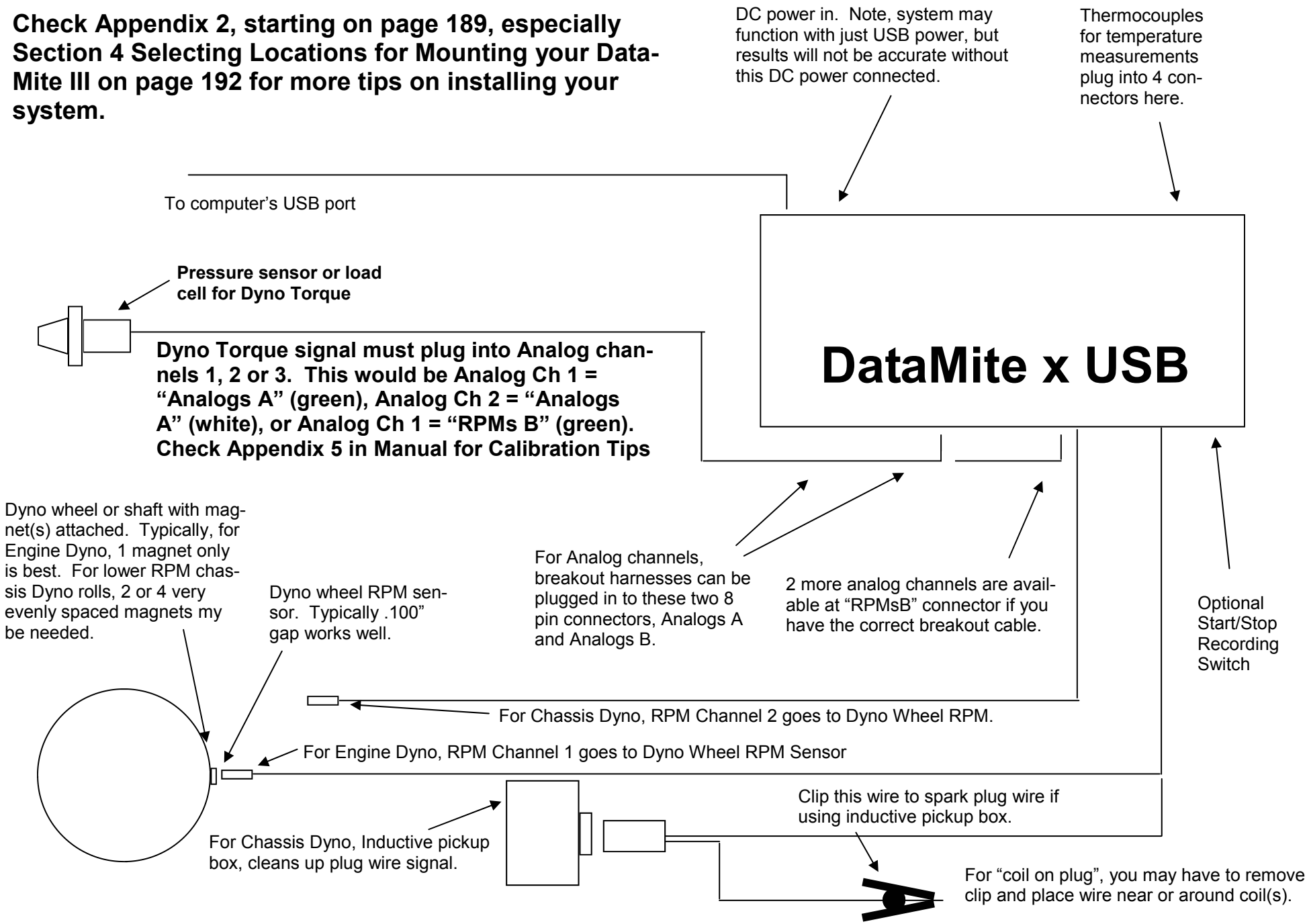
DataMite III USB Dyno Wiring for Inertia Dyno

Check Appendix 2, starting on page 189, especially Section 4 Selecting Locations for Mounting your Black Box II on page 192 for more tips on installing your system.



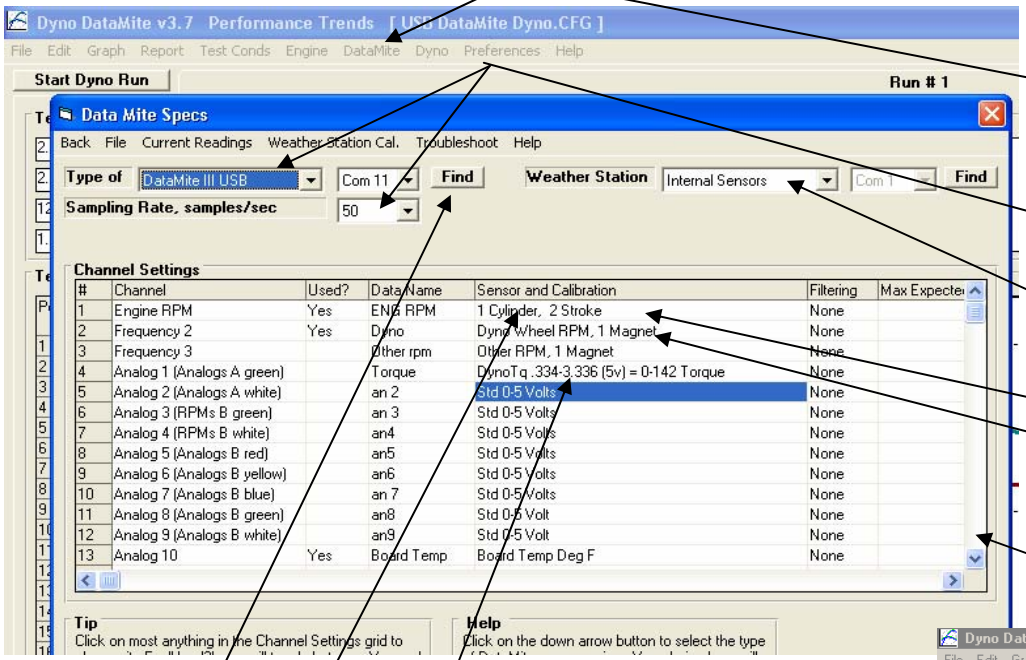
DataMite III USB Wiring for Absorber Dyno

Check Appendix 2, starting on page 189, especially Section 4 Selecting Locations for Mounting your Data-Mite III on page 192 for more tips on installing your system.



DataMite USB Dyno Software Setup

If you Open the correct Example Test File BEFORE setting up the software (see "Notes on Your Dyno Configuration" sheet) then most critical settings will be correct when you open this screen.



Configure DataMite III Channels by first clicking on Data-Mite at top of main screen.

Select "DataMite III USB", "DataMite 4 USB", or "DataMite Mini USB" (whichever you have) as the "Type" as shown here and select 50 samples per second (or slower).

Assign Internal Sensors if you have Internal Weather Station.

For Inertia Dynos, you typically use both RPM channels as shown here. Most all single cylinder Kart engines (Briggs included) will use the Engine RPM config of 1 Cylinder, 2 Stroke.

For most **DataMite III & 4** systems with thermocouples, you will use internal Thermocouple Channels. Slide the slide bar down to see these channels, which are below the section of screen shown here.

IMPORTANT: Click on the "Find" button to find possible Com ports. To start, choose the high-est Com Port # shown (except possibly 3).

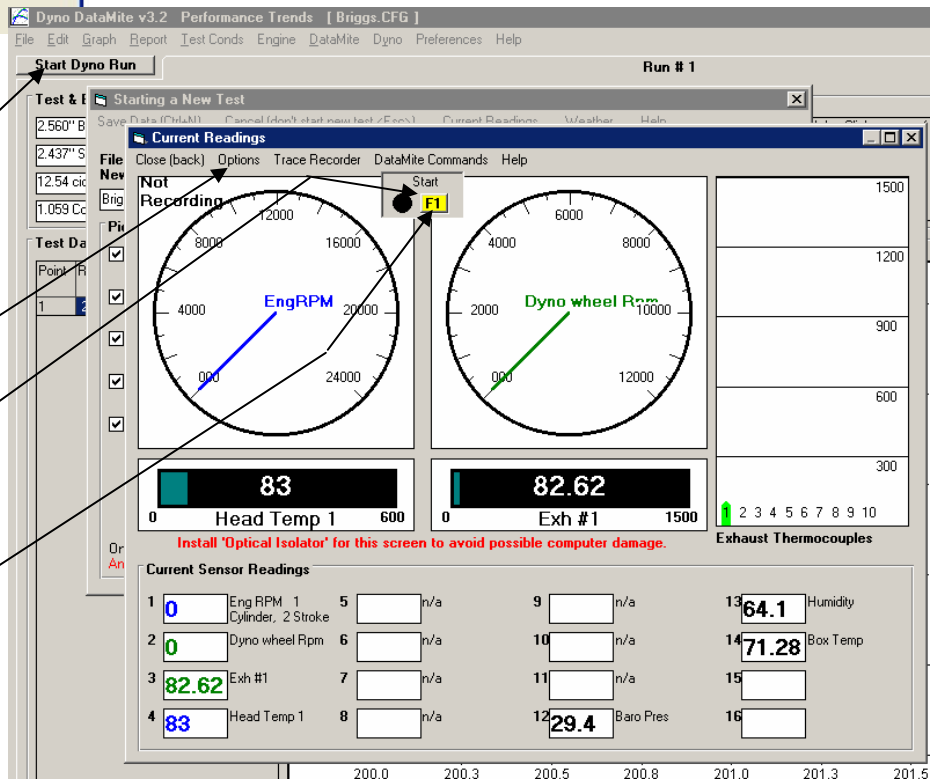
For Absorber Dynos, like a water brake, Stuska ™ , Go Power ™ , use Analog Channels 1 or 2 for Dyno Torque. Also, because the dyno is typically direct drive to the dyno, you will assign Engine RPM as 1 Cylinder, 2 Stroke and use RPM Channel 1 for Dyno RPM. Channel 2 RPM will typically NOT be used.

To start a test, click on Start Dyno Run button

Click on Options to set which channels show up on these Gauges

Press <F1> key to start recording data for the test.

Press <F2> key at the end of the test.



USB DataMite Black Box Internal Weather Station

Mount your DataMite in the same room as the engine, so the DataMite sees the same air as the engine. The Barometric Pressure and Humidity of the air at the engine WILL be the same at the engine as it is at the DataMite. However, the temperature may be different.

For improved accuracy, you can mount a thermocouple at the air inlet to the engine and assign that thermocouple as “Std Thermocouple, Eng Intake Air” in the Sensor and Calibration column in the DataMite specs and the software will then use that channel for performance corrections. If you purchased one of these air thermocouples, separate instructions will explain this in more detail.

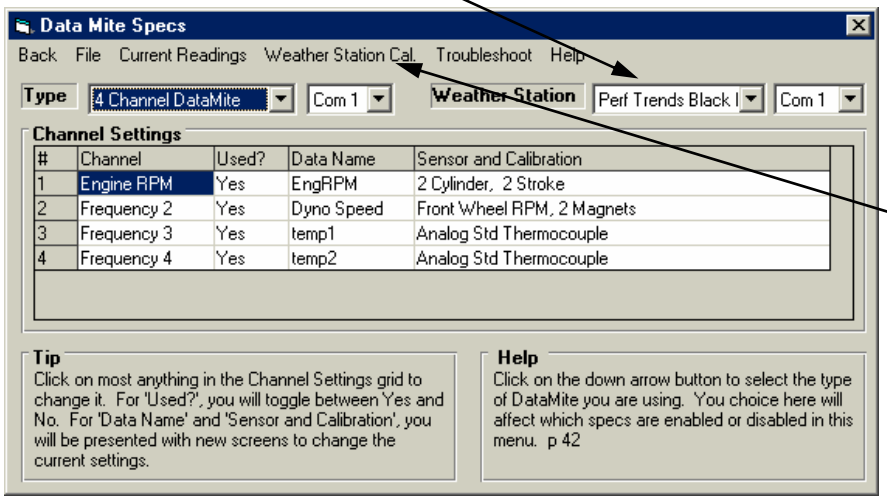
You must configure the DataMite software for the Black Box weather station as shown below.

Fan Operation: The DataMite III and Mini USB have recirculating fans which cycle on and off for improved weather sensor accuracy and long fan life. The default fan operation for the DataMite III is with the fan cycling on and off whenever it is powered up, by the power supply or the USB cable. The Mini’s fan only comes on when the “Current Readings” screen has been displayed at least once. Then it stays on for as long as the program runs, until you shut down the program. You can have the DataMite III operate much like the Mini (turning off the fan when the program is not running) by going into Preferences, the “Calculations (cont” tab, and set “Turn Fan Off When Shutting Down” to Yes. However, if you turn off power to the DataMite III, then turn power back on, it will revert to the default condition with the fan cycling on and off whenever power is on to the DataMite III.

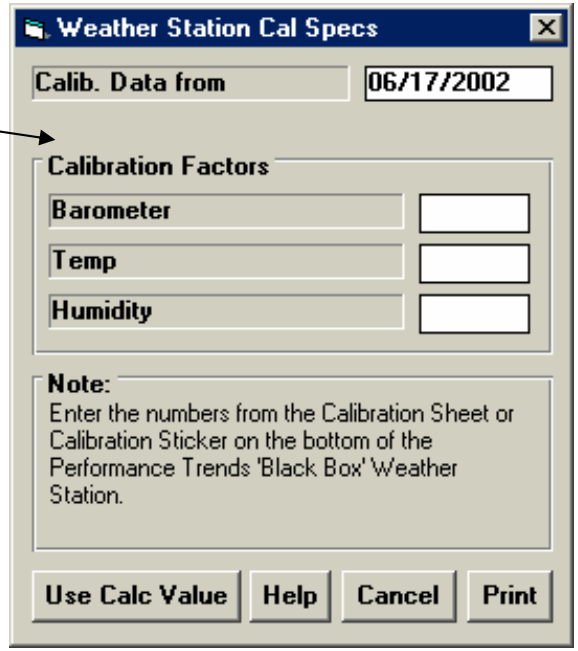
Calibration #s for sn _____

Select: **Internal Sensors** as the weather station in the DataMite specs.

Type in the numbers written below, then click on ‘Use Calc. Value’ so the program can more accurately read the weather station’s readings. For most all situations, these numbers are “0”



Click on Weather Station Cal. (visible only after you select ‘Black Box’ as the weather station) to bring up the calibration screen shown to the right.



Notes on Your Dyno Configuration

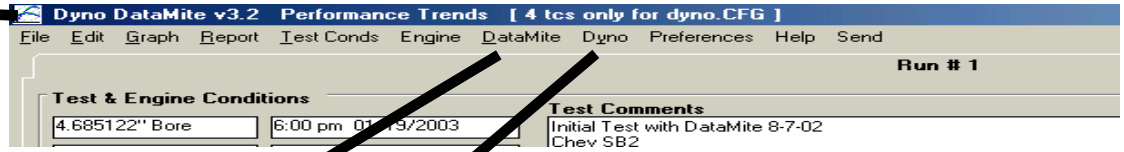
First click on File, then Open (from all saved tests) to open an example test file, similar to the dyno and DataMite system you have. Then click on DataMite and Dyno to obtain critical menus shown below to configure your Dyno system

Click on "File", then "Open (from all saved tests)". Then choose this Example test to start building your first test file, which will configure your DataMite and Dyno Specs.

____Stock Briggs.cfg ____ALC-MAG.cfg

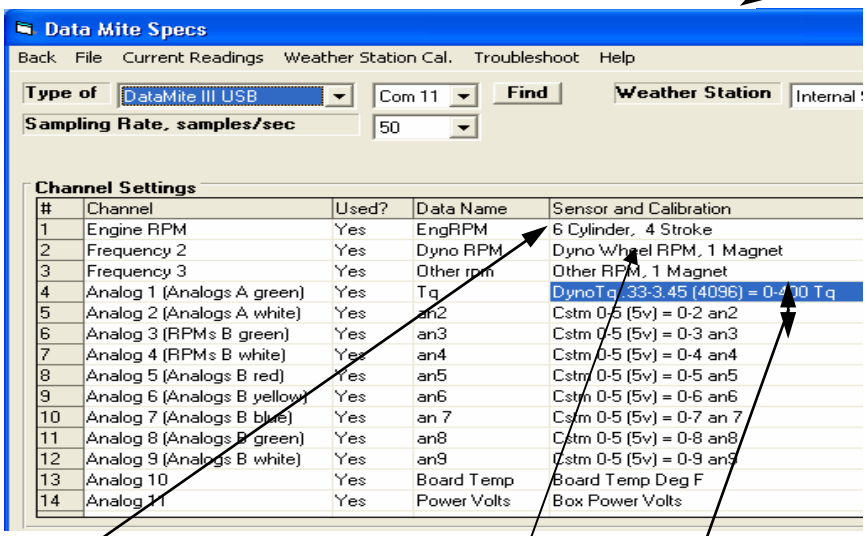
____Black Box II.cfg ____USB DataMite Dyno.cfg

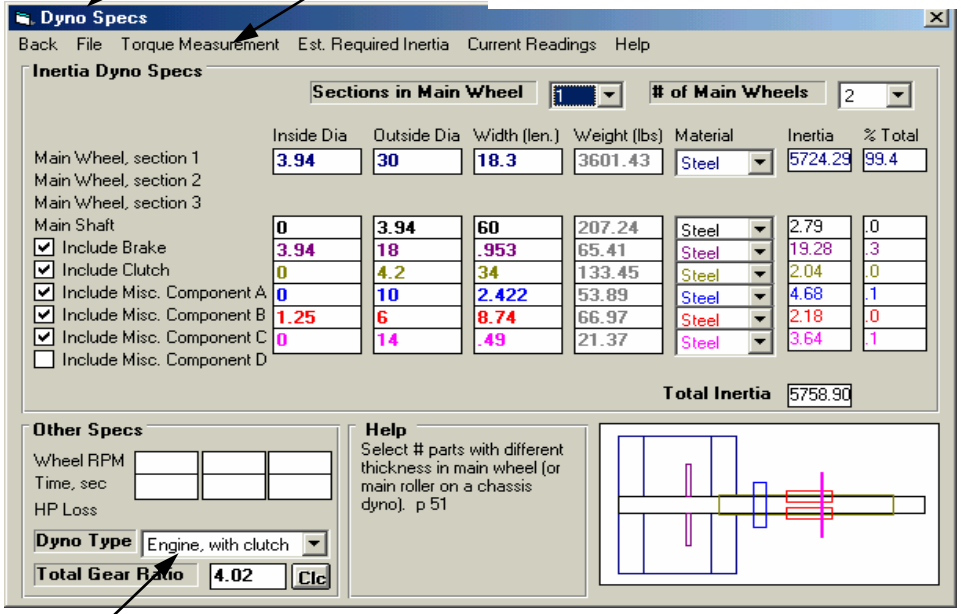
____ DataMite Mini USB Example.CFG ____DataMite 4 USB Example.cfg



Click on Torque Measurement to tell program you have:

1) An inertia dyno
2) An absorber (torque arm) dyno (see Appendix 5 in manual).





First row, Engine RPM: set to

_____

Row 2 (frequency row 2): set to

_____

If Absorber Type Dyno: Analog 4 for Black Box II, Analog 1 for DataMite II or Analog 1 for DataMite III USB): set to

_____

Dyno Type setting determines if you will measure both engine and dyno RPM, or if you need to. We recommend you select:

Engine, direct drive Engine, with clutch Engine, No clutch
Chassis Dyno Chassis Dyno, no eng RPM

Total Gear Ratio is then: Used only for clutch slip calculations
Critical to enter correctly Not used
Vehicle info for Chassis Dyno are entered in Test Conds screen (Pro version only)

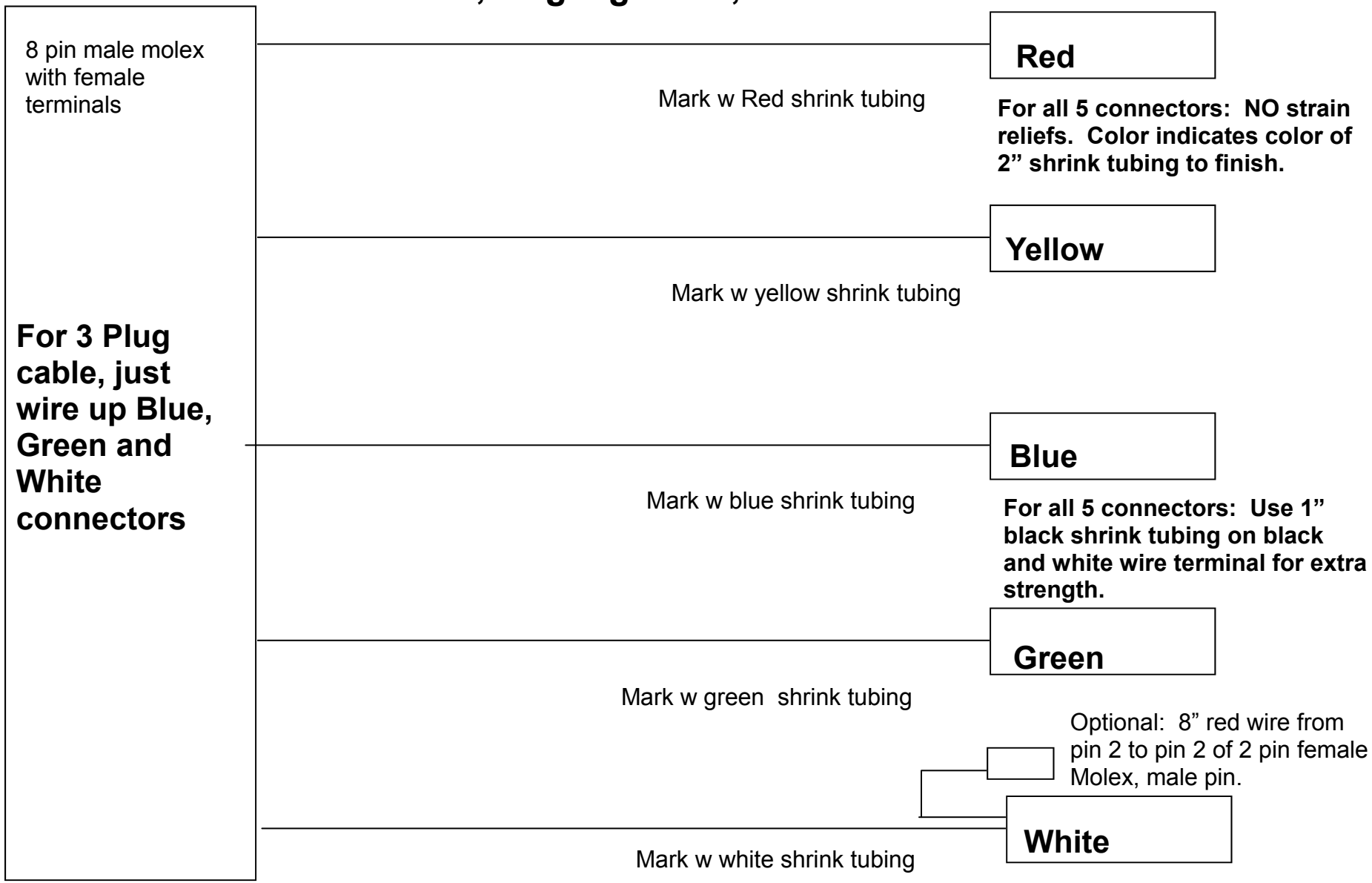
IMPORTANT: For this Dyno Type, go into Preferences, then Calculations tab, then set "Engine RPM is Calculated RPM" to Yes.

Once you have made these critical changes, click on File at the top of these screens, then Save as Master DataMite (or Dyno) specs.

DataMite USB 3 & 5 plug Analog Breakout Cable

All 5 connectors below are 4 pin female molex with male terminals

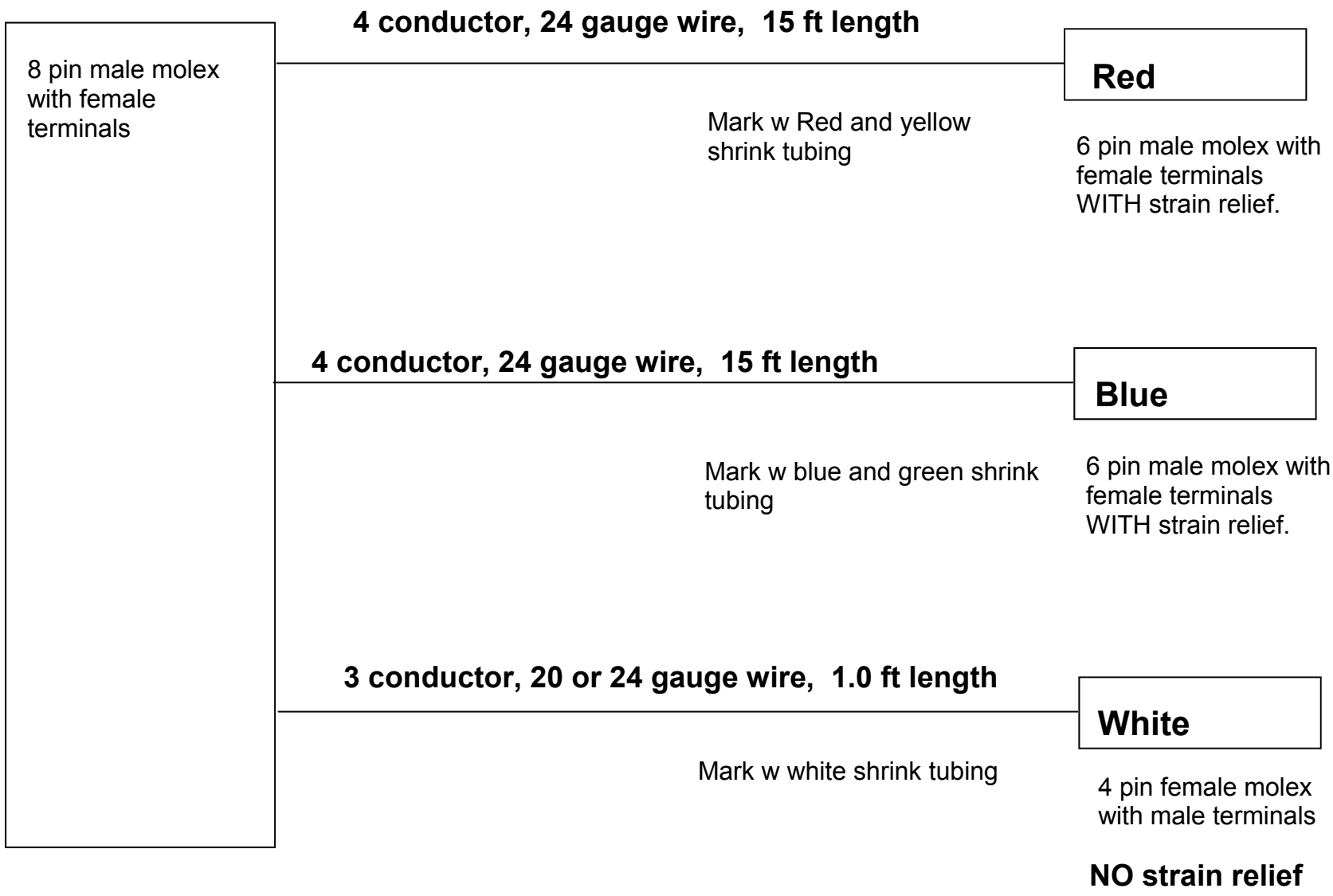
3 conductor, 24 gauge wire, 1.0 ft len



For all 5 connectors: NO strain reliefs. Color indicates color of 2” shrink tubing to finish.

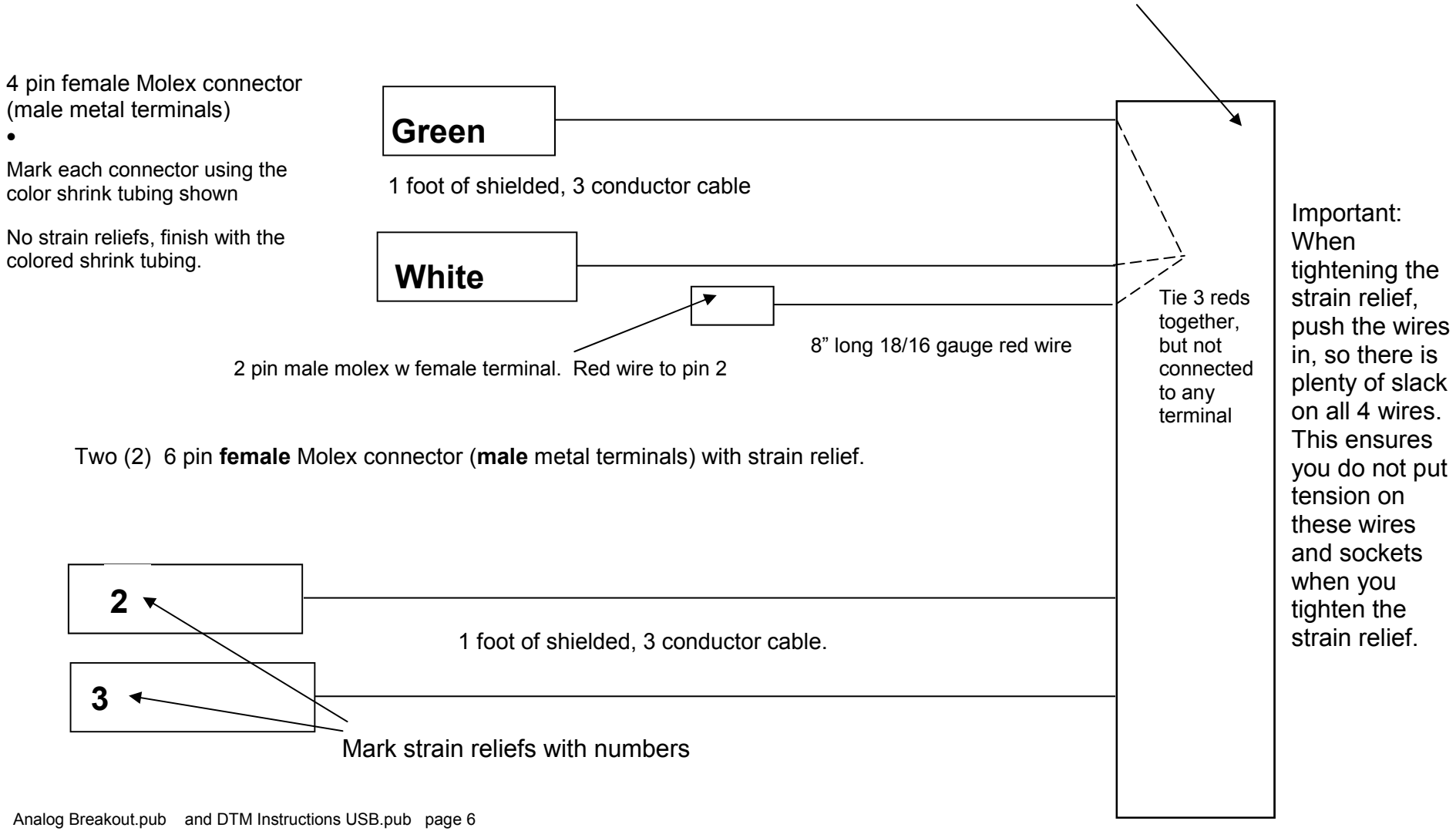
For all 5 connectors: Use 1” black shrink tubing on black and white wire terminal for extra strength.

DataMite USB 4 TC, 1 Analog Breakout Cable



DataMite USB 2 RPM 2 Analog Breakout Cable DT3-BCA2R

6 pin male Molex connector (female metal terminals) with strain relief.



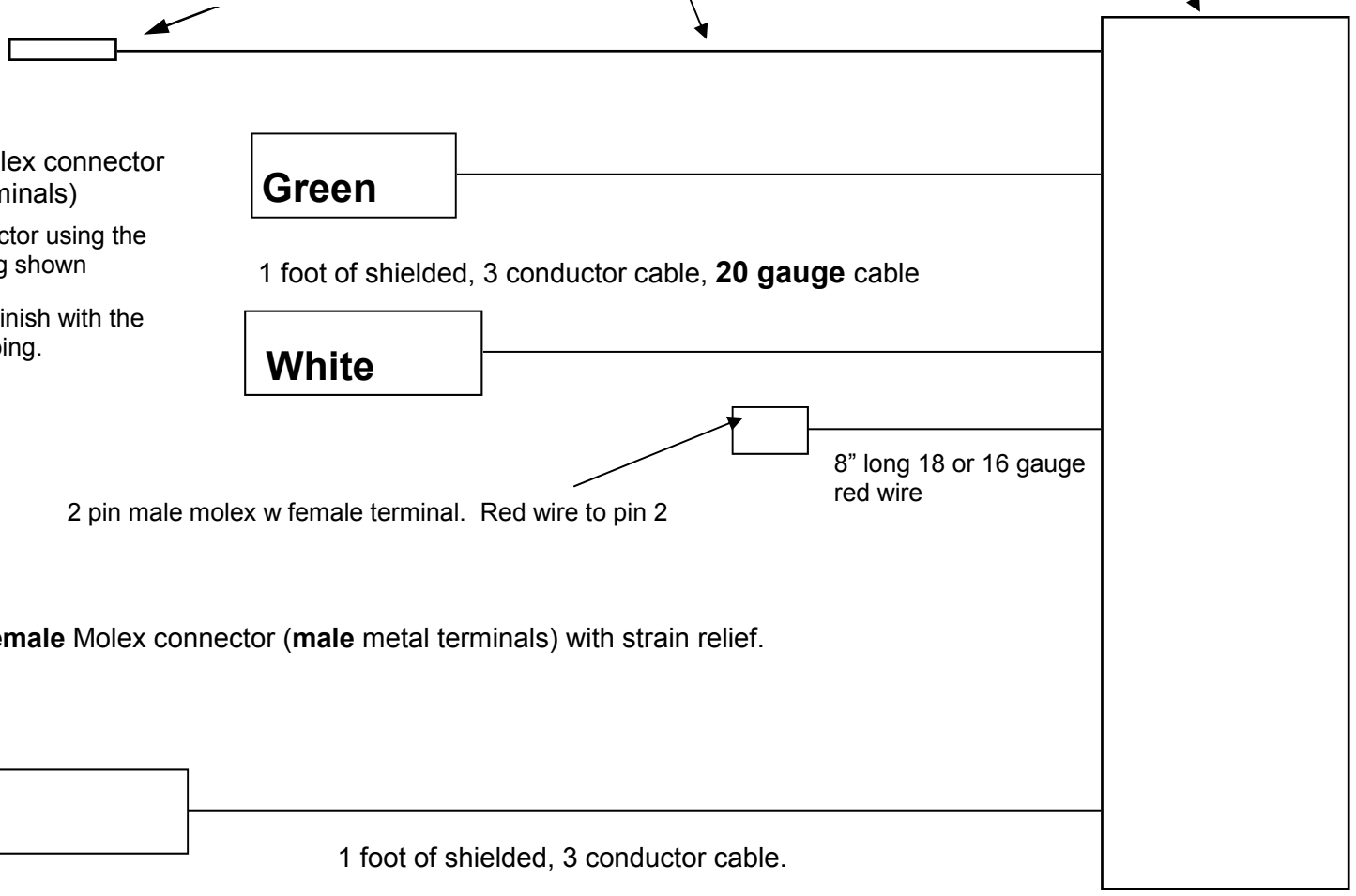
DTM III RPM Breakout Cable

RPM Sensor Cable PN **BB2-RPML**

6 pin male Molex connector (female metal terminals) with strain relief.

18 feet of shielded, 3 conductor cable.

Standard aluminum Reed switch, connected to black and white wire. Use black shrink tubing over end of red wire to prevent shorting to shield or shield wire. Then use 1 piece of black shrink tubing over all wires to finish off.



4 pin female Molex connector (male metal terminals)

Mark each connector using the color shrink tubing shown

No strain reliefs, finish with the colored shrink tubing.

Green

1 foot of shielded, 3 conductor cable, **20 gauge** cable

White

8" long 18 or 16 gauge red wire

2 pin male molex w female terminal. Red wire to pin 2

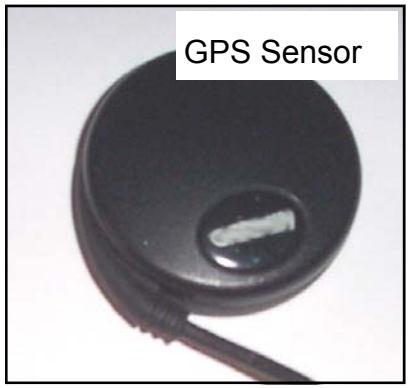
6 pin **female** Molex connector (**male** metal terminals) with strain relief.

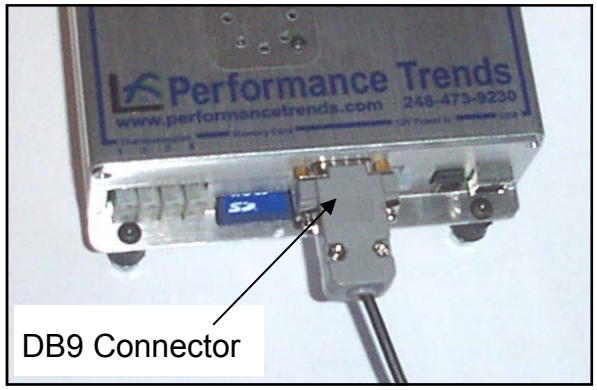
1 foot of shielded, 3 conductor cable.

Important: When tightening the strain relief, push the wires in, so there is plenty of slack on all 4 wires. This ensures you do not put tension on these wires and sockets when you tighten the strain relief.

DTM III GPS Sensor Tips (Road Race/Circle Track systems only)

Install the GPS sensor on top of the car, away from any vertical obstructions (windshield, spoiler, etc) which could prevent the sensor from “seeing” the various GPS satellites. The center of the roof (or side of roof away from track obstructions, high fence, etc.) is ideal if it will not be vulnerable to damaged there.



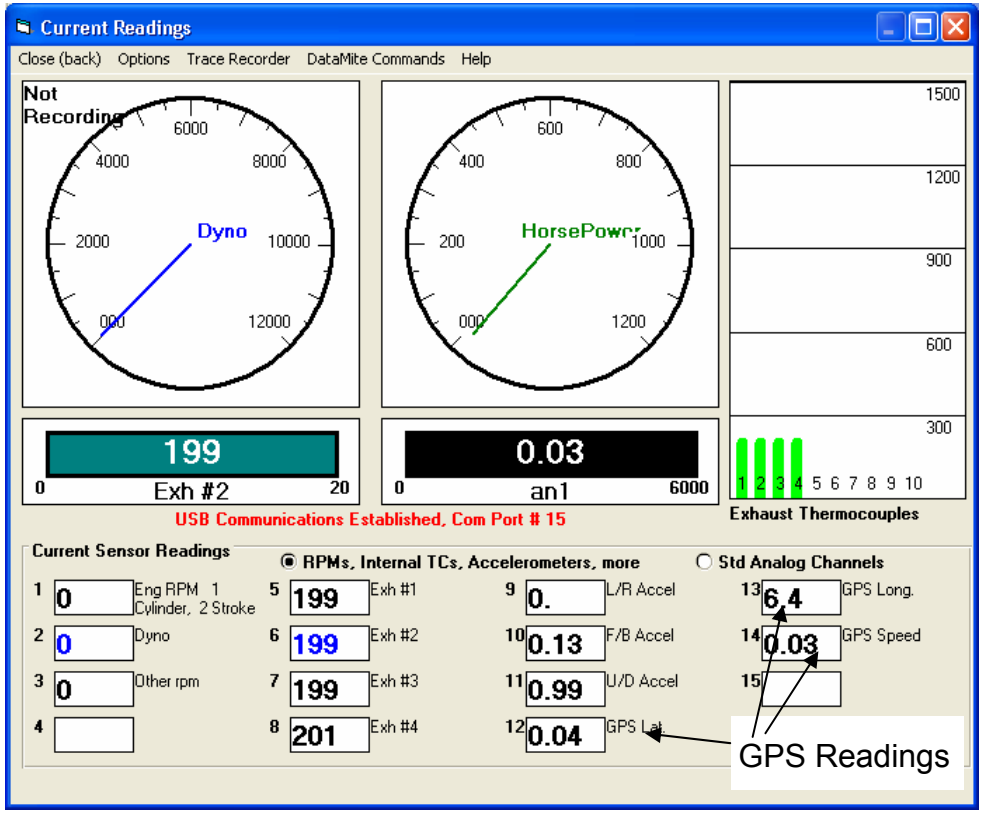


Typically the magnet in the sensor is sufficient t hold it in place on steel panels. Use the threaded hole in the bottom of the sensor if you need a more secure mount.

Plug the other end of the cable into the DB9 connector on the DataMite III USB box.

You do not have to tell the software the GPS sensor is installed. When the software reads your recorded data on the Flash Card, it will see if there is any GPS data available and use it as appropriate.

You can check the functioning of the GPS sensor by clicking on DataMite at the top of the Main Screen, then Current Readings. These readings are RELATIVE GPS position if feet, showing how GPS has changed since you first opened this screen. These stationery readings are not as accurate as when the vehicle is moving. Also displayed is GPS Speed, indicating how fast the GPS sensor is moving.

