

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
- Painted Aluminum enclosure, gasket
- The inclinometer is available with different set of connectors: one or two MIL4 connectors, one or two MIL6 connectors, one or two PG-11 strain reliefs.
- IP67 protection for MIL connector models
- IP65 for strain relief models with cable installed
- EDS File

Applications:

- Level, tilt, pitch and acceleration monitoring in 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 a standard CANopen® protocol.

Ordering Part Number:

Inclinometer:

- AX060851-1PG11** – Triaxial Inclinometer, CANopen®, 1 PG11 Strain Relief (supersedes model MVINC-CO-1-180-PG11-1)
AX060851-2PG11 – Triaxial Inclinometer, CANopen®, 2 PG11 Strain Reliefs (supersedes model MVINC-CO-1-180-PG11-2)
AX060851-1MIL4 – Triaxial Inclinometer, CANopen®, 1 MIL 4 Connector (supersedes model MVINC-CO-1-180-MIL4-1)
AX060851-2MIL4 – Triaxial Inclinometer, CANopen®, 2 MIL 4 Connectors (supersedes model MVINC-CO-1-180-MIL4-2)

The EDS file is on the website www.axiomatic.com. Go to the Log-In section and enter the password.

Accessories: None

Technical Specifications:

Static Parameters

Parameter	Value	Remarks
Measurement Range	±180° – Pitch & Roll 0...180° – Gravity	
Resolution	0.35°	Maximum Effective Resolution (3.46*NoiseRMS). Maximum at cut-off frequency, Fc=5Hz
Initial Accuracy	±3°	Maximum, at 25°C
Temperature Drift	±3.5°	Maximum, in the full temperature range: -40...85°C
Nonlinearity	±0.7%	Maximum, at 25°C
Cross-Axis Sensitivity	±3.5%	Maximum, at 25°C

Dynamic Parameters

Parameter	Value	Remarks
Cut-off frequency, Fc	1...50 Hz, 5 Hz default	User selectable
Settling time	≤0.2s	Typical at default Fc. From 0 to 95% of the static output value.

Inputs

Parameter	Value	Remarks
Supply Voltage	9...36 VDC	12V, 24V – nominal
Supply Current ¹	20 mA 30 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 Bosch CAN protocol specification 2.0, Part A, B.	120Ohm terminated twisted pair, baud rate up to 1MBit/s. Termination resistor is not installed. For the internal CAN controller.
Protection	Short circuit to ground Connection to the power supply	Only for 12V systems

