TECHNICAL DATASHEET #TDAX031950

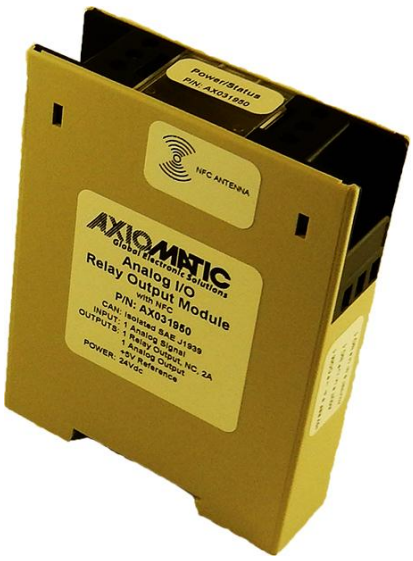
Analog I/O, Relay Output Module

+5 V Reference
SAE J1939
NFC
DIN Rail Mount

P/N: AX031950

Features

- 1 isolated CAN port, SAE J1939
- 1 universal signal input (bipolar or unipolar voltage, current, digital, PWM or frequency type)
- 1 analog output (0-5 V, 0-10 V, 0-20 mA or 4-20 mA)
- 1 form CNC relay output
- +5 V reference
- Operational 4 to 36 VDC (12 or 24 VDC)
- DIN rail mount, screw terminals
- Axiomatic Electronic Assistant, P/Ns: AX070502, AX070505K or AX070506K can be used for complex parameter configuration.
- A Near Field Communications (NFC) antenna is provided for simple configuration using an Android or Apple iOS device or smartphone:
  - Place the phone next to the antenna and configure the product while unpowered.
  - Axiomatic E-Write NFC Android and iOS application provides flexible user configurability for application-specific input-output relationship with slope or time response.
  - Protected and secure communications



Applications

- Industrial automation applications

Ordering Part Numbers

Analog I/O, Relay Output Module, SAE J1939: **AX031950**
Analog I/O, Relay Output Module, 500 kbps SAE J1939: **AX031950-01**
Analog I/O, Relay Output Module, 1 Mbps SAE J1939: **AX031950-02**

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

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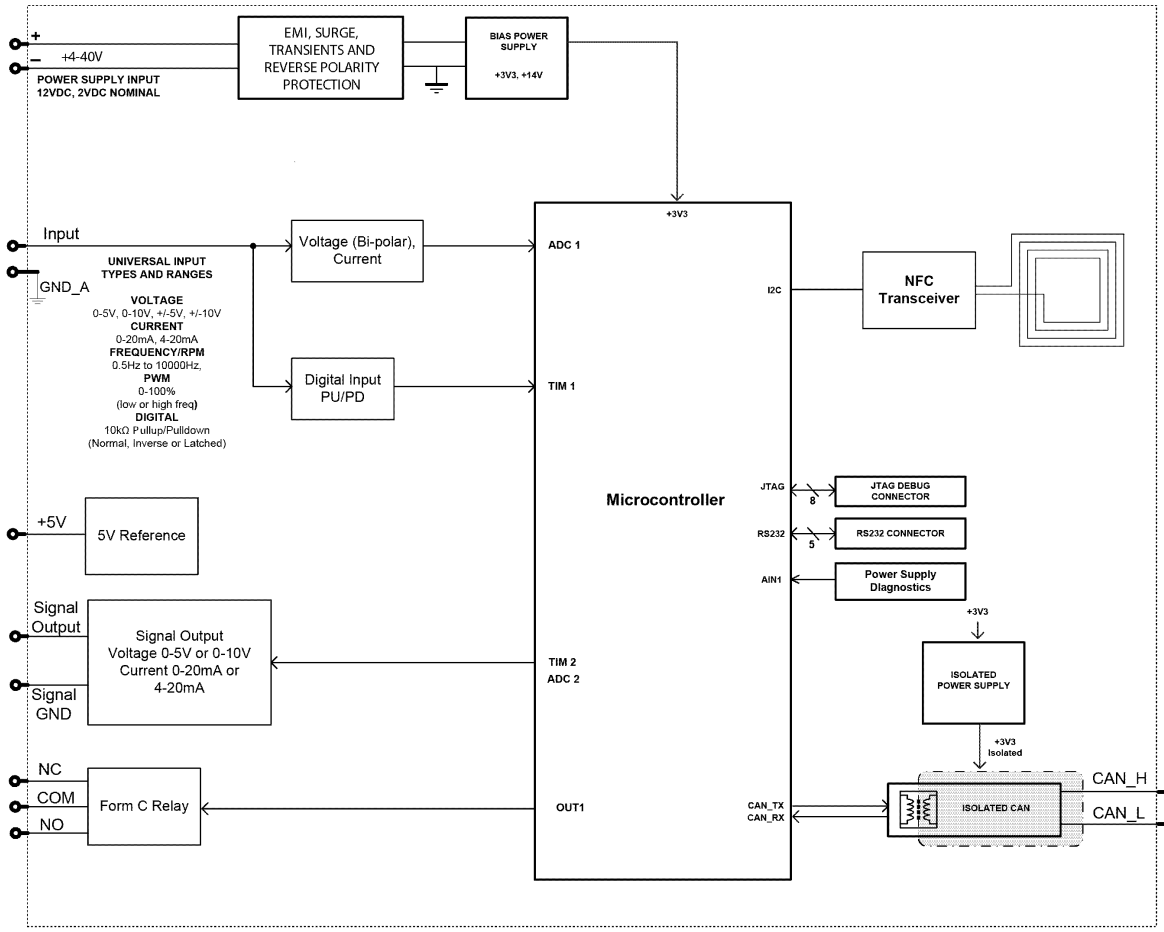
Block Diagram



