

7 Universal Signal, 3 RTD Inputs 2 Digital Outputs Controller CAN (SAE J1939) P/N: AX180010

Features

- SAE J1939 CAN port with auto-baud-rate detection
- 7 universal signal inputs are selectable as bipolar voltage, current, resistive, digital, PWM or frequency signal types:
 - 0-5V, 0-10V;
 - 4-20mA, 0-20mA;
 - Resistive
 - PWM;
 - Frequency;
 - or Digital.
- 3 PT100 Inputs
- 2 Digital Outputs (1 A)
- 12 or 24 Vdc nominal
- Operates from -40 to 85 °C (-40 to 185 °F)
- Two LED indicators
- IP20
- DIN rail mount, screw terminal connections
- Configurable via the Axiomatic Electronic Assistant



AX180010 has appearance like that of AX180000

Applications

- Industrial Control Panels
- Power Gen Set Engine Control Systems
- Oil and Gas Equipment Automation
- Machine Automation

Ordering Part Numbers

7 Universal Signal, 3 RTD Inputs, 2 Digital Outputs Controller, SAE J1939 with Auto-Baud-Rate Detection - P/N: **AX180010**

7 Universal Signal, 3 RTD Inputs, 2 Digital Outputs Controller, Modbus TCP/IP, SAE J1939 with Auto-Baud-Rate Detection - P/N: **AX180000**

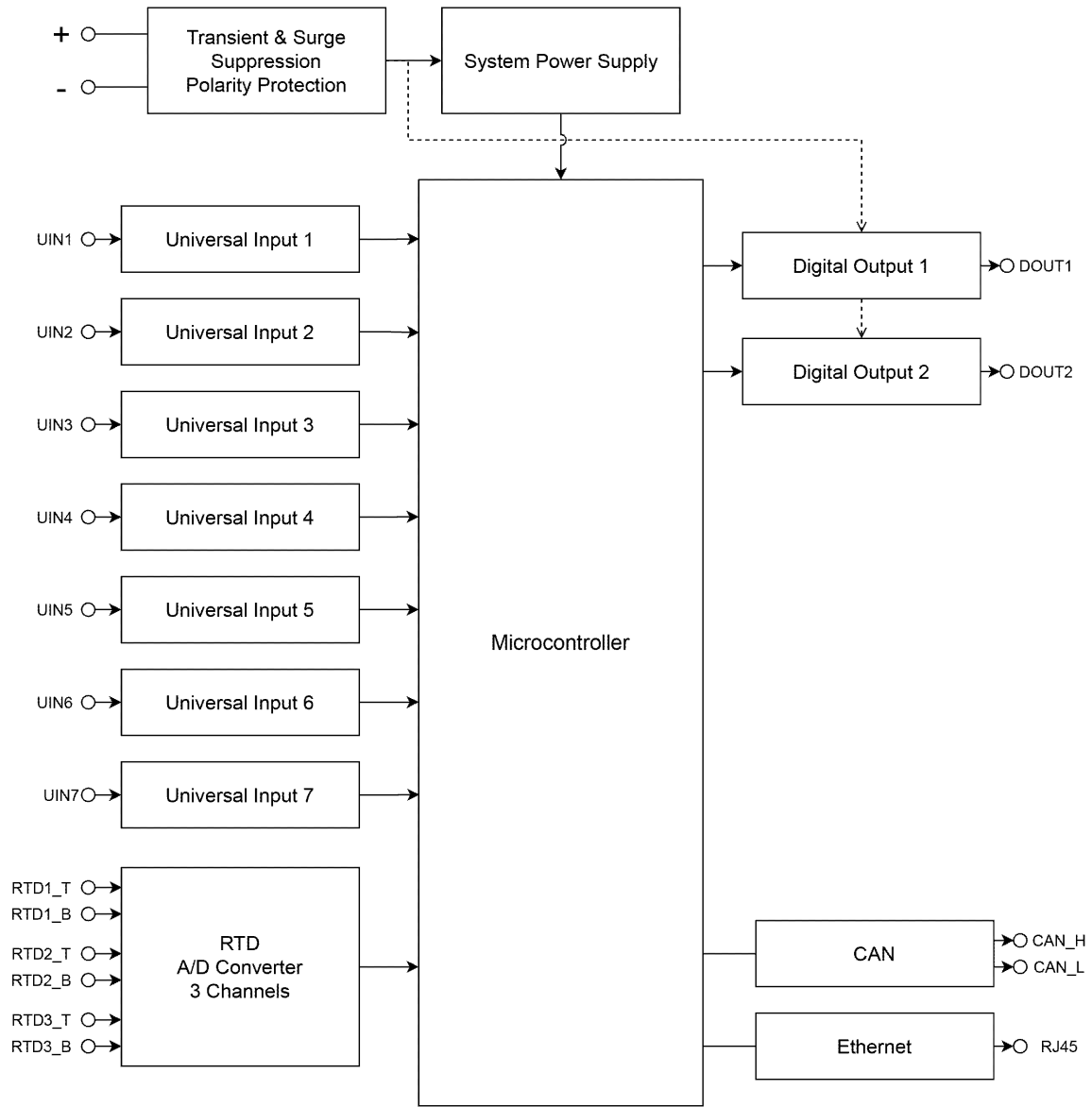
Accessories:

