



DATAPRO-45TM

Installation
And
Operations Guide

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Welcome

Congratulations on purchasing one of the most revolutionary aids to driving a race car since the invention of synthetic rubber! With Computech's **DATAPRO-45™** you will have a permanent record and know exactly how you and your car performed during your practice, qualifying, or race runs.

Before joining the revolution, of course, you need to do three things. First, you need to install *DATAPRO-45™*. (As if you didn't know that already!) Second, you need to learn how to use the *DATAPRO-45™*. Third, you need to install and learn to use the **DATAPRO-ONLINE™** software. Three easy and painless steps are all that is required to get you going. Start by reading and following the instructions in this manual for installation. While these steps are indeed easy, it's still very important that you install *DATAPRO-45™* correctly in order to maximize your benefits.

Next, you can jump directly to the Tutorial at the end of the Manual. The *DATAPRO-45™* intuitive interface lets you start using *DATAPRO-45™* immediately. The main body of this Manual is a detailed description of the *DATAPRO-45™* functions, and will serve as a reference to help you get the most out of your track time with the *DATAPRO-45™*.

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1. Installation

Before beginning the installation of your *DATAPRO-45™*, take a few minutes to fill out and return the Warranty Card. Upon receipt of your completed card, Computech will add your name to the customer list and you will receive free information on the availability of new upgrades and options.

This is also the time to check your package and be sure that you received all of the components of your *DATAPRO-45™* system. Your package should contain:

1. *DATAPRO-45™* Data Logger Main unit
2. *DATAPRO-45™* Junction Box
3. Cable Kit
 - *DATAPRO-45™* umbilical cable (DB25M-DB25F)
 - *DATAPRO-45™* download cable (DB25M-DB9F)
4. Wiring Kit
 - Screwdriver (for accessing small screws on junction box plugs)
 - 7 Junction Box Connector Plugs (for wiring into the junction box)
 - 1 Junction Box Connector Plug with Power Wire attached
 - Sample ID Wire (hint for how to identify your wires)
 - Black Heat Shrink (for making wires presentable)
 - Clear Heat Shrink (for identifying wires)
 - ID Sheet (for identifying wires)
5. Miscellaneous Parts
 - Record switch
 - Wall Transformer (for powering *DATAPRO-45™* when off the car)
 - *DATAPRO ON-LINE™* Software

If you have ordered any *DATAPRO-45™* optional sensors, the appropriate parts should also be included.

1.1. General Installation

Try to install your *DATAPRO-45™* more than just a few days before your first race. It's much easier to *shake down* any quirks in your installation at the shop than it is to do so at the track!

1.1.1. *DATAPRO-45™* - Main unit

Before mounting the main *DATAPRO-45™* main unit, locate a suitable mounting location. The main unit should **not** be mounted where it is exposed to full sunlight, rain, or excessive engine or transmission heat. If mounting in full sunlight cannot be avoided, the main unit should be protected by a light-colored cover when not in use (a white towel works well), or removed from the car. The LCD display main unit in *DATAPRO-45™* is rated for a maximum operating environment of 122°F, which can be easily exceeded in a closed car or in full sun. *DATAPRO-45™* should also be protected from excessive rain by covering the main unit or removing it from the car when not in use. A limited amount of rain can be tolerated while on the track.

You may also need to worry about ignition noise effecting your main *DATAPRO-45™* main unit. **If you have a *hot* ignition system with solid core coil or spark plug wires, then it is advisable to keep as great a distance as possible between those wires and your *DATAPRO-45™*. It is advisable to read through the complete installation instructions before choosing a final location for the *DATAPRO-45™* main unit.**

Heavy-duty hook and loop fastening strips are included with your package. Thoroughly clean the area selected to mount the main unit so the hook and loop fastener strips will adhere properly. Remove the backing tape from the hook strips, position the *DATAPRO-45™* main unit over the mounting location, and then press the main unit against the mounting surface until the hook strips have adhered to it.

Finally, to insure that the *DATAPRO-45™* main unit won't pop off during a minor incident, it's a good idea to place two tie wraps vertically around both the box and the mounting surface. With a proper installation, the tie wraps can be wiggled off the sides of the main unit when removing it, and then reused when the main unit is installed again. The heavy-duty hook and loop fastening strips will not let the box slide sideways as long as the tie wraps remains secure.

1.2. Junction Box

The *DATAPRO-45™* junction box provides a central place for all *DATAPRO-45™* wiring to come together. All sensors are connected to the junction box, and then the junction box is connected to the *DATAPRO-45™* main unit using the provided umbilical cable. There's only one cable provided that fits all of the connectors, so you don't have

too worry about using the wrong cable! Since the umbilical cable must reach from the main *DATAPRO-45™* main unit to the junction box, the junction box should be mounted within reach and in a position that is protected from weather and road spray. **Try to keep the junction box away from the engine and ignition for radio frequency interference reasons.** In full-bodied cars, be sure to place the box behind the firewall. In open bodied cars, place the box in the very rear or the very front. **It is advisable to read through the complete installation instructions before choosing a final location for the junction box.** In this way, you can keep in mind the route of the various wires that must go from the junction box to specific locations on the car. **Note that you may want to postpone permanent placement of the junction box until all other wiring is complete.**

Warning: placing the junction box near the exhaust pipes or other heat generator, or in the direct path of the wind or any cool generator, may cause erroneous temperature readings (such as exhaust gas temperatures). Be sure to avoid these situations.

With both the *DATAPRO-45™* main unit and the junction box at least temporarily located, connect the umbilical cable between the two. Be sure to hand tightened (no need to over-tighten) the two cable connector screws on each end of the cable. The umbilical cable should be anchored near each end using tie-wraps, and at intervals along its length to secure it. Leave enough slack at the end near the main *DATAPRO-45™* main unit to allow the main unit to be easily disconnected and removed from the vehicle for down loading.

1.2.1. Junction Box Connections

Wiring up your *DATAPRO-45™* junction box is a very simple, although tedious task. The lid of the junction box includes a label identifying all of the connections. Aside from the umbilical cable, which plugs into the “Communications Connector”, all of the other wiring uses one of eight removable plugs. These eight plugs are used with the eight connectors on the long side of the junction box. Each connector is identified with a letter (“A” through “H”) and each position on the connector is identified with a number (“1” through “12”) on the label on top of the junction box.

For a sensor, such as a pressure transducer, a single shielded cable should be used to carry the ground, power, signal, and any other connections. Following is a standardized color chart. Please use this when wiring your junction box.

- Black - Sensor and Signal Ground (“Chassis” or “Common”)
- Red - Sensor Power (will be your automotive voltage, such as 12V)
- White - Signal
- Bare Wire - Shield

Most importantly, the signal wire should be connected to the appropriate position of the appropriate plug. The ground (black) and shield (bare) wires should be twisted together and connected to the nearest available ground position. If appropriate, the power (red) wire should be connected to the nearest, appropriate +5V or +12V position. Consult the documentation that came with your sensor before making this connection. As necessary, any other connections should be made. For each connection, identify the cable according to the ID sample provided in your parts kit. Also, tinning each wire with solder before screwing it into the plug will improve reliability.

Note that thermocouple cables, such as used for the exhaust gas temperature sensors, are a special case. First of all, the cables are definitely NOT made of regular wire. They're made of a special alloy that must be used with thermocouples. Using any other kind of wire will cause significant reading errors. As an industry standard, the wire is color-coded yellow (signal) and red (ground). Don't ask why the ground is red! We know it doesn't make sense but that is the thermocouple industry's standard color combination for type K thermocouples. Anyway, simply connect the yellow and red wires into the appropriately positions according to the colored label on the top of the junction box.

