

**Race Technology**  
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## **DASH2 – Compact, Water Resistant, Advanced Data Display System**



### **Product Overview**

The DASH2 is a compact, water resistant data display system designed for use with Race Technology data logging products, but may also be used as a stand-alone dashboard. In stand-alone applications, the DASH2 can display up to four analogue channels, ideal for water temp, fuel level, oil pressure, etc. With warning lights included for indicators, brakes, fog light and headlamp main beam, as well as a non-resettable odometer with trip counter, the DASH2 is also an ideal display system for use on road-going cars.

Connecting the DASH2 to a Race Technology data logger enables access to the full range of features on offer. This will allow monitoring of all analogue channels from the data logger and viewing of GPS data, with user-definable alarm thresholds for automatic warnings. The DASH2 also allows control of the data logger itself for starting and stopping logging and adding timing markers.

Four remote buttons control the DASH2, three of which can be programmed to provide functions such as resetting monitored values to look for

changes, resetting the trip meter, viewing maximum or minimum values, etc.

The advanced lap timing features of the DASH2 enable viewing of best lap and sector times after a run, as well as live lap and sector times with predictive timing and programming of target lap and sector times for driver pacing.

### **Standard Features**

In stand-alone mode the DASH2 offers the following features:

- Die-cast zinc alloy enclosure, sealed to IP65 (sealed against dust ingress and low pressure water jets from all directions)
- High contrast, high visibility, non-reflective custom LCD display with EL backlight.
- Dual 14-Way Binder 423 series connectors
- 6 configurable shift lights
- 4 stand-alone analogue inputs (typically water temperature, oil pressure, oil temperature, fuel level)
- Wheel speed input for vehicle speed and odometer reading
- Non resettable odometer
- Resettable trip recorder
- Engine speed input
- Configurable RPM display options with user definable scales
- Configurable peak RPM hold
- Current gear calculated from speed and RPM
- Max/min recall with reset
- Configurable high/low alarms on all input channels
- Four external switches to control operation
- Configurable from any PC with a serial port (or USB port with USB to serial adaptor)
- Warning lights for brakes, main beam, left and right indicator, low alternator output and rear fog light
- Set up in mph/kph and miles/km
- 5 different user configurable screens of data

When used in conjunction with a Race Technology data logger the DASH2 also offers the following additional features:

- A choice of up to 16 additional analogue data channels to display
- Up to 4 frequency inputs for wheel speeds
- High accuracy lap and sector timing based on GPS data, without the need for a trackside beacon
- Predictive lap and sector timing features
- Best lap recall
- Editable target lap and sector times for driver pacing
- Configurable from a PC or directly from the data logger
- Vehicle and engine speed from data logger or standard external input
- Add timing markers and start/stop data logger from dashboard buttons

The actual information available for display depends on the data logger that the DASH2 is connected to, as described in the table below:

Hardware	DL2	DL1	AX22	SPEEDBOX
GPS based lap and sector times	Yes	Yes	Yes	-
Accelerations	Yes	Yes	Yes	Yes
RPM	Yes	Yes	Yes	-
Analogue channels	16	8	-	-
Frequency channels	4	4	-	-
Speed	Yes	Yes	Yes	Yes
Position/altitude	Yes	Yes	Yes	Yes

## Applications

The DASH2 is designed for anyone wanting a compact yet feature-packed dashboard. From road cars that never see a race track through to single-seater racing applications, the DASH2 displays all the information required by the driver in an extremely compact yet clear and easily read format.

## Technical Specification

<b>Display</b>	808 Segment customised HTN high contrast EL backlit LCD
<b>Controls</b>	4 externally mounted switches (optional)
<b>Power Supply Requirements</b>	12v nominal input, minimum of 10v, maximum of 15v. Nominal current consumption approximately 250mA
<b>Case Construction</b>	Die-cast zinc alloy. Sealed to IP66 against dust and liquid ingress
<b>Dimensions</b>	Approximately 150mm wide, 100mm high and 20mm thick
<b>Weight</b>	Approximately 400 grams
<b>Connector Type</b>	2 x 14-way Binder 423 Series circular multi-pole connectors
<b>Main Processor</b>	40MHz RISC with embedded flash program memory
<b>Serial Port</b>	Automatically detects the baud rate and adjusts to receive data from a data logger. Also used for re-flashing, diagnostics and configuration
<b>Vibration</b>	Factory tested at 25g, 50Hz sinusoid for 5 minutes. Design tested to 25g in 3 axes for 24 hours
<b>Temperature</b>	Factory tested from -20°C to 70°C

## Hardware Supplied

The DASH2 is supplied with the following items:

- The DASH2 display unit itself
- Serial extension cable, for connection to a PC for configuration
- Wiring harness and connectors, with 9-way d-type connector for communication between DASH2 and data logger/PC, and flying leads for connection to vehicle loom and external sensors
- Full operating and installation instructions
- Comprehensive software CD

