TECHNICAL DATASHEET #TDAX103000A

3 Universal Inputs, 2 Outputs Motor Controller, H-Bridge

CAN (SAE J1939)

5 or 8 V Reference

2 Half-Bridge or 1 Full H-Bridge (5 A) Output

Configurable with Axiomatic Electronic Assistant

P/N: AX103000A

Features

- 3 universal signal inputs selectable as follows.
  - Voltage
  - PWM
  - Frequency
  - Digital signal
- 1 full H-bridge 5 A output or 2 half-bridge outputs. The half-bridge outputs are selectable as follows.
  - Proportional current
  - Proportional voltage
  - Hotshot digital
  - PWM duty cycle
  - On/Off digital
- Voltage reference: 5 or 8 V programmable
- Operational voltage: 8 to 36 VDC (12 or 24 VDC)
- 1 CAN port (SAE J1939) with auto-baud-rate detection
- Integrated 12-pin connector
- Compact
- Laser-welded enclosure, IP67
- Configurable with Axiomatic Electronic Assistant

Applications

Machine control systems for actuators, valves and DC motors.

Ordering Part Number

3 Universal Inputs, 2 Outputs Motor Controller, 5 A H-Bridge, CAN (SAE J1939) with Auto-Baud-Rate Detection - P/N: **AX103000A**

Accessories:
Mating Plug KIT - P/N: **PL-DTM06-12SA**
Axiomatic Electronic Assistant Configuration KIT - P/N: **AX070502** or **AX070506K**

Description

This H-bridge controller reads numerous types of input signals and provides different outputs. It has three Universal Inputs. The two half-bridge outputs form one full H-bridge when used together. The H-bridge can provide up to 5 A power. When used independently, the two half-bridge outputs can be selectable as proportional current, proportional voltage, hotshot digital, PWM duty cycle, or on/off digital. The total current consumption at power supply voltage must not exceed 6 A. Powerful control algorithms allow the user to program the controller for a wide range of applications without the need for custom firmware. It features auto-baud-rate detection.

