Preliminary
TECHNICAL DATASHEET #TDAX032100

2 Bipolar Analog/Digital and 8 Universal Signal Inputs Controller

CAN (SAE J1939), Ethernet
Two +5V references
DIN rail mount

P/N: AX032100

Features:

- SAE J1939 CAN port
- Ethernet port
- Two (2) signal inputs are selectable as bipolar voltage, current, digital or PWM signal types:
  - 0-5V, 0-10V, 0 to +/- 5V, 0 to +/- 10V;
  - 4-20mA, 0-20mA, or 0-200 mA;
  - PWM;
  - or Digital.
- Eight (8) universal signal inputs are selectable as bipolar voltage, current, resistive, digital, PWM or frequency signal types:
  - 0-5V, 0-10V, 0 to +/- 5V, 0 to +/- 10V;
  - 4-20mA, 0-20mA, or 0-200 mA;
  - Resistive
  - PWM;
  - Frequency;
  - or Digital.
- 12Vdc or 24Vdc nominal
- Two reference voltages (+5V) are available.
- Operates from -40 to 85°C (-40 to 185°F).
- Two LED indicators
- IP20
- DIN rail mount, screw terminal connections
- Configurable via Electronic Assistant®

Applications:

- industrial control panels
- power gen set engine control systems
- oil and gas equipment automation
- machine automation

Ordering Part Numbers:

2 Bipolar A/D and 8 Universal Signal Inputs Controller, SAE J1939, 250 kbps: **AX032100**
2 Bipolar A/D and 8 Universal Signal Inputs Controller, SAE J1939, 500 kbps: **AX032100-01**
2 Bipolar A/D and 8 Universal Signal Inputs Controller, SAE J1939, 1 Mbps: **AX032100-02**

Accessories:
Electronic Assistant®: **AX070502**

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Description: The Controller accepts two analog/digital signal inputs and eight universal signal inputs. The control can be networked to a SAE J1939 or Ethernet fieldbus. Two +5V, 100 mA references are available to power sensor inputs. A rugged power supply interface accepts 12 Vdc or 24 Vdc nominal for battery powered machine applications. LED's indicate operational status. The enclosure is DIN rail mount. It operates from -40 to 85°C (-40 to 185°F). Standard embedded software is provided and is configurable using the Electronic Assistant® (EA). The sophisticated control algorithms allow the user to program the controller for a wide range of applications without the need for custom software.

