TECHNICAL DATASHEET #TDAX024010

4 INPUTS, 2 BIDIRECTIONAL 10 - 400 mA OUTPUTS VALVE CONTROLLER, DIN rail mount

Four Signal Inputs
Two Bi-directional 10-400 mA Outputs
One Reference Voltage
CAN (SAE J1939)
Programmable with the Axiomatic Electronic Assistant
and with Android and Apple iOS Devices and Smartphones
NFC

P/N: AX024010

Features:

- Two bidirectional outputs from -400mA to +400 mA
- 1 SAE J1939 CAN port
- Two analog signal inputs are selectable as the following voltage or current signals (Inputs 1 & 2).
  - 0-5V, 0-10V, 0 to +/- 5V, 0 to +/- 10V
  - 4-20mA, or 0-20mA
- Two analog/digital inputs are available as the following signals (Inputs 3 & 4).
  - 0-5V, 0-10V,
  - 4-20 mA, 0-20 mA,
  - PWM,
  - Frequency,
  - or Digital (Active High or Active Low).
- 12Vdc or 24Vdc nominal
- One reference voltage (+5V) is available to power sensors.
- Operates from -40 to 85¬C (-40 to 185¬F).
- Two LED indicators
- IP20
- DIN rail mount
- CE marking
- Configurable via the Axiomatic Electronic Assistant
- A Near Field Communications Antenna (NFC) is provided. E-Write NFC application for Android and Apple iOS devices can be used to configure the device.

Applications:

- Servo valve control in motion control, industrial automation

Ordering Part Numbers:

Valve Controller, SAE J1939 (250 kbps): **AX024010** Valve Controller, SAE J1939 (500 kbps): **AX024010-01** Valve Controller, SAE J1939 (1 Mbps): **AX024010-02**

Accessories:
Axiomatic Electronic Assistant Configuration KIT, P/Ns: **AX070502** or **AX070506K**
E-Write NFC Application is available for Android and iOS devices (see User Interface below).

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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/.](https://www.axiomatic.com/service/)