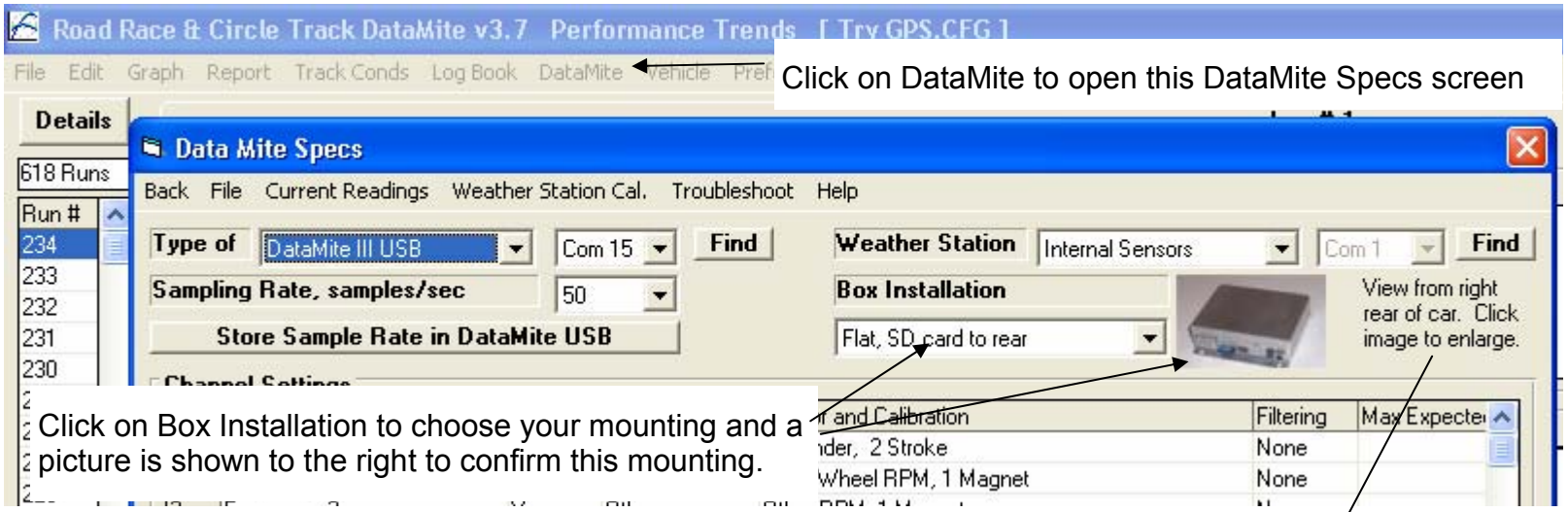


IMPORTANT: It may take several minutes for the GPS sensor to communicate with enough satellites to determine its position. Until it finds the satellites, you will see zero readings, the same as if the GPS sensor is not connected. This is especially true if you are near or inside buildings, or if the sensor has not been used for several days.

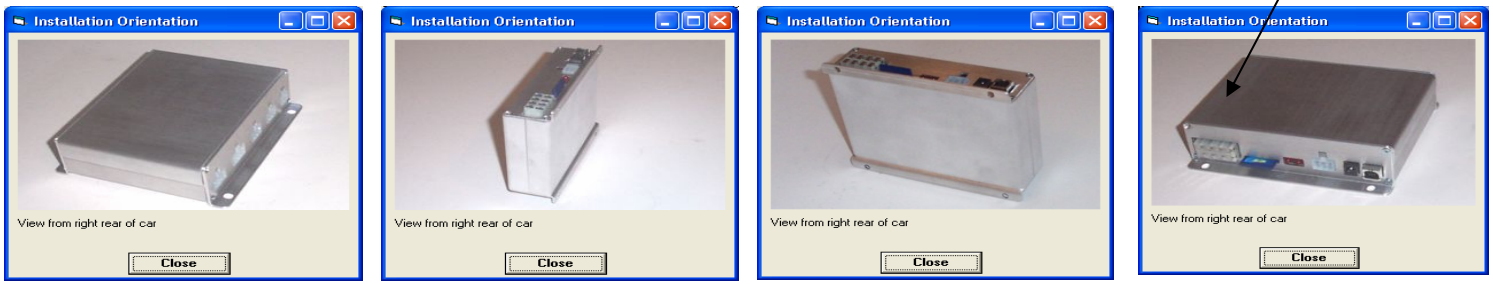
The GPS sensor **does** remember some things about the last time it was used, to get quicker location measurements the next time it is powered up. Therefore, if you are inside buildings, a new GPS sensor may never be able to find the satellites until it is moved outside at least once.

DTM III USB Mounting Tips for Accelerometers

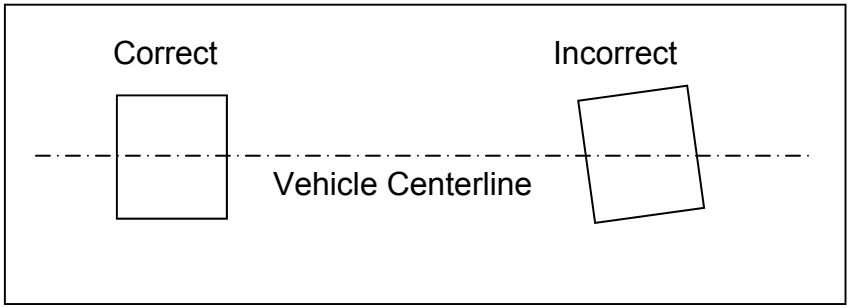
The DataMite III USB has a 3 axis accelerometer inside, to measure acceleration Gs in all directions. However, you must tell the software how you have mounted the box so it knows which accelerometer is measuring the front to back acceleration, side to side acceleration, etc.



Here are just 4 of the 14 possible mounting orientations. These are all views from the right, rear corner of the vehicle.



Mount the box as vertically if on edge or level if mounted flat as possible. Mount the box as parallel to the vehicle's centerline as possible.

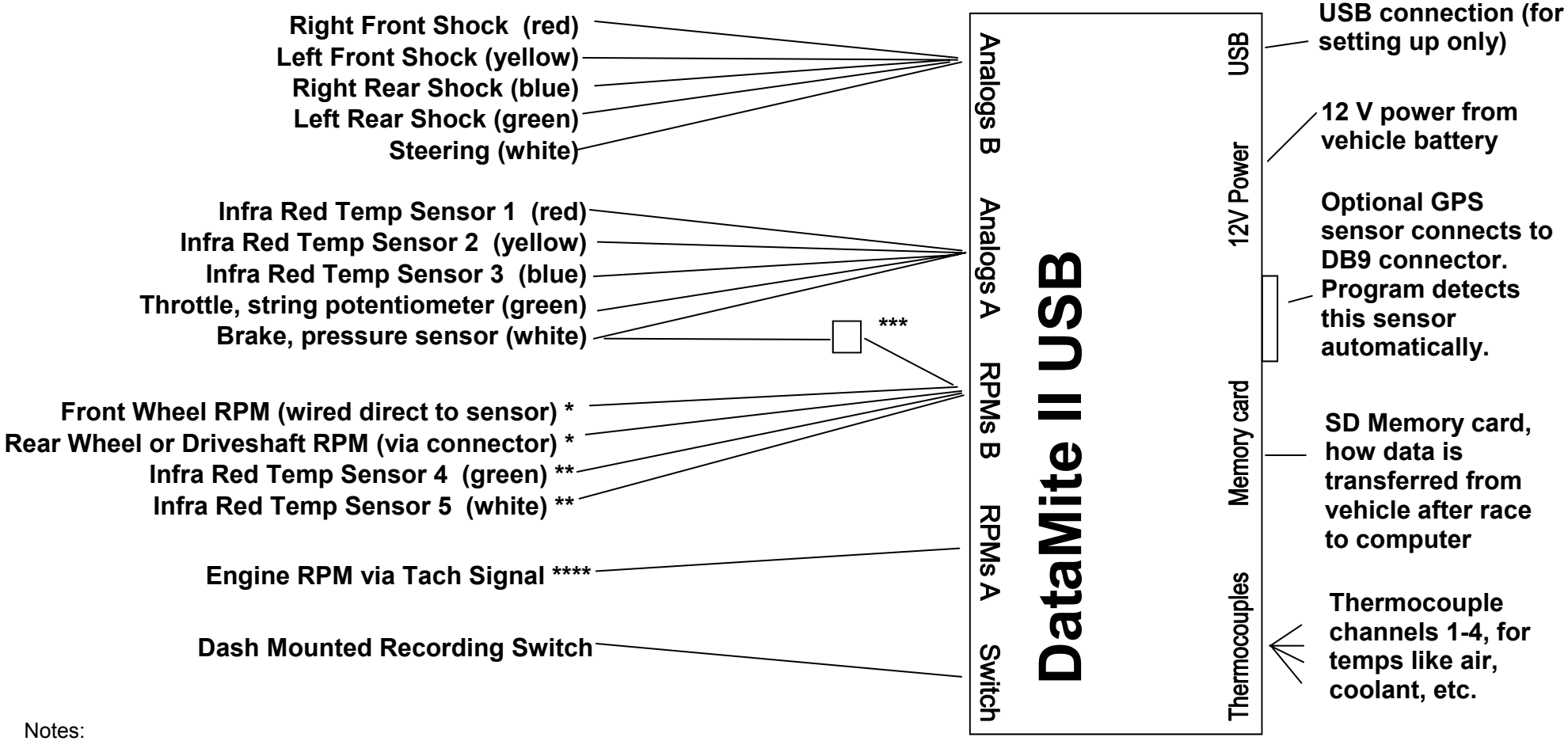


General Tips: Mount box using rubber isolators provided to isolate from vibration. Mount away from engine or exhaust heat and away from ignition wires or components.

DataMite III USB Wiring for Typical Road Race/Circle Track Car

The sensors and connections below will match up with the Example File in the DataMite software called **DataMite III USB Sensors**. Open this file and save its settings as you master DataMite specs (per instruction sheet). Then install sensors as shown below.

IMPORTANT: The sensors and connections below match those in the **DataMite III USB Sensors** file (making setup easy), but are not the ones you ***must*** use. Other sensors can be used and connected to different channels than what is shown here.



Notes:

* Front and Rear Wheel (or Driveshaft) RPMs are not as necessary if you are using GPS, but can still provide additional useful data.

** If you use the green or white analog inputs for RPMs B which require 5V power, you must connect the 2 pin power connector to the 2 pin mating connector from either Analogs A or Analogs B. **These are not available if Internal Weather Sensors are installed.**

*** This 2 pin connector lets you pull in 5V power from the Analogs A white connector.

**** Engine RPM input, typically works best from an MSD box's "Tach" signal. Other types of optical or magnetic sensors also possible.

If you change a sensor or connector from what is indicated above, you must let the program know. That is done by clicking on DataMite at the top of the main screen, and setting the channel specs for the appropriate channel. See additional instruction sheets or Section 2.5 DataMite Specs in the manual.

You can rezero ALL suspension sensors with 1 easy command. Click on DataMite at top of main screen, then Rezero at top of DataMite Specs screen then Rezero Suspension Sensors.

Notes on Your DataMite Configuration

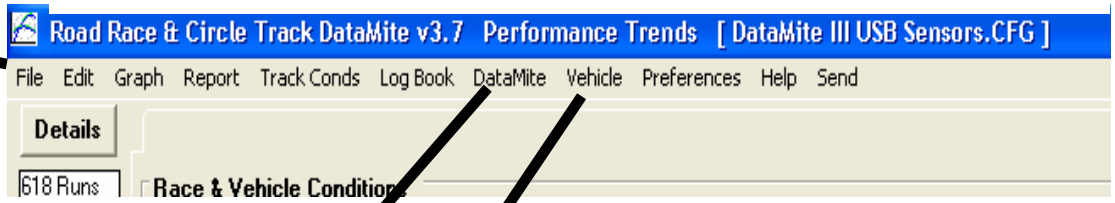
Click on “File”, then “Open (from all saved tests)”.

Then choose this Example test to start building your first test file, which will configure your DataMite and Vehicle Specs.

____DataMite III USB Sensors.cfg

____DataMite 4 USB Example.cfg

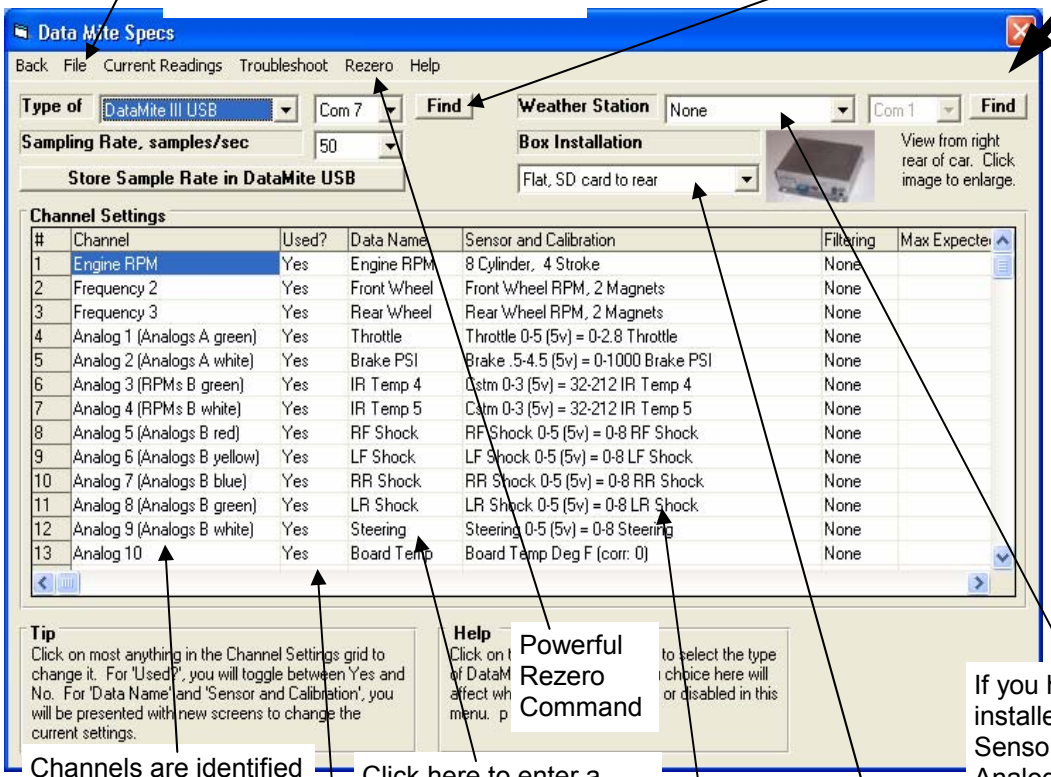
First click on File, then Open (from all saved tests) to open an example test file, similar to the vehicle and DataMite system you have. Then click on DataMite and Vehicle to obtain critical menus shown below to configure your DataMite system

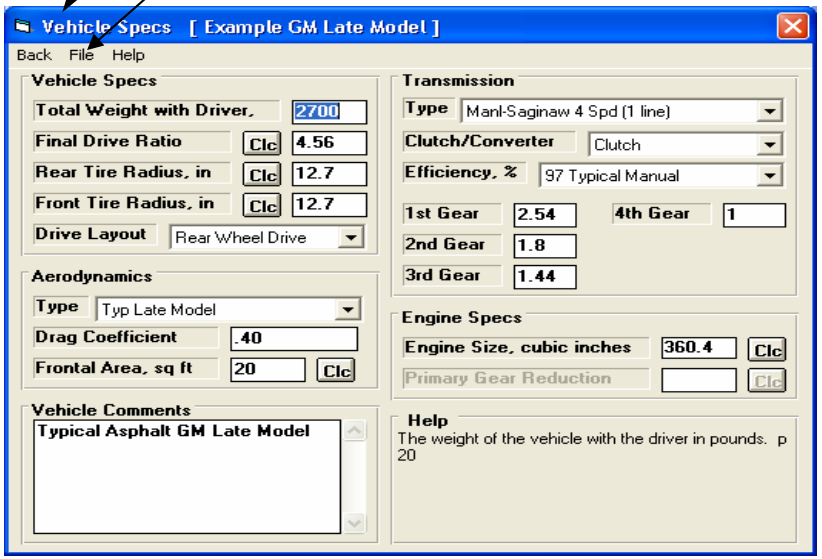


When you are done entering these specs, click on File, then Save as Master DataMite Specs.

Click here to see which Com Port you could be connected to (typically the highest number shown).

When you are done entering these specs, click on File, then Save as Master Vehicle Specs.





Channels are identified by connector name on box and color on connector.

Click here to enter a name for each channel, which will be used in graphs and reports.

Powerful Rezero Command

If you have weather sensors installed in the box, choose Internal Sensors here. Then channels Analog 12 and Analog 13 can **NOT** have external sensors connected (DataMite III only).

Most entries in the Vehicle Specs screen above are not critical unless you are calculating torque and HP from accelerating data, or calculating clutch, torque converter, or tire slip.

Choose how you have mounted your box in the vehicle so the program knows how the accelerometers are arranged.

Turn channels Off or On by clicking in the “Used” column.

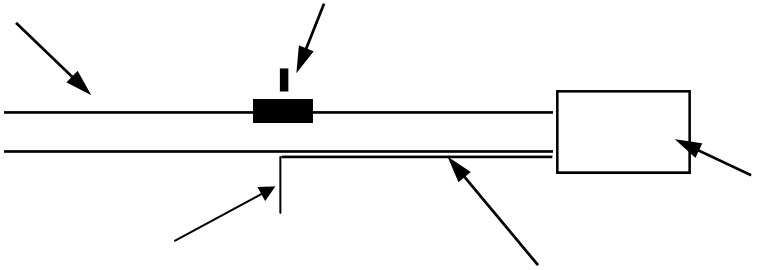
Click in the “Sensor and Calibration” column to display a new screen. There you will describe the sensor and tell the program, say, how many inches of travel is equal to how many volts signal.

DataMite III Vehicle Connector Wiring Diagram

DataMite 4 Barrel connector for vehicle power.
Connect the lead with gray dashes to 12 VDC power.
This will often have a piece of red shrink tubing on it to mark it as the + 12 VDC lead.
Undashed lead is ground.

An optional, user supplied, power switch can be installed. It lets you kill power to the box easily. This is sometimes needed to 'reboot" the DataMite III. **See Note Below *.**

Red (sometimes White) lead is power. If you provide your own power source, it must be a clean (no A/C ripple) 12-18 Volt DC, up to 1.5 amps. For vehicle installations, direct to battery is best, direct to kill switch is OK. DO NOT wire to feed which powers your ignition box.



Plug into DataMite connector. Power LED will light, indicating DataMite has got power.

Generally, a fuse is not required as the DataMite III has internal current limiting protection.

For some systems, a separate ground lead may be provided so you can easily ground the power input to the engine or vehicle.

For vehicle installations, black lead goes to battery ground or good frame ground. Poor grounding can be a source for many problems in operation and poor data quality. Note the precautions below. Welded stud is best ground point to frame. Pop riveted brackets are a poor ground. Do NOT ground to same point which grounds your ignition system.

* Note: For best results, it is best to start and stop recording with the Record Switch (lighted toggle switch). You can start recording by switching on power with the Record Switch in the Record position. HOWEVER, you can NOT stop recording by just switching power OFF, because the box will not be able to write an "end of file" mark on the recorded data file.

The Record Switch (lighted toggle switch) for the DataMite III will not come on or flash without the SD card plugged in.

Precautions:

The DataMite software allows you to display the Current Readings in a "live display" (what's happening right now) through the USB connection. For simple checks, the power from the USB port alone may provide enough power. However, if several sensors are connected, or you want to see how the sensors will read with 12V power, you must power up from the vehicle's battery, or with a 12 VDC wall transformer (500 mAmp minimum). These are available from Performance Trends for a nominal charge. If you use your own transformer, **BE SURE it is "center positive" where the center pin has the 12 V power and the outside barrel is ground.**

Improper grounding of the system or a high voltage spikes coming from a sensor through the DataMite can damage your computer. Here are some tips to reduce this possibility:

- The DTM-PS power supply should be plugged into the same outlet as your computer (plug both into the same power strip).
- For Dynos, the engine or dyno frame should have a good earth ground (grounded to cold water pipe or grounding rod).
- Laptop computers running off their battery, not a 110 VAC power supply, are less likely to have problems.

See Appendix 2 in the User's Manual for full details

DataMite II Calibration Sheet for Custom Sensor, cont

"Correction" (bottom entry in menu) is for fine tuning the calibration for a particular situation, like a shock travel sensor once it is installed in the vehicle. Correction is a number you want ***ADDED*** to the final reading. For example, if a thermocouple is reading too low by 5 degrees, you can enter 5 for the correction to increase this number by 5. If an accelerometer is reading too high by 0.05 Gs, you can enter -.05 to reduce this number by .05.

The Correction is very useful for shock or steering travel sensor, where we give you the calibration, say for a 6" travel sensor, with the first 4 readings in the menu to the right. But then, you want to "zero out" the sensor to read 0 at vehicle ride height for the shocks and with steering wheel pointed straight ahead for a steering sensor. This is done following the procedure below:

This is only available in the Pro version of the software and must be turned on. Do this by clicking on Preferences at top of main screen, then Calculations tab, then set All Correction to Calibration of Selected Recorded Channels to Yes. Then click on OK to save this change.

You will first enter the first 4 entries as shown to the right. Then once the sensor is installed, with the vehicle at ride height, you can either:

1 Read what the sensors are showing in the "Current Readings" screen in the DataMite software. If a reading is showing 2.64 but you want it to read 0, then enter -2.64 as the Correction.

2 Or, click on the "Read" button to have the software figure it automatically. After you click on Read, the program will ask what the reading should have been at that time.

The software will now read "0" for that shock at ride height.

Note that if you already had a Correction of 5 entered, and you want that channel to read 3 higher than it was reading, you must add that amount to the current Correction, 5 + 3 = 8. Remember to use a ***negative*** number for readings you want to ***reduce*** by a certain amount.

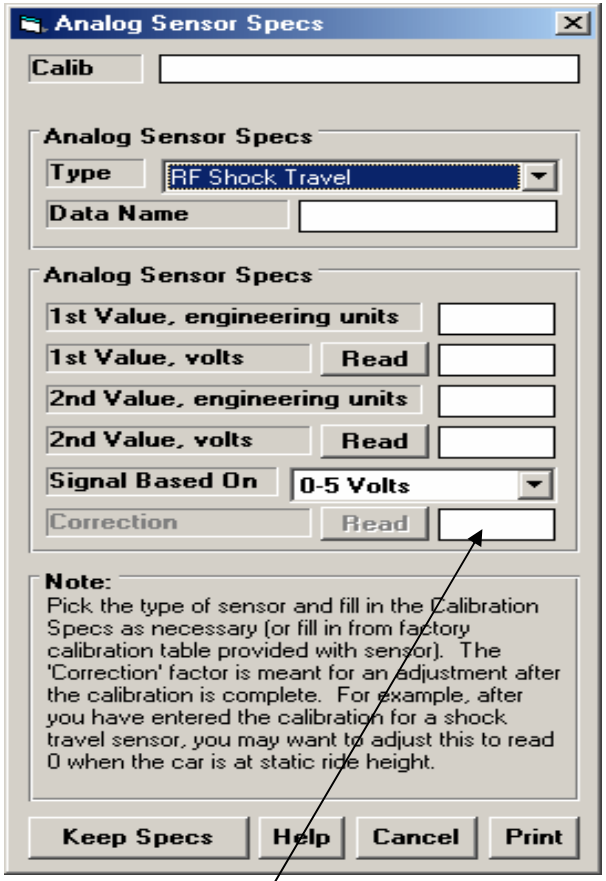
Notes: _____

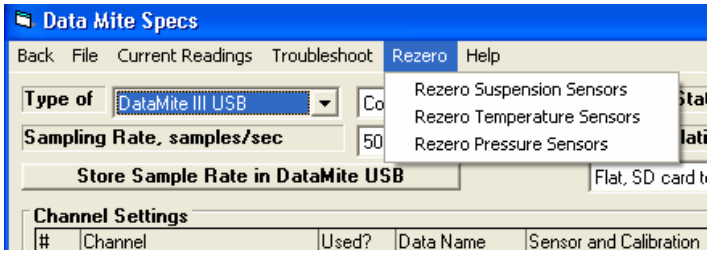
_____

_____

_____

A new feature in "non-dyno" versions lets you rezero several channels at once. Look for Rezero at the top of the DataMite Specs screen and choose you option as shown to the right.





DataMite III Eng Intake Air for Weather Corrections

An engine's output will vary with the weather conditions it is running in. The DataMite software can correct for these changes to give Corrected torque and HP numbers. When making comparisons from different days, Corrected torque and HP are more repeatable and are therefore the numbers you should use.

To do accurate weather corrections, accurate barometric pressure, humidity and temperature of the air entering the engine must be done. Barometric pressure, humidity and temperature sensors can be built into the DataMite III box. The barometric pressure at the box is EXACTLY the same at the engine, even if they are in different rooms. The humidity at the box is typically very close to that at the engine, even if they are in different rooms. However, the temperature at the box can be quite different between the box and the engine.

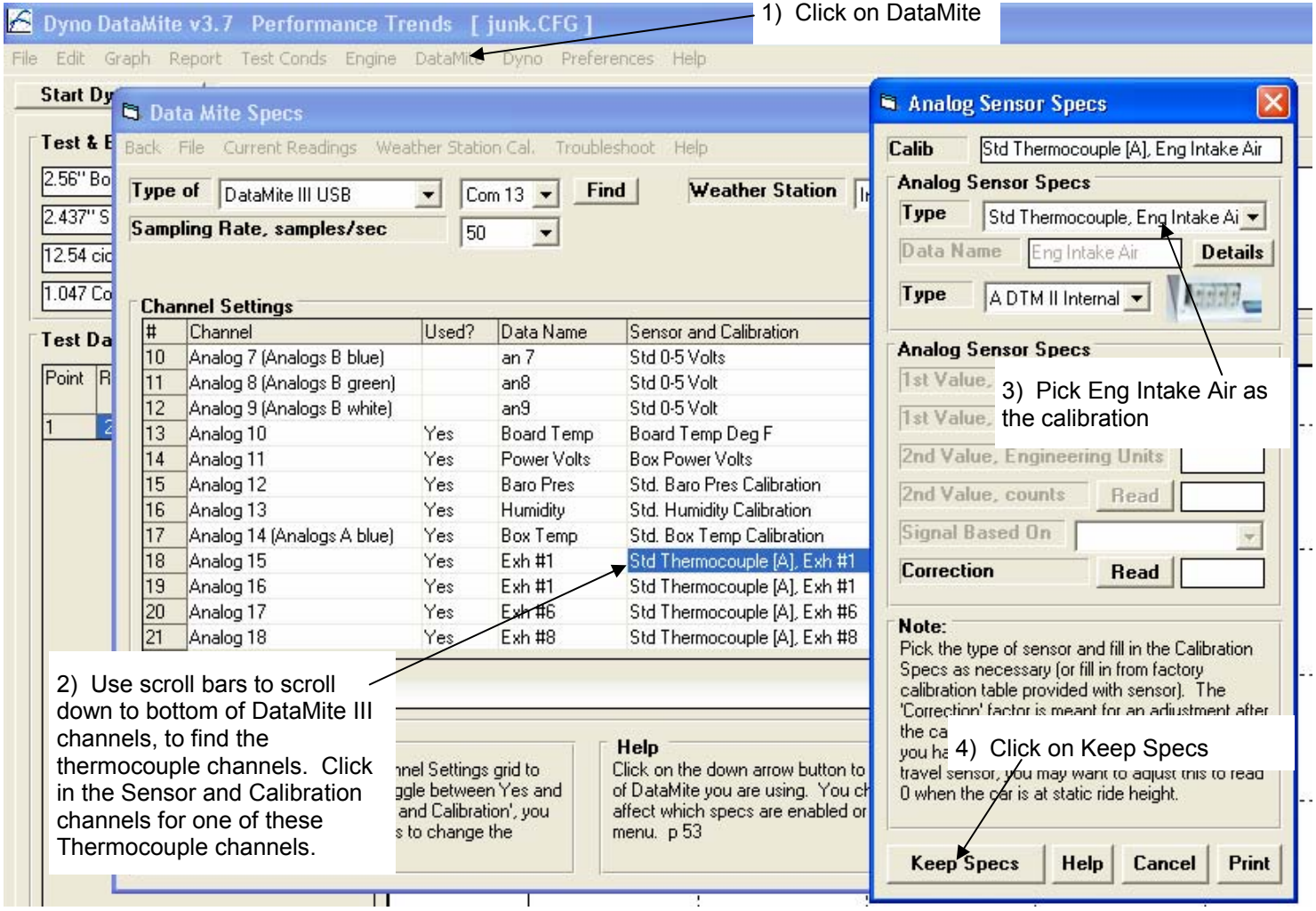
For that reason, you can chose to measure the air temp at the engine for more precise corrected data. There is a special thermocouple channel you can choose to do this with, called Eng Intake Air. If you pick this calibration for one of the thermocouple channels, and mount that thermocouple in the air inlet stream to the engine, the program will use this temperature for correction factors.

To do this:

1 Click on DataMite at the top of the Main Screen.

2 Click on the Sensor and Calibration for one of the thermocouple channels and choose Intake Eng Air.

3 Mount a thermocouple with an exposes tip or a special "air temperature" type thermocouple in the air stream going directly to the engine. **NOTE: Space this back from the engine inlet enough so that fuel "stand off" or "back spray" from the carb does not get fuel on the thermocouple. This will cool the thermocouple and record too low a temperature.**



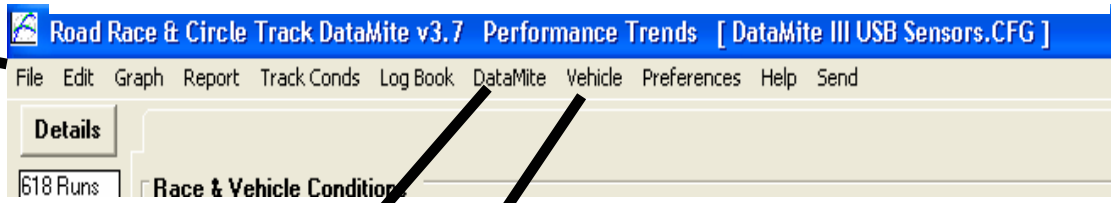
Notes on Your DataMite Configuration

First click on File, then Open (from all saved tests) to open an example test file, similar to the vehicle and DataMite system you have. Then click on DataMite and Vehicle to obtain critical menus shown below to configure your DataMite system

Click on "File", then "Open (from all saved tests)".

Then choose this Example test to start building your first test file, which will configure your DataMite and Vehicle Specs.

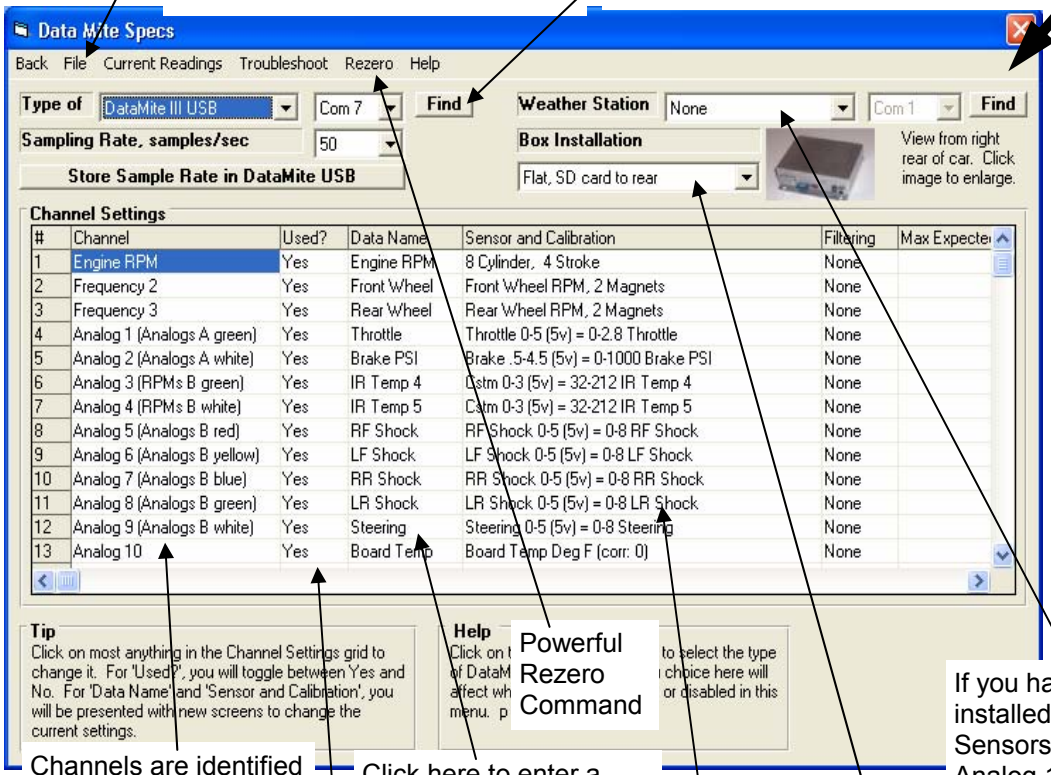
____Drag USB DataMite.cfg ____DataMite 4 USB example.cfg

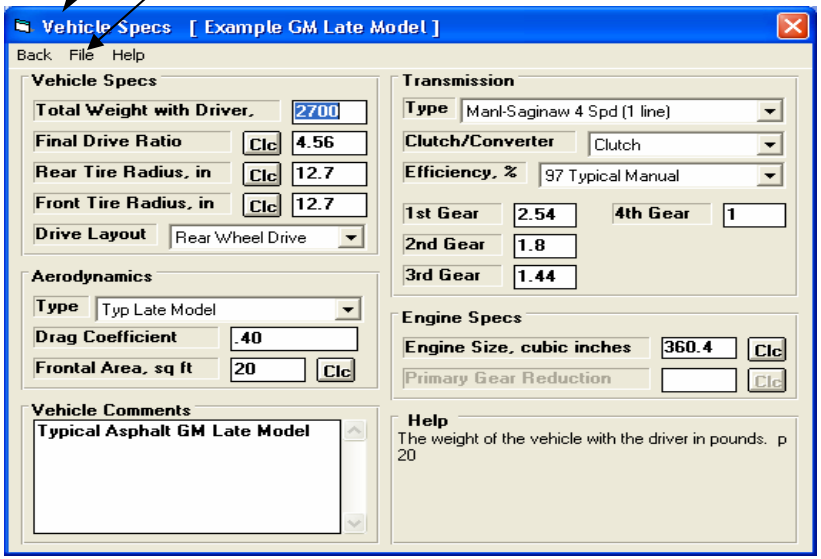


When you are done entering these specs, click on File, then Save as Master DataMite Specs.

Click here to see which Com Port you could be connected to (typically the highest number shown).

When you are done entering these specs, click on File, then Save as Master Vehicle Specs.





Powerful Rezero Command

Channels are identified by connector name on box and color on connector.

Click here to enter a name for each channel, which will be used in graphs and reports.

If you have weather sensors installed in the box, choose Internal Sensors here. Then channels Analog 12 and Analog 13 can **NOT** have external sensors connected (DataMite III only).

Most entries in the Vehicle Specs screen above are not critical unless you are calculating torque and HP from accelerating data, or calculating clutch, torque converter, or tire slip.

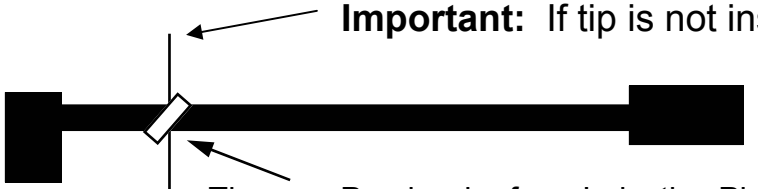
Choose how you have mounted your box in the vehicle so the program knows how the accelerometers are arranged.

Turn channels Off or On by clicking in the "Used" column.

Click in the "Sensor and Calibration" column to display a new screen. There you will describe the sensor and tell the program, say, how many inches of travel is equal to how many volts signal.

DataMite External Inductive Pickup Wiring Installation

Important: Do ***not*** kill engine by disconnecting the plug wire from the spark plug. This may cause high voltage spikes to travel back to your computer, damaging your COM port. Instead, ground the spark plug to kill the engine.



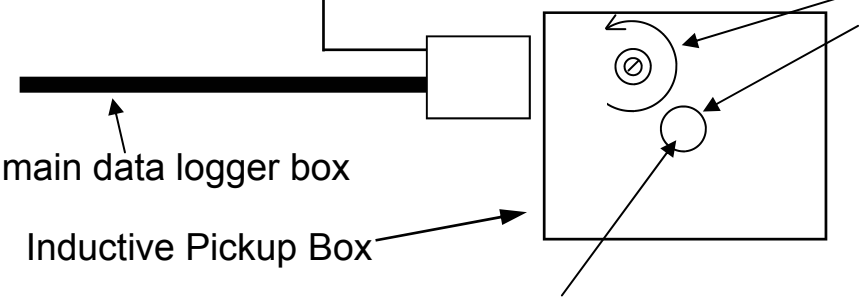
Important: If tip is not insulated, do not let it get near metal spark plug tip.

Tie wrap Purple wire from Inductive Pickup to spark plug wire, **OR use spring loaded clip provided**.

If you are getting eratic Engine RPM readings: Adjust the sensitivity screw through the hole in the top. Counter clockwise (CCW) rotation makes the system LESS sensitive. Many times you want to go LESS sensitive to improve the readings.

Another thing to try is to click on "Preferences" (top of main screen), then the "Calculations, cont.", then change the DataMite III USB Frequency Signal from whatever it is to the other choice.

Mounting Tip: To avoid excessive vibration, it is best to mount OFF the engine stand. If possible, leave the box hang its connecting cable.



Counter Clockwise, Less sensitive
Clockwise, Less sensitive (boxes w blue button)

DO NOT let metal screwdriver slip off screw or you risk shorting out the board inside. Box typically comes from factory with sensitivity set to maximum sensitivity. This is a 15 turn pot, so you can make several turns and still have adjustment. When it gets to either end of adjustment, it just slips (you may feel it click) to avoid damaging the adjustment potentiometer.

Blue button on newer boxes just indicates the sensitivity screw reverses (CW makes less sensitive).

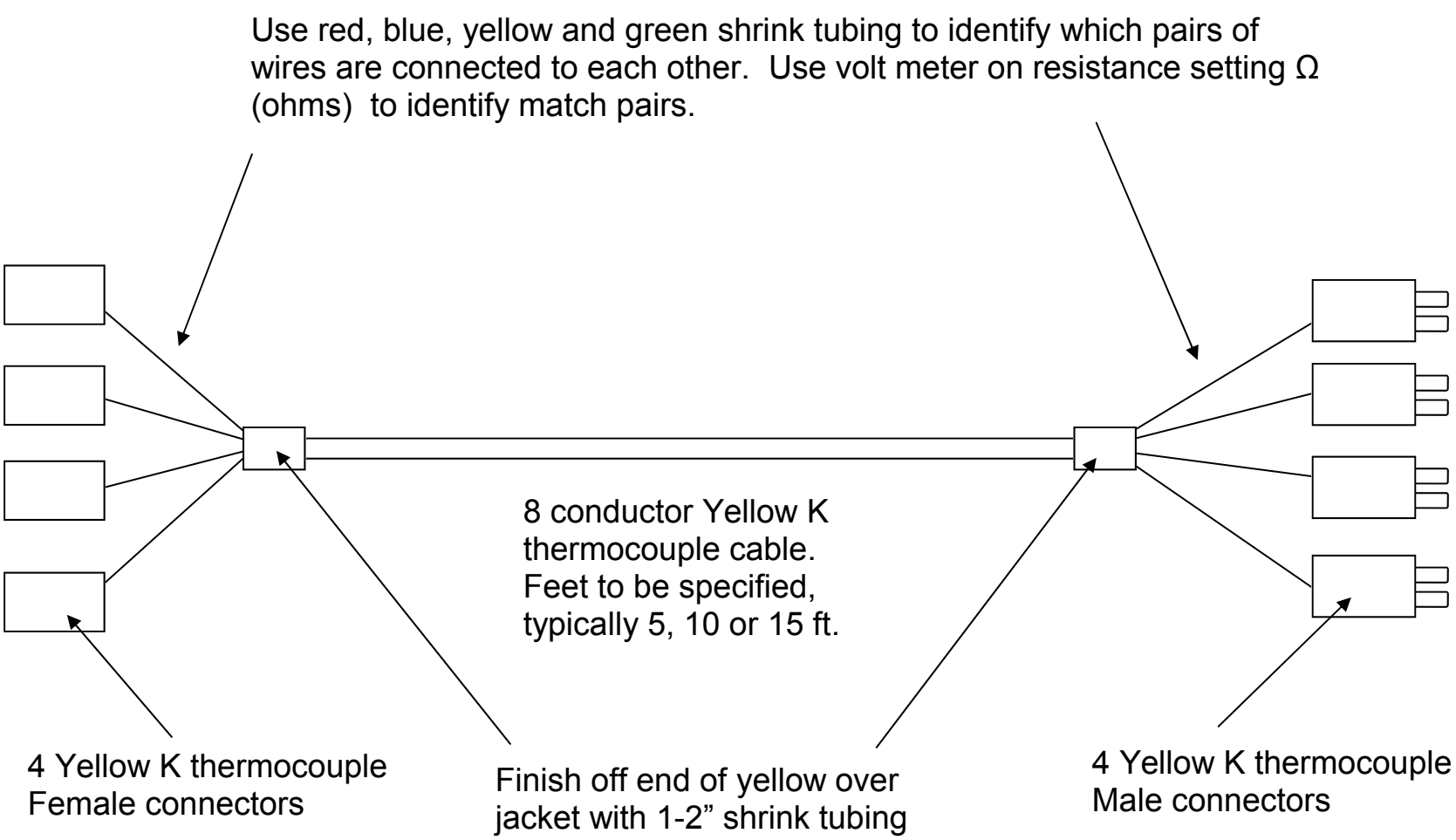
BB2-IPUP inductive pickup for low voltage wires like coil (12V) primary wire, fuel injector wire, etc.

