

## Dual Plug-In Valve Controller, SAE J1939

2-2.5A Outputs  
Programmable

P/N: AX022310

**Distribute your control functions directly onto the valve.**

### Features:

- Configurable for 1 or 2 outputs to drive hydraulic valves (proportional 0-2.5A or on/off 2.5A)
- Superimposed dither
- Independent ramps (0-10 seconds) to suit the application
- Fully protected outputs
- 12V, 24Vdc nominal input power
- 1 CAN port (SAE J1939) for integration into the machine's CAN bus network
- Rugged IP67 packaging
- Integrated connectors to minimize wiring and reduce installation time
- Compact, Plug-in style for valve coils with the molded-in TE Deutsch DT04-2P electrical connectors
- User programmable functionality (with the Axiomatic Electronic Assistant)



### Applications:

The hydraulic valve controller is designed to meet the rugged demands of mobile equipment, oil and gas equipment, and heavy duty industrial machine applications. It can be used for distributed control of the following.

- Flow or pressure control of single solenoid hydraulic valves
- Control of dual solenoid hydraulic valves
- Control of hydraulic fan drives
- Transmission control for accurate low-speed control of vehicles

### Ordering Part Numbers:

Dual Valve Controller, SAE J1939, Plug-In, Auto-Baud-Rate Detection: **AX022310**  
Axiomatic Electronic Assistant Configuration KIT, P/Ns: **AX070502**, **AX070505K**, or **AX070506K**  
Mating Plug Kit: **AX070119**

**Description:** The Dual Output Plug-In Valve Controller with SAE J1939 is designed for extremely versatile control of the two proportional outputs to directly drive coils or other loads from the machine's CAN bus. Its flexible circuit design gives the user a wide range of configurable output types. The sophisticated control algorithms allow the user to program the controller for a wide range of applications without the need for custom software. The two universal outputs can be setup to drive: proportional current (up to 2.5A each); hotshot digital current (2.5A); proportional voltage (up to supply); proportional PWM; or straight on/off digital loads. Both outputs are high-side driven (sourcing) outputs. A programmable controller, the user can configure it for their application using the Axiomatic Electronic Assistant. Its sophisticated control algorithms allow for open or closed loop drive of the proportional outputs. It is integrated into the machine's CAN network of controllers. All outputs and logical function blocks on the unit are inherently independent from one another, but can be programmed to interact in a large number of ways.

## Technical Specifications:

### Power Supply

Power Supply Input - Nominal	12, 24Vdc nominal (9...36 Vdc power supply range)
Protection	Surge protection is provided. Reverse polarity protection is provided. Overvoltage protection up to 38V is provided. Undervoltage (hardware and software shutdown at 7.5V) is provided.

### Inputs

CAN	1 CAN port, protocol SAE J1939 250 kbit/s, 500kbit/s, 667kbit/s, and 1Mbit/s auto-baud-rate detection
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### Outputs

Output Type	Two independent software controlled outputs User selectable output functions Half-bridge outputs, current sensing, grounded load High side switch (sourcing output) 0 – 2.5A High Frequency Drive (25 kHz) Refer to Figure 2.0. – De-rating Curve.
Output Functions	User selectable from the following <ul style="list-style-type: none"> <li>➤ Proportional Current [mA]</li> <li>➤ Proportional Voltage [V] (Average output is based on power supply.)</li> <li>➤ PWM Duty Cycle [%] (Configurable from 1 Hz to 25 kHz only if no current output types are selected. Otherwise, the default of 25 kHz is used.)</li> <li>➤ Digital On/Off (Load supply voltage must not draw more than 2.5A.)</li> <li>➤ Hotshot On/Off</li> </ul>
Current PID Loop	Factory calibrated.
Output Resolution and Accuracy	Output Current mode 1mA resolution, +/- 2% full scale error Output Voltage mode 0.1V resolution, +/- 3% full scale error Output PWM D.C. mode 0.1% resolution, +/- 1% full scale error
Dither	50 to 400 Hz 0 to 500 mA (0-20% of I-max.) Both outputs use the same dither frequency.
Ramp Times	Independent 0-10 seconds I max to I min
Protection for Output+	Fully protected against short circuit to ground and short circuit to power supply rail. Grounded short circuit protection will engage at 4.5A +/- 0.5A. Unit will fail safe in the case of a short circuit condition and is self-recovering when the short is removed.
Independence	Fully independent
Output GND Reference	Two are provided.