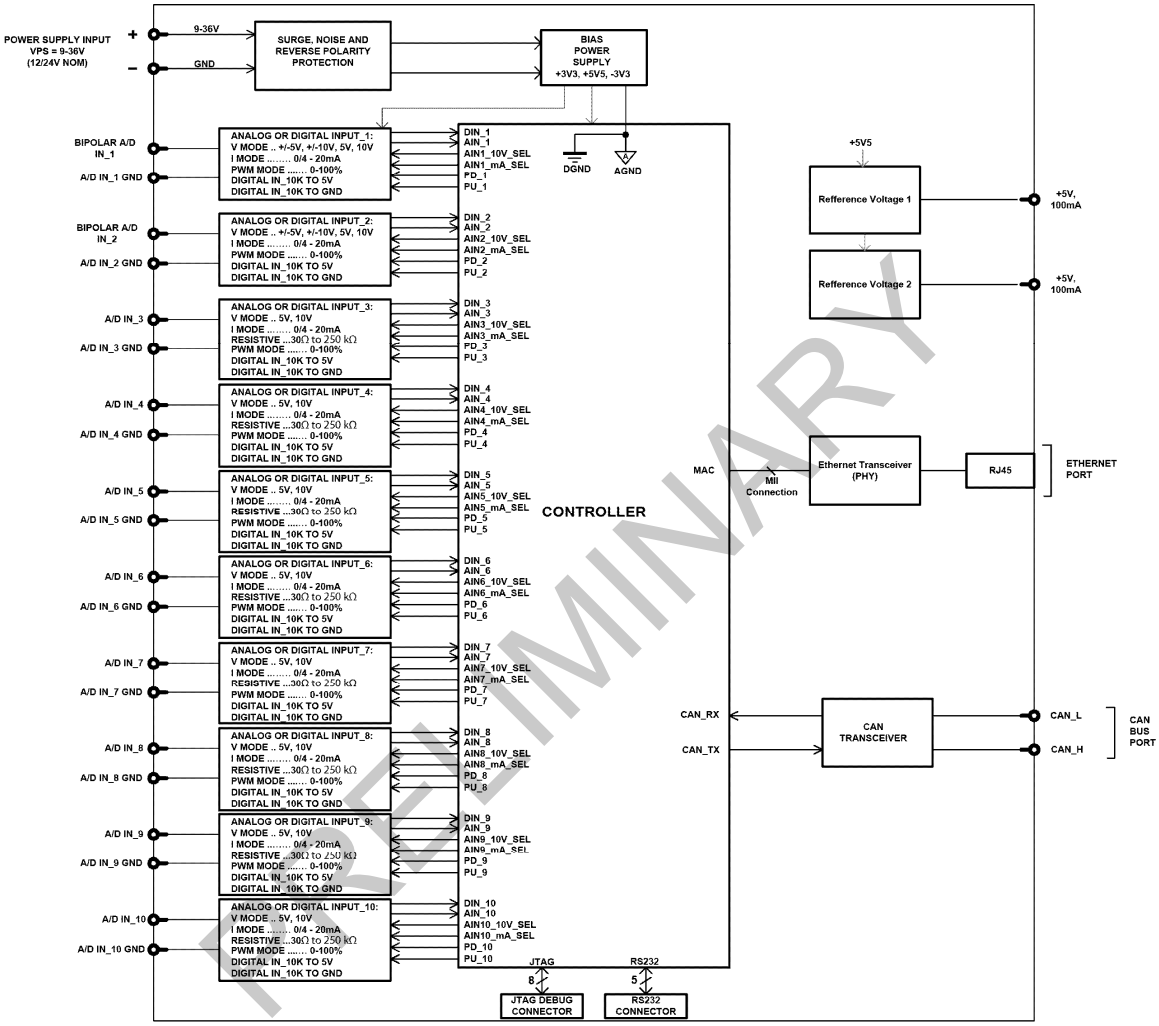

Figure 1.0 – Block Diagram

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 www.axiomatic.com/service.html.

Power Supply

Power Supply Input	12 Vdc or 24 Vdc nominal 8…36 Vdc power supply range
Protection	Reverse polarity protection

Inputs

Inputs	2 Bipolar Analog or Digital Signal Inputs User programmable as Bipolar or Unipolar Voltage, Current, PWM or Digital signal inputs types. Refer to Table 1.0.
Input Grounds	1 provided
Protection	All inputs are protected against short to GND. All inputs, except current inputs, are protected against shorts to Nominal Vps (36Vdc).

Table 1.0 –User Programmable Universal Inputs

Analog & Digital Input Functions	Voltage Input, Current Input or Digital Input 12-bit Analog to Digital
Voltage Input	0-5 V (Impedance 110 kΩ) 0-10 V (Impedance 130 kΩ) +/- 5V (Impedance 110 kΩ) +/- 10V (Impedance 130 kΩ)
Current Input	0-20 mA (Impedance 249 Ω) 4-20 mA (Impedance 249 Ω)
Digital Input	1 M Ω Impedance or Active High or Active Low with 10 kOhm pull-up or pull-down
Timer Input Functions	PWM Input, Frequency Input, RPM Input
PWM Input	Low Frequency (0.50 Hz to 1 kHz) High Frequency (100 Hz to 10 kHz) 0 to 100% D.C.
Maximum and Minimum Ratings	

Characteristic	Min	Max	Units
Power Supply	9	36	V dc
Voltage Input	0	36	V dc
Current Input 0(4)-20 mA	0	12	Vdc
Digital Input	0	36	Vdc
PWM Duty Cycle	0	100	%
PWM Low Frequency	10	1 000	Hz
PWM High Frequency	100	10 000	Hz
PWM Voltage pk - pk	0	36	V dc

Inputs	8 Universal Signal Inputs User programmable as Voltage, Current, Resistive, Frequency, RPM, PWM or Digital signal inputs types. Refer to Table 2.0.

