![Axiomatic Global Electronic Solutions logo]

# Voltage or Current Signal Input, PWM Output Converter
3-way Isolation
DIN rail mount
P/N: AX030000, AX030002, AX030003, AX030010

Features:

- 1 signal input:
    - Model AX030000: 0-5V
    - Model AX030003: 0-5V input
    - Model AX030002: 0-10 V
    - Model AX030010: 4-20 mA

  - 1 PWM signal output (All Models)
      - Model AX030003 (Fixed at 100 Hz)
- Three-way isolation between power supply, input and output.
- 12V or 24Vdc (nominal) power input
- DIN rail mount
- IP20
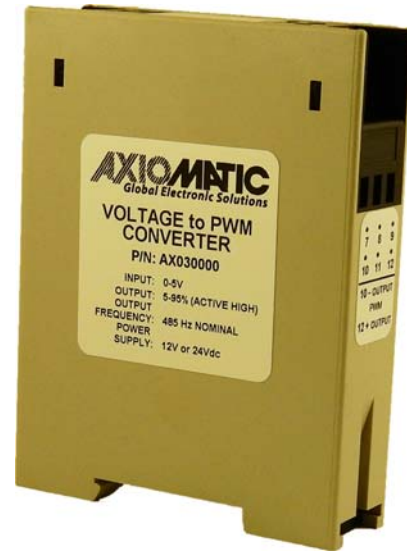
Description: The V/I to PWM Converter is a single channel signal converter in a DIN rail mount enclosure. It is designed for interfacing with legacy components in an engine control system on power generator sets. There are three models accepting either a 0-5V, 0-10V or 4-20mA signal input and generating PWM signal output.

Applications: The converter is designed for power generator set engine control system applications.

Ordering Part Numbers:

Model P/N	Description	Supersedes models:
AX030000	0-5V input, PWM output, DIN rail mount	VPWMDR5V
AX030003	0-5V input, 100 Hz PWM output, DIN rail mount	VPWMDR5V100Hz
AX030002	0-10V input, PWM output, DIN rail mount	VPWMDR10V
AX030010	4-20 mA input, PWM output, DIN rail mount	IPWMDR420MA

BLOCK DIAGRAM
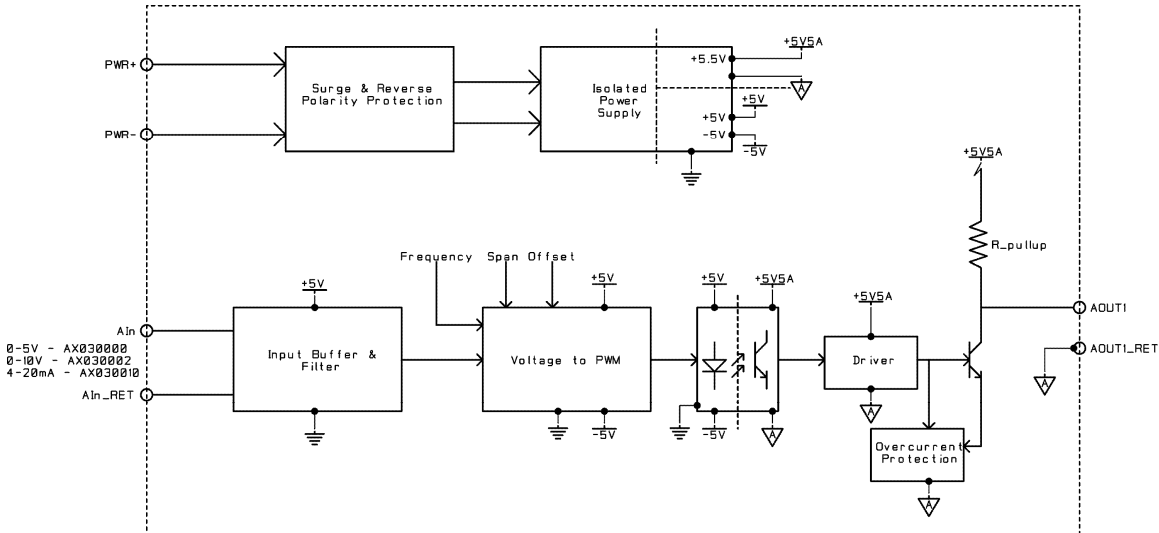
Technical Specifications:

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.

