



3 FORCE COMBINED SENSOR



This multi-faceted, Inertial Measurement Unit (IMU) has been designed specifically for motorsport, providing triple axis sensing of G-Force and Gyroscopic measurements. It also provides Compass (magnetic field) measurements.

The sensing range of each sensor has been tailored to suit a wide range of applications that experience high levels of dynamic motion. Each of the three axes (X, Y, Z) is orthogonal to the others, measuring positive and negative forces.

A compact and robust design ensures the 3Force unit is well suited the harsh motorsport environment.

► FEATURES

- Simultaneous measurement of G-Force, Gyroscopic and Magnetic Sensing (compass)
- Triple axis sensing of all parameters
- CAN bus interface with a high level of configurability
- Flexible CAN bus address and data rates
- Extensive customisation of the data output
- Rugged design
- Compact and low weight - less than 55 grams
- Cost competitive
- Spare processing capability for custom firmware
- Upgradeable - allowing for enhanced functionality
- Used in Australian V8 Supercars and Formula Ford series

► SPECIFICATIONS

General Specifications

Parameter	Min	Typical	Max	Units
CAN Speed	125 K	1	1 MB	baud
Supply Voltage		5		V sensor supply
Supply Current	-	20	40	mA
Operational Temperature	-20	-	70	degrees C

Dimensions: 52 x 32 x 15 mm

Weight: <55 grams (inc. pigtail loom)

Enclosure material: CNC Machined Anodised Aluminium 6016-T6

Heatshrink: Raychem DR-25

Connector Wire: Mil-W-22759/16

G-Force (Acceleration) Sensor

Parameter	Min	Typical	Max	Units
Measurement Range (16 g)	-16	-	+16	g
Stability	-	+/-0.015	-	% per degree C
Nonlinearity	-	+/-0.3	-	%
Inter-Axis Alignment Errors	-	+/-0.1	-	%

Parameter	Min	Typical	Max	Units
Cross-Axis Sensitivity	-	+/-1	-	%
CAN Bus Rate	1	50	500	Hz

Report Resolution: 1 mg (1000 counts per 1 g)

Gyroscopic (Rotation) Sensor

Parameter	Min	Typical	Max	Units
Measurement Range	-	500	-	degrees per second
CAN Bus Rate	1	50	500	Hz

Reported Resolution: 0.1 degrees per second

Internal Sample Rate: 800 Hz

Magnetic (Compass) Sensor

Parameter	Min	Typical	Max	Units
CAN Bus Rate	1	20	100	Hz

Internal Sample Rate: 75 Hz

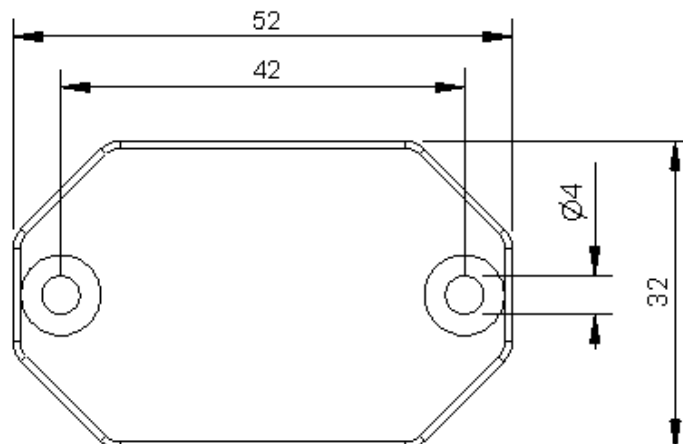
The sensor is capable of detecting the earth's magnetic field, although it is affected by the presence of ferrous objects at very short range.

Note:

- The CAN bus speed is selected when the sensor is purchased. It may be changed at a later stage.

DIMENSIONS AND MOUNTING

Measurements in mm.



CAN BUS ADDRESSES

The sensor transmits three sequential CAN bus messages. The default addresses for the CAN bus messages are:

- 0x610 - X, Y and Z axis G-Force Data
- 0x611 - X, Y and Z axis Gyroscopic Data
- 0x612 - X, Y and Z axis Compass Data

COMPATIBILITY

MoTeC Displays/Loggers: All current 5", 7", 12" Colour Displays/Loggers, Enclosed Loggers, ADL3, SDL3, CDL3

WIRING

The sensor is supplied with a pigtail loom and power is supplied via 5 volts.

The 3Force outputs are generated as messages on the CAN bus. There is no CAN termination resistor in the sensor.

Wire Colour	Function
Red	Supply Voltage (5 V)
Green	CAN High/ CAN +
Blue	CAN Low/ CAN -
Black	0 V/ Chassis