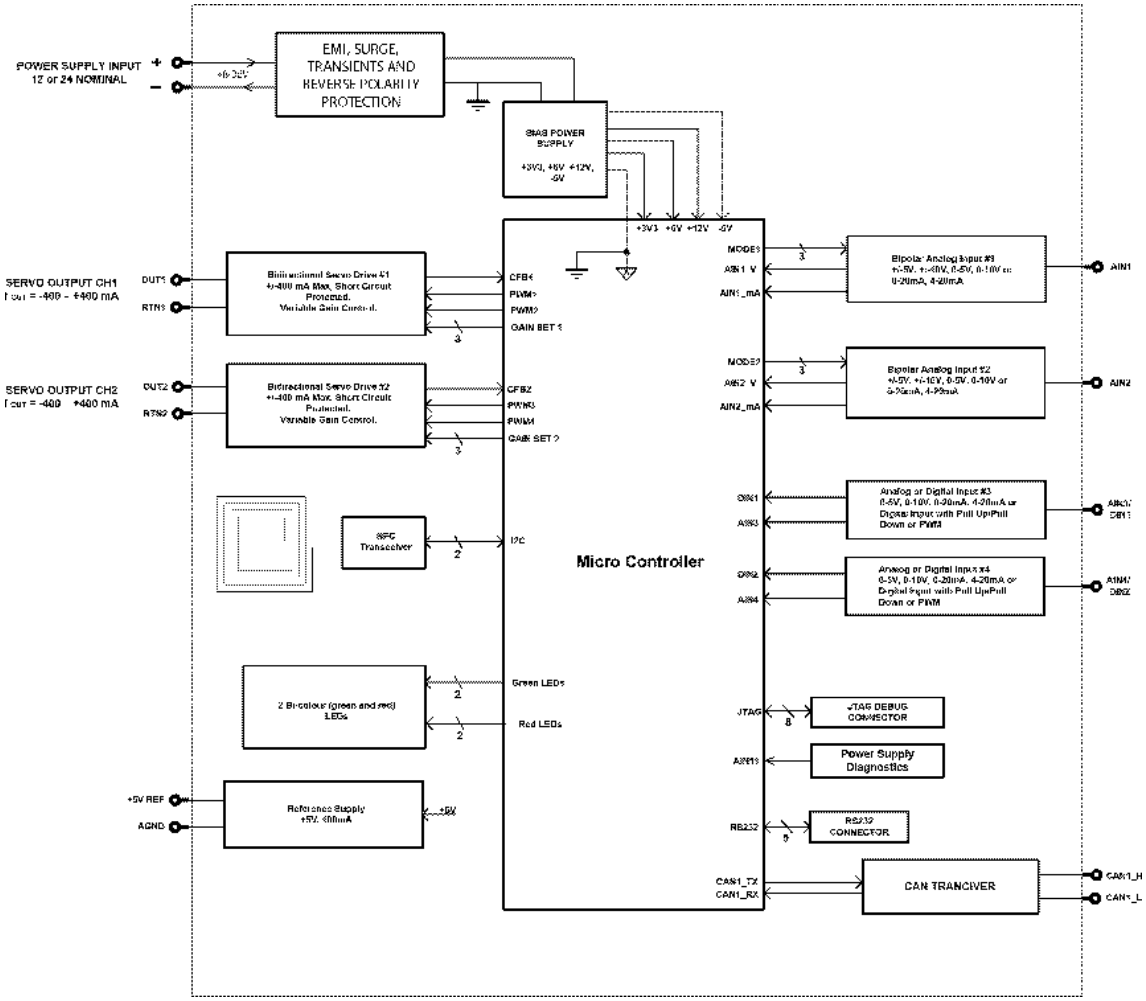

Figure 1.0 - Block Diagram

Inputs

Power Supply Input	12V or 24Vdc nominal (9 to 36 Vdc power supply range)
Protection	Reverse polarity protection Overvoltage protection up to 38V Under voltage shutdown at 7.5V.
Input Grounds	Three common input GND connections are provided.

Bipolar Analog Inputs	Two inputs (Input 1 and 2 in Table 2.0.) User selectable as Bipolar or Unipolar Voltage or Current 12-bit Analog to Digital Protected against shorts to GND or +Vsupply Voltage Types: 1mV resolution, accuracy +/- 1% error Ranges: +/-5V or +/-10V or 0-5V or 0-10V Current Types: 1uA resolution, accuracy +/- 1% error Ranges: 0-20mA or 4-20mA
Analog or Digital Inputs (Voltage, Current or PWM)	Two inputs (Inputs 3 and 4 in Table 2.0.) User selectable as: Voltage, Current, PWM or Digital 12-bit Analog to Digital (voltage, current) Protected against shorts to GND or +Vsupply Voltage Types: 1mV resolution, accuracy +/- 1% error Ranges: 0-5V, 0-10V Current Types: 1uA resolution, accuracy +/- 1% error Ranges: 0-20mA or 4-20mA PWM Signal Frequency: 1 – 10,000 Hz PWM Duty Cycle: 0 to 100% PWM Input: 0.01% resolution, accuracy +/- 1% error Digital Input: Active High or Active Low. Amplitude: 3.3V to +Vsupply
Minimum and Maximum Ratings	**Table 1.0. Absolute Maximum and Minimum Ratings**

Characteristic	**Min**	**Max**	**Units**
Power Supply	9	36	V dc
Voltage Input	0	36	V dc
Current Input	0	21	mA
Current Input – Voltage Level	0	12	Vdc
Digital Type Input – Voltage Level	0	36	Vdc
PWM Duty Cycle	0	100	%
PWM Frequency	1	10 000	Hz
PWM Voltage pk - pk	0	36	V dc
RPM Frequency	50	10 000	Hz

Outputs

Outputs	Two +/- 400 mA bidirectional outputs, independent User selectable as: Servo Valve Control or Proportional Current Selectable current ranges from +/- 10mA to +/-400 mA Accuracy: +/- 1% Maximum output resistance can be calculated as: R[ohms] = (Vps[V] -3) / Imax[A] Output voltage up to +Vps. Full bridge output Current sensing resistor Overcurrent protection is provided. Short circuit protection is provided.
Reference Voltages	One 5V, 100mA, 1% reference voltage
Protection for Output Terminals	Fully protected against short circuit to ground and short circuit to power supply rail. Unit will fail safe in the case of a short circuit condition, self-recovering when the short is removed.

