

General Description

Optoi **OIAC3-X** is a 1D or 2D inclination sensor, based on MEMS (Micro Electro Mechanical Systems) technology. The device is able to sense tilt angles very accurately, up to ± 60 degrees in the pitch and roll axis and 360 degrees in a mono-axis measure. The signals are filtered using an analog second order low-pass filter with cut-off frequency of 20Hz (fixed filter) and a user programmable digital filter. The sum of these filters produces an enhanced noise rejection (to vibrations for example) on the measured angles. The output is a CAN-OPEN port, fully compliant with DS 301 DSP 410. The device is very flexible, because it is user-programmable via CAN frames in a multitude of parameters, with no additional tool.

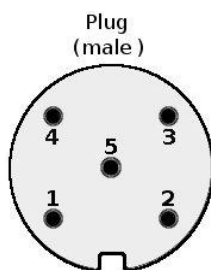
OIAC3-X is compact, rugged, fast, IP67 and it can be customized (on request) with several options.

The typical accuracy in both angles is ± 0.02 degrees, while the resolution can be set from 0.001deg to 1deg.

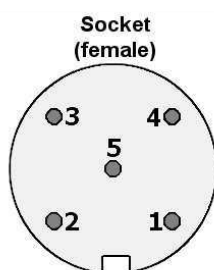
The device is guaranteed in a full industrial temperature range, in which the thermal stability is very good. If needed, the stability can be also reduced by a factor of 4, with a factory thermal compensation option.

Applications

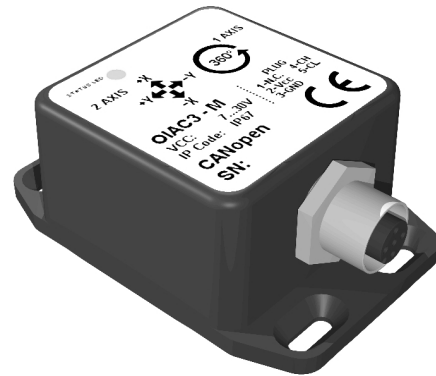
- Construction Equipment
- Aerial platforms
- Solar Farms
- Agricultural and Forestry Machines
- Mining and Well Drilling Equipments
- Overturn Alarm Systems



[**OIAC3-M**]
FRONT VIEW



[**OIAC3-F**]
FRONT VIEW



Features

- High Resolution (up to 0.001 deg)
- High Accuracy (± 0.05 deg)
- Anti-Vibration flexible programmable filter
- CANopen interface (DS301 DSP-410)
- IP67 protection class and industrial temperature range
- Wide (7-30V) power supply range
- Very fast sampling rate (up to 550 S/s)
- Very Easy Programming via CAN frames without additional tools
- Factory Calibrated
- 1D or 2D inclination measurement
- Several options on request:
 - reduced temperature drift, connector style,
 - max input voltage range, plastic¹/metal case

Pin Function

	Name	Function
1	SHIELD	Optional CAN shield
2	VCC	Power Supply
3	GND	Ground
4	Data AH	CAN_H bus line (dominant high)
5	Data BL	CAN_L bus line (dominant low)

Ordering Information

OIAC3-X

X = M for plug connector
X = F for socket connector

¹Plastic case could have reduced temperature range

OIAC3-X

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Min	Max	Unit
T _S	Storage temperature	-55	100	°C
T _A	Operating Temperature Range	-40	80	°C
V _{CC}	Supply Voltage Range (dc voltage)	7	30 ²	V

Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rated conditions for extended periods may affect device reliability.

