

BC-3Axx3Gyyy-000

6DoF IMU CAN Module



Key Features

- Up to 1000Hz IMU Signal output
- Integrated 6DoF IMU with individual range selection
 - accelerometers ($\pm 2 / 4 / 8 / 16G$) and gyros ($\pm 250 / 500 / 1000 / 2000^\circ/s$)
- Built-in coordinate transformation for non-orthogonal mounting position
- Built-in matrix Rotation for USER coordinate system
- Additional first order IIR filter for individual filtering for all axes
- Internal calibration and temperature compensation

Options:

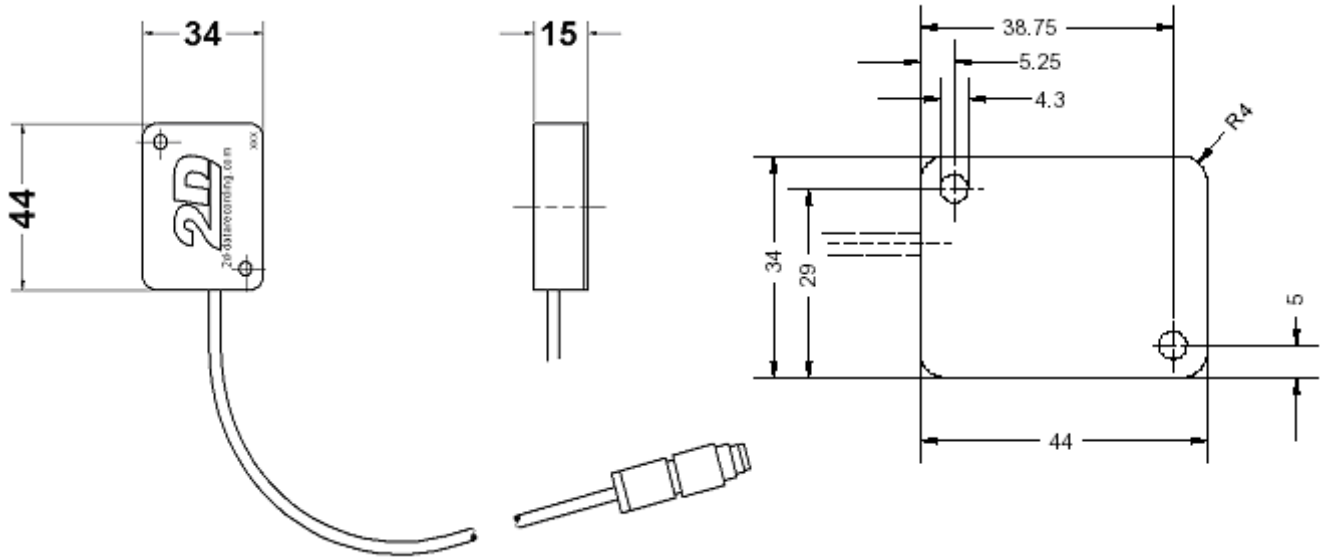
- Connector and cable length can be modified on customer request

Technical specifications

CAN characteristics			Mechanical		
CAN channels		32	Dimensions	mm	44x34x12.5
CAN lines		1	Weight (cable included)	g	50
Baud rate	kBd	up to 1000	Housing material		Aluminum
Sampling rate CAN channels	Hz	1000	CAN Connection		Binder 712, 5PM
3 axis accelerometers			Type		Raychem
Range switchable with 3 axes	G	$\pm 2/\pm 4/\pm 8/\pm 16$	Wire cross section		4x AWG26
Error of linearity	FS	<1%	Length	mm	800
Lowpass filter (programmable)	Hz	10 to 250	Electrical		
max. Sampling rate	Hz	1000	Power supply	V	4 to 18
3 Axis yaw-rate			Current consumption @ 12V	mA	40
Sensitivity			Environmental		
Range switchable with 3 axes	$^\circ/s$	250 / 500 / 1000 / 2000	Sealing class		IP67
Error for linearity	FS	<1%	Operating temperature	$^\circ C$	-10 to +75
Low-pass filter (programmable)	Hz	10 to 250	Humidity	%RH	5 to 95
max. Sampling rate	Hz	1000			

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Dimensions

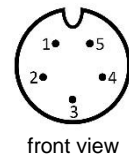


Connector layout

Connector type

CAN, Binder 712 5PM

Pin	Name	Description	Color
1	CAN H	CAN high	white
2	CAN L	CAN low	green
3	GND	Ground	black
4	-	not connected	-
5	Vext	Power supply	red



IIR Filter Channel Group (xxx_IIR)

Each IIR channel is directly linked to the raw channel of the IMU (xxx_RAW). Using the parameter “filter” you can set the desired filter frequency as follows:

$$f_{IIR} = \frac{f_{\text{sampling rate_raw}}}{2^{\text{Filterstep}}}$$

Example: Filterstep 4; sampling rate of raw channel = 200Hz
→ IIR filter frequency = 12.5Hz

Averaging

If the sampling rate of an IIR channel is set lower than the rate of the raw channel, an average is calculated by the ratio of raw channel to the IIR channel.