For your convenience, the connector wiring assignments are repeated below. Note that the Gage 1 and Gage 2 capability is only available as a special order option. Without this special option, these two inputs are replaced by simple inputs suitable for many uses, including oxygen sensors.

Later in this documentation, references may be made to specific junction box plug positions. For example, position "B3" refers to position 3 on connector "B" (the Engine RPM input).

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Connector A:

1. +12 Volts
2. Ground
3. Accelerometer (Also VRT "stop timer" input)
4. +5 Volts
5. TPS (Throttle position sensor)
6. Ground
7. +Gage 1 (or oxygen sensor 1)
8. - Gage 1
9. - Ex(Gnd) (Gage excitation ground)
10. + Gage 2 (or oxygen sensor 2)
11. - Gage 2

Connector B:

1. 11 to 24V (Main power connection)
2. Ground (Main power connection)
3. Engine RPM
4. Ground
5. Inputshaft RPM
6. Driveshaft RPM
7. Ground
8. Flow Meter 1
9. Ground
10. Flow Meter 2

11. Transbrake (VRT "start timer" input
12. Record (Contact closure to ground or chassis starts recording)

Connector C:

1. T1+ Yellow (Exhaust Gas Temp 1, 1800°F max)
2. T1- Red
3. T2+ Yellow (Exhaust Gas Temp 2, 1800°F max)
4. T2- Red
5. T3+ Yellow (Exhaust Gas Temp 3, 1800°F max)
6. T3- Red
7. T4+ Yellow (Exhaust Gas Temp 4, 1800°F max)
8. T4- Red
9. T5+ Yellow (Exhaust Gas Temp 5, 1800°F max)
10. T5- Red
11. T6+ Yellow (Exhaust Gas Temp 6, 1800°F max)
12. T6- Red

Connector D:

1. T7+ Yellow (Exhaust Gas Temp 7, 1800°F max)
2. T7- Red
3. T8+ Yellow (Exhaust Gas Temp 8, 1800°F max)
4. T8- Red
5. T9+ Yellow (Midrange Temp, 482°F max)
6. T9- Red
7. T10+ Yellow (Midrange Temp, 482°F max)
8. T10- Red
9. T11+ Yellow (Midrange Temp, 482°F max)
10. T11- Red
11. T12+ Yellow (Midrange Temp, 482°F max)
12. T12- Red

Connector E:

1. Ground
2. Left Front Suspension Sensor (Potentiometer type)
3. +5 Volts
4. Ground
5. Right Front Suspension Sensor (Potentiometer type)
6. +5 Volts
7. Ground
8. Left Rear Suspension Sensor (Potentiometer type)
9. +5 Volts
10. Ground
11. Right Rear Suspension Sensor (Potentiometer type)
12. +5 Volts

Connector F:

1. T13+ Yellow (Exhaust Gas Temp 7, 1814°F max)
2. T13- Red
3. T14+ Yellow (Exhaust Gas Temp 8, 1814°F max)
4. T14- Red
5. T15+ Yellow (Midrange Temp, 482°F max)
6. T15- Red
7. T16+ Yellow (Midrange Temp, 482°F max)
8. T16- Red
9. Shift Light 1 (provides up to 1 amp to light bulb...)
10. Shift Light 2 (...ground other side of bulb to chassis)
11. Shift Light 3
12. Shift Light 4

Connector G:

1. Ground
2. Pressure 1
3. +12 Volts
4. Pressure 2
5. Ground
6. Ground
7. Pressure 3
8. +12 Volts
9. Pressure 4
10. Ground
11. Switch 1 (reacts to 0-5V signal...)
12. Switch 2 (...or to contact closure to ground)

Connector H:

1. Ground
2. Analog 5
3. +12 Volts
4. Analog 6
5. Ground
6. Ground
7. Analog 7
8. +12 Volts
9. Analog 8 (Connected internal to "11 to 24V" power connection, can be overridden)
10. Ground
11. Switch 3
12. Switch 4

1.3. Junction Box Connector A (deferred)

Connections to this connector will be described last!

For each sensor you install, you should test it immediately, right there and then, by checking the LCD display on your *DATAPRO-45™* main unit. The display channels are substantially, but not completely, in the same order as the connectors on the junction box. As a result, this documentation takes you through the installation process in the same order as the corresponding sensor channels are displayed on the LCD. Otherwise, you would find yourself laboriously scrolling through all of the channels several times!

1.4. Junction Box Connector B**1.4.1. Power Supply**

To connect the power supply, first turn off the electrical master kill switch and possibly disconnect the battery. Use standard 14–16 gauge automotive wire, black in color for the negative wire and red in color for the positive wire. Connect the black wire to a good chassis ground that is connected to the negative terminal of the battery via another wire, or connect directly to the negative terminal of the battery. Connect the red wire to fused power source that is connected to the positive battery terminal, after the master power cut-off switch. Connect the other end of each wire to the appropriate junction box plugs and positions.

The actual power supply voltage may vary from 11 to 18 volts DC. Any standard automotive style battery is sufficient. If your car can not provide the suitable voltage, or doesn't have an on-board battery, then order a battery pack from Computech. Under normal operating conditions, less than 200mA will be drawn by *DATAPRO-45™*.

It is recommended that the power connection selected will provide power to the *DATAPRO-45™* even when the engine is not running. Leaving the *DATAPRO-45™* powered up for an entire day of racing will have very little effect on the vehicle's battery.

TESTING: Test your power supply connection by checking the *DATAPRO-45™* display. If it's on, everything is fine so far. If the display is still not on, check the troubleshooting section.

1.4.2. Engine RPM

WARNING: Ignition suppression spark plug wires are **highly recommended**. Without them, proper system performance is not guaranteed. Consult your dealer for more information on suitable spark plug wires.

DATAPRO-45™ senses your engine RPM electronically by tapping into the ignition system. Due to the wide variety of ignition systems, every installation is slightly different. Every effort has been made, however, to make your installation effortless. Select one of the scenarios below for your installation.

Regardless of your situation, you need to connect a 14-16 gauge automotive wire (violet color is recommended) from the chosen tachometer signal to the junction box position B3.

1.4.2.1. Installations having an electric tachometer

If you have an electric tachometer then the easiest method is to simply pick up the RPM signal directly behind the dash by tapping into the electric tachometer's wires. Most tach manufacturers choose a **green** wire for this signal.

1.4.2.2. Ignition systems with a dedicated tachometer output

Many CDI, electronic, and computer ignitions (such as MSD™) have a dedicated tachometer output. Connect to this output.

1.4.2.3. Conventional style Ignition systems with external coils

If your ignition has an external coil, then that coil will have one high-tension spark plug type wire (typically plugged into the top center) and two low-tension smaller wires

(typically screwed onto posts near the top). One of the two low-tension wires will be a suitable RPM signal. If the two wires or terminals are labeled “+” and “-”, use the “-” side for your RPM signal. Otherwise choose one side arbitrarily. It is safe to connect to the wrong one and you’ll realize you’ve done this if you get a very poor RPM reading later. In this case, you simply need to try the other terminal. Note also that some ignition systems require use of the “+” side.

1.4.2.4. Internal coil magneto ignitions

Internal coil magneto ignitions have a “kill” wire or terminal wire coming from the magneto main unit. This wire is typically connected to the coil inside the magneto main unit and thus provides a suitable RPM signal to connect to.

1.4.2.5. External coil magneto ignition systems

Most external coil magneto ignition systems simply don’t want to provide a clean RPM signal without the use of a RPM converter/interface. Consult with Computech to determine your specific needs.