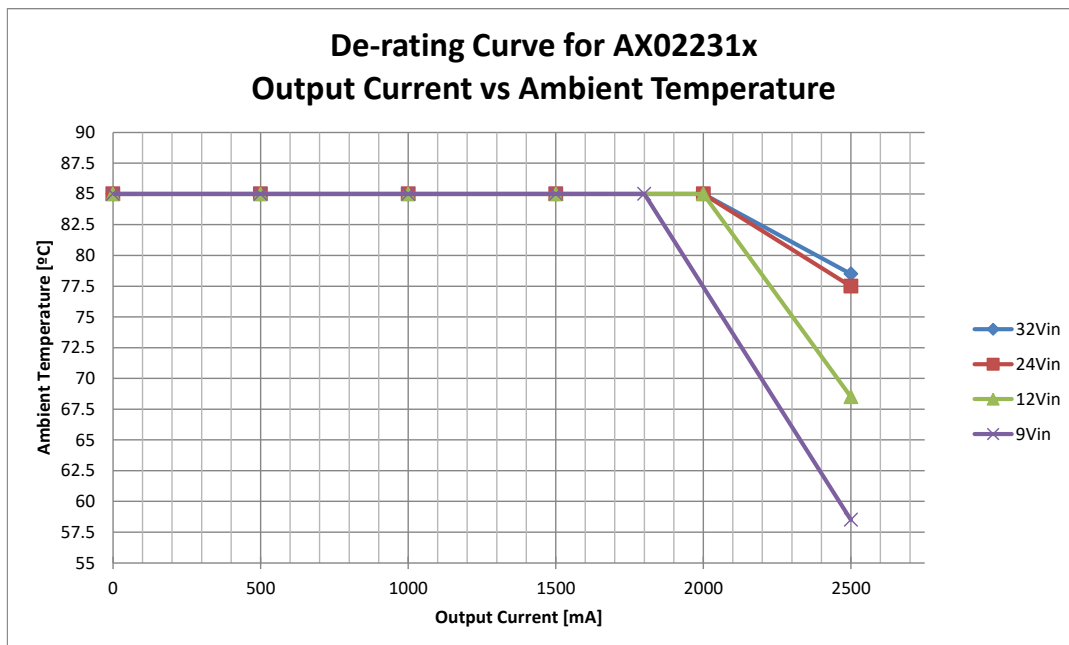
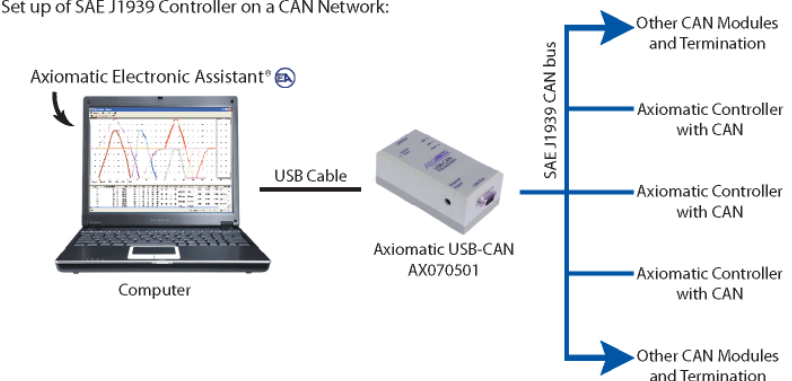
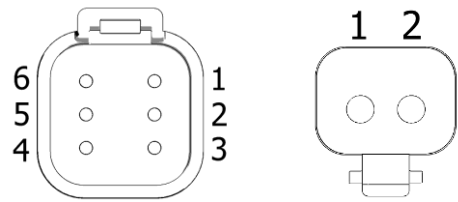
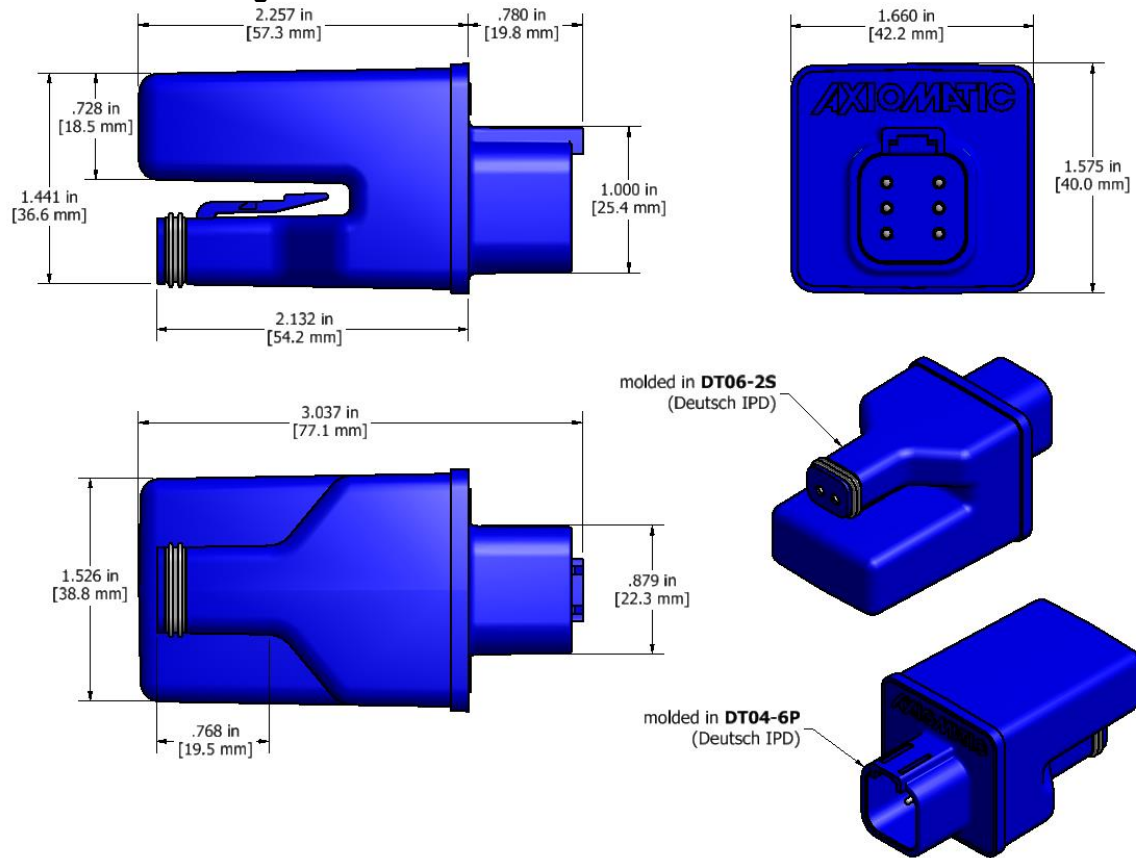


