

SDL Sport Dash Logger



Race smart.

THE COMPANY



MOTEC was founded in 1987 with the aim of providing world class products, superior customer service and the most advanced technology available.

A strong commitment to delivering the best possible solutions, state-of-the-art hardware and user friendly software has earned **MOTEC** international recognition as a leader in engine management and data acquisition systems.

As automotive technology continues to evolve, **MOTEC** reinforces its dedication to research and development with an innovative range of products and sophisticated software, all backed by an outstanding package of total customer support and an exceptional two year product warranty.

THE MOTEC DIFFERENCE

The **MOTEC** brand represents smart engineering, dedicated research and development and an uncompromising approach to quality. **MOTEC** insists on using first class components and superior manufacturing processes to ensure the highest levels of performance and reliability.

ENVIRONMENTAL PROTECTION

MOTEC Dash Loggers are built tough to withstand the extreme conditions of a diverse range of applications worldwide. Each SDL is robotically assembled and dipped in liquid silicone to fully encapsulate the components and circuit board. This military grade coating protects the surface mounted technology from damaging environmental contaminants such as moisture and dust, and improves resistance to vibration.

The 37 pin Autosport connector with gold plated contacts enhances connection reliability, while a robust aluminum enclosure provides further protection and a strong mounting solution.

FLEXIBILITY

MOTEC's SDL adapts to virtually any application, enabling users to tailor a system to their specific needs. All aspects of the Dash Logger are fully configurable, including sensor types, the allocation of sensors to inputs, channel selection, logging speeds, warning alarms and the control of auxiliary devices such as pumps, valves and solenoids.

The Sport Dash Logger is compatible with any **MOTEC** engine management system, as well as many other ECU brands, and can be used in conjunction with one or more **MOTEC** Professional Lambda Meters (PLMs).

INTERNAL G SENSOR - LATERAL & VERTICAL

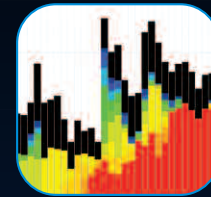
The SDL's built-in dual axis G sensor is useful for Track Mapping and analysis of cornering performance.

DATA ACQUISITION

In today's fiercely competitive motorsport environment, data acquisition systems have become one of the most powerful tools to success. Using sophisticated analysis software and data collected from a variety of sensors, the behaviour of a vehicle can be comprehensively investigated, the effects of changes evaluated in detail and improvements made.

By recording and analysing information about temperature, speed, acceleration, strain and movement, users can gain valuable insights into performance and reliability, resulting in more efficient testing and tuning and greater predictability on race day. This information can also be used to determine pit stop strategy, to assess and compare driver technique and to ensure maintenance schedules are met.

For immediate feedback, vehicle data and lap information can be monitored live in the vehicle's cockpit on the **MOTEC** SDL Sport Dash Logger display.



ALL-IN-ONE DISPLAY, LOGGER & CONTROLLER

Separate products are often used to perform logging, controlling and display functions individually. **MOTEC**'s SDL, however, delivers seamless integration of all three, with a configurable display and four auxiliary outputs as standard, plus the option for 8Mbytes of data logging. The one compact unit provides a complete solution, reducing space, weight and installation requirements.

CONVENIENT OPTIONAL UPGRADES

The SDL has been designed to grow with users' needs - from a sophisticated digital display to a fully optioned data acquisition system. Customers can minimise their initial investment by opting for a level of functionality that meets their current needs, with a view to adding options such as Data Logging, Wideband Lambda and Pro Analysis in future if they are required.

MOTEC's convenient password upgrade process allows users to activate these extra features quickly, without making physical alterations to the SDL.

Those looking for additional data functionality and system expansion can step up to **MOTEC**'s ADL2 Advanced Dash Logger. (See specification page for details)

FREE SOFTWARE & UPDATES

With **MOTEC** Dash Loggers, both the operating software and data analysis software are free. Updates are available at no cost via the website, giving users access to the latest features for the life of their equipment.