Power Input Specifications

Power Supply Input - Nominal	12 or 24Vdc nominal operating voltage 9…36 Vdc power supply range for voltage transients
Surge Protection	Provided
Reverse Polarity Protection	Provided up to 50V
Over-voltage Protection	Provided (Hardware shuts down at 41V.)
Under-voltage Protection	Provided (Hardware shuts down @ 7.5V with 1 V hysteresis.)
Quiescent Current	15 mA @ 12Vdc; 9 mA @ 24Vdc Typical

Signal Input Specifications

Signal Input	1 isolated signal input (factory set) o Model AX030000, AX030003: 0-5V o Model AX030002: 0-10 V o Model AX030010: 4-20 mA With voltage inputs, short circuit protection is provided.
Minimum and Maximum Ratings	**Table 1.0. Absolute Maximum and Minimum Ratings** <table><tr><th>Characteristic</th><th>Min</th><th>Max</th><th>Units</th></tr><tr><td>Power Supply</td><td>9</td><td>36</td><td>V dc</td></tr><tr><td>Voltage Input</td><td>0</td><td>25</td><td>V dc</td></tr><tr><td>Current Input</td><td>0</td><td>100</td><td>mA</td></tr><tr><td>Current Input – Voltage Level</td><td>0</td><td>5</td><td>Vdc</td></tr></table>
Input Accuracy	+/- 1%
Input Impedance	0-5V: 250 kOhm 0-10V: 300 kOhm 4-20mA: 50 Ohm
Analog GND	1 Analog GND connection is provided.

Signal Output Specifications

PWM Output	1 isolated PWM output
	
	PWM Frequency default settings:
	  ○ Model AX030000: 0-5V input has 485 Hz +/- 10% output
	  ○ Model AX030003: 0-5V input has 100 Hz +/- 10% output
	  ○ Model AX030002: 0-10 V input has 475 Hz +/-10% output
	  ○ Model AX030010: 4-20 mA input has 550 Hz +/- 10% output
	
	Option: Other PWM frequency settings are available from 100 to 10,000 Hz.
	(A trim pot on the PCB is adjusted.)
	
	Duty Cycle default settings:
	Model AX030000, AX030003 (0-5V input): 5-95% D.C. (Active High)
	Model AX030002 (0-10 V input): 0-100% Duty Cycle (Active High)
	Model AX030010 (4-20 mA input): 10-90% Duty Cycle (Active High)
	
	Option: Other duty cycles available on request.
	
	Current limited to 10 mA
	
	Output clamped via 10 kΩ resistor
	Low output voltage of 0.2 V
	High output voltage of 5.5 V

Output Accuracy	+/- 1%
Signal GND	1 GND connection is provided.

General Specifications

Isolation	3-way isolation between input, output and power. 850 V_{RMS} between power supply and input/output 3750 V_{RMS} between input and output
Response Time	<40 msec.
LED Indicator	Green ON = Power is on.
Adjustments – PWM Duty Cycle	Span and offset adjustment for PWM Duty Cycle is provided with trim potentiometers. Span (Turn CCW to increase.) Offset (Zero) (Turn CW to increase.) Trim pots are 10 turn. For Model AX030000, AX030003: When 0.1 V is applied adjust Zero to 5%. When 5V is applied, adjust Span to 95%. For Model AX030002: When 0.1 V is applied adjust Zero to 0%. When 10V is applied, adjust Span to 100%. For Model AX030010: When 4 mA is applied, adjust Zero to 10%. When 20 mA is applied, adjust Span to the 90%. PWM output can be measured using a multi-meter (with a PWM measurement feature).
Adjustments – Frequency Output	Frequency output adjustment can be made on request for from the factory settings. Coarse and Fine trim pots are located on the PCB board and are only accessible by removing the PCB assembly from the housing. *Contact Axiomatic to arrange for factory set outputs different from the default settings.* If there is a need to adjust the frequency, remove the unit carefully from the housing, noting the orientation of the PCB assembly with the DIN rail foot and front label on the housing. These features can be used as orientation guides when re-inserting the PCB assembly. Adjust the coarse adjustment trim pot to obtain an output in the vicinity of the frequency required. Next, fine-tune it using the "fine" potentiometer. The sum of the minimum values of the potentiometers sets the high frequency (10

