

General Description

OIAC2 dual-axis inclinometers can measure tilt angles in two dimensions up to ± 90 degrees. OIAC2 single-axis versions can measure inclination up to 360 degrees.

The compact sturdy anodized metal enclosure can withstand shocks and vibrations, while the filling resin makes OIAC2 inclinometers waterproof and dustproof.

To guarantee the optimal accuracy on measured tilt angles, OIAC2 inclinometers are factory calibrated. Filters and computing algorithms on acquired signals improve the noise rejection and measure stability.

OIAC2 comes with CANopen interface compliant to CiA standard DS-301 with device profile DSP-410.

OIAC2 factory default configuration can be easily modified (e.g.: node ID, baud rate, filter, ...) and stored in the non-volatile memory with the CANopen interface.

OIAC2 inclinometers can be requested with different connectors, cable lengths, or customer-specific default configurations. Redundant variants are also available on request.

Applications

- Mobile and fixed cranes
- Aerial platforms
- Telehandlers
- Drilling rigs
- Earth moving machines
- Agricultural machines
- Forestry machines

Pin function

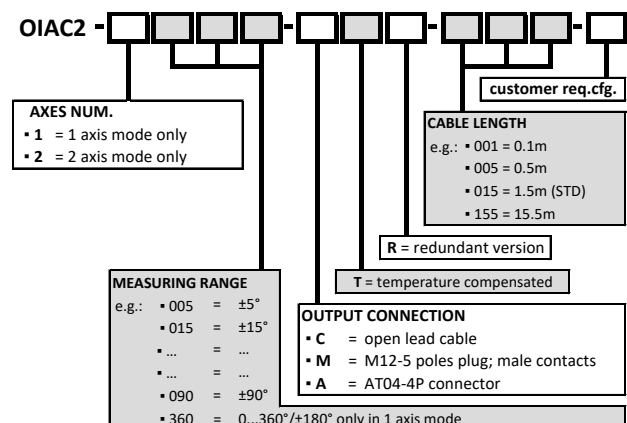
OIAC2 inclinometers are available with different connectors and cables. See pinout information at page number 3.



Features

- Rugged device: fully metal case filled with a protective resin
- Angles resolution up to ± 0.01 deg
- Typical accuracy up to ± 0.2 deg
- 1D or 2D inclination measurement
- Extended range up to ± 90 deg in 2AX mode
- CANopen DS301 with DSP-410
- Programmable filter
- Easily configurable
- Operating temperature -40°C to $+85^{\circ}\text{C}$
- IP67 protection grade
- Customizable on customer request

Ordering Information



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Min	Max	Unit
T _s	Storage temperature	-40	85	°C
T _A	Operating Temperature Range	-40	85	°C
V _{CC}	Supply Voltage Range (DC voltage)	7	30	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.

