

Pulsar Valve Controller

*Two Universal Signal Inputs
Four 2.0A High Side Outputs
+5V Reference
CAN (SAE J1939)*

Programmable with the Axiomatic Electronic Assistant

P/N: AX022460-03, AX022460-04

Features:

- Two (2) signal inputs are selectable as bipolar or unipolar voltage, current, digital, PWM or Frequency signal types:
 - 0-5V, 0-10V, 0 to +/- 5V, 0 to +/- 10V;
 - 4-20mA, 0-20mA;
 - PWM;
 - Frequency;
 - or Digital.
- Four (4) independent outputs to drive pulse type valves (0-2.0A) are factory set as:
 - PWM 33 Hz in model AX022460-03
 - PWM 75 Hz in model AX022460-04
- SAE J1939 port
- 12Vdc or 24Vdc nominal
- One reference voltage (+5V) is available to power sensors.
- Operates from -40 to 85°C (-40 to 185°F).
- Two LED indicators
- IP20
- DIN rail mount
- Configurable via the Axiomatic Electronic Assistant



Applications:

The controller is designed to meet the rugged demands of industrial machine and automation applications. These applications include, but are not limited to:

- Pulse-Type Valve Control

Ordering Part Numbers:

Pulsar Valve Controller, 33 Hz, 250kbps SAE J1939: **AX022460-03**

Pulsar Valve Controller, 75 Hz, 250kbps SAE J1939: **AX022460-04**

Accessories:

Axiomatic Electronic Assistant Configuration KIT, P/N: **AX070502, AX070505K, or AX070506K**

Description:

The Pulsar Valve Controller is designed for extremely versatile control of up to four pulse type valves.

The controller has two fully programmable universal inputs that can be setup to read: bipolar or unipolar voltage, current, resistive, frequency, or digital input signals. All I/O ports on the unit are independent from one another.

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

All setpoints are user configurable using the Axiomatic Electronic Assistant.

A rugged power supply interface accepts 12 Vdc or 24 Vdc nominal for battery powered machine applications. Two LEDs indicate operational status. The enclosure is DIN rail mount. It operates from -40 to 85°C (-40 to 185°F).