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 https://www.axiomatic.com/service/.

Power

Power Supply Input	12 or 24 VDC nominal (4 to 36 VDC range)
Typical Quiescent Current	50 mA @ 12 VDC; 27 mA @ 24 VDC
Protection	Reverse polarity protection from 6 to 60 V Under-voltage protection is down to 4.5 V Overvoltage protection is up to 27.5 V
Reference Voltage	1x +5 V, ±1%, 100 mA

Input

Input	1x universal signal input User selectable as bipolar or unipolar voltage, current, digital, frequency, or PWM input types. Refer to Table 1.0.

Table 1.0 - User Programmable Universal Signal Inputs

Analog & Digital Input Functions	Voltage input, current input, or digital input
Voltage Input	0-5 V (impedance 100 kΩ) 0-10 V (impedance 100 kΩ) ±5 V (impedance 100 kΩ) ±10 V (impedance 100 kΩ) Resolution: ±1 mV Accuracy: ±0.5 % error
Current Input	0-20 mA (impedance 124 Ω) 4-20 mA (impedance 124 Ω) Resolution is ±1 µA Accuracy is ±0.7 % error
Digital Input Level	Accepts 5 V TTL Accepts up to Vps Threshold: Low <1 V High >2.2 V
Digital Input	1 MΩ impedance or active high or active low with 10 kΩ pull-up or pull-down
Timer Input Functions	PWM input or frequency input
PWM Input	0.50 Hz to 15 kHz) 0 to 100 % D.C. Resolution: 0.01 % Accuracy: ±0.1 % error
Frequency/RPM Input	0.5 Hz to 50 Hz; 10 Hz to 1 kHz; or 100 Hz to 20 kHz Resolution: 0.01% Accuracy: ±0.1 % error

Maximum and Minimum Ratings

Characteristic	Min	Max	Units
Power supply	9	36	VDC
Voltage input	0	36	VDC
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	VDC
Frequency	0	20 000	Hz

GND	1x analog Ground connection is provided.

