

TECHNICAL DATASHEET #TDAX200102  
**12 CHANNEL STRAIN GAUGE CONTROLLER**  
 with Electronic Assistant  
 P/N: AX200102

**Features:**

- 12 channels for inputs from 4-wire full bridge strain gauges
  - Input range is selectable from +/- 2.5mV to +/- 2.5VDC.
  - Update rate is maximum 83.3 Kcps for all 12 channels.
- 1 digital input (push button)
- 12 +5V or +10V excitation connections
- LED indicators
- 12V, 24V or 48Vdc (nominal) power input
- 2 CAN ports (SAE J1939)
- Rugged packaging and connectors (7 M12 8-pin connectors)
- Standard control logic
- User configurable with Axiomatic Electronic Assistant



**Applications:**

- agricultural equipment automation

**Ordering Part Numbers:**

- SAE J1939 Controller, 250 kbps baud rate: **AX200102**  
 SAE J1939 Controller, 500 kbps baud rate: **AX200102-01**  
 SAE J1939 Controller, 1 Mbps baud rate: **AX200102-02**

**Accessories:**

Electronic Assistant Configuration KIT: **AX070502**

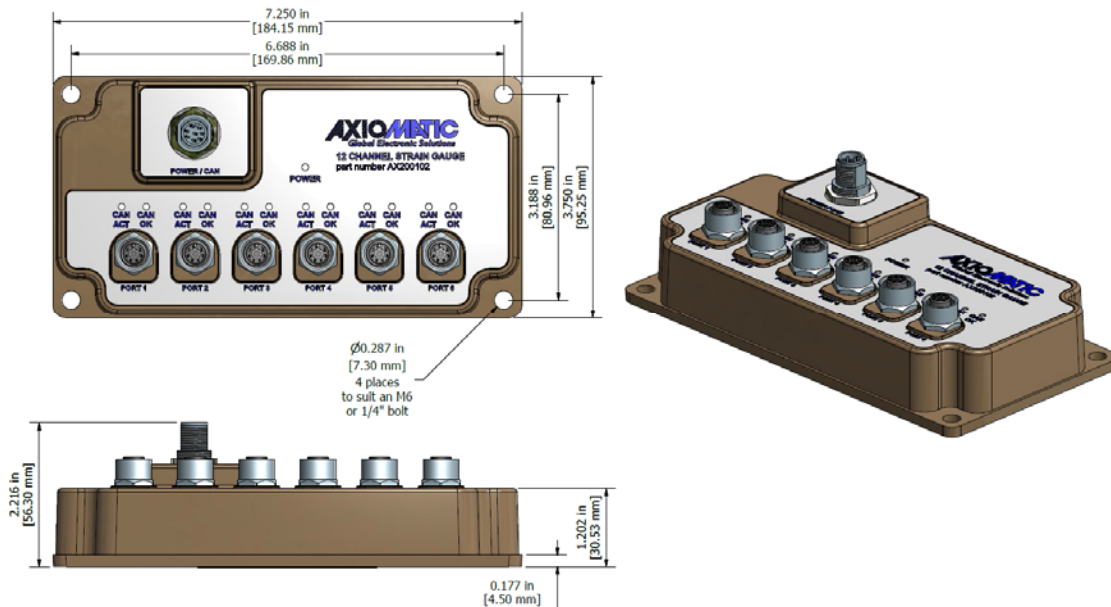
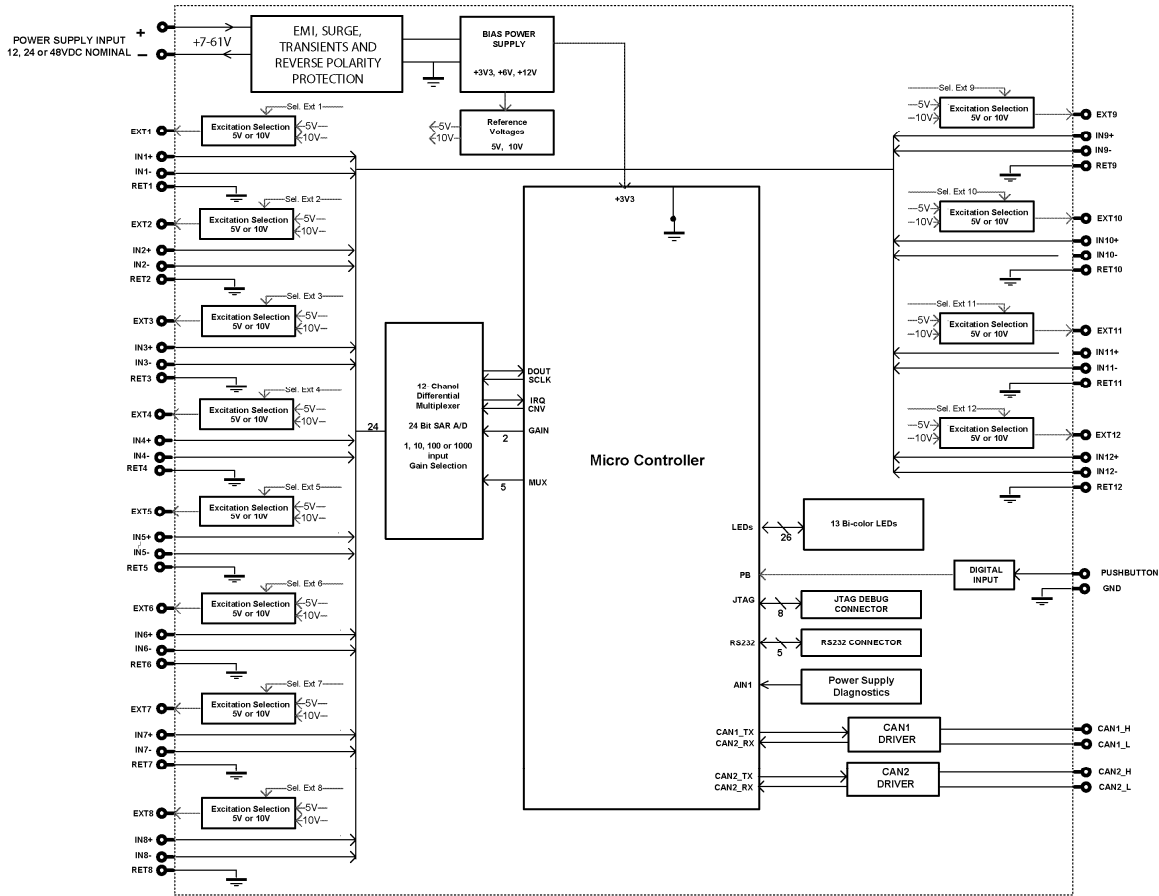


