Dual Output

Valve Controller

1 Universal Input
+5V reference
RS-232

with Axiomatic Service Tool AX070511

P/N: AX022010

Features:

- 1 universal signal input
- 2 proportional or on/off outputs up to 3 A
- 8…32VDC (12V or 24V nominal)
- +5V reference to power a sensor
- 1 RS-232 port
- Aluminum enclosure with integral 12-pin connector
- IP67
- **AX070511 Axiomatic Service Tool** for user configuration

Applications:

This unit was designed to be a simple, low cost solution to drive dual coils in hydraulic systems. Since only one output can be energized at a time, it is intended for applications in push-pull type systems such as forward-backward, lift-lower, right-left, in-out, etc. It is packaged for harsh operating environments such as mobile construction equipment.

Description: Using the RS-232 service tool, the AX070511, the controller is easy to setup and configure, and it has the ability to show live feedback from the unit for monitoring on a PC. No extra programming devices are required to communicate with the unit, simply a standard COM port on a PC or laptop. The controller has one programmable universal input that can be setup to read: voltage; current; frequency; PWM; or digital input signals. This input can be used to either control both outputs in a "deadband" profile, per the above applications, or alternatively, only a single output proportional to the input signal. Each of the two universal outputs that can be setup individually to drive: proportional current up to 3A, hotshot digital current; or straight on/off digital loads. The only restriction is that only one output can be on at a time. In an application where only a single output is used, it is always Output 1, with Output 2 being disabled. The device has a wide power supply range, and will operate from 8 to 32VDC. The supply is protected against reverse polarity connections. The unit also includes a 5V reference voltage capable of sourcing up to 10mA, which can be used to power a sensor connected to the input. The controller has a number of built-in protection features that can shut off the outputs in adverse conditions, such as a short to GND or +Vcc. These features include hardware shutoffs to protect the circuits from being damaged as well as software error react features.

Ordering Part Numbers:
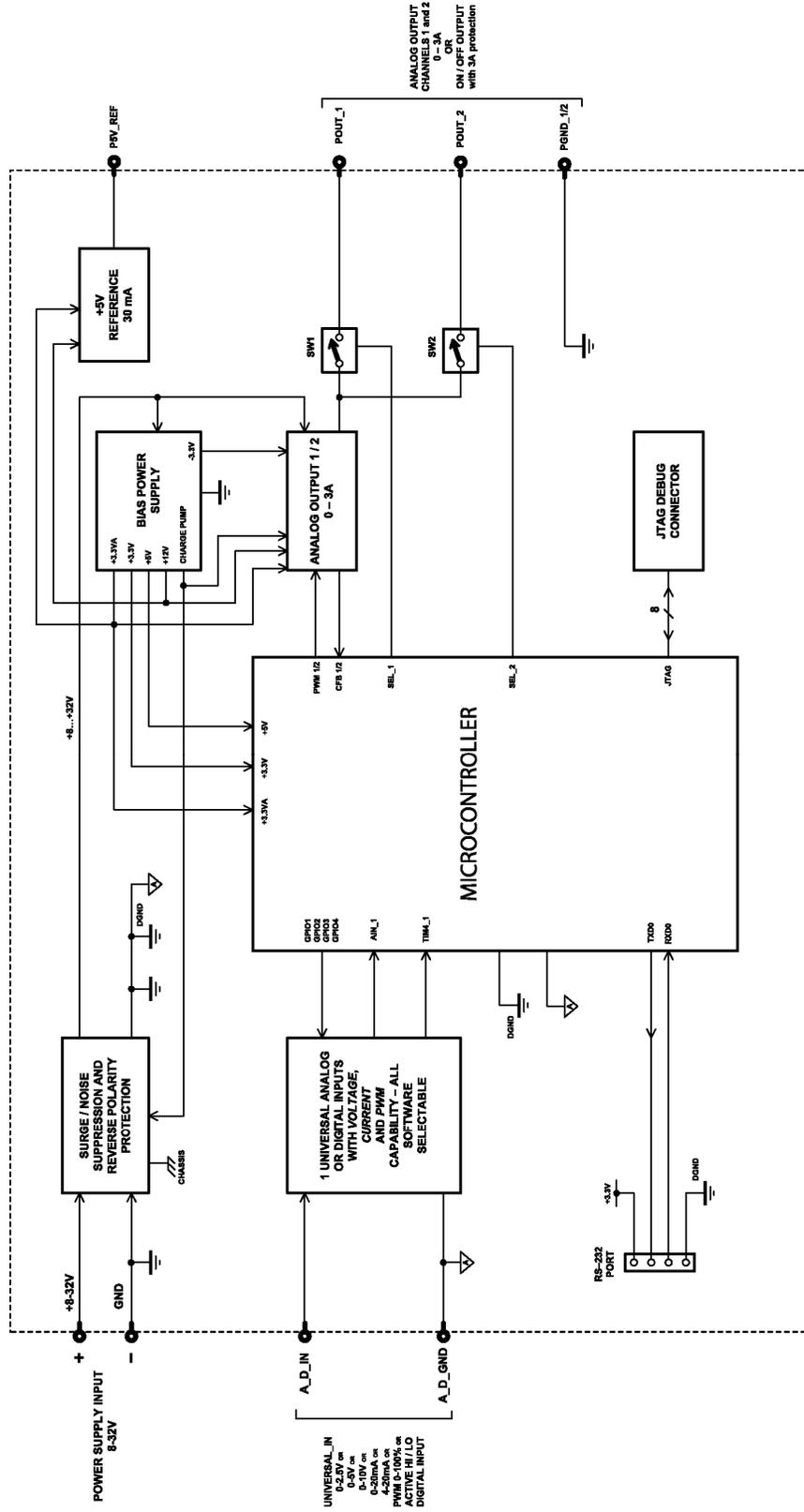
Controller, RS-232: **AX022010**
AX070511 Service Tool: AX070511 Go to www.axiomatic.com and enter the password under the Log-In tab to obtain the service tool.
Configuration Cable: **AX070512**
Accessories: **AX070105** Mating Plug Kit (DT06-12SA, W12S, 12 0462-201-16141, 3 plugs)