TECHNICAL CHARACTERISTICS²

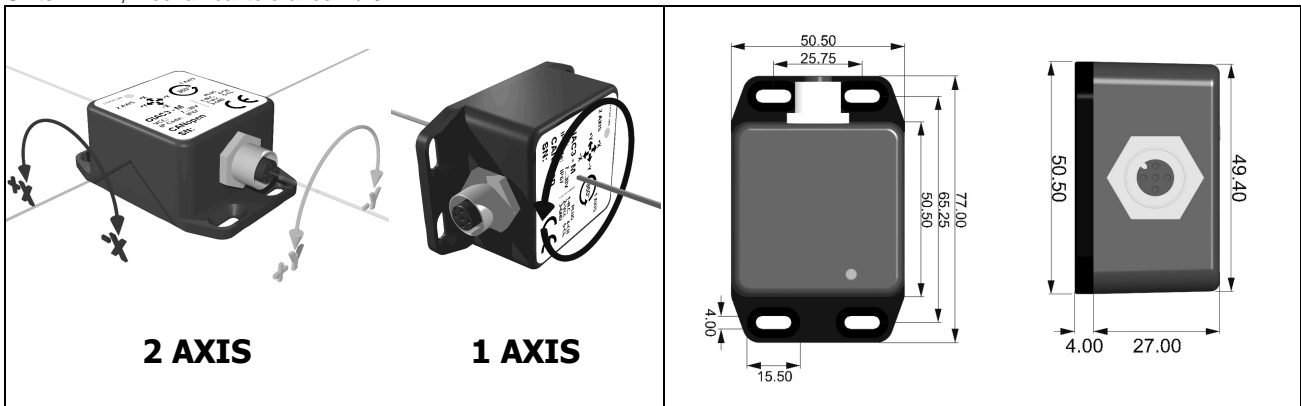
T_A = 25°C, unless otherwise noted.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _{CC}	Supply Voltage Range	-40 < T _A < +80	7	12/24	30 ³	V
I _{CC}	Current consumption		60	65	75	mA
R	Resolution	user programmable	1.0	0.01	0.001 ⁴	deg
A ₂	Accuracy 2-DIM mode	2-DIM, +/-60 deg, filter max		±0.02	±0.05	deg
A ₁	Accuracy 1-DIM mode	1-DIM, +/-60 deg, filter max		±0.03	±0.05	deg
SR	Sample Rate			550		S/s
BR	Baud Rate	user programmable	20	250	1000	Kbit/s
D	Temperature Drift			±0.008 ⁵		deg/°C
Rg ₂	Range	2-DIM, user programmable	±5		±60	deg
Rg ₁	Range	1-DIM, user programmable		0-360		deg

MECHANICAL CHARACTERISTICS AND DIMENSIONS

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
W	Width		50	50,50	51	mm
L	Length		76,50	77	77,50	mm
H	Height		30,50	31	31,50	mm
W	Weight		150	180	220	g
C	Connector		5-pole M12 Male or Female (on request)			

Units = mm ; Mechanical tolerance=+/-0.2mm



USER PROGRAMMABLE SETTINGS

- 1D (0-360deg) or 2D Operational Mode
- Angle Resolution (from 0.001 to 1 degree)
- Pitch and Roll Measurement Range (from ±5 to ±60 deg)
- Pitch and Roll Offsets (2D mode)
- Angle Offset from 0 to 360degree (in 1D Mode)
- Moving Average Noise-Rejection Filter (0-1000 points)
- Pitch and Roll Transmission on Inclination Change (2D Mode)
- Transmission on Inclination Change (1D Mode)
- Pitch and Roll Axis Inversion (2D Mode)
- Temperature Surveillance High and Low Thresholds
- RTR, Cyclic, Event-Driven, Synchronized TPDO Transmission
- EMCY Producer, Failure Monitoring (Heartbeat or Nodeguarding/Lifeguarding)

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This document is subject to change without notice. No claims can be made from the details, illustration and description in this document. We are researching continuously of new innovative improvements to achieve better performances from our products.

² Reference manual contains a complete description of the technical data

³ Custom option: 40V

⁴ Only if range is below ± 30deg in two axis mode

⁵ Temperature drift can be decreased to ±0.002 deg/°C by thermal calibration: available as option