ADR2 - ACCIDENT DATA RECORDER (FIA)

The ADR2 is MoTeC's second generation Accident Data Recorder. It records critical data from vehicle accidents, such as lateral, longitudinal and vertical accelerations. This data can help to better understand forces in high impact collisions and may assist with the medical assessment of drivers.

The ADR2 captures minimum 30 seconds of data per accident, including 15 seconds immediately before the event which triggered recording. Subsequent impact during the event will extend the recording time.

The device can be used stand-alone or in conjunction with other devices such as a GPS, Display Logger or ECU.

The MoTeC ADR2 conforms to FIA standard 8872-2018 and is included in the FIA ADR Program.

FEATURES

- Configurable thresholds to trigger an event - password protected feature
- Configurable thresholds to trigger the medical light output - password protected feature
- Pre-event data capture of 15 secs
- Total event data capture of minimum 30 seconds
- Support for external medical and status lights
- CAN and GPS inputs for data recording
- Internal backup power to continue recording if power is lost
- Real time clock for accurate time keeping
- Password protection restricts selected features to FIA access only

SPECIFICATIONS

Communications

- CAN for transmitting and receiving FIA specified data
- RS232 for receiving GPS data
- USB for communication with ADR2 Manager

Connectors

- 1 x 13 pin Autosport connector size 10

Physical construction and dimensions

- Case size: 86 mm x 45 mm x 25 mm
- Case material: anodized aluminium
- Ingress protection rating: IP66 / IP67
- Operating temperature: -40 to 85 °C
- Weight: 130 g

Power

- Power supply: 6 – 32 V
- Current: nominal 200 mA @ 12 V (with external GPS), maximum 1 A when charging backup power supply
- USB power when connected to PC (when no other power source connected)
- Backup power supply
  - provides power for at least 45 seconds of continued recording after vehicle power is lost
  - recharges in less than one minute after vehicle power is applied

Medical and status light outputs

- Topology: current limited open collector high-side drive
- External load: LED to GND or logic level input with pull-down resistor
- Voltage on: 5 V - Regulated
- Voltage off: 0.3 V (with external 10k load to ground)
- Voltage off: 2 V (approximately, when not connected)
- Current Limit: 20 mA
- Reverse polarity protected
- Voltage diagnostic feedback

Operational

- Recording of lateral, longitudinal and vertical accelerations at 3000 Hz
- Recording of CFC60 filtered acceleration data at 1000 Hz
- Acceleration channel resolution: 0.125G
- Recording of FIA specified CAN channels
- GPS data recorded:
  - Date and Time
  - Latitude and Longitude
- Accelerometers range: -480G to +480G
- Accelerometers overload: 1800G minimum
- Pre-event recording: 15 seconds
- Total event recording: minimum 30 seconds, extended on subsequent impact
- Data output format: CSV

ADR2 MANAGER SOFTWARE

The ADR2 Manager application requires Windows 10, 64 bit.

The software is used to:

- Configure the device (password protected, FIA access only)
- Download data
- Format the ADR2 to erase stored events (password protected, FIA access only)
- Update the firmware

