Multi-Function Dash Logger

Users Guide

Part No. 2650-1446-00 Rev. A

Input	Sensor Part #	Channel Name
PA1		
PA2		
PA3		
PA4		
A5		
A6		
A7		
A8		
A9		
A10		
PA11		
PA12		
PA13		
PA14		
A15		
A16		
A17		
A18		
A19		
A20		
PA21		
PA22		
PA23		
PA24		
A25		
A26		
A27		
A28		
A29		
A30		
PA31		
PA32		
PA33		
PA34		
A35		
A36		
A37		
A38		
A39		
A40		

Preface

Congratulations

Congratulations on choosing the Auto Meter Multi-Function Dash Logger. This system will give you a wealth of information to enable you to obtain the maximum performance from your vehicle.

Purpose of this manual

This manual will help you install and use the Auto Meter Multi-Function Dash Logger. It explains how to set up and configure the system for your vehicle.

Related Products From Auto Meter

If you need information about other Auto Meter motor sport products, these can be obtained from your local Auto Meter dealer. Products available from Auto Meter include:

- Playback Tachometers
- Auxiliary Gauges
- Data Logging Systems
- Display and Logging Systems
- Display and Analysis Software
- Video Overlay Systems
- Solid-state Video Recorders

Contents

Chapter 1. Introducing the Multi-Function Dash Logger

The Auto Meter Multi-Function Dash Logger can monitor a range of values, known as performance parameters, needed for effective car and driver management in most competitive situations.

The system consists of a nine-input sensor module with a built-in two megabyte data recorder.

The system also provides a gearshift warning light that illuminates above an RPM value that you define for your vehicle.

All of the sensors may be recorded at rates up to 200 samples per second (200 Hz). Data recording can be configured to start when a parameter, eg, Engine Speed, rises above a preset value (Please check with your sanctioning body to determine if this is legal) or with the push of the start record button.

The recorder can hold multiple runs and those runs can be downloaded to you PC using the Auto Meter DataPro software (see separate Users Guide).

How to use this Manual

Auto Meter recommends that you unpack and connect the components in the system **before** you install it in your vehicle. This will enable you to familiarize yourself with operating the system and configuring it for the vehicle in which you intend to install it.

This manual starts by taking you through the process of checking the system before installation, installing it in your vehicle, configuring the system and finally using it.

! *This manual does not attempt to explain how to interpret or use the information from the Multi-Function Dash Logger as this is very specific to the type of vehicle in which it is installed and the type of competition in which that vehicle is engaged.*

Chapter 2. Getting Started

This chapter guides you through the initial unpacking and setting-up of the equipment for pre-installation checks and familiarization with its operation.

Standard Multi-Function Dash Logger Items

The Multi-Function Dash Logger is supplied with the following standard components:

Quantity	Description
1	Multi-Function Dash Logger Module (#9601/2/3)
1	Wiring Harness (ST872-925)
1	Network Starter Harness (ST877)
3	Peak, Layer & Alarm Switches (ST511)
1	CAN-USB Network Interface (ST8990)
3	Internal G Sensors
1	DataPro Software (ST920033)
1	DataPro Quick-start Guide (ST542095)
1	Designer Quick-start Guide (ST542068)

Optional Items

Quantity	Description
1	Auto Meter Shift Light and / or Alarm Light Relay Module (9580)
Various	Sensors to suit your needs

The Multi-Function Dash Logger Module

The Multi-Function Dash Logger Module consists of a compact display module which incorporates an analog tachometer, a display panel and warning lights. That module is connected to up to nine external sensors by a wiring harness with a 19-way military connector. The wiring harness also allows connection to a PC for configuration and downloading recorded data.

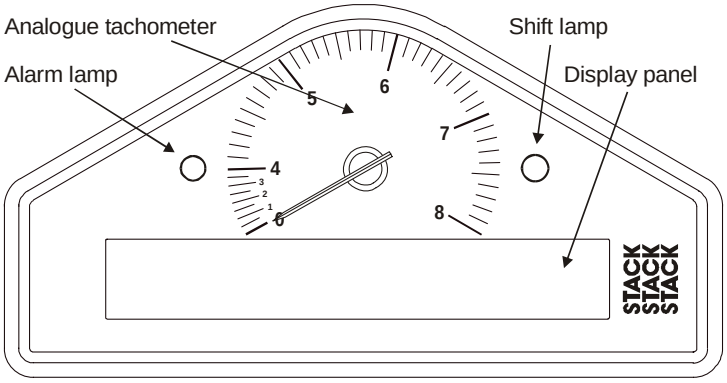
Wiring Harness

Each of the wires in the harness is labelled:-

Label	Connection to
AL	Alarm light
SL	Shift light
S1, S2 and S3	Peak, Layer and Alarm Switches
PA1	Engine speed (RPM) or 5 volt sensor
PA2 to PA4	Pulse or 5 volt sensors
A5 to A9	5 volt sensors
NET	CAN-USB connection to PC
B+	Battery positive (9 – 18 volts)
B–	Battery negative (Ground)

