AIMS µMotion IMU Industrial

FEATURES

- **MEMS sensors**
- **6 DOF**
- **Ultra-small size**
- **Light weight**
- **Low cost / High performance**
- **CAN 2.0B interface**
- **RS-232 interface**
- **Flexible mounting**
- **Robust mechanical housing**

The AIMS µMotion from KebNi Inertial Sensing is an ultra-small, six degrees of freedom (6 DOF) MEMS based Inertial Measurement Unit (IMU) and can be used for analysis of movements, control systems etc.

TYPICAL APPLICATIONS

- Autonomous and remote operated vehicle systems
- High accuracy tilt/inclination sensing
- Active chassis systems
- Electronic Stability Control Unit for vehicles
- Throttle Supervising Unit for vehicles
- Active Suspension Control Unit for vehicles
- Evaluation system for movement analysis for vehicles
- Track/road/driver analysis
- Detection of road characteristics for cars and motorbikes
- Six degrees of freedom (6 DOF) measurement system
- Platform/antenna stabilization
- Vehicle and boat control system

Technical data

Technical Data

Housing:	Sealed IP67
Physical Dimensions:	49 x 45.3 x 21.8 mm (L x W x H)
Connector A, Power and I/O:	Binder 7-pin Micro (712 99 0421 00 07)
Cable:	PUR Ø5.2 mm, Length 400 mm *(Note 1)*
Power Supply:	12 VDC typical (8 – 18 VDC)
Output Interface:	CAN 2.0B and RS-232
Operating Temperature Range:	-20°C to +70°C *(Note 1)*
Storage Temperature Range:	-40°C to +85°C
Weight:	90 grams
Update Rate:	200 samples/second *(Note 1)*
Vibration Resistance:	6 g_{rms} (5 – 200 Hz)
	3 g_{rms} (200 – 500 Hz)
Shock Resistance:	150 g, half-sine 0.5 ms

Acceleration Performance

Range:	±5 g
Bias Error:	2.5 mg, 1σ (*Note 2*)
Scale Factor Error @ 1 g:	2.5 mg, 1σ (*Note 2*)
Non-linearity:	1.25 % of FS (*Note 3*)
Noise:	0.18 mg/√Hz (*Note 3*)
Bandwidth:	30 Hz *(Note 1)*
Misalignment:	4 mrad (*Note 3*)

Angular Rate Performance

Range:	±150 °/s
Bias Error:	0.3 °/s, 1σ (*Note 2*)
Scale Factor Error:	0.75 %, 1σ (*Note 2*)
Non-linearity:	0.75 % of FS (*Note 3*)
Noise:	0.38 °/s/√Hz (*Note 3*)
Bandwidth:	30 Hz *(Note 1)*
Misalignment:	4 mrad (*Note 3*)

Note 1: Other configurations are available upon request
Note 2: Max value over full temperature range
Note 3: Max value at +25°C

CAN 2.0B INTERFACE

This is the standard interface with a baud rate of 1 Mbit with an 11 bit identifier and a data update rate of 200 samples/second.

Every sample is delivered on the CAN-bus with two CAN-IDs; one for the accelerometer data and one for the gyroscope data. The byte format is Little-Endian (Intel x86 format) with a SP of 60%. There are 5 TQ before SP and 4 TQ after SP. The synchronization jump width is 2 TQ.

Accelerometers		Gyroscopes	
Output	**Value**	**Output**	**Value**
32767	-250 µg	32767	-6400 µ°/s
32768	0 g	32768	0 °/s
32769	+250 µg	32769	+6400 µ°/s

CAN-ID 1, Identifier: 0x508 (11 bit)

Byte 0-1	Byte 2-3	Byte 4-5
Accelerometer X (16 bit)	Accelerometer Y (16 bit)	Accelerometer Z (16 bit)

CAN-ID 2, Identifier: 0x510 (11 bit)

Byte 0-1	Byte 2-3	Byte 4-5
Gyroscope X (16 bit)	Gyroscope Y (16 bit)	Gyroscope Z (16 bit)

Other interface formats (baud rate, ID etc.) are available upon request.

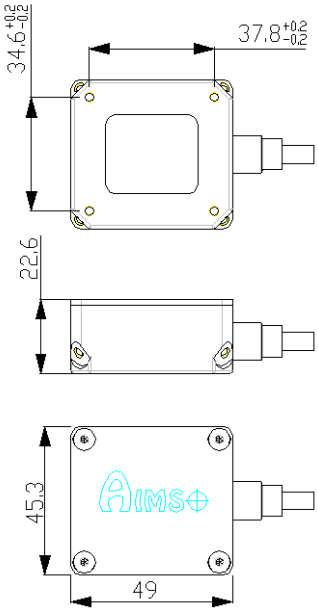
RS-232 INTERFACE

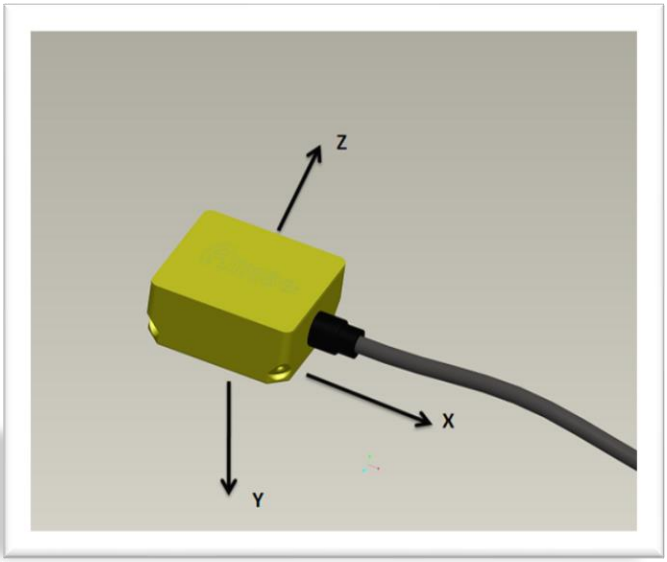
The serial interface is a 115.2 kbps RS-232 link.
The settings for the communication are 1 start bit, 8 data bits, no parity and 1 stop bit.

Accelerometers		Gyroscopes	
Output	**Value**	**Output**	**Value**
32767	-250 µg	32767	-6400 µ°/s
32768	0 g	32768	0 °/s
32769	+250 µg	32769	+6400 µ°/s

Byte No.	Description	Data
0	STARTFLAG	0x7F
1	STARTFLAG	0x7F
2	STARTFLAG	0x7F
3	Gyroscope X	BIT 15 to 8
4	Gyroscope X	BIT 7 to 0
5	Accelerometer X	BIT 15 to 8
6	Accelerometer X	BIT 7 to 0
7	Gyroscope Y	BIT 15 to 8
8	Gyroscope Y	BIT 7 to 0
9	Accelerometer Y	BIT 15 to 8
10	Accelerometer Y	BIT 7 to 0
11	Gyroscope Z	BIT 15 to 8
12	Gyroscope Z	BIT 7 to 0
13	Accelerometer Z	BIT 15 to 8
14	Accelerometer Z	BIT 7 to 0

MECHANICAL DRAWING





PINNING

Pin	Signal
1	GND
2	TX
3	CANL
4	BOOT
5	CANH
6	RX
7	V-batt