Check the additional instructions packed with this **BB2-IPUP** for attaching this end to various signal wires.

The **BB2-IPUP** replaces the Inductive Pickup Box shown above. This connector plugs into same harness connector as where the Inductive Pickup Box would plug into.

See Appendix 2 in the User's Manual for more details

DTM III USB Thermocouple Extension Cable



DataMite Strain Gauge Amp Setup

View from back of 8 pin connector

8	7	6	5
4	3	2	1

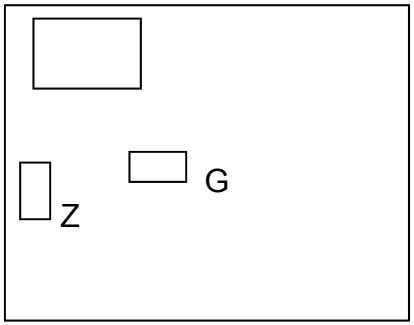
Connections:

1. Black, ground from logger (typically comes wired in harness)
2. Red, 5V power from data logger (typically comes wired in harness)
3. White (typically) from strain gauge, signal - *
4. Black (typically) from strain gauge, excitation -
5. White, amplified signal back to logger (typically comes wired in harness)
6. no connection
7. Green (typically) from strain gauge, signal + *
8. Red (typically) from strain gauge, excitation +

* Typically green and white to these pins are for a load cell in tension. Reverse green and white if you want to read the load cell in compression.

Amp Adjustments:

Adjustments in Amp



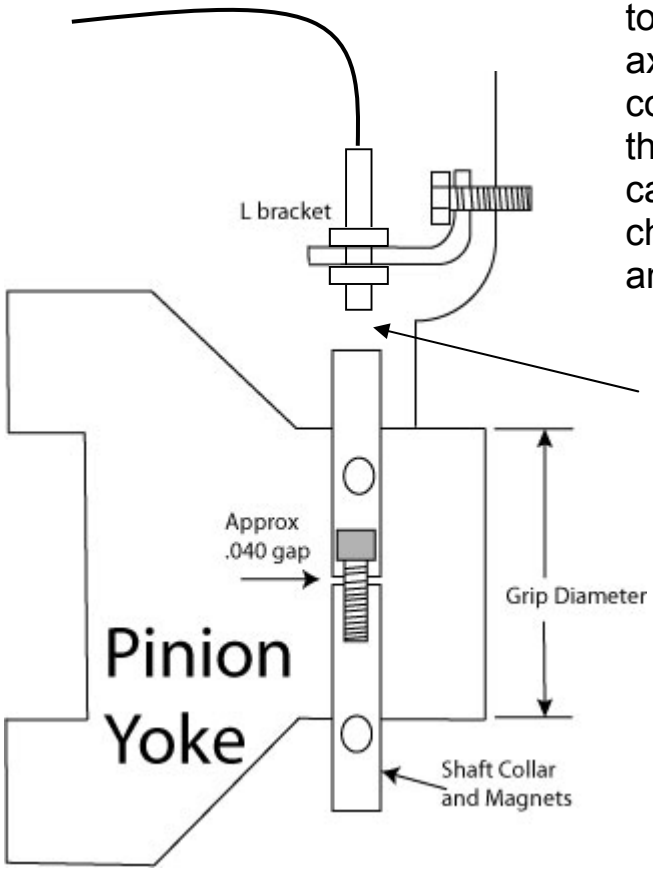
1. After wiring up the amplifier as above, hook it up to your data logger. Set up this channel as Std 0-5 Volts. Go into the Current Readings screen and watch this channel display volts.
2. Remove screws from cover to reveal the Zero and Gain screw adjustments. DO NOT touch any part of the board with a screwdriver except the screws on the adjustment potentiometers.
3. Determine how much load you are going to put on the load cell and calculate how much voltage you should see from the amplifier. First, calculate the percent of desired full scale this weight is. For example, if you hung 100 lbs on a 2 ft arm, you are producing 200 ft lbs. If you want the full scale to be 800 ft lbs, you have added 25% load (200/800 = .25 x 100 = 25%) This should then produce a 25% increase in the desired amplified signal voltage.
4. Typically, the desired full voltage is 4.5 volts, a 4.2 volt increase over the starting voltage. Typically .3 volts is a good starting voltage. .25 x 4.2 volts is 1.05 volts, which you must add to the starting .3 volts (1.05 + .3 = 1.35 volts). This means you want 1.35 volts from the amp when you produce the 200 ft lbs on the dyno.
5. Adjust the Zero pot until you get about .3 volts with no load on the load cell
6. Hang weights to get a load on the load cell, the 200 ft lbs. Adjust the Gain pot until you get the desired 1.35 volts.
7. Remove the weight and see if you are back to .3 volts. If not, repeat steps 5 and 6 until you get close enough to the desired .3 volts with no load and 1.35 volts with the 200 ft lbs. Plus/minus 0.01 volts is typically close enough for the zero reading, .03 volts for the loaded reading.

Notes:

- The .3 volts is used for most all calibrations as a good zero load voltage. The 1.35 volts will change depending on the calculations you do above for your particular situation.
- This calibration does NOT have to be very precise. You will do a precise calibration through the DataMite software as described in Appendix 5 after you get these voltages close. These adjustments are just so you get a good voltage change for the amount of load your dyno will see, but not so much that you max out the voltage.

DataMite III Driveshaft RPM Collar Installation

Picture of sensor and collar installation. Note: This collar has slightly different magnet installation.



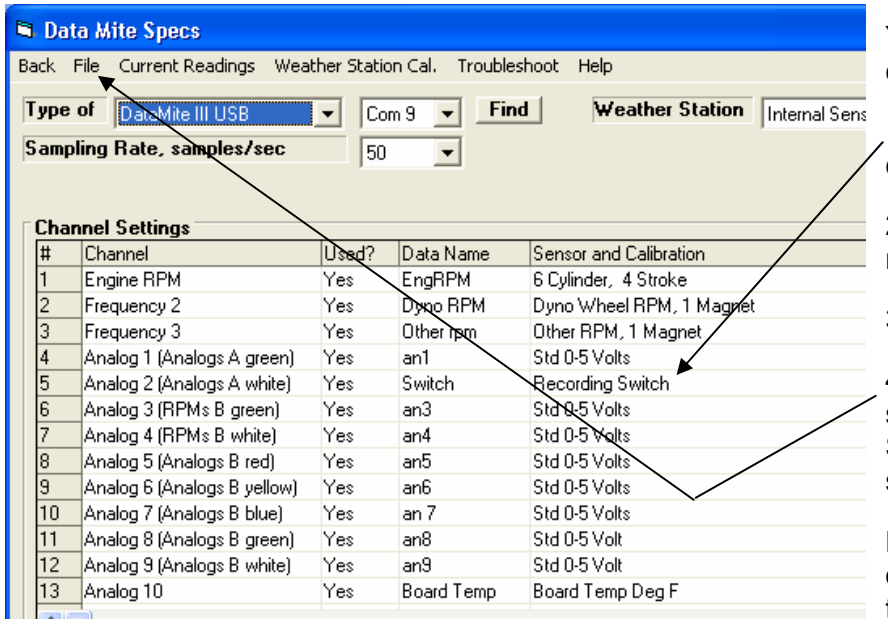
IMPORTANT: You must install the sensor bracket on something that moves with the driveshaft yoke. This picture shows you mounting it to the rear axle housing and the rear axle yoke. You CAN NOT install the collar on the transmission Yoke and the bracket on the underbody of the car, because the clearance will change with suspension movement and vibration.

Use Locktite or RTV on all threads to prevent them from backing out.

Adjust to about .080 inch gap to start with. If you have RPM dropping out at higher RPMs, adjust to a closer gap.

Collars come with holes for 4 magnets. However, typically they have only 2 magnets installed. Check this before you install the collar. In DataMite Specs screen, assign this channel as Driveshaft RPM and tell the software now many magnets are in the collar.

DataMite III USB Recording (or WOT) Switch Operation



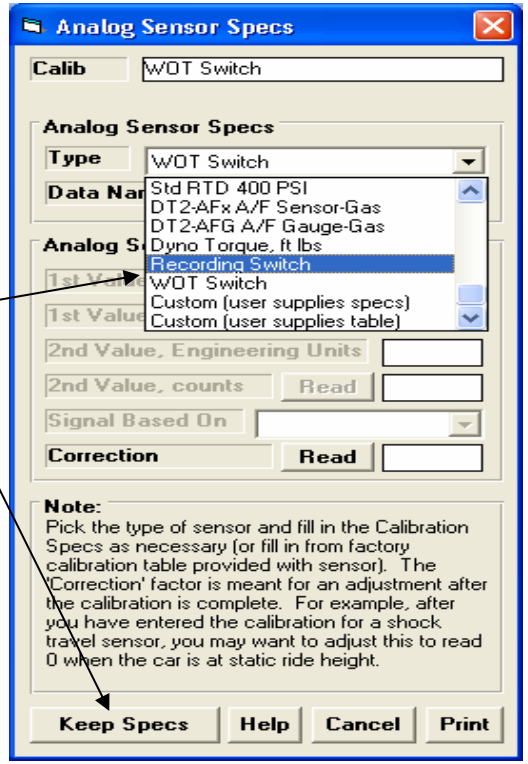
You must assign one of the analog channels as a Recording Switch.

1) Click on the Sensor & Calibration column for the channel you will use

2) Pick Recording Switch from the menu shown on the right.

3) Click on Keep Specs.

4) Back at the DataMite specs screen, be sure to click on File, then Save as Master DataMite Specs to save this change.



Plug the Switch into one of the analog channels. **DO NOT** plug the switch into the 4 pin connector marked “Switch” on the DataMite III USB logger box. That is for a vehicle switch.

Note that WOT Switch is also an option. When using this calibration, this input does NOT start or stop the recording. You must do that via the F1 and F2 key. This switch just marks exactly when the engine is Full Power (Wide Open Throttle). When this switch is pushed now marks what part of the test will be used for doing power curves.

Now when you run a test, you can still press F1 or F2 to Start and Stop recording, or click on the F1 (then F2) button. But you can also press and hold the Record switch button (for about 1 second) to start recording. Then after the recording has started, release the button. When you are finished recording, press the button again for about 1 second to stop recording

IMPORTANT: If you do not have the switch plugged into the correct channel, recording may start automatically as soon as you go to the Current Readings screen.

DataMite Dual Thermocouple Converter Installation Tips

The Dual Thermocouple Converter lets you read 2 K thermocouples as a 0-5 volt signal. It is both very precise and very affordable. Here are some tips for mounting and using it.

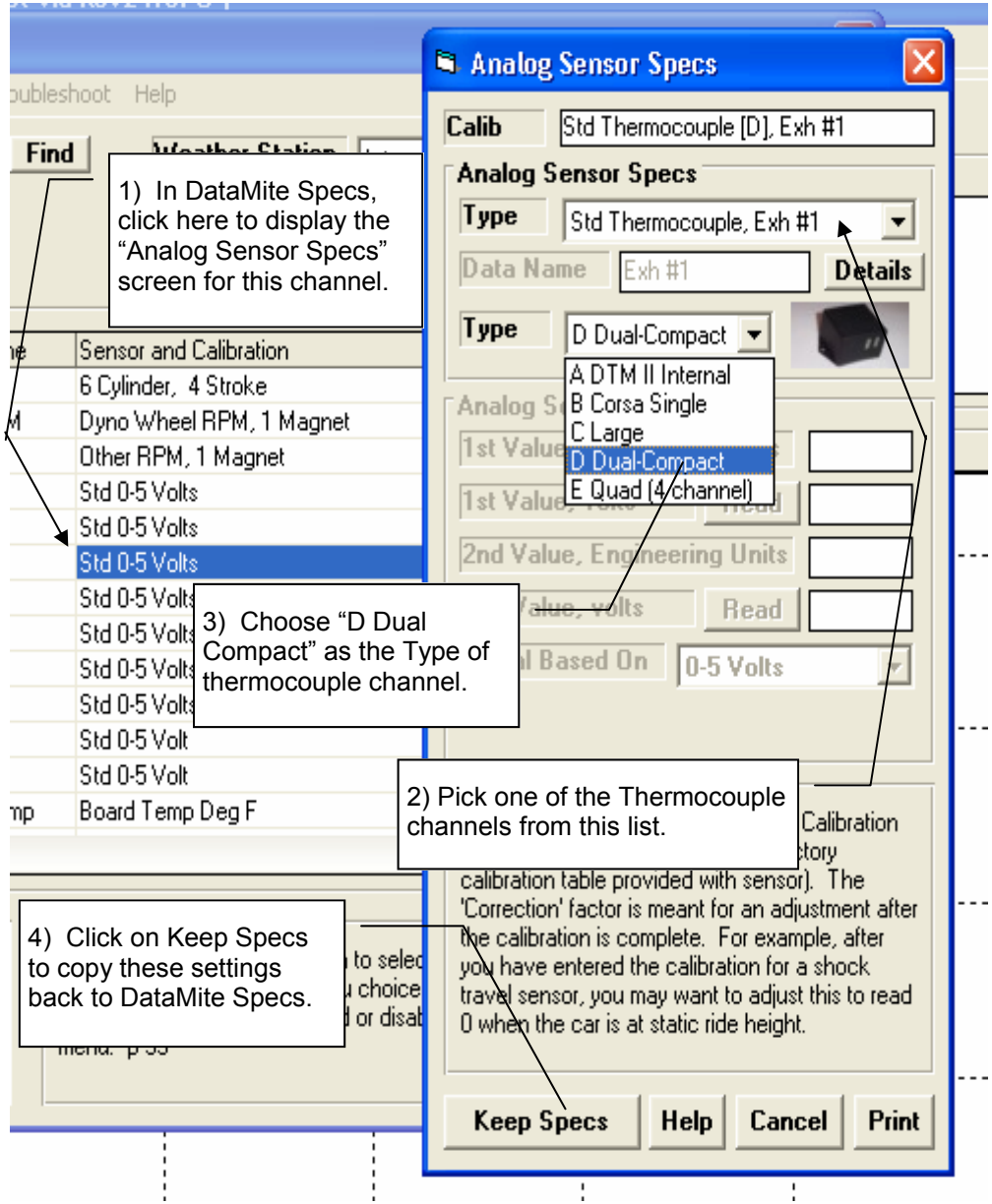
Keep it away from heat sources.. Mount at least 3 feet away from very not surfaces, like exhaust surfaces. When possible put some type of heat shield between the converter and the heat source. Note: The shield should “hide” the converter from the heat source but still allow good air circulation around the converter.

Isolate the converter from vibration. It is best to let it dangle, suspended from the lead to the 6 pin connector. If you mount it with the tabs, use rubber isolators and ideally mount it off the engine dyno test stand.

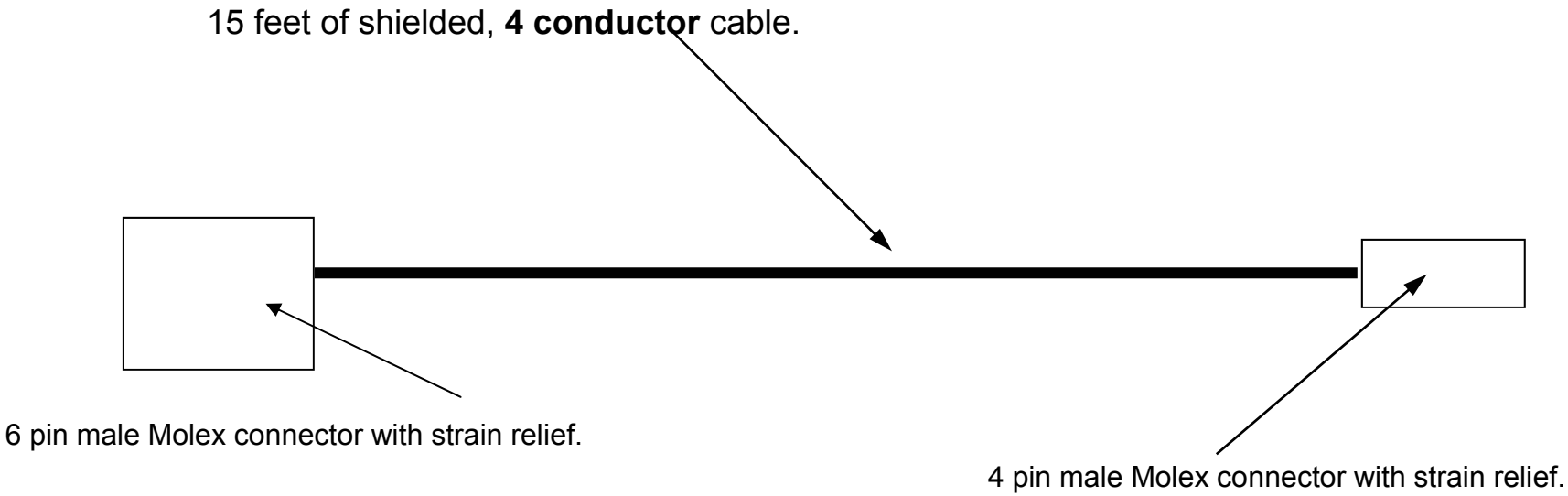
The thermocouple connectors grip the terminals of the yellow K thermocouple connector very tightly. Avoid repeatedly connecting and disconnecting these connectors if possible.

Set up the calibration in the DataMite software following the 4 steps shown to the right.

Setting up Calibration in DataMite Specs Screen



DataMite Mini USB Thermocouple Converter Cable PN **DMM-BCT**



DataMite Mini USB RPM Cable Build PN DMM-RPMC

18 feet of shielded, 2 or 3 conductor cable. ***For Hewitt: 30 ft 3 conductor.***

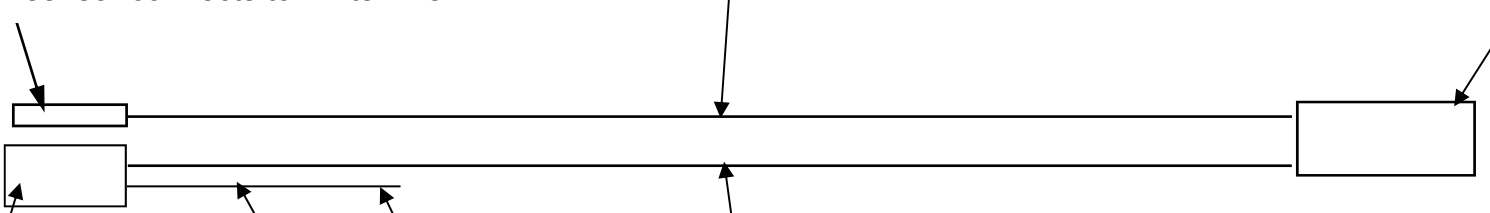
Standard aluminum Reed switch, connected to black and white wire. Use black shrink tubing over end of red wire to prevent shorting to shield or shield wire. Then use 1 piece of black shrink tubing over all wires to finish off.

For Hewitt, use a 3 wire Active (powered) sensor which triggers on a magnet (the sensor itself is NOT magnetic).

- Brown from sensor connects to red wire
- Blue from sensor connects to black wire
- Black from sensor connects to white wire.

6 pin male Molex connector (female metal terminals) with strain relief.

- Blacks (2) and shield wire from RPM sensor to pin 1
- Red from 4 pin Molex (and Red wire **for Hewitt Only)** to pin 6
- White wire from 4 pin Molex to pin 5
- White wire from RPM sensor to pin 4
- 0.1M cap between pin 3 and pin 4, and pin 3 and pin 5. Protect with shrink tubing.



Cover tip with shrink tubing.

4 ft purple wire to pin 4

For Hewitt, this is 7 ft

18 feet of shielded, 3 conductor cable.

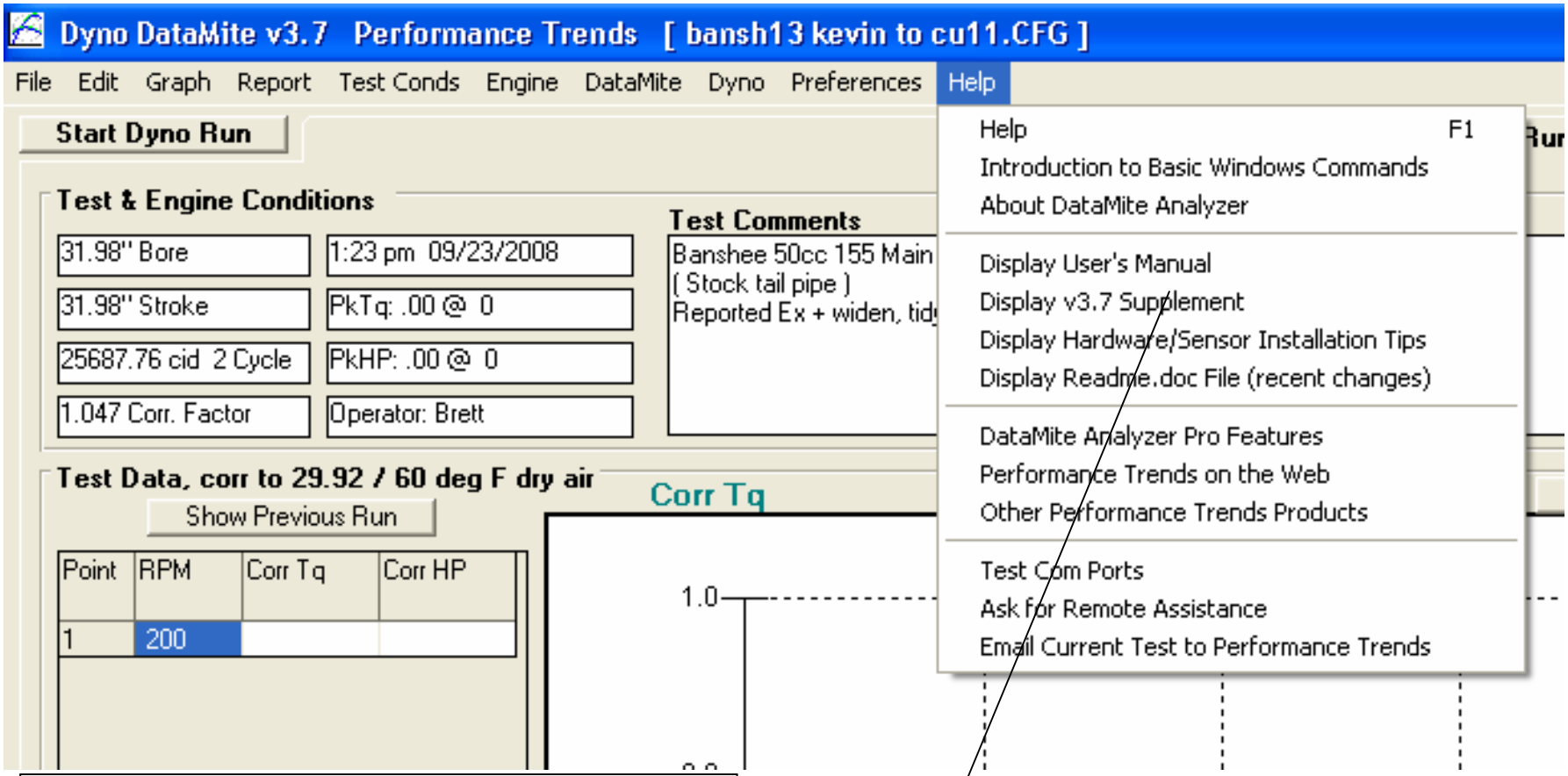
For Hewitt, this is 25 ft long.

4 pin Male Molex, female terminals with strain relief

- Black & shield together to pin 1
- Red to Pin 2
- White to Pin 3
- Purple wire to pin 4

DataMite v3.7 Supplement Instructions

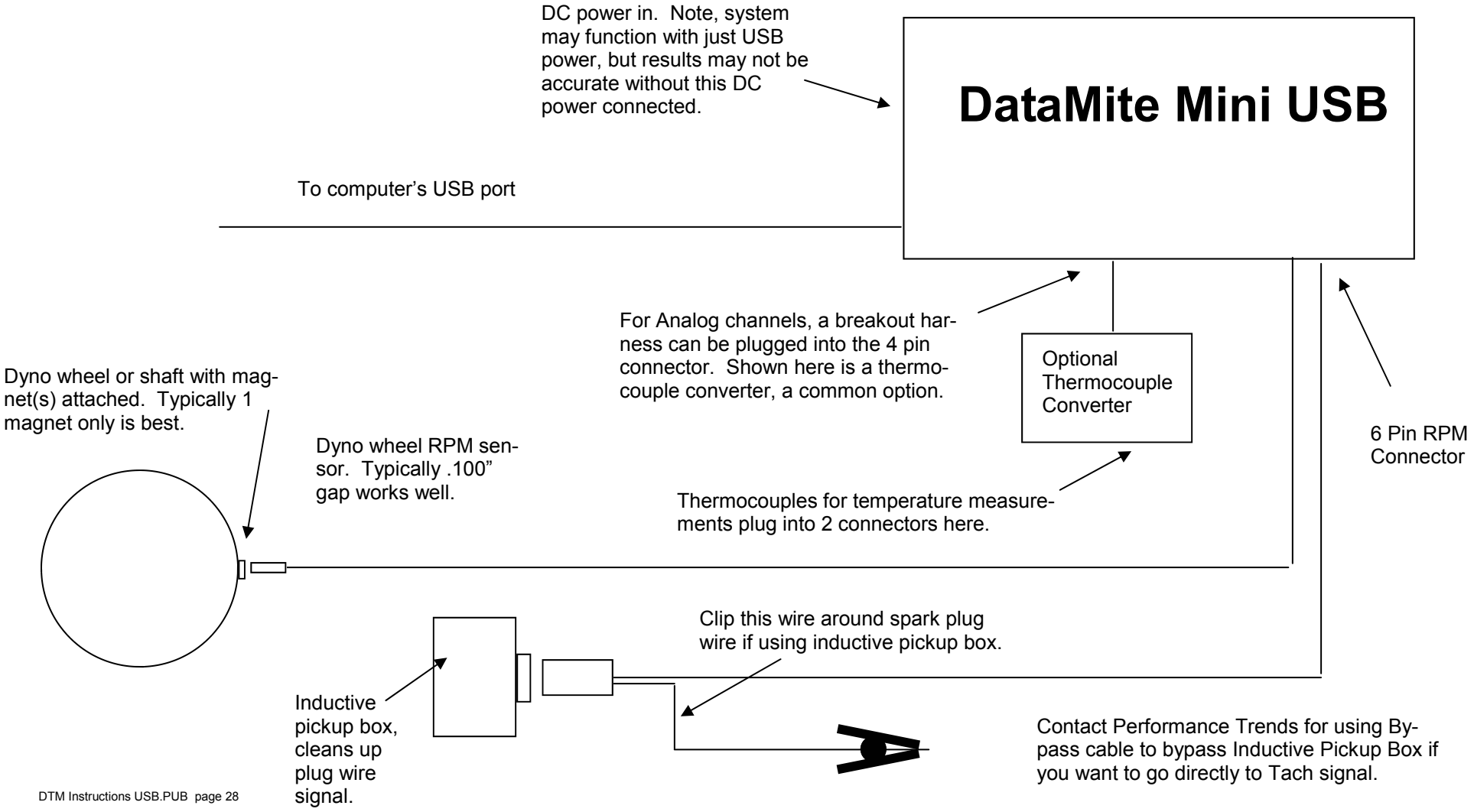
The printed manual talks about v3.2. The recent changes and additions to v3.7 of the software are discussed and illustrated in Appendix 7, which has not yet been added. You can view Appendix 7 on screen by clicking on Help (top of main screen), then Display v3.7 Supplement.



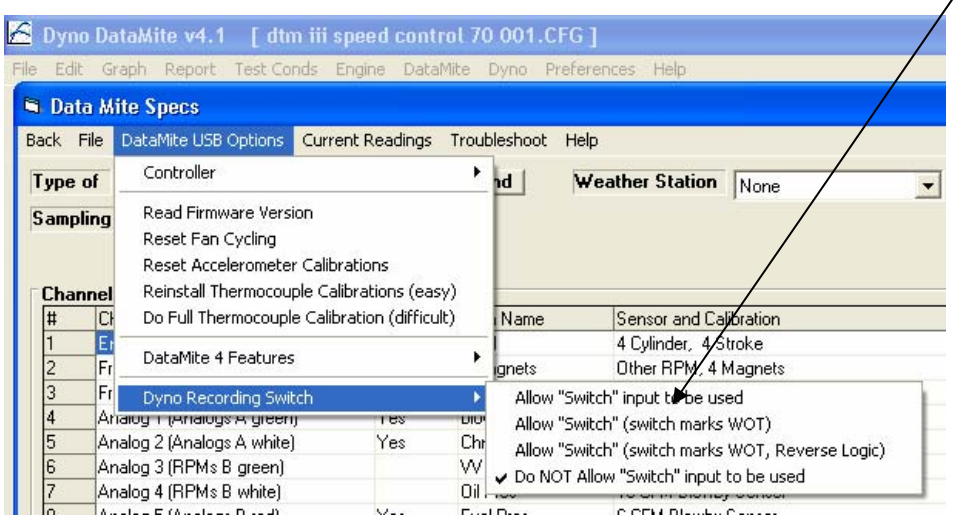
Click on Display v3.7 Supplement and Display Readme.doc file for the latest info on this data logger and program features.

DataMite Mini USB Dyno Wiring for RPM

Check Appendix 2, starting on page 189, especially Section 4 Selecting Locations for Mounting your Data-Mite USB on page 192 for more tips on installing your system.



DataMite III USB Recording Switch Operation



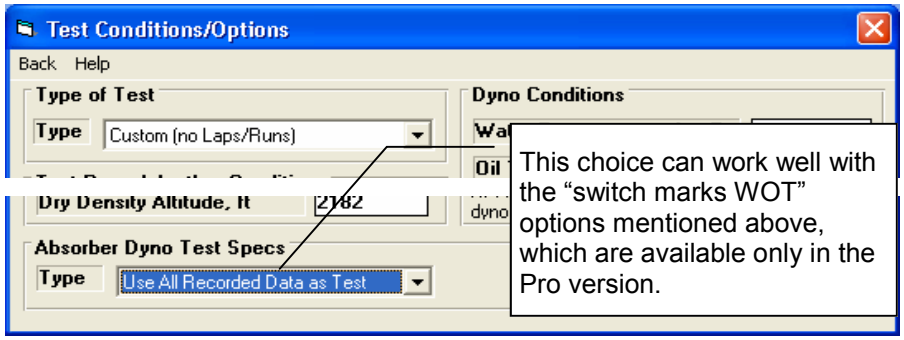
Go into DataMite specs, click on DataMite USB Options, then Dyno Recording Switch, then Allow "Switch" input to be used. NOTE: You must have Firmware Version 1.06 or later (starting around Oct 2008) in your DataMite III USB for this to work. If you are not sure, click on DataMite USB Options, then Read Firmware Version to check this.

"Allow Switch Input to be used" The software will start and stop recording on either the <F1> or <F2> keys on the keyboard, or pressing (for about half a second) ***and releasing*** a special switch from Performance Trends which plugs into the DataMite III USB's 4 pin "Switch" input. See Figure below left.

"Allow Switch (switch marks WOT)" Pressing and holding the switch will start recording. When you release the switch, recording will stop. This method is very useful when the engine is accelerating or decelerating erratically. If you also set your Type of Absorber Dyno Specs in Test Conds screen, to "Use All Recorded Data as Test", then all data recorded while holding the switch will be used as the dyno run. See Figure below. For good accuracy, you must ensure the switch is only pressed when the engine is at full throttle.

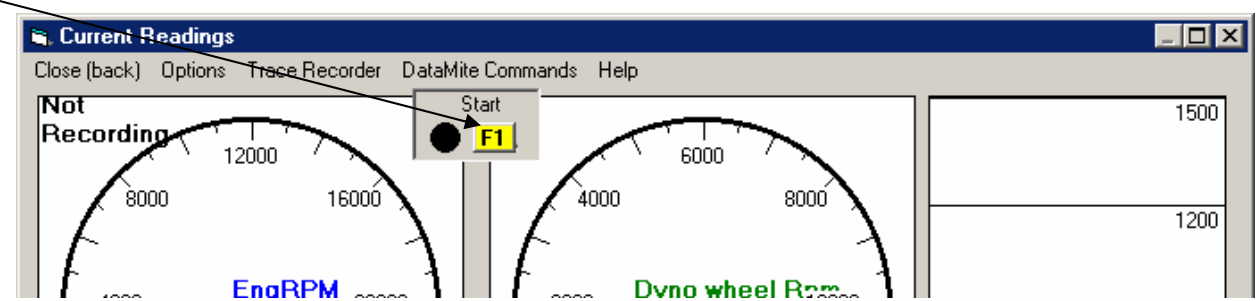
"Allow Switch (switch marks WOT, Reverse Logic)" This option reverses the On/Off operation of the switch. If you are trying to wire into an existing switch which may start a dyno controller, you may need this option rather than the option above.

Plug the Switch into the 4 pin connector marked "Switch" on the DataMite III USB logger box as shown to the right.



This choice can work well with the "switch marks WOT" options mentioned above, which are available only in the Pro version.

Now when you run a test, you can still press F1 or F2 to Start and Stop recording, or click on the F1 (then F2) button. But you can also press and hold the Record switch button (for about 1 second) to start recording. Then after the recording has started, release the button. When you are finished recording, press the button again for about 1 second to stop recording.

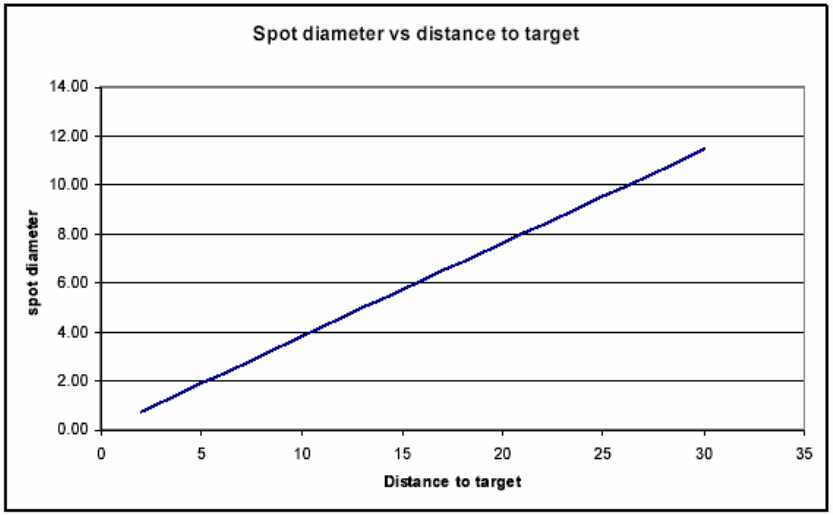


IMPORTANT: If you do not have the switch plugged into the correct channel, recording may start automatically as soon as you go to the Current Readings screen.

DataMite Infra-Red Temperature Sensor Notes

The Infra-Red temperature sensor puts out a 0-4.5 volt signal over a range of 0 to 150 deg C (32 to 302 deg F). For typical calibration numbers, see Analog Sensor Specs screen below.

The sensor has a “spot diameter” which expands at a conical angle 22 deg. For example, at a distance of 5 inches, the circular area it is measuring the average temperature of is a circle of about 2 inches in diameter. See graph to the right. This means if you want precise measurements of a particular area, you must mount the sensor close to that area.

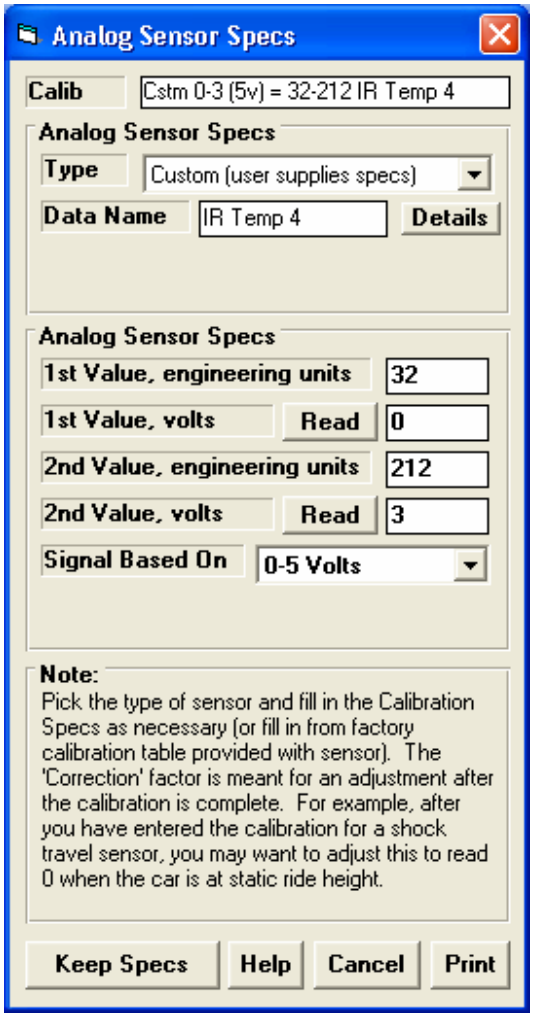


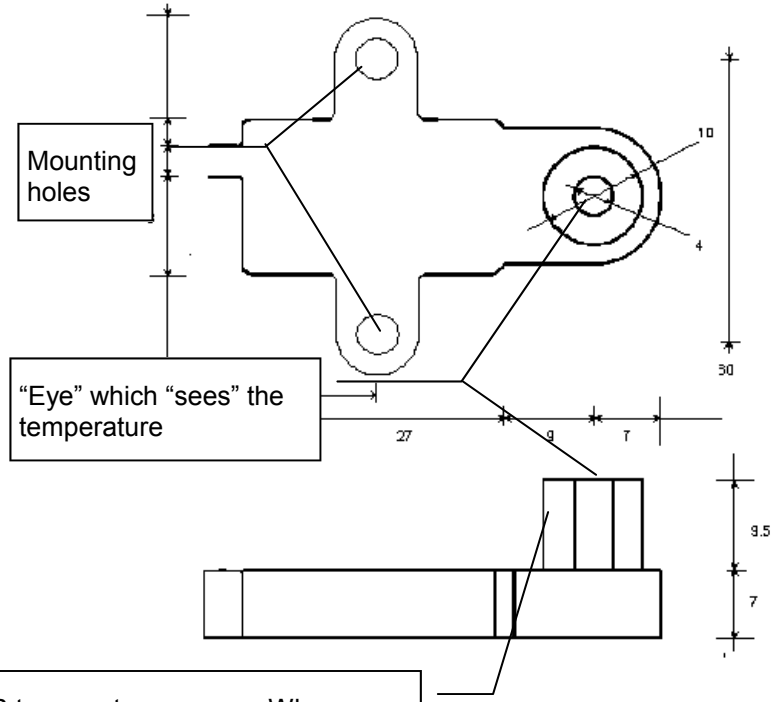
Mounting tips:

If mounting to record tire temperature, it is best if you mount to a bracket which moves with the tire’s movement. If the distance and angle of the sensor eye to the tire is changing, it is quite likely you can measure just tire temperature some times, and tire and road at others, introducing errors.

Keep the sensor body and line of sight to the target away from engine exhaust, from which the heat can introduce errors.

Do not let the aluminum “temperature reference” cylinder around the eye of the sensor touch other metal. This can affect the temperature of this “reference” and introduce errors in the measurements.





Cylindrical, aluminum heat reference for the IR temperature sensor. When mounted, this should NOT touch any metal components for best accuracy.