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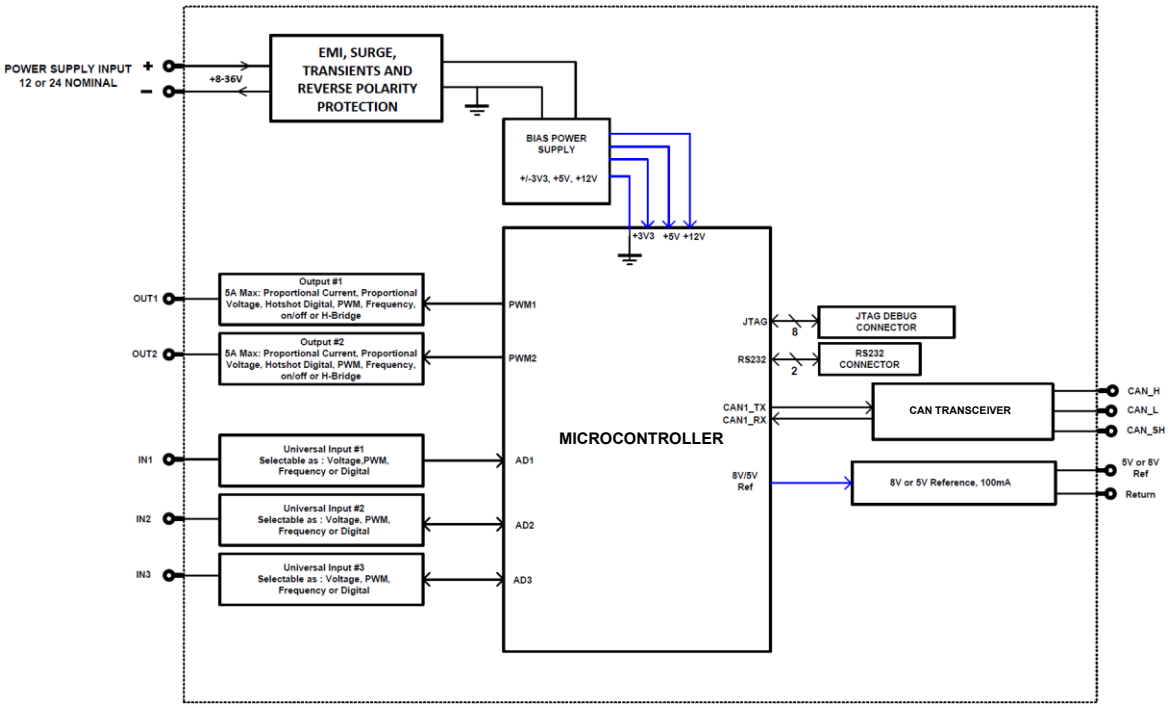
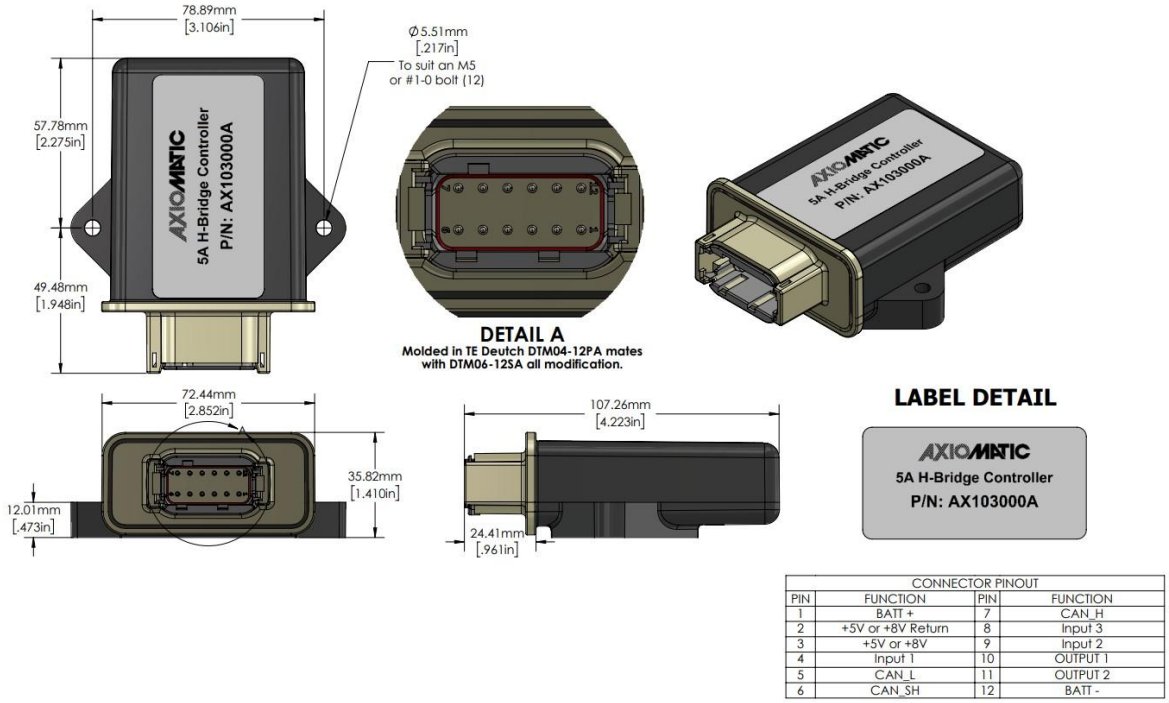
Block Diagram



Dimensional Drawing



CONNECTOR PINOUT			
PIN	FUNCTION	PIN	FUNCTION
1	BATT +	7	CAN_H
2	+5V or +8V Return	8	Input 3
3	+5V or +8V	9	Input 2
4	Input 1	10	OUTPUT 1
5	CAN_L	11	OUTPUT 2
6	CAN_SH	12	BATT -

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

Power Supply Input	12 or 24 VDC nominal 8 to 36 VDC range
Quiescent Current Draw	36.5 mA @ 12 VDC; 22.3 mA @ 24 VDC (typical)
Protections	Surge protection is provided. Reverse polarity protection is provided. Undervoltage protection is provided. Hardware shutdown at 6.6 V. Overvoltage protection is provided. Hardware shutdown at 36.77 V.

Inputs

Inputs	3 universal inputs 12-bit analog to digital (voltage) All 3 inputs are programmable as follows.

Voltage Inputs	Range: 0 to 5 V, Impedance (204 kΩ) 0 to10 V, Impedance (136 kΩ) 1 mV resolution, ±0.2 % error
PWM Inputs	Frequency: 1 Hz to 10 kHz Duty Cycle: 0 to 100 %
Frequency Inputs	Range: 1 Hz to 10 kHz 0.01% resolution, ±0.1 % error
Digital Inputs	Active High or active Low with 10 kΩ pull-up or pull-down Amplitude: Up to +Vsupply

Protection	Protected against short circuit to Ground or +Vsupply

Outputs

Outputs	One full **H-bridge 5 A** output or two half-bridge outputs. The half-bridge outputs are programmable as follows.

