Advanced Dash Logger

LAP TIME

1:19.46

LO FUEL

6

1

8 FUEL

SPEED

241

RACE

8.2

12 13 14 15
8
4
0

MoTeC

MoTeC in control

ANALOG AND DIGITAL CHANNELS

In total, the ADL can accommodate over 200 channels derived from a mixture of Analog, Digital, RS232 Serial and CAN bus data channels. It directly supports up to 28 analog inputs, 12 digital/speed inputs, 8 auxiliary outputs and 2 high accuracy Wideband Lambda (air/fuel ratio) inputs.

The analog channels sample at up to 1000 samples per second per channel, with a measurement range of 0 to 15 VDC, and 12 bit resolution. Digital and Speed inputs are used for state monitoring, counting and pulse width measurement. They accept switch, logic, open collector (Hall Effect), or magnetic signals.

MoTeC ADVANCED DASH LOGGER

- Fully programmable
- Up to 8 Mbyte Flash memory
- Advanced Control Functions
- Support for modems, GSM devices & GPS systems
- High Contrast LCD display (backlit display optional)
- Sampling rates up to 1000 samples/ second
- Over 200 Channels of Analog, Digital & Serial Data
- High Speed data downloading
- Easy to use 32 bit Windows software
- Powerful Analysis Software
- 32 Bit Microprocessor

The **MoTeC** Advanced Dash Logger (ADL) is a fully featured, self contained, programmable data logger, device controller and display unit. Easy to use 32 bit software gives the system a flexible interface that allows it to be adapted to most applications.

Many vehicle, marine and industrial applications require separate products to perform the logging, controlling and displaying. However, the **MoTeC** ADL offers seamless integration of all three functions.

Most aspects of the ADL are fully configurable - what to log, what logging rates, which channels to use for display, warning lights and control outputs.

The **MoTeC** ADL uses a high speed 32 bit microprocessor and incorporates a 79 pin autosport connector. The ADL is built to internationally recognised quality and manufacturing standards and is backed by a full 2 year worldwide warranty.

OUTPUTS

The auxiliary outputs can be configured to operate as simple off/on outputs, duty cycle control or frequency based outputs.

DATA LOGGING

Data logging allows for readings taken from Analog, Digital, Serial, CAN or Calculated channels to be stored in the ADL for later analysis on a computer. The ADL uses non-volatile Flash memory. Data memory may be retrieved at very high speeds (approximately 19 seconds per Mbyte). Different logging options allow 384Kbyte, 1Mbyte, 2Mbyte, 4Mbyte or the full 8Mbyte to be accessed.

The ADL can store samples at up to 1000 per second per channel, the rate can be individually set for each channel. Four logging modes may be run concurrently (Normal, Fastest Lap and two Burst modes), each with user defined start and stop logging parameters. Memory can operate in stack or circular buffer mode.
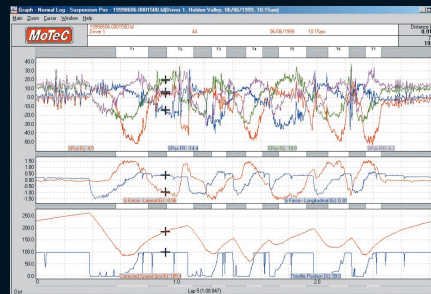
User definable graphs provide analysis of data from all logged channels.

DISPLAY

The *MoTeC* ADL display is a high contrast, high temperature, custom designed reflective LCD. Its unique design makes it easily viewed in direct sunlight or artificial light. An optional backlit LCD display is now also available for maximum visibility in low ambient light conditions.

The display has three modes of operation, where each mode is fully programmable and independent of each other. Each mode may be selected by pressing a button, or activated by a user defined condition.

The 70 segment bar graph display can be programmed to display any channel, with an optional peak hold marker and shift marker. Each numerical display item can be programmed to display any channel value as required. The 13 digit alphanumeric display has 20 lines available to scroll through and may be used to display any channel or warning messages.