## DASH2 Configuration Options

The data displayed on the DASH2 can be configured using the PC software provided, allowing the unit to be set up to display only the

data channels of interest and present these in the desired format. Using the PC software it is possible to configure:

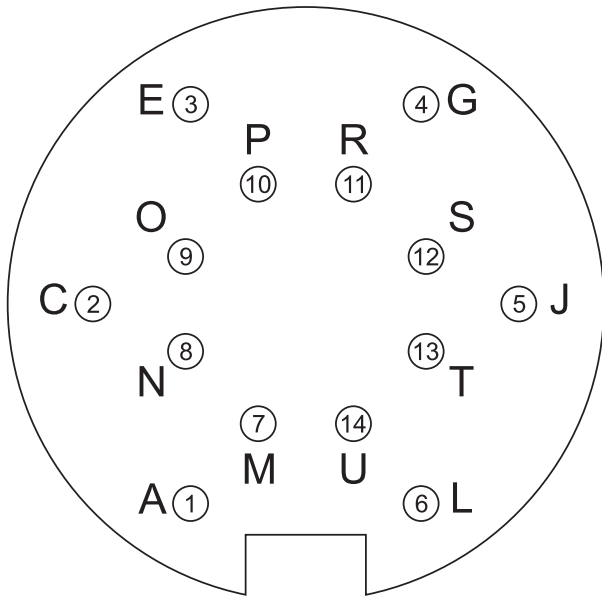
- Which channels are displayed
- Channel names
- Channel scaling
- Channel filtering
- Number of decimal places displayed
- Number of channels displayed on the screen
- Upper and lower warning levels for each channel
- Duration for which lap and sector times are displayed
- Target lap and sector times
- Duration of warning message displays
- Behaviour of the peak RPM hold feature and RPM scaling

The configuration of some features can be carried out directly on the DASH2. There is no need to connect to a PC or data logger to configure any of the following:

- Button functions
- Duration for which lap and sector times are displayed
- Duration for which warning messages are displayed
- Target lap and sector times
- Displayed units: mph/kph and miles/km
- Whether logger or external sensor data is used for speed and RPM

## Connector Pin Assignments

Conn.	Pin N <sup>o</sup>		Description	Range
<b>Connector-1 (TOP)</b> Binder 423 Series Male Bulkhead (09-0453-90-14)	1	A	Analogue input 4	0-15v
	2	C	Engine speed input	12v square wave
	3	E	+12v supply	10-16v
	4	G	Left indicator	+12v to activate
	5	J	Analogue input 3	0-15v
	6	L	Ground	
	7	M	Main beam warning	+12v to activate
	8	N	Wheel speed input	Switch to 0v
	9	O	Analogue input 1	0-15v
	10	P	Alternator warning / field drive	0v to activate
	11	R	Brake warning	0v to activate
	12	S	Analogue input 2	0-15v
	13	T	Right indicator	+12v to activate
	14	U	Fog light warning	+12v to activate
<b>Connector-2</b> Binder 423 Series Male Bulkhead (09-0453-90-14)	1	A	Sidelights	+12v when on
	2	C	Switch common	
	3	E	+12v supply	10-16v
	4	G	RS232 pin 3	
	5	J	Select button	Switch to common
	6	L	Ground	
	7	M	No Connection	
	8	N	Down button	Switch to common
	9	O	5V reference output	50mA max
	10	P	RS232 Ground	
	11	R	RS232 pin 2	
	12	S	No Connection	
	13	T	Up button	Switch to common
	14	U	Menu button	Switch to common



**Figure 1:** Pin view of male connector on DASH2.  
**NOTE:** Please take special care to ensure correct orientation relative to connector keyway when identifying pins

## Frequently Asked Questions

### Can the DASH2 be used as a stand-alone street legal dashboard system?

Yes, the DASH2 has built in analogue inputs for monitoring temperatures and pressures, alarm levels and set up information can be set directly from the PC so it doesn't have to be connected to a data logger. It also has a non resettable odometer with trip counter for distance measurements and warning lights for main beam, fog light, indicators, brakes and alternator output.

### How does the lap and sector timing work without a beacon?

Because the DASH2 uses the GPS data from the data logger, the system always knows its position on the track. To set your current point as a lap or sector timing marker you simply press a button on the DASH2. The data logger then calculates the lap and sector times every time you subsequently pass that point on the track and transmits them to the DASH2 for display.

### If the GPS data is 5Hz, does this mean the times have a resolution of 0.2 seconds?

No, the system calculates the position very accurately and the lap times have a resolution of 0.01 seconds. Sector times are generally far more accurate than a traditional lap beacon system.

### Can I directly compare the lap sector times from the display and the analysis software?

Yes, the track markers can be imported and exported from the analysis software.

### Does the dashboard work with the DL90 data logger?

No, there is no serial output from the DL90 for the DASH2 to use. The DASH2 can be used with DL1, DL2, AX22 and SPEEDBOX.