Preliminary
TECHNICAL DATASHEET #TDAX020800

4 Inputs, 8 Proportional Outputs Valve Controller

Wake-on-CAN

2 CAN Ports (SAE J1939)
Configurable with Axiomatic Electronic Assistant
P/N: AX020800

Features

- 4 universal signal inputs configurable as follows.
  - Voltage
  - Current
  - Resistive
  - Frequency
  - PWM
  - Digital
- 8 proportional outputs (up to 3 A) selectable as follows.
  - Voltage
  - Current
  - Hotshot Digital
  - PWM
  - Digital
  - Disabled
- 2 CAN ports (SAE J1939) with auto-baud-rate detection
- **Wake-on-CAN** function for power saving
- Operates on 8 to 65 Vdc battery power
- Surge, transient, and reverse polarity protection
- Withstands -40 to 85 °C (-40 to 185 °F)
- Suitable for high vibration and shock environments for off-highway applications
- IP67 rated CINCH enclosure for protection against dust and water ingress
- 1x 32-pin CINCH connector
- All setpoints configurable via Axiomatic Electronic Assistant

Applications

Drive actuators, hydraulic valves, or motors with inputs from sensors, joysticks, switches, or push-buttons in off-highway or construction equipment, municipal vehicles, trucks, or other SAE J1939 control systems.

Ordering Part Numbers

4 Inputs, 8 Proportional Outputs Valve Controller, SAE J1939 - P/N: **AX020800**

Accessories:
Axiomatic Electronic Assistant Kit - P/N: **AX070502** or **AX070506K**
(See General Specifications for mating plugs)

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Description

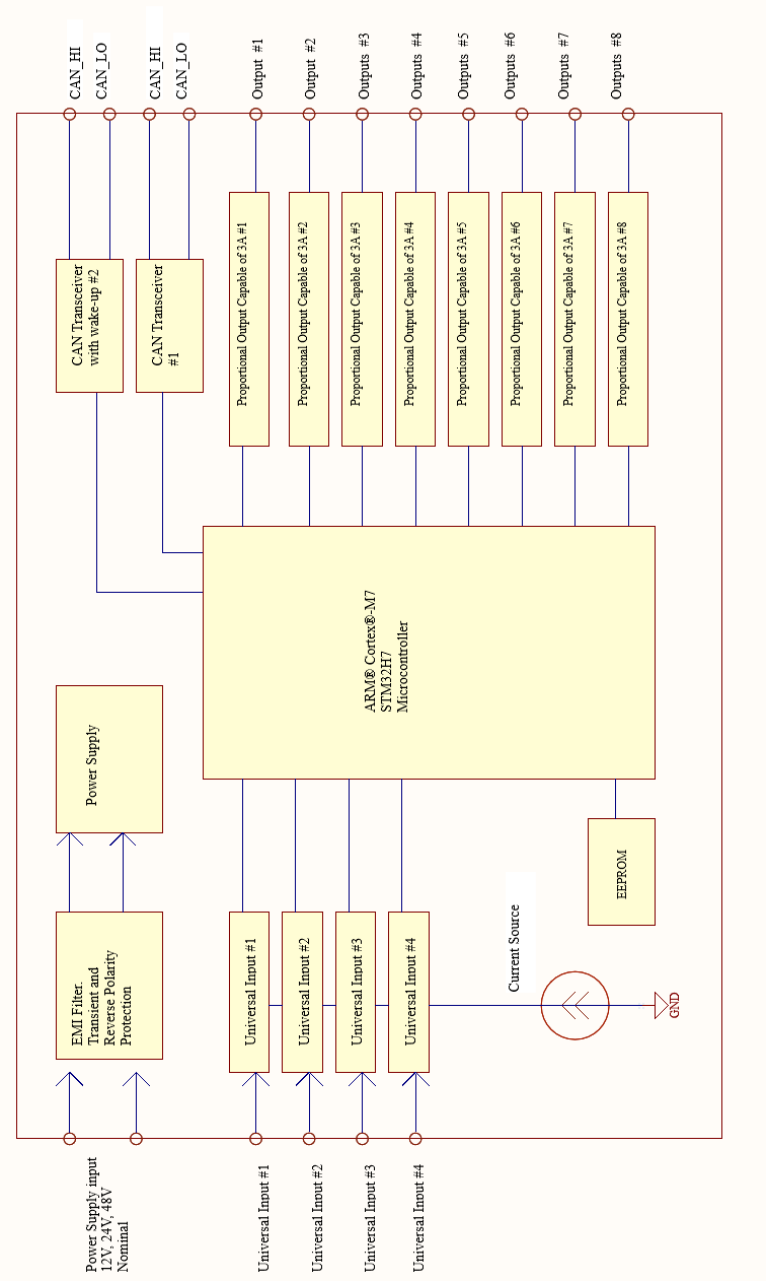
The AX020800 accepts 4 universal command signal inputs as voltage, current, resistive, frequency, PWM, or digital types from sensors, joysticks, switches, or push-buttons. It provides 8 proportional outputs (up to 3 A) capable of driving actuators, hydraulic valves, or motors. The outputs are programmable as voltage, current, hotshot digital, PWM, digital, or disabled.