1.4.2.6. All ignitions

TESTING: Before testing your RPM connection, be sure your *DATAPRO-45™* is properly calibrated for your engine. If it’s not, no harm will come; the RPM indication will be wrong, however. Your *DATAPRO-45™* comes from the factory calibrated for an 8 cylinder, 4 stroke motor. If you have anything else, you’ll need to use the *DATAPRO ON-LINE™* software to calibrate your main unit to match your specific requirements.

Now, test your RPM connection by starting the engine and letting it idle. The LCD display should indicate the correct RPM. You should be concerned with a having a “smooth” reading. In spite of how smooth you may believe your idle to be, it will probably bounce very rapidly within a 25 to 100 RPM range. While the last two digits may seem to vary wildly, your reading is probably just fine as long as the remaining digits to the left appear steady.

If you think you have a RPM problem, then see the troubleshooting section. Note that many race ignition systems generate a great deal of radio frequency interference. This interference can cause erratic RPM readings and may sometimes even cause computer systems such as your *DATAPRO-45™* to go totally “haywire”. If your LCD seems to go “haywire” as soon as you start the engine, or if you can’t seem to get a smooth RPM display no matter what you do, then you may need to go a couple of steps further. Aside from checking the troubleshooting section, make sure that all wires are as far from any ignition

components as possible. Make sure that your *DATAPRO-45™* main unit and junction box are also as far from any ignition components as possible.

1.4.3. Inputshaft RPM (INP) and Driveshaft RPM (DRV)

If you have purchased the Inputshaft or Driveshaft RPM option, the necessary wiring, hardware and sensor should have been included with your kit.

Verify that the two piece collar (if ordered) fits your pinion shaft. The sensor is passed through the hole in the sensor mounting bracket and is then held in position by the two jam nuts. The sensor should be pointed directly at the outer edge of the collar and toward the center of the rotating shaft. The exact position of the sensor in the bracket should be adjusted to achieve a gap of approximately 1/8" (.125").

For the input shaft sensor and trigger magnet installation, please get specific details from your transmission supplier or from Computech. The typical sensor gap required for most input shaft installations is approximately .020". The use of the Computech supplied pick-up magnet is critical for proper operation. Alignment of the magnet and the sensor is also critical to proper operation.

The sensor and cable supplied in the inputshaft and driveshaft kits are interchangeable. For the inputshaft, connect the white wire to junction box position B5 and the black and shield wires to B4. For the driveshaft, connect the white wire to junction box position B6 and the black and shield wires to as B7.

INPUTSHAFT TESTING: Change the LCD display channel to "Inpshft RPM." Start the engine while the transmission is in neutral, and release the clutch so that the inputshaft safely turns. The LCD display should show the RPM of the inputshaft.

If you are using more than one magnet as your inputshaft trigger, you will need to use your *DATAPRO ON-LINE™* software to calibrate the number of pulses per shaft revolution.

DRIVESHAFT TESTING: Testing your driveshaft input could be dangerous. The safest method is to wait until you're on the track. Nevertheless, it is possible to test this input by putting the car on jack stands. Again, for the sake of safety, it is not recommended that you run the engine in order to turn the driveshaft and tires. Instead, spin the tires by hand as fast as you can while the transmission is in neutral. Change the LCD display channel to "Drvshft RPM." The driveshaft should turn fast enough to get a very small reading.

If you are using anything other than two magnets as your driveshaft trigger, you will need to use your *DATAPRO ON-LINE™* software to calibrate the number of pulses per shaft revolution.

1.4.4. Flow meter 1 and 2

If you have purchased a flow meter option, then you should have all necessary hardware for this sensor.

Connect the signal wire to junction box position B8 or B10. Connect the ground wire to a position such as B9. If +12V or +5V power is required for your flow meter, use position A1 or A4. Do not use position B1 for this purpose.

TESTING: Change the LCD display channel to “Flow 1” or “Flow 2” and look for a reading while the meters are seeing a reasonable flow rate.

1.4.5. Vehicle Reaction Timer (Transbrake input)

If you have purchased the Vehicle Reaction Timer option, then you should have all necessary hardware for this sensor.

The Vehicle Reaction Timer function of your DATAPRO-45™ is requires a “start timer” and a “stop timer” signal. The “start timer” signal is usually connected to the transbrake solenoid. The figures below indicate the use of a blue wire, connected between your “start timer” signal and junction box position B11. Any color 14-20 gauge automotive type wire may be used, however.

1.4.5.1. If you have a transbrake

See Figure 2: Connect the blue wire directly to the transbrake control wire. This control wire loses 12V when the transbrake is released, starting both the car and the timer

1.4.5.2. If you have a two step or throttle stop, but no transbrake

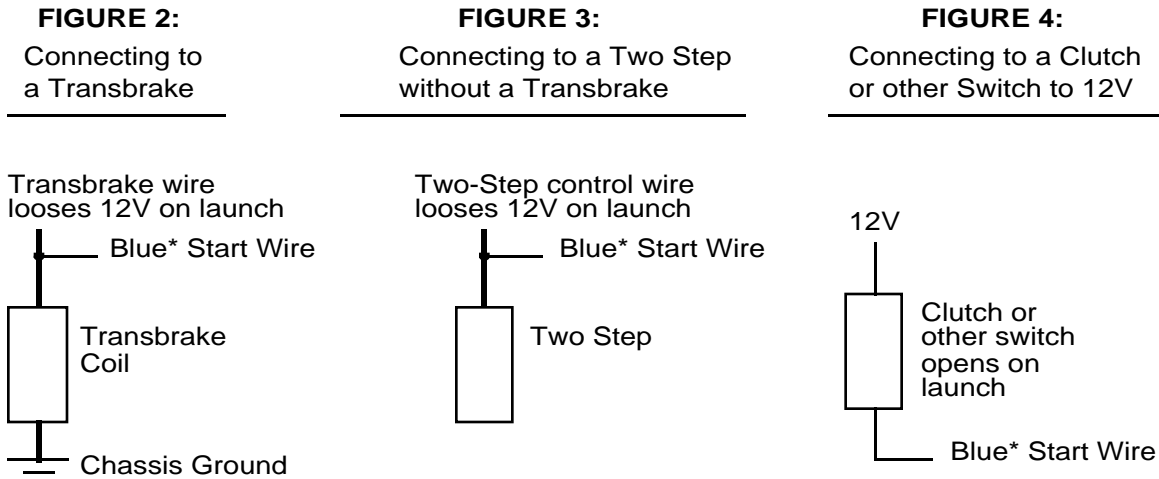
See Figure 3. These devices will have a 12V-control signal (similar to a transbrake’s) that loses the 12V whenever the car is launched. Connect the blue wire directly to this control wire.

1.4.5.3. If you do not have a two step, throttle stop, or transbrake

You may still have a control signal that loses 12V when the vehicle is launched. If so, please follow the installation instructions for the two step above.

1.4.5.4. If you don’t have the 12V control signal

You may need to add a switch or relay, such as one connected to the clutch. See Figure 4. One side of the switch or relay output should be connected to 12V while the other side should be connected to the blue wire. The contacts of the switch or relay should open whenever the vehicle is launched. It's OK if you have other devices connected to this switch; they will all act independently.



* Connect this signal wire to junction box position B11.

TESTING: Before your Vehicle Reaction Timer function may be tested, the “timer stop” signal must also be connected. This is normally done with an accelerometer or motion switch attached to junction box position A3. Please see the testing instructions later in this manual.

1.4.6. Record Switch

The record switch should be mounted on the dash or in a suitable position to be operated by the driver. Alternatively, the switch may be mounted outside of the car where a crewmember may activate it.