MOTEC's groundbreaking new **i2** data analysis software offers unparalleled versatility to users of all levels.

SDL SPORT DASH LOGGER



Proven on two wheels and four, on land and on water, from 4 second quarter miles to 24 hour endurance events, **MOTEC** Dash Loggers are renowned for outstanding accuracy and reliability.

The SDL offers the same superior construction and advanced technology of **MOTEC's** top of the line ADL2 Advanced Dash Logger, with a package of features tailored to suit more moderate system requirements.

The SDL can be purchased as a display-only Dash or as a combined Dash Logger with 8Mbytes of memory and, because each unit has data logging capability built in, display-only SDLs can be upgraded at any time via password.

Over 200 channels can be derived from a mixture of Analogue, Digital, RS232 Serial and CAN bus data channels.

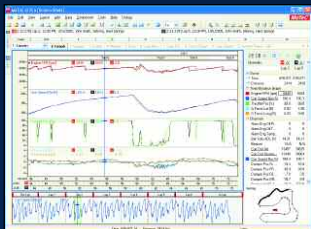
CHANNELS MAY INCLUDE:

- Infrared tyre temperatures
- Suspension positions
- Suspension forces
- Ride heights
- Vehicle yaw
- Hydraulic pressures
- Fuel used
- Driveshaft speed
- Throttle position
- Exhaust Gas Temperatures
- Boost pressure
- Brake rotor temperatures
- Damper velocities
- Chassis strain
- G Forces
- Tyre slip angle
- Fuel and Oil Pressures
- Wheel speeds
- Engine RPM
- Steered angle
- Lambda
- Air temperature

The Sport Dash Logger directly supports up to 12 analogue inputs, 6 digital/speed inputs, 8 auxiliary outputs and a single Wideband Lambda (air/fuel ratio) input.

DATA LOGGING

Readings taken from analogue, digital, serial, CAN or calculated channels can be stored in the SDL for download and analysis using **MOTEC's** new *i2* software.



Channels can be selected independently and logged at user defined rates of up to 200 samples per second. The most appropriate rate varies from channel to channel; for instance, engine temperature doesn't need to be logged at the same rate as damper position. This

flexibility allows users to maximise the available memory without compromising the quality of the data being logged.

The SDL's non-volatile flash memory operates in a circular buffer mode in accordance with user defined start and stop parameters. Logged data is quickly retrieved via USB at a speed of approximately 500kBytes/second.

DISPLAY

The SDL's high contrast, reflective LCD screen has been custom designed for easy viewing in direct sun and artificial light, with an

optional adjustable backlight for maximum visibility in low light or at night time. High temperature tolerance ensures consistent reliability in all conditions.

The screen layout and units of measurement (e.g. imperial versus metric) are user-defined to suit individual preferences. Each numerical item is programmable to show any value and can be overridden by user defined conditions.

The 70 segment curved bar graph can be configured to display any channel, with optional shift markers.

Thirteen alphanumeric digits along the bottom of the screen can be used to display channel values, messages and warning alarms. There is one programmable override available and 10 text lines which can be scrolled using an external button.

Lap times can be displayed when the SDL is used in conjunction with a **MOTEC** Lap Beacon (or driver activated switch), with or without the Logging option enabled.

SPECIAL FUNCTIONS

The SDL can calculate and display additional information including: Lap Time Gain/Loss, Lap Number, Minimum Corner Speed, Maximum Straight Speed, Fuel Used, Fuel Remaining, Trip Distance and Odometer. It also features a sophisticated engine log system.

WARNING ALARMS



Warnings are extremely beneficial in alerting users to potential concerns with their vehicle, for example, low oil pressure, high engine temperature or low fuel level. Alarms are fully customisable and can be set for any analogue, digital, serial or calculated channel.

The SDL allows for up to 20 warning alarms and each may be defined by two conditions to ensure correct activation. They can be displayed on screen as a visible warning for the driver and, if logging is enabled, can also be stored in the SDL's logging memory.