|	kHz), and the sum of the maximum values sets the low frequency (70 Hz).
Electrical Connections	#14-24 AWG screw terminals
Enclosure and Dimensions	JIT Components P/N: DR12, Polycarbonate DIN rail mount 75 x 98.5 x 22.5 mm (W x H x D) 2.95 x 3.88 x 0.89 inches Refer to Figures 1.0, 2.0 and 3.0.
Operating Conditions	-40 to 85°C (-40 to 185°F)
Weight	0.25 lbs. (0.11 kg)
Protection	IP40 housing, IP20 connectors, Unit is conformal coated in the housing.
Mounting	The controller is designed to be installed in a control panel.
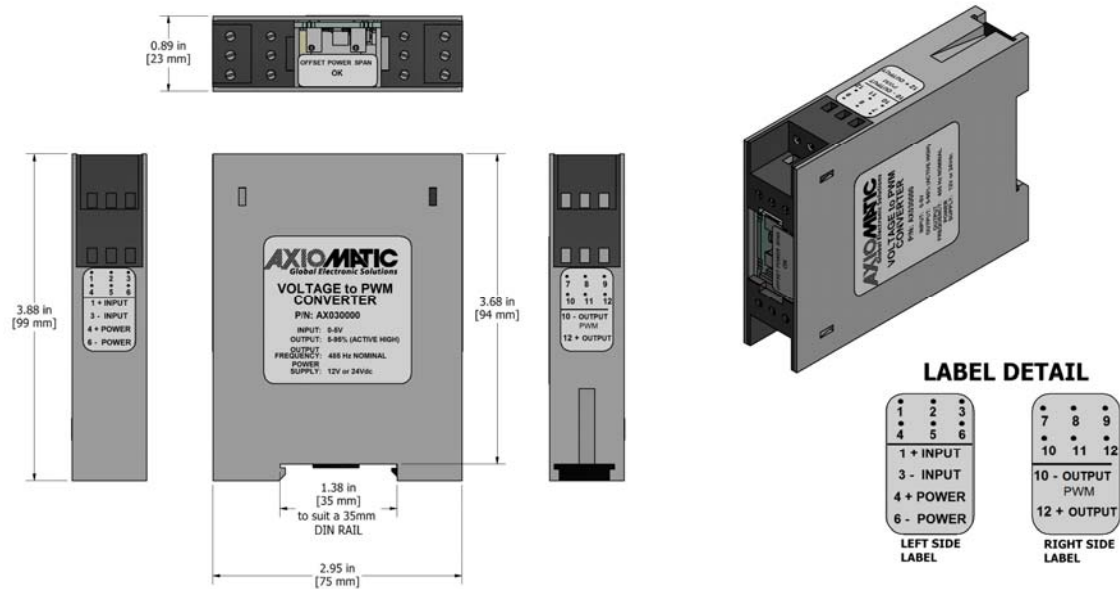
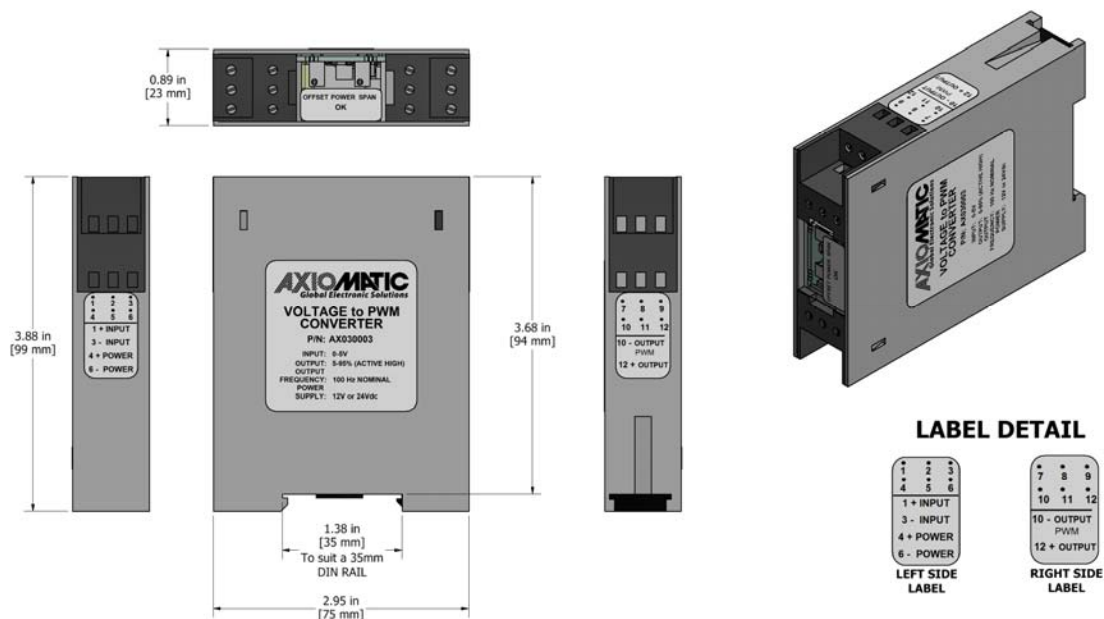
Figure 1.0 – Dimensions for AX030000
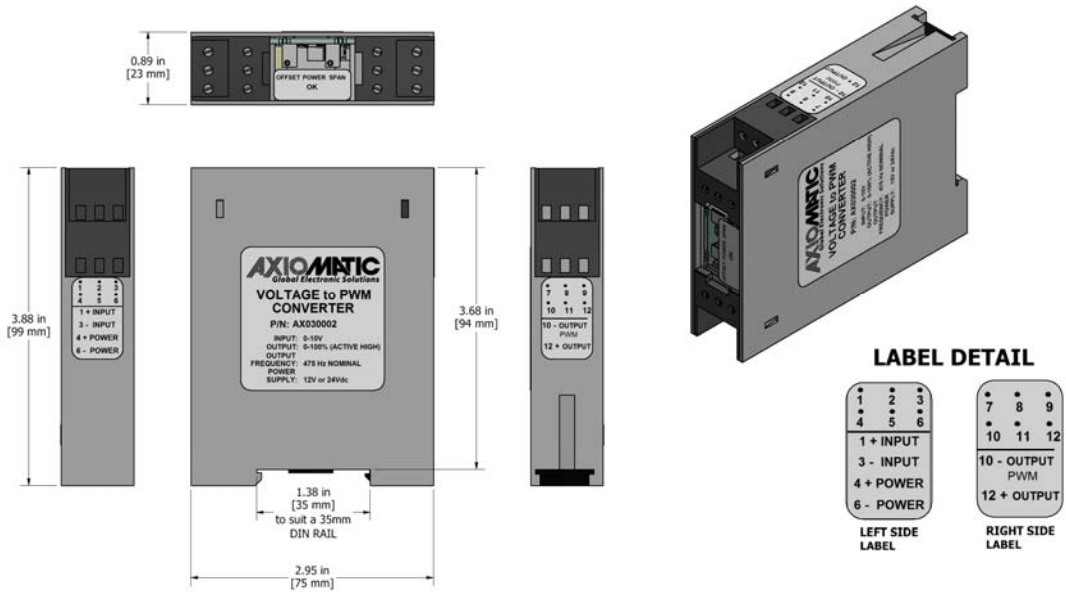