Wiring:

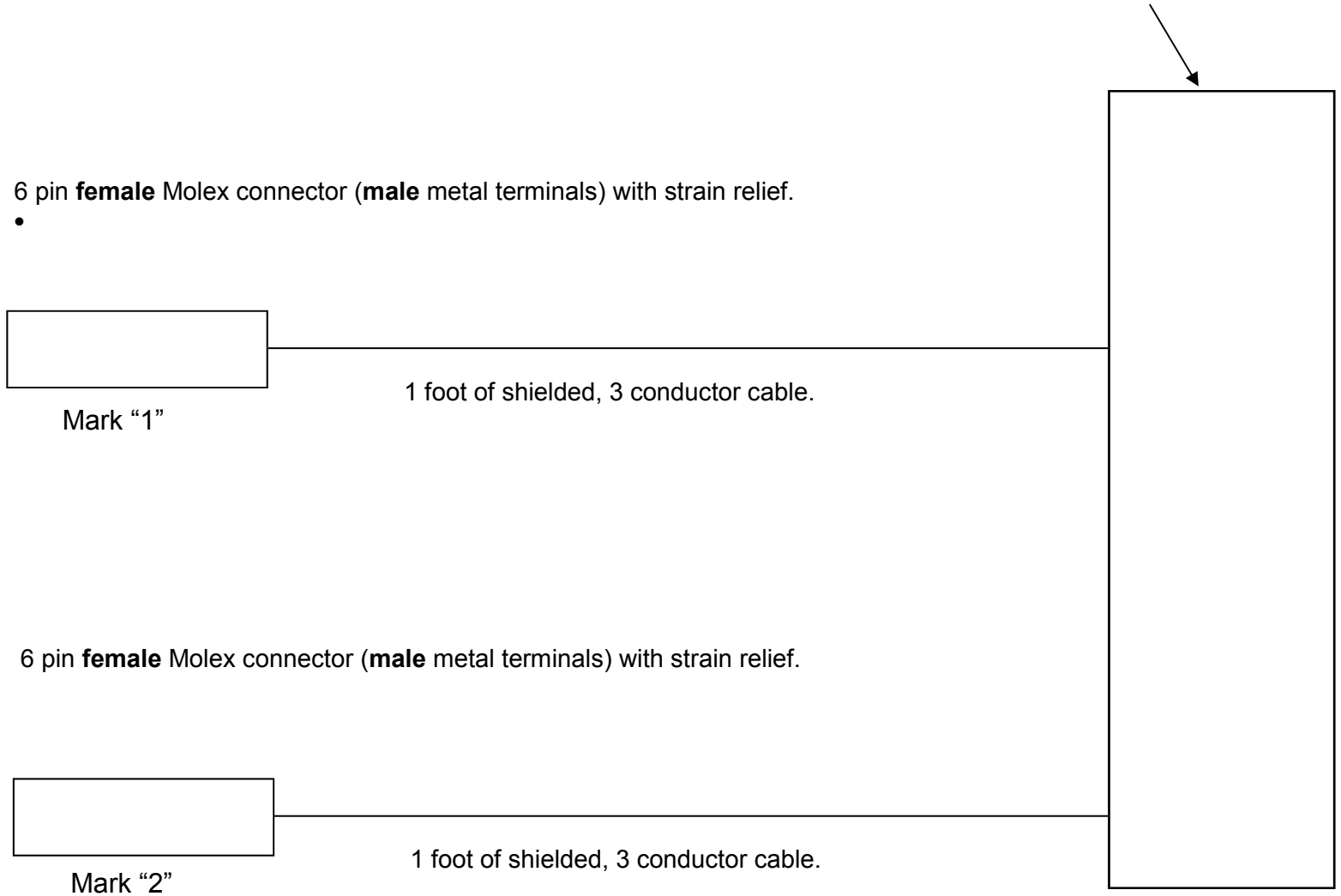
Red = 4.75 to 5 VDC power, 6 mA

Black = Ground

Blue = signal

DTM III Dual RPM Breakout Cable DT3-RPMBO2

6 pin male Molex connector (female metal terminals) with strain relief.



6 pin **female** Molex connector (**male** metal terminals) with strain relief.

-

1 foot of shielded, 3 conductor cable.

Mark “1”

6 pin **female** Molex connector (**male** metal terminals) with strain relief.

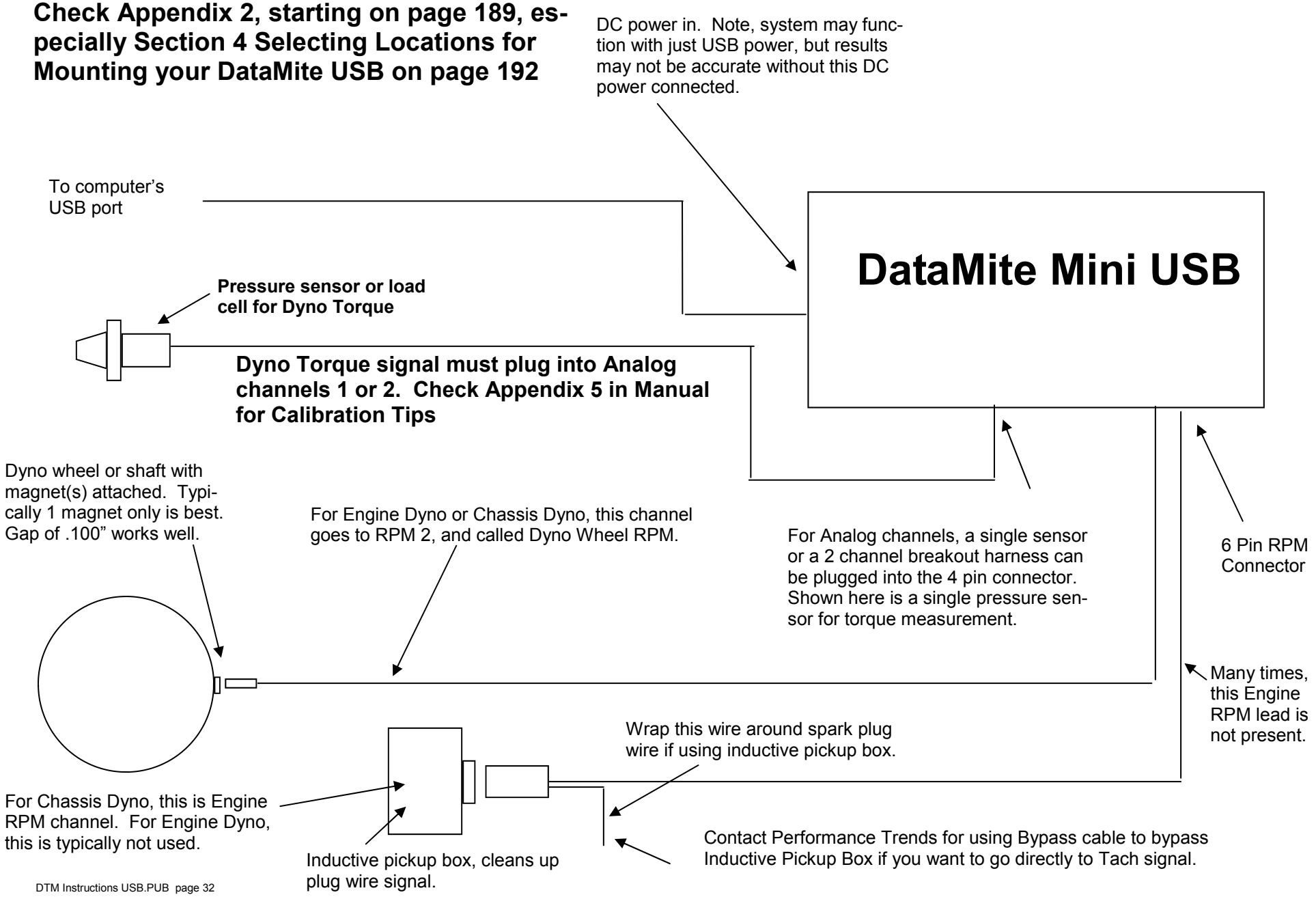
1 foot of shielded, 3 conductor cable.

Mark “2”

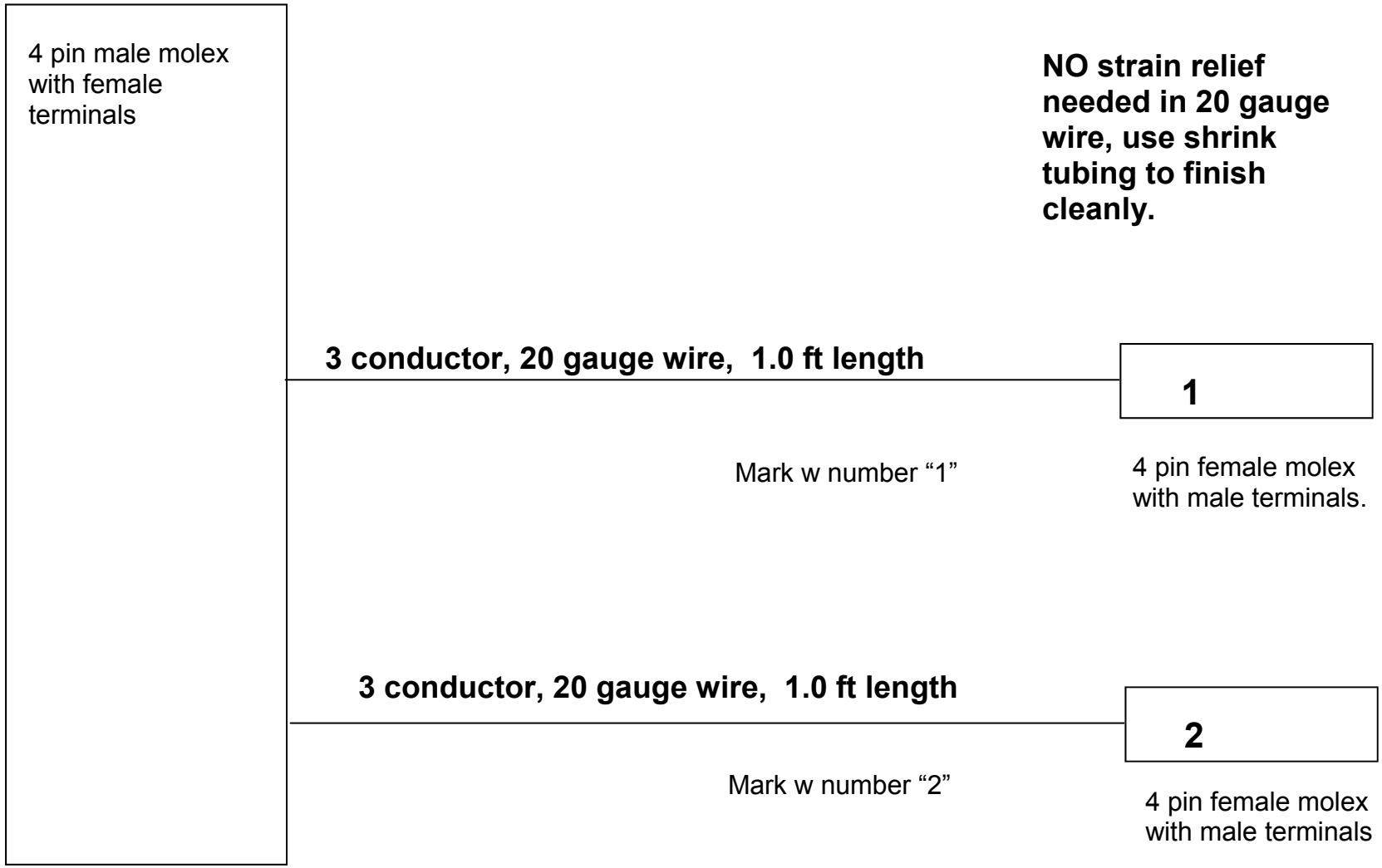
Important: When tightening the strain relief, push the wires in, so there is plenty of slack on all 4 wires. This ensures you do not put tension on these wires and sockets when you tighten the strain relief.

DataMite Mini USB Dyno Wiring for Absorber Dyno

Check Appendix 2, starting on page 189, especially Section 4 Selecting Locations for Mounting your DataMite USB on page 192



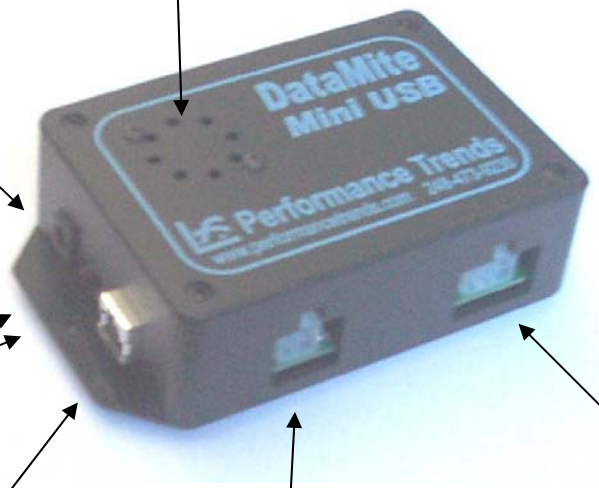
DataMite Mini USB 2 Analog Breakout Cable



DataMite Mini USB Connections

Optional fan. All boxes have the vents for a fan. However, only boxes with internal weather sensors come equipped with a fan.

12 Volt DC power in. Note: Box will operate correctly without 12 Volt power, using only power from the USB cable in most situations. However, for some sensors you need a full 12 Volts for best accuracy. Therefore, it is recommended you use 12 volt power for all your testing.



Operation LEDs. These LEDs will not light if the processor inside the DataMite Mini USB is not operating correctly or has no power.

RPM Channels 1 and 2

USB Cable to Computer

Analog Channels 1 and 2

DataMite III USB SD Memory Card

The Drag Race and Road Race/Circle Track versions of the DataMite III use an SD memory card for storing data during on-track testing. These cards are typically 1.0 GB in size (1000 meg).

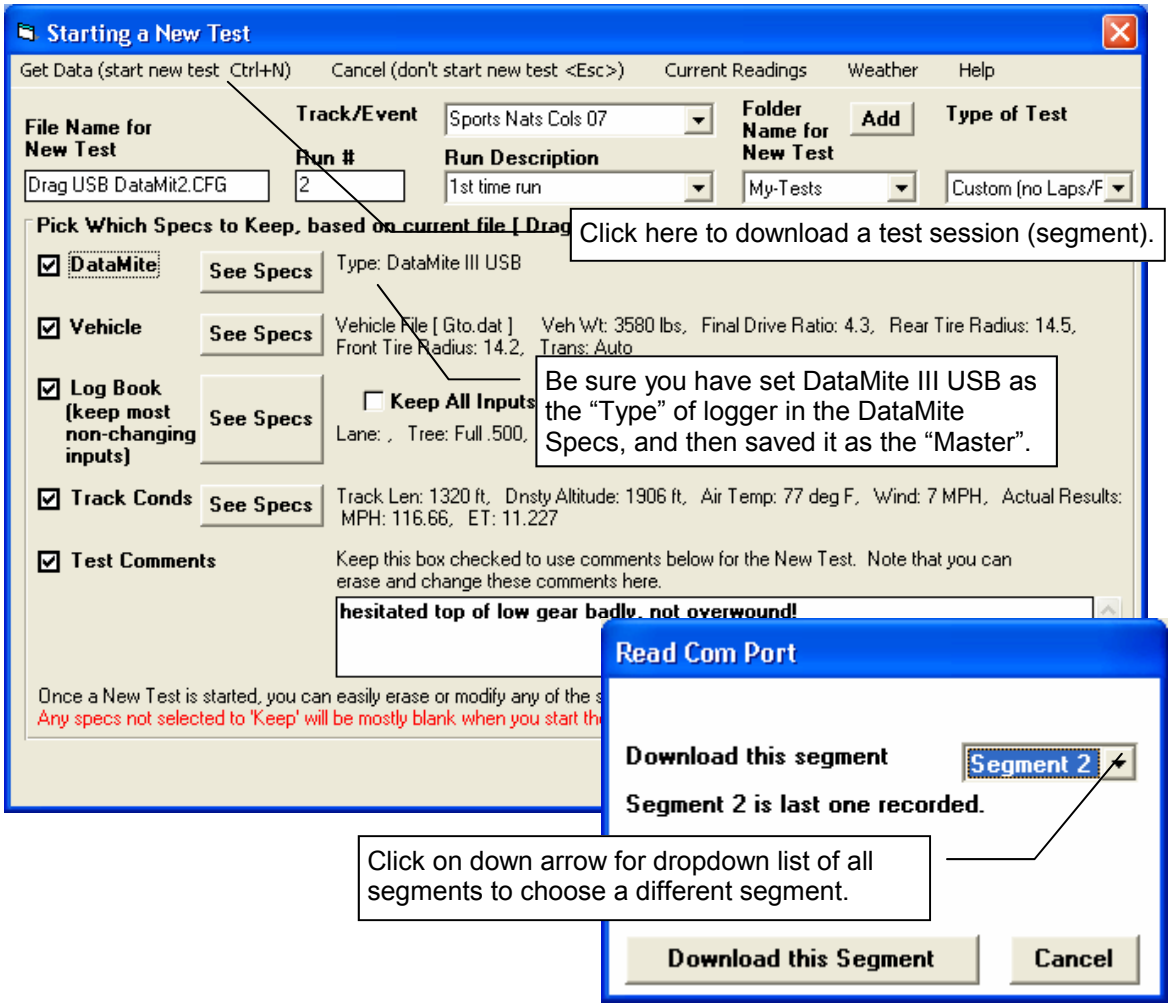
The memory is typically broken up into 8 segments. This means you can record 8 different track sessions before you need to remove this card and download its contents. If you record 9 sessions before downloading, you will overwrite your first session with the data from the 9th session.

Downloading is done by inserting this card into the SD card slot of your computer, or a separate SD card reader which attaches to a USB slot. Performance Trends can supply these readers. Then start up your DataMite Analyzer software. Click on File in the upper left, then New (get data from DataMite) to be presented with the New Test screen shown below. From here you pick various items you want to carry over from the previous test, or new settings to be made. Click on Get Data in the upper left corner and you will be presented with a screen where you can choose any of the 8 segments to download. The most recently recorded session (segment) is always presented as the default.

These cards **MUST BE PROPERLY FORMATTED** to work. You can NOT just buy another card and expect it to work. Contact Performance Trends to purchase another card if you think you need a backup.

The SD card may come already installed in the slot of your DataMite III USB or inside a package with these instructions.

NOTE: Your recording switch will not light until the DataMite III USB has this memory card installed properly into the slot.



Be sure card is always in the unlocked position for data recording

DataMite Fuel Flow, Using 2 Flow Meters

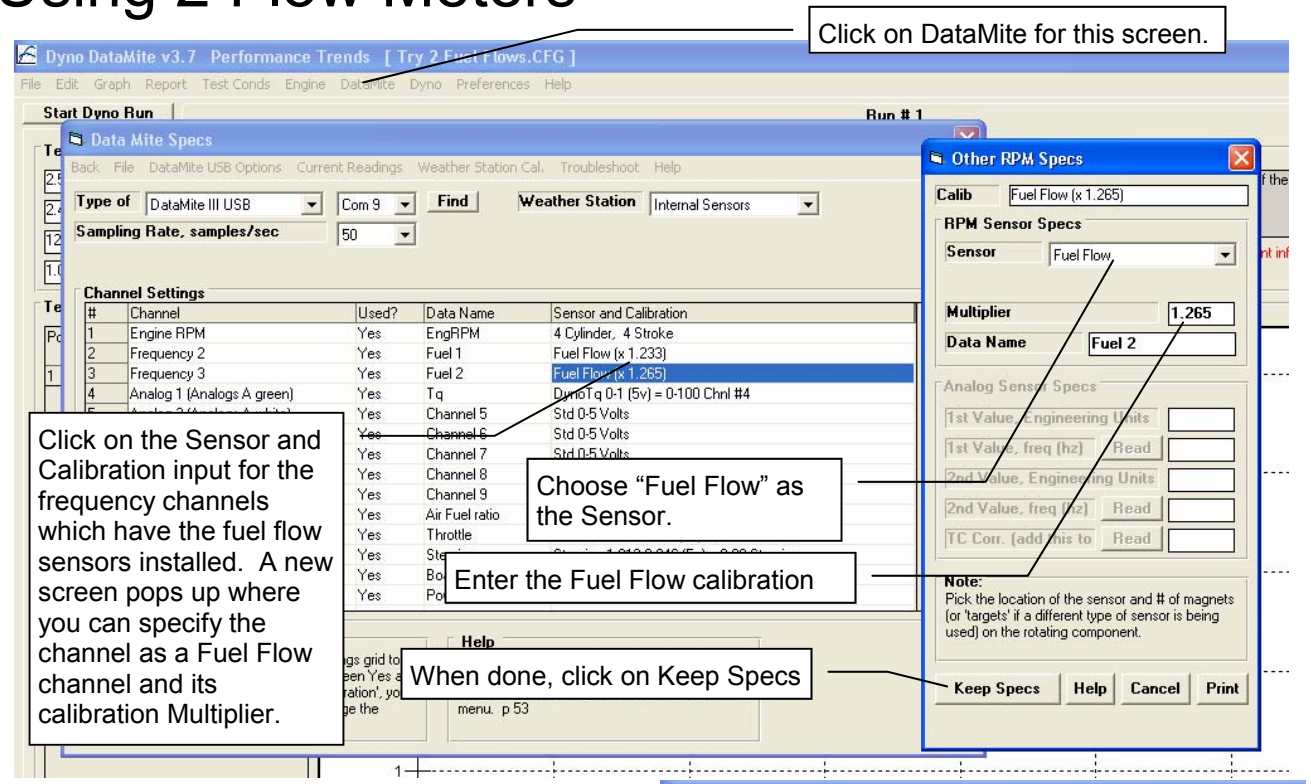
The Pro version of the DataMite software (v3.7 A.058 or later) allows you to use 2 fuel flow sensors. You can choose either:

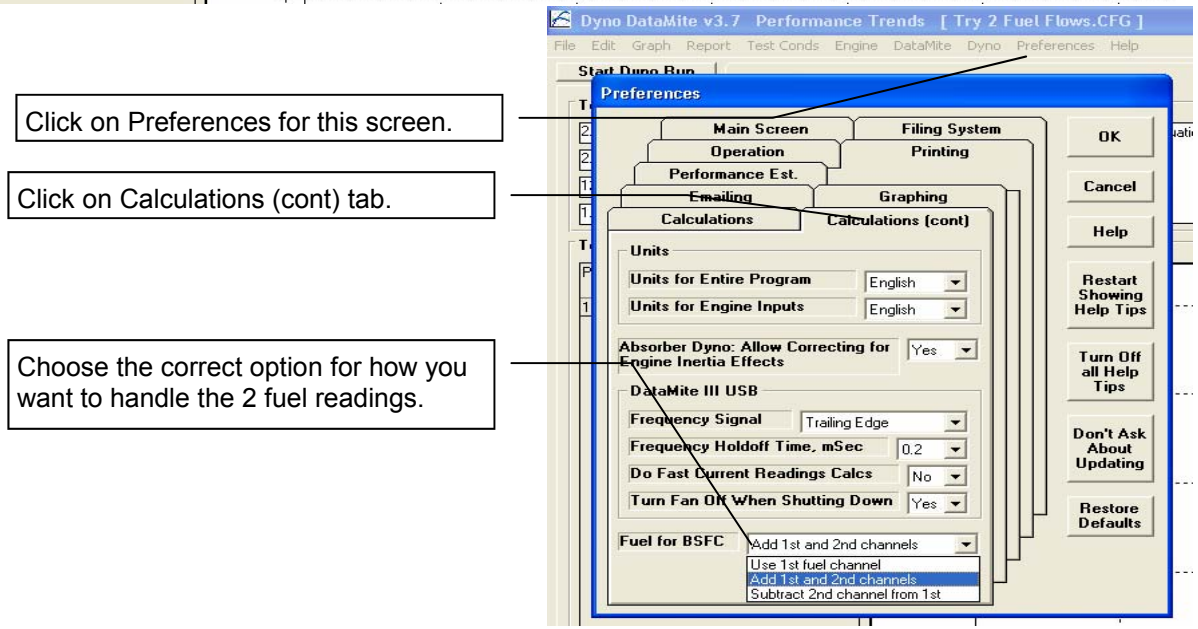
To add the 2 flow readings together (like when you have 2 sensors in parallel, so about half the flow goes through 1 meter and half goes through the other meter).

To subtract one flow reading from the other (like when you have 1 sensor measuring the fuel TO the engine, and 1 sensor measuring the flow being returned FROM the engine).

To do this, you first must specify the 2 sensors in the DataMite specs screen, as shown to the right.

After this, you must ALSO specify what to do with these 2 fuel readings in the Preferences menu. See pic to lower right.



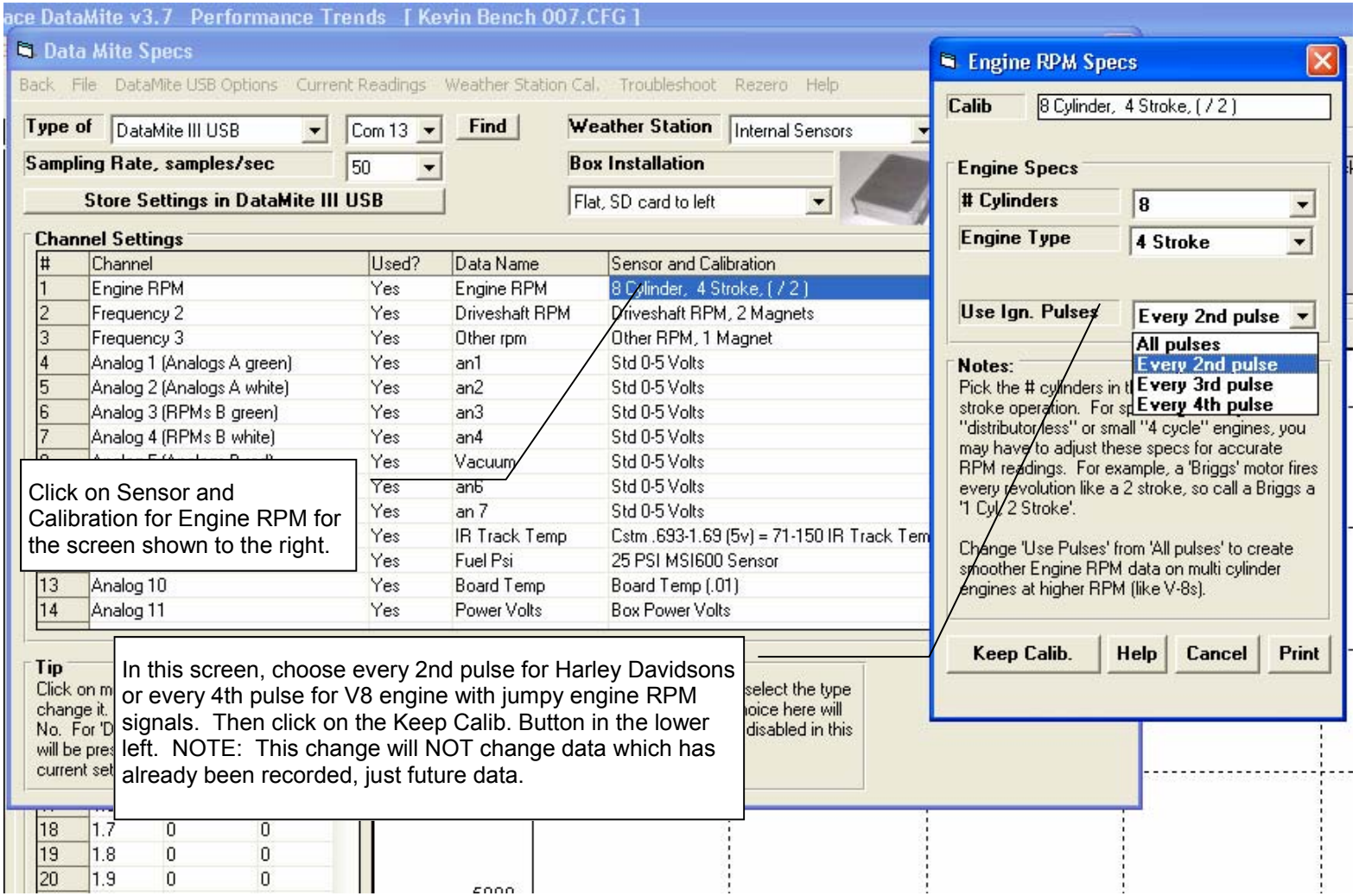


DataMite III Engine RPM Input Options

The DataMite III has options to NOT use every ignition pulse on the Engine RPM input. NOT using every pulse improves RPM accuracy for 2 cases.

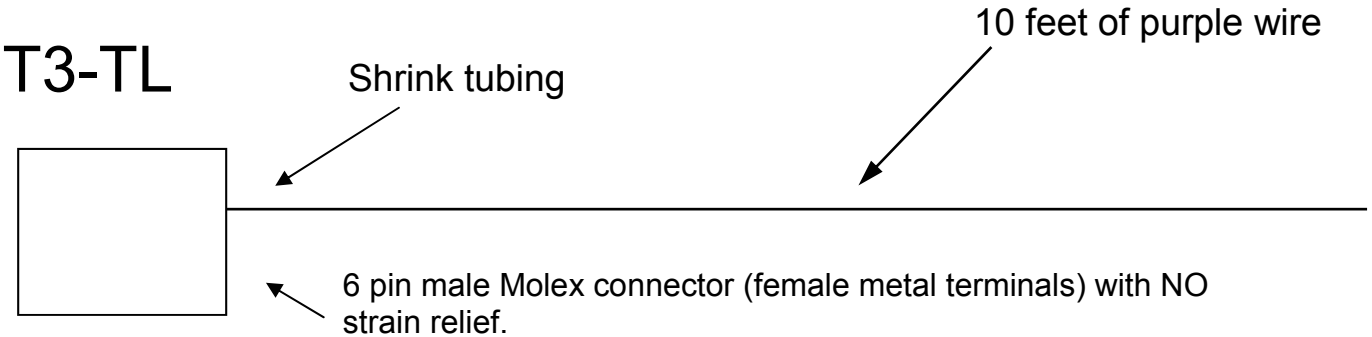
First is for uneven firing engines, like Harley Davidsons. Then you should set the program to use every 2nd pulse. This lets the electronics just every 2nd pulse, which will be evenly spaced.

Second is for improving V8 RPM quality. If the spark signal is advanced just 1 degree, from a previous firing, that is a 2deg change out of 90 degrees (89 deg vs 91 deg). This can make engine RPM jump around A Lot. If you change this to just using every 4th pulse, engine RPM readings can be MUCH more stable.



DataMite III Power (DT3-PL) and Tach DT3-TL) Leads

DT3-TL



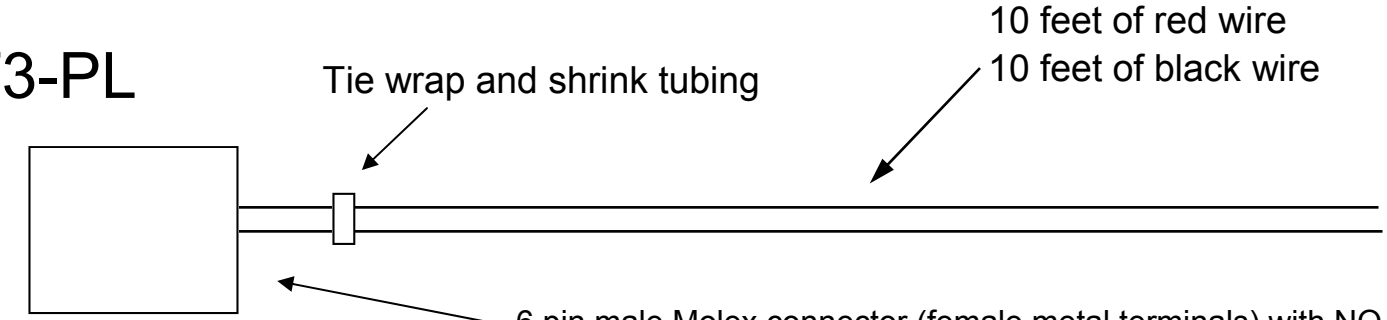
6 pin male Molex connector (female metal terminals) with NO strain relief.

- Use shrink tubing on each individual wire about 1 “ long. Then use shrink tubing over both wires and tie wrap to hold both wires together.

Bend capacitor as shown below

Use shrink tubing so legs do

DT3-PL

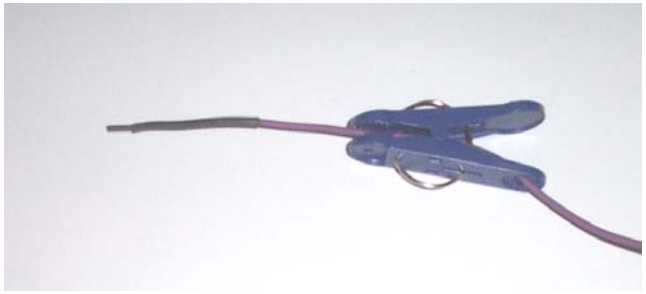


6 pin male Molex connector (female metal terminals) with NO strain relief.

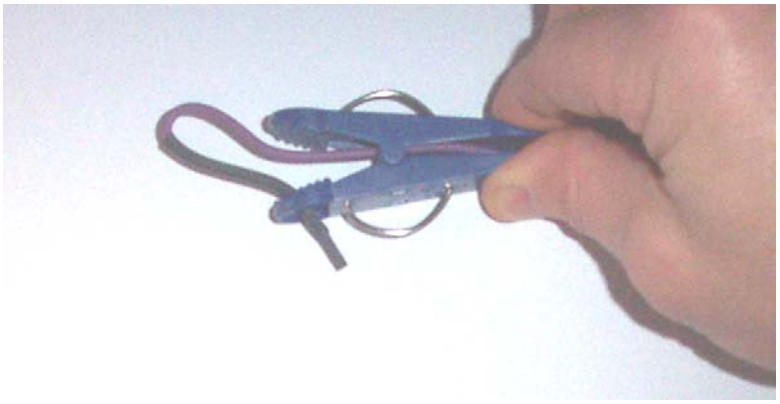
- Use shrink tubing on each individual wire about 1 “ long. Then use shrink tubing over both wires and tie wrap to hold both wires together.

Installing DataMite Inductive Pickup Clip DTM-IPUCW

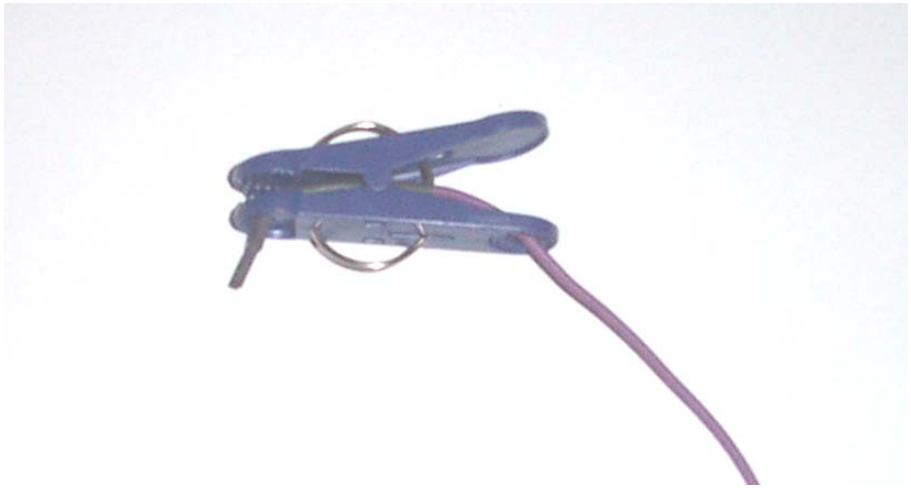
1) Thread inductive pickup wire (typically purple) through hole in finger pad, then through hinge and out the clip end



2) Now open clip and insert purple wire through hole in clip about half an inch (12 mm). Then allow clip to close some and pull wire back through hinge and hole in finger pad.

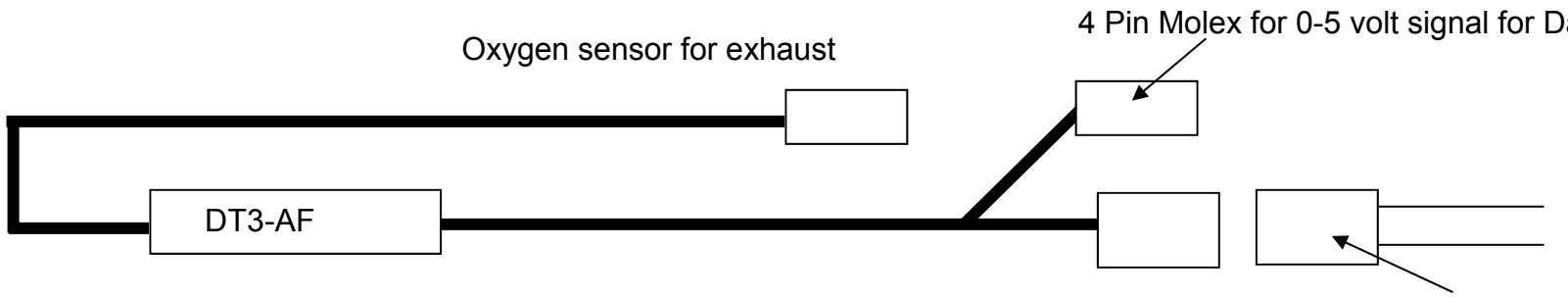


3) Finished clip installation should look as it does below. The clip is only to provide a convenient way to attach the purple wire to your plug wire. To adjust sensitivity, you need to adjust the sensitivity screw in the inductive pickup box. (Older inductive pickup boxes did not have this adjustment) Sometimes you may want to remove this clip, like if you need to put the purple wire close to the coil for “coil on plug” type ignition systems.

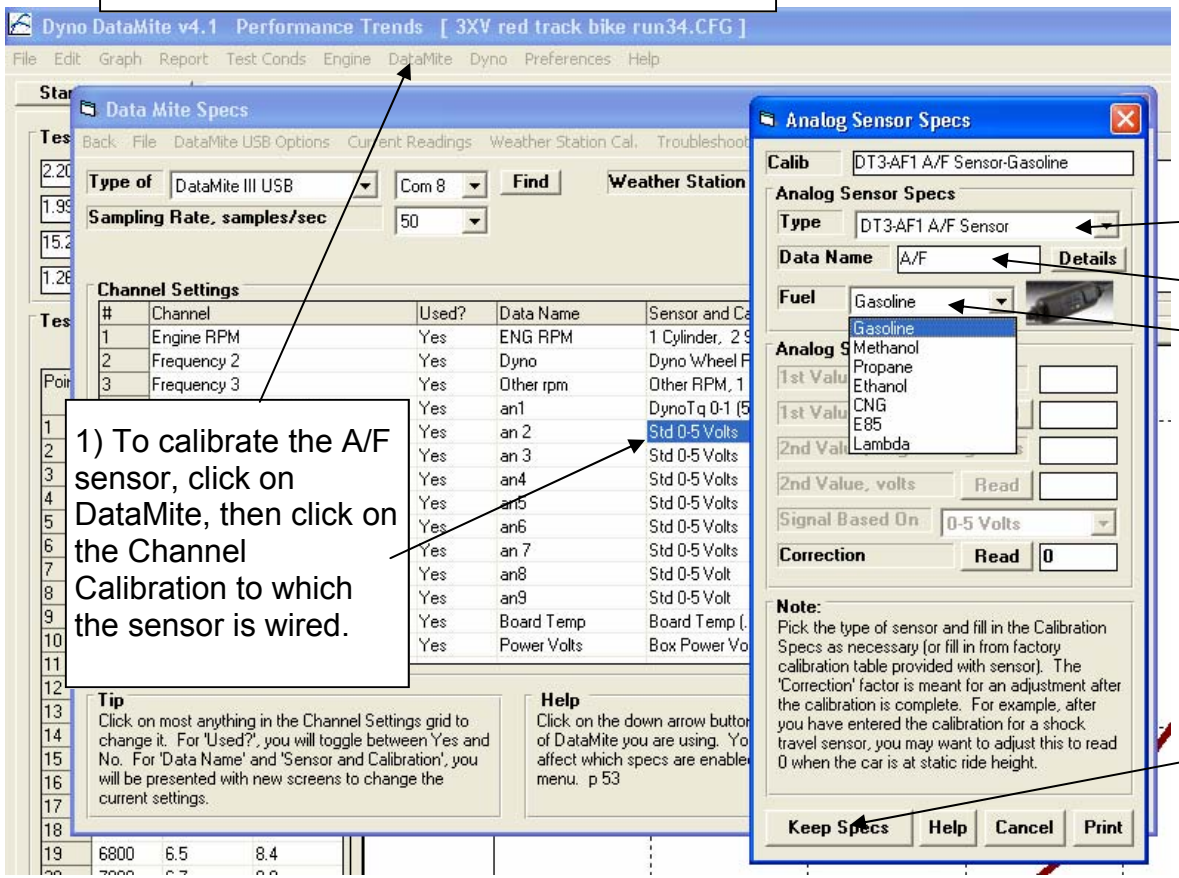


DT3-AF1 Options

DT3-AFCK Connector Kit



Calibrate the software using these 3 steps



1) To calibrate the A/F sensor, click on DataMite, then click on the Channel Calibration to which the sensor is wired.

2) Choose the appropriate A/F sensor, in this case DT3-AF1 as the Type.

Enter a Data Name like “A/F” or “Air Fuel”.

Choose the type of fuel you are running, or choose Lambda.

NOTE:Lambda is convenient because a lambda of .85 to .90 is approximately best power richness (10% to 15% rich) for all fuels.

3) Click on Keep Specs to keep this calibration. This calibration will be loaded back into the DataMite’s Calibration Table.

