

CANopen®, Dual Output Valve Controller

with Axiomatic Electronic Assistant

P/N: AX020201

Features:

- Two independent, software-controlled outputs selectable as: Proportional Current (up to 2.5A); Hotshot Digital; PWM Duty Cycle; Proportional Voltage; or On/Off Digital types (2.5A)
- 12Vdc or 24Vdc nominal input power
- 1 CAN (CANopen®) port
- Compact plastic enclosure with integral 8-pin connector
- LED status indication
- IP67
- CE marking
- .EDS provided to interface to standard CANopen® tools



Applications: The controller is designed to meet the rugged demands of mobile equipment and heavy duty industrial machine control applications. These applications include, but are not limited to the following.

- PID Closed Loop Valve Control
- Hydraulic Valve Control

Ordering Part Numbers:

CANopen® Controller: AX020201

Accessories:

Mating Plug Kit: **AX070112** (comprised of DT06-08SA, W8S, 0462-201-16141, 114017)

EDS File: **AX020201-EDS**

Description: The CAN to Dual Output Valve Controller is a highly programmable controller, allowing the user to configure it for their application. It must be integrated into a CANopen® network of controllers. Its sophisticated control algorithms allow for open or closed loop drive of the proportional outputs. All logical function blocks on the unit are inherently independent but can be programmed to interact in a large number of ways. Figure 1A shows the hardware features.

The CAN-20 has several built-in protections that can shut off the outputs in adverse conditions. These features include hardware shutoffs to protect the circuits from being damaged as well as software shutdown features that can be enabled in safety critical systems.

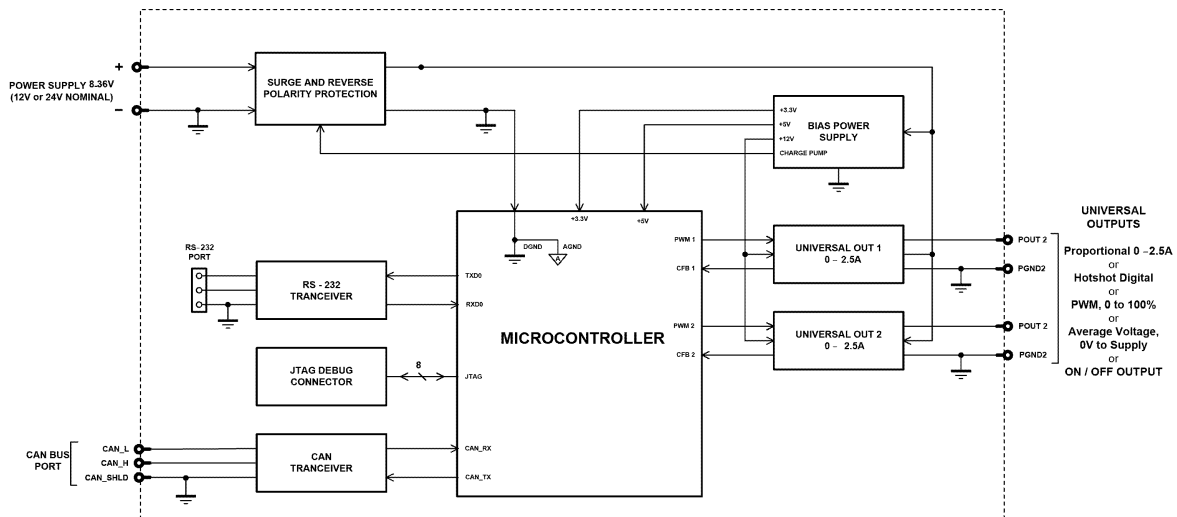


Figure 1A – Hardware Functional Block Diagram

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/>.

Inputs

Power Supply Input	12Vdc or 24Vdc nominal (9...36 Vdc power supply range) The design is suitable for engine cranking and load dump conditions.
Protection	Reverse polarity protection is provided. Surge protection up to 150V is provided. Under-voltage protection (software, hardware shutdown at 2.5V) is provided. Over-voltage shutdown of the output load is provided.

Outputs

Output	Two independent, software-controlled outputs selectable as: Proportional Current; Hotshot Digital; PWM Duty Cycle; Proportional Voltage; or On/Off Digital types High side switch (sourcing output), Grounded Load Current sensing for close-loop control, current feedback on object 2370h Two outputs; 0-2.5A Note: When both outputs are on from 2A to 2.5A, the device is derated to operate at -40 to 70°C (-40 to 158°F).
Output Accuracy	Output Accuracy Output Current mode <2% full scale error Output Voltage mode <3% full scale error Output PWM Duty Cycle mode < 3% full scale error
Current PID Loop	Factory calibrated
Independence	Outputs are fully independent from one another with two exceptions: a) both use the same AO Dither Frequency (object 2320h sub-index 1) both use the same AO Output Frequency (object 2380h sub-index 1)
Power GND Reference	One provided
Error Detection/Reaction	EMCY code generation (object 1003h) and fault reaction possible (1029h) when an open or short circuit is detected at the output (current mode only)
Protection for Output + Terminal	Fully protected against short circuit to ground or +Vcc Grounded short circuit protection will engage at 2.5A +/- 0.5A Unit will fail safe in the case of a short-circuit condition and is self-recovering when the short is removed.

