Dual Plug-In Valve Controller, CANopen®

2-2.5A Outputs
Programmable

P/N: AX022311

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 (CANopen®) 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 having the molded-in TE Deutsch DT04-2P electrical connectors
- User programmable functionality (.EDS provided to interface to standard CANopen® tools)

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:

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| Dual Valve Controller, CANopen®, Plug-In: **AX022311**
EDS File, User Manual: **CD-AX022311**
Mating Plug Kit: **AX070119** |

Description:

The Dual Output Plug-In Valve Controller with CANopen® 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. Its sophisticated control algorithms allow for open or closed loop drive of the proportional outputs. It is integrated into the machine's CANopen® 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. Refer to Figure 1.

Figure 1 –Logical Functional Block Diagram
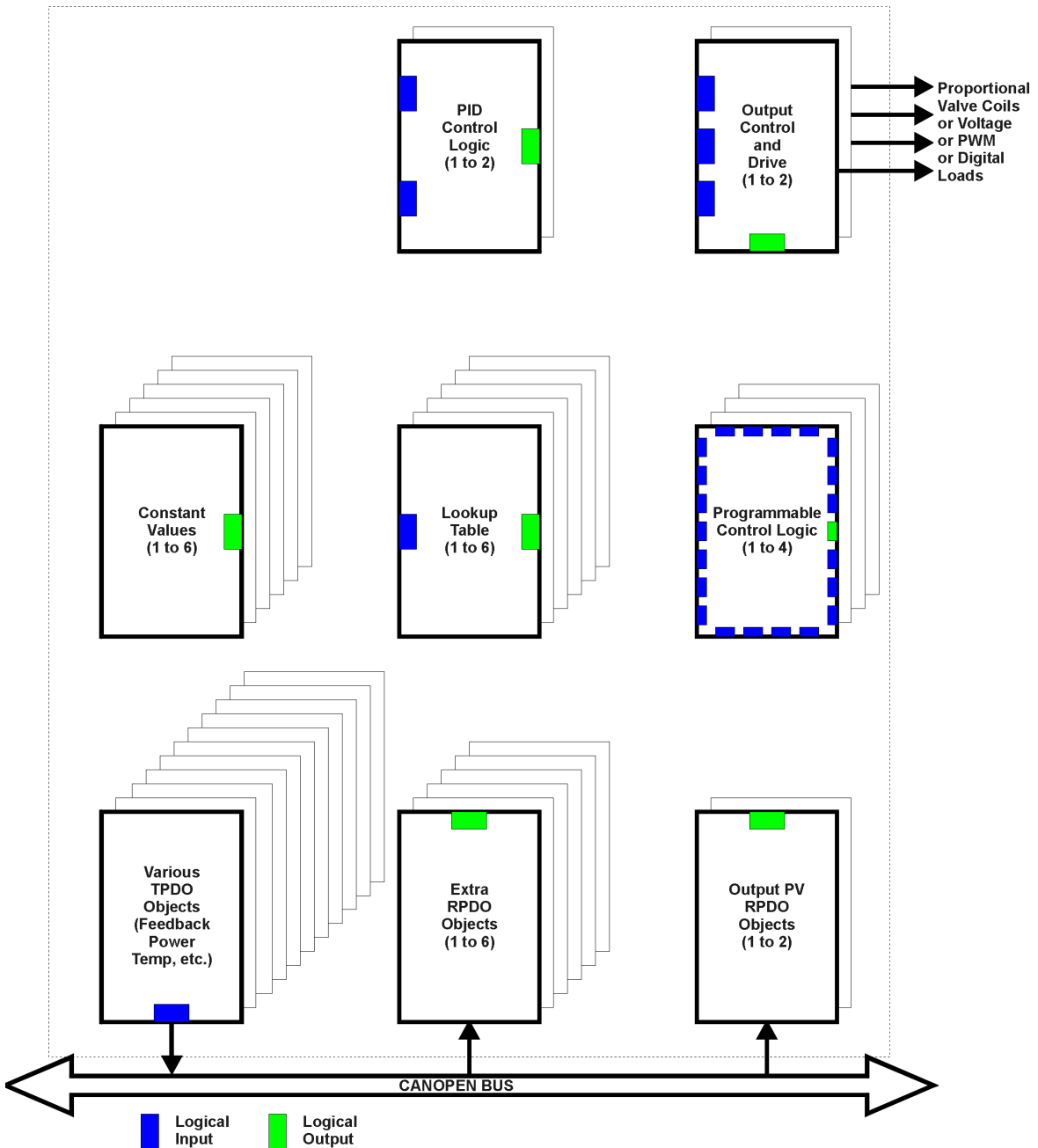
Technical Specifications:

Power Supply Input

Power Supply Input - Nominal	12, 24VDC nominal (9…32 VDC power supply range)
Protection	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 CiA CANopen® By default, the controller transmits output current feedback (FV object 2370h) on TPDO1 CiA DS-404 V1.2 – CANopen® profile for Measurement Devices and Closed Loop Controllers. CAN in Automation 2002 (SAE J1939 is also available.)