One side of the record switch should be wired to junction box position B12. Any color 14-20 gauge automotive type wire may be used. The other side may be wired to a convenient chassis ground location. Alternatively, the ground connection may be made at any convenient junction box ground position, such as B9.

TESTING: While looking at the LCD display of your *DATAPRO-45™*, turn the record switch on. The display should say “Recording.” When you turn the switch off, the LCD display should say “Stop.”

1.5. Junction Box Connectors G and H (switches only)

So that you may conveniently scroll through the display channels on the LCD, install the switches next.

1.5.1. Switch Inputs (S1-S4)

Your *DATAPRO-45™* CAN record up to 4 switch inputs. You may connect either a switch or a voltage to each one of the inputs at positions.

To connect to a conventional type on/off switch

In order to connect a switch, run a single 14-20 gauge automotive type wire from one side of the switch to the appropriate junction box position (G11, G12, H11, or H12). Run a wire from the other side of the switch to a convenient chassis ground position. You may alternatively return this ground side to the junction box and share one of the nearby ground connections on the same plug such as G10 or H10.

To connect to a voltage source such as a nitrous solenoid

In order to connect a voltage source, simply run a single 14-20 gauge automotive type wire from the voltage source to the appropriate junction box position. Normally, the voltage source, such as an activated nitrous solenoid, will have a ground path through the device to the chassis. Note that the switch inputs respond to a voltage crossing the range of one half to one volt. That is, if the voltage is above one volt, then the switch will naturally indicate “off.” If the voltage falls below one half volt, then the switch will naturally indicate “ON.” If the voltage persists between these two levels, then the reading may be indeterminate.

TESTING: Change the LCD display channel to one of the switch channels (“Switch 1” through “Switch 4”). Physically cause a switch change and verify that the reading changes.

1.5.1.1. Calibration

The factory calibration inside your *DATAPRO-45™* for switches assumes that when a connection to ground (or an input below one half volt) is made, the input should be considered “ON.” Depending on your installation, this sense may need to be reversed. You may use the *DATAPRO ON-LINE™* software to change this sense for your installation. For details on this feature, see the on-line software help.

1.6. Junction Box Connectors C, D, and F

Note that the *DATAPRO-45™* records all temperature sensors (thermocouples) at 50 samples per second rather than the typical 100.

1.6.1. Exhaust Gas Temperature Probes (T1-T8)

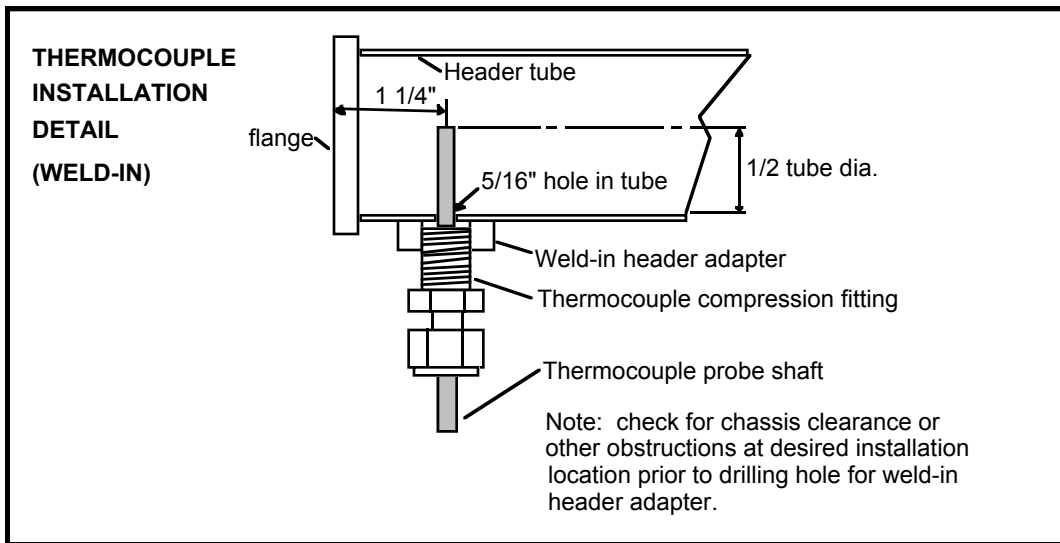
The first eight temperature inputs on your *DATAPRO-45™*, T1 through T8, are designed for use with type K thermocouple probes for measuring exhaust gas temperature. They have a maximum reading capability of approximately 1814°F. Special type K extension cable must be used, without exception. This cable contains two wires, color coded yellow and red. For each sensor, connect the yellow wire into the odd numbered position. Connect the red wire into the even numbered position. The appropriate positions and wire colors are indicated on your junction box label. If using one probe per cylinder, it's advisable to connect the probe for cylinder 1 to position T1, cylinder 2 to position T2, etc.

Follow the appropriate instructions below for installing your sensor probes.

1.6.1.1. Weld-In Style Sensor #6035

1. Select the header tube in which you wish to mount the sensor.
2. Measure a spot 1- " from the header flange. If more than one cylinder is to be monitored, it is important that all probes be located the same distance from the header flange. This will allow for comparison from cylinder to cylinder.
3. Once the spot has been located, drill a 5/16" diameter hole in the header pipe.
4. Center the weld-in weldment on the hole and weld to the header pipe a full 360°.
5. Coat the 1/8" pipe threads on the compression fitting liberally with anti-seize and install the male connector portion of the compression fitting into the weldment and tighten.
6. Now, using a marker or pencil, make a mark on the probe that is half the diameter of the header pipe *plus* 1" (the length of the weldment and the compression fitting) from the exposed tip of the probe. Verify this depth by visual inspection into the pipe. The tip of the probe should reach to the center of the pipe. (For example, for a 1-1/2" header pipe, the mark on the probe should be half of this diameter plus 1" from the tip, which amounts to 1-3/4" from the tip. For a 2" header pipe, the mark should be 2" from the tip.)
7. Slip the nut (with the cup side to the exposed tip of the probe) and the ferrule onto the probe.
8. Insert the probe into the compression fitting base to the point where the ferrule and the line on the probe come together. This will insure that the probe is in the middle of the exhaust stream and will set the ferrule on the probe sheath.
9. Holding the probe in place, tighten the compression nut down tight. **Make certain that the thermocouple probe is in its proper position prior to tightening the compression nut.**