General Specifications

Microprocessor	STM32F205VGT7 32-bit, 1MByte flash memory
Typical Quiescent Current	60mA @ 12Vdc; 35mA @ 24Vdc
Response Time	70 ms for 0 to 400 mA current change
LED Indicators	2 bicolour LED's (Red and Green) Power, heartbeat, input fault indication and output fault indication
Control Logic	Standard embedded software is provided. Setpoints are user configurable. (Application-specific control logic or factory programmed setpoints on request) Refer to the User Manual for details.
Communications	Near Field Communication Full-duplex Data rate: 106 kbit/s Complies with ISO1443 (RF protocol), ISO13239, and ISO7816 Protected and secure configuration
User Interface	Axiomatic Electronic Assistant P/N: **AX070502** or **AX070506K**. E-WRITE NFC Application is available for a fee from Google Play for Android devices (https://play.google.com/store/apps/details?id=com.axiomatic.ewritenfc). E-WRITE NFC Application can be downloaded for a fee from Apple's App Store for iOS devices (https://apps.apple.com/us/app/e-write-nfc/id6473560354).
Software Reflashing	Via the Axiomatic Electronic Assistant KIT, P/Ns: **AX070502** or **AX070506K**
CAN bus	1 CAN port (SAE J1939) AX024010: 250 kbps baud rate AX024010-01: 500 kbps baud rate SAE J1939 AX024010-02: 1 Mbps baud rate SAE J1939
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.
Operating Conditions	-40 to 85 °C (-40 to 185 °F)
Enclosure and Dimensions	Phoenix Contact: ME MAX 22,5 G 2-2 KMGY – 2713638 or PHO ME MAX 22.5 2-2 KMGY – 2713625 (vented) 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.
Protection	IP20
Electrical Connections	4 Phoenix Contact PSPT 2,5/ 4-ST KMGY spring clamp connectors or 4 Phoenix Contact MSTBT2,5HC/4-STPGY screw terminals (based on availability) Accepts 24-14 AWG wire. Refer to Table 2.0 and Figure 2.0. for pin out.
Compliance	CE marking
Weight	0.30 lb. (0.136 kg)
Installation	DIN rail mount TH 35-7.5

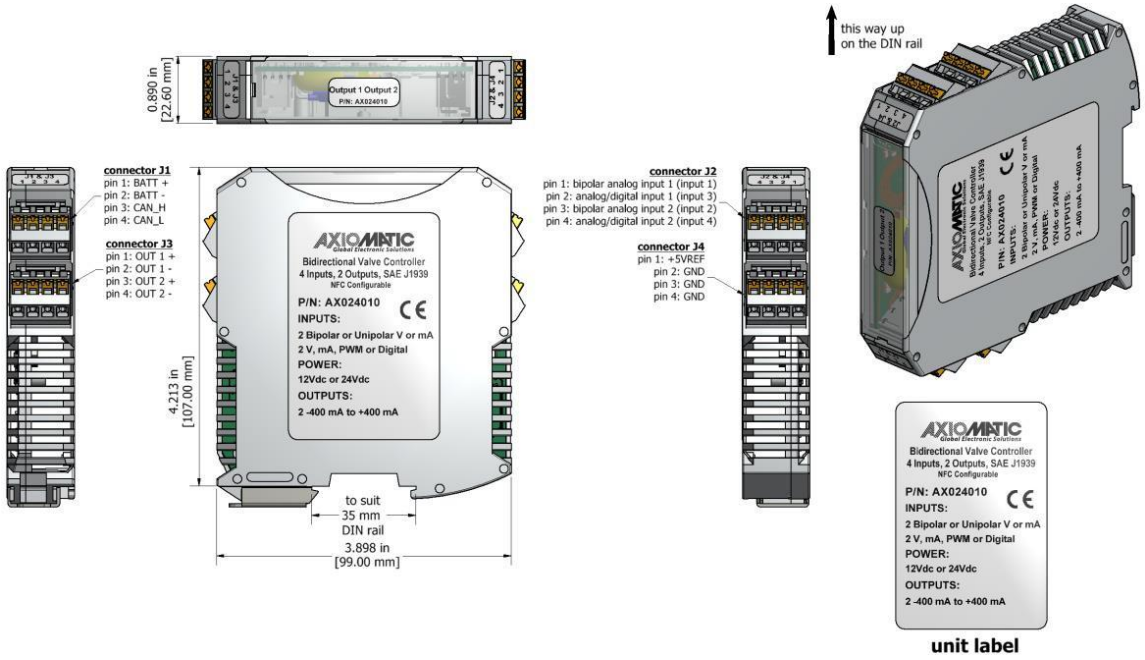

Figure 2.0 – Dimensions

Table 2.0 – Pin out: AX024010

Power and CAN (J1)		Outputs (J3)		Inputs (J2)		Reference and GNDs (J4)	
PIN #	Function	PIN #	Function	PIN #	Function	PIN #	Function
1	BATT +	1	Output 1+	1	Bipolar Analog Input 1 (Input 1)	1	+5V Reference
2	BATT –	2	Output 1-	2	Analog/Digital Input 1 (Input 3)	2	Common Analog GND
3	CAN_H	3	Output 2+	3	Bipolar Analog Input 2 (Input 2)	3	Common Analog GND
4	CAN_L	4	Output 2-	4	Analog/Digital Input 2 (Input 4)	4	Common Analog GND

Form: TDAX024010-07/24/2024