Outputs

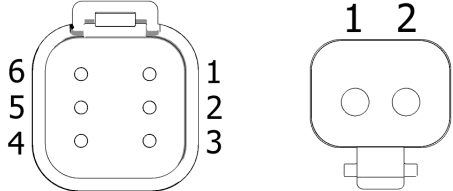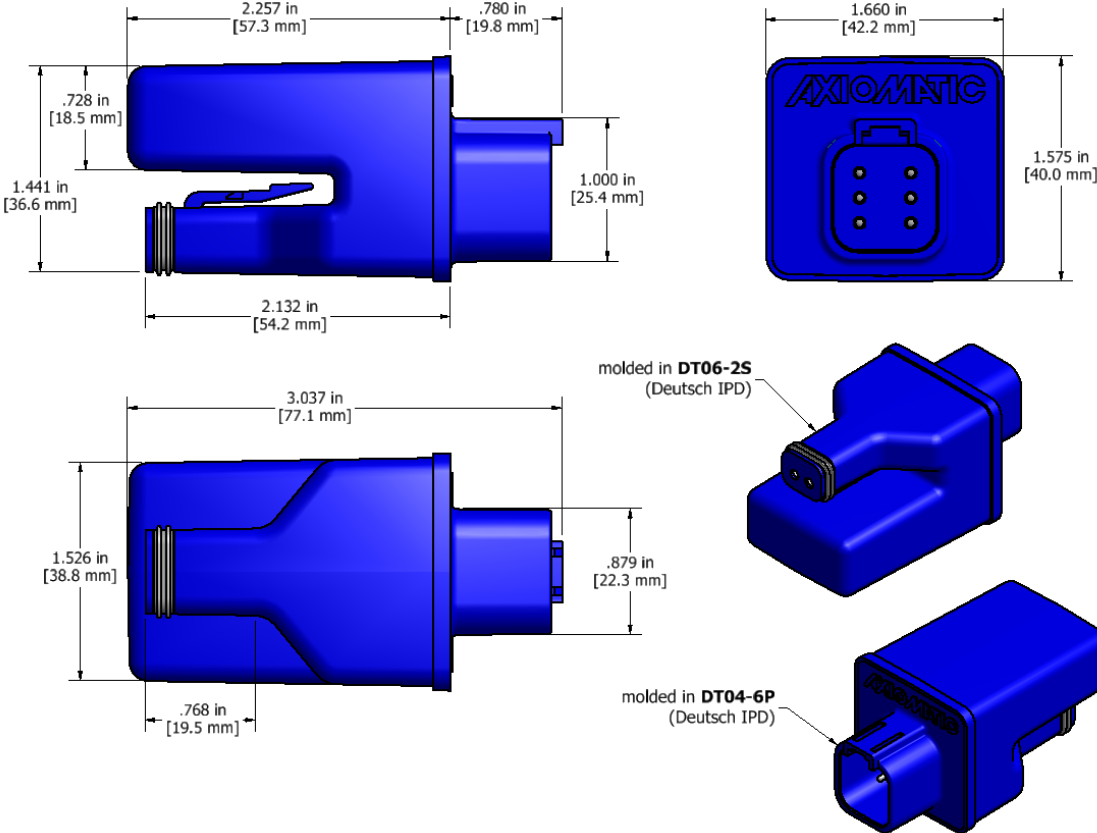| Output Functions	Current [mA], Voltage [V], PWM [%], Digital On/Off, Hotshot On/Off
Output Type	Two outputs High side switch (sourcing output) 0 – 2.5A, Grounded Load Current sensing for close-loop control Refer to Figure 2.0. – De-rating Curve.
Current PID Loop	Factory calibrated.
Output Resolution and Accuracy	Output Current mode 1mA resolution, +/- 2% full scale error Output Voltage mode 0.1V resolution, +/-3% full scale error Output PWM DC mode 0.1% resolution, +/- 1% full scale error
Dither	50 to 400 Hz 0 to 500 mA (0-20% of I-max.)
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. Unit will fail safe in the case of a short circuit condition, self-recovering when the short is removed
Independence	Fully independent
Output GND Reference	Two are provided
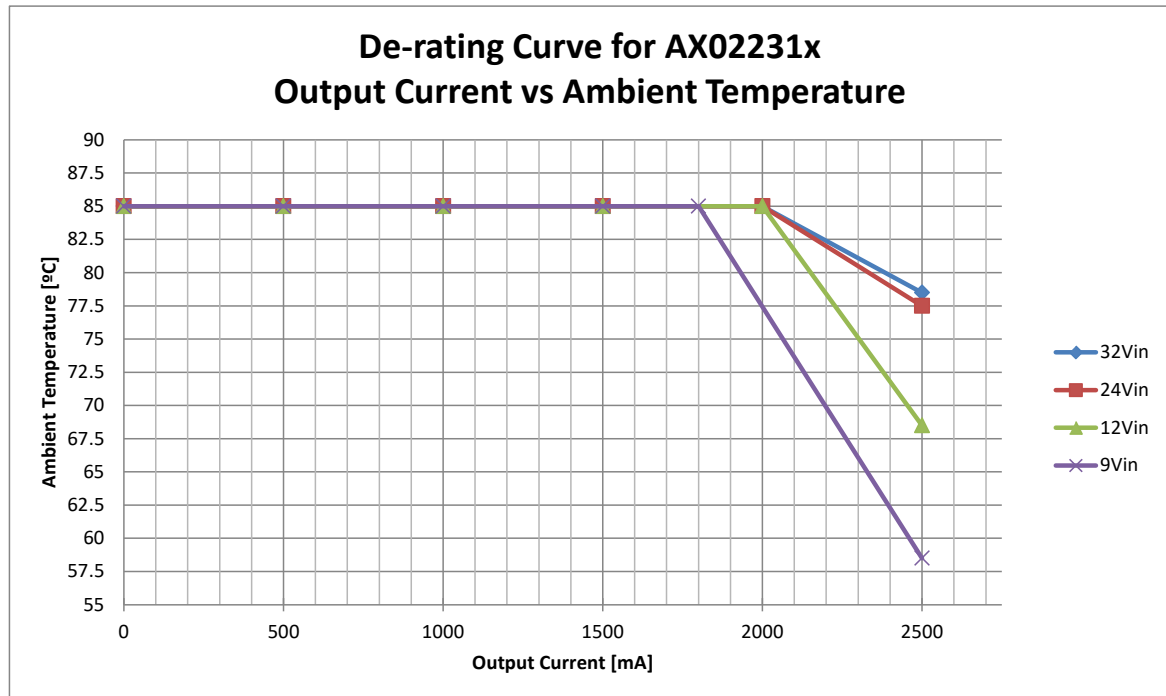
Figure 2.0 - De-rating Curve (based on both outputs on)