Outputs

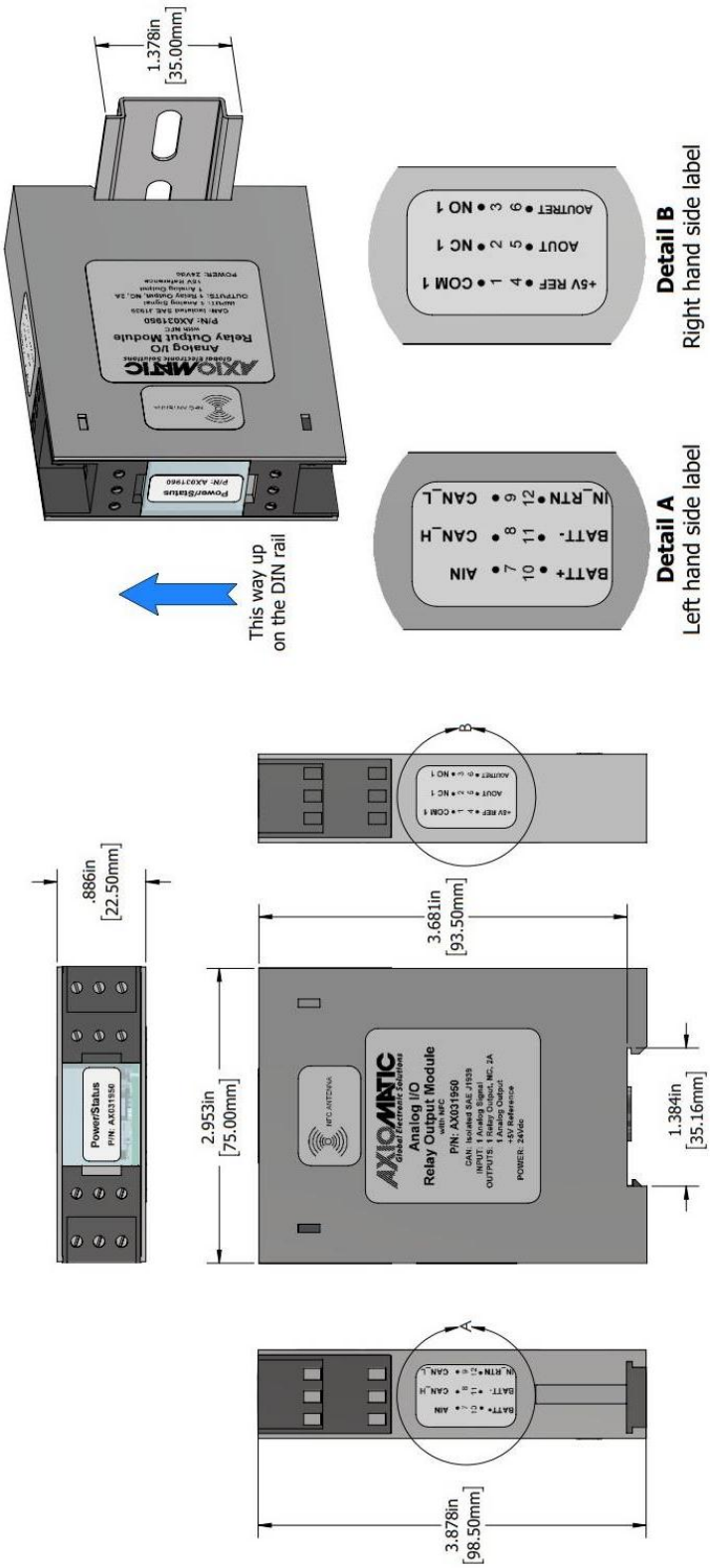
Output	1x Form C relay NC 3 contact pins per output Maximum 2 A @ 250 VAC or 2 A @ 30VDC per contact
Analog Output	1x analog output, user selectable as: • 0-5 V, 0-10 V (±1.4 % error) • 0-20 mA, 4-20 mA (±2 % error)
Analog Output GND	1x Ground connection is provided.

General Specifications

Microcontroller	STM32F205RE, 32-bit, 512 KB flash program memory
Isolation	300 Vrms CAN bus isolation
Control Logic	Standard embedded software is provided.
Communications	1x isolated CAN port (SAE J1939) Model AX031950: 250 kbps Model AX031950-01: 500 kbps Model AX031950-02: 1 Mbps
NFC Communications	Near Field Communication (NFC) Full-duplex Data rate: 106 kbit/s Complies with ISO1443 (RF protocol), ISO13239, and ISO7816 Protected and secure configuration
User Interface	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 - P/Ns: **AX070502** or **AX070506K**
User Interface via CAN	Axiomatic Electronic Assistant - P/Ns: **AX070502** or **AX070506K**
LED Indicator	1x RED and GREEN LED with application-specific responses
Compliance	RoHS
Vibration	IEC-60068-2-6:2007-12 2g peak (Sine)
Shock	IEC 60068-2-27:2008-02 15 g peak
Operating Conditions	-40°C to 85°C (-40°F to 185°F)
Storage Temperature	-55°C to 125°C (-67°F to 257°F)
Protection	IP40 (enclosure), IP20 (terminals)
Weight	0.22 lb. (97.2 g)
Enclosure	DR12, 35 mm DIN rail mount Polycarbonate 75 mm x 98.5 mm x 22.5 mm (W x H x D) 2.95 in x 3.88 in x 0.89 in Refer to the dimensional drawing.
Electrical Connections	12 screw terminal connections Refer to dimensional drawing for pin out orientation.

Screw Terminal #	Description
1	Relay Output COM 1
2	Relay Output NC 1
3	Relay Output NO 1
4	+5V Reference
5	Analog Output
6	Analog Output Return
7	Analog Input
8	CAN_H
9	CAN_L
10	Power +
11	Power -
12	Analog Input GND

Dimensional Drawing



Form: TDAX031950-07/22/2025