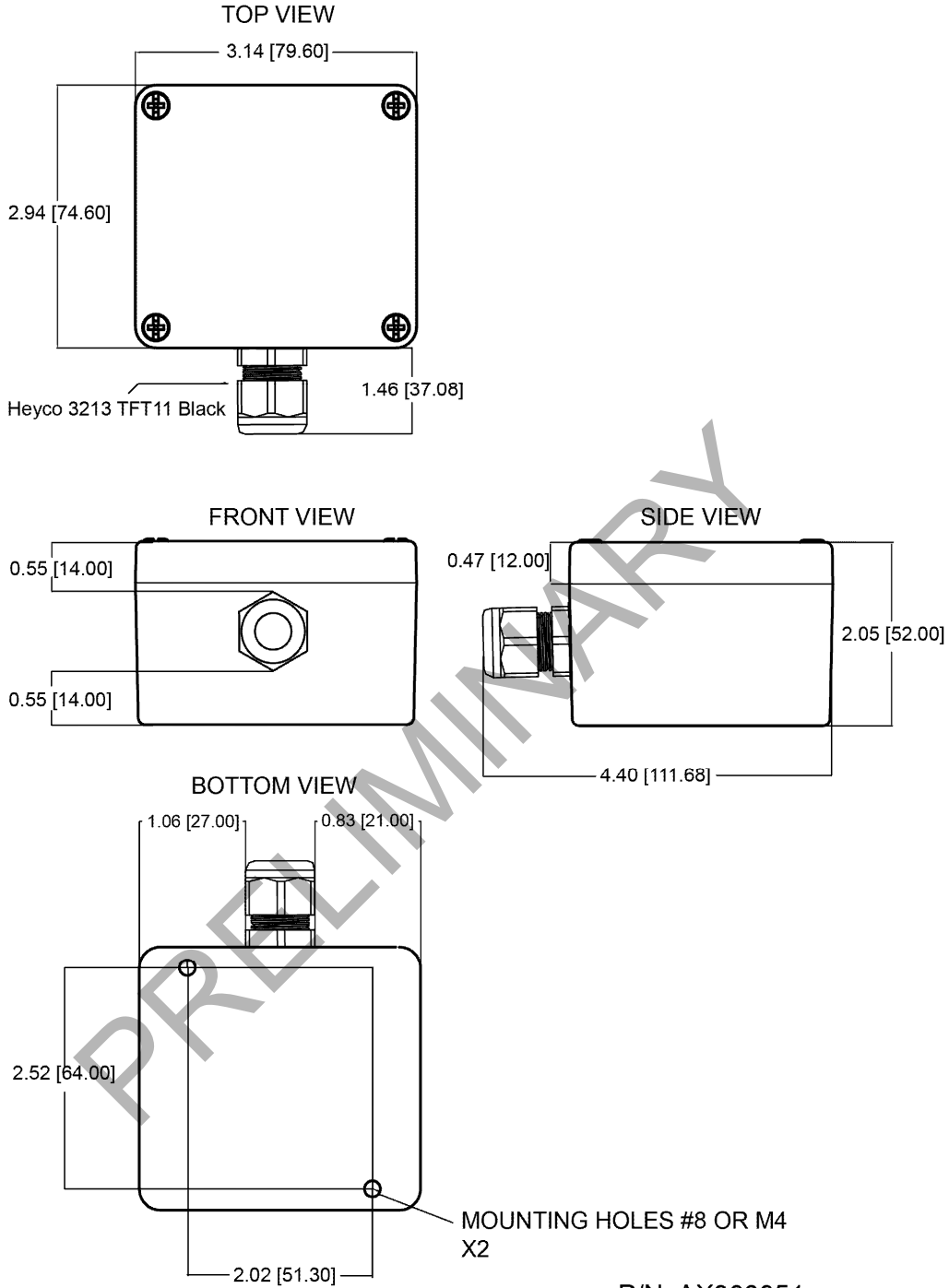
General Specifications

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	<p>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.</p> <p>Sweep Characteristic: 10Hz to 2000Hz to 10Hz Sweep Period: 20 Minutes Test Duration: 8hrs/axis Test Intensity: 10g Peak</p> <p>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):</p> <p>Frequency Range: 5Hz to 2000Hz Test Duration: 8hrs/axis Overall Grms: 7.68 Grms</p> <p>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:</p> <p>Pulse Type: half sine Pulse Duration: 9 ms Peak Value: 50 g Pulses per axis: 8</p>
Enclosure	<p>Metal enclosure, painted</p> <p>Options:</p> <ul style="list-style-type: none"> - 1 PG11 Heyco 3213 TFTL11 black strain relief - 2 PG11 - 1 MIL 4 - 2 MIL 4
Size	<p>Refer to dimensional drawing and electrical connections.</p> <p>See dimensional drawing. 75 x 80 x 52 mm 2.95 x 3.14 x 2.05 inches (L x W x H excluding strain relief or connectors)</p>
Weight	<p>Contact Axiomatic.</p>

¹MEMS sensor can withstand 20000 g max.

Dimensions:



P/N: AX060851
Dimensions: inches [mm]

Electrical Connections:

The inclinometer is available with different set of connectors: one or two MIL4 connectors; or one or two PG-11 strain reliefs.

Model: AX060851-PG11

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

An Heyco Strain Relief, P/N: 3213 TFT11 (PG11) is located in the housing to accept cables with the following minimum and maximum dimensions.

Minimum: 0.230 inches or 5.8 mm

Maximum: 0.395 inches or 10 mm

The PCB connector consists of ZFKKDS-5.08 spring load terminal blocks and which are manufactured by Phoenix Contact.

Maximum allowed wire size is 1.5mm² (AWG 16).

<i>Pin</i>	<i>Signal</i>	<i>Type</i>	<i>Function</i>
1	CAN SH	CAN	CAN shield
2	V supply	PWR	Power supply
3	GND	GND	Power supply ground
4	CAN HI	CAN	CAN bus hi signal
5	CAN LO	CAN	CAN bus lo signal

Table of Connector J1 signals

Model: AX060851-MIL4

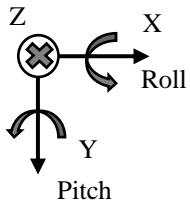
ITT Cannon CA3102E14S-14-2P-F80, 4pins, male IP67, cable clamp provided.

Pin	Signal
A	BATT+
B	BATT-
C	CAN hi
D	CAN lo

Table of MIL 4 Connector Pin out

Unit Orientation:**Model: AX060851**

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



Z points vertically into the picture

Compliance
Enclosure Protection

Standard	Description	Conditions
IEC 60529	Degrees of protection provided by enclosures (IP Code).	IP67 MIL Connector models or IP65 with cable connected via PG11 strain relief compliant with IEC 61076-2-101:2012

Name	Remarks
CE Marking	EMC 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.

Notes: CANopen® is a registered community trademark of CAN in Automation e.V.

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 www.axiomatic.com/service.html.

Form: TDAX060851-05/17/19

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