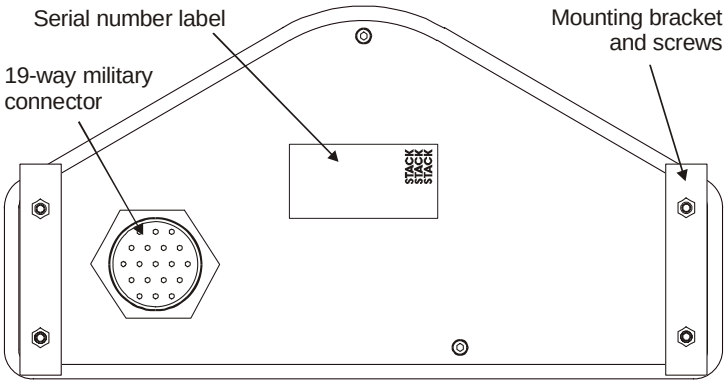
The Display Module

The Display Module consists of an analog tachometer, a digital display panel and two warning lamps.



Front View

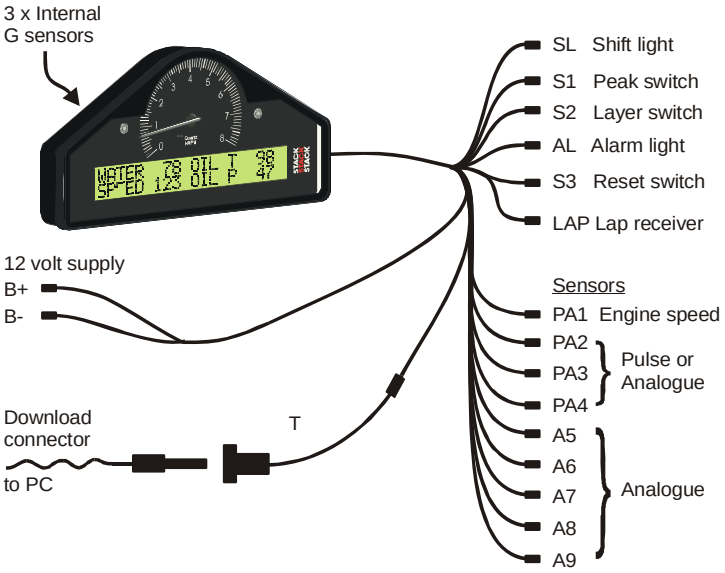
The Display Module is connected to a variety of sensors by a wiring harness. The wiring harness has a 19-way military connector for connection to the Display Module.



Rear View

Connecting the Components

Refer to the diagram below which shows the wiring for the Multi-Function Dash Logger:-



1. Connect the Wiring Harness to the Multi-Function Dash Logger Module.
2. Connect the three switches to the wires labelled S1, S2 and S3.
3. Connect the Alarm Light to the wire labelled AL.
4. Connect the optional Multi-stage Shift Light or Single Shift Light to the wire labelled SL.
5. Connect each of the sensors that you have purchased to the appropriate wire in the wiring harness. The first four sensor connections (PA1 to PA4) can handle either Pulse or Analog (5 volt) sensors. The remaining five connections (A5 to A9) can only handle Analog sensors.
6. Connect a 12v DC power supply to the power inputs, eg, from a car battery. B+ is battery positive and B- is battery negative. Protect the B+ line with a 5 amp fuse.
7. Switch on the 12v DC power supply.

You can now proceed to familiarize yourself with operating the Multi-Function Dash Logger.

Chapter 3. Installing the Multi-Function Dash Logger

This chapter guides you through installing the system in your vehicle.

Who can install the Multi-Function Dash Logger?

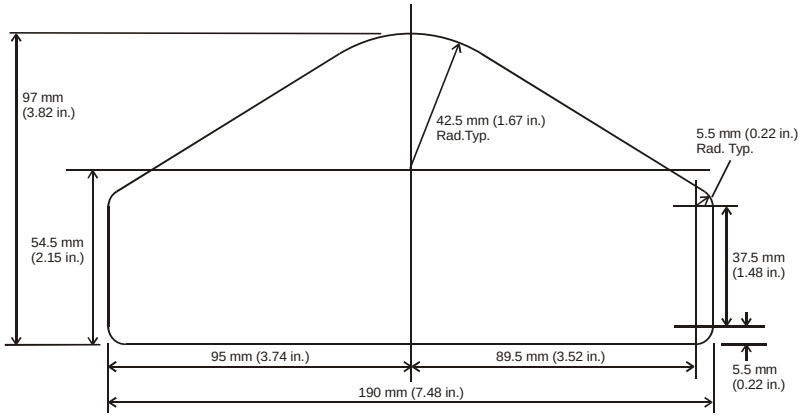
The Multi-Function Dash Logger can be installed by anyone competent in fitting electrical and mechanical accessories to cars.