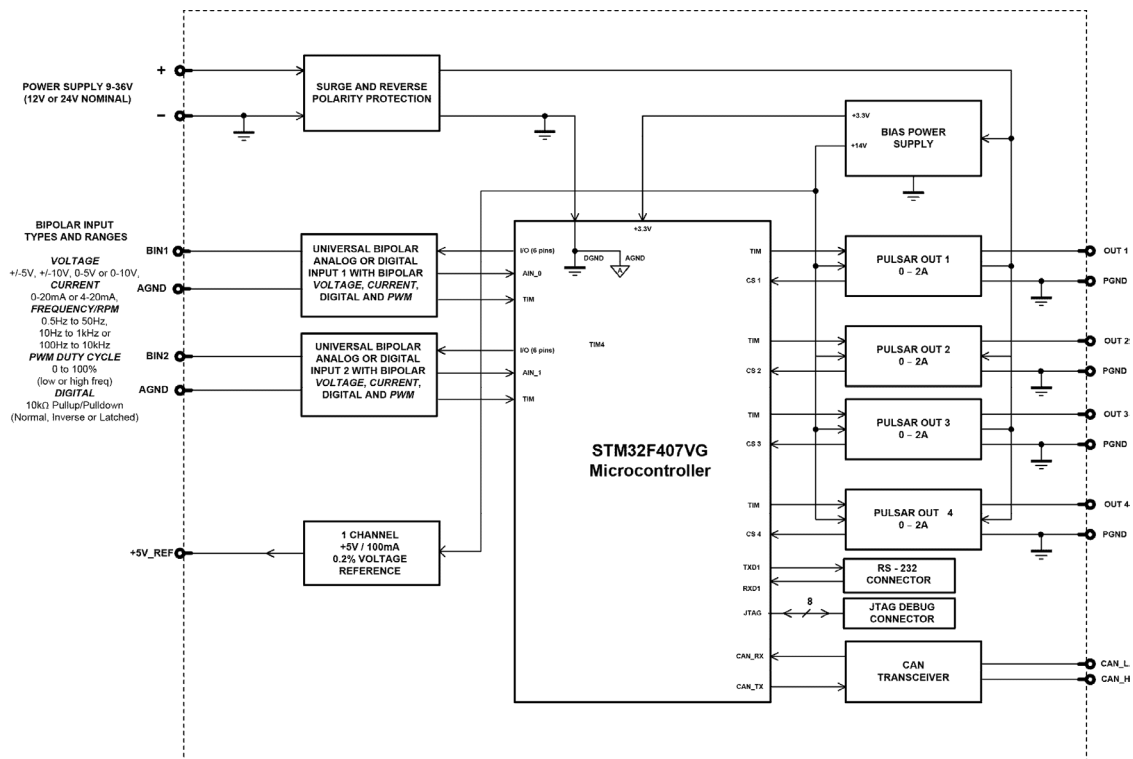


Figure 1 –Logical Functional Block Diagram

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/>.

Power Supply

Power Supply Input	12 Vdc or 24 Vdc nominal 8...36 Vdc power supply range Shutdown voltage is 6.0 Vdc.
Protection	Reverse polarity protection is provided. Surge protection up to 150V is provided. Overvoltage shutdown of the output load is provided at 41V. Undervoltage protection (hardware and software shutdown at 6V) is provided.

Inputs

2 Bipolar Analog or Digital Signal Inputs	User programmable as Voltage, Current, Frequency, RPM, PWM or Digital signal inputs types. Refer to Table 1.0.																																								
Table 1.0 –User Programmable Bipolar Voltage or Other Signal Inputs																																									
Analog & Digital Input Functions	Voltage Input, Current Input, Resistive Input or Digital Input 12-bit Analog to Digital resolution																																								
Voltage Input	0-5 V (Impedance 110 k Ω) 0-10 V (Impedance 130 k Ω) +/- 5V (Impedance 110 k Ω) +/- 10V (Impedance 130 k Ω) 1mV resolution, accuracy +/- 0.2% error																																								
Current Input	0-20 mA (Impedance 124 Ω) 4-20 mA (Impedance 124 Ω) 1 μ A resolution, accuracy +/- 0.2% error																																								
Digital Input Level	Accepts 5 V TTL Accepts up to Vps Threshold: Low <1 V High >2.2 V																																								
Digital Input	1 M Ω Impedance Active High or Active Low with 10 k Ω m pull-up or pull-down																																								
Timer Input Functions	PWM Input, Frequency Input or RPM Input																																								
PWM Input	Low Frequency (0.50 Hz to 1 kHz) High Frequency (100 Hz to 10 kHz) 0 to 100% D.C. 0.01% resolution, accuracy +/- 0.1% error																																								
Frequency/RPM Input	0.5 Hz to 50 Hz; 10 Hz to 1 kHz; or 100 Hz to 20 kHz 0.01% resolution, accuracy +/- 0.1% error																																								
Maximum and Minimum Ratings	<table border="1"> <thead> <tr> <th>Characteristic</th> <th>Min</th> <th>Max</th> <th>Units</th> </tr> </thead> <tbody> <tr> <td>Power Supply</td> <td>8</td> <td>36</td> <td>V dc</td> </tr> <tr> <td>Voltage Input</td> <td>0</td> <td>36</td> <td>V dc</td> </tr> <tr> <td>Current Input 0(4)-20 mA</td> <td>0</td> <td>12</td> <td>Vdc</td> </tr> <tr> <td>Digital Input</td> <td>0</td> <td>36</td> <td>Vdc</td> </tr> <tr> <td>PWM Duty Cycle</td> <td>0</td> <td>100</td> <td>%</td> </tr> <tr> <td>PWM Low Frequency</td> <td>10</td> <td>1 000</td> <td>Hz</td> </tr> <tr> <td>PWM High Frequency</td> <td>100</td> <td>10 000</td> <td>Hz</td> </tr> <tr> <td>PWM Voltage pk - pk</td> <td>0</td> <td>36</td> <td>V dc</td> </tr> <tr> <td>RPM Frequency</td> <td>0.5</td> <td>20 000</td> <td>Hz</td> </tr> </tbody> </table>	Characteristic	Min	Max	Units	Power Supply	8	36	V dc	Voltage Input	0	36	V dc	Current Input 0(4)-20 mA	0	12	Vdc	Digital Input	0	36	Vdc	PWM Duty Cycle	0	100	%	PWM Low Frequency	10	1 000	Hz	PWM High Frequency	100	10 000	Hz	PWM Voltage pk - pk	0	36	V dc	RPM Frequency	0.5	20 000	Hz
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Protection	All inputs are protected against short to GND. All inputs, except current inputs, are protected against shorts to Nominal Vps (36Vdc).																																								
Sampling Time	Inputs are sampled multiple times per millisecond. Response time to change at the input is 2 mSec +/- 1 mSec (without software filtering) unless otherwise noted.																																								
Analog GND References	One GND connections is provided.																																								
+5V Reference	One +5V Reference, +/- 0.5%, 100 mA																																								