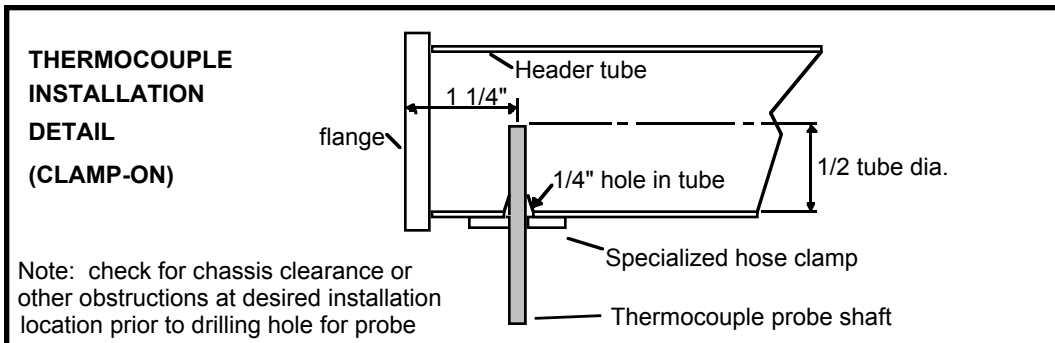
10. Loosen the nut to the point that the probe will turn and, if room permits, align the transition spring and the lead wire at a 90 degree angle from the exhaust pipe. This will position the sender tip correctly in the exhaust stream.
11. Tighten the nut back down to secure the probe.
12. Attach the thermocouple extension cable to the probe and route the extension cable to the junction box, using tie wraps along the way, but leaving sufficient slack to easily insert the connector into the appropriate junction box jack. **Do not harness the cable tightly, being sure to use sweeping bends and loosely guiding the cable to the junction box.** This will allow the cable to absorb vibrations along its length
13. The cable may be shortened if required. Cut the cable to the desired length (plus some spare) and carefully cut the stainless steel overbraid back approximately 1". Shrink tubing should be used over the cable where it exits the connector to make for a neater installation. Make certain that the overbraid in no way comes in contact with the wire terminals in the connector. Strip the YELLOW wire back approximately 1/2" and connect to the plus (+) terminal in the connector such as C1. Repeat the process for the RED wire and connect to the negative (-) terminal such as C2. NOTE: Only this wire can be utilized. Substitution of a different wire *will* affect the operation of the sensor. **REMEMBER - The RED wire must be connected to the MINUS (-) terminal and the YELLOW wire must be connected to the POSITIVE (+) terminal.**



1.6.1.2. Clamp-In Style Sensor #6037

1. Select the header tube in which you wish to mount the sensor.
2. Measure a spot 1-1/2" from the header flange. If more than one cylinder is to be monitored, it is important that all probes be located the same distance from the header flange. This will allow for comparison from cylinder to cylinder.

3. Once the spot has been located, drill a .250" (1/4") diameter hole in the header pipe.
4. Insert the probe into the hole and snug it to the header using the band clamp.
5. If room permits, align the transition spring and the lead wire at a 90 degree angle from the exhaust pipe. This will position the sender tip correctly in the exhaust stream.
6. Tighten the band around the exhaust header pipe.
7. Route the probe's cable to the junction box, using tie wraps along the way, but leaving sufficient slack to easily insert the connector into the appropriate junction box jack. **Do not harness the cable tightly, being sure to use sweeping bends and loosely guiding the cable to the junction box.** This will allow the cable to absorb vibrations along its length.
8. The cable may be shortened if required. Cut the cable to the desired length (plus some spare) and carefully cut the stainless steel overbraid back approximately 1". Shrink tubing should be used over the cable where it exits the connector to make for a neater installation. Make certain that the overbraid in no way comes in contact with the wire terminals in the connector. Strip the YELLOW wire back approximately 1/2" and connect to the plus (+) terminal in the connector such as C1. Repeat the process for the RED wire and connect to the negative (-) terminal such as C2. NOTE: Only this wire can be utilized. Substitution of a different wire *will* affect the operation of the sensor. **REMEMBER - The RED wire must be connected to the MINUS (-) terminal and the YELLOW wire must be connected to the POSITIVE (+) terminal.**



1.6.1.3. Testing

TESTING: Change the LCD display channel to the appropriate channel, such as "Exhaust 1." If the engine is off or cold, the readings should be within about 20 degrees Fahrenheit of room temperature. If the engine is warm, appropriate readings should be seen.

If readings close to 30°F appear, then there is very likely an accidental reversal of wires somewhere. Check all connections between the actual probe and the junction box.

1.6.2. Midrange Temperature Sensors (T9-T16)

The last eight temperature inputs on your *DATAPRO-45™*, T9 through T16, are designed for use with type K thermocouple probes measuring fluid and ambient air temperatures. These channels have a maximum reading capability of approximately 482°F. Special type K extension cables must be used, without exception. The cable may be shortened if required. Cut the cable to the desired length (plus some spare) and carefully cut the stainless steel overbraid back approximately 1". Shrink tubing should be used over the cable where it exits the connector to make for a neater installation. Make certain that the overbraid in no way comes in contact with the wire terminals in the connector. Strip the YELLOW wire back approximately ½" and connect to the plus (+) terminal in the connector such as D5. Repeat the process for the RED wire and connect to the negative (-) terminal such as D6. NOTE: Only this wire can be utilized. Substitution of a different wire *will* affect the operation of the sensor. **REMEMBER - The RED wire must be connected to the MINUS (-) terminal and the YELLOW wire must be connected to the POSITIVE (+) terminal.**

TESTING: Change the LCD display channel to the appropriate channel, such as "Temp 9." An appropriate temperature should be seen. Note that an error as large as 5°F may be present. This is especially evident when trying to read temperatures close to ambient (room temperature). This is because thermocouple technology is not designed for accurate readings at these levels. The readings will be repeatable from run to run, but not any more accurate. These inputs are really intended for reading things such as oil or water temperature, which are typically higher. If you need more accurate readings of room temperature values, such as intake air temperature, consult with Computech for an alternative temperature sensor.

If readings close to 30°F appear, then there is very likely an accidental reversal of wires somewhere. Check all connections between the actual sensor and the junction box.

1.6.3. Shift Lights

Your *DATAPRO-45™* can drive up to four sequential shift lights, or it will light one light up to 4 times. See your *DATAPRO ON-LINE™* software for configuring the shift point for each light.

You may connect a 12V automotive light or relay to the shift light outputs. The light or relay should draw no more than 1 amp or have a rating no more than 12 Watts.

Run one single 14-20 gauge automotive style wire, any color, from the appropriate junction box position (F9-F12) to the light. Run a wire from the other side of the light to a convenient chassis ground.

TESTING: Wiring may be tested by using a special test feature of your *DATAPRO-45™*. Turn off the power to the *DATAPRO-45™*. This may be done by turning off your master kill switch or by temporarily unplugging connector B from your junction box. Now, while holding down the “Channel” button on your *DATAPRO-45™*, turn the power back on (or replace the plug). Continue holding down the “Channel” button for 12 seconds. During this time, each light should illuminate and extinguish one at a time, in order, for approximately 2 seconds each.

1.7. Junction Box Connector E

1.7.1. High Speed Suspension Sensors (LF, RF, LR, RR)

If you have purchased suspension sensors, then you should have all necessary hardware for these sensors. Note that *DATAPRO-45™* records these sensors at 600 samples per second rather than the typical 100.

For each sensor, connect the black ground wire, red power wire, and white signal wire to the appropriate group of three positions on junction box connector E such as E1, E2, and E3. Note that some sensors may be provided with an extension cable and this cable may use different color codes, so please check the documentation that comes with your sensor. Note also that the +5 Volt position is not actually a “power” connection. Instead, it is a “reference voltage” which the suspension sensor uses to divide down and produce a signal corresponding to suspension deflection.

TESTING: Change the LCD display channel to one of the four suspension channels (“Left Front”, “Right Front”, “Left Rear”, or “Right Rear”). Bounce the suspension up or down and verify that the reading changes. It is advisable to attempt to deflect just one sensor in a noticeable fashion in order to make sure that you don’t inadvertently have any sensor cables crossed.

1.7.1.1. Calibration

The factory calibration inside your *DATAPRO-45™* for suspension sensors is a double ended range from -100.0 to 100.0, intended to represent percent deflection up (+) or down (-). Depending on your installation, there may be three ways in which the LCD readings differ from ideal. You may use the *DATAPRO ON-LINE™* software to customize the calibration for your installation. For details on this feature, see the on-line software help. This process is very similar to adjusting the throttle position sensor readings.

