

General Description

OIAC4 is a 1D or 2D inclination sensor based on MEMS (Micro Electro Mechanical Systems) technology. The device senses tilt angles up to ± 60 degrees in the pitch and roll axis and 360 degrees in a mono-axis measure. Output signal is 4-20mA.

OIAC4 is suitable for many applications, it is compact and rugged: the metal enclosure and internal resin protect electronic parts and connections against mechanical shocks, vibrations, thermal shocks, humidity and other external agents. An input protection circuit makes the inclinometer highly robust to external electrical disturbances, due to switching processes and transients generated for example in an automotive environment or in an industrial environment. MEMS signals are internally filtered using an analog low-pass filter, with a cut-off frequency of 50Hz, and again using a second moving average software filter.

OIAC4 is guaranteed in the full industrial temperature range $[-40;+85]^{\circ}\text{C}$. MTTF is greater than 100 years, in order to have high reliability. The 1/2 meter output lead cable can be customized with a male M12 connector on request (only for non redundant devices).



Applications

- Stability control for agricultural machinery
- Stability control for construction machinery
- Mowers inclination control
- Leveling control
- Tractors safety applications

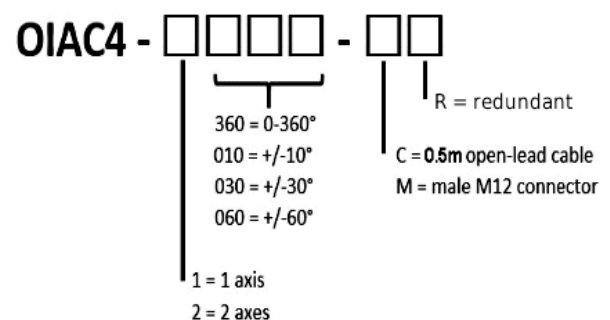
Pin Functions

No	Color	Name	Function
1	GREY	IU1	Internal use only (leave it open if present)
2	RED	VCC1	Power Supply 1
3	BLACK	GND1	Ground 1
4	PINK	OUTX1	Analog output 1 (x-axis in 2 axes mode and 1-axis mode)
5	PURPLE	OUTY1	Analog output 1 (y-axis in 2 axes mode, not present in 1-axis mode)
6	YELLOW	IU2	Internal use only (leave it open if present)
7	WHITE	VCC2	Power Supply 2
8	BLUE	GND2	Ground 2
9	BROWN	OUTX2	Analog output 2 (x-axis in 2 axes mode and 1-axis mode)
10	GREEN	OUTY2	Analog output 2 (y-axis in 2 axes mode, not present in 1-axis mode)

Features

- Robust metal case protects from shocks and vibrations
- Rugged and protected against electrical disturbs and transients
- Filling resin protects against thermal shocks, moisture and harsh environments (IP67)
- Analog output (4–20 mA)
- Protected against reverse bias
- Medium accuracy
- Available in different angle ranges
- Customizable connection system on request
- Fully redundant version available

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	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.

ELECTRICAL CHARACTERISTICS

T_A = 25°C, unless otherwise noted.

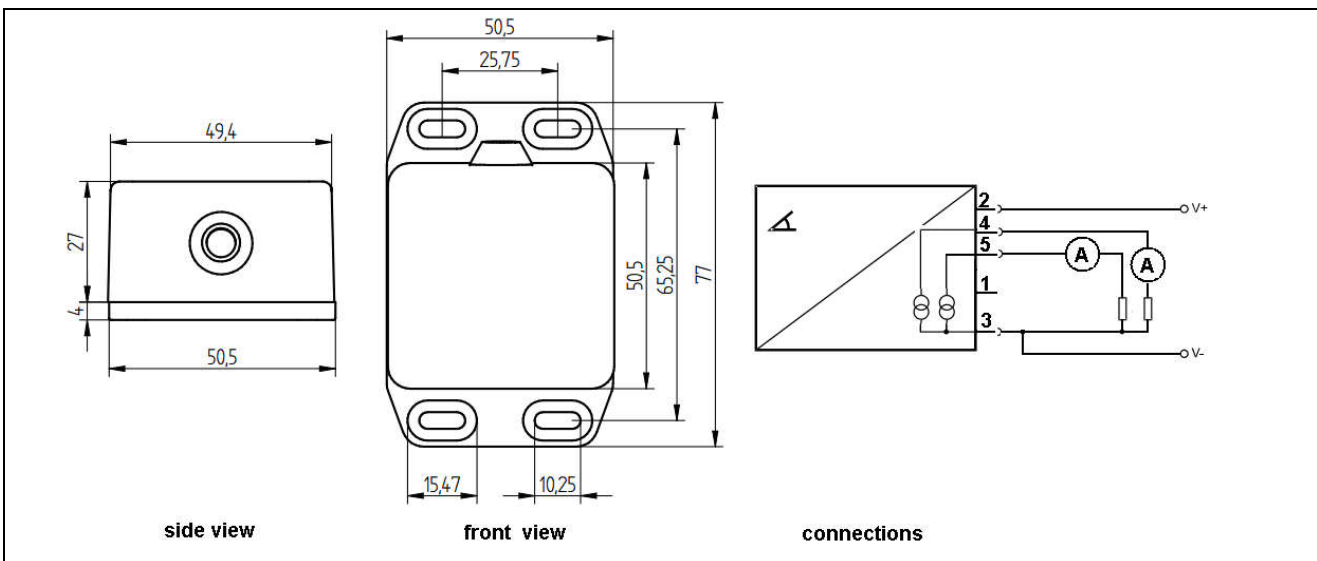
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _{CC}	Supply Voltage Range		7	12/24	30	V
I _{CC}	Current consumption *	output current isn't considered non redundant version †		40		mA
Rg ₁	Range of measurement	model OIAC4-1360		±180		deg
Rg ₂	Range of measurement	model OIAC4-20xx	±10	±30	±60	deg
Res	Resolution of the analog output			7.33		µA
A	Accuracy	Rg ₁ =±180°; Rg ₂ <+/-30°		±0.20	±0.50	deg
X _A	Cross Axis Error			±1.0		% FS
D _T	Temperature drift			± 0.008		deg/°C
‡R _L	Load resistor	V _{CC} = 12V		250		Ω