Tools needed

No special tools other than normal workshop tools are required.

Fitting the Multi-Function Dash Logger Module

The Display Module is fitted into a cut-out in the instrument panel/dashboard and secured using the two U-brackets at the rear. The dimensions for the cut-out are shown below. A full-size template can be found in Appendix A.



Positioning the Display Module

Ensure that there is sufficient space behind the cut-out to allow the wiring harness to be connected to the 19-way connector without any tight bends to the wiring near the connector.

The Display Module must be positioned on the dashboard so that the driver can see it, either over the steering wheel or through it.

In order to get the most accurate results from the internal G sensors, the Display Module should be aligned so that it is as close as possible to the three main axes (X, Y and Z) of the vehicle. The DataPro Designer Calibration function allows any minor out-of-axis errors to be corrected but it cannot be used to correct alignment errors of more than 5 degrees.

Switches

The three switches are used to control the functions of the Multi-Function Dash Logger.

The normal functions of the switches are:

Switch	Function
1	Show Peak Values
2 (short press)	Clear Alarms or Change Display Layer
2 (long press)	Toggle Recording – start and stop recording
1 & 2	Display software version banner
1 & 3	Reset peak values

You can install the switches in any convenient location. When installing the switches, you should take account of the following considerations:

- The cable for each switch is approximately 16" (400 mm) in length from the 19-way military connector so use extender cables if necessary.
- It is important that the driver can reach the Peak and Layer Switches easily in order to show peak values and to clear alarms. These switches would normally be fitted on or near the steering wheel.
- Drill a half inch (13 mm) hole in a suitable panel or manufacture a bracket with a hole in it.
- Insert each switch from the reverse side of the panel and screw on the rubber cover from the front. Do not over-tighten the nut; just greater than hand-tight should be enough.

Warning lights

The Display Module has two built-in warning lights. One of these is for the gear shift light and the other for warning the driver that an alarm has been triggered.

As an option, you can install an additional external warning light which should be mounted in any position that is in the driver's direct line of vision as it needs to be visible at all times.

Auto Meter can supply suitable external warning lights for installation in the dashboard as well as shrouded versions that can be mounted on top of the dashboard.

- Drill a half inch (13 mm) hole in a suitable panel or manufacture a bracket with a hole in it.
- Pass the light through the hole from the viewing side.
- Thread the plastic nut over the two wires and tighten it on to the light. Do not over-tighten the nut; just greater than hand-tight should be enough.
- Connect the wires to the AL cable on the wiring harness using an extension cable if necessary.

! *If you are using your own warning light, ensure that the bulb rating does not exceed 2 Watts otherwise the Multi-Function Dash Logger Module will be damaged.*

External Shift Lights (optional)

In addition to the internal shift light, the Multi-Function Dash Logger Module has the ability to illuminate an external light to indicate it is time to change up a gear. The gear shift light illuminates when the engine RPM exceeds a predefined value.

To use any Auto Meter shift light, it is necessary to purchase the shift light relay module (9580). Connect the red wire from the module to +12V and the black wire from the module to a good engine ground. Plug the Sure Seal connector on the relay module to the connector marked SL on your sensor harness. Plug the 2 pin connector from the relay module into the Auto Meter shift light.

! *If you are using your own warning light, ensure that the bulb rating does not exceed 2 Watts otherwise the Multi-Function Dash Logger Module will be damaged.*

Engine Speed (RPM) Measurement

The engine speed (RPM) is measured by connecting the engine speed wire directly to the ignition system. A single wire from the connector labelled PA1 connects the Multi-Function Dash Logger to the ignition system.

! *The PA1 input has special properties which will reject noisy signals making it ideal for connecting to engine speed signals, particularly signals obtained from magnetos. For this reason Engine speed signals should not be connected to PA2 to PA4.*

Connecting the Multi-Function Dash Logger to the ignition system

The Multi-Function Dash Logger can be connected to engines with a variety of ignition systems as shown in the table below:

Ignition System	Connection Point
ECU / Ignition Box	Direct to tachometer output
Coil and Points	Use adapter (ST493) to connect to the coil negative (low tension) terminal
HT coil lead	Use HT pick-up (ST697)

The following connections are shown in greater detail:

- Electronic ignition, ECU connection, CDI ignition (MSD, Mallory…..)
- Standard contact breaker system
- Contact breaker series resistor connection

Electronic Ignition or ECU Connection

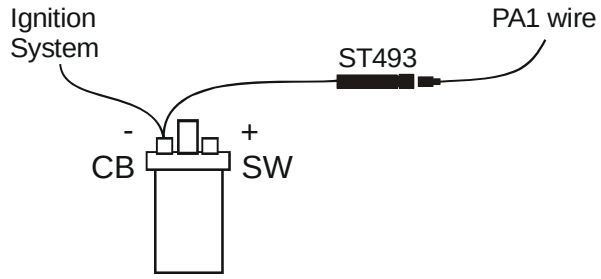
Connect the PA1 wire directly to the "Tach" output of the electronic ignition or Engine Control Unit.