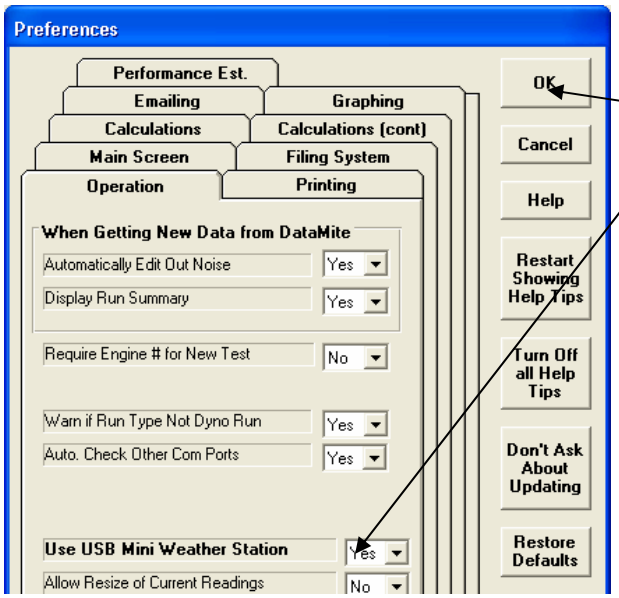
DataMite Mini USB External Weather Station Part # DMM-WS

Fan openings. You should hear fan come on when you are running the DataMite program AND have opened up the Current Readings screen. The fan will shut off when you close the DataMite program. It is best to have the fan running at least 5 minutes so readings can stabilize before you take accurate readings.

12 VDC power input. It is actually recommended you do NOT hook up 12 V power as this creates more heat inside the box and can make the air temperature read too warm.

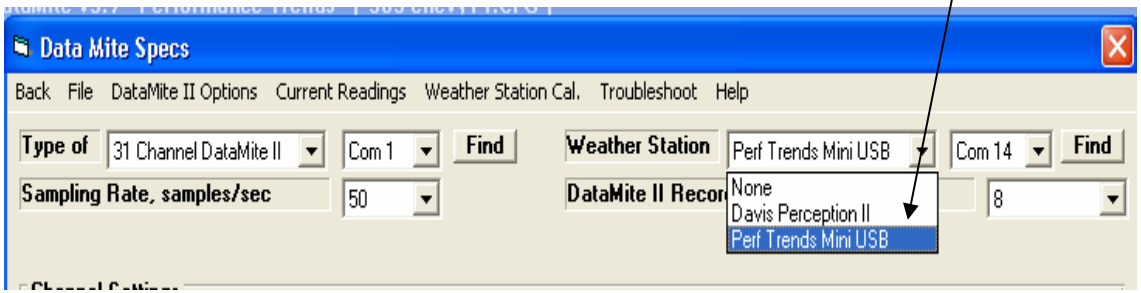
USB Connector is typically the only connection you will have.

Place weather station in room with engine, so it can sample the air being delivered to the engine's air intake.



In Preferences, choose to use the USB Mini Weather Station. Then click on OK in upper right corner.

After changing Preferences, the Mini will be an option instead of the Performance Trends Black Box.



Be sure to set the correct Com Port for this weather station. Click on the Find button to see what the possible ports could be.

When you plug in the Mini USB for the first time, it should say "Found New Hardware" and start up the Wizard. When asked for a CD, install the Performance Trends "Full Product Line" CD, the same CD which contains your DataMite Software. If you are having problems, check our website FAQs for more info on getting your USB device to communicate.

Notes on DataMite Air Flow Sensor and Volumetric Efficiency

The DataMite system can accept the input (taking the special precautions when wiring) from the SuperFlow ™ air turbine, shown above. This lets you measure both air flow in CFM and calculate Volumetric Efficiency, %.

First, assign the correct calibration to the correct Frequency Channel in the DataMite specs screen (Figure 1).

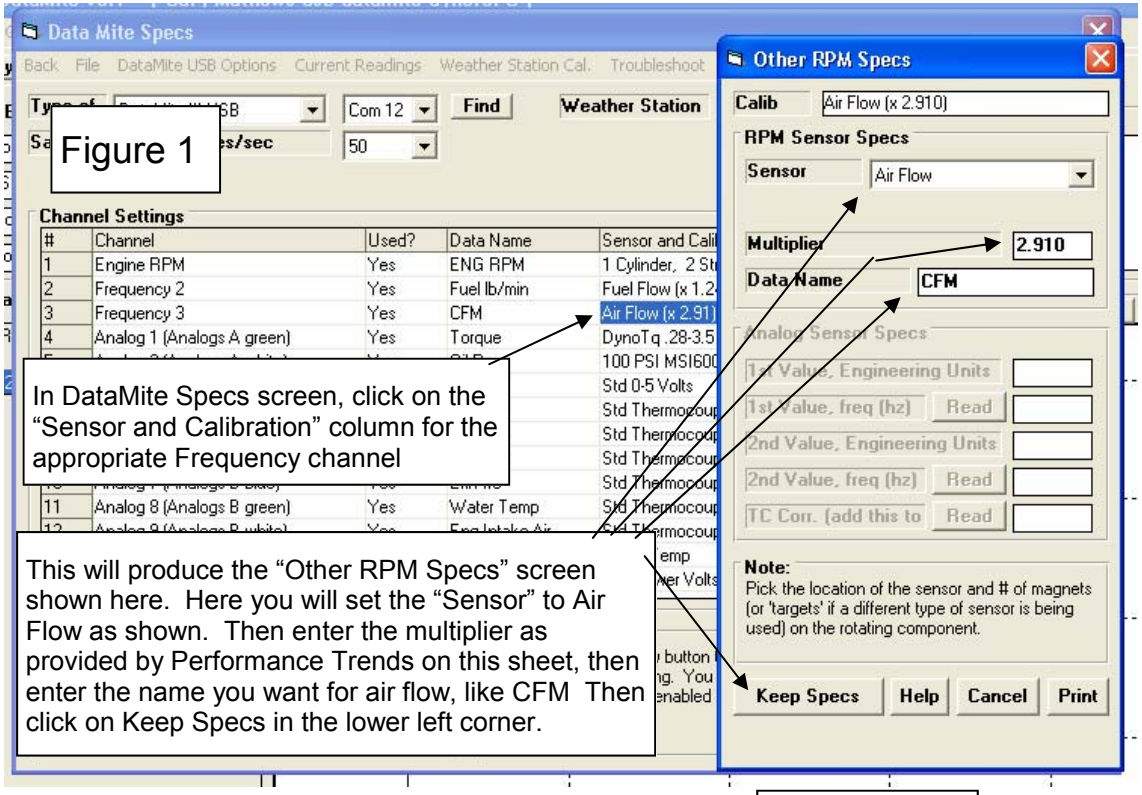


Figure 1

In DataMite Specs screen, click on the "Sensor and Calibration" column for the appropriate Frequency channel

This will produce the "Other RPM Specs" screen shown here. Here you will set the "Sensor" to Air Flow as shown. Then enter the multiplier as provided by Performance Trends on this sheet, then enter the name you want for air flow, like CFM Then click on Keep Specs in the lower left corner.

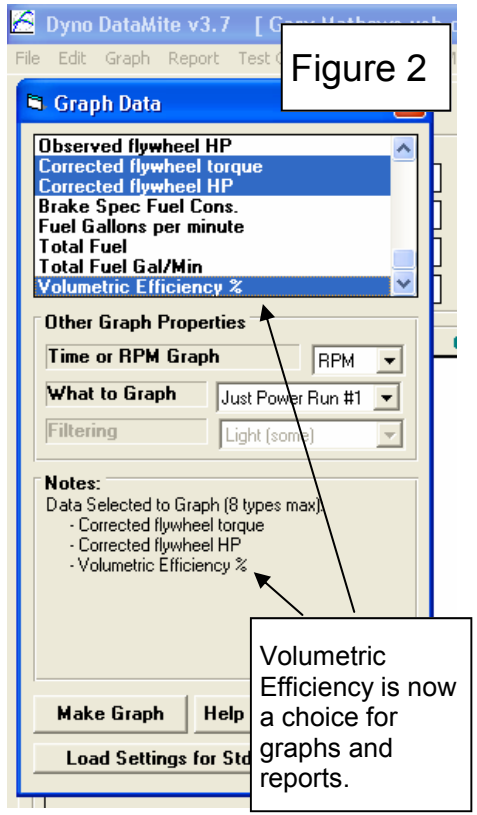


Figure 2

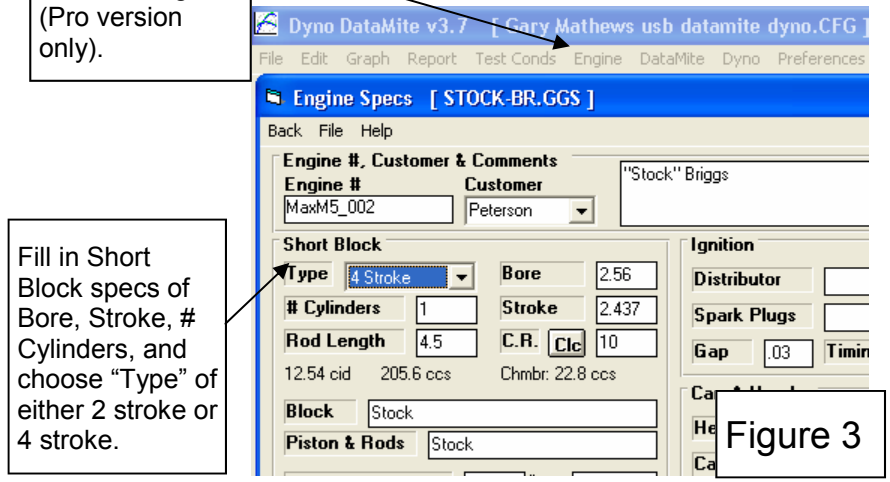
Volumetric Efficiency is now a choice for graphs and reports.

The multiplier for your particular meter is _____ in CFM/Hz.

Figure 2 shows you can now pick Volumetric Efficiency from the list of data types for making Graphs and Reports (Pro version only).

Volumetric Efficiency is a measure of how completely the engine is filling each cylinder volume on each intake stroke Volumetric Efficiencies of 70-90% are typical from production street engines. Naturally aspirated race engines can get as high as 130%, and turbo'd and supercharged engines can get to 300% or more. To do the Volumetric Efficiency calculation, the DataMite program needs you to accurately enter your engine specs to calculate engine displacement and 2 Stroke vs 4 Stroke. See Figure 3.

Click on Engine (Pro version only).



Fill in Short Block specs of Bore, Stroke, # Cylinders, and choose "Type" of either 2 stroke or 4 stroke.

Figure 3

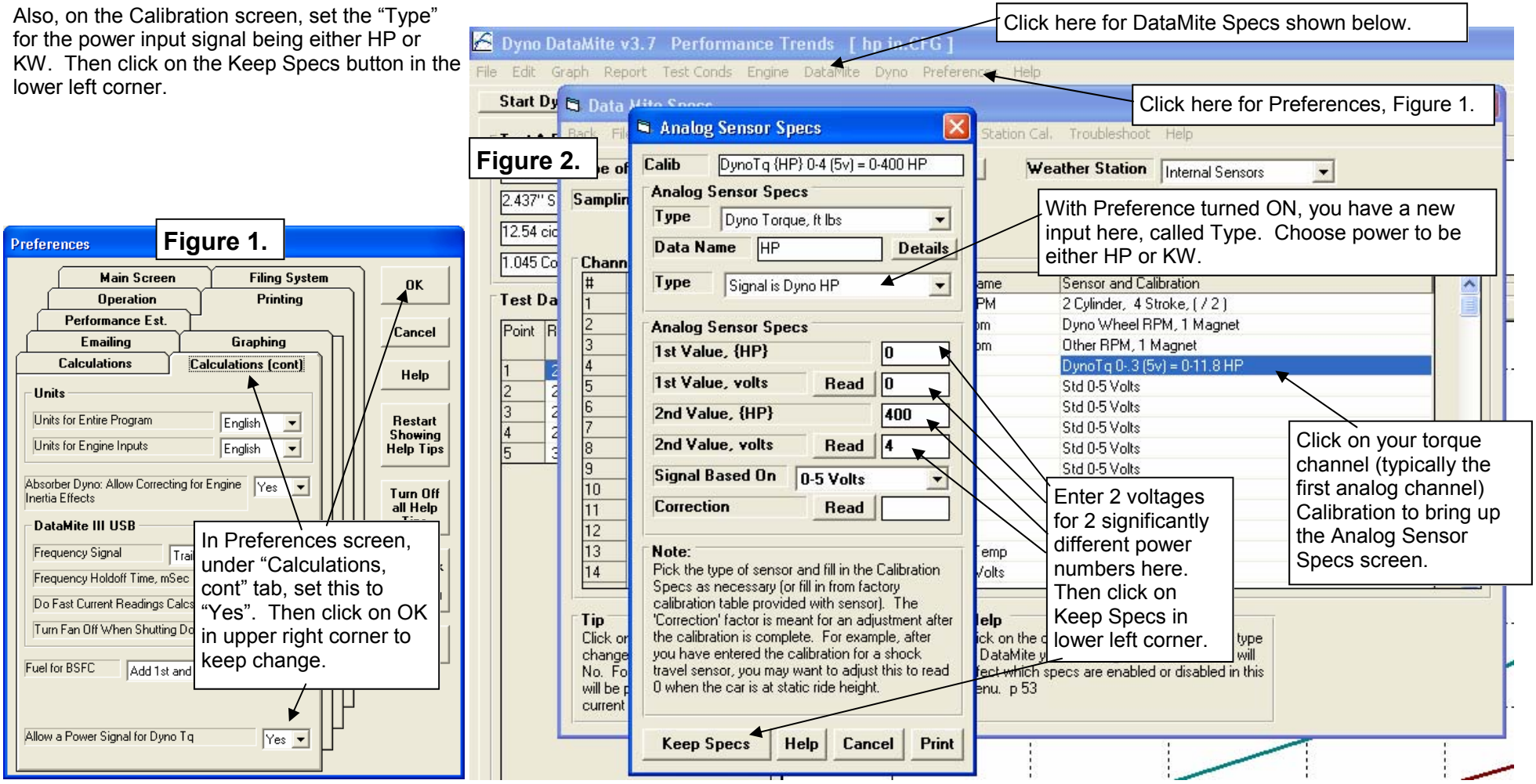
Using a Power (not Torque) Input Signal for Dyno DataMite

Some dynos (especially chassis dynos) are designed to output a power (horsepower or kilowatt) signal instead of a torque signal. The Pro version of the DataMite Dyno software can use this signal and calculate torque, corrected power, etc, just as if it had a real torque signal. To implement this option, you first must turn on the option in the Preferences menu, under the "Calculations, cont." tab as shown in Figure 1.

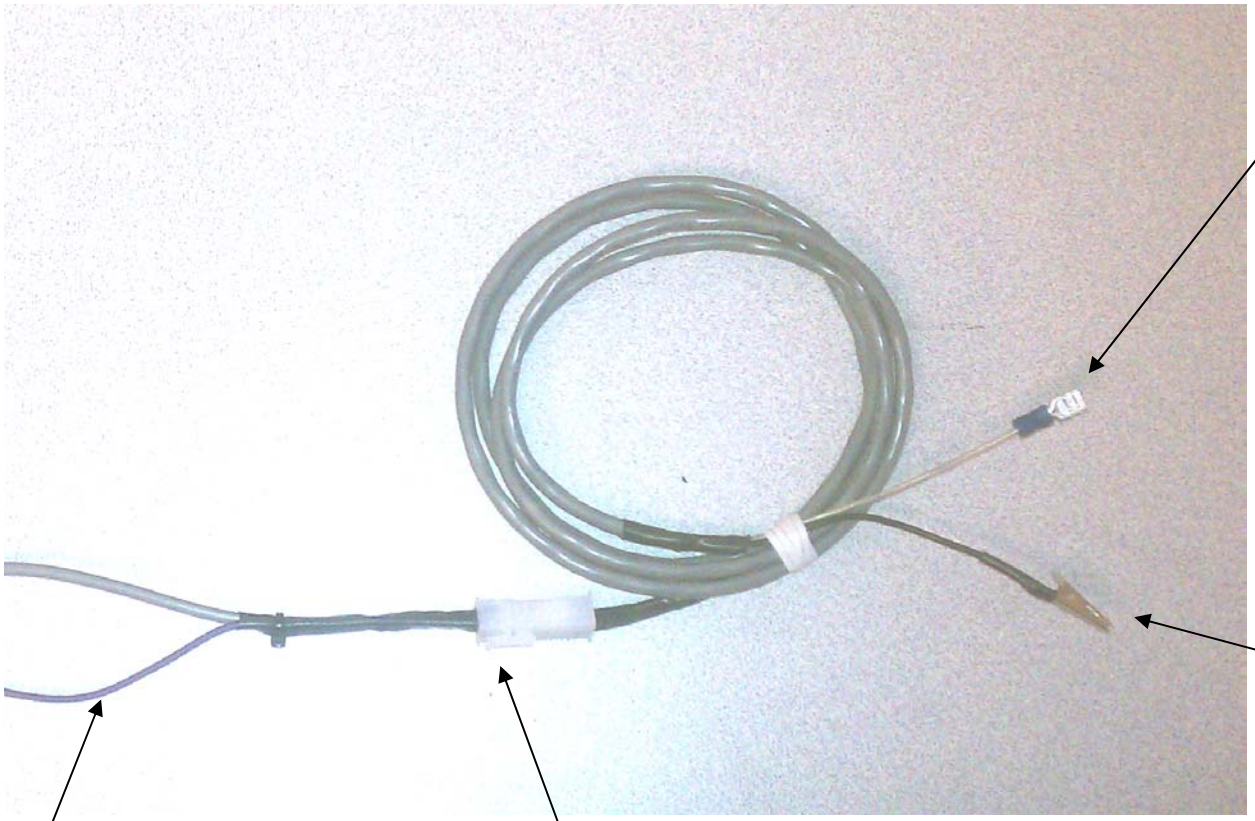
Then go into the DataMite specs and click on the Sensor and Calibration for the Torque channel (actually the power input channel) as shown in Figure 2. In this calibration screen you must enter the numbers to describe how many volts produce a certain amount of HP or KW. This must be provided by the dyno manufacturer, as it is difficult to hang weights to obtain this number.

Note: This CAN be done if you can hang weights and spin (or simulate spinning) the dyno at some known RPM while providing no additional load to the dyno. This is for the more knowledgeable dyno operator.

Also, on the Calibration screen, set the "Type" for the power input signal being either HP or KW. Then click on the Keep Specs button in the lower left corner.



Tach Input for IPU Cable



Spade connector for Tach Out, Spark Out, or similar “tach” signal from MSD or similar engine controller or negative side of coil.

Alligator clip to attach to something grounded to engine.

Note: Purple wire is NOT used for this situation.

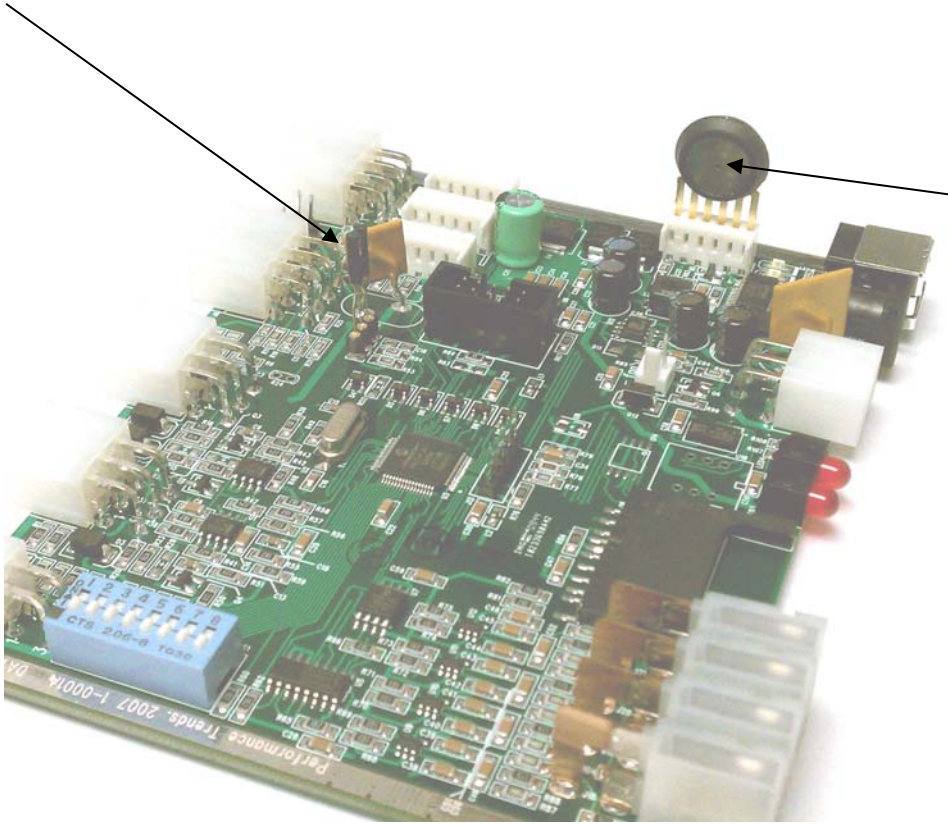
Plug into Inductive Pickup Harness where the Inductive Pickup Box would normally plug in.

Sometimes we provide a cable like this which plugs directly into the DataMite Box.

DataMite III Weather Station Sensor Installation

Fig 2, Holding Humidity Sensor Leads

Humidity Sensor: Side with writing (or a number) and rounded cutout goes toward the **outside** of the board, toward side with 5 white Molex connectors. Leads must be very straight (not bent) and you must hold them firmly between the tips of your fingers to insert them in socket without bending the leads. See Fig 2. Bent leads may not insert into socket fully. Once installed, **check that none of the 3 leads touch each other**.



Barometer sensor, with metal side facing in toward center of board.

DataMite 4 USB 2 RPM 1 Analog Breakout Cable DT4-BCA2R

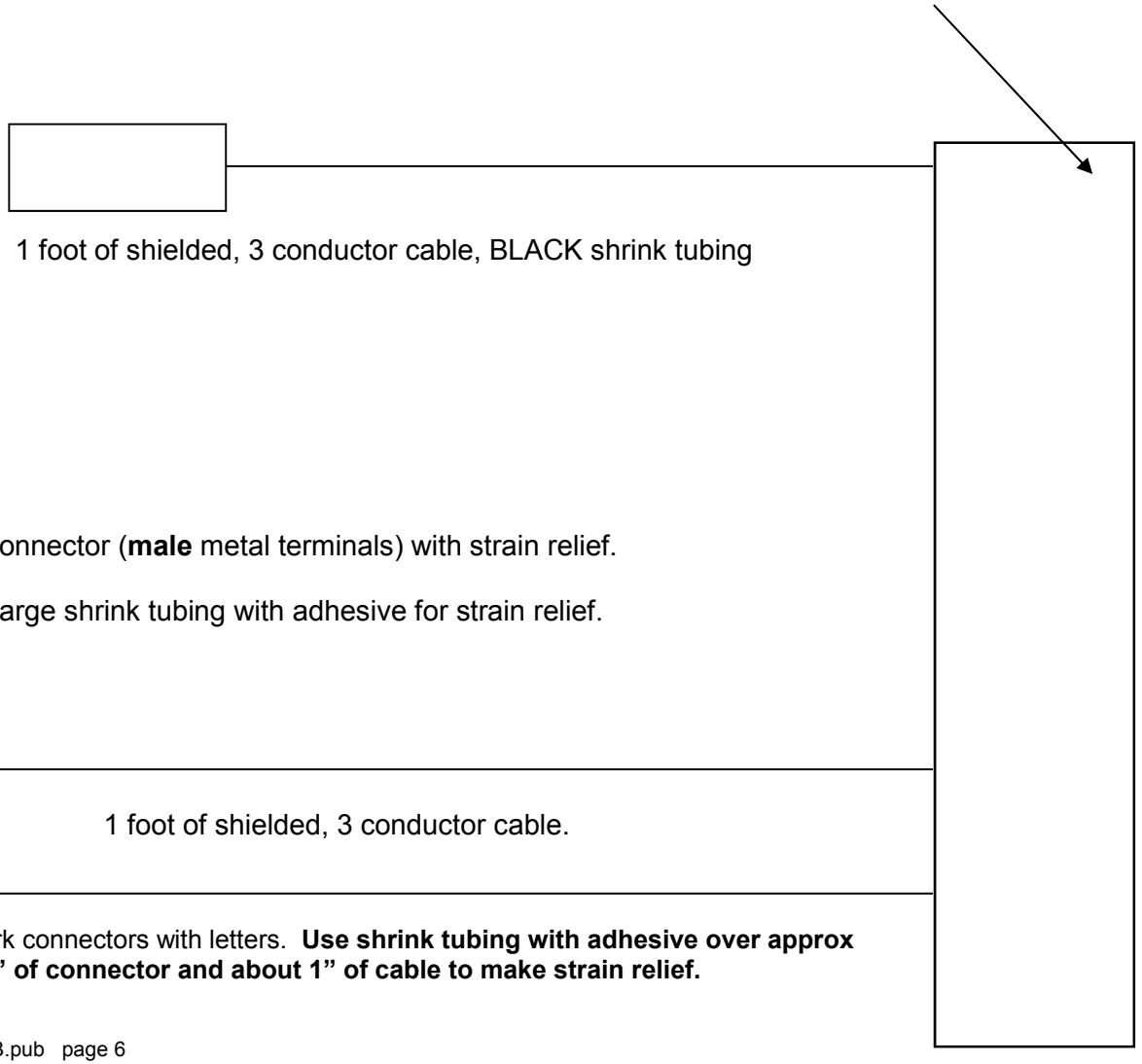
6 pin male Molex connector (female metal terminals) with strain relief.

•

4 pin female Molex connector (male metal terminals)

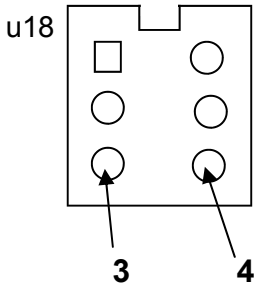
•

No strain reliefs, finish with the BLACK shrink tubing. . **Use shrink tubing with adhesive over approx 1/4" of connector and about 1" of cable to make strain relief.**



DataMite III USB “Accelerometer Fix”

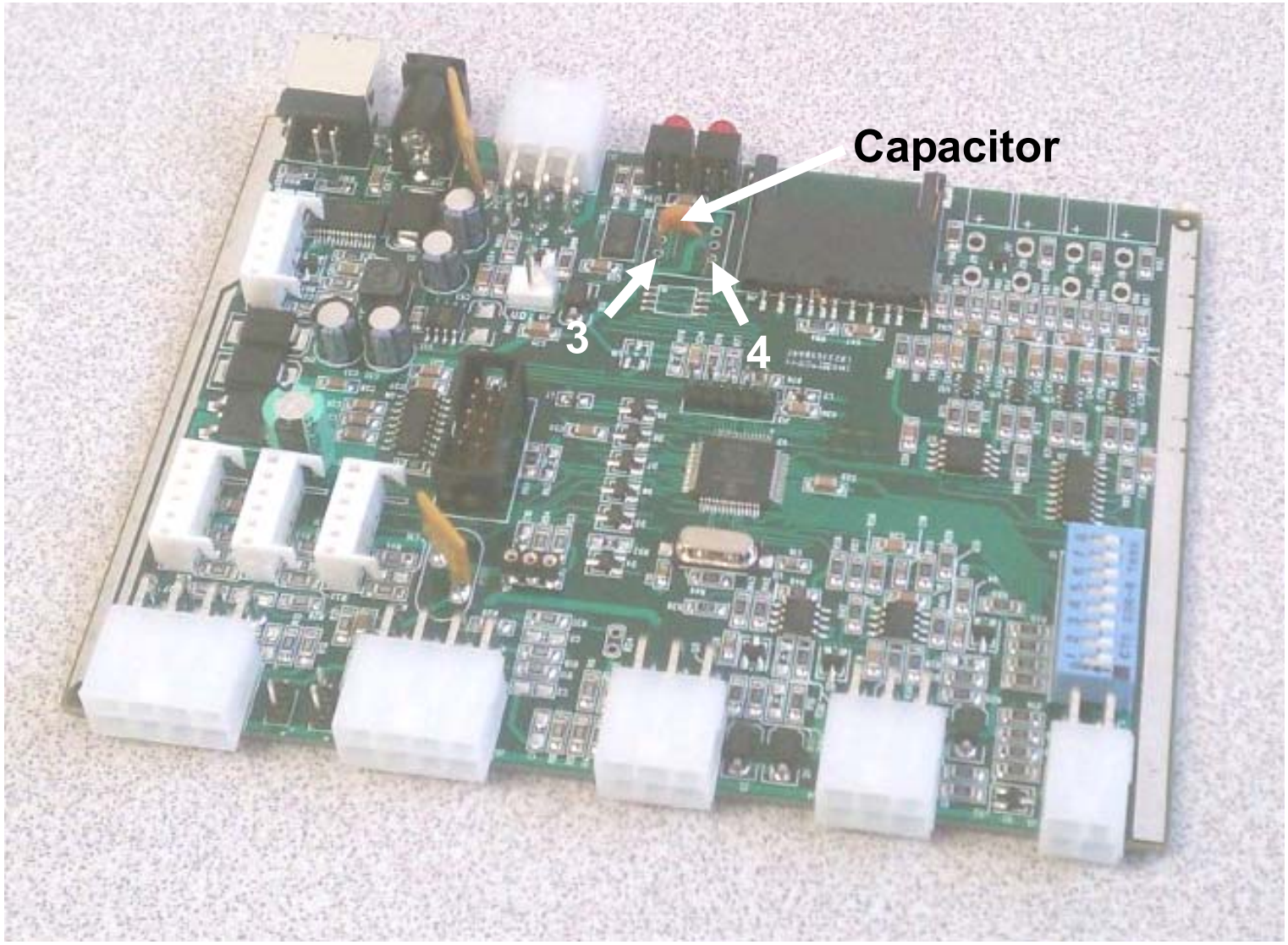
Solder in 470 pF capacitor into board for chip marked U18, into holes 3 and 4. The capacitor has no polarity, so it doesn’t matter which leg goes into which hole. See picture below. It’s best to remove the 4 screws holding on the top lid. Then remove 2 more screws holding an end panel to the bottom. Then slide the board out as shown to lower right. Disconnect fan if board is so equipped.



Push capacitor legs through holes 3 and 4 as shown to right, turn board over and solder legs in from below. If left longer, you could short out capacitor on enclosure.

Reassemble, being sure to replace fan lead and being careful that any foam tape on the top lid is pressing lightly down on the barometer and humidity sensors. This dampens out vibration to these sensors.

Reassemble end panels and lid.



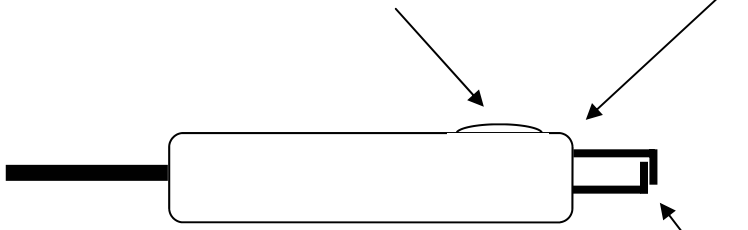
Tips on using the BB2-IPUP MSD (GMR 8918)

Check the additional instructions packed with this **BB2-IPUP** for attaching this end to

BB2-IPUP inductive pickup for low voltage wires like coil (12V)

The **BB2-IPUP** replaces the Inductive Pickup Box shown above. This connector plugs into same harness connector as where the Inductive Pickup Box would plug into.

Adjust the clamping of the 2 metal tabs so they touch each other, with the washers typically above the tab. Then tighten the screw to clamp onto primary (low voltage) wire. Check MSD instructions on separate sheet of paper for more information..



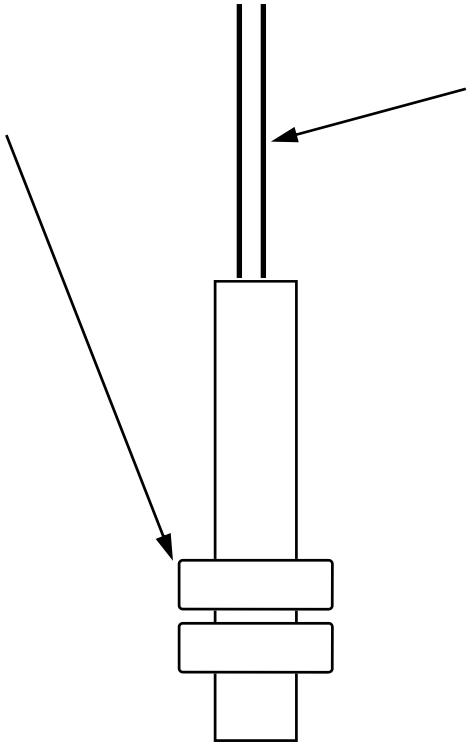
Side View of clamp.

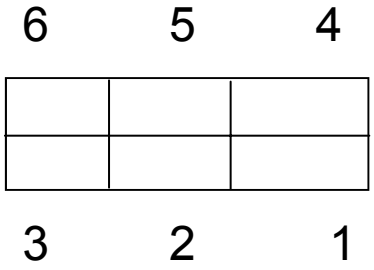
IMPORTANT: For most all applications, these 2 metal tabs MUST touch each other, to complete the circuit of metal surrounding the wire carrying the low voltage current .

This sensor senses current flowing through the primary (low voltage) wire. The current must be 3 amps or more for it to trigger. If it is not triggering (reading RPM), there may not be enough current for your application.

DTM-RPMA (standard RPM sensor) Installation

Note: **Do NOT** overtighten these nuts as you may crack the body of the sensor.





Typical 6 pin connector attached to cable to this type RPM sensor. Pins 1 and 4 are typically connected to this sensor. Pin 6 may be present but is not used for this type sensor.

This sensor is simply an On/Off switch and does not have polarity. It does not matter which lead you hook to which side of your circuit.

If you are replacing a sensor, you will attach one side of this sensor to the black wire.

Depending on the type of harness you have, you will either attach the other wire to:

The white wire (if present)

Or the red wire (if no white wire is present).

To check if a sensor is working: Switch your volt meter to ohms Ω (resistance) and disconnect the sensor from the DataMite logger. Put the probes across the 2 terminals connected to the black and either red or white wire terminals as described above (pins 1 and 4 in picture to lower left). You may have to remove the strain relief “cap” from the connector to see the color of the wires. (Note: Some cables will have a terminal for the red wire even if there is also a terminal for the white wire. In those cases the red wire is not used.)

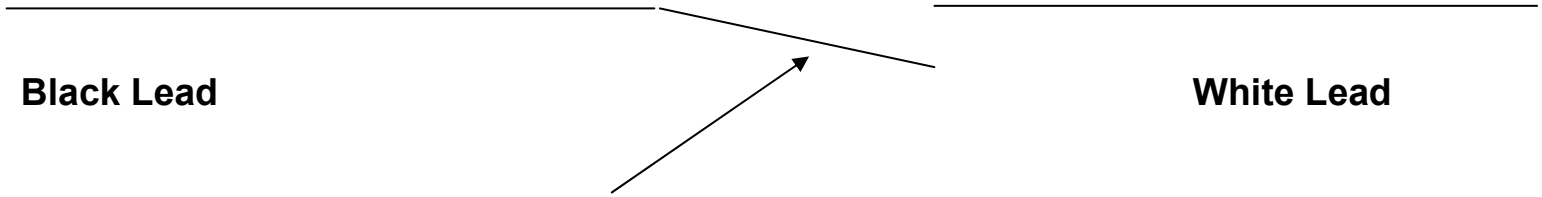
With no magnet, the resistance ohms should be very high (infinity). With a magnet at the tip of the sensor (either north or south pole), the resistance should be less than 5 ohms.

Notes on DataMite RPM Cables (part number DTM-LDR):

DTM-LDR Standard RPM cable with 6 pin connector for frequency (RPM) input channel. The DataMite loggers sense when the signal wire has been shorted to ground and then released from ground. It is an open collector circuit with a pull up resistor on the signal input.

- Red (pin 6) is typically 12 volt power (or whatever power is being supplied to the data logger), **50 milliamps MAX**. ***DO NOT*** connect red lead to ground or to a voltage source (for example, do not connect to 12 volt battery). If you are not using 12 volt power (for example, a magnetic reed switch needs no power) ***do not connect this lead to anything. Insulate the end with a piece of tape or shrink tubing.***
- Black (pin 1) wire is signal ground
- Silver, uninsulated wire is shield ground. (We recommend you do not connect this lead to anything as it is connected to the black signal ground at the connector.)
- White (pin 4) insulated wire is “open collector” signal input

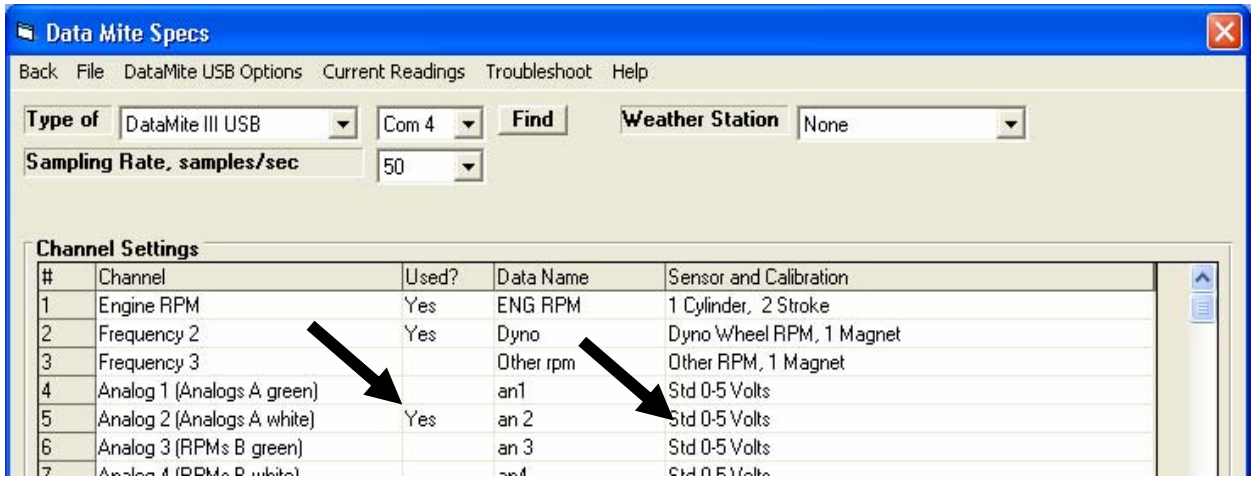
Typical Reed Switch Wiring (no power from red wire needed)



Switch closes (makes contact) and then opens as magnet passes by

IMPORTANT: The DataMite may be supplied with (and will run fine on) an unregulated power supply, up to 18 volts or more. This is the power being supplied by the red wire. If your sensor is damaged by voltage over a certain amount, **be sure the DataMite power supply does not produce more voltage than you sensor can tolerate.**

DT3-RTDA Resistive Temp Sensor Calibration for Air



The DT3-RTDA lets you read air temperature via an analog channel (**NOT for fluid temps**). It is not quite as accurate as a thermocouple, and it produces a non-linear response. So it requires a "table" calibration as shown to the right.

First, select a channel for your temp sensor and set "Used" to Yes and then click on Sensor and Calibration for that sensor.

In the Analog Sensor Specs screen which opens:

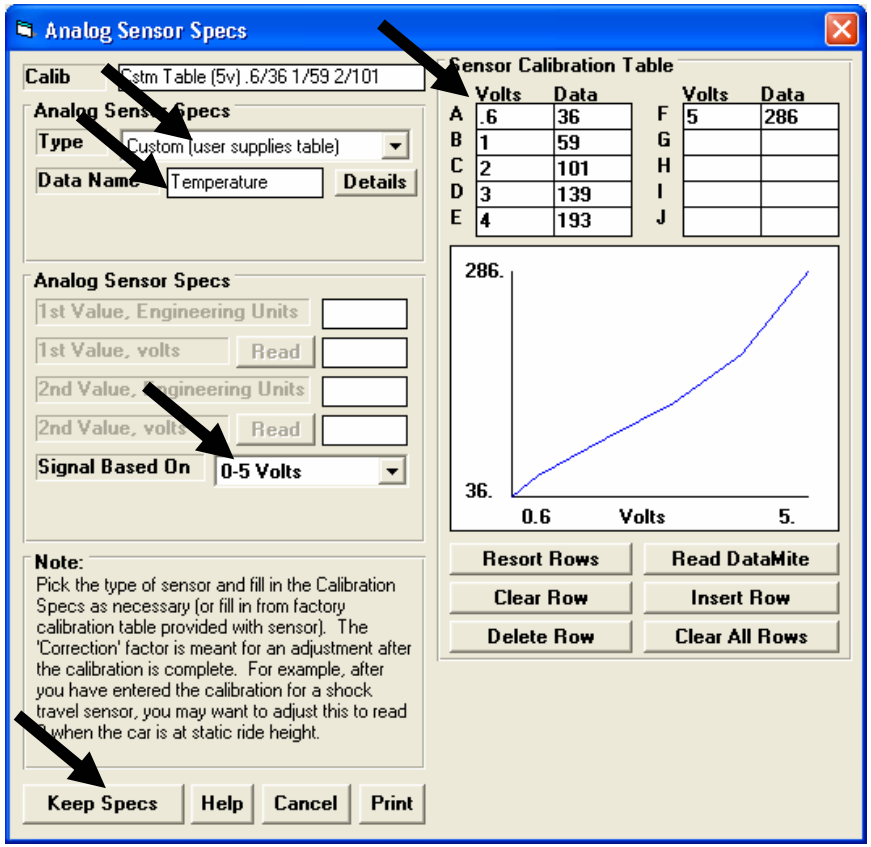
For Type, select "Custom (user supplies table)"

For Data Name, enter some name for the temperature you will measure

For Signal Based On, select "0-5 volts"

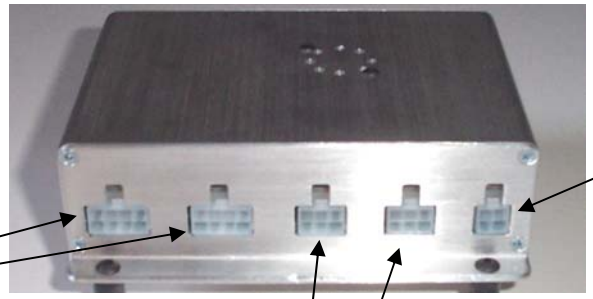
Then type in the values for A through F as shown in the table in the upper right..