Proportional Current Output	1 mA resolution, ±1 % error
Proportional Voltage Output	0 to Vps 0.1 V resolution, ±5 % error
Hotshot Digital Output	Firmware programmable waveform
PWM Output	Up to 25 kHz 0 to 100 % 0.1 % resolution, ± 0.1 % error
On/Off Digital Output	0 to Vps Sourcing from power supply, sinking from output to ground or off.

High frequency drive (25 kHz)

The load is connected between the two output pins for the full H-Bridge output. This output features current sensing.

The total current consumption at power supply voltage must not exceed 6 A.

Voltage Reference	5 or 8 V programmable 100 mA, 2 % reference voltage output
Protection	Overcurrent protection Short-circuit protection in hardware

General Specifications

<table>
<tr><td>Microcontroller</td><td>STM32H725RGV3</td></tr>
<tr><td>Communications</td><td>1 CAN SAE J1939-compliant port
250 kbit/s, 500 kbit/s, 667 kbit/s, 1 Mbit/s with auto-baud-rate detection</td></tr>
<tr><td>Control Logic</td><td>Standard embedded control logic is provided. Refer to the User Manual.</td></tr>
<tr><td>User Interface</td><td>User configuration and diagnostics are provided with the Axiomatic Electronic Assistant P/N: AX070502 or AX070506K</td></tr>
<tr><td>Compliance</td><td>RoHS</td></tr>
<tr><td>Vibration</td><td>MIL-STD-202H, method 204, test condition C
10 g peak (Sine)
MIL-STD-202H, method 214A, test condition I/B
7.56 Grms (Random)</td></tr>
<tr><td>Shock</td><td>MIL-STD-202H, method 213B, test condition A
50 g peak</td></tr>
<tr><td>Operating Conditions</td><td>-40°C to 85°C (-40°F to 185°F)</td></tr>
<tr><td>Storage Temperature</td><td>-40°C to 105°C (-40°F to 221°F)</td></tr>
<tr><td>Weight</td><td>0.25 lb. (0.111 kg)</td></tr>
<tr><td>Protection Rating</td><td>IP67</td></tr>
<tr><td>Enclosure and Dimensions</td><td>Molded Enclosure, integral connector
Nylon 6/6, 30% glass, Laser Welded
4.28 in. x 3.69 in. x 1.41 in. (108.6 mm x 94 mm x 36 mm)
Note: L x W x H includes the integral connector
Flammability rating: UL 94 HB
Refer to Dimensional Drawing.</td></tr>
<tr><td>Electrical Connections</td><td>Integral 12-pin receptacle (equivalent to TE Deutsch P/N: DTM04-12P)
<table>
<tr><th>Pin</th><th>Description</th></tr>
<tr><td>1</td><td>Battery +</td></tr>
<tr><td>2</td><td>5 or 8 V Return</td></tr>
<tr><td>3</td><td>5 or 8 V</td></tr>
<tr><td>4</td><td>Input 1</td></tr>
<tr><td>5</td><td>CAN Low</td></tr>
<tr><td>6</td><td>CAN Shield</td></tr>
<tr><td>7</td><td>CAN High</td></tr>
<tr><td>8</td><td>Input 3</td></tr>
<tr><td>9</td><td>Input 2</td></tr>
<tr><td>10</td><td>Output 1</td></tr>
<tr><td>11</td><td>Output 2</td></tr>
<tr><td>12</td><td>Battery -</td></tr>
</table></td></tr>
<tr><td>Mating Connectors</td><td>Mating Plug KIT P/N: PL-DTM06-12SA (includes 1x DTM06-12SA plug, 1x WM-12S wedgelock, 12x 0462-201-20141 solid contacts, and 6x 0413-204-2005 sealing plugs)</td></tr>
<tr><td>Mounting</td><td>Mounting holes are sized for #10 or M5 bolts. The bolt length will be determined by the end-user’s mounting plate thickness. The mounting flange of the controller is 0.47 in. (12 mm) thick. It should be mounted with connectors facing left or right to reduce 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).</td></tr>
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Form: TDAX103000A-08/20/2025