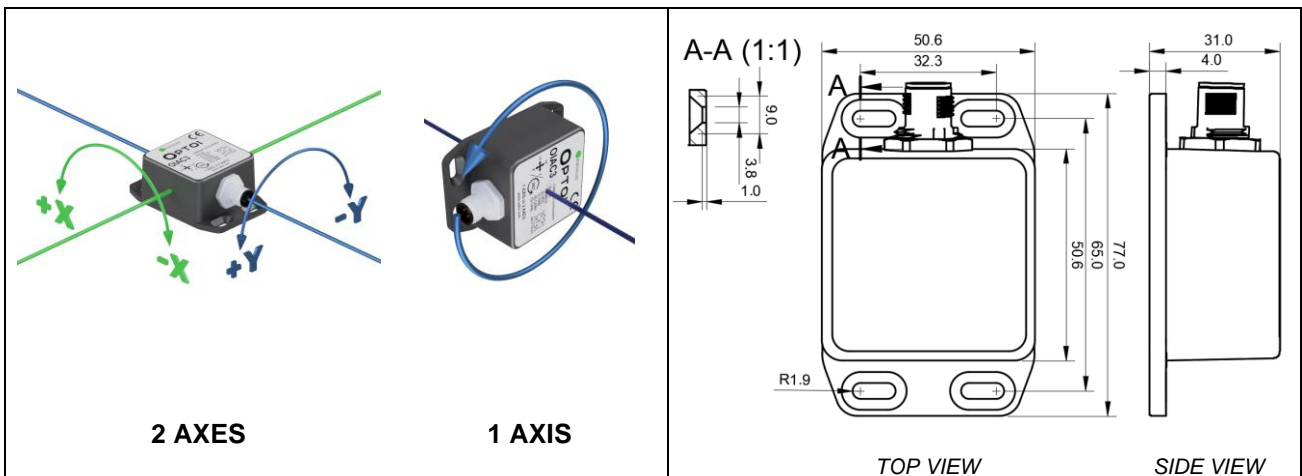
TECHNICAL CHARACTERISTICS*

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	V
I _{CC}	Current consumption	average value; V _{CC} = 12V		20		mA
C	Range of measurement	2 axes mode 1 axis 0-360° format 1 axis ±180° format	±5	±75 360 ±180	±90	deg
R	Resolution	user-programmable	1	0.1	0.01	deg
A _{2AX}	2 Axes Accuracy	Angle ≤ 60deg 85 > Angle > 60deg 90 > Angle > 85deg		±0.2 ±1.5 ±5	±0.5 ±3	deg
A _{1AX}	1 Axis Accuracy			±0.2	±0.5	deg
X _{2AX}	2 Axes Cross Axis Error	-85deg < Angle < +85deg		±0.2	±1	% FS
BR	Baud Rate	fixed baud rate		250		Kbit/s
D	Temperature Drift			±0.01		deg/°C

MECHANICAL CHARACTERISTICS AND DIMENSIONS

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
W	Width			50,6		mm
L	Length			77,0		mm
H	Height			31,0		mm
W	Weight	non-redundant; M12 connector additional cable	150	180 75	220	g g/m



* Reference manual reports a complete description of the technical data

- The highest accuracy is achieved using 4 flat head countersunk screws with a maximum thread diameter of 4mm externally centered in the 4 slot holes.
- For 1-axis models, the sensor's mounting surface must be vertical. The measured **angle value increases with clockwise** rotation. Zero position with left-oriented connector (top view).



- For 2-axes models, the sensor's mounting surface must be flat and perfectly level. Sensors mounted on a non-flat surface can be compensated using the offset and preset register (see the [Reference manual](#)) for angle's offset compensation.

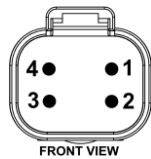


- For heavy vibrating applications, inclinometers isolation from vibration is required, if not the measured angles may be inexact.
- Strong accelerations applied to the inclinometers lead to inexact measure values.

Pin Functions

CABLE VERSION 0.1M LENGTH, WITH AMPHENOL AT04-4P CONNECTOR: OIAC2-XXXX-A-LLL

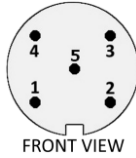
No	Color	Name	Function
1	BLACK	CAN_GND	Ground / 0V / V-
2	BLACK	CAN_H	CAN H bus line (dominant high)
3	BLACK	CAN_L	CAN L bus line (dominant low)
4	BLACK	CAN_V+	Positive power supply



The diagram shows the front view of the 4-pin connector. The pins are arranged in a 2x2 grid and are numbered 1, 2, 3, and 4. Pin 1 is top-right, pin 2 is bottom-right, pin 3 is bottom-left, and pin 4 is top-left.

M12-5 POLES MALE PLUG CONNECTOR VERSION: OIAC2-XXXX-M

No	Color	Name	Function
1		SHIELD	Optional CAN shield
2		CAN_V+	Positive power supply
3		CAN_GND	Ground / 0V / V-
4		CAN_H	CAN H bus line (dominant high)
5		CAN_L	CAN L bus line (dominant low)



The diagram shows the front view of the 5-pin connector. The pins are arranged in a circle with a central pin. The outer pins are numbered 1, 2, 3, and 4 clockwise starting from the bottom. The central pin is numbered 5.

OTHER VERSIONS ARE AVAILABLE ON REQUEST

MAIN USER-PROGRAMMABLE SETTINGS

See the reference manual for further details (available for download on: <https://optoi.com/en/downloads/certificates-manuals>)

- o Node ID
- o Baud Rate
- o Numeric Filter
- o Angle Offsets
- o Axis Sign
- o Measurement Range
- o Axis swap in TPDO1 frames
- o Event timer for TPDO1 frames transmission
- o Angle Resolution (from 0.01 to 1 degree)
- o Failure Monitoring (Heartbeat)
- o 0...360deg or ±180deg 1 Axis Angle Format