Then click on Keep Specs in the lower left.



DataMite 4 USB Connections

Analog Inputs on 8 pin connectors. Right is analog channels 1, 2, 10, 11, 12 (10, 11, and 12 may not be available if you are using weather sensors).. Left is analog channels 5-9 (1, 2 or -3 of which may not be available if you are using internal pressure sensors). Analog channels are for measuring 0-5 volt signals, like position, travel, pressure, infra-red temperatures like tire temperatures, etc. Because internal sensors can be installed, you should be careful NOT to assume that you can use a breakout cable designed for left connector on the right connector and vice versa.



Lighted Recording Switch:

- Light Off, no power or no SD card installed.
- Light Flashing, standby mode, ready to record.
- Light On, box is recording data.

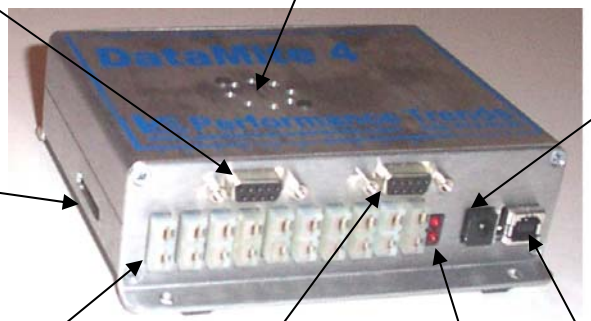
Install in dash with notch in threads down.

Toggle Up position is Recording Position. In up position logger will start recording if box already is powered up (or start recording when power is supplied) and will keep recording until you flip switch down or memory segment is full. Box records to next available memory segment in SD card for each recording session.

RPM Inputs on 6 pin connectors. Right is Engine RPM and other RPM (channels1 & 4). Left is RPM channels 2 and 3. Both provide access to additional 1 analog channel if the proper breakout cable is used.

Digital Inputs and Outputs Connector. Connect breakout cable here to access digital inputs and programmable digital outputs. ***

Fan Opening Fan to improve weather sensor response time.



12 V DC barrel connector. This can be from a wall transformer (typically used only for Dyno installations) or special cable with red and black leads for vehicle installation. NOTE: USB connector power is enough to make the box function, but not enough for accurate sensor calibrations.

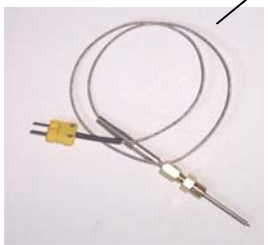
SD Memory Card: Box records directly to SD card. There is no internal data memory. Box records to next available memory segment in SD card for each recording session. SD cards are formatted for 4, 8 or 16 segments. You can record all segments before you need to remove card to upload to PC. If you record 9 sessions on a card with only 8 segments, you will overwrite (loose) your first session with data from the 9th session. To upload in DataMite software, place card in drive, click on File, then "New, get data" to start a new test.

GPS Connector Is used for the GPS sensor and for 0-5 volt analog outputs. ***

LEDs Bottom LED indicates power to box. Top LED lights each time a data sample is written to SD card which can be a steady blur.

USB connection to initially config box (typically not needed) or to check real time readings for setting up sensors or troubleshooting.

Thermocouple Channels. Thermocouples are used to measure temperatures, like exhaust temperatures, fluid temps like oil and water, air temperatures, etc. They can measure from 0 to 2100 deg F.



*** Early versions of board did not have this and may require reprogramming to activate this feature.

DataMite III & 4 Power (DT3-PLAF) Leads w A/F power supply

6 pin male Molex connector (female metal terminals) ***with*** strain relief.

- Black wire and non-ribbed or black wire to pin 1
- Red wire and ribbed or red wire to pin 6

Dashed side from barrel connector goes to ribbed or red side of 2 conductor cable.

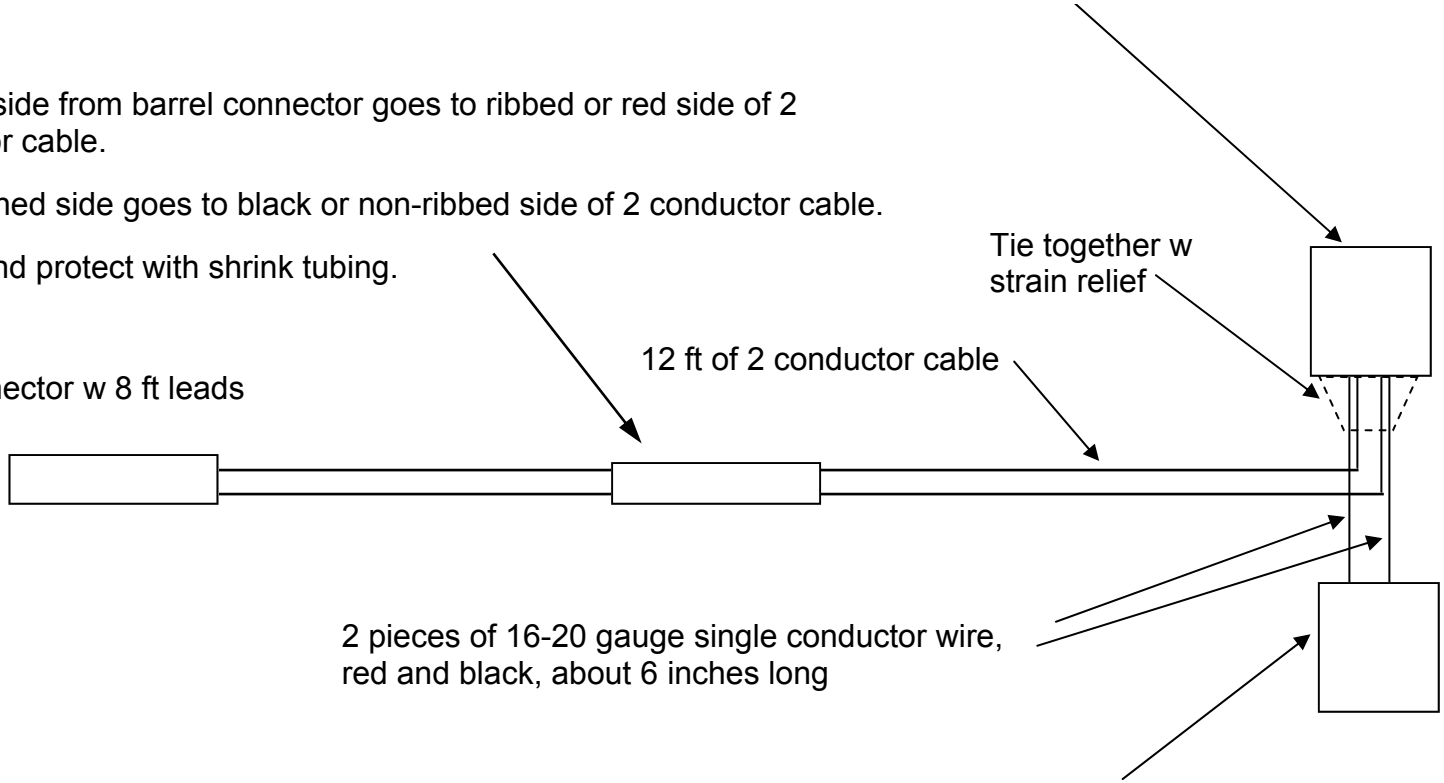
Non-dashed side goes to black or non-ribbed side of 2 conductor cable.

Solder and protect with shrink tubing.

Tie together w strain relief

12 ft of 2 conductor cable

Barrel Connector w 8 ft leads



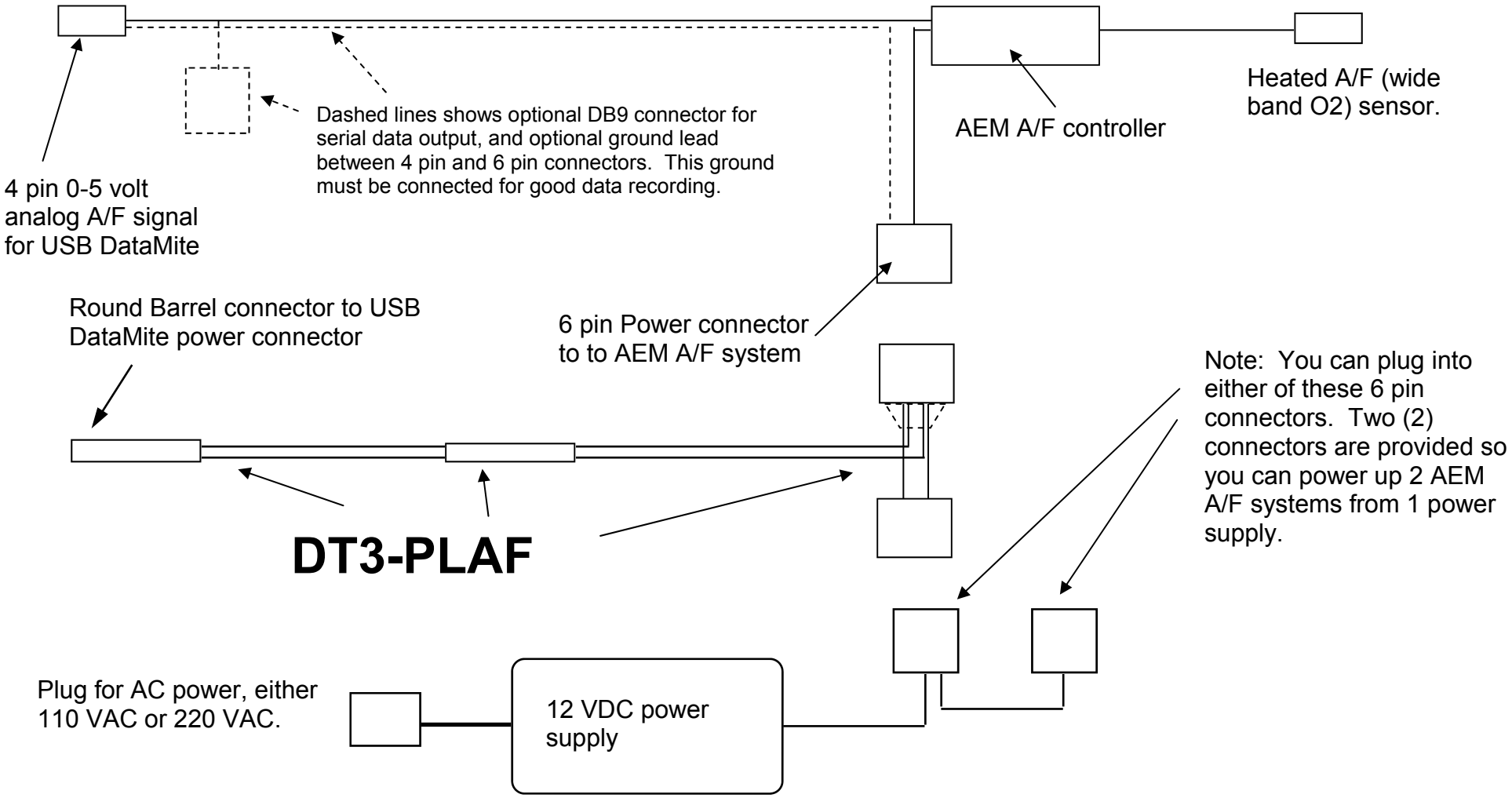
2 pieces of 16-20 gauge single conductor wire, red and black, about 6 inches long

6 pin female Molex connector (male metal terminals) with NO strain relief.

- Black wire to pin 1
- Red wire to pin 6

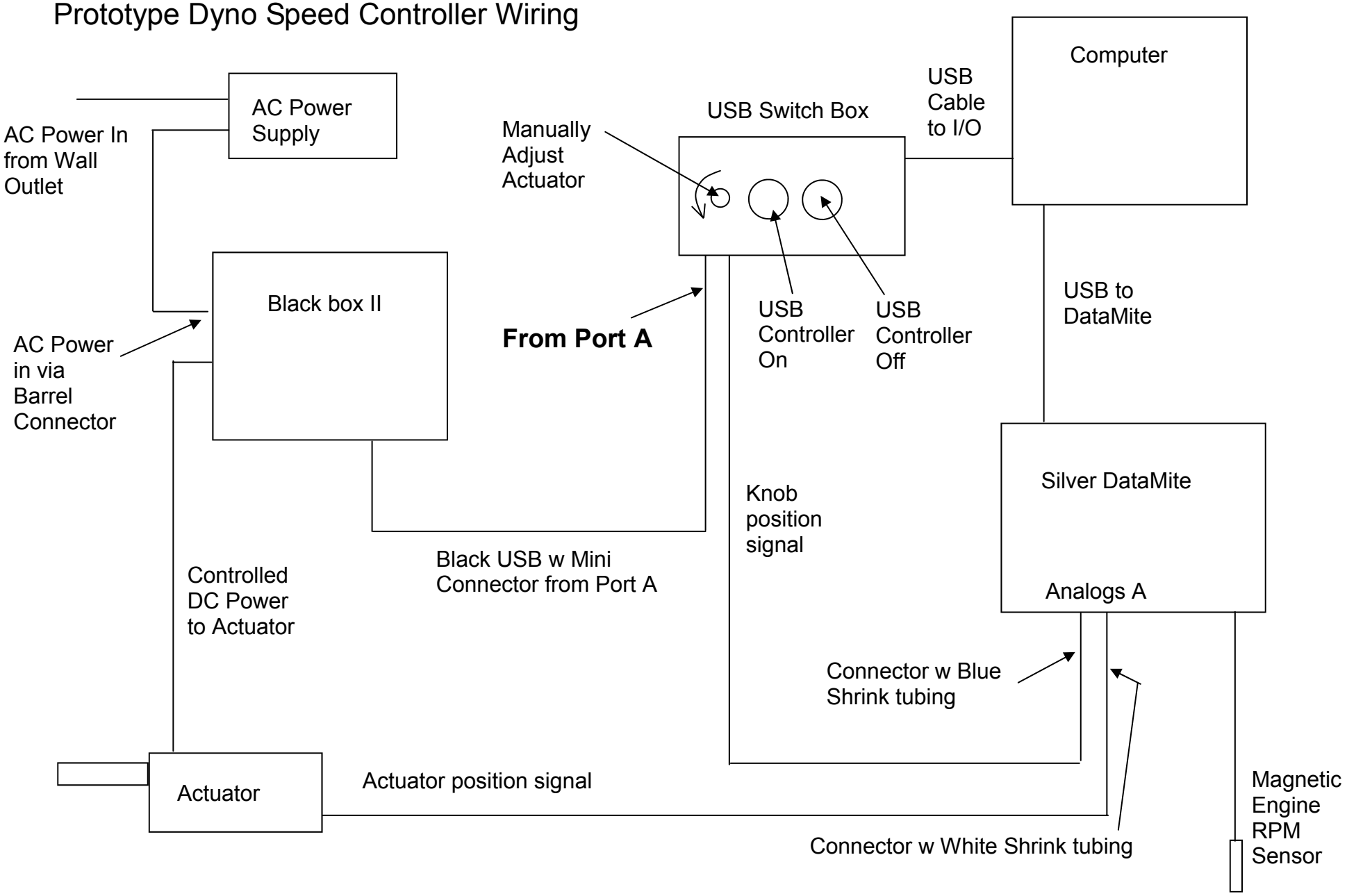
DataMite III & 4 Power (DT3-PLAF) Leads w A/F power supply Installation

For the AEM A/F system to provide a good signal to the DataMite, we must power up the DataMite from this same power supply as the AEM A/F system. The DT3-PLAF lead lets you do this as shown below.

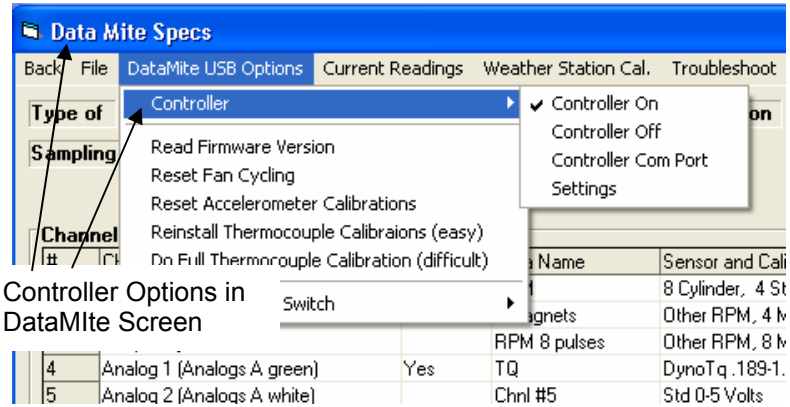


12 VDC power supply for A/F system. For the AEM A/F system to provide a good signal to the DataMite, we must power up the DataMite from this same power supply.

Prototype Dyno Speed Controller Wiring

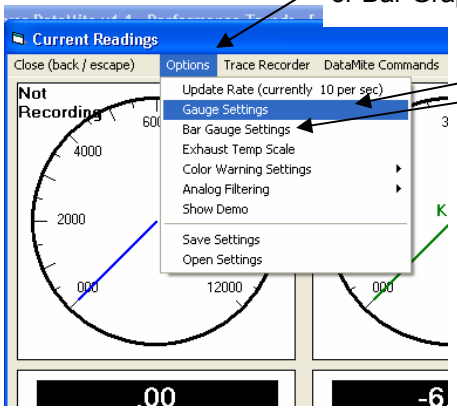


Prototype Dyno Speed Controller Screens

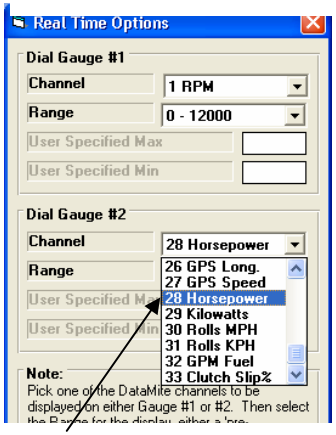


Controller Options in DataMIte Screen

Click on Options to set Gauge or Bar Graph to Horsepwer

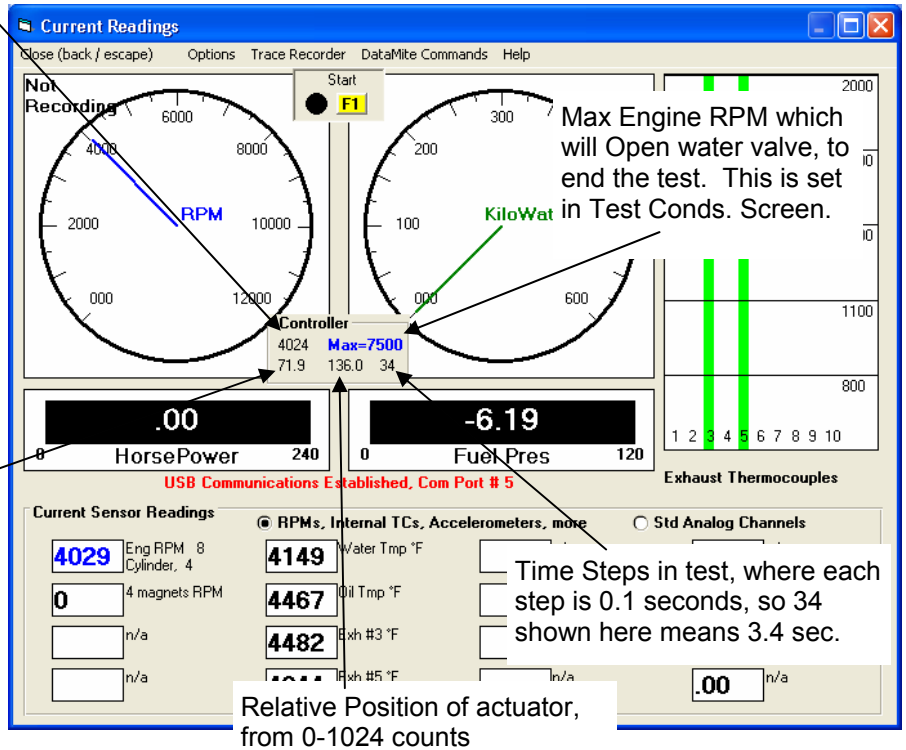


Choose Gauge or Bar Graph Settings for screen below.



Set a channel as Horsepower

Current Engine RPM as seen by controller.



Max Engine RPM which will Open water valve, to end the test. This is set in Test Conds. Screen.

Controller signal from DataMite. This is the knob setting when in manual mode, or automatic setting being generated from DataMite when in Automatic mode, from 0-100%.

Time Steps in test, where each step is 0.1 seconds, so 34 shown here means 3.4 sec.

Relative Position of actuator, from 0-1024 counts

Basic TestProcedure:

- With ENGINE OFF, go into Current Readings screen and verify you have control with the knob by watching the controller signal and actuator position.
- Set approximate actuator position for idle, start engine.
- Warm up controlling actuator manually with knob.
- When ready to test, go to full throttle while holding RPM low with manual adjustment knob.
- When full throttle and low RPM, press F1 on keyboard and DataMite software will take over and ramp up the actuator per Controller settings.
- When done with test time or max RPM is encountered, actuator will go to full open (full load) to bring down engine RPM.
- Press the OFF button on USB Switch Box to also bring engine down.

IMPORTANT: You need some alternative method to shut off the engine should something fail in this prototype controller.

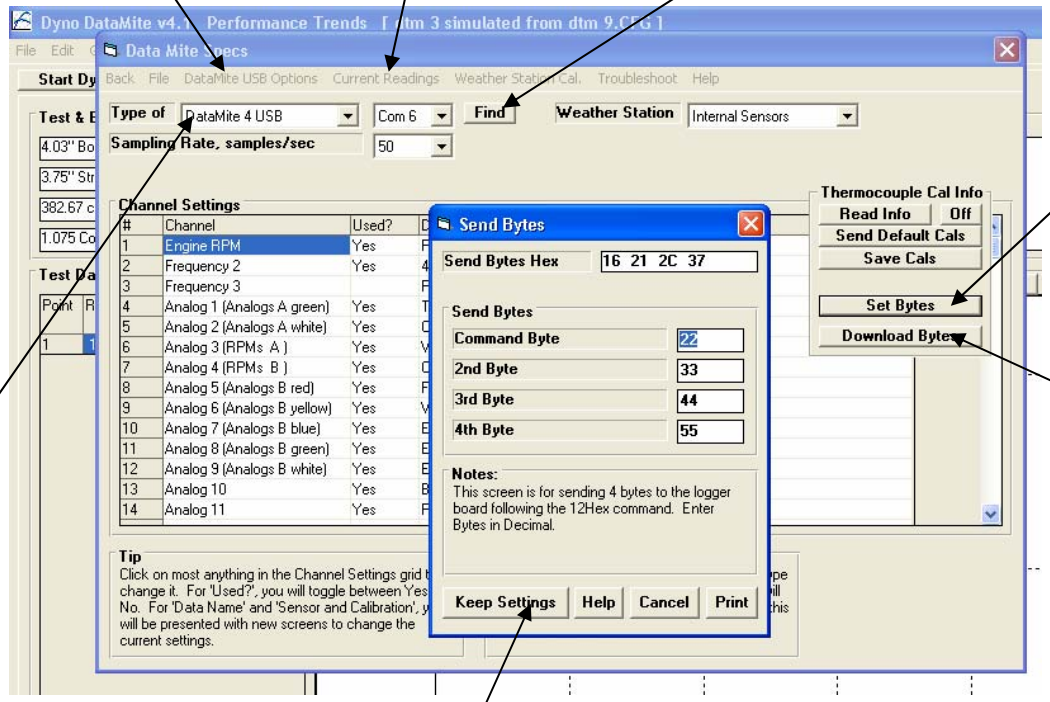
NOTE: If you move the manual control knob when computer has control, the control reverts back to the knob. This lets you manually over-ride the computer control should something go wrong.

Sending Bytes via H12 Command Click on DataMite at top of main screen for this screen.

4) Click DataMite USB Options, then Read Firmware Version to bring up Thermocouple Cal Info section shown to right.

3) Click Current Readings to ensure you can establish communications. Once established, back out to this DataMite Specs Screen

2) Click Find to find possible Com Port, then set to that port



5) Click Set Bytes for the Send Bytes screen letting you enter the 4 bytes to send via the H12 command

1) Set to DataMite 4 USB

7) Click Download Bytes to send bytes in proper command string and CRC to logger board.

6) Enter 4 bytes and click Keep Settings

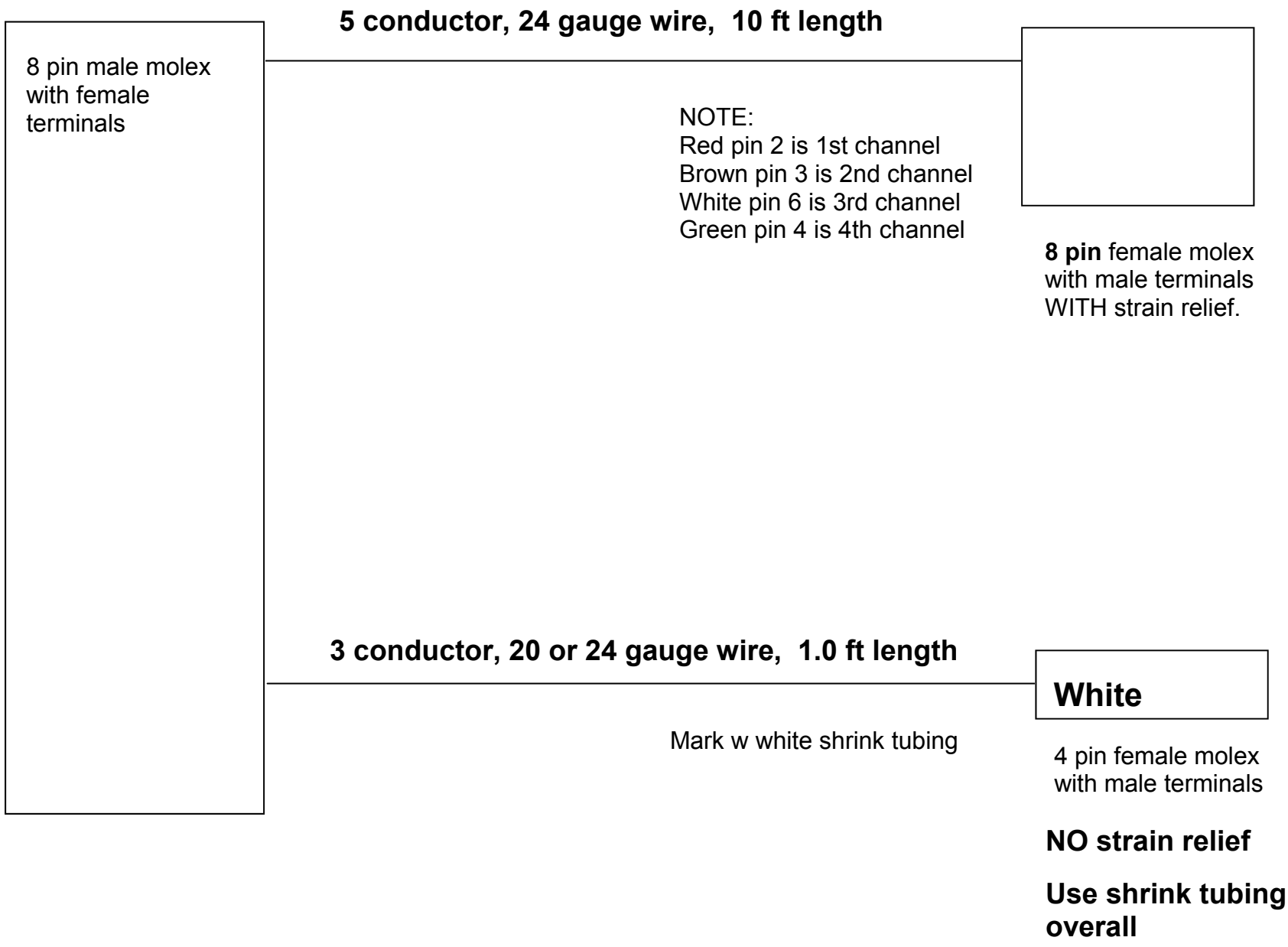
Important:

This fuel flow sensor requires 11 to 14 volt power. More than 14 volts will damage the sensor and void the warranty.

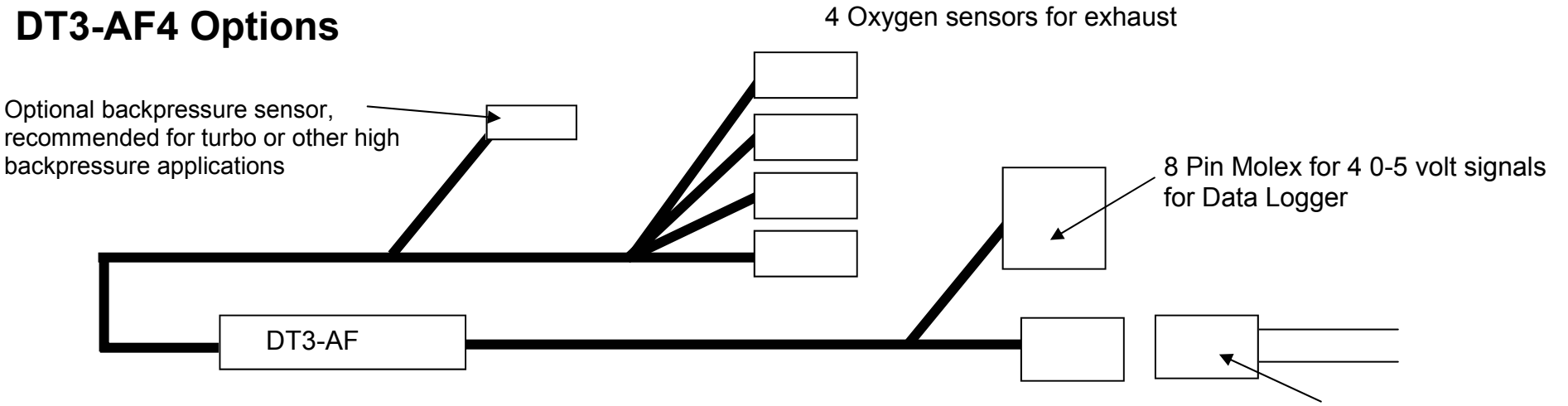
This sensor gets its power from the DataMite logger box. Whatever power you supply to the DataMite will be passed directly through to this fuel flow sensor.

Therefore it is critical you use only the regulated 12 VDC power supply provided with your DataMite, or you will void the warranty.

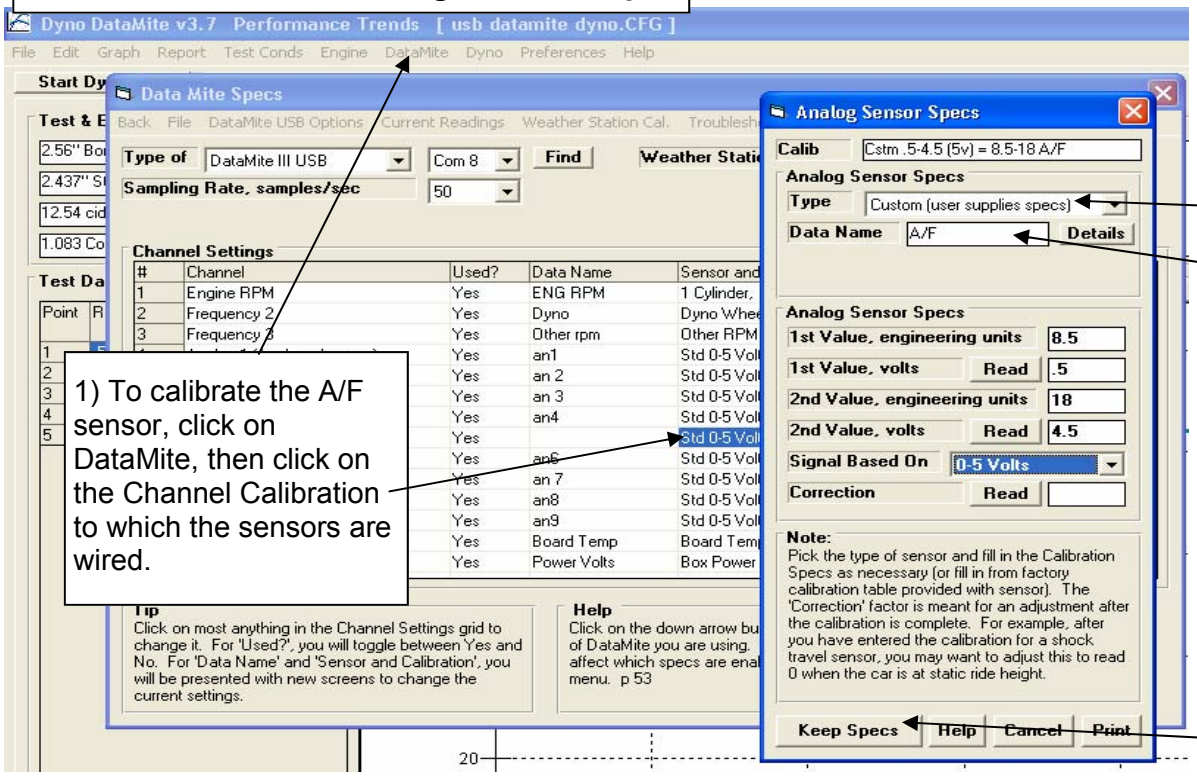
DataMite USB 4 A/F, 1 Analog Breakout Cable



DT3-AF4 Options



Calibrate the software using these 3 steps



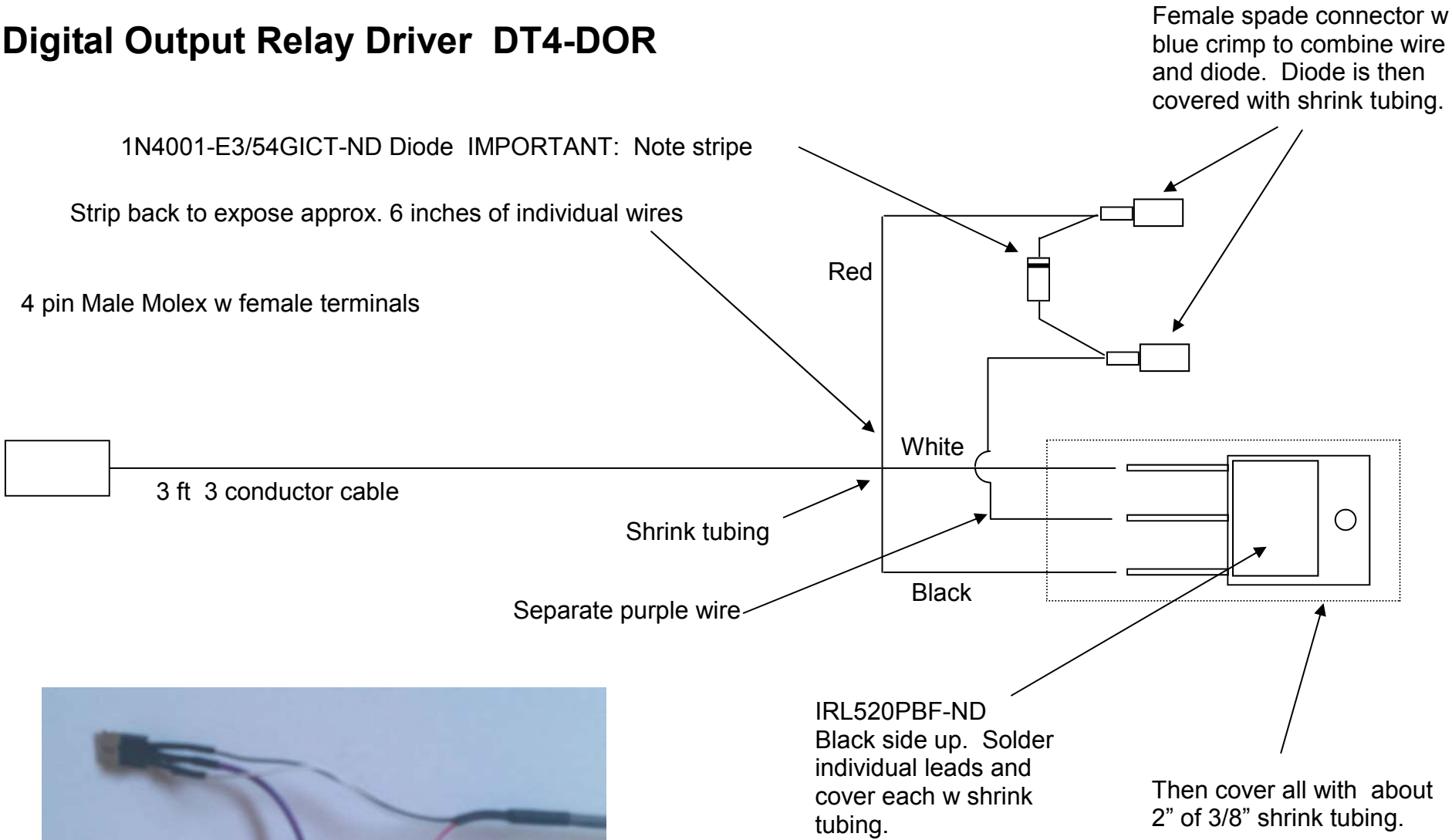
1) To calibrate the A/F sensor, click on DataMite, then click on the Channel Calibration to which the sensors are wired.

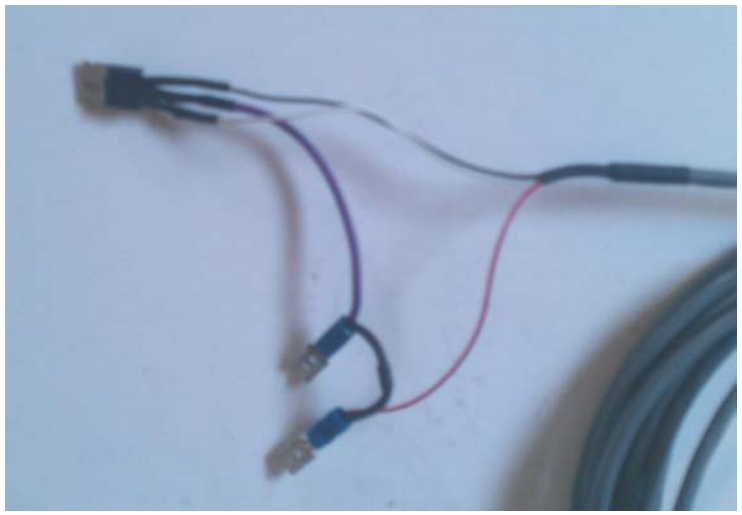
2) Choose the Custom (user supplies specs) Type.
Enter a Data Name like “A/F” or “Air Fuel”.
Enter these numbers for Analog Sensor Specs:

1st Value, engr..	8.5
1st Value, volts	.5
2nd Value, engr..	18
2nd Value, volts	4.5
Signal Based On	0-5 volts
Correction:	0 or blank (if displayed)

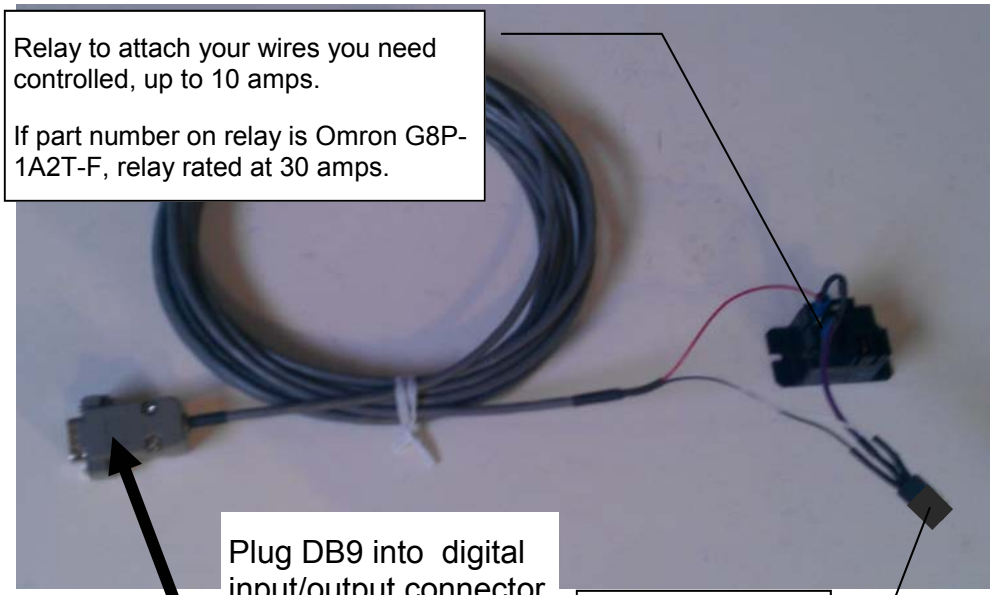
3) Click on Keep Specs to keep this calibration. This calibration will be loaded back into the DataMite’s Calibration Table.

