



- Compact Inertial Measurement Unit
- Single cable connection to DL1, AX22, DL2
- Full six degree of freedom output
- 100Hz output of all sensor data

What is the IMU06?

The IMU06 is a compact 6 degree of freedom inertial measurement unit. It provides 3 axis acceleration (maximum 10G) and angular velocities (maximum 300 degrees/s) on both CAN and RS232 at user configurable data rates of up to 100Hz. The unit can also provide a timing pulse to indicate the moment at which the sample has been taken for data alignment purposes. NOTE: The IMU06 outputs roll, pitch, and yaw rates, not actual roll, pitch and yaw angles. These can be estimated from the rates but will not be exact.

Who is the IMU06 designed for?

The IMU06 is designed for vehicle dynamics testing applications, particularly for suspension of braking testing. It can also find application in a number of other position sensing applications such as stability control.

How does the IMU06 integrate in to an existing data logging system?

There are two output formats available on the IMU06, RS232 and CAN data. The RS232 data is formatted using the Race Technology data format, detailed in Appendix A. This data can be fed directly in to a Race Technology data logger such as the DL1 or DL2, alternatively it can be viewed directly on a PC or Race Technology display product.

The CAN data can be user configured to use any two CAN channel IDs. This data is transmitted at selectable rates of up to 100Hz.

IMU06 Specifications

IMU06 MK2 General Specification

General Specification	IMU06	IMU06WP
Power requirements	8-15v dc, 150mA	
Case construction	Anodised aluminium	
Maximum dimensions	60.4(W) X 70 (L) X 35 (H)	70.4(W) X 75 (L) X 35 (H)
Mass	175g	220g
Fixing method	5mm mounting holes machined for M4 shoulder screws	
Sensor orientation		
IP rating	IP50	IP67
Operating temperature	-20 to +60°C	
Humidity	5-90% non condensation	5-95% non condensation
Vibration	20g all axis 5 minutes	
Sensor alignment	Internal sensor ± 0.2 degrees from case mounting holes	
Pulse Output	5v, 25% duty cycle approx 100Hz. Rising edge synchronised with data	

Technical Specification - Gyroscopes

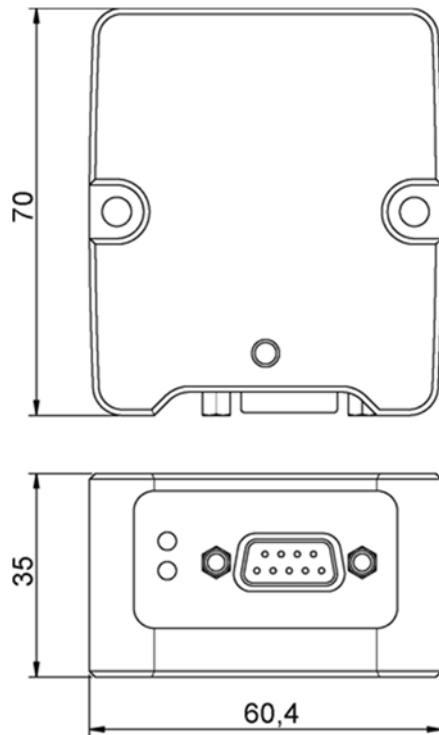
Technical Specification - Gyroscopes					
Parameter	Conditions	Min	Typ	Max	Unit
GYROSCOPE SENSITIVITY					
Dynamic Range		±300	±350		°/sec
Initial Sensitivity	Dynamic range=±300°/sec	0.0495	0.05	0.0505	°/sec/LSB
	Dynamic range=±150°/sec		0.025		°/sec/LSB
	Dynamic range=±75°/sec		0.125		°/sec/LSB
Temperature Coefficient	ADIS16365, -40°C ≤ TA ≤ +85°C		±40		ppm/°C
Misalignment	Axis – to - axis		±0.05		Degrees
	Axis – to – frame (package)		±0.5		Degrees
	Bestfit straightline		±0.1		% of PS
GYROSCOPE BIAS					
Initial Bias Error	±1σ		±3		°/sec
In – Run Bias Stability	1σ, SMPL_PRO = 0x0001		0.007		°/sec
Angular Random Walk	1σ, SMPL_PRO = 0x0001		2		°/Vhr
Bias Temperature Coefficient	ADIS16365, -40°C ≤ TA ≤ +85°C		±0.01		°/sec/°C
Linear Acceleration Effect on Bias	Any axis, 1σ(MSC_CTRL[7]=1		0.05		°/sec/g
GYROSCOPE NOISE PERFORMANCE					
Bias Voltage Sensitivity	VCC = 4.75V to 5.25V		±0.3		°/sec/V
Output Noise	±300 °/sec range, no filtering		0.8		°/sec rms
Rate Noise Density	F = 25Hz, ±300 °/sec range, no filtering		0.044		°/sec/VHz rms
GYROSCOPE FREQUENCY RESPONSE					
3 dB Bandwidth			330		Hz
Sensor Resonant Frequency			14.5		kHz
Self-test change in Output Response	±300 °/sec range setting	±696	±1400	±2499	LSB

Technical Specification – Accelerometers

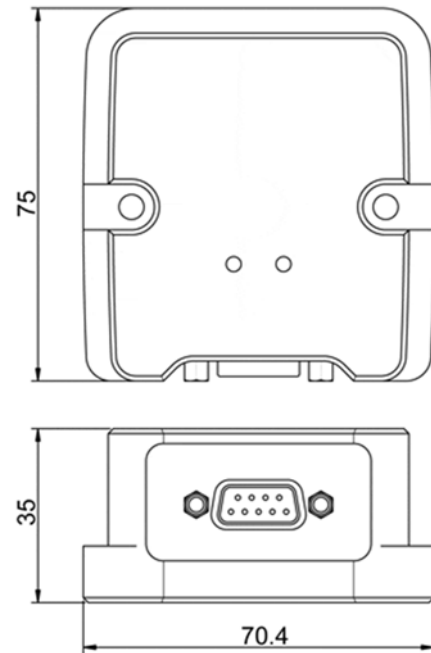
Technical Specification – Accelerometers					
Parameter	Conditions	Min	Typ	Max	Unit
ACCELEROMETER SENSITIVITY	Each axis				
Dynamic Range		±18			g
Initial Sensitivity		3.285	3.33	3.38	mg/LSB
Sensitivity Temperature Coefficient	ADIS16365, -40°C ≤ TA ≤ +85°C		±50		ppm/°C
Misalignment	Axis – to – axis		0.2		Degrees
	Axis – to – frame (package)		±0.5		Degrees
ACCELEROMETER BIAS					
Nonlinearity	Bestfit straightline		0.1		% of PS
Initial Bias Error	±1σ		±50		mg
In-Run Bias Stability	1σ		0.2		mg
Velocity Random Walk	1σ		0.2		m/sec/Vhr
Bias Temperature Coefficient	ADIS16365, -40°C ≤ TA ≤ +85°C		±0.3		mg/°C
Bias Voltage Sensitivity	VCC = 4.75V to 5.25V		25		mg/V
ACCELEROMETER NOISE PERFORMANCE					
Output Noise	No filtering		9		mg rms
Noise Density	No filtering		0.5		mg /VHz rms
ACCELEROMETER FREQUENCY RESPONSE					
3 dB Bandwidth			330		Hz
Sensor Resonant Frequency			55		kHz
Self-test change in Output Response	X-axis and Y-axis	59		151	LSB

Dimensions

IMU06:



IMU06WP:



Ordering information

- IP50 version: IMU06
- IP67 version: IMU06WP