12 Signal Inputs, 12 Outputs Valve Controller

SAE J1939, Ethernet (Modbus TCP/IP)
DIN Rail Mount
P/N: AX028010

Features

- 9 signal inputs are configurable as:
  - Voltage
  - Current
  - PWM
  - Frequency
  - or Digital
- 3 signal inputs are configurable as:
  - Voltage
  - Current
  - Resistive
  - PWM
  - Frequency
  - Digital
- 12 outputs are user configurable as:
  - Proportional Current
  - Proportional Voltage
  - Hotshot Digital
  - PWM Duty Cycle
  - On/Off Digital
- Output type is high side sourcing.
- SAE J1939 CAN port with auto-baud-rate detection
- Modbus TCP/IP (Ethernet 10/100 Mbit/s port)
- 12 Vdc or 24 Vdc nominal
- Operates from -40 to 85°C (-40 to 185°F).
- IP20
- Reflash via Axiomatic Electronic Assistant
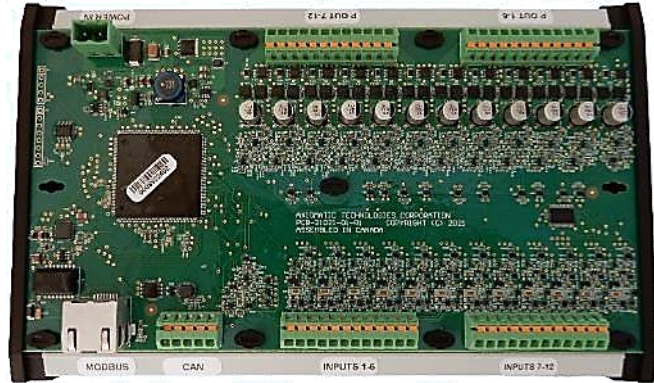
Valve Controller

Phoenix Contact 1754568

Applications:

The valve controller is designed to be applied in industrial process control equipment.

Ordering Part Numbers:

12 Signal Inputs, 12 Outputs Valve Controller: **AX028010**

Accessories:
Axiomatic Electronic Assistant**: AX070502**, or **AX070506K**
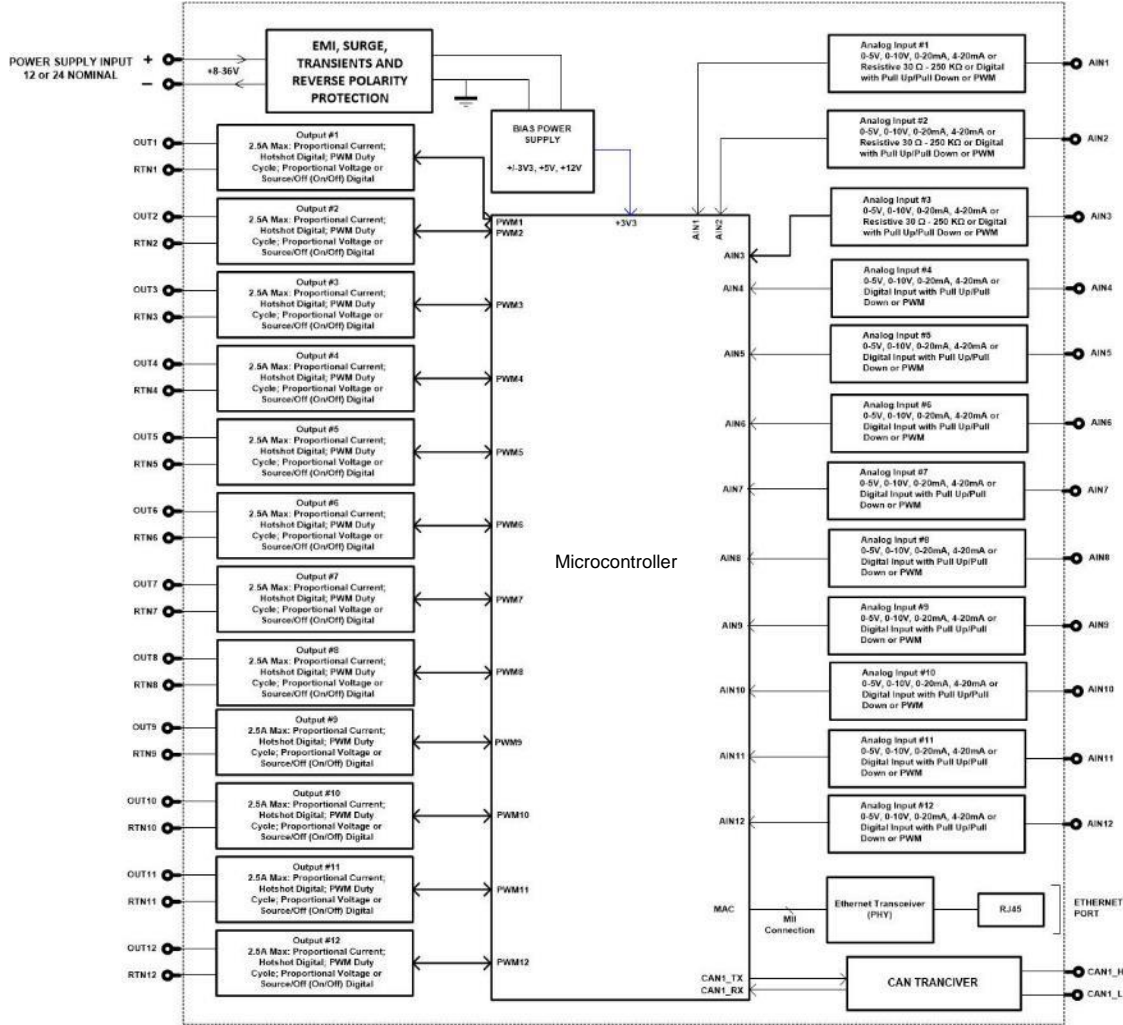
Block Diagram:

Figure 1 – Functional 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 Supply

Power Supply Input	12 or 24 Vdc nominal 8 to 36 Vdc power supply range
Quiescent Current	145 mA @12 Vdc; 78 mA @ 24 Vdc typical
Protection	Reverse polarity protection is provided. Surge and transient protection are provided. Undervoltage protection is provided.

Inputs

Analog or Digital Signal Inputs	9 signal inputs are provided. All inputs are user selectable as Voltage, Current, PWM, Frequency, or Digital input types. 12-bit Analog to Digital (voltage, current). Protected against shorts to Ground or +Vps Refer to Table 1.0.

Table 1.0 – **Analog or Digital Input – User Selectable Options**	
Voltage Types	1mV resolution, accuracy +/- 0.2% error Ranges: 0-5V or 0-10V Input Impedance 0-5V range: 1 MΩ or 10 kΩ pull-down Input Impedance 0-10V range: 204 kΩ
Current Types	1uA resolution, accuracy +/- 0.2% error Ranges: 0-20mA or 4-20mA Input Impedance 249 Ω Maximum compliance voltage: 12V
Frequency Types	0.01% resolution, accuracy +/-0.1% error Range: 1 – 10,000 Hz
PWM Type	0.01% resolution, accuracy +/- 1% error PWM Signal Frequency: 1 – 10,000 Hz PWM Duty Cycle: 0 to 100%
Digital Input	Configurable as Active High or Active Low Configurable 10 kΩ pull-up or pull-down Input impedance: 1 MΩ Maximum input voltage from GND to VPS Minimum input High Voltage: 3.2V Maximum input Low Voltage: 0.5V

Analog, Resistive, or Digital Signal Inputs	3 signal inputs are provided. All signal inputs selectable are user selectable as Voltage, Current, Resistive, PWM, Frequency or Digital. 12-bit Analog to Digital (voltage, current, resistive) Protected against shorts to Ground or +Vsupply Refer to Table 2.0.