Digital Output Relay Driver DT4-DOR





Digital Output Harness DT4-DOR (relay driver)

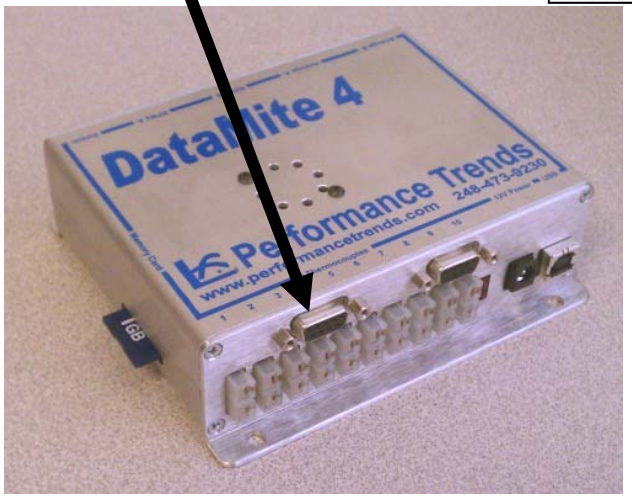


Relay to attach your wires you need controlled, up to 10 amps.

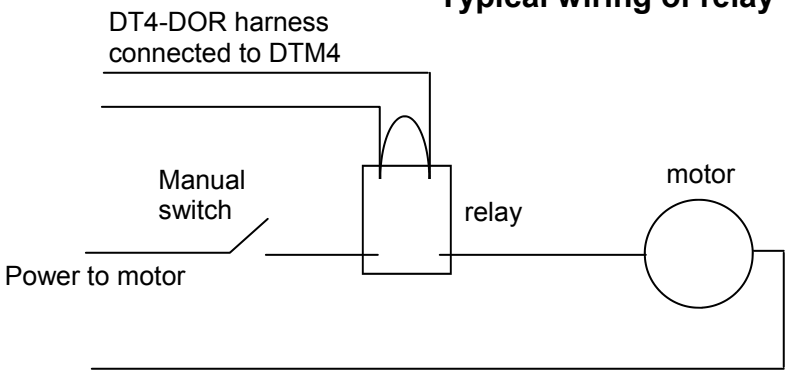
If part number on relay is Omron G8P-1A2T-F, relay rated at 30 amps.

Plug DB9 into digital input/output connector on DataMite 4

Relay driver, leave free hanging, attach to nothing.



Typical wiring of relay



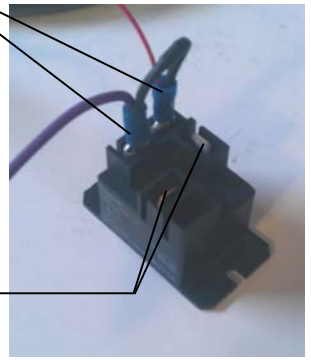
Notes:

Manual switch not required but strongly recommend to manually override the relay and DTM4 control should something go wrong.

The motor could also be power to the ignition for an engine “kill” switch or overspeed, or a warning light, etc.

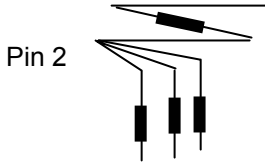
IMPORTANT: Always test your circuit and software settings at a relatively safe condition to ensure it is working correctly.

Control wires from DataMite 4 connected to smaller terminals. They can be connected to either terminal, no polarity.



Relay to attach your wires you need controlled to the 2 larger terminals. No polarity, power “hot side” can be connected to either terminal.

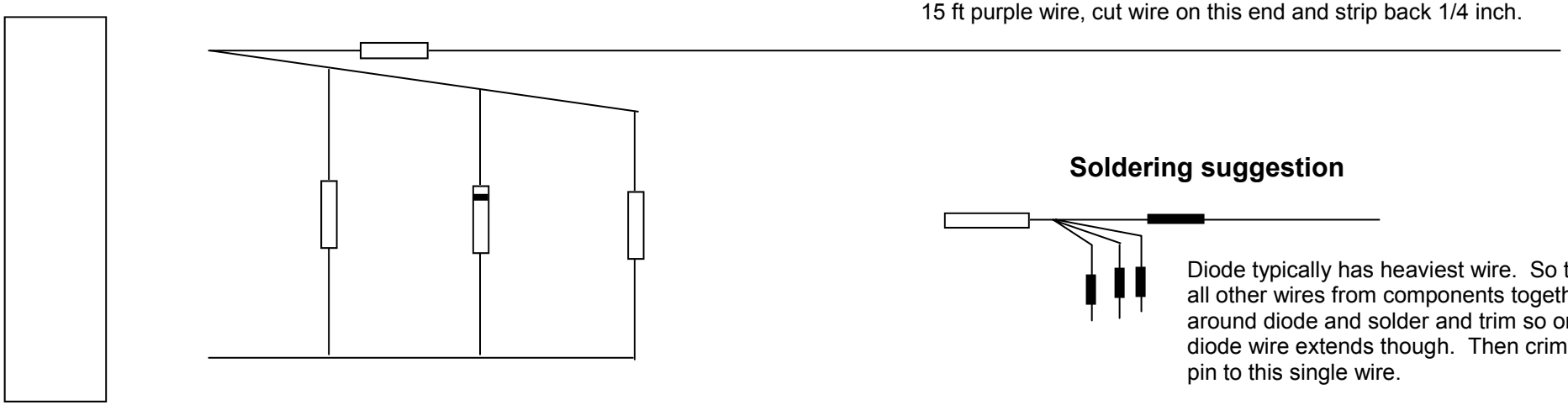
DT4-DITB Trans Brake Trigger Cable



Picture of how to squeeze all 4 components into DB9 connector shell.

Crimp into male pins
and then solder also

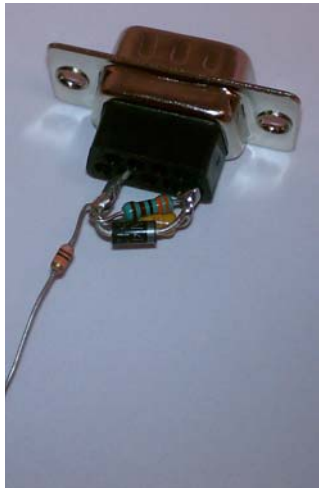
15 ft purple wire, cut wire on this end and strip back 1/4 inch.

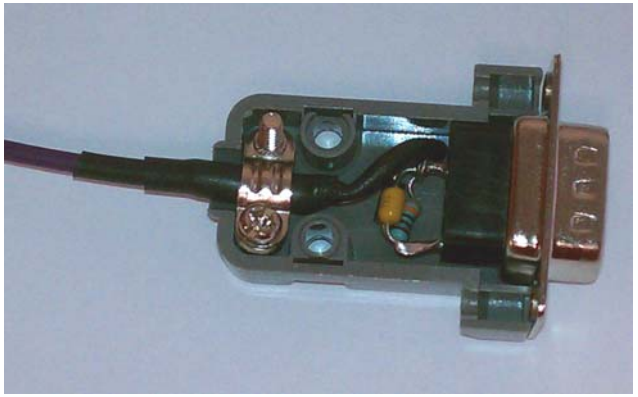


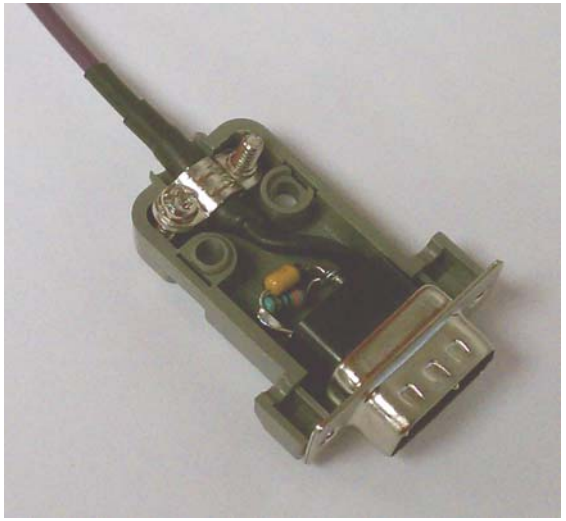
Soldering suggestion

Diode typically has heaviest wire. So twist all other wires from components together around diode and solder and trim so only diode wire extends though. Then crimp male pin to this single wire.

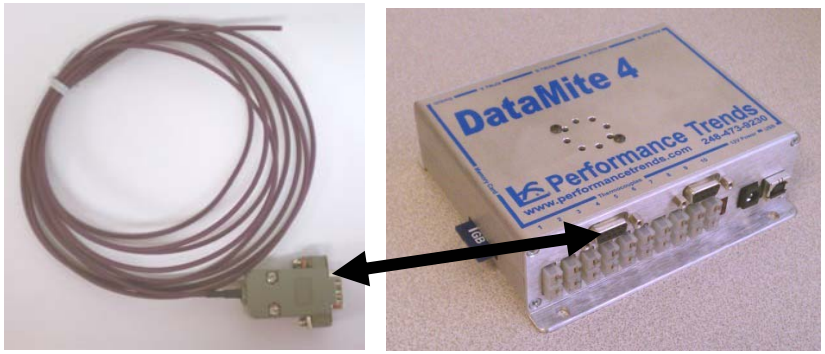
DB9 connector with 2 male pins

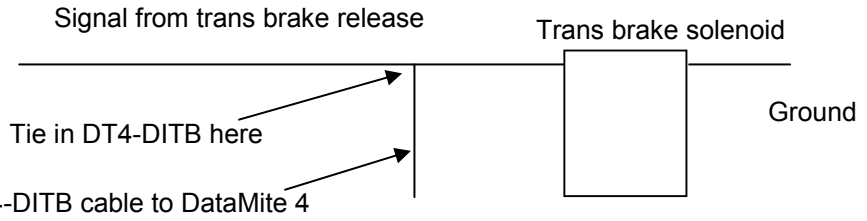






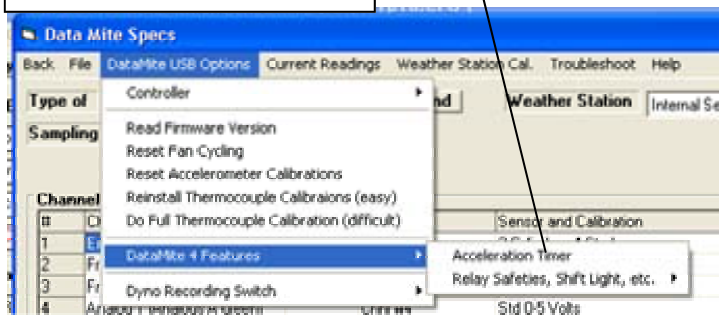
DT4-DITB Trans Brake Trigger Cable Installation and Software Setup



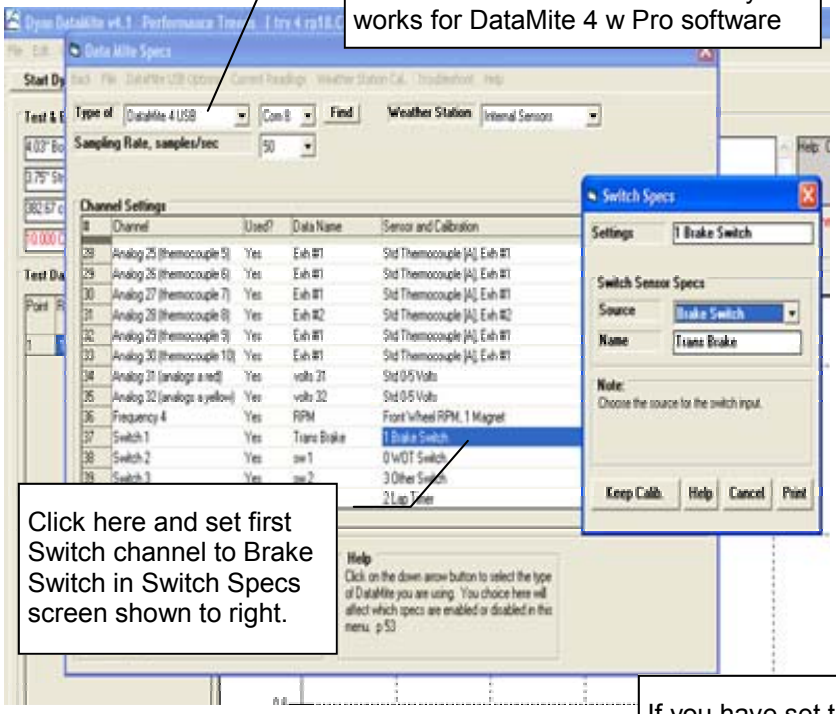


Set Timer specs as needed, then click on Keep Settings in lower left. Note: Troubleshoot mode can be handy for troubleshooting initial setup.

Choose Acceleration Timer from DataMite 4 Features



Automatic Acceleration Timer only works for DataMite 4 w Pro software

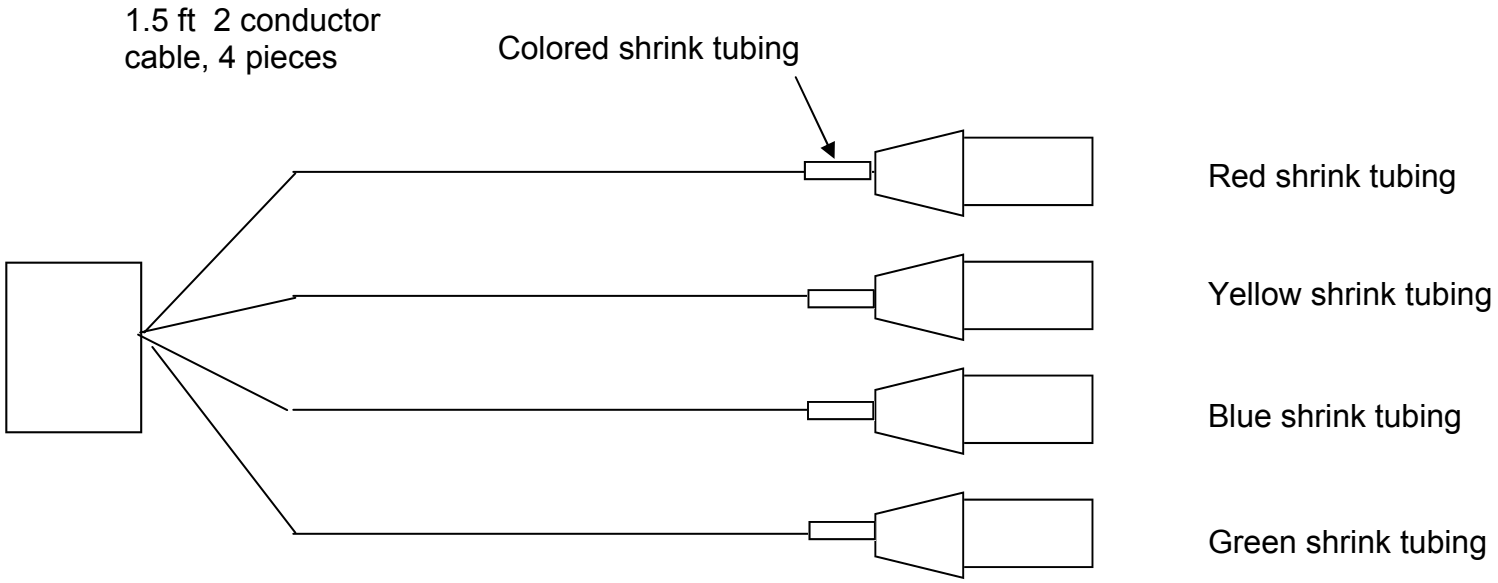


Click here and set first Switch channel to Brake Switch in Switch Specs screen shown to right.

After downloading real drag race run, click on Logbook to see results.

If you have set things up properly, you should see response time (R/T) here in Log Book.

Digital Input Breakout Cable DT4-DIBC



DB9 with male pins:

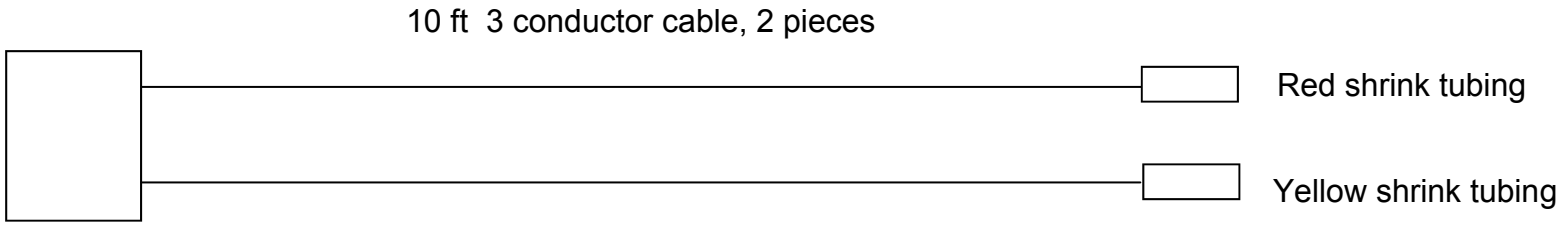
NOTE: You may need to use tie wrap rather than screw clamp which comes with connector kit to bundle wires and keep inside the shell.

4 pieces:

2 pin female molex with male terminals. Red to pin 2 and black and shield to pin 1. Each terminal needs shrink tubing, then shrink tubing over connector and about 1” of cable to act as strain relief.

Each connector also gets about 2” of colored shrink tubing to identify channels.

Digital Output Harness DT4-DOH



DB9 with male pins:

NOTE: You may need to use tie wrap rather than screw clamp which comes with connector kit to bundle wires and keep inside the shell.

2 pieces:

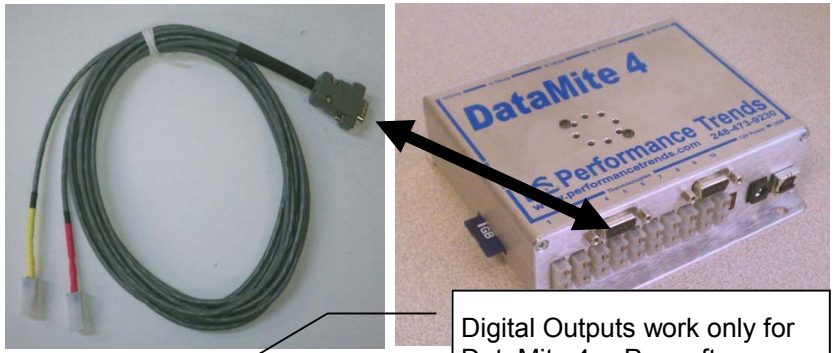
4 pin female molex with male terminals.

.

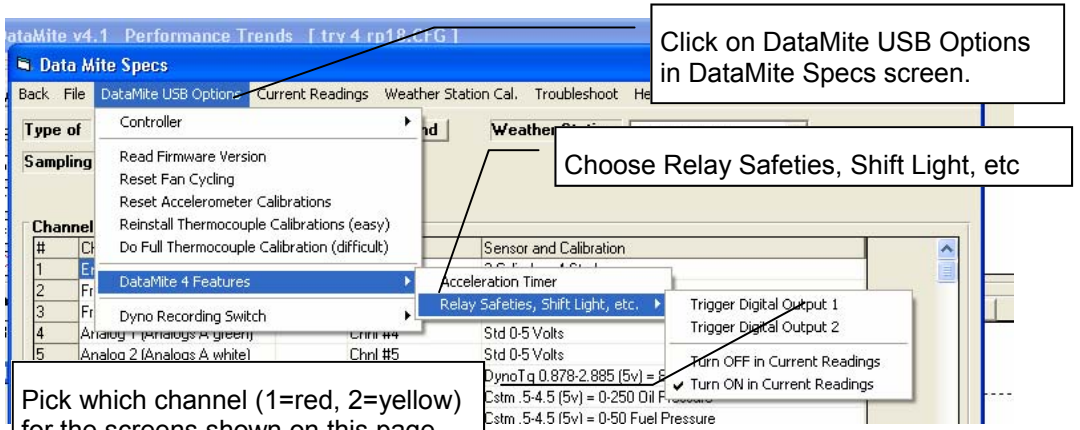
Each terminal needs shrink tubing, then shrink tubing over connector and about 1” of cable to act as strain relief.

Each connector also gets about 2” of colored shrink tubing to identify channels.

DT4-DOH Digital Output Harness Installation and Software Setup



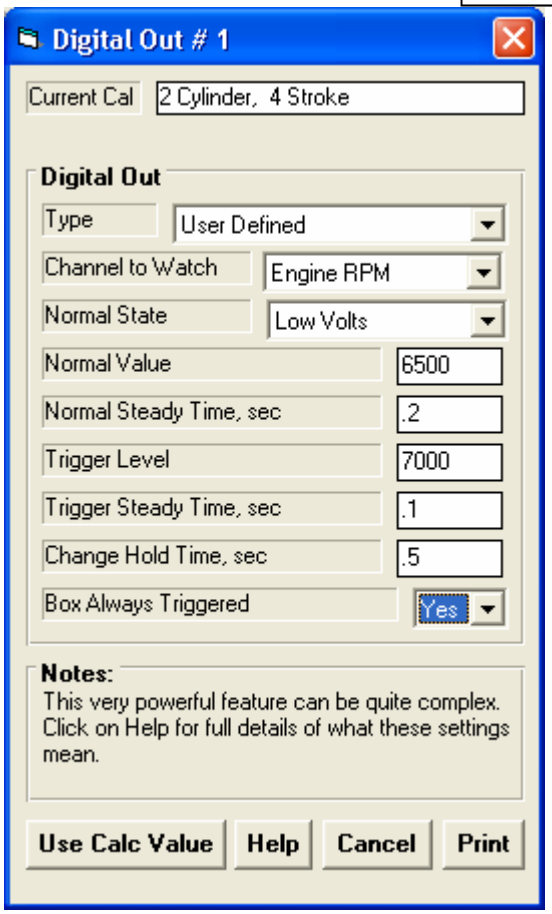
Digital Outputs work only for DataMite 4 w Pro software



Click on DataMite USB Options in DataMite Specs screen.

Choose Relay Safeties, Shift Light, etc

Pick which channel (1=red, 2=yellow) for the screens shown on this page.



Choose one of the **Type** options and most settings are disabled. The remaining inputs make your choices easier for the typical user. Choose User Defined to enable all settings. (Tip: Choose a predefined Type to fill in most inputs, but then change to User Defined to do minor customizing.)

Pick **Channel to Watch** to indicate which channel's value will be used to trigger the digital output.

Set **Normal State** as needed to choose between turning something On or Off when the condition is met.

Set **Normal Value** and **Normal Steady Time** to indicate what condition on the Channel to Watch will arm the Digital Output.. The Digital Output must be armed before the **Trigger Level** will switch the Digital Output.

The **Trigger Level** is the value which will cause the Digital Output to be changed.

Trigger Steady Time is how long the **Channel to Watch** must be at the Trigger Level before the Digital Output is switched.

Change Hold Time is the minimum time the switched condition is held before reverting back to normal start.

For example, for the settings shown: Assume Digital Output #1 connected to the DT4-DOL shift light. It is held low at 0 volts with the light turned Off. The light is armed if the Engine RPM is below 6500 RPM for at least 0.2 seconds. (***Below*** is determined because the Normal Value is ***less than*** the Trigger Level.) Once armed, if engine RPM goes above 7000 RPM for at least 0.1 seconds, channel 1 will go high, shift light will light. The light will remain on until engine RPM goes below 7000, but for at least 0.5 seconds minimum, Once Off, the light will not light until the system is armed by Engine RPM going back below 6500 for at least 0.2 seconds, and then goes above 7000 RPM for at least 0.1 seconds.

Set **Box Always Triggered** to No if you want this safety criteria to only work when the box is logging data (not displaying, but actually recording data in the Dyno version, the Recording Switch in the record position, steadily lit for vehicle versions). Set to Yes and the box will execute this logic at all times the box is On.

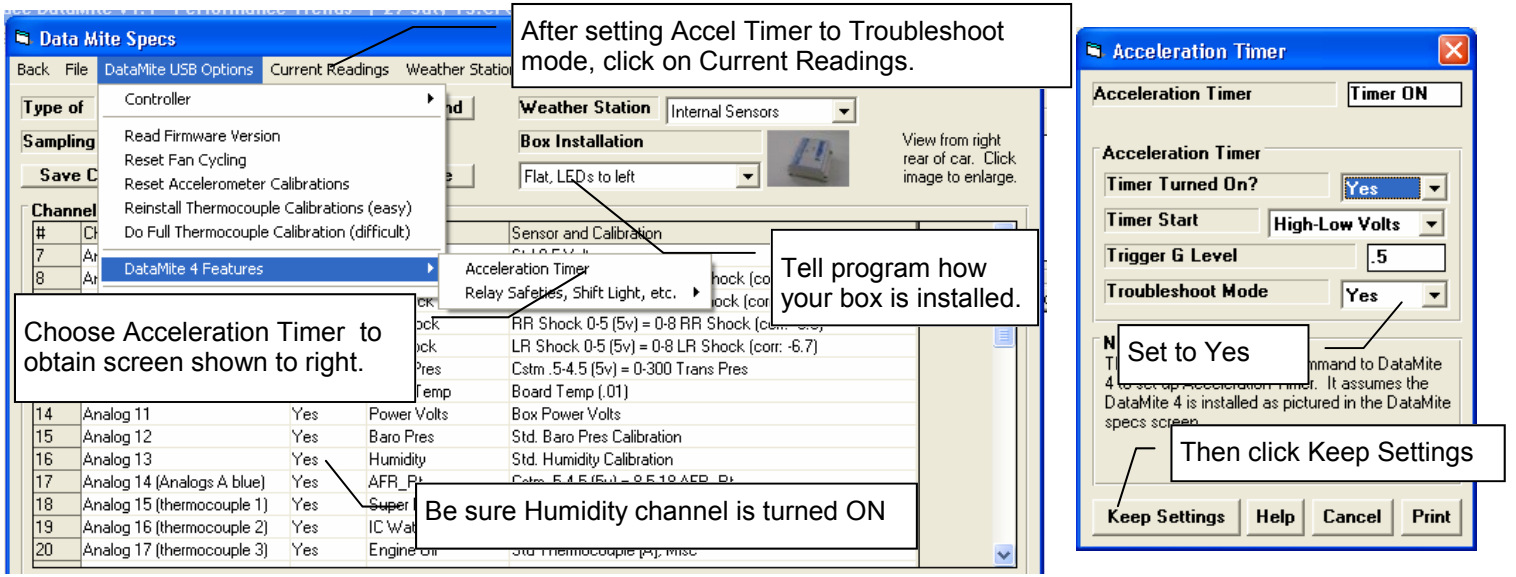
Click on **Use Calc Value** to have this logic written to the box. Note: It will take 5-10 seconds to do this and then the software will respond saying the box has been updated: **IMPORTANT: Be sure to test the settings thoroughly before you assume it will work as you expect.**

DT4-DITB Trans Brake Troubleshooting Mode

The Troubleshoot Mode is used to check you have the Trans Brake Timer settings correct.

In DataMite specs, tell program how box is installed, turn on the Humidity channel (even if you don't have weather sensors), and Open the Acceleration Timer screen. Enter your settings, and Set Troubleshoot Mode to Yes, then click Keep Settings.

Back at DataMite specs screen, click on Current Readings to obtain screen to lower right. Choose display to show the Humidity reading. Note it will be constant at some value.

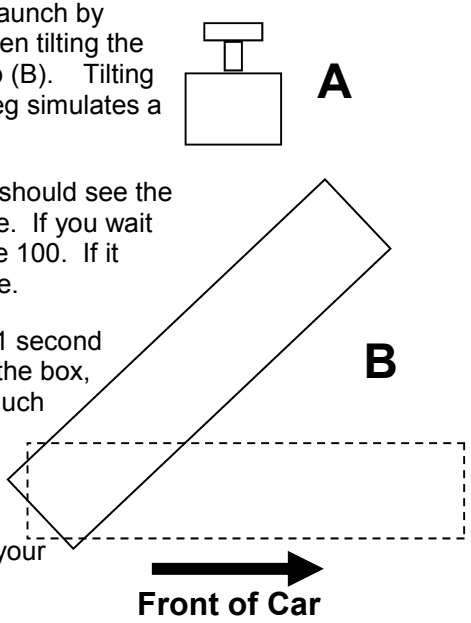


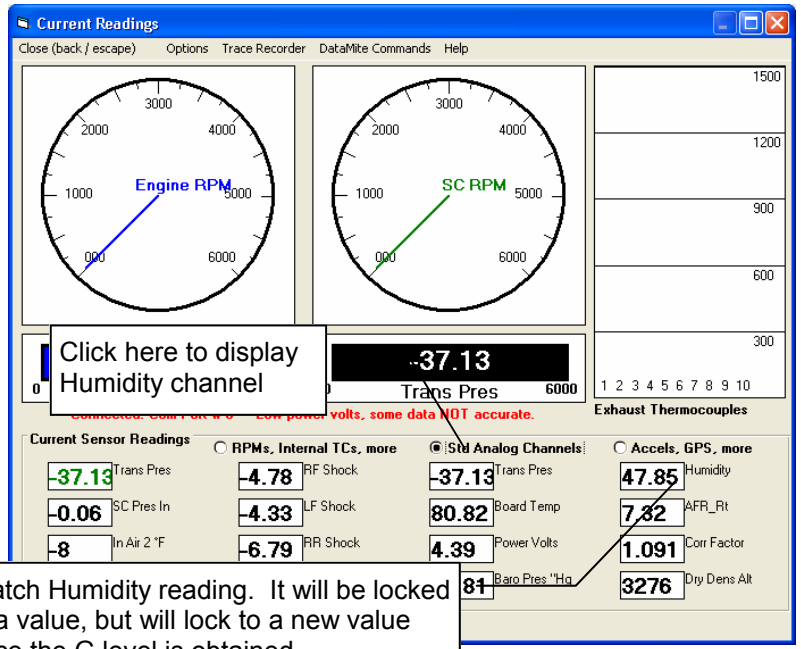
Now, with your car not running, simulate a launch by releasing your trans brake switch (A) and then tilting the end of the box toward the front of the car up (B). Tilting 45 deg simulates a .7 G launch, tilting 90 deg simulates a 1.0 G launch.

When you obtain the G level specified, you should see the Humidity channel lock in on some new value. If you wait more than approximately 1.5 sec, it could be 100. If it was originally 100, you will not see a change.

For troubleshooting, it is best to wait about 1 second between the trans brake release and tilting the box, even though in the actual launch it will be much faster.

If you do not see a change, check your Accel Timer settings or the Box Installation settings which tells program how you have your box installed in your vehicle.





IPU Protection Cable Build

4 conductor, 24 gauge wire, 1 ft length

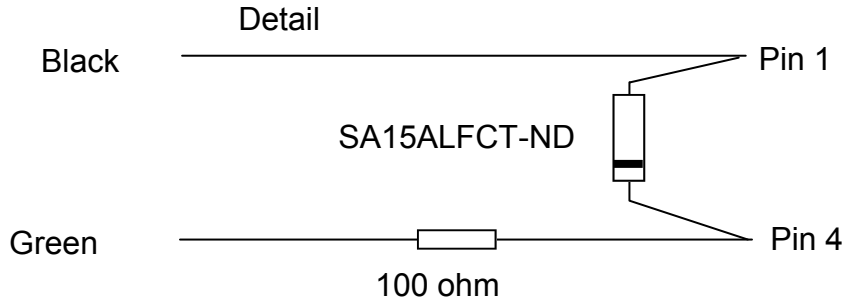
4 pin female molex with male terminals

Black and shield to pin 1
Red to pin 2
White to pin 3
Green to pin 4

Black and non-bar end of SA15ALFCT-ND diode to pin 1
Red to pin 2
White to pin 3
Green (first through 100 ohm resistor) and bar end of SA15ALFCT-ND diode to pin 4

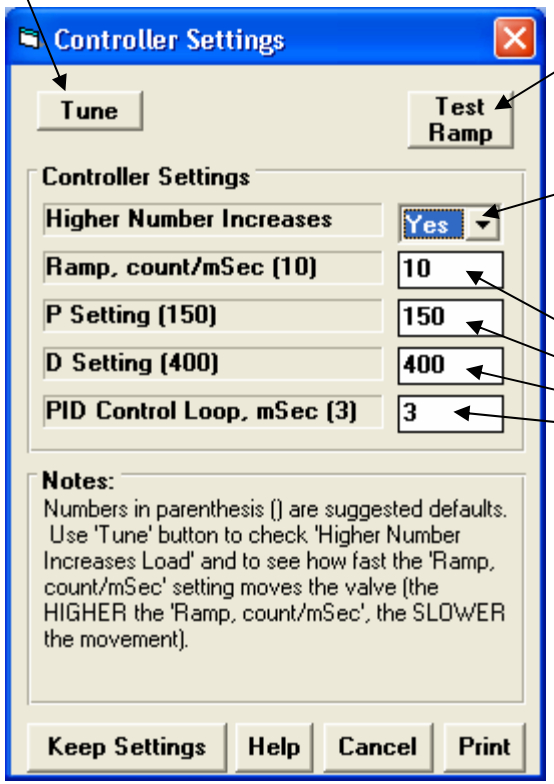
See detail below.

4 pin male molex with female terminals WITH strain relief to cover extra components.



Dyno Controller Setup Screen

Set default settings, then click on the Tune button to send to controller



Test Ramp will run just the last few steps of the entire Tune Button procedure. This is handy for showing you how the Ramp count will close the valve to allow the engine to accelerate.

The Tune button will determine if this setting should be Yes or No

Typical Default (good starting point) settings

When done with the Tune Button, click on Keep Settings

DataMite Calibration Sheet for Std & Custom Sensors

For sensors that do NOT have a pre-programmed calibration in the DataMite software, specify it as a Custom sensor as follows:

- Click on ***DataMite*** at the top of the Main Screen.
- Click on the ***Sensor and Calibration*** (rightmost column) for the channel where the Custom sensor will be installed. Be sure this channel is configured in the DataMite II box as an Analog channel and not a Thermocouple channel. A screen similar to the one to the right will be displayed.
- Select ***Custom (user supplies specs)*** for the Sensor Type and ***0-5 Volts*** for Signal Based On.
- Enter the ***Analog Sensor Specs*** in the lower section as written in the menu shown to the right. You can also enter a ***Data Name***, with a suggested name shown to the right.
- When finished, click on Keep Specs. In the DataMite screen, this channel will now be listed as:
  Cstm xxx-xxx Hz = xx-xx xxxx

This will produce the calibration (conversion from DataMite signal to actual units) recommended by the factory.