1. Up and down, plus and minus may be reversed. Simply negate all calibration coefficients.
2. The reading may not be zero when the suspension is at rest. Make a note of the digits displayed instead of zero. For example, if 12.7 is displayed (a little more than ten), then note the digits 127 (a little more than 100). Multiply this number by 65,536 and then subtract it from the C coefficient. Note that if the display was a negative number, then you need to subtract a negative number, which is tantamount to adding a
n u m b e r .
3. The reading change under full deflection is not 100.0. Make a note of the deflection from rest. Be sure to take into account any difference in the at-rest position from zero. For example, if 12.7 is displayed at rest and 85.4 is displayed at full deflection,

then the reading change under full deflection is actually 72.7. If your desire is for this reading change to be 100.0, then the current reading change is only 72.7% of the desired reading change. Conversely, the desired reading change is 1.376 times the current reading. (Get that by dividing 100.0/72.7.) To adjust the reading change, multiply the B and C coefficients by the number you calculate (1.376 in this example).

Note that, once you get close to ideal, adjustments to the zero reading and the reading change under full deflection can effect each other. It may take a few repetitions of the process to get things exactly right. However, since sensors, mounting points, and vehicle ride height are liable to change very slightly over time, don't spend too much effort trying to get things perfect. The readings will only change from perfect later. It is certainly not recommended to worry about the digit to the right of the decimal place. This digit is provided strictly for seeing minute changes in suspension and for accurately calculating deflection rates.

1.8. Junction Box Connectors G and H (excluding switches)

1.8.1. Uncommitted analog inputs (A1-A8)

If you have purchased additional sensors, such as pressure sensors, then you should have all necessary hardware for these sensors. The factory calibration inside your *DATAPRO-45™* for analog sensors is an assortment of pressure sensors. If you have purchased one or more of these anticipated pressure sensors, your life will be easier if you choose the corresponding analog input!

Analog 1:	24 PSI
Analog 2:	120 PSI
Analog 3:	120 PSI
Analog 4:	400 PSI
Analog 5:	400 PSI
Analog 6:	1600 PSI
Analog 7:	Vacuum in PSI
Analog 8:	Battery Voltage*

*Note that the A8 position is internally connected to the 11-24V automotive battery power supply. This means that if you do not connect any external sensor to this position, your *DATAPRO-45™* will record and display battery voltage, accurate to within approximately one tenth of a volt. On the other hand, if you connect an external sensor signal to position H9, then that signal will override the internal connection, giving you the ability to record and display the sensor reading instead. In order to do this; the factory *DATAPRO-45™* calibration will have to be changed correspondingly using the *DATAPRO ON-LINE™* software.

For each sensor, connect the black wire along with the bare shield wire (black wire and bare shield wire should be twisted together), red power wire, and white signal wire to the appropriate group of three positions on junction box connector G or H, such as G1, G2, and G3, or H3, H4, and H5. Note that adjacent sensors will need to share a +12 Volt position. Note also that some sensors may be provided with an extension cable and this cable may use different color codes, so please check the documentation that comes with your sensor.

TESTING: Change the LCD display channel to one of the analog channels (“Analog 1” through “Analog 8”). Physically cause a sensing change and verify that the reading changes. For pressure sensors, the at-rest reading should be close to zero. This zero reading corresponds to a non-zero voltage. Therefore, it may not be necessary to actually verify a sensing change. The presence of the non-zero voltage when the sensor is at rest is sufficient.

1.8.1.1. Calibration

If you have found it necessary to install a sensor in a position for which your *DATAPRO-45™* was not factory calibrated you may use the *DATAPRO ON-LINE™* software to select the appropriate calibration. For details on this feature, see the on-line software help.

1.9. Junction Box Connector A

1.9.1. Accelerometer

If you have purchased the optional accelerometer, then you should have all necessary hardware for this sensor.

For accurate readings, it is important to properly mount your accelerometer. For single axis accelerometers in drag racing applications, simply make sure that the arrow on the accelerometer points exactly straight forward. For dual axis accelerometers in other racing applications, find a location near the center of gravity of the car and then properly align the accelerometer when mounting. Mounting the accelerometer away from the center of gravity of the car will introduce false readings as “yaw” (mere rotation or spinning) is misperceived as acceleration (changing direction of motion or cornering).

Find a suitable mounting location, wire up, and test your accelerometer before permanently mounting it! Connect the shield/black to ground (A2), red power (A1), and white signal (A3) wires to the appropriate junction box positions.

If you have a dual axis accelerometer, connect the second signal wire to a free input such as the +G2/Oxy2 input at position A11. You may need to use the *DATAPRO ON-LINE* software and change both the name and calibration of this channel.

TESTING: Change the LCD display to the accelerometer channel. (On some cable television systems this is between the Comedy Channel and the Discovery

Channel.) With the accelerometer wired but not mounted, tilt it so that the arrow points straight up! A reading close to one should result. This indicates one earth gravity or one “g” of acceleration. If you point the arrow straight down, the reading should be minus one. If you hold the sensor level to the ground, the reading should be close to zero. Now, permanently mount the sensor. If the reading is not exactly zero, then use shims at the front or back to adjust the reading.

If you have a dual axis accelerometer, the lateral acceleration channel should similarly react to left and right tilting. This is when it’s fun to tilt your body along with the accelerometer in order to simulate centripetal force as you go around corners. Don’t forget to make engine noises, especially when you tilt back and accelerate out of the turn.

1.9.1.1. Calibration

If you have found it necessary to install a sensor in a position for which your *DATAPRO-45™* was not factory calibrated, you may use the *DATAPRO ON-LINE™* software to select the appropriate calibration. For details on this feature, see the on-line software help.

1.9.2. Throttle Position Sensor (TPS)

If you have purchased the optional throttle position sensor (TPS), then you should have all necessary hardware for this sensor.

Connect the black ground wire (A6), red power wire (A4), and white signal wire (A5) to the appropriate group of three positions on junction box connector A. Note that some sensors may be provided with an extension cable and this cable may use different color codes, so please check the documentation that comes with your sensor. Note also that the +5 Volt position is not actually a “power” connection. Instead, it is a “reference voltage” which the throttle position sensor uses to divide down and produce a signal corresponding to suspension deflection.

TESTING: Change the LCD display channel to the throttle channel. Open and close the throttle, causing a significant reading change on the LCD display.

1.9.2.1. Calibration

The factory calibration inside your *DATAPRO-45™* for your throttle position sensors is a single ended range from 0 to 100.0, intended to represent percent throttle. Depending on your installation, there may be three ways in which the LCD readings differ from ideal. You may use the *DATAPRO ON-LINE* software to customize the calibration for your installation. For details on this feature, see the on-line software help. This process is very similar to adjusting the suspension sensor readings.

1. More and less throttle, near 100 or near 0 may be reversed. Customize your calibration to use the coefficients $B = -64251$ and $C = 65568768$. Note that coefficient B is a negative number.
2. The reading may not be zero when the throttle is at rest. Make a note of the digits displayed instead of zero. For example, if 12.7 is displayed (a little more than ten), then note the digits 127 (a little more than 100). Multiply this number by 65,536 and then subtract it from the C coefficient. Note that if the display was a negative number, then you need to subtract a negative number, which is tantamount to adding a number.
3. The reading change under full deflection is not 100.0. Make a note of the deflection from rest. Be sure to take into account any difference in the at-rest position from zero. For example, if 12.7 is displayed at rest and 85.4 is displayed at full deflection, then the reading change under full deflection is actually 72.7. If your desire is for this reading change to be 100.0, then the current reading change is only 72.7% of the desired reading change. Conversely, the desired reading change is 1.376 times the current reading. (Get that by dividing $100.0/72.7$.) To adjust the reading change, multiply the B and C coefficients by the number you calculate (1.376 in this example).