Table 2.0 –User Programmable Universal Inputs	
Analog & Digital Input Functions	Voltage Input, Current Input, Resistive Input or Digital Input
Voltage Input	0-5 V (Impedance 110 kΩ) 0-10 V (Impedance 130 kΩ) +/- 5V (Impedance 110 kΩ) +/- 10V (Impedance 130 kΩ)
Current Input	0-200 mA (Impedance 5 Ω); 1V max. 0-20 mA (Impedance 249 Ω) 4-20 mA (Impedance 249 Ω)
Resistive	30 Ohms to 250 kOhms Auto-ranging, +/- 1%
Digital Input Level	Accepts up to +Vps
Digital Input	1 M Ω Impedance or Active High or Active Low with 10 kOhm pull-up or pull-down
Timer Input Functions	PWM Input
PWM Input	Low Frequency (0.50 Hz to 1 kHz) High Frequency (100 Hz to 10 kHz) 0 to 100% D.C.

Maximum and Minimum Ratings

Characteristic	Min	Max	Units
Power Supply	9	36	V dc
Voltage Input	0	36	V dc
Current Input 0(4)-20 mA	0	12	Vdc
Current Input 0-200 mA	0	1V	Vdc
Resistive Input	30	250 000	Ω
Digital Input	0	36	Vdc
PWM Duty Cycle	0	100	%
PWM Low Frequency	10	1 000	Hz
PWM High Frequency	100	10 000	Hz
PWM Voltage pk - pk	0	36	V dc

Input Accuracy and Resolution

Input Type	Input Range	Accuracy	Resolution
Voltage	0-5V	+/- 0.2%	1 mV
	0-10V	+/- 0.2%	1 mV
	-5V to 5V	+/- 0.2%	1 mV
	-10V to 10V	+/- 0.2%	1 mV
Current	0(4)-20mA	+/- 0.2%	1 µA
Resistive	30-250KOhm	+/- 1%	1 Ohm
PWM	Low Frequency	+/- 0.1%	0.01%
	High Frequency	+/- 0.1%	0.01%

Outputs

Voltage References	Two +5V, +/- 0.2%, 100 mA Ground is shared with Input Grounds.

General Specifications

Microprocessor	STM32F407Z, 32-bit, 1MByte flash memory
Typical Quiescent Current	Contact Axiomatic.
Response Time	Contact Axiomatic.
LED Indicators	2 bicolour LED's (Red and Green) Power, heartbeat, input fault indication and output fault indication Ethernet LINK/ACT
CAN Communications	1 CAN port (SAE J1939) (CANopen® on request) Model: AX032100 – 250 kbps baud rate
Control Logic	Refer to the user manual.
Ethernet	One 10/100 Mb Ethernet port
Software Reflashing	Electronic Assistant® P/N: AX070502
User Interface	To configure the controller for sophisticated control applications, the AX130540 setpoints can be viewed and programmed using the standard J1939 memory access protocol through the CAN port and the PC-based Axiomatic Electronic Assistant®. The EA can store all setpoints in one setpoint file and then flash them into the unit in one operation. The setpoint file is created and stored on disk using a command *Save Setpoint File* from the EA menu or toolbar. The user then can open the setpoint file, view or print it and flash the setpoint file into the AX130540. The Electronic Assistant®, P/N: **AX070502**, for *Windows* operating systems comes with a royalty-free license for use on multiple computers. It includes an Axiomatic USB-CAN converter to link the device's CAN port to a *Windows*-based PC.
Operating Conditions	-40 to 85 °C (-40 to 185 °F)
Storage Temperature	-55 to 125 °C (-67 to 257°F)
Protection	IP20
Weight	0.30 lb. (0.136 kg)
Enclosure and Dimensions	Phoenix Contact: ME MAX 22,5 G 2-2 KMGY – 2713638 Polyamide, UL94V0, cULus recognized, China RoHS DIN rail TH 35-7.5 99 x 114.5 x 22.5 x 99 mm (L x H x W x D) Refer to Figure 2.0.
Electrical Connections	4 sets of 5 Phoenix Contact MC 1,5/ 5-ST-3,5 GY7035 3.5 mm screw terminal connectors Accepts 28-16 AWG wire. Refer to Table 3.0 and Figure 2.0. for pin out.
Installation	DIN rail mount TH 35-7.5
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.