Notes:

_____

_____

_____

_____

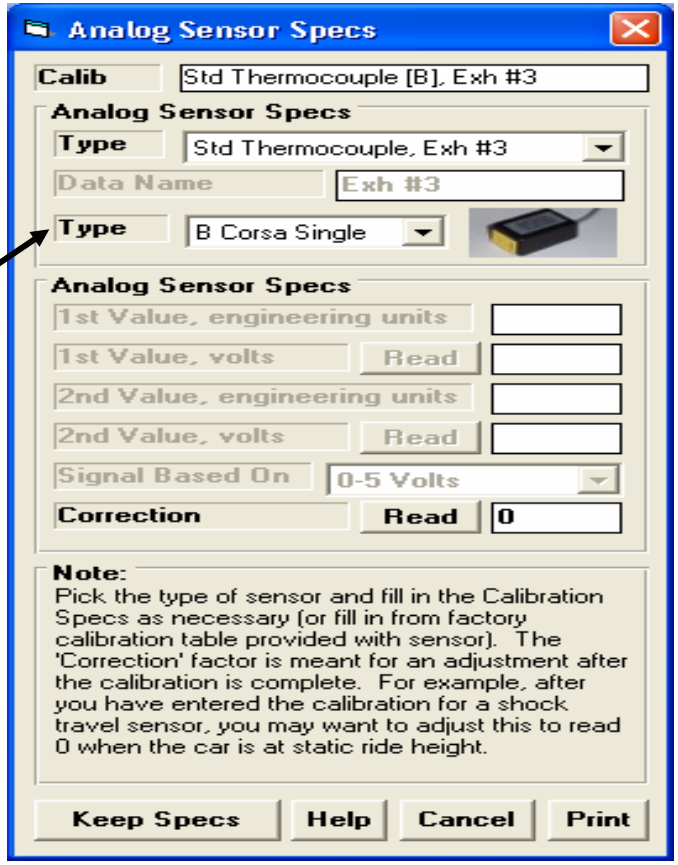
For Thermocouples, pick this "Type":

____ A DTM II Internal
____ B Corsa (tm)
____ C Large
____ D Dual Compact
____ E Quad 4 Channel

For Stainless Pres Sensor and Blowby, enter:

_____ Range

For A/F Sensors, choose the type of fuel: Gasoline, Methanol, Propane, Ethanol, CNG, E85, or choose Lambda. **Lambda of 0.85 to 0.90 is a good number for best performance for *any* fuel.**



Possible Choices Include:

Std 0-15 PSI
Std 0-70 PSI
Head Thermocouple
Std 0-150 PSI
Std 150-230 Deg
Std Thermocouple
Std 0-5 Volts
Std 0-20 Volts
Std PTI-CFM3 1.5
Std PTI-CFM3 1.0

Std Frequency (Hz)

Stainless Pres Sensor
Range _____

Blowby
Range _____

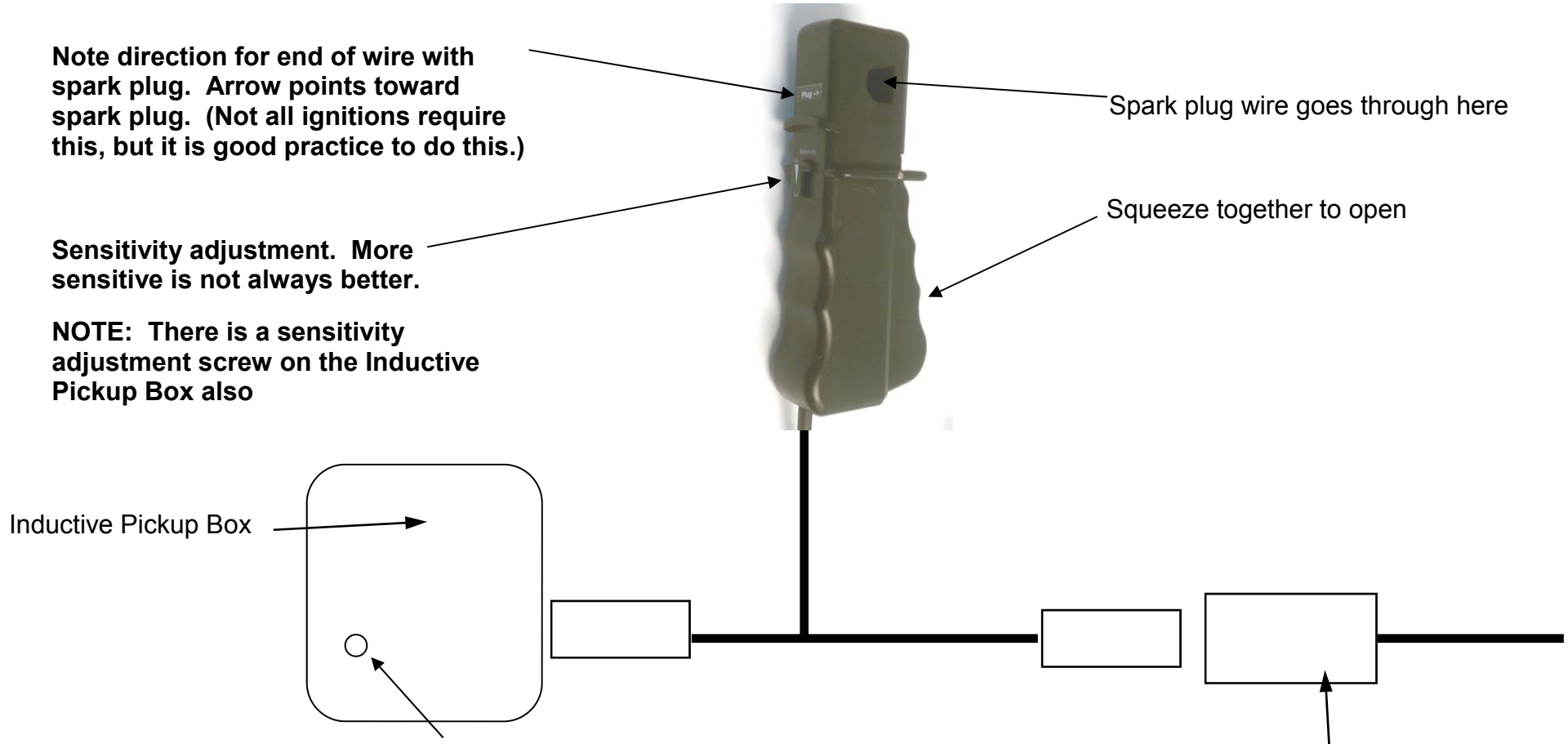
DT2-AFx Sensor
DT2-AFG Gauge
DT3-AF1 Sensor
DT3-AF4 Sensor

Dyno Torque, ft lbs
Std Accel., Forward
Std Accel., Side
Std Accel., Up
Custom Accel., Forward
Custom Accel., Side
Custom Accel., Up
RF Shock Travel
LF Shock Travel
RR Shock Travel
LR Shock Travel
Steering

Throttle
Brake
Std RTD Air Temp
Std RTD Fluid Temp
DT2-AFx A/F Sensor-Gas
DT2-AFG A/F Gauge-Gas
Custom (user supplies specs)
Custom (user supplies table)

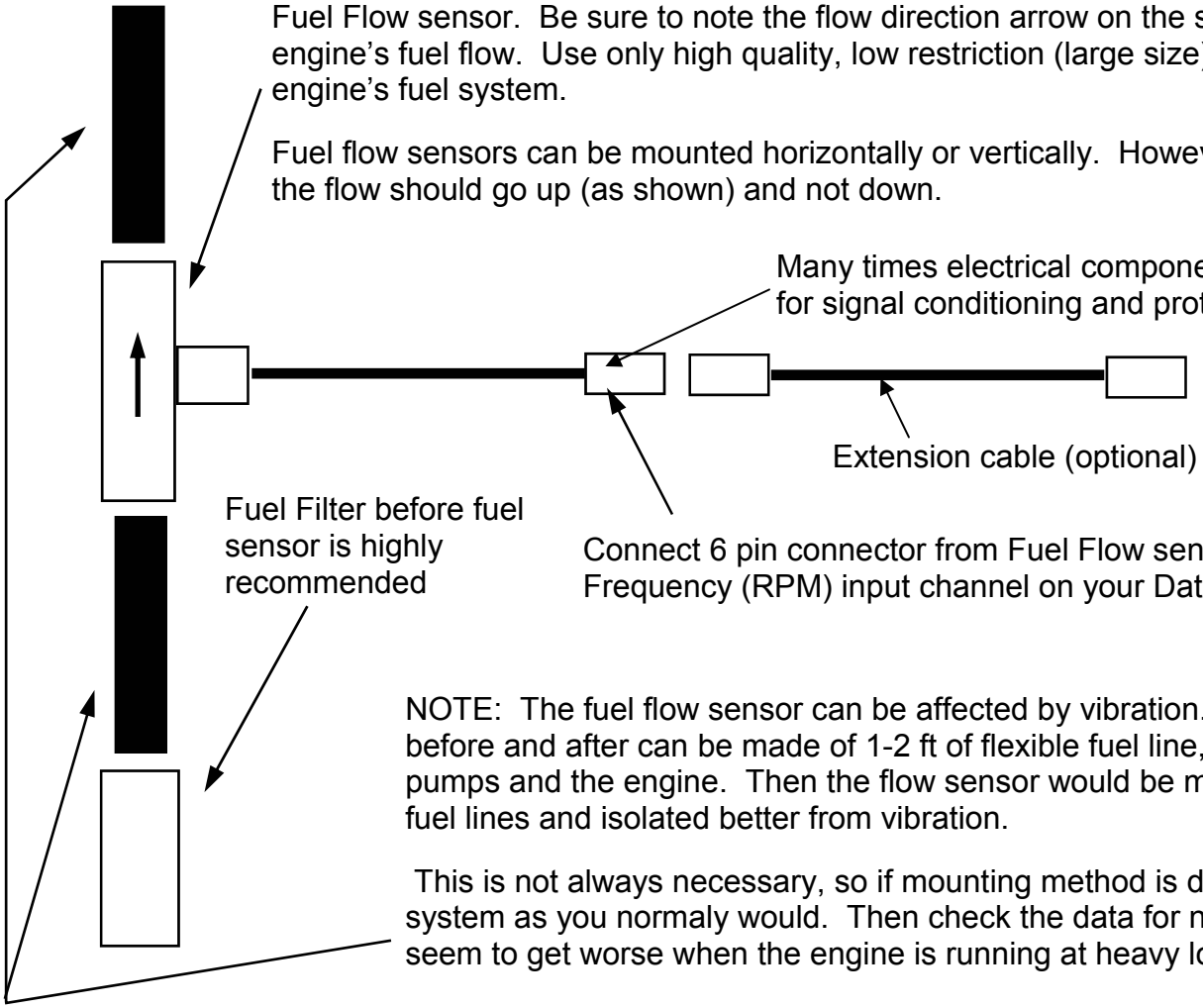
DataMite Inductive Pickup “Clamp On” Input

The “clamp on” inductive pickup is installed between the wiring harness and the inductive pickup box (or bypass



Sensitivity Adjustment: Counter Clockwise, Less sensitive DO NOT let metal screwdriver slip off screw or you risk shorting out the board inside. Box typically comes from factory with sensitivity set to maximum sensitivity. This is a 15 turn pot, so you can make several turns and still have adjustment. When it gets to either end of adjustment, it just slips (you may feel it click) to avoid damage.

DataMite Fuel Flow Meter Wiring Diagram



NOTE: The fuel flow sensor can be affected by vibration. It is best if the plumbing both before and after can be made of 1-2 ft of flexible fuel line, to dampen out vibrations from pumps and the engine. Then the flow sensor would be mounted only from these rubber fuel lines and isolated better from vibration.

This is not always necessary, so if mounting method is difficult, plumb into your fuel system as you normaly would. Then check the data for noisy or erratic results which seem to get worse when the engine is running at heavy load or vibrating more.

IMPORTANT: Fuel flow sensors use the power through the DataMite directly from the DataMite power supply. Therefore if the DataMite has an unregulated power supply, the power could be 18-20 volts DC. However, most all fuel flow sensors will be damaged if power goes over 12 to 15 volts DC. **Therefore use a regulated 12 volt DC power supply on your DataMite.** If you are using a fuel flow meter, Performance Trends typically supplies regulated power supplies. Power supplies provided for A/F sensors are typically regulated to 12 volts.

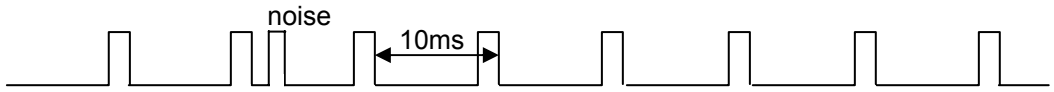
DataMite USB RPM Measurement Preferences (for Advanced Users)

The USB DataMite III and DataMite 4 loggers allow for adjustments for measuring RPM signals. These can be accessed via Preferences.

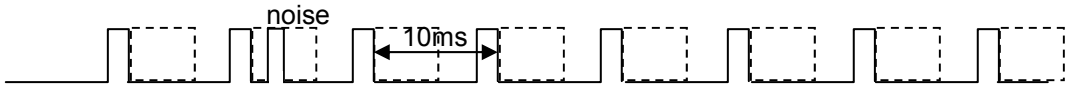
One is to use either the leading edge or trailing edge of the signals. Typically trailing edge works best, but you can try changing it when troubleshooting bad engine RPM signals.

You can also adjust the Frequency Holdoff Time, mSec. **This is the amount of time the logger will allow before it will look for a new pulse.** For example, if a single cylinder 2 stroke motor is running at 6000 RPM, the ignition system is putting out an ignition pulse 6000 times per minute, or 100 times a second. The time between these ignition pulses is 1/100 second, or 10 milliseconds. See pic below, 10 msec between trailing edges.

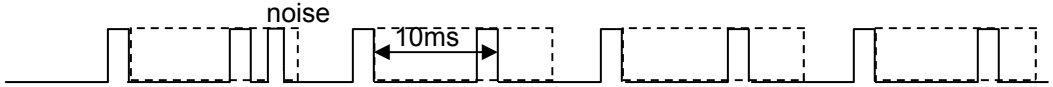
If a "stray" pulse comes in, the logger things the RPM just have jumped way up for a short period of time, which shows up as a noise spike in your RPM data.



If you tell the program to not use any pulse which is within, say, 6 milliseconds of another pulse, then the logger will ignore the noise pulse and you will get good RPM. The dotted block indicates the hold off time and any trailing edge of a pulse which occurs in the dotted block is ignored by the logger. This will eliminate the noise spike.



If you would specify a holdoff time too big, say 16 milliseconds, you will start loosing real pulses, and the RPM recorded will be too low, in the case below, half of the real RPM.



To estimate the Holdoff time you should use, use this equation:

Holdoff time, mSec = 0.6 x 60000 / Max RPM / pulses per revolution

0.6 is a 60% safety factor to not make this setting too large. You could use something larger, if you want to more completely eliminate noise, but risk eliminating real data.

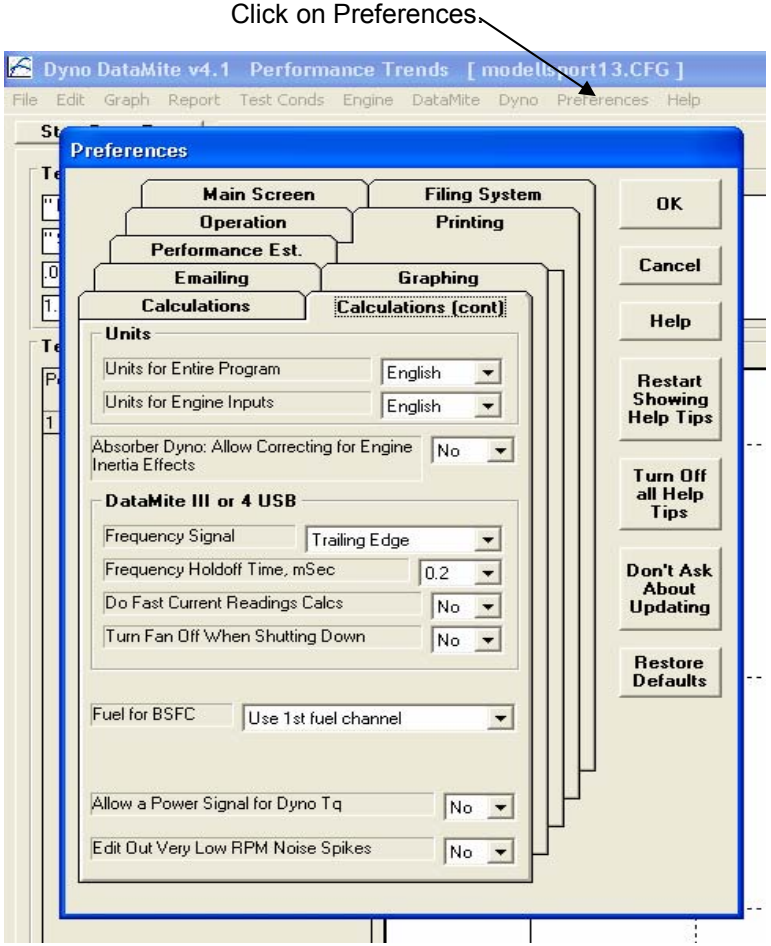
Max RPM is the highest RPM you expect to measure

Pulses per revolution are the number of ignition pulses produce per engine revolution. Some examples of pulses per revolution include:

1 cylinder 2 stroke (or 4 stroke wasted spark) fires 1 per revolution would be 1

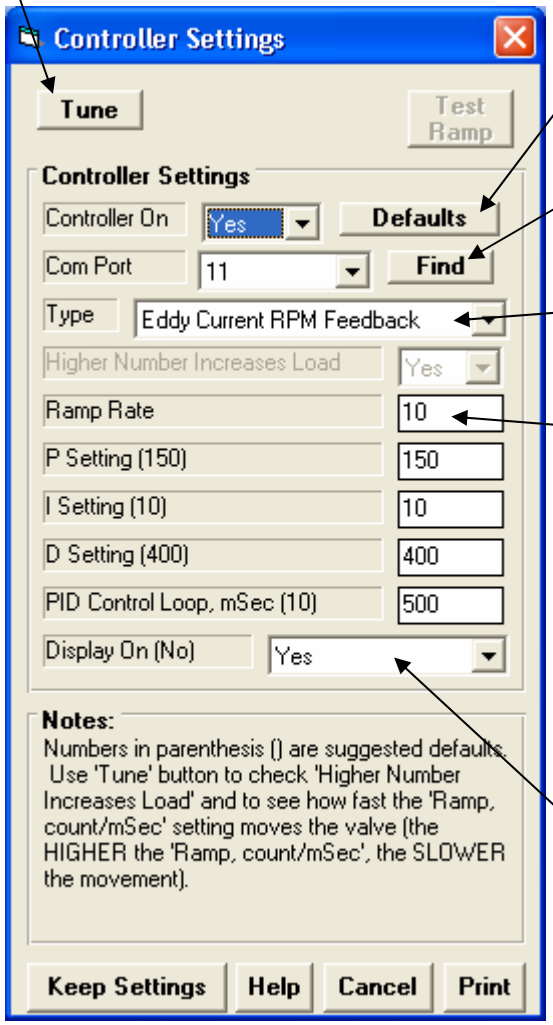
V-8 4 stroke on coil wire (sees all 8 pulses) would be 4

V-8 4 stroke on separate plug wire (sees only 1 cylinder's pulse) would be 0.5



Eddy Current Dyno Controller Setup Screen

Set default settings, then click on the Tune button to send to controller (send settings via USB to controller).



Click here to load typical default values after choosing Eddy Current RPM Feedback

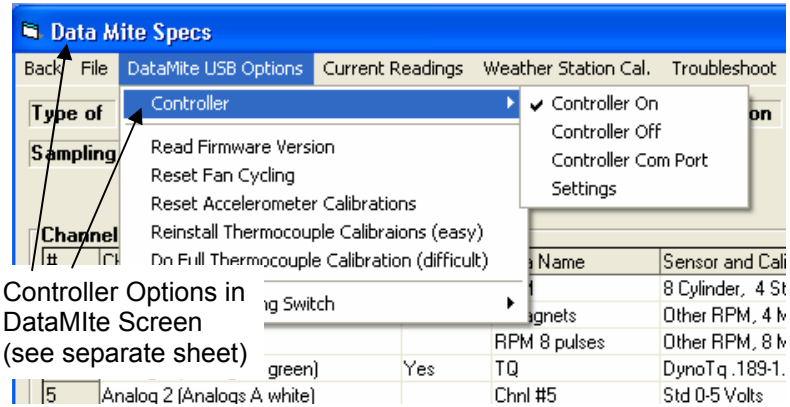
Click here to find which com ports your controller could be connected to.

Choose Eddy Current here first to set up other settings correctly on this screen.

Enter a number to change the rate at which RPM is changed when you start recording data for a test. NOTE: A higher number means a slower ramp rate.

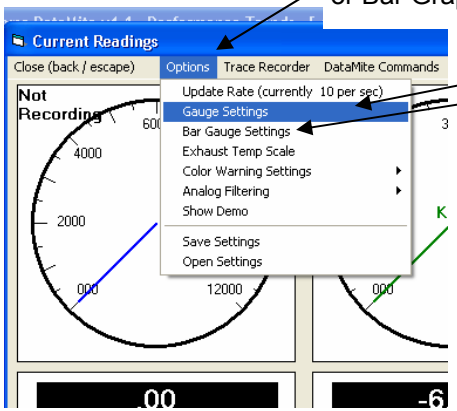
Setting Yes lets you view the control calculations on the LCD screen of the controller. However this takes time so the PID Control Loop, mSec must be set high, typically 200 to 500 mSec to slow down the control loop.

Prototype Eddy Current Dyno Speed Controller Screens

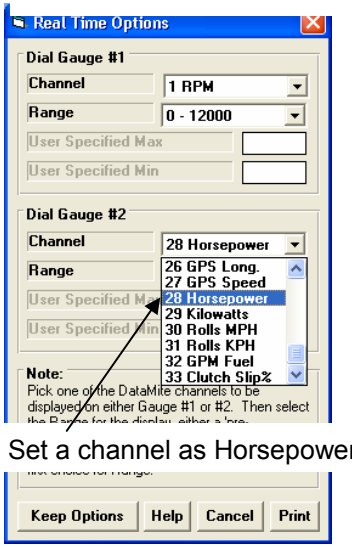


Controller Options in DataMIte Screen (see separate sheet)

Click on Options to set Gauge or Bar Graph to Horsepwer

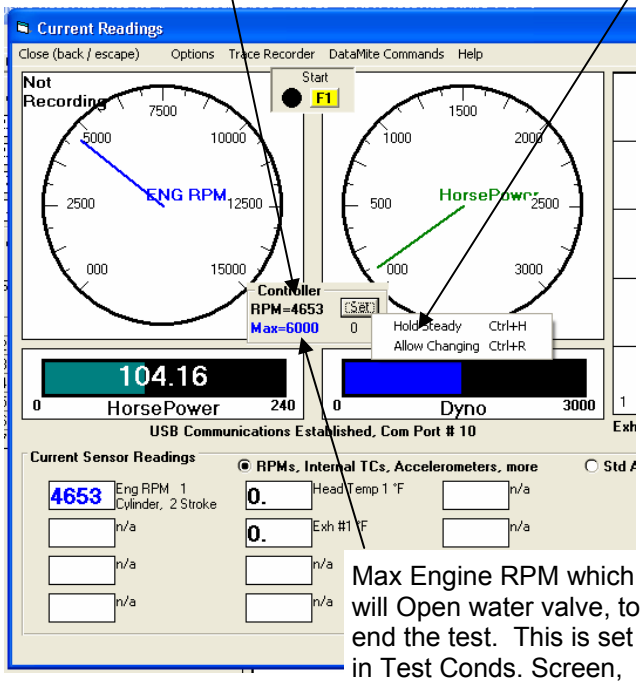


Choose Gauge or Bar Graph Settings for screen below.



Set a channel as Horsepower

Current Engine RPM as seen by controller.



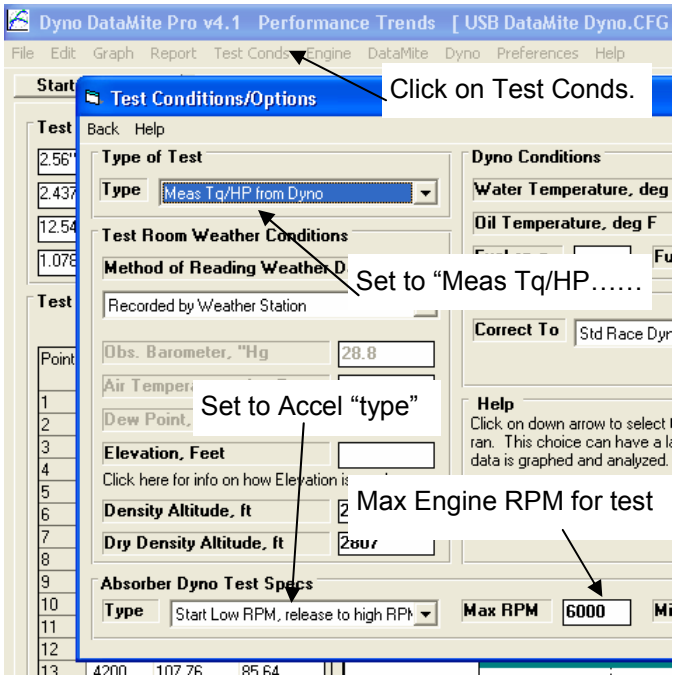
Max Engine RPM which will Open water valve, to end the test. This is set in Test Conds. Screen, shown to left.

Basic Test Procedure:

- Warm up engine and hold RPM low with manual knob.
- Go full throttle and controller should hold RPM relatively low.
- Press F1 to start test and recording will start and controller should allow engine or vehicle to accelerate at a steady rate.
- Then RPM gets to the “Max” shown on screen (set in Test Conditions), recording will stop and controller will ramp the engine down to the approximate starting RPM.
- Control should then be returned to the manual control knob.

IMPORTANT: You need some alternative method to shut off the engine should something fail in this prototype controller.

NOTE: If you move the manual control knob when computer has control, the control reverts back to the knob. This lets you manually override the computer control should something go wrong.



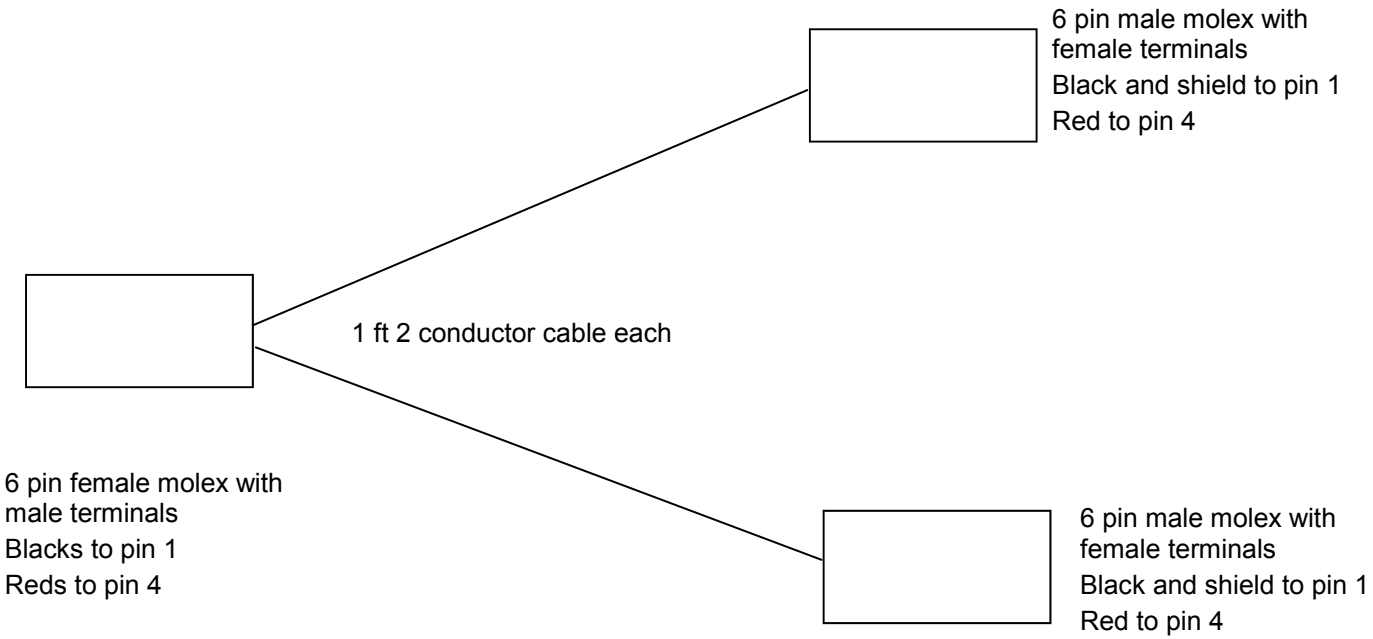
Click on Test Conds.

Set to “Meas Tq/HP……

Set to Accel “type”

Max Engine RPM for test

Dyno Speed Controller RPM T Harness



Using the OBD2 Link

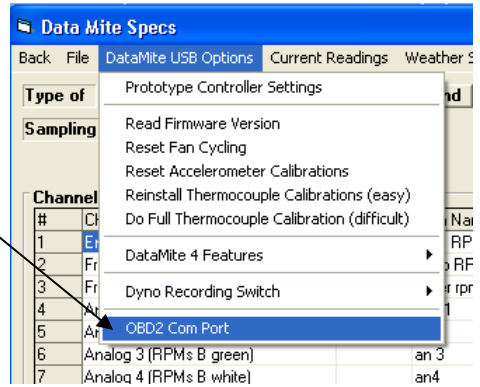
Plug in the OBD2 Link into one of your computer's USB ports. It should say found new hardware and you should get a USB connect tone. Follow the program instructions for installing the USB driver. If your Link came with a small CD, insert that CD into your computer's CD drive when asked by the USB Driver Installer program. If you don't have the small CD, insert the blue Performance Trends CD. It has the drivers also.

When the installer is done, it should say Driver Installed Successfully. You may need to restart your computer to finish the process. To check the driver, find Device Manager in Control Panel (typically under System). It should appear as:

Ports (COM & LPT)

Prolific USB-to-Serial Bridge (COMxx)

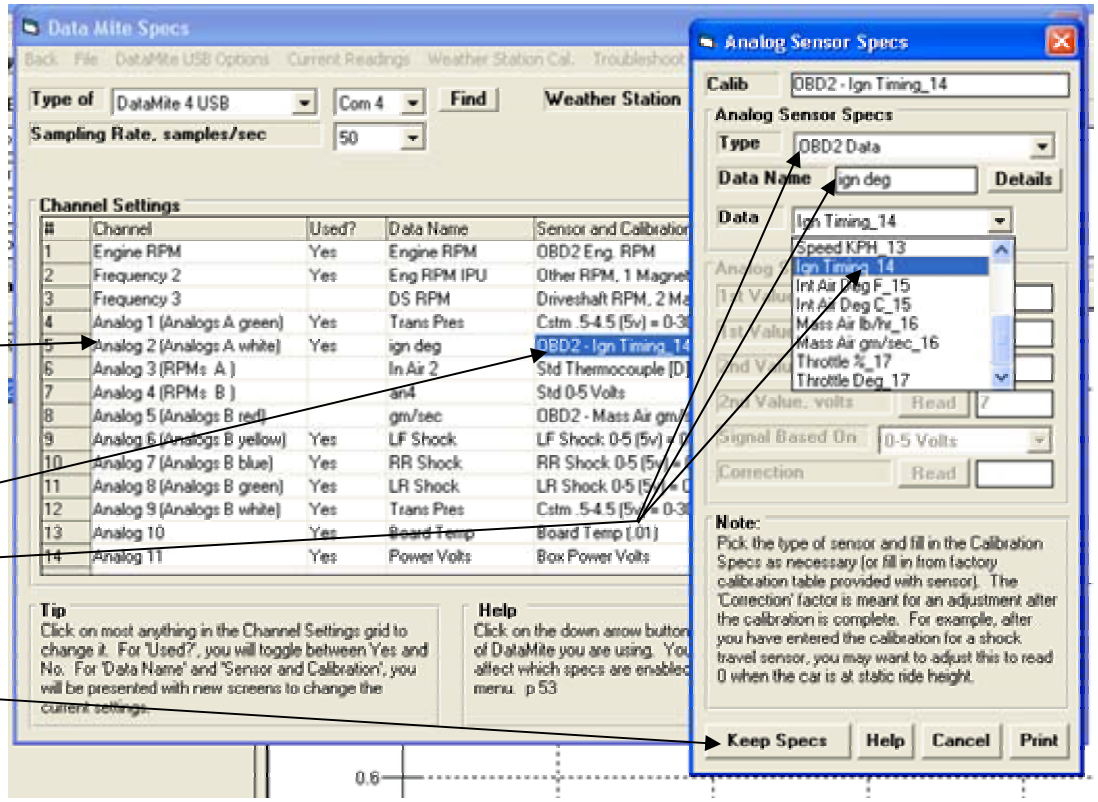
Click on DataMite USB Options, then OBD2 Com Port. This starts the Enterprise version of the DataMite program looking for possible Com Ports. Then it asks which Com Port number to use, typically the largest number found. Then click on OK.



You will choose an analog channel for recording the OBD2 data, in this case shown, Analog 2.

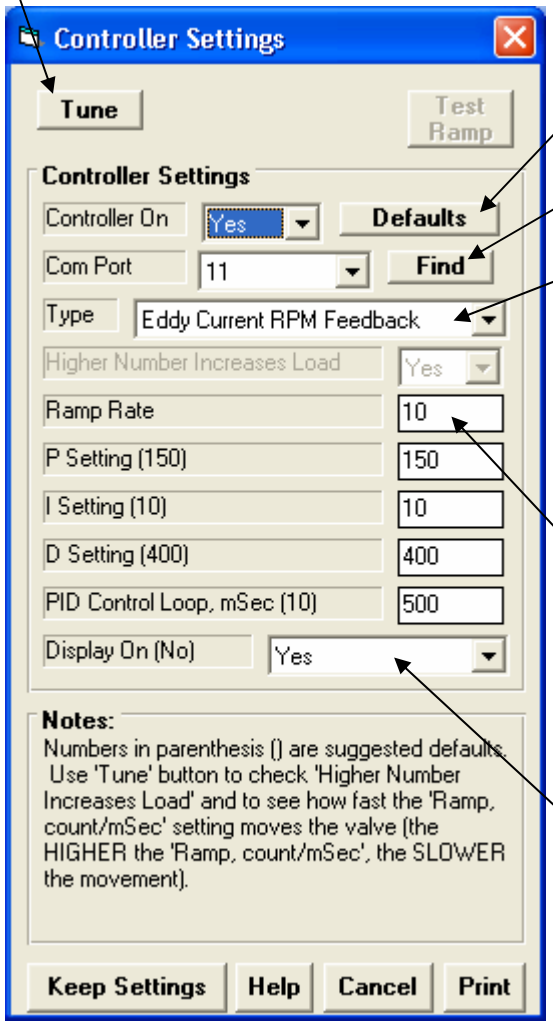
Then click on the Sensor and Calibration for this analog channel to bring up the Analog Sensor Specs screen shown.

Choose ODB2 Data for the Type. Then you can type in most any name you want to use for this data, and then choose what



Water Brake Dyno Controller Setup Screen

Set default settings, then click on the Tune button to send to controller (send settings via USB to controller).



Click here to load typical default values after choosing Water Brake for either Position or RPM feedback

Click here to find which com ports your controller could be connected to.

Choose Water Brake... here first to set up other settings correctly on this screen.

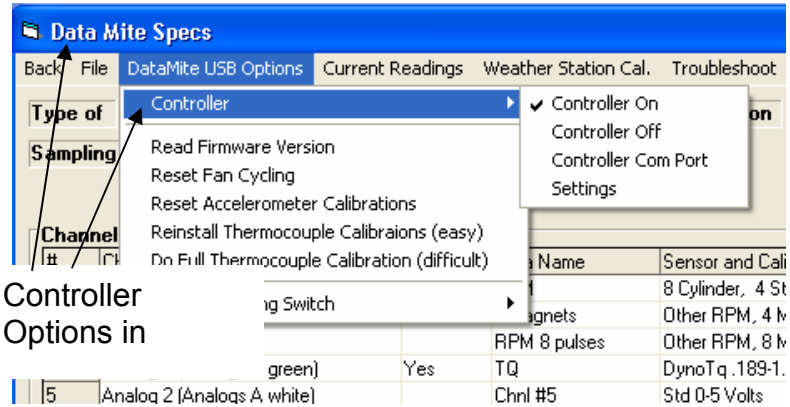
If you want to just open and close the valve via the controller and knob, choose Position Feedback (good for troubleshooting).

If you want the controller to hold RPM constant or ramp it at a certain rate, choose RPM Feedback.

Enter a number to change the rate at which RPM is changed when you start recording data for a test. NOTE: A higher number means a slower ramp rate.

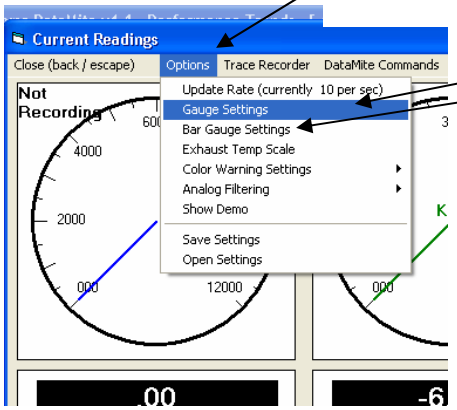
Setting Yes lets you view the control calculations on the LCD screen of the controller. However this takes time so the PID Control Loop, mSec must be set high, typically 200 to 500 mSec to slow down the control loop.

Prototype Water Brake Dyno Speed Controller Screens

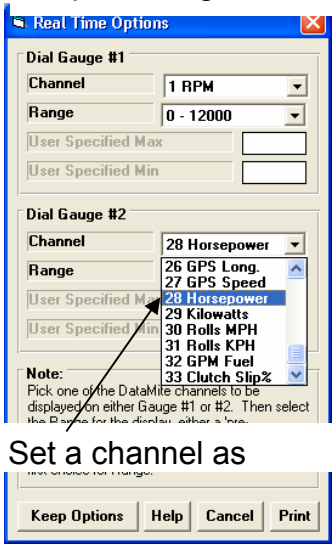


Controller Options in

Click on Options to set

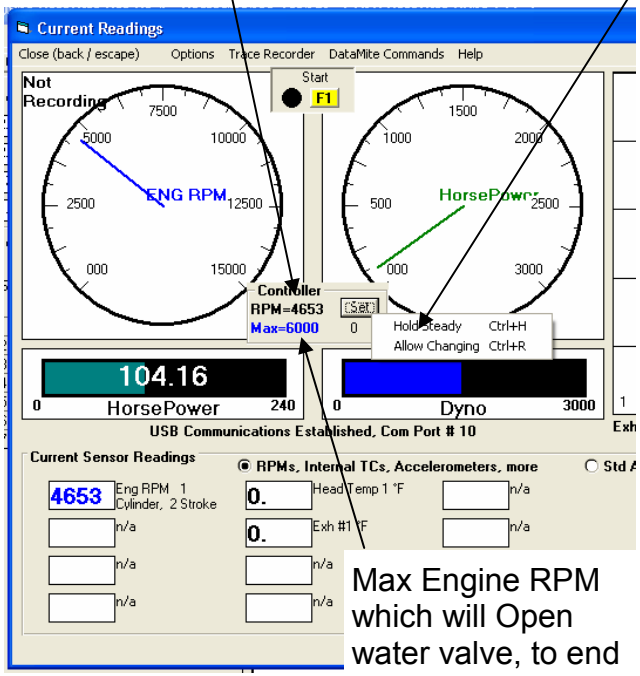


Choose Gauge or Bar Graph Settings for screen



Set a channel as

Current Engine

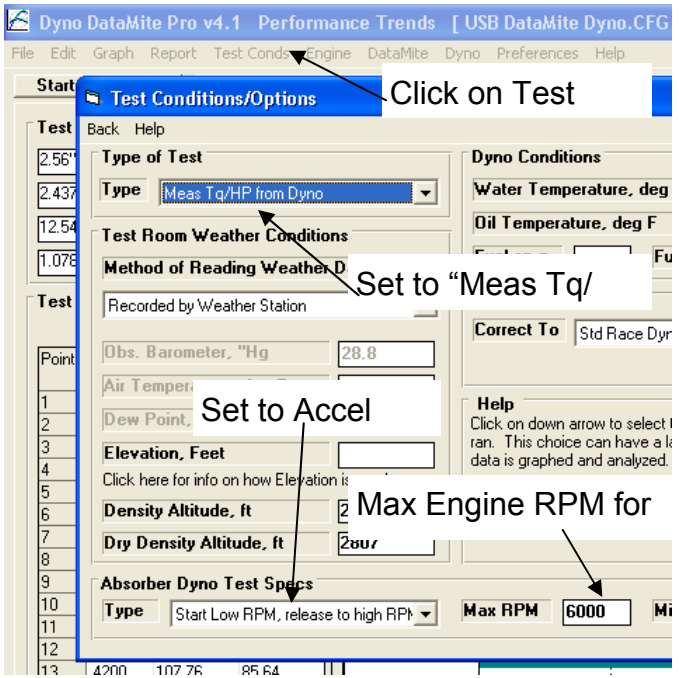


Max Engine RPM which will Open water valve, to end the test. This is set

Basic Test Procedure:

- Warm up engine and hold RPM low with manual knob.
- Go full throttle and controller should hold RPM relatively low.
- Press F1 to start test and recording will start and controller should allow engine or vehicle to accelerate at a steady rate.
- Then RPM gets to the “Max” shown on screen (set in Test Conditions), recording will stop and controller will ramp the engine down to the approximate starting RPM.
- Control should then be returned to the manual control knob.

IMPORTANT: You need some alternative method to shut off the engine should something fail in this



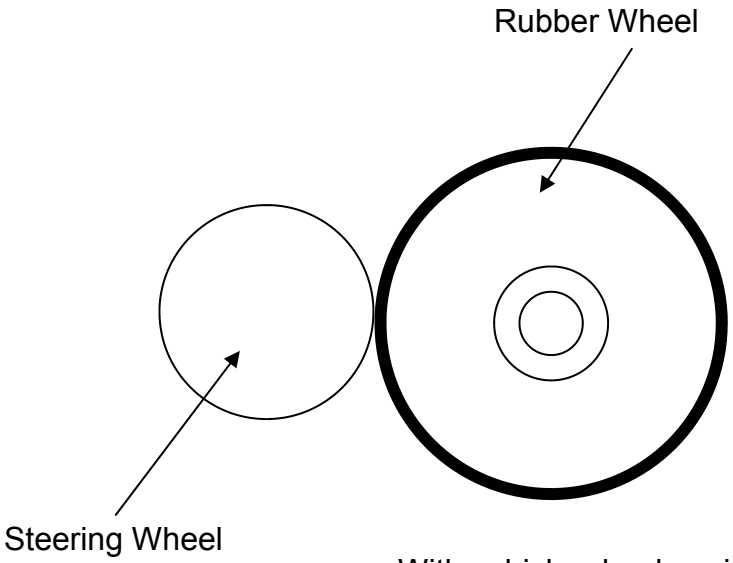
Click on Test

Set to “Meas Tq/

Set to Accel

Max Engine RPM for

Steering Sensor w Rubber Wheel



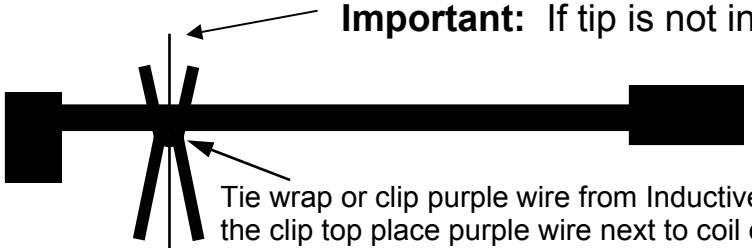
With vehicle wheels pointing straight ahead, install sensor with rubber wheel 1.5 turns from one end of travel. Sensor has 3 turns, so turn to a stop, then turn

4 pin male molex connects to breakout cable

Make bracket with 7/16 (about 10.5 mm) hole diameter. Mount bracket to hold wheel firmly to steering shaft.

DataMite External Inductive Pickup Wiring Installation

Important: Do ***not*** kill engine by disconnecting the plug wire from the spark plug. This may cause high voltage spikes to travel back to your computer, damaging your COM port. Instead, ground the spark plug to kill the engine.



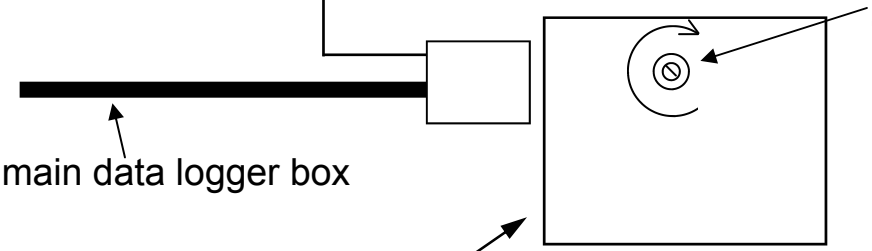
Important: If tip is not insulated, do not let it get near metal spark plug tip.

Tie wrap or clip purple wire from Inductive Pickup to spark plug wire. Sometimes you may have to remove the clip top place purple wire next to coil or spark plug for COP (coil on plug) engines.

Mounting Tip: To avoid excessive vibration, it is best to mount OFF the engine stand. If possible, leave the box hang its connecting cable.

If you are getting eratic Engine RPM readings: Adjust the sensitivity knob (or screw through the hole in the top on earlier versions). Clockwise (CW) rotation makes the system LESS sensitive. Many times you want to go LESS sensitive to improve the readings.

Another thing to try is to click on "Preferences" (top of main screen), then the "Calculations, cont.", then change the DataMite III USB Frequency Signal settings from whatever it is to the other choice.



Clockwise, Less sensitive (boxes with knob)

To main data logger box

For older boxes, with screw inside hole in top of box:

Counter Clockwise, Less sensitive (old boxes)

Clockwise, Less sensitive (newer boxes w blue button)

Inductive Pickup Box

BB2-IPUP inductive pickup for low voltage wires like coil (12V) primary wire, fuel injector wire, etc.

Check the additional instructions packed with this **BB2-IPUP** for attaching this end to various signal wires.

The **BB2-IPUP** replaces the Inductive Pickup Box shown above. This connector plugs into same harness connector as where the Inductive Pickup Box would plug into.

See Appendix 2 in the User's Manual for more details