Triaxial Inclinometer

CANopen®
2 M12 Connector(s), IP67

P/N: AX060835

Features:
- Reliable, real-time, accurate and stable slope angle data
- MEMS-based accelerometer measures angle with respect to gravity
- Measures pitch and roll inclination angles in a full ±180 degree orientation range
- Outputs gravity angle and accelerations in 3 orthogonal directions
- CANopen®
- 12V, 24Vdc nominal power supply
- Aluminum enclosure, 2 round 5-pin A-coded M12 connectors, gasket
- IP67 protection
- CE marking
- EDS file

Applications:
- Agricultural, off-highway and mining equipment
- Platform levelling and stabilization in industrial machines
- Navigation system component

General Description: The unit measures pitch and roll inclination angles in a full ±180 degree orientation range. The unit can also output gravity angle and unit accelerations in three orthogonal directions. The inclinometer transmits angular data over CAN bus using CANopen® protocol.

Ordering Part Numbers:

Inclinometers:
AX060835 – Triaxial Inclinometer, CAN (CANopen®), 2 M12 Connectors
The EDS file is on the website www.axiomatic.com. Go to the Log-In section and enter the password.

Accessories:
AX070140 - Screw Plug PROT-FB M12 1555538

Technical Specifications:

Specifications are indicative and subject to change. Actual performance will vary depending on the application and operating conditions. Users should satisfy themselves that the product is suitable for use in the intended application. All our products carry a limited warranty against defects in material and workmanship. Please refer to our Warranty, Application Approvals/Limitations and Return Materials Process as described on https://www.axiomatic.com/service/.

Static Parameters

Parameter	Value	Remarks
Measurement Range	±180° – Pitch & Roll 0…180° – Gravity	
Resolution	0.06°	Effective Resolution (3.46*NoiseRMS). Maximum at cut-off frequency, Fc=5Hz
Initial Accuracy	±2°	Maximum, at 25°C
Temperature Drift	±3°	Maximum, in the full temperature range: -40…85°C
Nonlinearity	±0.1%	Maximum, at 25°C
Cross-Axis Sensitivity	±1%	Maximum, at 25°C

Dynamic Parameters

Parameter	Value	Remarks
Cut-off frequency, Fc	1…50 Hz, 5 Hz default	User selectable

Inputs

Parameter	Value	Remarks
Supply Voltage	9…36 VDC	12V, 24V – nominal
Supply Current[1]	15 mA 25 mA	Maximum at 24V Maximum at 12V
Protection	Reverse polarity, Transients[2]	

[1] CAN bus is connected.
[2] Withstands 80 VDC @25°C for 2minutes for jump start conditions

CAN Output

Parameter	Value	Remarks
Number of ports	1 CAN Port	To output data and change the internal configuration of the inclinometer.
Communication standards	CANopen®	
	ISO 11898	120Ohm terminated twisted pair, baud rate up to 1MBit/s. Termination resistor is not installed.
	Bosch CAN protocol specification 2.0, Part A, B.	For the internal CAN controller.
Protection	Short circuit to ground	
	Connection to the power supply	Only for 12V systems

General Specifications

Parameter	Value
Sensor Type	MEMS
User Interface	EDS provided to interface to standard CANopen ® tools
Operating Temperature	-40…+85 °C
Environmental Protection	IP67

Vibration and Shock[1]	The sinusoidal component of the vibration testing was conducted following MIL-STD-202G, method 204D, test condition C (10g peak). A resonant frequency analysis was performed, no resonances were noted. Sweep Characteristic: 10Hz to 2000Hz to 10Hz Sweep Period: 20 Minutes Test Duration: 8hrs/axis Test Intensity: 10g Peak The random component of the vibration testing was conducted meeting or exceeding the requirements of MIL-STD-202G, method 214A, test condition I/B (7.68 Grms): Frequency Range: 5Hz to 2000Hz Test Duration: 8hrs/axis Overall Grms: 7.68 Grms The shock component of the vibration testing is based on MIL-STD-202G, method 213B, test condition A. The pulse duration was shortened to 9 ms from the standard 11 ms due to our vibration system limits. Eight pulses per axis were performed instead of six. The test was conducted as follows: Pulse Type: half sine Pulse Duration: 9 ms Peak Value: 50 g Pulses per axis: 8
Enclosure	Metal enclosure, anodized with two 5-pin M12 A-coded round connectors. Refer to dimensional drawing.
Size	Refer to dimensional drawing.
Weight	0.75 lb. (0.34 kg)

[1]MEMS sensor can withstand 20000 g max.

