

**TECHNICAL DATASHEET #TDAX13020X**  
**PWM to Current (or Voltage) Signal Converter**  
**P/N: AX13020X**

PWM to  
Current (or Voltage)  
Signal Converter

- DIN rail mount
- Single channel
- PWM input
- 0-20 mA, 4-20 mA,  
0-5VDC or 0-10VDC  
output (factory set)
- 12V/24VDC nominal

**Description:**

Isolated signal converters provide a compact solution for converting digital pulse width modulated (PWM) signal into a current or voltage signal. Current to PWM and Voltage to PWM signal converters are also available.

**Applications:**

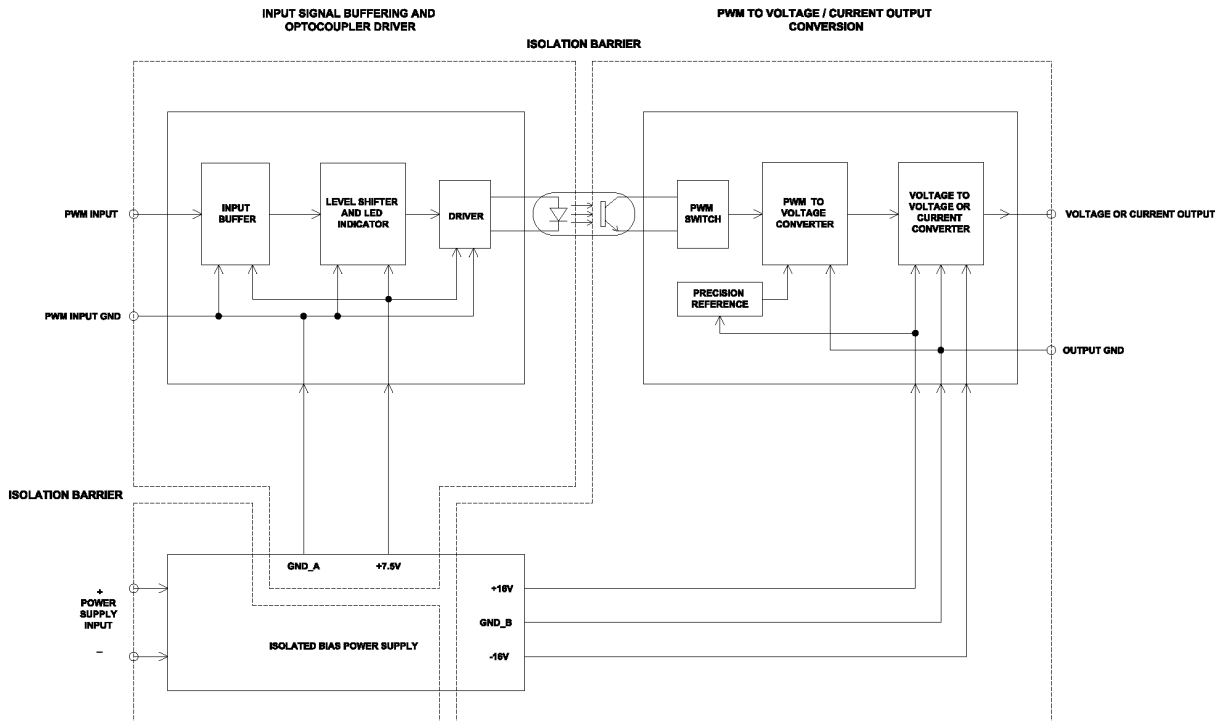
Industrial control panels  
Engine control panels