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 www.axiomatic.com/service.html.

Inputs

Power Supply Input	12V or 24VDC nominal (8…32 VDC power supply range)
Protection	Reverse polarity protection is provided. Overvoltage protection up to 60V is provided. Overvoltage (undervoltage) shutdown of the output load is provided.
Universal Signal Input	Refer to Table 1.0. The input is user selectable.

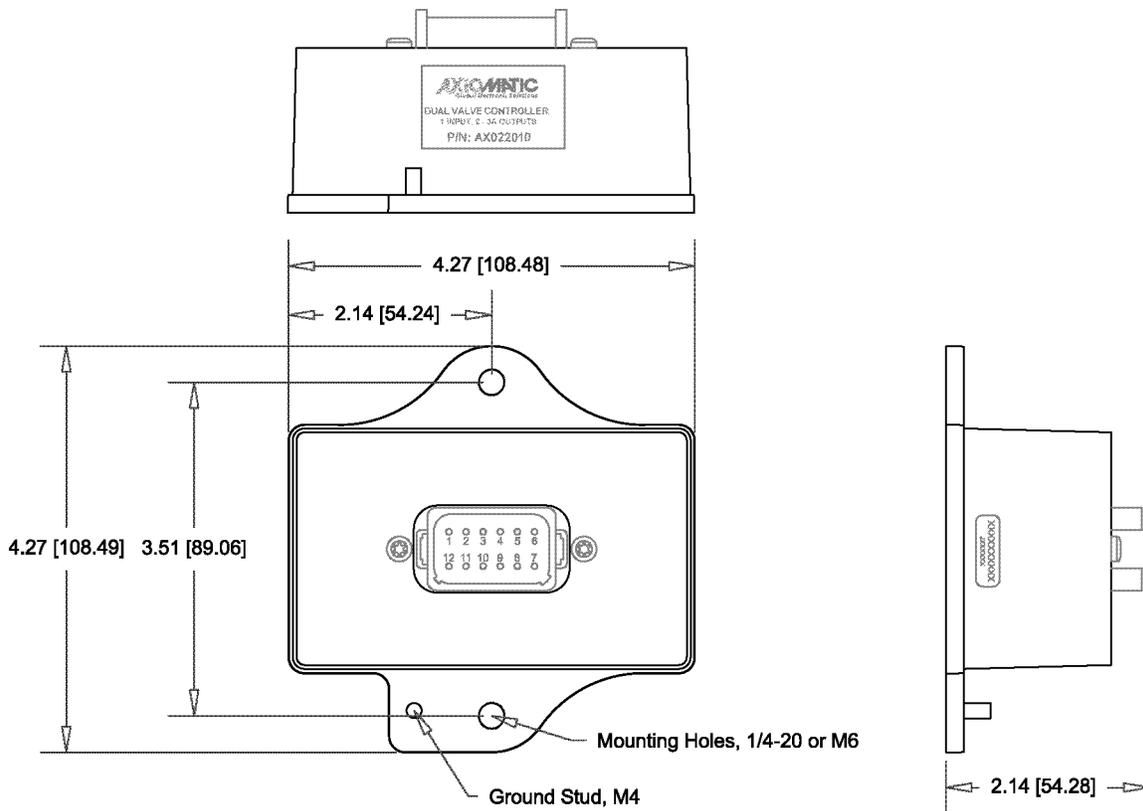| Table 1.0 – **Input – User Selectable Options**	
Analog Input Functions	Voltage Input or Current Input
Voltage Input	0-1V (Impedance 1 MOhm) 0-2.5V (Impedance 1 MOhm) 0-5V (Impedance 200 KOhm) 0-10V (Impedance 133 KOhm for 0-5V, 133 to 20 KOhm for 5-10V))
Current Input	0-20 mA (Impedance 124 Ohm) 4-20 mA (Impedance 124 Ohm)
Digital Input Functions	Discrete Input, PWM Input, Frequency Input
Digital Input Level	5V CMOS
PWM Input	0 to 100% 0.5 to 50 Hz 10 Hz to 1kHz 100 Hz to 10 kHz
Frequency Input	10 Hz to 1kHz 100 Hz to 10 kHz
Digital Input	Active High, Active Low
Input Impedance	1 MOhm high impedance, 10KOhm pull down, 10KOhm pull up to +5V
Input Accuracy	$\leq$ 1%
Input Resolution	12-bit