Figure 1.0 – Dimensional Drawing

**Description:** The 12 Channel Strain Gauge CAN controller accepts up to twelve 4-wire strain gauge connections. The input range is user selectable from +/- 2.5 mV to +/- 2.5 Vdc. It interfaces with the machine's CAN network (SAE J1939). Two CAN ports are provided. The measurement rate and the update rate are high speed for all channels. Standard embedded software is provided. Rugged IP66 rated packaging and a power supply input of 12V, 24V or 48Vdc nominal suits applications in the harsh environment of mobile equipment with on-board battery power. All setpoints are user configurable using the Electronic Assistant.

**Block Diagram:**



**Technical Specifications:**

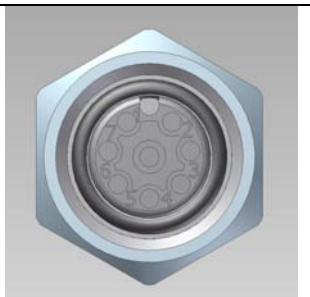
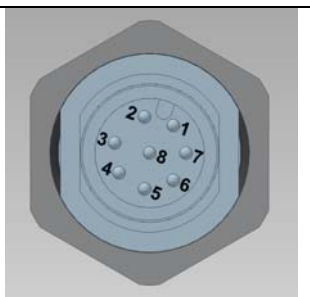
**Input Specifications**

Power Supply Input	12V, 24V or 48Vdc nominal (7...61 Vdc power supply range) Suitable for engine cranking and load dump
Reverse Polarity Protection	Provided up to -80Vdc
Surge and Transient Protection	Provided
Under-voltage Protection	Provided (hardware shutdown)
Overvoltage Protection	Provided (hardware shutdown)
Digital Input	One (1) Digital Input Configurable pullup or pulldown resistor Digital Input: Active High to 5V or Active Low to GND Amplitude: up to +Vsupply

Ground Connections	12 GND connections 1 Digital Input GND connection
Strain Gauge Inputs	Twelve (12) channels of 4 wire full bridge stain gauge connections <ul style="list-style-type: none"> <li>• Input range is selectable from +/- 2.5mV (Gain 1000) to +/- 2.5VDC (Gain 1).</li> <li>• All input channels have excitation and ground connection on the connector.</li> <li>• Programmable input gain of 1, 10, 100 and 1000 enables gauge sensitivity selectable from 200mV/V down to 0.4mV/V.</li> <li>• Integrated digital filter with real-time averaging with up to 65536 averaged conversations</li> <li>• 98dB SNR at 1Msps (digital filter =1) up to 140dB SNR at 15.25sps (digital filter = 65536)</li> <li>• ±4.5ppm INL maximum and no missing codes at 24 bits</li> <li>• Zero-scale drift with temperature maximum +/- 20ppm/°C at full temperature range</li> </ul>
Measurement rate	The measurement rate is 1000 scans per second for all 12 channels. The update rate is 1msec for all 12 channels.
Resolution	24-Bit resolution
Drift	Overall drift with temperature is 50 ppm/°C of span (maximum).
Input Accuracy	+/- 0.5% throughout the entire range of the input
Excitation	12 +5V/+10V excitation connections