**Ordering Part Numbers:**

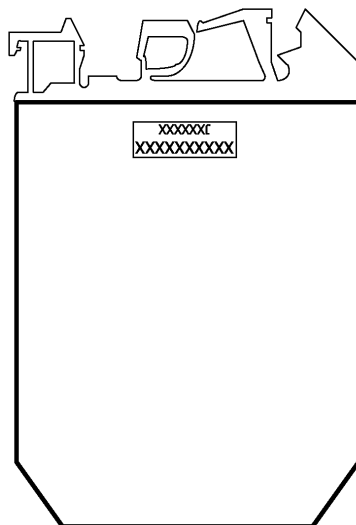
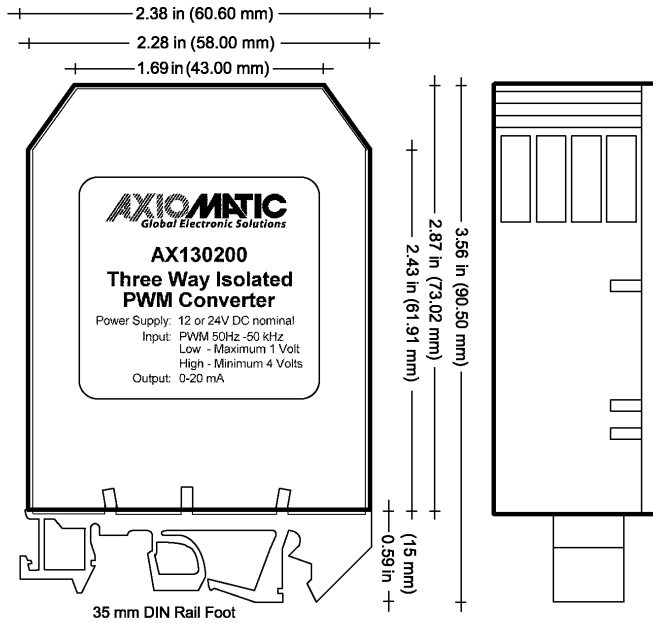
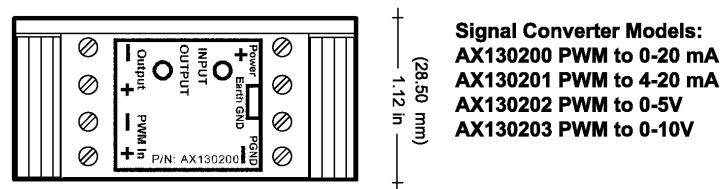
PWM to 0-20 mA output: **AX130200**  
 PWM to 4-20 mA output: **AX130201**  
 Open Collector PWM to 4-20 mA Output: **AX130204**  
 5 Hz PWM to 4-20 mA Output: **AX130206**  
 PWM to 0-5V output: **AX130202**  
 PWM to 0-10V output: **AX130203**