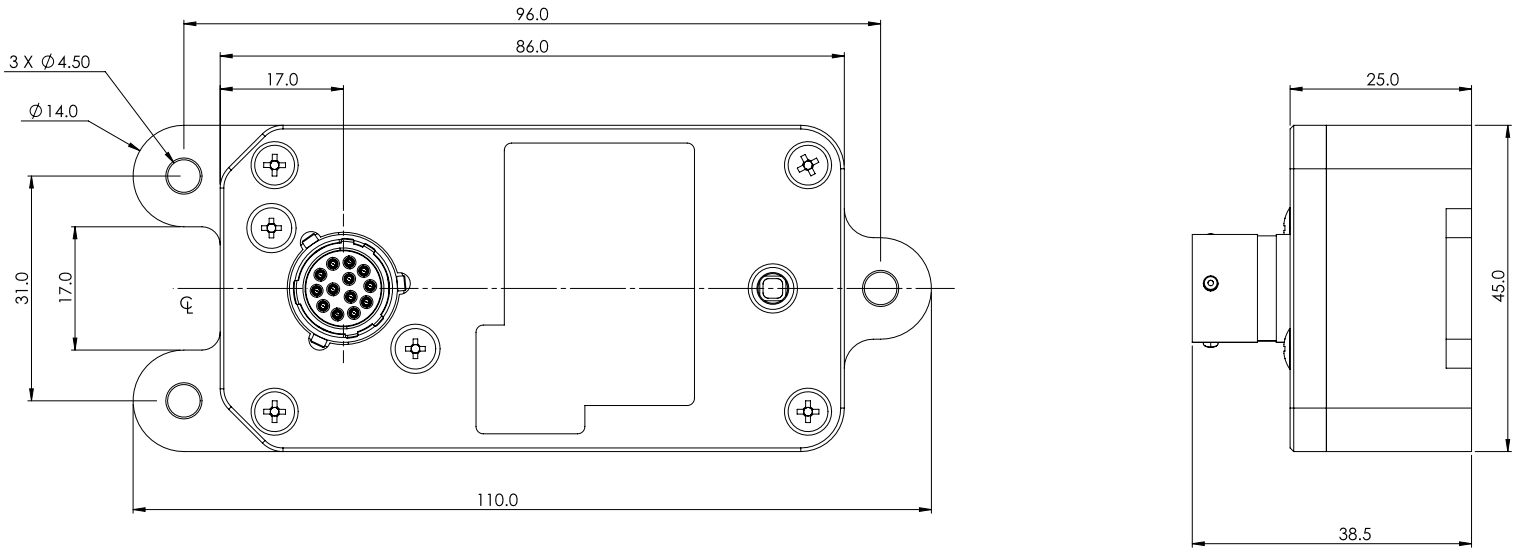
CONNECTOR AND PINOUT

Connector: 13 pin Autosport size 10 (AS 2 10-35 PN)

Mating connector: AS 6 10-35 SN

Pin	Function
1	RS232 - receive
2	Medical light output
3	CAN-high
4	CAN-low
5	Status light output
6	Not used
7	USB 5 V
8	USB D+
9	USB D-
10	Not used
11	5 V supply (GPS power)
12	Battery positive
13	Ground and USB 0 V

DIMENSIONS



LIGHTS

A single RGB LED indicator is visible on the enclosure. Support is provided for external medical and status lights.

RGB LED Indicator

Device State	Colour	Flash Rate	Duty Cycle [%]	Brightness [%]
Firmware starting	OFF			
Event stored*	RED	4 Hz	5%	100%
Recording event	GREEN	10 Hz	50%	50%
Normal operation (on vehicle power)	GREEN	Solid	100%	50%
Normal operation (on internal backup power)	GREEN	2 Hz	10%	25%
Backup power supply charging** (on vehicle power)	GREEN	1 Hz	20-100%	50%
Low power	GREEN	1 Hz	10%	5%
No GPS lock (on vehicle power)	GREEN	1 Hz	90%	50%
	ORANGE		10%	100%
USB communications***	CYAN			
Normal operation (on USB power)	BLUE	Solid	100%	50%
Diagnostics	ORANGE	refer to *Diagnostics*		

* When an event is recorded, the LED shows *Event stored* until the device is powered down. If the device is powered on and a recorded event has not been retrieved by ADR2 Manager, the LED will show *Event stored* for 60 seconds.

** Duty cycle equals charge level; i.e. 20% duty cycle = 20% charge level.

*** Flashing to indicate command in progress e.g. firmware update. All normal operations are suspended.

Diagnostics

When an error occurs, the RGB LED indicator will flash orange ON for 250 ms at 50% brightness, OFF for 250 ms, repeated according to the error number (see table), followed by a one second pause.

Only the error with the highest priority (lowest number) is displayed and will continue for as long as the error is active.

Error	Number of flashes
CAN bus fault	2
No FIA CAN frames	3
External power supply failure	4
Over temperature	5
Internal fault	6

Additional information on errors or internal faults can be found in the diagnostic channels section in ADR2 Manager software.

External Status Light

Device State	Output State
Event stored*	Flashing
Vehicle power connected	ON
Vehicle power disconnected	OFF

* When an event is recorded the status light will flash until the device is powered down. If the device is powered on and a recorded event has not been retrieved by ADR2 Manager the status light will flash for 60 seconds.

External Medical Light

Device State	Output State
Medical event detected since device powered on	ON
No medical event detected since device powered on	OFF

PRODUCT INFORMATION

Compliances

This product is designed for use in a vehicle. As such, this product complies with the following standards:

- Directive 2014/30/EU: Electromagnetic Compatibility; by application of UNECE Regulation No.10 (R10) Rev. 6 for ESAs
- Directive 2011/65/EU: RoHS (Restriction of the Use of Certain Hazardous Substances in Electrical & Electronic Equipment)
- Directive 2006/1997/EC REACh: Regulation concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals

Installation

- **IP Rating (dust and water ingress)**

  This product is rated IP66 / IP67; it is protected against dust ingress, powerful water jets and the effects of temporary immersion in water.

  Ensure the connector and related wiring is also protected against water ingress.

- **Operating Temperature Range**

  This product is designed for an internal operating temperature range of -40 °C to 85 °C.

- **Vibration Statement**

  This product is designed to withstand vibrations typical for normal vehicle installations.

Safety

- For safe operation, use only undamaged.
- At no time operate the device with faulty, bare or exposed wiring.
- Minimal force should be exerted to plug in connectors.
- Adhere to the normal supply voltage limits as listed in the specifications.

Repair

Do not attempt to open and/or repair the device.

For repairs, contact your local MoTeC representative and return the product via an Authorised MoTeC Dealer.

Disposal

This product should be disposed of in accordance with relevant national regulations for disposal of electronic waste.
It does not contain hazardous materials which might be subject to specific materials regulations.

The product contains a battery which can be removed after opening the product; depending on relevant national regulations it may be required to dispose of the battery separately.

Manufacturer Information

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