Outputs

Output	2 Proportional or On/Off Outputs (Up to 3A) Can only be operated as ON one at a time. High Side Switch, Current Sensing, Grounded Load • Proportional Current (High frequency 25 kHz) • Hotshot Digital • Discrete Output
Output Accuracy	Output Current mode $\leq$2%
Adjustable Output Parameters	Refer to the User Manual for more details. Output types are fully independent of one another. When both outputs are enabled, the input range is split into two parts. The first half of the range controls Output 2 when the measured input is between "**Error Minimum**" and "**Deadband Min**". The second part controls Output 1 when the measured input is between "**Deadband Max**" and "**Error Maximum**". Adjustable output parameters include the following. Output Type: Current, Hotshot Digital, Discrete Output Maximum: 0 to 3,000 mA Output Minimum: 0 to 3,000 mA Ramp Up: 0 to 60,000 mSec. Ramp Down: 0 to 60,000 mSec. Superimposed Dither Frequency: 50-400 Hz • Used in Current Output Type only • Output 2 is always the same as the setting for Output 1. Dither Amplitude: 0 to 500 mA This depends on the properties of the coil. Fault Response: Shutoff, Ramp Off, Ramp to Min or Ramp to Max.
Voltage Reference	+5V, 30 mA, 0.5% Short circuit protected (current limited to 22-24 mA) Protected from connection to the power supply rail.
Protection for Output + Terminal	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.

General Specifications

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Microprocessor	32-bit, 128 KByte flash program memory
Control Logic	User programmable functionality using the Axiomatic Service Tool, AX070511 Refer to UMAX022010 for details. (Application-specific control logic or factory programmed setpoints are available.)
Communications	1 RS-232 port
User Interface	The AX070511 service tool is used to configure the unit, and to monitor or log the data when the unit is operating. In order to use this tool to establish communication, it must be set to the same COM port the unit is connected to. This tool makes configuring more than one unit to the same setting extremely simple. After the first unit is configured to the desired parameters, these parameters can be saved by clicking the "Save Parameters As…" in the File menu. The saved file can then be loaded into other unit when the units are connected to the service tool individually and communication has been established. A saved parameter file can be loaded onto another unit by clicking the "Load Parameters…" in the File menu. Refer to UMAX022010 for details.
Operating Conditions	-40 to 85 °C (-40 to 185 °F)
Packaging	Aluminum enclosure, integral Deutsch IPD connector Encapsulated 4.27 x 4.27 x 2.14 inches 108.49 x 108.49 x 54.28 mm L x W x H including integral connector
Protection	IP67 rating for the product assembly
Weight	1.3 lbs. (0.59 kg)

Dimensional Drawing

Dimensions: inches {mm}

Electrical Connections	12 pin Deutsch IPD connector P/N: DT15-12PA A mating plug kit is available as Axiomatic P/N: **AX070105**.
	CAN and I/O Connector

Pin #	Description
1	Output 1 +
2	Output 1,2 GND
3	Power -
4	Power +
5	Input GND
6	Input 1
7	RS-232_RXD
8	RS-232_TXD
9	RS-232_GND
10	BOOT_IN
11	+5V Reference
12	Output 2 +

Installation	For mounting information, refer to the dimensional drawing. If the module is mounted without an enclosure, it should be mounted to reduce the likelihood of moisture entry. 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). All field wiring should be suitable for the operating temperature range of the module. All chassis grounding should go to a single ground point designated for the machine and all related equipment.