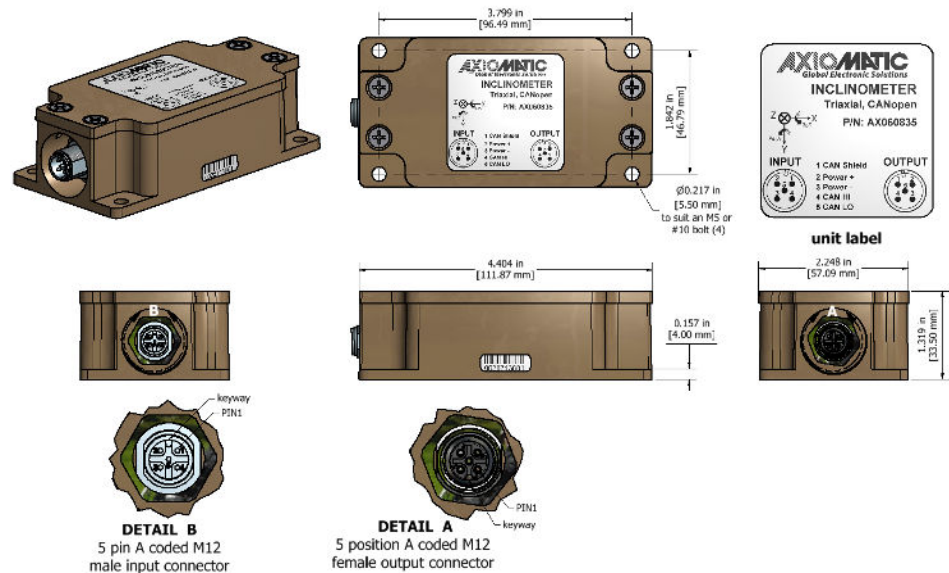## Compliance
Enclosure Protection

Standard	Description	Conditions
IEC 60529	Degrees of protection provided by enclosures (IP Code).	IP67. Mating connectors compliant with IEC 61076-2-101:2012 should be installed.

Name	Remarks
CE Marking	EMC – DIN EN13309:2010 RoHS

Installation Instructions:
The CAN wiring is considered intrinsically safe. All field wiring should be suitable for the operating temperature range of the module. CAN wiring may be shielded using a shielded twisted conductor pair and the shield must be connected to the CAN_SHIELD pin.
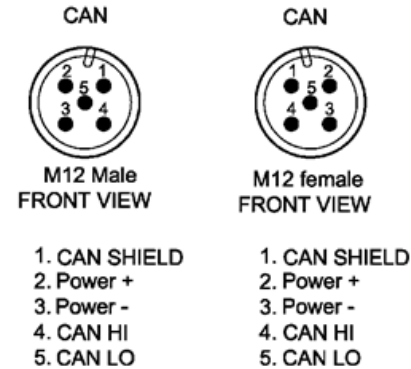
Dimensions:

DETAIL B
5 pin A coded M12
male input connector

DETAIL A
5 position A coded M12
female output connector

Electrical Connections:
Model: AX060835

There is only one CAN port supported by the unit. Both CAN connectors are physically connected to facilitate cable routing in the user system.

The unit contains two 5-pin M12 A-coded round connectors. Use mating connectors compliant with IEC 61076-2-101:2012.

CAN

M12 Male
FRONT VIEW

1. CAN SHIELD
2. Power +
3. Power -
4. CAN HI
5. CAN LO

CAN

M12 female
FRONT VIEW

1. CAN SHIELD
2. Power +
3. Power -
4. CAN HI
5. CAN LO

Unit Orientation:
Model: AX060835

The unit coordinates, together with the Pitch and Roll directions are shown on the inclinometer label.

Z points vertically into the picture
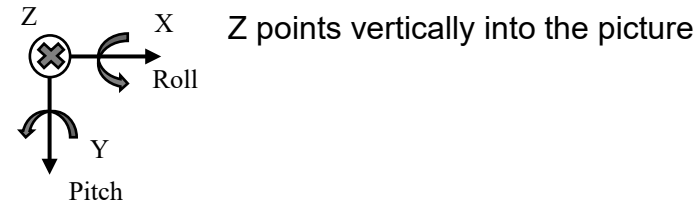
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Form: TDAX060835-07/04/23