When an alarm condition has been detected, an auxiliary output may also be activated. These outputs can be used for warning lights or the control of other devices.

The alarms remain active until they are either acknowledged by activating a switch or removed automatically following a user definable period of time.



OUTPUTS

The SDL provides four auxiliary outputs as standard. These can be configured to operate in different modes to activate a wide variety of external functions.

Users may wish to program these outputs to control such devices as shift lights, warning lights, thermo fans, oil and fuel pumps, intercooler spray bars, transmission and diff coolers, nitrous injection, electronic relays and many more.

SENSOR CONFIGURATION

Each input channel on the SDL can be configured with the sensor type and calibration for the appropriate sensor. Common sensor calibration data is incorporated in **MOTEC's Sport Dash Manager** software for users to simply select and assign to a channel. For other sensors a custom calibration can be created and saved for use in subsequent installations.

While **MOTEC** provides a wide range of sensors and accessories, this flexibility gives customers complete freedom of choice.

COMMUNICATION

CAN (CONTROLLER AREA NETWORK)

The CAN bus is a high speed communication standard, operating at speeds of up to 1 Mbit. CAN allows many devices to be connected by a common bus, enabling the sharing of information as part of a larger system.

CAN devices include engine management systems (**MOTEC** and other), sensors, beacons and **MOTEC's** thermocouple amplifier (8 temperature inputs).

SERIAL

The RS232 serial data port is programmable up to 57600 baud. Serial communications devices can be connected for display and logging purposes, including engine management systems (**MOTEC** and other) and GPS systems.

Information may be simultaneously received from one device and transmitted to another.

SPORT DASH MANAGER SOFTWARE

Mindful of those new to data acquisition, **MOTEC** has developed custom set up software for the SDL. The **Sport Dash Manager** program is used to configure the SDL and to download any logged data.

Display preferences, data logging settings and inputs and outputs are stored in a Configuration File which can be modified offline as required and later resent to the SDL. Conditions, tables, alarms and overrides can all be created to activate outputs, warnings and displays.

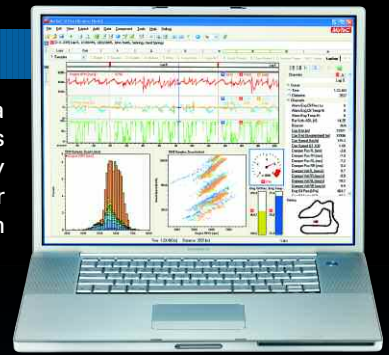
User friendly online help is integrated throughout the software, giving customers access to the power of the SDL without the need for advanced levels of computer knowledge or intense training.

i2 SOFTWARE

MOTEC's all new **i2** data analysis software allows users to comprehensively analyse and manage their data once it has been downloaded from the SDL.

Developed over a number of years with valuable input from race teams worldwide, **i2** offers a state of the art user interface and an extensive package of advanced analysis tools.

There are two levels of functionality - **i2 Pro** and **i2 Standard**. **i2 Pro** requires the *Pro Analysis* SDL upgrade while the **Standard** version is free for all users. Those familiar with **MOTEC's** original *Interpreter* program will notice significant advances in this new generation software.



COMPLETE CUSTOMISATION

The increasing diversity of **MOTEC** users in recent years has prompted a need for software that easily adapts to individual preferences. **i2's** unprecedented levels of customisation allow users, both professional and amateur, to tailor data management tools to suit their specific requirements.

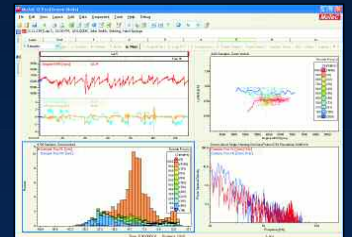
PROJECTS

Projects are central to the management of data in **i2**, particularly when dealing with multiple vehicles or motorsport categories. They store user settings, workbooks, maths and many other customisations. The menus and terminology for each Project have been adapted to suit that type of application, for example Circuit Racing, Drag Racing or Rally.