The signal can be either a 5 volt or 12 volt pulse.

Standard contact breaker system

Connect the PA1 wire to the negative terminal on the coil using a ST493 ESPD Interface cable.

! *Do not connect the PA1 cable directly to the coil or the Multi-Function Dash Logger Module will be damaged.*



! *Ensure the ignition system wire is held away from the ST493 wiring for greater than 4 inches (100 mm).*

! *Magnetos – RPM Senor or Mag Signal Converter (9118) required.*

Fluid Pressure Sensors

The Multi-Function Dash Logger can be connected to a range of fluid pressure sensors to measure, for instance, Oil Pressure and Fuel Pressure.

Fitting the pressure sensors

- Position the sensors and their cables as far as possible from all sources of intense heat and from the ignition HT leads.
- Each sensor can either be screwed (1/8" NPT) in directly to the monitoring point or fitted separately by using a suitable pressure hose to connect it to the monitoring point.
- Do not screw the sensor directly into the engine block because excessive vibration from some racing engines can affect the long-term life of the sensor.
- Do not over-tighten the sensor.
- Plug the sensor's Mini Sure-Seal connector into any of PA2 to PA4 and A5 to A9 of the Sensor Harness.

Fluid Temperature Sensors

The Multi-Function Dash Logger can be connected to a range of temperature sensors to measure, for instance, Water Temperature and Oil Temperature.

Fitting the temperature sensors

- Position the sensors and their cables as far as possible from sources of intense heat and from the ignition HT leads.
- Mount each temperature sensor directly in the appropriate fluid line. Screw (1/8" NPT) the sensor into a suitable mounting boss so that its tip lies near the middle of the flow of fluid.
- Plug the sensor's Mini Sure-Seal connector into any of PA2 to PA4 and A5 to A9 of the Sensor Harness.

Exhaust Gas Temperature Sensors (EGT), Intake Temperature Sensors and Cylinder Head Sensors

The Multi-Function Dash Logger can be connected to a range of K-Type thermocouple sensors to measure, for instance, Exhaust Gas Temperature. These typically measure temperatures from zero up to 400°F (200°C) or 2000°F (1100°C).

Plug the sensor's Mini Sure-Seal connector into any of PA2 to PA4 and A5 to A9 of the Sensor Harness.

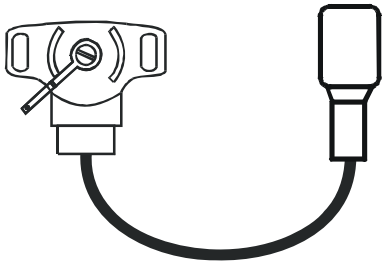
Position Sensors

The Multi-Function Dash Logger can be connected to a range of position sensors for measuring throttle, steering or damper movements.

Plug the sensor's Mini Sure-Seal connectors into any of PA2 to PA4 and A5 to A9 of the Sensor Harness.

Rotary position sensor with arm

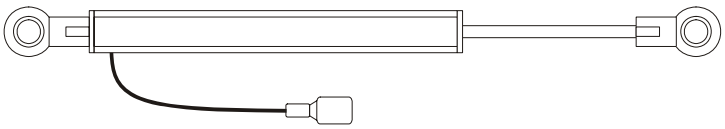
This sensor has a spring loaded lever which should be attached using a length of stranded wire to, for instance, a throttle pedal.



1. Find a mounting position which does not interfere with the drivers feet or operation of the controls.
2. Once the intended location for fixing is determined, drill 3/16" (4.5 mm) holes to provide clearance for the supplied bolts
3. Bolt the sensor in place and connect it to the wiring harness
4. Using the length of cable supplied, pass the end of the cable through the hole in the lever arm and attach the other end to the side of the pedal lever.
5. Adjust the cable tension until the lever arm is just pulled away from its resting position. This adjustment should be checked regularly to remove any slack in the cable which may give rise to errors in throttle position.

Linear Displacement Sensors

The linear displacement sensor should be mounted between the vehicle's chassis and a suspension member. These sensors are available with various maximum displacements to suit different suspension systems.



1. Find mounting positions on the suspension members and the adjacent chassis.
2. Once the intended location for fixing is determined, drill 3/16" (5 mm) holes and fit suitable bolts.
3. Attach the sensor body to the chassis and the extending arm to the suspension.
4. Connect the sensor cable to the wiring harness.