MECHANICAL CHARACTERISTICS AND DIMENSIONS

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Wdt	Width		50	50,50	51	mm
Lgt	Length		76,50	77	77,50	mm
Hgt	Height		30,50	31	31,50	mm
Wgt	Weight			200		g
C	Connection	non redundant versions	4 or 5 poles open lead cable, 0,5m			
		fully redundant versions	8 or 10 poles open lead cable, 0,5m			

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

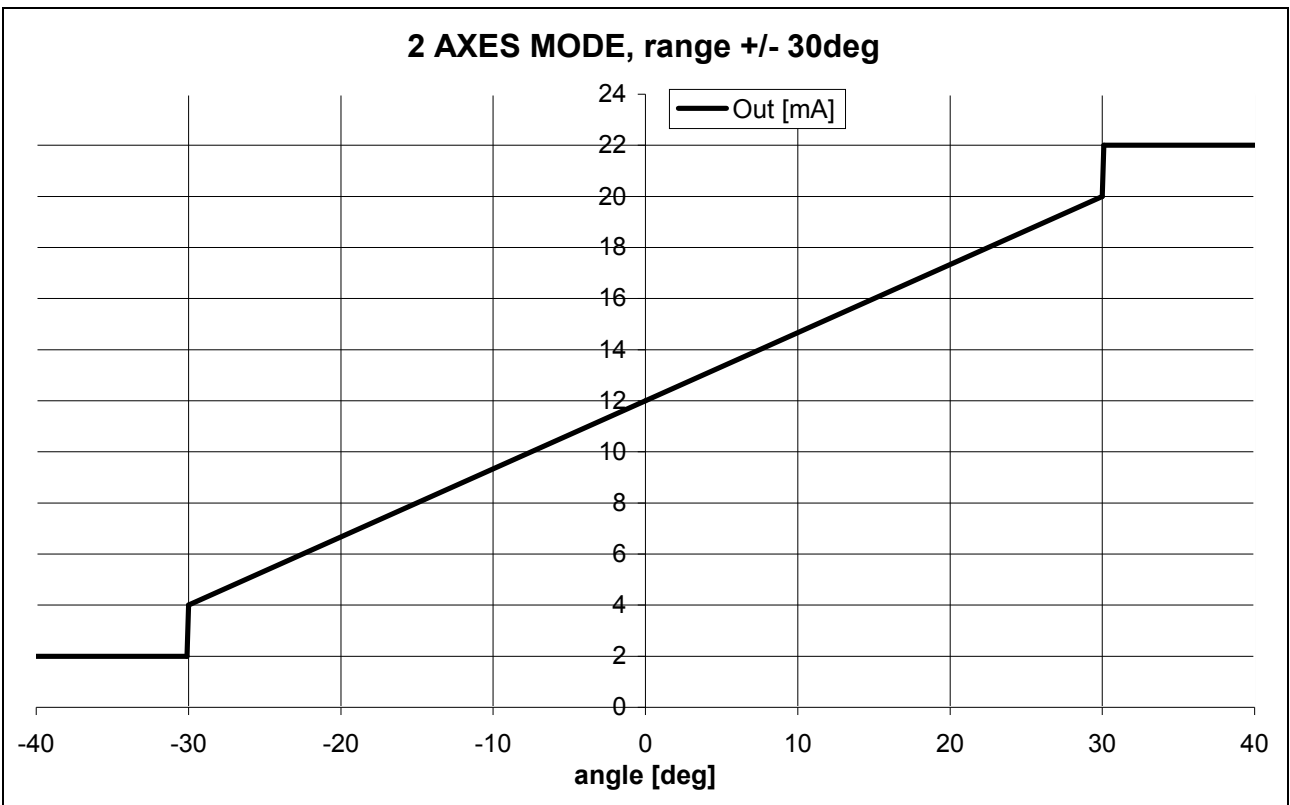
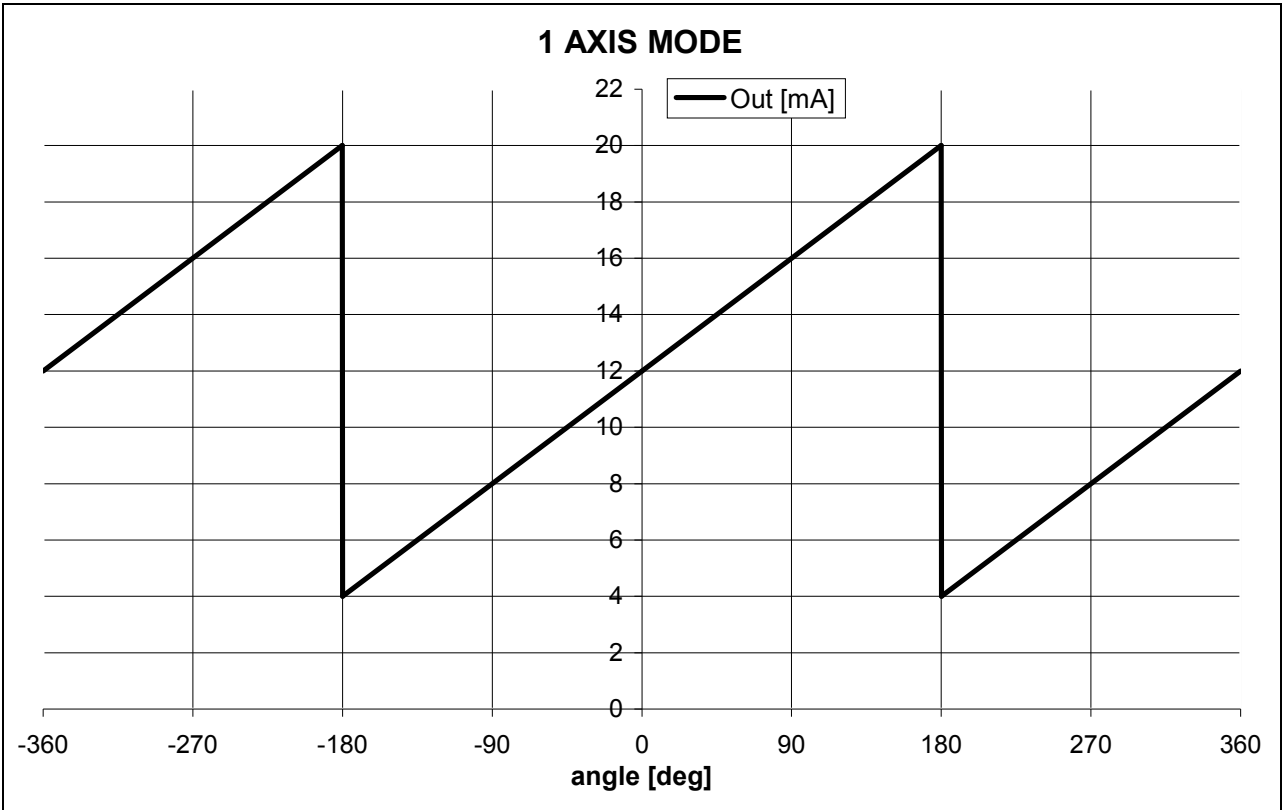
The reference (zero point) of the single-axis model (OIAC4-1360) is looking it from front side, with the connector/cable to the left.



* Sensor current consumption is 40mA. At X and Y full scale (20mA+20mA), the total current consumption is 80mA
 † For the redundant versions the total value of current consumption must be doubled: 40mA for channel 1 plus 40mA for channel 2
 ‡ Choose a proper value of Rload looking at the safe operating area RI Vs Vcc, page 4

OUTPUT CHARACTERISTICS

Fully redundant devices has two output signals available for each axis. These signals match themselves (no cross-signal)



LOAD RESISTANCE SAFE OPERATING AREA

The max and min load resistance are considered as the sum of load resistor and cable resistance.