WORKBOOKS & WORKSHEETS

i2's Workbook and Worksheet structure is flexible and intuitive, allowing users to systematically organise their data into logical layouts. The software is equipped with templates that can be tailored to individual requirements for optimum data analysis efficiency.

Each Worksheet can contain any combination of analysis components including graphs, histograms, scatter plots, FFT plots, mixture maps, reports and various gauges, all of which can be individually customised.



GLOBAL CHANNEL PROPERTIES

Many channel properties such as colour, display units and min/max scales can be changed globally, allowing users to maintain consistency across all data components.

To switch display units, e.g. from metric into imperial, **i2** can perform Automatic Unit Conversion to update all instances with your preferred option.

ACCESSORIES

SENSORS

A wide range of sensors is available for use with the **MOTEC** SDL, including: linear potentiometers, accelerometers, strain gauges, ride height sensors, gyro sensors, tyre slip angle, pressure sensors, temperature sensors (resistive, infrared and thermocouple), hall and magnetic speed sensors, Lambda and many others.



LAP BEACONS

MOTEC's Lap Beacon Transmitter and BR2 Beacon Receiver offer superior optics, low power consumption and are proven to perform reliably even in direct sunlight and at distances of up to 25 metres.



With almost one thousand different channels to choose from, **MOTEC** customers can be confident of avoiding any accidental crossover with other racers' beacons (a common problem with inferior systems).

MOTEC's multiple beacon capability allows users to generate split times by placing several transmitters around the track, or by taking advantage of existing master beacons.



Photo: Peter Zsidy

SHIFT LIGHTS & WARNING LIGHTS

MOTEC provides flexible control over multiple, staged shift lights. In addition, users can set up an intelligent warning system that illuminates a single light to alert the driver to a warning message on the SDL.

WIRING

Two wiring options are available for the SDL:

- Standard (vehicle style) wiring loom for specific permanent installations
- Custom wiring looms for complex installations.

SDL INTERCONNECTIVITY

The SDL can be integrated with many other devices, such as an Engine Control Unit (ECU), to form a comprehensive logging and control system.

Channels being measured, calculated or logged by the ECU - **MOTEC** or otherwise - can be accessed by the SDL via serial or CAN bus communications. This clever connectivity allows the sharing of information around the vehicle without the need for duplicate sensors, triggers, wiring and associated installation costs.

The SDL can also communicate with **MOTEC's** new ACL* (Advanced Central Logger), which has been developed to gather, store and transfer large amounts of high resolution data. In this application the SDL will essentially act as a display for the entire logging network.

In addition, the SDL can perform slave or secondary display duties for a **MOTEC** ADL2 (Advanced Dash Logger) or another SDL, and can even be nominated as a master controller for other sub displays, such as **MOTEC's** MDD (Mini Digital Display). This is ideal for vehicles in which a driver and co driver need to share information.

The **MOTEC** ADL2 Advanced Dash Logger is an alternative unit for those with more demanding system requirements. While physically similar to the SDL, it offers increased functionality and expansion capabilities. Specifications for both models are shown opposite for comparison purposes.

*Due for release in 2006. Contact **MOTEC** for details.

MOTEC SUPPORT & TRAINING

MOTEC is committed to delivering the highest level of customer service. Our worldwide team of support personnel and trained dealers provide expert technical assistance and advice on the most suitable **MOTEC** system for each application. Product information, diagrams and free software downloads are available at the website.

MOTEC also conducts regular training seminars to help users make the most of their systems. Visit the website for details.

ALSO AVAILABLE FROM MOTEC - visit www.motec.com.au for details



ECUs:
MOTEC's range of ECUs includes: M4, M48, M400, M600, M800, M880 and M800 Plug & Play.