Outputs

Universal Outputs	<p>Four Pulse Type Valve Outputs</p> <p>Four independent outputs are PWM type. Model AX022460-03 is factory set at 33 Hz. Model AX022460-04 is factory set at 75 Hz.</p> <p>Output type: Up to 2.0A sourcing (high-side)</p> <p>All output types have configurable minimum and maximum output levels.</p>
Protection	<p>Fully protected against short circuit to ground or +Vps Grounded short circuit protection will engage at 4.0A +/- 0.5A. Unit will fail safe in the case of a short-circuit condition and is self-recovering when the short is removed.</p>
Power GND Reference	Four (4) are provided.

General Specifications

Microprocessor	STM32F407VG, 32-bit, 1MByte flash memory
Quiescent Current	85mA @ 12V; 59 mA @ 24V Typical
LED Indicator	2 bicolour LEDs (Red and Green) Status of output fault indication.
CAN Communications	1 CAN port (SAE J1939, 250 kbps baud rate)
Control Logic	User programmable functionality using the Axiomatic Electronic Assistant service tool. Refer to the User Manual for details.
CAN Communications	Compliant to SAE CAN J1939 Standard 1 CAN port (SAE J1939)
User Interface	Axiomatic Electronic Assistant Configuration KIT, P/N: AX070502 , AX070505K , or AX070506K
Software Reflashing	Axiomatic Electronic Assistant Configuration KIT, P/N: AX070502 , AX070505K , or AX070506K
CAN Response Time	Per the J1939 standard, the maximum recommended transmit rate for any message is 10ms. Response time of feedback on the CAN to changes at the I/O will be a combination of the I/O type's response time and the configurable software filtering, ramps, delays, etc. that were selected in the application.
Protection	IP20
Weight	0.25 lb. (0.113 kg)
Temperature Rating	Operating: -40 to 85°C (-40 to 185°F) Storage: -50 to 105°C (-58 to 221°F)
Enclosure and Dimensions	Phoenix Contact: PHO ME MAX 22.5 2-2 KMGY – 2713625 (vented) Polyamide, UL94V0, cULus recognized, China RoHS DIN rail TH 35-7.5 99 x 114.5 x 22.6 mm (L x H x D) Refer to Figure 2.0.
Electrical Connections	4 Phoenix Contact PSPT 2,5/ 4-ST KMGY spring clamp connectors Accepts 24-14 AWG wire. Refer to Table 3.0 and Figure 2.0. for pin out.
Installation	DIN rail mount, TH 35-7.5
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.