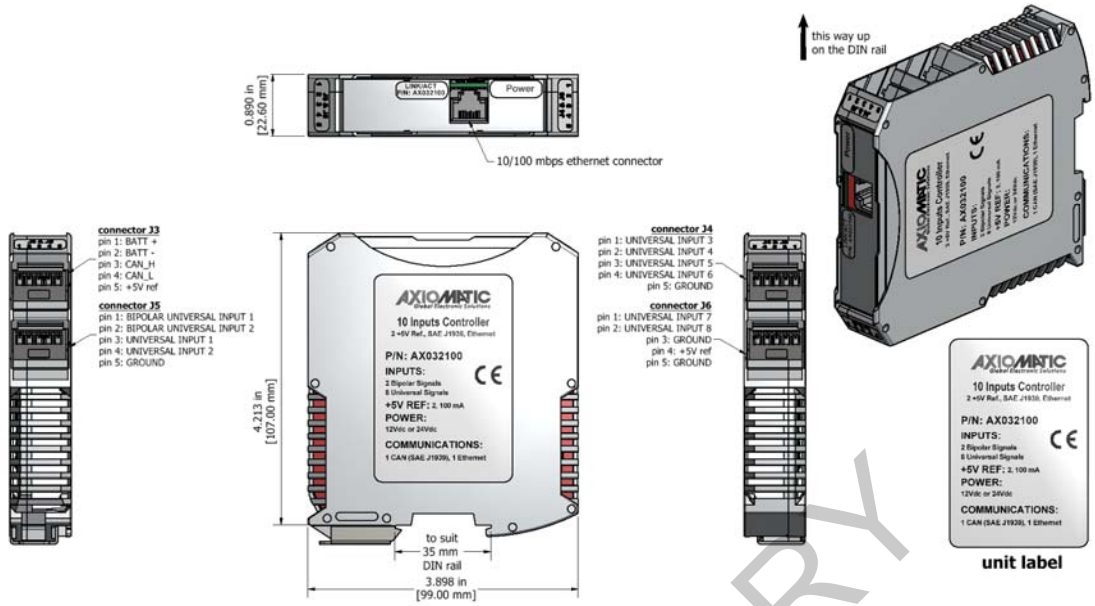

Figure 2.0 – Dimensions

Table 3.0 – Pin out: AX032100

Power and CAN (J3)		Inputs 1-4 (J5)		Inputs 5-8 (J4)		Inputs 9-10 (J6)	
PIN #	Function	PIN #	Function	PIN #	Function	PIN #	
1	BATT +	1	Bipolar Analog/Signal Input 1	1	Universal Input 3	1	Universal Input 7
2	BATT –	2	Bipolar Analog/Signal Input 2	2	Universal Input 4	2	Universal Input 8
3	CAN_H	3	Universal Input 1	3	Universal Input 5	3	Input GND
4	CAN_L	4	Universal Input 2	4	Universal Input 6	4	+5V Reference
5	+5V Reference		Input GND	5	Input GND	5	Input GND

Form: TDAX032100-01/04/19