! *The spherical bearings at each end of the sensor are designed to absorb any bending forces on the sensor rod and should not be restricted in any way. Failure to do this will result in bending forces being applied which will cause the sensor to fail.*

! *The sensor will be damaged if it is allowed to extend or compress beyond its normal range of movements.*

Wiring harness

The Multi-Function Dash Logger Module and the sensors, switches and lights are connected together by means of the wiring harness and sensor extender cables supplied with the system or the sensors.

The wiring harness can be fitted after the Multi-Function Dash Logger Module and all the sensors and switches have been installed.

The sensor harnesses have short cables terminated with Mini Sure-Seal connectors. Likewise the sensors have short cables terminated with the mating connector. Since neither of those short cables is likely to be long enough to reach the sensors in their installed positions, you will need to bridge the gap using extender cables which are available from your dealer in a variety of lengths.

Fitting the wiring harness

When fitting the harness on the vehicle, you should observe the following:

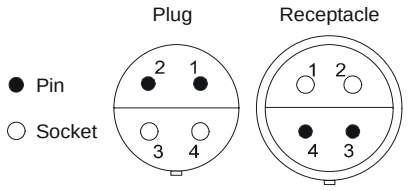
- Start by attaching the sensor harness to the Multi-Function Dash Logger Module by connecting the 19-way military connector.
- First position the ends of all the wires at the locations of the sensors, lights and switches to which each is to be connected, but do not connect them yet.
- All wires should be as far as possible and not less than 3 inches (75 mm) from sources of heat and electrical noise such as exhaust pipes, ignition HT leads, distributor caps etc.
- When you pass any wire through a bulkhead or dashboard, fit a grommet into the hole so that the edge of the hole cannot chafe the wire.

! *Particular care is needed when passing wires through holes in carbon fiber as the carbon can cut through cables very easily.*

- The download jack socket (the NET connector) should be mounted to the vehicle through a 1" (25.4 mm) diameter hole. It should be positioned so that it is easily accessible to the PC for downloading data when the vehicle comes into the pits. Packing washers are provided to ensure the socket is securely mounted.
- Connect the wires when all the sensors are in position and you have secured the wiring harness.

Mini Sure-Seal Connectors

The Multi-Function Dash Logger Module connects to its sensors via four way ITT Cannon Mini Sure-Seal (MSS) connectors. A plug (the smaller of the two connectors) can be found on the ends of the Sensor Harness and a receptacle on the cable from the sensor. The following polarity is observed in all cases:



Pin	Signal Description
1	Signal from sensor
2	5 volt sensor supply
3	Battery positive
4	Sensor ground

! *Mini Sure seal connectors offer excellent vibration and waterproof performance. However they do not have a positive locking mechanism so must not be subject to bending or pulling load, as such loads can cause the connector to fail.*

Chapter 4. Display Panel

The built-in Display Panel has been designed for presenting driver information in as clear and precise a way as possible.

Simple controls allow the display to be scrolled through six display layers by pressing the Layer Switch. Each layer can show either 2, 4, or 6 parameters.

During alarm conditions the whole display is used to present a warning message and its associated alarm value.

Peak Values (Tell Tales)

The Multi-Function Dash Logger can display the peak values (sometimes called 'tell-tales') that have been recorded during a run for all the displayed parameters.

Peak values are updated only when the engine speed has exceeded its fixed 'gate value' of 3000 RPM *for at least one second* which allows the values to stabilize. Blipping the engine may not be enough to update the peak values. This is to prevent abnormal peak values from being recorded when, for example, the engine is either not running, is idling or is being warmed up.

Displaying the Peak Values

Press and hold the Peak Switch to show the peak values for the parameters currently being displayed. Release the switch to return to the normal display.

Resetting the Peak Values

You can reset all of the peak values manually. If the engine is running **at** or **above** its gate RPM when the peak values are reset, they are set to the current value of each performance parameter.

If the engine is running **below** its gate value, the peak values are not reset to the current values but are set to full-scale values appropriate for the type of peak which has been chosen.

To reset the peak values:

- Press and hold the Peak Switch to display the peak values.
- While holding that switch, press and hold the Reset Switch.
- With the Reset Switch held down, you will see the parameters revert to the current values. The new peak values that are stored are those being displayed when you release the Reset Switch.

Alarms

The Multi-Function Dash Logger has the ability to show warnings and alarms to alert the driver when certain parameters either exceed or fall below their alarm values. For example, a warning may be issued if the fuel pressure falls below its alarm value or if the oil temperature rises above its alarm value. You can adjust the preset alarm levels when you configure the Multi-Function Dash Logger using DataPro Designer.

You can configure the warnings so they are triggered only while another parameter is above or below a defined value, eg, while the engine speed exceeds a certain RPM. Blipping the engine should not be enough to trigger a warning. This helps to prevent abnormal warnings from being triggered when, for example, the engine is either not running, is idling or is being warmed up.

Displaying an Alarm

When an alarm condition occurs, the built-in red warning light turns on and a pop-up message is displayed. The optional external light will also illuminate.