Lap times may be displayed when used in conjunction with a MoTeC Lap Beacon (or driver activated switch). Other performance information can be displayed, including: Minimum corner and maximum straight speed, fuel used or fuel remaining and many more.

SERIAL COMMUNICATIONS

The RS232 serial port is programmable up to 115k baud and can be used as both a telemetry data output port and a serial data input port.

As a telemetry port; devices such as modems, GSM and satellite phones, radio modems etc. can be connected to facilitate remote connection.

As a serial data input port; serial communication devices can be connected for displaying and logging purposes. These include Engine Management Systems (*MoTeC* and other), bar code devices, keypads, GPS Systems or other serial communication devices. Information may be simultaneously received from one device and transmitted to another.

The Virtual Instrument Dash provides a representation of the data using a gauge format.

Automatic track maps with colour gradients allow for easy analysis.

ALARMS

Warning alarms may be defined for any analog, digital, serial or calculated channel. Alarm limits are fully programmable and may include up to 6 conditions to ensure that the alarms are only activated at the correct time.

When an alarm condition has been detected, a message can be shown on the display and an auxiliary output activated. These outputs can be used for warning lights or the control of other devices.
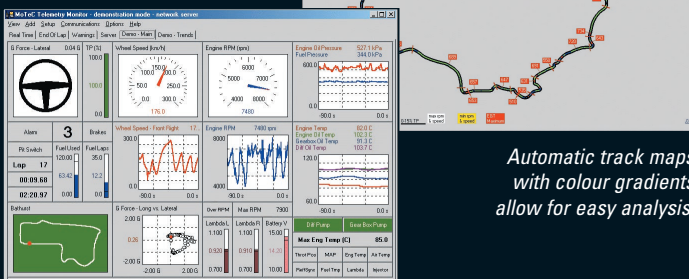
The alarms remain active until they are acknowledged by activating a switch or automatically after a definable period of time.

CONTROLLER AREA NETWORK (CAN)

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

CAN devices include: automatic transmission controllers, sensors, multi-channel input/output modules, engine management systems etc.

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HOST SOFTWARE

The ADL is supplied with software packages for managing the ADL, analysing the logged data and monitoring a telemetry link. Ease of use is one of the most attractive aspects of the *MoTeC* ADL software. There is no complex language to learn, just simple menu driven windows. A full online help system is easily accessible and is integrated throughout the software.

DASH MANAGER SOFTWARE

The *Dash Manager* software is used to configure the ADL and download logged data. It is logically laid out, giving the user access to the power of the ADL without requiring high levels of computer knowledge or intense training.

INTERPRETER SOFTWARE

The *Interpreter* software contains pre-defined configurations for easy data analysis. Screen display formats may be varied to suit all preferences, including user defined graphs, virtual instrument display, histograms and statistical summaries. By utilising these different display methods, users can view data in many formats to obtain accurate, meaningful analysis. Data can also be exported into ASCII CSV file format for analysis in other software packages.

The Pro Logging option includes multiple graph overlays, advanced mathematical functions, XY graphs (scatter plots), rainbow track maps (shows minimum and maximum speeds, gear change point and braking points) and other advanced features.

TELEMETRY MONITOR (OPTIONAL)

The *Telemetry Monitor* software allows for real time viewing of the telemetry data either via direct serial communications, modems or radio modems. Data can be viewed in various formats such as charts, bar graphs, dial gauges, numerics, lights, XY graphs and scroll charts. All objects are definable by the user.

UPGRADES AND ACCESSORIES

The *MoTeC* ADL is completely field updateable by the user. The control software and logged data is stored in Flash memory. No programming interface is required, simply send the new program to the ADL and the latest features are immediately available.

UPGRADE OPTIONS

The *MoTeC* ADL has field upgradeable options using a password enabling system. Upgrade options include: 30 and 50 Inputs/Outputs (see table below), Pro Logging, 384Kbyte, 1Mbyte, 2Mbyte, 4Mbyte and 8Mbyte Logging, Telemetry Support, Remote Logging and Wideband Lambda measurement.