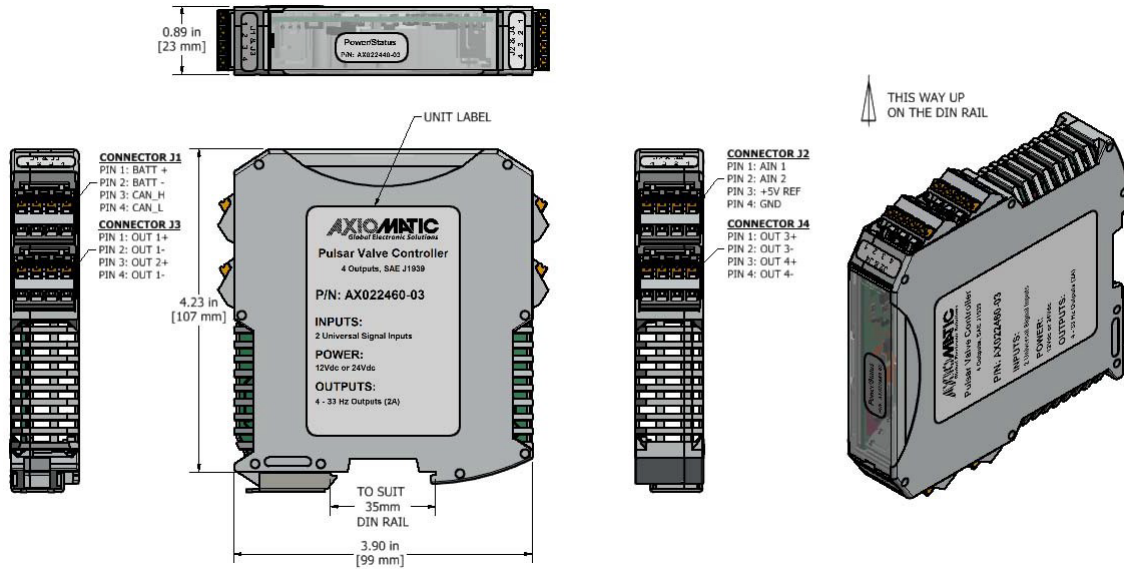


Figure 2 – Dimensional Drawing – AX022460-03

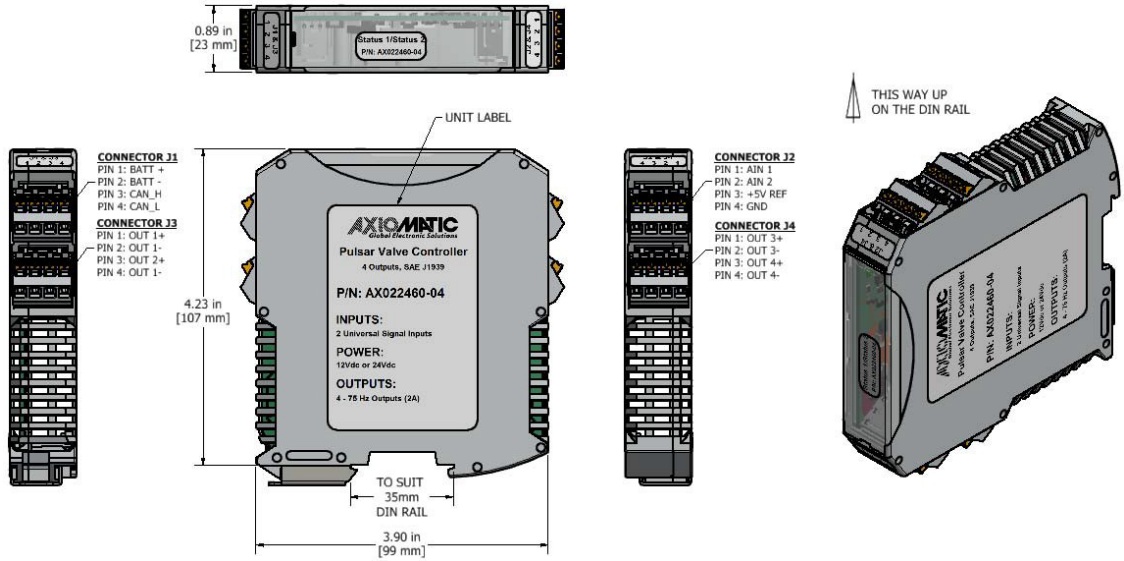


Figure 3 – Dimensional Drawing – AX022460-04

Table 3.0 – Pin out: AX022460-03 and AX022460-04

Power and CAN (J1)		Outputs (J3)		Inputs (J2)		Inputs (J4)	
PIN #	Function	PIN #	Function	PIN #	Function	PIN #	Function
1	BATT +	1	Output 1+	1	Signal Input 1	1	Output 3+
2	BATT -	2	Output 1-	2	Signal Input 2	2	Output 3-
3	CAN_H	3	Output 2+	3	+5V Reference	3	Output 4+
4	CAN_L	4	Output 2-	4	Analog Input GND	4	Output 4-

Form: TDAX022460-03(04)-06/14/23