Clearing an Alarm

Press the Layer Switch while an alarm is being displayed to clear that alarm.

Chapter 5. Using the Multi-Function Dash Logger

Configuring the system

Before using the Multi-Function Dash Logger it must be configured to work with the sensors and optional parts you have installed. This is performed using the DataPro Designer program.

There is no limit to the number of times configurations can be uploaded into the Multi-Function Dash Logger. So, as your system changes over time, perhaps by adding new sensors, changing the recording rates of existing sensors or modifying the layout of the LCD Display, new configurations can be created. This makes the Multi-Function Dash Logger a very powerful tool since it is so easy to adapt it to new environments.

Details of how to install the DataPro suite of software and how to use Designer to configure your Multi-Function Dash Logger is described in separate User Guides supplied with your system.

Configuration Memory

The uploaded configuration is stored in non-volatile memory so it is retained when the external power source is disconnected from the system.

If, after several years, the configuration (and any recorded data) is lost when the system is powered down, it is likely that the internal back-up battery will need replacing. In that case the Multi-Function Dash Logger Module should be returned to Auto Meter for a service during which its internal battery will be changed.

! *Ideally the modules should be returned every 4-5 years to ensure no loss of data.*

Checks and Alarms

You should check the system to ensure that all the sensors are detecting the correct values. This is most easily accomplished using DataPro's Data Monitor function. You should run the engine up to its operational levels to check that the values displayed are accurate.

Recording Data (Data Logging)

While it is possible to start and stop recording by pressing the Layer switch, it is more useful to control recording automatically using DataPro Designer to start when the Engine Speed exceeds a pre-defined RPM. The Multi-Function Dash Logger records channels at the rates chosen in Designer. When setting the recording rates Designer indicates the maximum amount of recording time which is possible with those rates.

A message will pop-up on the LCD Display when ever recording starts or stops.

The Multi-Function Dash Logger can record up to 30 runs of data. No more recording is allowed if the memory is full or the maximum number of runs is reached.

Once data has been recorded it can be downloaded to your PC using DataPro's Recorder menu. Connect the Multi-Function Dash Logger to your PC using the CAN-USB interface cable. Connect it to the PC via the USB connector and to the vehicle using the 4-way jack plug.

It is possible to put DataPro into download mode prior to the car being available, eg, before it arrives at the pits. Then all that is required to perform the download is to plug the jack into the on-vehicle socket. Data will be transferred to the PC immediately the connection is made.

! *For further details please refer to the Auto Meter DataPro documentation.*

Calibrating Sensors

Certain sensors should be calibrated so that their recorded data is displayed correctly once downloaded to DataPro. The following parameters are the most common types which need to be calibrated:

Parameter	**Calibration**
Wheel speed	Set the Wheel Circumference to the overall measurement of the sensing wheel
G sensors	Set the zero point for each G sensor with the race-ready vehicle standing on a level surface
Suspension sensors	Set the zero point for each suspension sensor with the race-ready vehicle standing on a level surface
Pedal positions: Throttle, Brake etc	Set the values for resting and fully depressed pedal positions
Steering position	Set the 90° left and 90° right steering wheel positions

! *For further details please refer to the Auto Meter DataPro Designer documentation.*

Chapter 6. System Specifications

Power supply	9 to 18 Volts DC @ 0.3A typically 1 Amp max (fuse @ 5A)
Working temperature	-4 to 160 Degrees Fahrenheit (-20 to +70 Degrees Celsius)
Size	8” x 4¼” x 2” (200 mm x 105 mm x 50 mm)
Weight	1.1 LB (0.5 kg)
Vibration	30 G, 50 to 2000 Hz, 1 Octave / min, 36 Hours
Humidity	0 to 100% condensing (Fully sealed)
Immersion	IP67

Analog sensor inputs

Input Description	Value	Units & Notes
Input impedance	>1.0	MOhms (to +6.25v)
Input voltage measurement range	0 to +5.0	Volts min/max
Input over-voltage range	-2 to +18	Volts min/max
Input resolution	10bit (~5mV)	0-1023

Pulse sensor inputs

Input Description	Value	Units & Notes
Input pull-up	18	mA (to +6.25v)
Input edge threshold	5.5 ±0.5	Volts Note: Add 390R in series for 2.25v
Input over-voltage range	-2 to +18	Volts min/max
Max input frequency	2.5	KHz
High period pulse width	0.1	mS Min
Low period pulse width	0.1	mS Min

Pulse sensor outputs (S5V)