General Specifications

Quiescent Current	16.41 mA at 12 V Typical, 11.74 mA at 24 V Typical
Microprocessor	STM32, 32-bit, 128 KByte program memory
Control Logic	User programmable functionality using SDO object access Refer to the User Manual for details. The controller meets the following CAN in Automation standards. • DC-301 V4.1 - CANopen® Application Layer and Communication Profile (CiA 2005) • DS-305 V2.0 – Layer Setting Service (LSS) and Protocols (CiA 2006) • DS-404 V1.2 – CANopen® profile for Measurement Devices and Closed Loop Controllers (CiA 2002)
Communications	1 CAN port, protocol CiA CANopen®
User Interface	.EDS provided to interface to standard CANopen ® tools
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
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	6-pin Integral Connector (equivalent TE Deutsch P/N: DT04-6P) The 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).
Electrical Pinout	Wires should be of the appropriate gauge to meet requirements of applicable electrical codes and suit the specifications of the connector(s). **6-pin Connector** <table><tr><th>Pin #</th><th>Description (Notes)</th></tr><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></table> **2- pin Connector** <table><tr><th>Pin #</th><th>Description (Notes)</th></tr><tr><td>1</td><td>Solenoid A+</td></tr><tr><td>2</td><td>Solenoid A-</td></tr></table>

Dimensional Drawing

2.257 in [57.3 mm]
.780 in [19.8 mm]
.728 in [18.5 mm]
1.441 in [36.6 mm]
1.000 in [25.4 mm]
2.132 in [54.2 mm]

3.037 in [77.1 mm]
1.526 in [38.8 mm]
.879 in [22.3 mm]
.768 in [19.5 mm]

1.660 in [42.2 mm]
1.575 in [40.0 mm]

molded in **DT06-2S** (Deutsch IPD)

molded in **DT04-6P** (Deutsch IPD)

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/.

 Note: CANopen® is a registered community trademark of CAN in Automation e.V.

Form: TDAX022311-06/13/23