Axiomatic Electronic Assistant Configuration KIT - P/Ns: **AX070502** or **AX070506K**

Description

The Controller accepts 7 universal and 3 RTD inputs. It has 2 digital outputs. The control can be networked to a SAE J1939. A rugged power supply interface accepts 12 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 Axiomatic Electronic Assistant. The powerful control algorithms allow the user to program the controller for a wide range of applications without the need for custom software.

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 Limitations & Return Materials Process as described on <https://www.axiomatic.com/service/>.

Power Supply

| | |
|--------------------|---|
| Power Supply Input | 12 or 24 Vdc nominal (8 to 36 Vdc) |
| Quiescent Current | 45 mA @ 12 Vdc; 30 mA @ 24 Vdc typical |
| Protections | Reverse polarity protection Transient protection Short circuit to Ground protection |

Inputs

| | | | | |
|---|---|---------------------------|------------------------|-------------------|
| Signal Inputs | 7 Universal Signal Inputs User programmable as Voltage, Current, Resistive, Frequency, PWM or Digital signal input types. Refer to Table 1.0. | | | |
| RTD Inputs | 3 Channels, 2-Wire, Pt100 | | | |
| Table 1.0 – User Programmable Universal Inputs | | | | |
| Analog Input Functions | Voltage Input, Current Input, Resistive Input | | | |
| Voltage Input | 0-5 V (High impedance) 0-10 V (Impedance 204 k Ω) | | | |
| Current Input | 0-20 mA (Impedance 249 Ω) 4-20 mA (Impedance 249 Ω) | | | |
| Input Accuracy and Resolution | Input Type | Input Range | Accuracy | Resolution |
| | Voltage | 0-5 V | ± 0.05 V | <1.5 mV |
| | | 0-10 V | ± 0.1 V | <3 mV |
| Current | 0(4)-20 mA | ± 0.2 mA | <12 μ A | |
| Resistive Input | Input Range | Resolution | | |
| | Auto Range | – | | |
| | 10 to 250 k Ω ^{1,2} | | | |
| | 0 to 250 Ω ² | <0.15 Ω | | |
| | 0 to 2.5 k Ω | <1.5 Ω | | |
| | 0 to 25 k Ω | <15 Ω | | |
| | 0 to 250 k Ω | <150 Ω | | |
| | ¹ Resolution and accuracy depend on the automatically selected Input Range. ² Resistance <10 Ω is measured as 0. | | | |
| Analog Update Rate | 1.67 ms depending on analog filter settings In resistive mode, it also depends on the number of resistive inputs. | | | |
| Digital Input Functions | Discrete Voltage Level, PWM Duty Cycle Input, Frequency Input | | | |
| Input Polarity | Active High or Active Low | | | |
| Input Impedance | High impedance, 10 k Ω pull-down, 10 k Ω pull-up to +12 V | | | |
| Input Level | 5 V CMOS compatible A direct connection to the power supply is acceptable. | | | |
| Discrete Voltage Level Input | 1 ms sampling rate Configurable debouncing | | | |
| Frequency Input | Input Number | Counter Resolution | Frequency Range | Resolution |
| | Universal Input #1-7 | 16-bit | 100Hz...10kHz | <0.0017...0.17% |
| | | | 10Hz...1kHz | |
| 1Hz...100Hz | | | | |
| PWM Input | Input Number | Counter Resolution | Frequency Range | Resolution |
| | Universal Input #1-7 | 16-bit | 100Hz...10kHz | <0.0017...0.17% |
| | | | 10Hz...1kHz | |
| 1Hz...100Hz | | | | |
| PWM Duty Cycle | 0 to 100% Duty Cycle | | | |
| Protection | +36 V maximum. Forward voltage only. No reverse polarity protection. | | | |

Outputs

| | |
|-----------------|---|
| Digital Outputs | 2 Channel Type: Hot Shot, ON/OFF, PWM High Side Sourcing from Battery+, Low Side Sinking to Battery- 1 A Current Limit |
|-----------------|---|