**Block Diagram**



<b>Technical Specifications:</b>																
All specifications are typical at nominal input voltage and 25 degrees C unless otherwise specified.																
<b>Input Specifications:</b>																
<i>PWM Frequency and Range</i>	Fully isolated Models AX130200, AX130201, AX130202, AX130203: PWM 50 Hz to 50 kHz 0-100% Duty Cycle Model AX130204: Open Collector PWM Input with 10 kΩ pull-up resistor. Model AX130206: 5 Hz to 1 kHz PWM, 0-100% Duty Cycle Application-specific duty cycles are available on request. (A 5 Hz to 50 kHz PWM input model is available on request with a 3 second response time.)															
<i>Input Voltage</i>	Low <1.5V High >3.5V (50V max.) TTL and CMOS compatible															
<i>Input Impedance</i>	200kOhm															
<b>Output Specifications:</b>																
<i>Voltage Output</i>	Fully isolated Active output AX130202: 0-5 VDC AX130203: 0-10 VDC Accuracy: +/- 0.02V															
<i>Output Impedance</i>	1 Ohm Transient protection is provided. Short circuit protection is provided.															
<i>Current Output</i>	Fully isolated AX130200: 0-20 mA AX130201: 4-20 mA Accuracy: +/- 0.1 mA															
<i>Compliance Voltage</i>	8.8VDC															
<i>Maximum Load Resistance</i>	500 Ohms@ 20°C															
<b>General Specifications:</b>																
<i>Power Supply</i>	12VDC or 24VDC nominal (8-36VDC range) Transient protection is provided. Overvoltage protection is provided.															
<i>Reverse Polarity Protection</i>	Provided															
<i>Isolation</i>	500Vrms (5 sec., 0.1 mA maximum)															
<i>Response Time</i>	100 mSec.															
<i>Power Consumption</i>	50 mA @ 12V; 30 mA @ 24V															
<i>Operating Temperature</i>	-40 to 85 degrees C (-40 to 185 degrees F) 0-95% relative humidity															
<i>Storage Temperature</i>	-50 to 125 degrees C (-58 to 257 degrees F)															
<i>Adjustments</i>	Span and Offset (Zero) are factory set. Trim pots are accessible by opening the front cover. Turn CW to increase. ZERO: Apply 0% PWM signal to the input. Adjust the trim pot to desired min. output. SPAN: Apply 100% PWM signal to the input. Adjust the trim pot to desired max. output.															
	<table border="1"> <thead> <tr> <th>Model</th> <th>Range of Zero</th> <th>Range of Span</th> </tr> </thead> <tbody> <tr> <td>AX130200</td> <td>-0.65 to 1.17 mA</td> <td>17.92 to 20.17 mA</td> </tr> <tr> <td>AX130201</td> <td>2.95 to 4.81 mA</td> <td>18.63 to 20.46 mA</td> </tr> <tr> <td>AX130202</td> <td>-0.29 to 0.29 V</td> <td>4.66 to 5.25 V</td> </tr> <tr> <td>AX130203</td> <td>-0.58 to 0.59 V</td> <td>9.32 to 10.49 V</td> </tr> </tbody> </table>	Model	Range of Zero	Range of Span	AX130200	-0.65 to 1.17 mA	17.92 to 20.17 mA	AX130201	2.95 to 4.81 mA	18.63 to 20.46 mA	AX130202	-0.29 to 0.29 V	4.66 to 5.25 V	AX130203	-0.58 to 0.59 V	9.32 to 10.49 V
Model	Range of Zero	Range of Span														
AX130200	-0.65 to 1.17 mA	17.92 to 20.17 mA														
AX130201	2.95 to 4.81 mA	18.63 to 20.46 mA														
AX130202	-0.29 to 0.29 V	4.66 to 5.25 V														
AX130203	-0.58 to 0.59 V	9.32 to 10.49 V														
<i>Electrical connection</i>	#12 to #22 AWG screw terminals															
<i>Enclosure</i>	PCB is conformal-coated. Enclosure (Wieland WEG8), Polyamide 6.6 plastic. Flammability rating: UL94V-0 DIN rail mount, 35 mm															
<i>Dimensions</i>	60.6 x 90.5 x 28.5 mm (W x H x D) 2.38 x 3.56 x 1.12 inches excluding DIN rail															
<i>Weight</i>	0.15 lbs. (0.07 kg)															
<i>Protection</i>	IP20															
<i>Grounding</i>	The converter provides full isolation between input, output and power. Therefore, grounding is not necessary. If grounding is desired, however, the input, output and power grounds can be tied together. An Earth GND connection is provided for use in noisy environments.															

## Dimensions, Connections and Adjustments



**Adjustments:**  
 To access trim pots, remove front cover. Trim pots are factory set. For calibration purposes, turn clockwise to increase.

ZERO

SPAN

Model (Output Factory Setting)	Range of Zero (mA or V)	Range of Span (mA or V)
AX130200 (0-20 mA)	-0.65 to 1.17	17.92 to 20.17
AX130201 (4-20 mA)	2.95 to 4.81	18.63 to 20.46
AX130202 (0-5 V)	-0.29 to 0.29	4.66 to 5.25
AX130203 (0-10 V)	-0.58 to 0.59	9.32 to 10.49

DIM: inches [mm]  
 AX130200, AX130201, AX130202, AX130203  
 August 24, 2010 A. Wilkins  
 Axiomatic Technologies Corporation

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/>.

Form: TDAX1302XX-05/31/23