### General Specifications

Operating Conditions	-40 to 85°C (-40 to 185°F)
Weight	1.37 lb. (0.622 kg)
Protection	IP66
Microprocessor	STM32F407VGT7
Quiescent Current Draw	112 mA @ 12Vdc; 90 mA @ 24Vdc typical
LED Indicators	Each channel has an individual bi-color status/ calibration/ error LED indicator.
CAN Interface	2 CAN ports (SAE J1939) Model AX200102: 250 kbps Baud Rate Model AX200102-01: 500 kbps Baud Rate Model AX200102-02: 1 Mbps Baud Rate  Transmit Rate 1 mSec
Network Termination	It is necessary to terminate the network with external termination resistors. The resistors are 120 Ohm, 0.25W minimum, metal film or similar type. They should be placed between CAN_H and CAN_L terminals at both ends of the network.
Control Logic	Standard embedded software is provided and is configurable using the Electronic Assistant (EA). Refer to the User Manual. <i>(Application-specific control logic is available on request.)</i>
User Interface	User configuration and diagnostics are provided with the Axiomatic Electronic Assistant, p/n AX070502. The Axiomatic Service Tool is a Windows-based graphical user interface that allows easy configuration of the controller setpoints.
Vibration	MIL-STD-202G, Test 204D and 214A (Sine and Random) 10 g peak (Sine), 7.68 Grms peak (Random) (PENDING)
Shock	MIL- STD-202G, Method 213B, test condition A 50g (PENDING)
Enclosure and Dimensions	Cast aluminum, hard anodized Refer to the dimensional drawing, Figure 1.0.
Installation	For mounting information, refer to the dimensional drawing Figure 1.0.

Electrical Connections	6 CONEC M12 8-pin connectors (A-coded), P/N: 43-01332 (Ports 1-6) 1 CONEC M12 8-pin connector (A-coded) P/N: 43-01014 (Port 7)																			
	<p>Port 1: Input Channels 1 and 2</p> <table border="1"> <thead> <tr> <th>PIN#</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Excitation 1 +</td> </tr> <tr> <td>2</td> <td>IN 1+</td> </tr> <tr> <td>3</td> <td>IN 1-</td> </tr> <tr> <td>4</td> <td>Excitation 1 -</td> </tr> <tr> <td>5</td> <td>Excitation 2 +</td> </tr> <tr> <td>6</td> <td>IN 2+</td> </tr> <tr> <td>7</td> <td>IN 2-</td> </tr> <tr> <td>8</td> <td>Excitation 2 -</td> </tr> </tbody> </table> 		PIN#	Description	1	Excitation 1 +	2	IN 1+	3	IN 1-	4	Excitation 1 -	5	Excitation 2 +	6	IN 2+	7	IN 2-	8	Excitation 2 -
PIN#	Description																			
1	Excitation 1 +																			
2	IN 1+																			
3	IN 1-																			
4	Excitation 1 -																			
5	Excitation 2 +																			
6	IN 2+																			
7	IN 2-																			
8	Excitation 2 -																			
<p>The remaining connectors have the same pin out order as Port 1.  Port 2: Input Channels 3 and 4  Port 3: Input Channels 5 and 6  Port 4: Input Channels 7 and 8  Port 5: Input Channels 9 and 10  Port 6: Input Channels 11 and 12</p> <p>Port 7: Digital Input, Power and CAN</p> <table border="1"> <thead> <tr> <th>PIN#</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>BATT +</td> </tr> <tr> <td>2</td> <td>CAN1_H</td> </tr> <tr> <td>3</td> <td>CAN1_L</td> </tr> <tr> <td>4</td> <td>Digital Input 1 +</td> </tr> <tr> <td>5</td> <td>BATT -</td> </tr> <tr> <td>6</td> <td>CAN2_H</td> </tr> <tr> <td>7</td> <td>CAN2_L</td> </tr> <tr> <td>8</td> <td>Input GND</td> </tr> </tbody> </table> 			PIN#	Description	1	BATT +	2	CAN1_H	3	CAN1_L	4	Digital Input 1 +	5	BATT -	6	CAN2_H	7	CAN2_L	8	Input GND
PIN#	Description																			
1	BATT +																			
2	CAN1_H																			
3	CAN1_L																			
4	Digital Input 1 +																			
5	BATT -																			
6	CAN2_H																			
7	CAN2_L																			
8	Input GND																			

*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](http://www.axiomatic.com/service.html).*

Form: TDAX200102-12/03/19