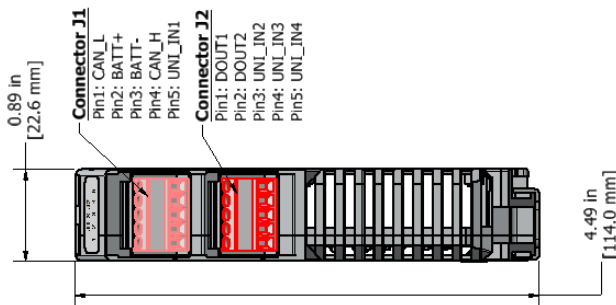
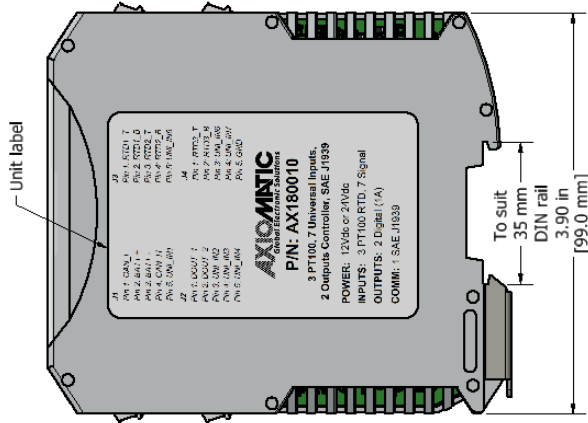
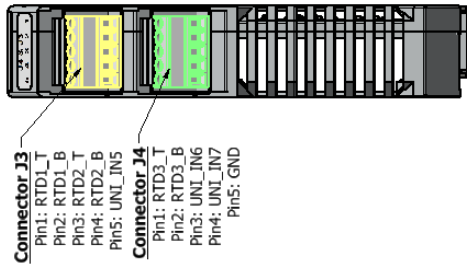
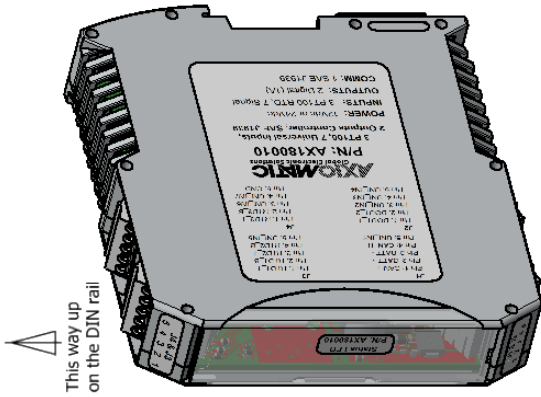
General Specifications

| | |
|--------------------------|---|
| Microcontroller | STM32F407Z, 32-bit, 1 MByte flash memory |
| LED Indicators | 2 bicolour LED's Red/Green Flashing: Bootloader Mode Red: CAN/System Error Green Flashing: CAN Link (Activity) |
| CAN | 1 CAN port (SAE J1939) Full support for SAE J1939 ECU User-configurable PGN's Baud rate: 250 kbit/s, 500 kbit/s, 667 kbit/s, 1 Mbit/s with auto-baud rate detection |
| Control Logic | Refer to the user manual. |
| User Interface | Axiomatic Electronic Assistant KIT - P/Ns: AX070502 or AX070506K To configure the controller for control applications, the controller 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 Axiomatic 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 <i>Save Setpoint File</i> from the Axiomatic EA menu or toolbar. The user then can open the setpoint file, view or print it and flash the setpoint file into the unit. Refer to the user manual for details. |
| Software Reflashing | Axiomatic Electronic Assistant KIT - P/Ns: AX070502 or AX070506K |
| Operating Conditions | -40 to 85 °C (-40 to 185 °F) |
| Storage Temperature | -55 to 125 °C (-67 to 257 °F) |
| Protection | IP20 |
| Weight | 0.25 lb. (0.113 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 0.89 in x 3.9 in x 4.5 in (22.6 mm x 99 mm x 114 mm) (W x H x D) Depth from top edge of DIN rail: 4.2 in (107 mm) Refer to Dimensional Drawings |
| Electrical Connections | 4 sets of 5-pin Phoenix Contact MC 1,5/ 5-ST-3,5 GY7035 3.5 mm screw terminal connectors Accepts 28-16 AWG wire. Refer to Table 2.0 and Dimensional Drawings for pin out. |
| Installation | DIN rail mount TH 35-7.5 or TH 35-15 (mm) |
| Network Termination | ISO 11898 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. Baud-rate up to 1 Mbit/s is supported. |

Table 2.0 – Pin Out

| Pin | Connector | | | |
|-----|-------------------|-------------------|-------------------|-------------------|
| | J1 | J2 | J3 | J4 |
| 1 | CAN L | Digital Output 1 | RTD1 T | RTD3 T |
| 2 | Battery + | Digital Output 2 | RTD1 B | RTD3 B |
| 3 | Battery - | Universal Input 2 | RTD2 T | Universal Input 6 |
| 4 | CAN H | Universal Input 3 | RTD2 B | Universal Input 7 |
| 5 | Universal Input 1 | Universal Input 4 | Universal Input 5 | Ground |

Dimensional Drawings



Form: TDAX180010-11/21/2024