ADL2 ADVANCED DASH LOGGER:
MOTEC's top level Dash Logger. (See opposite for comparison with SDL)



MINI DIGITAL DISPLAY:
The MDD is a compact satellite display for use with **MOTEC's** Dash Loggers or ECUs.



LAMBDA METER:
Our fully configurable PLM accurately determines exhaust gas mixture for various fuels.



SENSORS & ACC'S
A full range is available to suit individual applications. Contact your dealer for details.

A comprehensive **MOTEC** Product Catalogue is now available at www.motec.com.au for free download.

DASH LOGGER FEATURES	SDL	ADL2*	DASH LOGGER FEATURES	SDL	ADL2*
GENERAL			OPTIONAL FEATURES		
Microprocessor: 32 bit high performance	✓	✓	50 I/O	✗	✓
Manufacturing Quality Standard	ISO9002	ISO9002	Wideband Lambda	Single	Dual
Power Supply	7V-22V 0.15A	7V-22V 0.15A	8Mb Logging Memory	✓	(Standard)
High RFI Immunity	✓	✓	16Mb Logging memory	✗	✓
Reverse Battery Protection and Battery Transient Protection	✓	✓	Backlight	✓	✓
Ambient Operating Temperature Range	-10° to 70°C	-10° to 70°C	Pro Analysis (required for i2 Pro)	✓	✓
Size: 180mm x 91mm x 18mm (excluding connector)	✓	✓	Telemetry, Remote Logging	✗	✓
Weight: 385gms (0.85lbs)	385g (0.85lb)	385g (0.85lb)	SPECIAL FUNCTIONS		
Autosport Connector	37 pin	79 pin	Access Passwords	✗	✓
Warranty: 2 year parts and labour	✓	✓	Preserved Channels	✗	✓
DISPLAY			ACCESSORIES		
Custom reflective LCD, high contrast, high temperature tolerance	✓	✓	USB Interface Cables	✓	✓
Backlit LCD	Optional	Optional	Beacon Transmitter and Receiver	Available separately	Available separately
Display any value from sensors, CAN bus, RS232 or calculations	✓	✓	SOFTWARE		
Display Modes	1	3	ADL2 Dash Manager Software	✗	✓
70 Segment Bar Graph with user definable range and channel source	✓	✓	Sport Dash Manager Software	✓	✗
Programmable Peak Hold and Set Point on bar graph	✗	✓	i2 Standard Data Analysis Software	Logging required	✓
4 Numeric Display Items	✓	✓	i2 Pro Data Analysis Software	Pro Analysis req'd	Pro Analysis req'd
13 Digit Alphanumeric Display Area - 1,2 or 3 channels per line	✓	✓	Telemetry Software	✗	Optional
Alarms	20	48	i2 DATA ANALYSIS SOFTWARE		
Display Overrides top, left/right	1	2	ANALYSIS COMPONENTS		
Number of Bottom Lines (overrides)	10 (1)	20 (4)	Graphs (number)	Unlimited	5
INPUTS			Graph - number of channels	Unlimited	10
Analogue Voltage Inputs	8	10 (20 Opt.)	Graph - Window Zoom	✓	✓
Analogue Temperature Inputs	4	4 (8 Opt.)	Graph - Overlapped Panels	✓	✗
Digital Inputs	2	2 (4 Opt.)	Graph - Variance	✓	✓
Speed Inputs	2	4	Graph - Min/Max/Avg, Filter, Scale & Offset	✓	✓
Switch Inputs	2	4	Graph - Dual Cursor for comparative measurements	✓	✗
Wideband Lambda channels	1 (Opt.)	2 (Opt.)	Graphical Errors & Status Display	✓	✓
Expansion Units:			Gauges (Configurable)	✓	✓
E888: 8 AV Inputs, 8 Thermocouples, 4 Digital (20 inputs)	8 Thermocouples only	2 x 20 (Opt.)	Histogram (number), Colour Channel, Gating	Unlimited	2