Service Tool – AX070511

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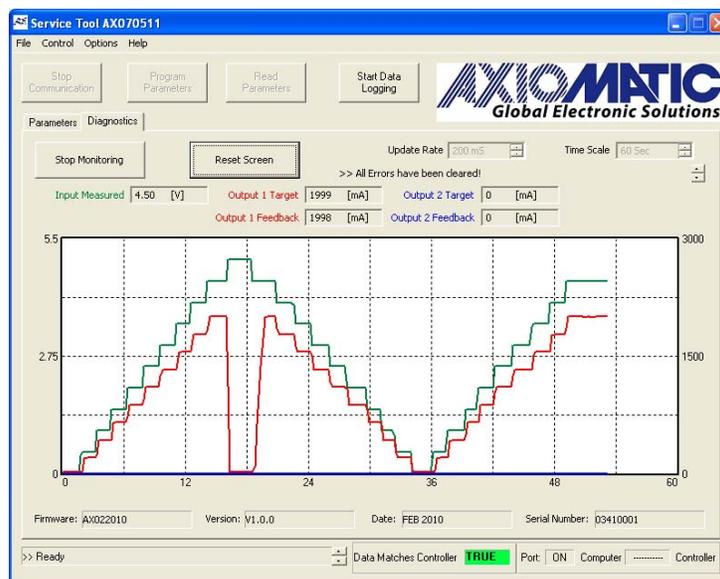
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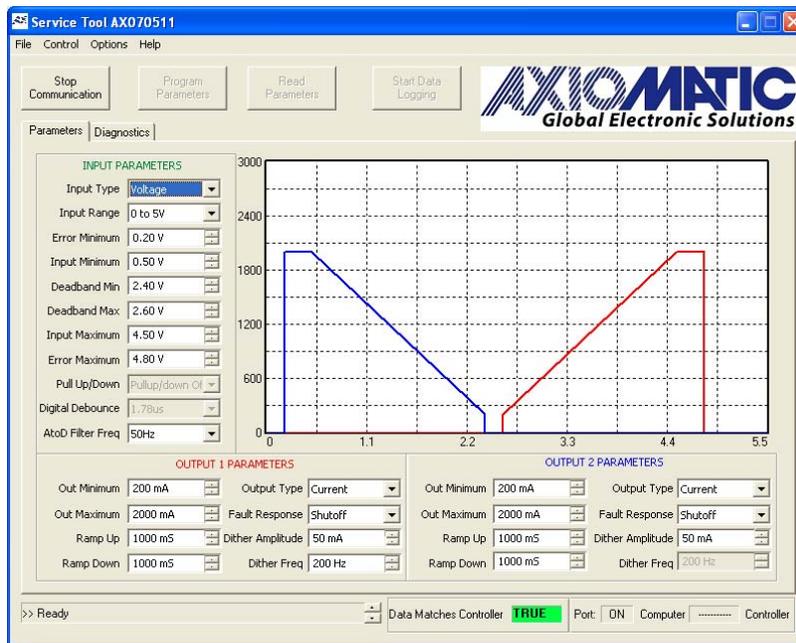
Diagnostics - The diagnostics tab is used to receive live feedback from the unit and to monitor its input and outputs status. This information can also be logged for future use by using the **"Start Data Logging"** button. A screen capture of the diagnostics tab is shown below as well as a table that describes each section in the tab. Refer to the User Manual for more details.

The following table shows the diagnostics features.

Section	Section Name	Description
1	Start/Stop Monitoring	This button is used to start or stop monitoring of the unit.
2	Reset Screen	Clears the screen and starts the graph from the beginning.
3	Graph Settings	Used to change the graphs update rate and time scale.
4	Data Feed	Shows the values of the input and outputs of the unit. It also displays any errors that is be flagged by the unit.
5	Graph	Graphs the values of the input and outputs of the unit.
6	Error Reaction	Shows an example of how the output shutoff when the input went out of range high.
7	Unit Information	Displays important unit information as read from the controller

Form: TDAX022010-02/06/15