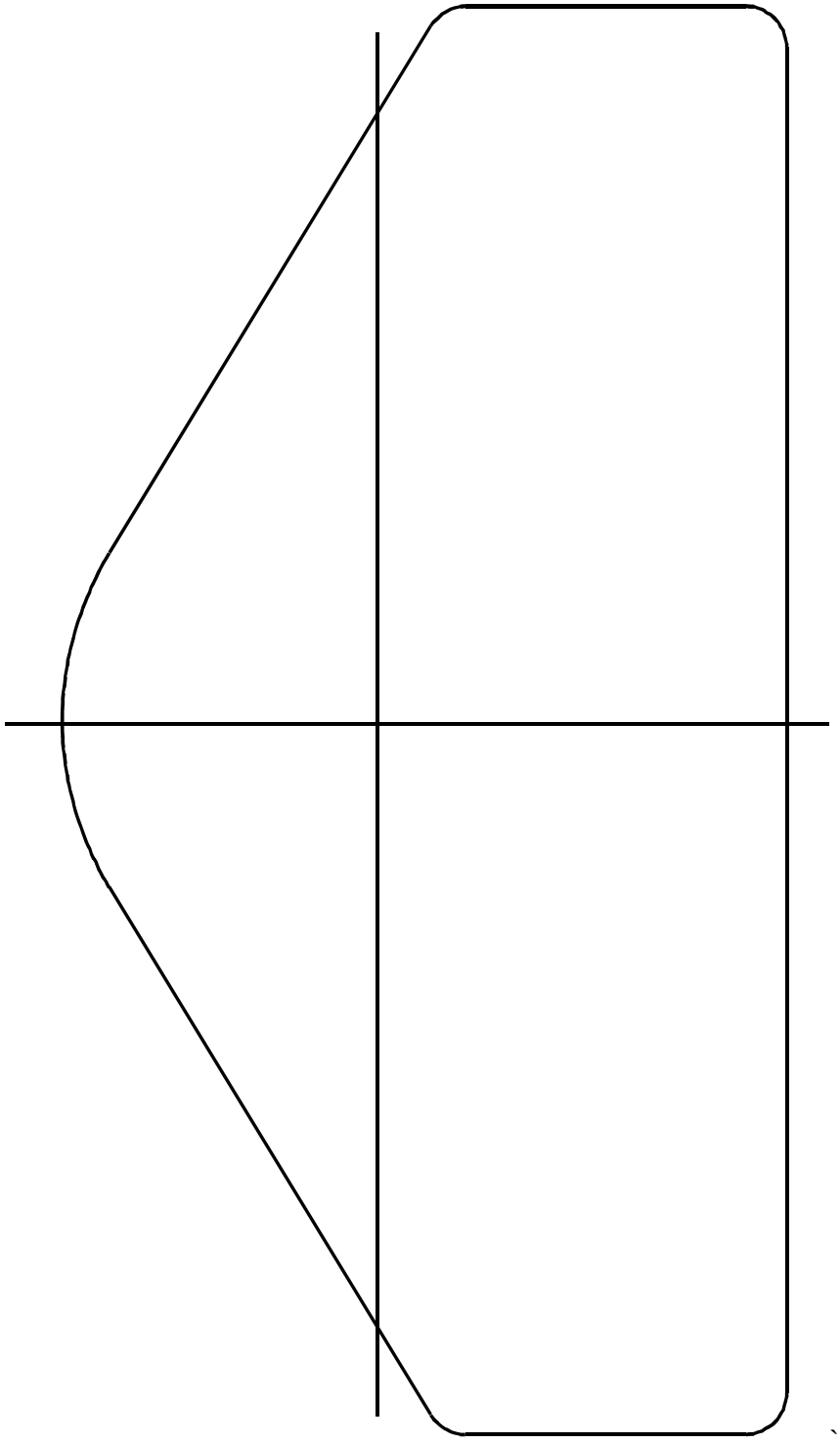
Output Description	Value	Units & Notes
Sensor 5v supply voltage	5.00 ±0.05	Volts
Sensor 5v supply current	100.0	mA max

Battery power input (B+ & B-)