Example: If the raw channel is set to 400Hz and the IIR channel is set to 100Hz, an additional average of 4 samples is calculated.

Rotation Channel Group (xxx_ROT)

The rotation channels are linked directly to the IIR channels, every change of standard and IIR channel will influence the rotation channel. The misalignment can be compensated by entering the mounting angles in comparison to the orthographic system to the rotation channels.

Example: If the sensor is tilted 10 degrees forward and mounted upright,
→ mounting angles to insert: x=90°; y=10°; z=10°

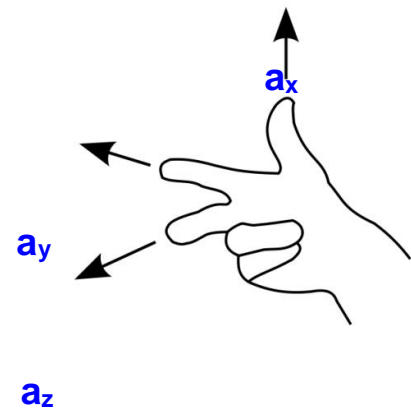
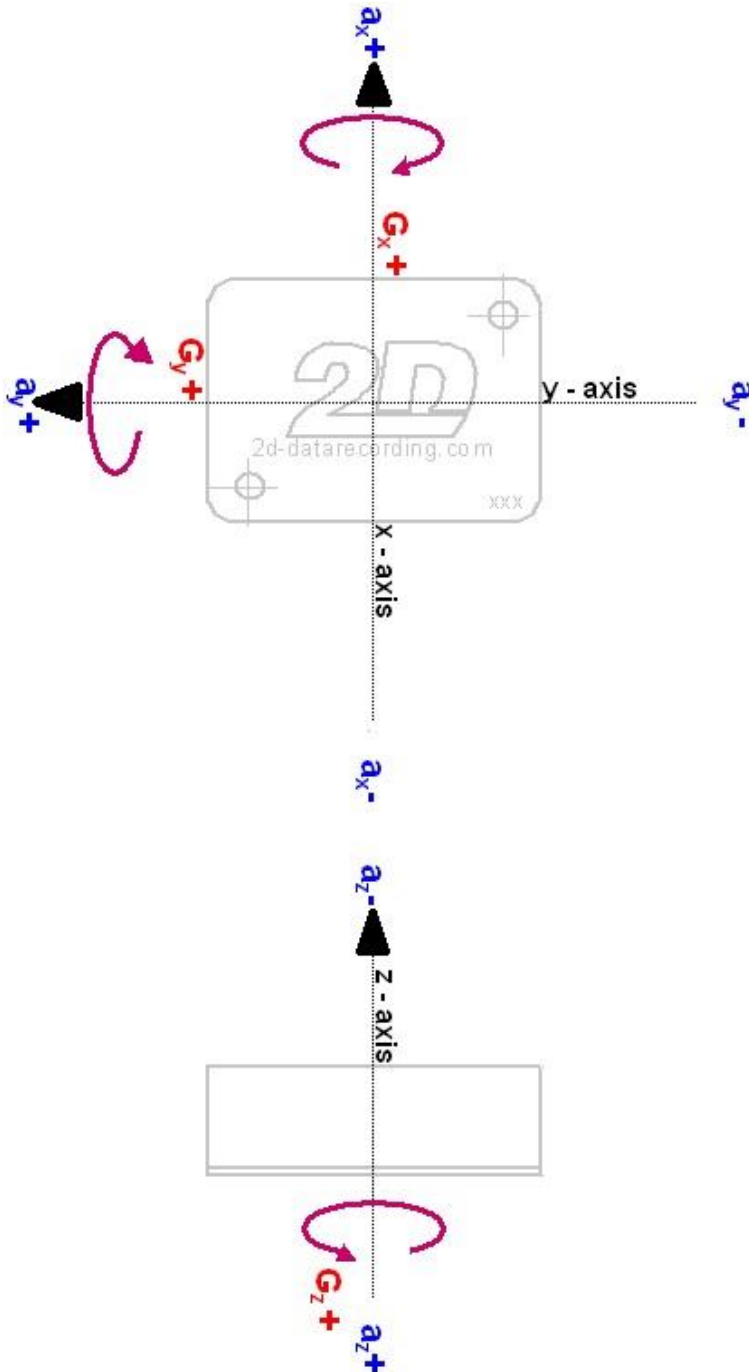


Maximum Sampling Rate

The sampling rate for the IIR / ROT channel can never exceed sampling rate of the raw channel

Supplementary Sheet

The Figure shown beneath shows the “correct directions” for the accelerometers in three directions (x, y and z) as well as the three included gyros. The directions are essential if you calibrate this sensor using Winlt.



“right-hand rule“ for orientation of axis $a_{x,y,z}$



“right-hand rule“ for gyro sense of rotations