Note that, once you get close to ideal, adjustments to the zero reading and the reading change under full deflection can effect each other. It may take a few repetitions of the process to get things exactly right. However, since sensors, mounting points, throttle linkage, and driver foot force are liable to change very slightly over time, don't spend too much effort trying to get things perfect. The readings will only change from perfect later. It is certainly not recommended to worry about the digit to the right of the decimal place. This digit is provided strictly for seeing minute changes in throttle position and for accurately calculating deflection rates.

1.9.3. Strain Gages

If you have purchased strain gages and had your junction box upgraded for internal strain gage inputs, then you should have all necessary hardware for these sensors. Refer to the documentation accompanying the strain gages.

1.9.4. Oxygen Sensors (Oxy1 and Oxy2)

Your *DATAPRO-45™* CAN directly interface to standard automotive oxygen sensors. The factory calibration will provide a milli-volt reading, which should be between 400 and 1200, centering around 800 or 900. If your junction box has been upgraded for internal strain gage inputs, then it is no longer compatible with oxygen sensors on these channels. One of the uncommitted analog inputs on connectors G or H may be used instead.

Connect the signal wire from each oxygen sensor to the appropriate junction box position, either A7 or A11. Note that these inputs are alternatively used for strain gages and are therefore labeled for either strain gages or oxygen sensors.

If you have heated oxygen sensors, do not under any circumstance use a junction box connector for the heater power. Wire this feature directly to your automotive electrical system according to the sensor manufacturer's specifications.

TESTING: Change the LCD display to one of the two oxygen sensor channels. If your engine is cold, the reading will probably be zero. Warm up the engine. After a few minutes, the sensor will warm up and a reading between 400 and 1200 should result. Expected operating conditions should produce a reading in the vicinity of 800 or 900. Note that it is expected for this reading to bounce up and down many counts.

1.10. Transformer Power Supply

The optional transformer power supply may be used to provide power to *DATAPRO-45™* when it's not in the car. This power supply makes it possible for you to download your data to your computer in your trailer or motorhome instead of outside at the car.

To use the transformer, simply insert the transformers round plug into the round hole at the end of the *DATAPRO-45™* case. Plug the transformer into an appropriate AC power plug.

2. General Operation

DATAPRO-45™ has a very simple control interface - just four buttons.

Each button performs a specific function when you press it. This function is indicated by the legend in all capital letters above the button.

Some buttons perform an additional function if you hold them down for over a second. This function is indicated by the legend in mixed case letters below the button.

Some buttons also perform yet another function if you hold them down while power is first applied to the main unit. This function is not indicated on the legend.

2.1. STOP button

Pressing the “STOP” button will cause recording to stop. Holding this button will actually start recording again.

2.2. CHANNEL button

Pressing the “CHANNEL” button advances the LCD display to the next channel. Since the LCD has two lines, you’ll be able to see the bottom line move up to the top, and then a new channel appear on the bottom line.

Holding this button will cause the channels to start scrolling. As long as you hold the button, the channels will continue scrolling. This feature allows you to find a channel without getting your finger tired by pressing the button so many times. Also, just in case you get distracted while you’re waiting for the desired channel to come around, this scrolling feature will stop when you reach the first (time) channel. In order to continue scrolling beyond this point, release the button temporarily and press and hold it again.

Since there are so many channels, scrolling through all of them takes a while. To make your life easier, your *DATAPRO-45™* has been designed to skip any channels that are not recorded. Since you probably don’t have a full set of 41 sensors and 4 shift lights, it’s advisable that you use the *DATAPRO ON-LINE* software to turn recording off for the unused sensor inputs. Doing so will not only save memory and increase your total recording time, it will also save you time if you ever use the “CHANNEL” button to scroll through your channels!

Finally, holding the “CHANNEL” button down when power is first applied will initiate a shift light test. As long as the button is held down, the shift lights will illuminate in succession at a rate of about one light every 2 seconds. When you let go of the button, normal *DATAPRO-45™* operation will continue.

2.2.1. MEMORY button

Pressing the “MEMORY” button will cause the LCD display to indicate approximately how much recording time is left. Holding this button will actually clear your memory. If you’re planning to record multiple runs before downloading to your PC, be sure not to accidentally hold this button for too long.

Note that the “MEMORY” button also serves to perform a communications check. If a special “loopback” adapter is plugged into the communications adapter whenever this button is pressed, the LCD display should indicate “Communication OK” for a moment.

Holding the “MEMORY” button down when power is first applied will cause the internal LCD backlight to be turned on or off. Once set, the on/off status of the backlight will be remembered.

2.3. TELLTALE button

Pressing the “TELLTALE” button will toggle your *DATAPRO-45™* in and out of telltale mode. This allows you to see the maximum and minimum value visited by each sensor during a run. Please note the first time you enter telltale mode for a particular recorded run, a number of seconds will pass as your *DATAPRO-45™* scans the recorded data in order to identify these telltale values. For long recordings with all channels recorded, this can take a substantial amount of time. If you get tired of waiting, it is indeed safe to just turn the power off and back on. This time consuming task only occurs once per recorded run. You can visit the telltale information a second time without having to wait.

Holding this button will change runs. If you’ve recorded multiple runs, then as you hold the “TELLTALE” button, the display will scroll through the various runs. Just like the “DISPLAY” button, it will stop scrolling at the current run. To scroll further, release the button for a moment and then press and hold it again.

If you ever change runs, be sure not to get confused about which run you’re looking at whenever you’re looking at the telltale readings!

3. Recording

3.1. Before recording a run

There are a couple of things you should do before recording a run to be sure that you make the best use of *DATAPRO-45™*.

First, Press the "MEMORY" button to be sure that there is sufficient memory to record the run.

Next, be sure about which channels are to be recorded. Normally this is done when you first install *DATAPRO-45™* or new options and then never touched again. You can always change which channels are recorded however. To do so, see the on-line documentation for your *DATAPRO ON-LINE™* software.

3.2. Recording a Run

3.2.1. Beginning a Recorded Run

To start recording, simply turn on the record switch. (If the switch is still on from the last run, turn it off and then immediately back on again.) Alternatively you can press and hold the "STOP" button on the keyboard for approximately three seconds. *DATAPRO-45™* will automatically create a new run record, and begin recording. The LCD display will say "Recording..." to indicate that *DATAPRO-45™* is recording. While recording, no sensor values are displayed in order to comply with the regulations of some sanctioning bodies. Typically you will want to start recording after you have pre-staged the car. This will allow the *DATAPRO-45™* to automatically find time zero, as time zero is determined by the first sign of sustained driveshaft movement. You may choose to start recording earlier, however, in order to record your burnout. During equipment testing, of course, you may want to record at any time.

3.2.2. Ending a Recorded Run

A recorded run may be ended manually by simply turning the record switch off or pressing the "STOP" button on the keyboard. Alternatively, you can use your *DATAPRO ON-LINE™* software to configure the automatic stop feature of *DATAPRO-45™*. This configuration is accessible next to the Engine Information calibration. For details, see the on-line documentation for details.

When a recorded run is ended, your *DATAPRO-45™* returns to Real Time mode. In Real Time mode all channels are operational, they are just not being recorded.

4. Tutorial (a day at the races)

This section is intended as an introduction to *DATAPRO-45™*, and a guide to its effective use.

First things first:

This tutorial assumes that you have completed the installation and calibration of *DATAPRO-45™* as detailed in the first sections of this manual. If you've gotten through that, then read along for a quick introduction to *DATAPRO-45™*'s features. If you get stuck or get curious (if all else fails...) then refer to the manual for the details of how *DATAPRO-45™* works.