INPUT/OUTPUT UPGRADES

	BASIC	30 I/O	50 I/O
Analog Voltage Inputs	6	10	20
Analog Temperature Inputs	4	4	8
Analog Voltage Inputs (0 to 1V)	0	2	2
Wideband Lambda (uses 0 to 1Vpins)	2 (opt)	2 (opt)	2 (opt)
Digital Inputs	2	2	4
Switch Inputs	4	4	4
Speed Inputs	2	4	4
Auxiliary Outputs	4	4	8
CAN Bus	40	40	40
Serial RS232 (ECU, GPS etc.)	40	40	40

Three wiring options are available for the ADL:
- Standard (vehicle style) wiring loom for specific permanent installations
- Custom wiring looms for complex installations.
- Separate I/O Terminal Module with plug-in screw terminals. Includes a Real time Clock, additional RS232 port and wide ranging power supply.

ACCESSORIES

A wide range of sensors are available for use with the ADL including: linear position, accelerometers, pressure, resistive and thermocouple temperature sensors, Lambda, hall and magnetic speed sensors and many others.

The *MoTeC* Lap Beacon transmitter and receiver has been designed in conjunction with the ADL. It features high channel count (990), improved optics, low power consumption and multi beacon capability.

And for peace of mind, the *MoTeC* ADL offers a full 2 year worldwide warranty.

MoTeC

GENERAL

- Microprocessor: 32 bit high performance
- Manufacturing Quality Standard: ISO9002
- Field updateable operating system
- Non-volatile FLASH memory for data and operating system
- High RFI immunity
- Rugged aluminium housing (IP-55, NEMA 4)
- 79 pin Autosport connector
- Operating Temperature: -10 to 70° C
- Operating voltage: 7 to 22 VDC
- Operating Current: 0.3 A maximum
- Weight: 385gms (0.85 lbs)
- Size: 180mm x 91mm x 18mm (excluding connector)
- Reverse battery and transient protection
- Warranty: 2 years parts and labour

MEASUREMENT INPUTS

- 28 Analog Inputs (10 standard):
  - 20 Analog Voltage (6 standard)
  - 8 Analog temperature (4 standard)
  - 12 bit resolution, 0 to 15 VDC range
  - Update rate: up to 1000 times/second (maximum 8 channels)
  - Other inputs: up to 500 times/second
- 2 Low voltage analog inputs
  - 12 bit resolution, 0 to 1 VDC range (differential)
- 4 Digital Inputs (2 standard)
- 4 Speed Inputs (2 standard)
  Digital and speed:
  - Switch to 0V, logic signal, open collector (Hall Effect), or Magnetic (speed inputs only)
  - State and counting (1MHz)
  - Period (1 microsecond)
  - Pulse width (1 microsecond)
- 4 Switch Inputs (4 standard)
- User definable sensor calibrations

AUXILIARY OUTPUTS

- 8 Digital Outputs (4 standard)
  - Open Collector (drives to the ground) with pullup (10k ohms) to battery positive
  - On/Off or Pulse Width Modulation with variable frequency and duty cycle

AIR FUEL RATIO MEASUREMENT (OPTIONAL)

- 2 High Accuracy Wideband Lambda (Air/Fuel ratio) Inputs
- Resolution: 0.01 Lambda
- Temperature compensated
- Range: 0.75 to 1.5 Lambda
- Accuracy: 1.5% (below 1.05 Lambda)

DATA LOGGING

- Memory: 384Kbyte, 1Mbyte, 2Mbyte, 4Mbyte or 8Mbytes (ADL 8 option)
- Non-volatile FLASH, field upgradeable
- Logging of any Analog, Digital, Serial, CAN bus or calculated channel
- Maximum Logging throughout: 20Kbytes/second
- 2 Burst Logging buffers with pre triggering (4Mbyte logging option only)
- Typical Unload Speed: 19 sec/Mbyte, using parallel port of PC to CAN bus RS232 unload rates dependent on baud rate.