General Specifications

Microprocessor	STM32F103CBT7 32-bit, 128 KByte flash program memory
Control Logic	User programmable functionality using SDO object access, per CiA DS-301
Quiescent Current	<40 mA @ 12Vdc; <30 mA @ 24Vdc
LED Indicator	User configurable to react to different events or faults
CAN Communications	1 CAN 2.0B port, protocol CiA CANopen® By default, the CAN-20-LED Controller transmits output current feedback (FV object

	2370h) on TPDO1 CiA DS-404 V1.2 – CANopen® profile for Measurement Devices and Closed Loop Control Automation 2002
User Interface	.EDS provided to interface to standard CANopen® tools
Network Termination	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.
Operating Temperature	Operating: -40 to 85°C (-40 to 185°F) Storage: -50 to 105°C (-58 to 221°F)
Enclosure	Molded Enclosure, integral connector Nylon 6/6, 30% glass Ultrasonically welded 3.47 x 2.75 x 1.31 inches (88.2 x 70.0 x 33.3 mm) L x W x H including integral connector <i>Refer to the dimensional drawing, Figure 2.0.</i>
Protection	IP67 rating for the product assembly
Approvals	CE marking
Vibration and Shock	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 lb. (0.068 kg)

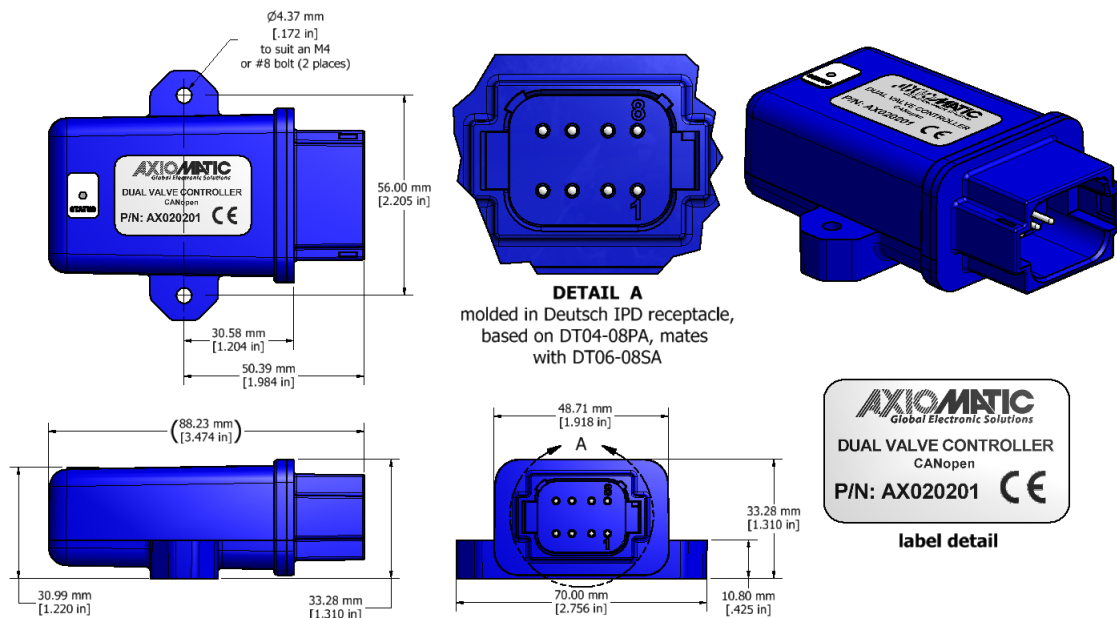


Figure 2.0. – Dimensional Drawing

Electrical Connections	<p>Integral 8-pin receptacle (equivalent TE Deutsch P/N: DT04-08PA) 18 AWG wire is recommended for use with contacts 0462-201-16141.</p> <p>A mating plug kit is available. Ordering P/N: AX070112 is comprised of 1 DT06-08SA, 1 W8S, 8 0462-201-16141, and 3 114017.</p> <table border="1" data-bbox="688 317 1230 598"> <thead> <tr> <th colspan="2">CAN and I/O Connector</th> </tr> <tr> <th>Pin #</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CAN_L</td> </tr> <tr> <td>2</td> <td>CAN_H</td> </tr> <tr> <td>3</td> <td>Output 2 GND</td> </tr> <tr> <td>4</td> <td>Output 2</td> </tr> <tr> <td>5</td> <td>Output 1</td> </tr> <tr> <td>6</td> <td>Output 1 GND</td> </tr> <tr> <td>7</td> <td>Batt-</td> </tr> <tr> <td>8</td> <td>Batt+</td> </tr> </tbody> </table>	CAN and I/O Connector		Pin #	Function	1	CAN_L	2	CAN_H	3	Output 2 GND	4	Output 2	5	Output 1	6	Output 1 GND	7	Batt-	8	Batt+
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Installation	<p>Mounting holes are sized for #8 or M4 bolts. The bolt length will be determined by the end-user's mounting plate thickness. The mounting flange of the controller is 0.425 inches (10.8 mm) thick.</p> <p>If the module is mounted without an enclosure, it should be mounted vertically with connectors facing left or right to reduce likelihood of moisture entry.</p> <p>The CAN wiring is considered intrinsically safe. The power wires are not considered intrinsically safe and so in hazardous locations, they need to be located in conduit or conduit trays at all times. The module must be mounted in an enclosure in hazardous locations for this purpose.</p> <p>No wire or cable harness should exceed 30 meters in length. The power input wiring should be limited to 10 meters.</p> <p>All field wiring should be suitable for the operating temperature range.</p> <p>Install the unit with appropriate space available for servicing and for adequate wire harness access (6 inches or 15 cm) and strain relief (12 inches or 30 cm).</p>																				

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Form: TDAX020201-06/09/23