4.1. While the dew is still on the grass

It will be at least an hour before your first run, and you and your crew have been checking over the final details on the car. This is the time to check over *DATAPRO-45™* as well.

1. Make sure the electrical circuit for *DATAPRO-45™* is on.
3. With the engine on, press and hold the "CHANNEL" button until you see "Engine RPM". If the RPM on the right doesn't read the correct value, see the documentation section on Configuration.
4. If you want to check your driveshaft RPM sensor, jack up the rear of the car first and support it with appropriate jack stands. Make sure the LCD display channel is on "Drvshft RPM". If the DRV on the left remains zero after you spin the driveshaft, see the documentation section on Troubleshooting.
5. Press the "MEMORY" button to see how much recording time is available. If there is at least 30 seconds, you're probably fine. If there isn't enough for the next run, consider resetting and clearing your previous recordings by holding down the "MEMORY" button.

4.2. Before you start your run

It's a day at the races and you're just about to go out on the track. *DATAPRO-45™* was installed and configured days, months, or years ago. You're so busy or so deep in concentration that you won't even give your mother the time of day. There's only one thing you have to do to get *DATAPRO-45™* on your side...

1. Turn on that little record switch.

The LCD display will indicate that you're recording, and you're ready to go. Good Luck! When the run is over, turn this record switch off.

4.3. After the run

For most racers, the memory capacity of *DATAPRO-45™* is enough to record numerous runs in a row, so you don't *have* to do anything between runs. However, to get the most out of your track time, you may want to download your recent recording.

4.4. Later on in the garage or at home

This is where you can really get a great deal out of *DATAPRO-45™*. Among countless other improvements you can make based on information you get from *DATAPRO-45™*'s recordings, try some of the following:

1. Compare all of your runs, and look for variations, inconsistencies, and improvements made by certain changes. You may find that somewhere in there is buried a faster way down the track.
2. Check your engine RPM at the end of your run, along with your driveshaft RPM (DRV) to see how much your torque converter or clutch is slipping.
3. Check your driveshaft RPM (DRV) coming off the line and then continuing down the track. You may find tire spinning, tire rollup, etc.

5. Troubleshooting

5.1. Display is blank

First, make sure that the junction box is properly powered. A good way to do this is to first remove the plug from connector A. Then use a voltmeter to probe the screw heads on the plug at positions B1 and B2.

Second, make sure that the umbilical cable is connected between the junction box and your *DATAPRO-45™* main unit.

DATAPRO-45™ requires a DC power source between 11 and 24 volts. If the display shows no signs of power, then maybe the power source is off or too weak.

5.2. RPM is zero

First, make sure that your tachometer signal is wired into the correct position, B3.

If the engine is running and the RPM displayed is still zero, then you must diagnose the wiring of the tachometer pickup. Remove the signal wire from position B3. Then short this position to ground. This should cause a jump in RPM. If it does not, then call Computech, Inc.

Once you've established that shorting the RPM input to ground causes a jump in RPM, it may be necessary to adjust the RPM threshold. This requires opening up your junction box case and setting a dip switch. Consult Computech customer support before doing this.

5.3. RPM is erratic or noisy

If you have erratic or noisy RPM readings, make certain you are using high quality suppression spark plug wires such as MSD 8.5 mm Super Conductors wires. If the use of these wires does not solve your problem, contact Computech customer support for assistance.

5.4. DRV or INP is zero

First, make sure that your sensors are wired into the correct position. The inputshaft sensor should be wired to position B5. The driveshaft sensor should be wired to position B6. Both sensors should have their other wire connected to chassis ground or to a ground position at connector B.

If DRV (INP) is still always zero, adjust the DRV (INP) sensor so that the gap to the magnet is as small as possible without touching the magnet or balancing weights. Next, turn the driveshaft (inputshaft) until the magnet passes from more than 2" away from the sensor to closer than 1/4" to the sensor. The LCD display should show a small nonzero number for a moment. If you can't move the driveshaft (inputshaft), then you may remove the sensor from the bracket and then move the sensor from far away to nearby the magnet. If you do get a LCD display reading, then the DRV (INP) input is working properly.

If DRV (INP) remains zero, unplug the sensor and work with the connector on the cable coming from the junction box. Short a screwdriver or wire between the two conductors of the connector. A LCD display reading should result. If it does not, call for customer support.

5.5. DRV is erratic or noisy

You may find yourself in the following situation. You're in the shop and your car stationary. The DRV reads zero on the LCD display with the engine off, but registers random values when the engine is on. If you find this to be the case, then your DRV sensor circuit is picking up ignition noise. The junction box includes a DRV sensor circuit that is already filtering much of your ignition noise out. Evidently, your ignition system generates such strong electromagnetic noise that the filter can not eliminate all of it.

You have a few options at this point. First check the location of your ignition module and your ignition coil relative to your DRV sensor, wiring, junction box, and *DATAPRO-45™*. If it is possible to put more distance between them, then do so.

If you still can't eliminate the noise on your DRV sensor, then inspect your ignition wiring. Most likely, you have a zero resistance (solid core) wire from your coil to your distributor, a zero resistance rotor button, and zero resistance spark plug wires. You will need to replace these wires with a higher quality radio noise suppression type wire, such as MSD 8.5 mm Super Conductor wires.

5.6. Switch status (S1-S4) is backwards

If the LCD indicates the opposite of the desired switch position, then you have the switch status configured backwards. See the on-line documentation of your *DATAPRO ON-LINE™* software.

5.7. Switch (S1-S4) is always on or off

If the switch status does not react to the switch, short the switch input to chassis ground right at the junction box. If the switch status does not respond, call your dealer for customer support. If the switch status works, try shorting the signal to ground at the other end of the cable near the switch. If the switch status now fails, the problem is in the cable. If the switch status works, then the problem is with the switch.

5.8. Record Switch doesn't work

First, make sure that you can start recording by holding down the "START" button on the *DATAPRO-45™*. If this doesn't work, call your dealer for customer support.

Otherwise, short junction box position B12 directly to chassis ground. If this starts recording, then your problem is with your cable or your switch. You can short the record signal to ground at the far end of the cable, next to the switch. If recording starts, then the cable is good and the problem is with the switch. If recording does not start, then the problem is with the cable.

6. Specifications

Dimensions:	Main unit: 4.5" w, 2.6" h, 1.9" deep, Approx. 6.5 ounces Junction Box (excluding feet): 9" wide, 3.5" high, 1.7" deep, under 24 ounces
Power Requirements:	11 to 24 volts DC Approximately 200mA
LCD Operating Temperature:	0°C to 50°C (32°F to 122°F)
LCD Storage Temperature:	-20°C to 70°C (-4°F to 158°F)
Data Sample Rate:	100 samples/second standard. Thermocouples 50 samples per second Suspension Sensors 600 samples per second
Memory Capacity:	Estimated 3 minutes recording all channels
COM/PRT port:	Naturally 14,400 Baud, 8 data bits, 2 stop bits, no parity Configurable to standard rates up to 115,000 baud.

7. Customer Support

We will always be happy at Computech Systems, Inc. to help if you have any trouble installing, configuring, or using your new *DATAPRO-45™* main unit. Before calling,

however, be sure to reread the sections of the manual dealing with the aspect with which you may be having trouble. Be especially sure to read the troubleshooting section.

Recommended wire colors:

Power	Red
Ground	Black
Engine RPM	Violet
Transbrake	Blue
Record	Green
Oxy1	Orange
Oxy2	Yellow
Switch-1	Brown
Switch-2	
Switch-3	
Switch-4	
Shift Light 1	
Shift Light 2	
Shift Light 3	
Shift Light 4	Grey