It interfaces with 2 SAE J1939 CAN networks using auto-baud-rate detection and utilizes a Wake-on-CAN function to save on power. Configuration is via the Axiomatic Electronic Assistant.

Operating with machine battery power, it accepts 8 to 65 VDC (12, 24, or 48 V nominal). It is designed for harsh environments with an IP67 rating. It operates from -40 to 85 °C (-40 to 185 °F).

The controller can be applied on off-highway machines in distributed valve control CAN networked work functions.

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

Input Power Supply	12, 24, or 48 Vdc nominal 8 to 65 Vdc power supply range
Quiescent Current	90 mA @ 12 Vdc; 60 mA @ 24 Vdc; 60 mA @ 48 Vdc In sleep mode: 69.9 mA @ 12 Vdc; 109.9 mA @ 24 Vdc; 109.9 mA @ 48 Vdc
Protection	Surge and transient protection are provided. Reverse polarity protection is provided. Undervoltage protection provided. Hardware shutdown at 5.9 V. Overvoltage protection provided. Hardware shutdown at 65 V.

Inputs

Universal Inputs: 4 universal signal inputs user selectable as follows.

Voltage	Ranges: 0-2.5 V, 0-10 V Resolution: 1 mV Accuracy: ±0.1 %
Current	Ranges: 0-20 mA, 4-20 mA Resolution: 1 µA Accuracy: ±1 %
Resistive	Range: up to 250 kΩ Accuracy: ±2 %
Frequency	Range: 0-10 kHz Resolution: 0.01 % Accuracy: ±1 %
PWM	Range: 1 Hz - 10 kHz Duty Cycle: 0-100 % Accuracy: ±1 %
Digital	1 MΩ impedance, or Active High with 10 kΩ pull-up, or Active Low with 10 kΩ pull-down resistor to Ground

12-bit Analog to Digital resolution (voltage, current)
Current source for resistive input using DAC (Digital-to-Analog Converter)
Protected against shorts to Ground

Outputs

Proportional Outputs: 8 proportional outputs (up to 3 A sourcing) programmable as follows.

Voltage	Ranges: 0-Vps (up to 48 V) Resolution: 10 mV Accuracy: ± 2 %
Current	Ranges: 0-3 A Resolution: 10 mA Accuracy: ±1 %
Hotshot Digital	See profile diagram below.
PWM	Range: 1 Hz - 25 kHz Duty Cycle: 0-100 % Accuracy: ±1 % error
Digital	On/Off
Disabled	-

Current sensing provided
Overcurrent protection against shorts to Ground or +Vps provided at 4.8 A

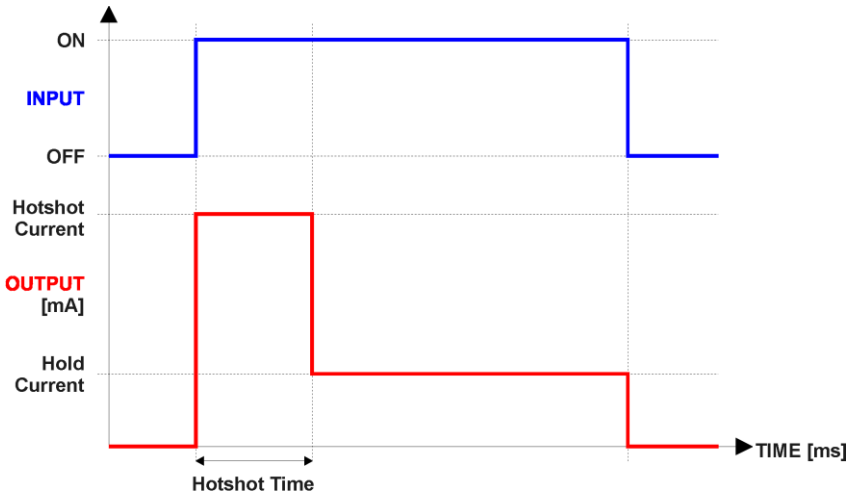
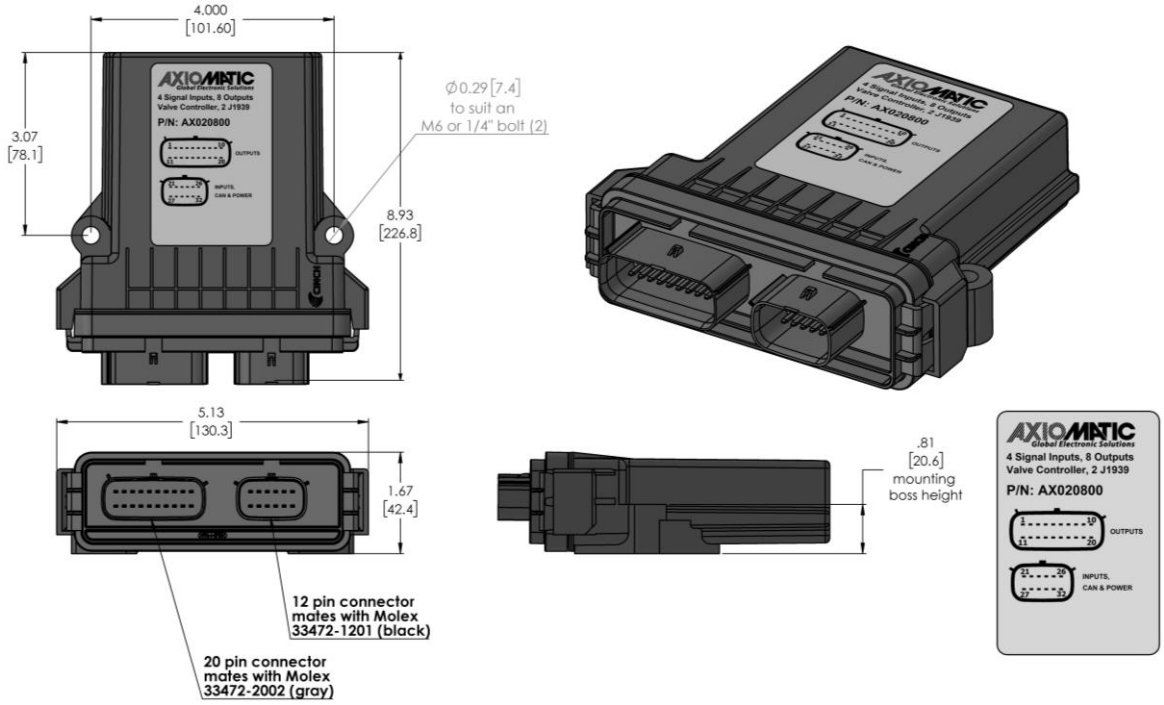