Table 2.0 – **Analog, Resistive, or Digital Input – User Selectable Options**	
Voltage Types	1mV resolution, accuracy +/- 0.2% error Ranges: 0-5V or 0-10V Input Impedance 0-5V range: > 1 GΩ or 10 kΩ pull-down Input Impedance 0-10V range: 204 kΩ
Current Types	1uA resolution, accuracy +/- 0.2% error Ranges: 0-20mA or 4-20mA Input Impedance 249 Ω
Resistive Type	1 Ω resolution, accuracy +/- 2% error Range: 30 Ω to 250 kΩ
Frequency Type	0.01% resolution, accuracy +/-0.1% error Range: 1 – 10,000 Hz
PWM Type	1 – 10,000 Hz PWM Duty Cycle: 0 to 100%
Digital Input	Active High or Active Low with 10 kΩ pull-up or pull-down Amplitude: up to +Vsupply

Outputs

Proportional Output (2.5A)	12 outputs selectable as: Proportional Current; Hotshot Digital; PWM Duty Cycle; Proportional Voltage; or On/Off Digital Half-bridge output, current sensing, grounded load. High side sourcing up to 2.5A Overcurrent protection Short circuit protection in hardware Current Outputs: 1mA resolution, accuracy +/- 1% error Voltage Outputs: 0.1V resolution, accuracy +/- 5% error High frequency drive PWM Outputs: 0.1% resolution, accuracy +/- 0.1% error Digital On/Off: Sourcing from power supply or output off Load at supply voltage must not draw more than 2.5A.

General Specifications

Microcontroller	32-bit, 1MByte flash memory, STM32H747BIT6
Control Logic	User programmable functionality using Axiomatic Electronic Assistant service tool

CAN Communications	Compliant to SAE CAN J1939 Standard 1 CAN port (SAE J1939) 250kbit/s, 500kbit/s, 667kbit/s, 1Mbit/s. Auto-baud-rate detection
Ethernet Communications	One 10/100 Mbit Ethernet compliant port Modbus TCP/IP is available.
User Interface - Reflashing	Axiomatic Electronic Assistant P/N: **AX070502**, or **AX070506K**
Protection	IP20
Weight	0.272 kg (0.60 lb.)
Operating Temperature	-40 to 85°C (-40 to 185°F)
Enclosure	PHOENIX Flammability rating: UL94 V0 1x TERMINAL BLOCK 5 PIN 160V 16A 3.5mm 45 DEGREE SPRING CLAMP RoHS T/H-12 4x TERMINAL BLOCK 12 PIN 160V 16A 3.5mm 45 DEGREE SPRING CLAMP RoHS T/H24 1x HEADER VERTICAL SHROUDED 2 PIN 5.08 16A 250V RoHS T/H 1x UM-PRO PROFILE 108 X 222mm RoHS -40-100C 1x END CAP LEFT 108mm BLK RoHS 1x END CAP RIGHT 108mm BLK RoHS 8x S-LOCK CLIP BLK FOR TOP RAIL RoHS 3x C-LOCK CLIP BLK FOR TOP RAIL RoHS
Electrical Connections	Push In Terminals – PHOENIX 1 MSTBVA 2.5 HC/2-G-5.08 HEADER 1 RJ-45 8-pin Ethernet Connector

J3: RJCSE538001

PIN#	Description
1	TX_P
2	TX_N
3	RX_P
4	Not Used
5	Not Used
6	RX_N
7	Not Used
8	Not Used

J4: MSTBVA 2.5 HC/2-G-5.08

PIN#	Description
1	BATT_IN+
2	BATT_IN-

J5: Phoenix SPTAF1/12-3,5-IL-1862039

PIN#	Description
1	Input 1
2	Ground
3	Input 2
4	Ground
5	Input 3
6	Ground
7	Input 4
8	Ground
9	Input 5
10	Ground
11	Input 6
12	Ground