Figure 2.0 - De-rating Curve (based on both outputs on)

## General Specifications

Quiescent Current	16.41 mA at 12 V Typical, 11.74 mA at 24 V Typical																								
Microcontroller	STM32, 32-bit, 128 Kbyte program memory																								
Control Logic	User programmable functionality Refer to the User Manual for details.																								
Reflashing over CAN	Provided Per SAE J1939 standard using the Axiomatic Electronic Assistant. 29 bit IDs, 250 kbps baud rate																								
Communications	1 CAN port, protocol SAE J1939																								
User Interface	<p>User configuration and diagnostics are provided with the Axiomatic Electronic Assistant KIT, P/Ns AX070502, AX070505K, or AX070506K. The Axiomatic Service Tool is a <i>Windows</i>-based graphical user interface, that allows easy configuration of the controller setpoints.</p> <p>Set up of SAE J1939 Controller on a CAN Network:</p> 																								
Packaging	Molded Enclosure, integral connectors Polyester, 15% glass Silicone seals 3.037 x 1.44 x 1.53 inches (77.1 x 36.6 x 38.8 mm) L x W x H including integral connectors																								
Protection	IP67 rating for the product assembly																								
Vibration	Random Vibration for vibration isolated cab mount components 16 hours/axis, 4.41 - 6.79 Grms, 5 Hz – 2000 Hz, Modified Kurtosis 9.3 Parts of SAE J1445, MIL-STD-202, IEC 60068-2-64																								
Weight	0.15 lbs. (0.068 kg)																								
Temperature Rating	Operating: -40 to 85°C (-40 to 185°F) Storage: -50 to 105°C (-58 to 221°F)																								
Connectors	<p>6-pin Integral Connector (equivalent TE Deutsch P/N: DT04-6P) This plug mates to a TE Deutsch P/N DT06-6S equivalent. (A mating plug kit is available, P/N AX070119.) 2-pin Integral Connector (equivalent TE Deutsch P/N: DT06-2S); mates to valve coil with integral DT04-2P Connector (not supplied)</p> 																								
Electrical Pinout	<p>Wires should be of the appropriate gauge to meet requirements of applicable electrical codes and suit the specifications of the connector(s).</p> <table border="1" data-bbox="641 1638 1323 1806"> <thead> <tr> <th colspan="2">6-pin Connector</th> </tr> <tr> <th>Pin #</th> <th>Description (Notes)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Solenoid B-</td> </tr> <tr> <td>2</td> <td>CAN H</td> </tr> <tr> <td>3</td> <td>CAN L</td> </tr> <tr> <td>4</td> <td>Power +</td> </tr> <tr> <td>5</td> <td>Power -</td> </tr> <tr> <td>6</td> <td>Solenoid B+</td> </tr> </tbody> </table> <table border="1" data-bbox="641 1827 1323 1911"> <thead> <tr> <th colspan="2">2-pin Connector</th> </tr> <tr> <th>Pin #</th> <th>Description (Notes)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Solenoid A+</td> </tr> <tr> <td>2</td> <td>Solenoid A-</td> </tr> </tbody> </table>	6-pin Connector		Pin #	Description (Notes)	1	Solenoid B-	2	CAN H	3	CAN L	4	Power +	5	Power -	6	Solenoid B+	2-pin Connector		Pin #	Description (Notes)	1	Solenoid A+	2	Solenoid A-
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## Dimensional Drawing



*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/>.*

Form: TDAX022310-09/21/23