Figure 2.0 – Dimensions for AX030003
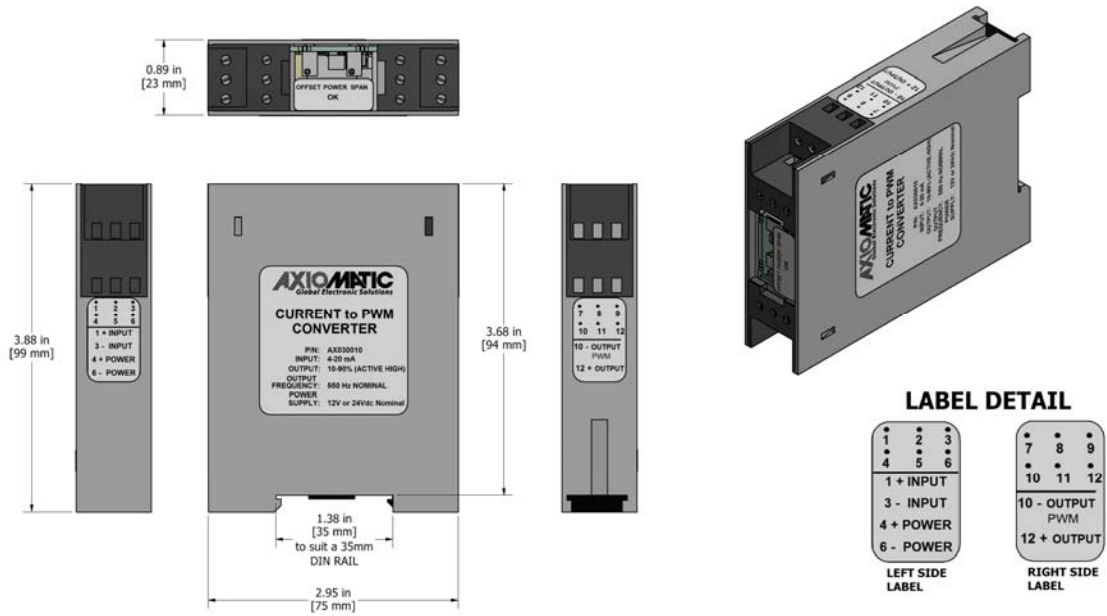
Figure 3.0 – Dimensions for AX030002

Figure 4.0 – Dimensions for AX030010

Form: TDAX0300XX-08/25/20