J6: Phoenix SPTAF1/12-3,5-IL-1862039

PIN#	Description
1	Input 7
2	Ground
3	Input 8
4	Ground
5	Input 9
6	Ground
7	Input 10
8	Ground
9	Input 11
10	Ground
11	Input 12
12	Ground

J7: Phoenix SPTAF1/12-3,5-IL-1862039

PIN#	Description
1	Proportional Output 1
2	Ground
3	Proportional Output 2
4	Ground
5	Proportional Output 3
6	Ground
7	Proportional Output 4
8	Ground
9	Proportional Output 5
10	Ground
11	Proportional Output 6
12	Ground

J8: Phoenix SPTAF1/12-3,5-IL-1862039

PIN#	Description
1	Proportional Output 7
2	Ground
3	Proportional Output 8
4	Ground
5	Proportional Output 9
6	Ground
7	Proportional Output 10
8	Ground
9	Proportional Output 11
10	Ground
11	Proportional Output 12
12	Ground

J9: Phoenix SPTAF1/12-3,5-IL-1862039

PIN#	Description
1	CAN_H
2	CAN_L
3	CAN_SH
4	Not Used
5	Not Used

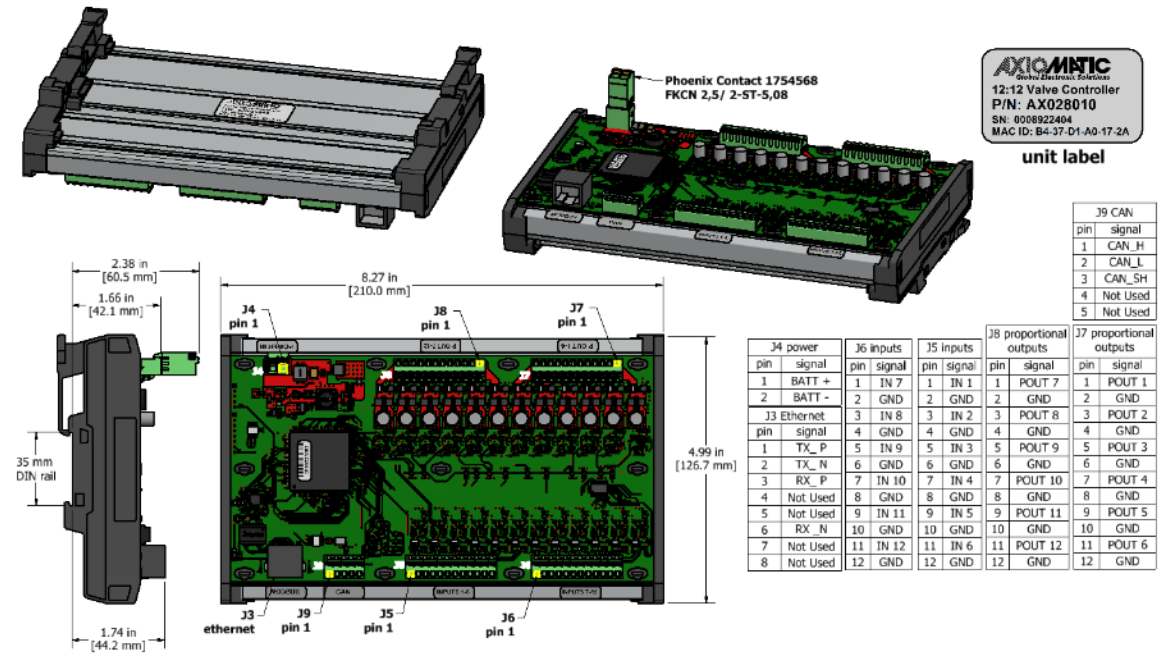|	
Installation	DIN rail mount, TH 35-7.5
Network Termination	It is necessary to terminate the network with external termination resistors. The resistors are 120Ω, 0.25W minimum, metal film or similar type. They should be placed between CAN_H and CAN_L terminals at both ends of the network.

Dimensional Drawing

Figure 2 – Dimensional Drawing

Form: TDAX028010-10/26/23