CALCULATIONS

- Timers (0.01s, 0.1s and 1s resolution)
- 2D and 3D Tables
- User Conditions
- Math Functions: Differentiate, Integrate, Absolute, Min/Max
- Lap Timer and Number
- Lap Gain/Loss
- Speed and Distance
- Gear Detection
- Fuel Prediction
- Tell-tales
- Running Min/Max

DISPLAY

- Custom LCD, High Contrast, High Temperature, Reflective
- Backlit LCD display (optional)
- Display any Analog, Digital, Serial, CAN bus or calculated channel
- 3 Display modes
- 70 Segment bar graph:
  - Definable range
  - Programmable setpoint and peak hold point
- 4 Numeric display items
- 13 Digit alpha numeric display area, 1, 2 or 3 channels per line (20 scrollable lines per display mode)
  - Alarm messages, channel display or descriptive text
- Enclosed ADL (without display) (optional)

COMMUNICATION

- Serial RS232 Comms. (1200 baud to 115k baud)
- CAN data link (250Kbit to 1Mbit)
- Telemetry link output (RS232)

HOST SOFTWARE

1. Dash Manager Software
2. Interpreter Analysis Software
3. Telemetry Software (Optional)

Computer Requirements:
- IBM PC compatible running Windows 95/98/ME or NT4.0/2000
- Pentium (Min.) 90MHz, 16Mb RAM

UPGRADES

The *MoTeC* ADL in its base configuration includes:
- 6 Analog Voltage Inputs, 4 Analog Temperature Inputs
- 4 Switch Inputs, 2 Digital Inputs, 2 Speed Inputs
- 4 Digital Auxiliary Outputs
- No memory (384Kbytes minimum recommended)
- RS232 and CAN bus communications support
- Software: Dash Manager and Interpreter
- User's Manual

ADL Upgrades (field updateable by the user)**:**
- **Input and Output Upgrades**

30 Input/Outputs
- 10 Analog Voltage Inputs, 4 Analog Temperature Inputs
- 4 Switch Inputs, 2 Digital Inputs, 4 Speed Inputs
- 2 x Low Voltage Analog Inputs, 4 Auxiliary Outputs

50 Input/Outputs
- 20 Analog Voltage Inputs, 8 Analog Temperature Inputs
- 4 Switch Inputs, 4 Digital Inputs, 4 Speed Inputs
- 2 x Low Voltage Analog Inputs, 8 Auxiliary Outputs

- **Pro Logging -** Advanced Analysis Software
- XY Plots
- Advanced Math Functions
- Rainbow Track Mapping
- Lap Reports

- **Memory Upgrades**
- 384Kbyte: - Entry Level Memory
- 1Mbyte: - 384Kbyte to 1Mbyte Memory
- 2Mbyte: - 1Mbyte to 2Mbyte Memory
- 4Mbyte: - 2Mbyte to 4Mbyte Memory
(includes Burst mode logging and fastest lap logging)
- 8Mbyte: - 4Mbyte to 8Mbyte Memory (ADL 8 option)

- **Lambda Measurement :** - 2 Wideband Lambda Inputs
- **Telemetry:** - Enables real-time viewing of data via a telemetry link
- **Remote Logging (***requires Telemetry Upgrade)*
- Allows Remote Logging via a telemetry link or hand held computer

ACCESSORIES

- PC Communications Cable (High Speed CAN)
- Wiring Looms
- Input/ Output Terminal Module (see separate data sheet)
- Lambda (Air/Fuel ratio) Sensors and Kits (see separate data sheet)
- Telemetry Products - GSM mobile phones, radio modems etc.
- Sensors and transducers - a full range of sensors, amplifiers, transducers, lights and buttons are available
- Lap Beacon: Transmitter and Receiver (990 channel)

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