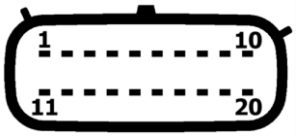
Figure - Hotshot Digital Profile

Dimensional Drawing



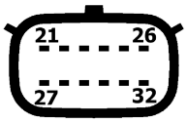
General Specifications

Microcontroller	STM32H723ZGT6, 32-bit, 1 MB flash memory
Control Logic	User programmable functionality. Refer to the User Manual.
CAN	2 CAN ports (SAE J1939) 250 kbit/s, 500 kbit/s, 667 kbit/s, and 1 Mbit/s with auto-baud-rate detection **Wake-on-CAN** functionality on CAN 2 port
Network Termination	It is necessary to terminate the network with external termination resistors. The resistors are 120 Ω, 0.25 W minimum, metal film or similar type. They should be placed between CAN H and CAN L terminals at both ends of the network.
User Interface	Axiomatic Electronic Assistant - P/N: **AX070502** or **AX070506K**
Compliance	RoHS
Operating Temperature	-40 to 85 °C (-40 to 185 °F)
Storage Temperature	-50°C to 125 °C (-58 to 257 °F)
Enclosure	CINCH enclosure P/N: 5810130065 Glass filled Polyphthalamide (PPA) material Flammability rating: UL94HB 8.93 in. x 5.13 in. x 1.67 in. (226.8 mm x 130.3 mm x 42.4 mm) L x W x H including integral connectors
Protection	IP67
Weight	0.576 lb. (0.261 kg)
Mounting	Mounting holes are sized for ¼" or M6 bolts. The bolt length will be determined by the end-user's mounting plate thickness. The mounting flange of the controller is 0.81 in. (20.6 mm) thick. It should be mounted with connectors facing left or right to reduce the likelihood of moisture entry. All field wiring should be suitable for the operating temperature range. Install the unit with appropriate space available for servicing and for adequate wire harness access (6 in. or 15 cm) and strain relief (12 in. or 30 cm).
Electrical Connections	32-pin two-part CINCH ME-MX receptacle - P/N: 5810132011
Mating Plug	Mates with Molex 33472-2002 (grey) and 33472-1201 (black)



Mates with Molex 33472-2002 (grey)

Pin	Description	Pin	Description
1	Output 1	11	Ground
2	Output 2	12	Ground
3	Output 3	13	Ground
4	Output 4	14	Ground
5	Output 5	15	Ground
6	Output 6	16	Ground
7	Output 7	17	Ground
8	Output 8	18	Ground
9	Input 1	19	Ground
10	Input 2	20	Ground



Mates with Molex 33472-1201 (black)

Pin	Description	Pin	Description
21	Input 3	27	Ground
22	Input 4	28	Ground
23	CAN 2 H	29	CAN 2 L
24	CAN 1 H	30	CAN 1 L
25	Battery +	31	Ground
26	Battery -	32	Ground

Form: TDAX020800-03/28/2025