E816: 16 AV Inputs, 4 Digital (20 inputs)	✗	2 x 20 (Opt.)	Histogram – number of channels	Unlimited	1
OUTPUTS			Suspension Velocity Histograms (number), Multi Channel	Unlimited	✗
Digital Outputs Switched output or PWM	4	4 (8 Opt.)	FFT (Fast Fourier Transform) (number), Multi Channel	Unlimited	✗
PID Control	✗	✓	Scatter Plots (number), Colour Channel, Gating, Trend Line with Coefficients	Unlimited	2
E888 Expansion Unit (8 outputs)	✗	2 x 8 (Opt.)	Scatter Plot – number of channels	Unlimited	2
E816 Expansion Unit (8 outputs)	✗	2 x 8 (Opt.)	Mixture Map (number), Gating, Gear Shift Filter	Unlimited	1
Gear Dependant Shift Lights	✗	✓	Mixture Map – number of channels	Unlimited	2
INTERNAL SENSORS			Track Map Report (number)	Unlimited	1
Battery Voltage	✓	✓	Track Map Report – number of user channels	Unlimited	0
Internal Temperature	✓	✓	Rainbow Track maps (number)	Unlimited	0
G Force - Lateral and Vertical	✓	✗	Section Times Reports (number)	Unlimited	1
Speed, Lap Distance, Trip Distance and Odometer	✓	✓	Channel Reports (number)	Unlimited	2
Lap Timer and Number	✓	✓	Synchronised Video	✓	✗
Lap Time Gain/Loss	✓	✓	Overlays (number)	Unlimited	1
Timers (0.01s, 0.1s or 1s resolution)	✗	✓	Graphical Overlay Alignment	✓	✓
3D Tables	2	16	Zoom Link Selectable	✓	✗
2D Tables	2	16	Animation	✓	✓
Maths Functions	✗	✓	Edit Lap Beacons & Lap Times	✓	✓
Gear Detection	✓	✓	Lap Stretching	✓	✓
Fuel Prediction	Incremental fuel used only	✓	Track Section Editor (Standard Sections)	✓	✓
User Conditions	✗	✓	User Defined Track Sections	✓	✗
Running Min/Max	Max corner and straight speed	✓	Basic Maths – Smooth, Scale & Offset	✓	✓
Memory (Non-Volatile Flash)	8Mb (Optional)	8Mb (16Mb Opt.)	Wheel Lock Correction	✓	✓
Logging Rate	1-200 samples/sec	1-1000 samples/sec	Maths Expressions	✓	✗
Selectable Anti-aliasing Filter	✗	✓	Multiple Maths Files, Plain Text Maths Editor, Maths Import / Export	✓	✗
Selectable Cycle Through Logging Memory	✗	✓	Maths Plugins (Maths Module)	✓	✗
Quick Erase Function	✓	✓	Data Logging (Graph, Histo, Scatter & Reports)	✓	✗
Logging Start/Stop Parameters	Limited conditions	Selectable	Vehicle Setup Sheet (Session Constants) (Excel)	✓	✗
Fastest Lap Logging	✗	✓	Units Conversion	✓	✓
Status Channels	✗	✓	Details Editor	✓	✓
Engine Logs	1	4	Compare Details (side by side)	✓	✓
Engine Log Conditions	2	6	User Definable Projects	✓	✗
Tell-tales	✗	14	Application Profiles (Circuit Racing etc)	✓	✓
Diagnostic Log	✗	✓	User Definable Worksheet Layouts	✓	✗
Pro Analysis (required for i2 Pro)	Optional	Optional	Global Channel Colours & Channel Scales	✓	✓
Remote Logging, Telemetry	✗	Optional	Make Reference Lap	✓	✓
USB/CAN Communication	✓	✓	Channel Mapping (Name & Units), Channel Aliases	✓	✓
CAN Communication Templates	6	16	View Device Configuration	✓	✓
RS232 Communication Template	✓	✓			
Remote Control Channels	✗	✓			