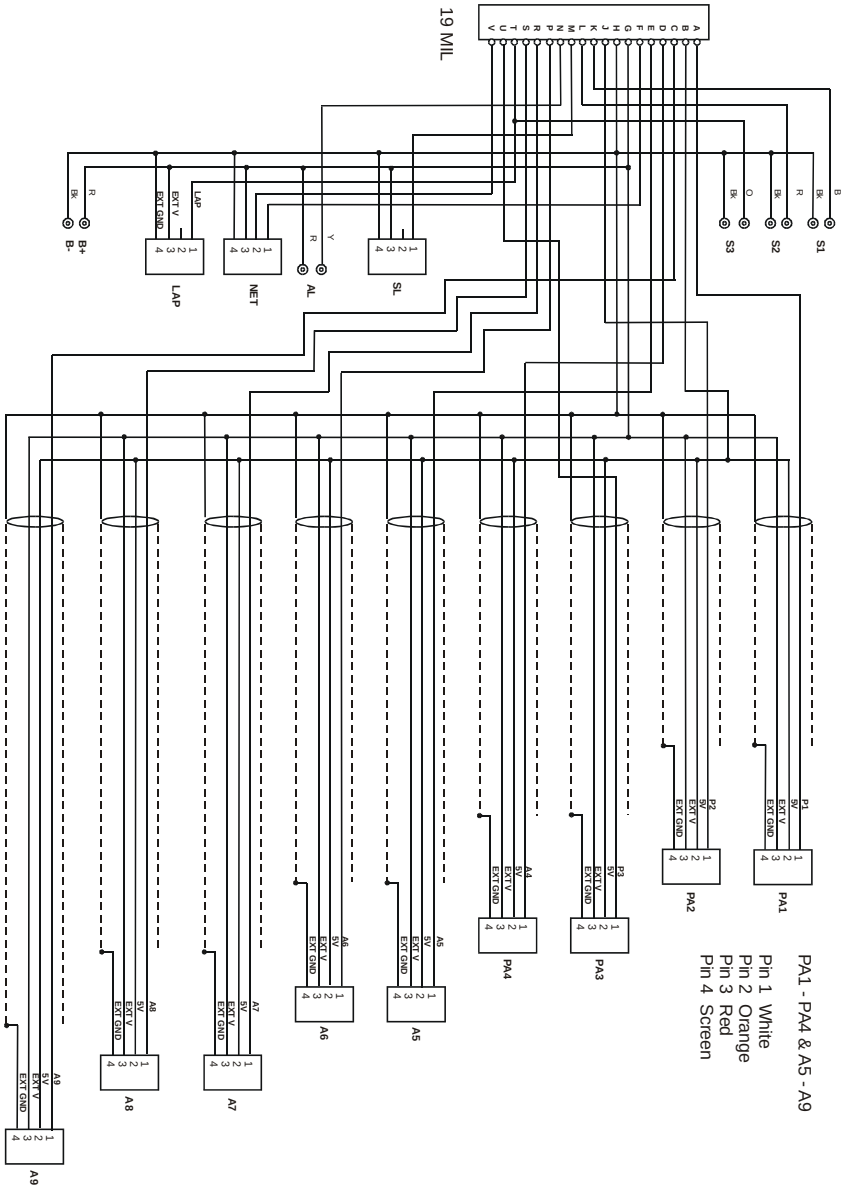
Description	Value	Units & Notes
Input voltage operating (B+ & B-)	9 to +18	Volts min/max
Input over-voltage range	-20 to +25	Volts min/max
Supply current	0.3 to 1.0	Amps typical – Max (fuse at 5A)

Appendix A. Display Module Template

Use the template on the following page for cutting out an aperture for the Display Module.



Appendix B. Wiring Harness Diagram



Appendix C. Switch Functions

Functions	Switch
Show Peak Values	1
Clear Alarms or Change Display Layer	2 (short press)
Toggle Recording	2 (long press)
Display software version banner	1 & 2
Reset lap times and reset peak values	1 & 3

Appendix D. Light Functions

Functions	Light
Alarm active on display	Warning light
Engine speed above shift set-point	Shift light

Appendix E. Service and Support

Service

For service send your product to Auto Meter in a well packed shipping carton. Please include a note explaining what the problem is along with your phone number. Please specify when you need the product back. If you need it back immediately mark the outside of the box “RUSH REPAIR”, and Auto Meter will service product within two days after receiving it. ($10.00 charge will be added to the cost of “RUSH REPAIR.”) If you are sending product back for Warranty adjustment, you must include a copy (or original) of your sales receipt from the place of purchase.

12 Month Limited Warranty

Auto Meter Products, Inc. warrants to the consumer that all Auto Meter High Performance products will be free from defects in material and workmanship for a period of twelve (12) months from date of the original purchase. Products that fail within this 12 month warranty period will be repaired or replaced at Auto Meter’s option to the consumer, when it is determined by Auto Meter Products, Inc. that the product failed due to defects in material or workmanship. This warranty is limited to repair or replacement of parts in the Auto Meter instruments. In no event shall this warranty exceed the original purchase price of the Auto Meter instruments nor shall Auto Meter Products, Inc. be responsible for special, incidental or consequential damages or costs incurred due to the failure of this product. Warranty claims to Auto Meter must be transportation prepaid and accompanied with dated proof of purchase. This warranty applies only to the original purchaser of product and is non-transferable. All implied warranties shall be limited in duration to the said 12 month warranty period. Breaking the instrument seal, improper use or installation, accident, water damage, abuse, unauthorized repairs or alterations voids this warranty. Auto Meter Products, Inc. disclaims any liability for consequential damages due to breach of any written or implied warranty on all products manufactured by Auto Meter.

For Service Send To: AUTO METER PRODUCTS , INC.
413 W. Elm St., Sycamore, IL 60178 USA (866) 248-6357

Email us at service@autometer.com
http://www.autometer.com

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