TECHNICAL DATASHEET #TD2014AX

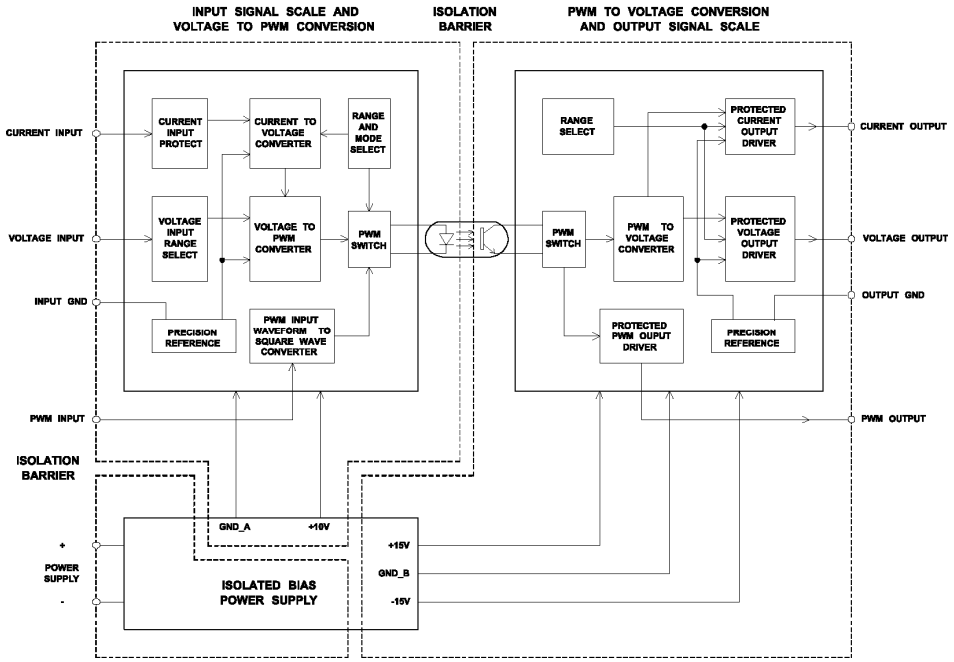
UNIVERSAL SIGNAL CONVERTER

(with Three-way Isolation)

P/N: USC-CVB225-01

Description: The universal signal converter offers three-way isolation and translates one input control signal into one to three simultaneous outputs. Switches allow the user to select the desired input and output(s) from the following options. A choice of PWM signal (0-5kHz, 0-100% Duty Cycle), 4-20 mA, 0-20 mA, -20 to +20 mA, 0-2.5V, 0-5V, 0-10V, +/-2.5V, +/-5V or +/-10V analog signal input is accepted. PWM, voltage and current outputs are simultaneously available.

Span and zero adjust with multi-turn pots for both voltage and current outputs. A rugged power supply interface accepts 8-48VDC and is appropriate for machine applications. The circuitry is conformal coated and packaged in a Lexan DIN rail enclosure designed for installation in a control panel. Plug-in screw terminal connections are provided for a minimum of 6-wires. It operates from -40 to 85°C (-40 to 185°F).



Applications: The signal converter provides precise signal conversion and isolation between sensors, PLC's and other controls. Applications include industrial automation, test equipment and off-highway machine automation. For harsh environments, the module should be mounted in a protective control panel.

Three-way isolation is used to eliminate ground loops causing signal errors. Also, control systems with limited channels can use the converter when each channel requires a different configuration. For example, the three-way isolation permits the device to provide a sinking input and sourcing output.

Ordering Part Numbers:

Universal Signal Converter: USC-CVB225-01
Universal Signal Converter with a 4-20mA input and +/- 10V output: USC-CVB225-B10V

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Technical Specifications:

Input Specifications

Isolation	1500 VDC Three-way isolation provided between power, input and output circuits.
Input Impedance	Current input: 50 Ohms Voltage input: >250 KOhms
Power Supply Input - Nominal	12 or 24VDC nominal 8…48VDC power supply range Transient and surge protection is provided
Reverse Polarity Protection	Provided
Input Signal Selection - Analog	DIP Switch 1 – 8 switches select the desired input from the following choices. Select one input. Contact the manufacturer for instructions on more than one input combination. 0-2.5V 0-5V 0-10V -2.5 to +2.5V -5 to +5V -10 to +10V 4-20 mA (With a +/-10V output, you need to order model USC-CVB225-B10V.) 0-20 mA -20 to +20 mA
PWM Input to PWM output	0-5,000 Hz frequency range 0-100% Duty Cycle range Selecting a PWM input disables the analog input capability.
PWM Input to voltage or current output	Range is 10-90% for +/- voltage output or 0-5V output. Range is 50-90% for 0 to +10V voltage output. Frequency is 2,000 to 10,000Hz
Ground	A current input GND is provided. A voltage input GND is provided. When using PWM input, connect to the current input GND.

Output Specifications

Signal Output	Up to 3 output signals can be selected. All outputs follow the input, simultaneously. DIP Switch 2 – 8 switches select the desired output from the following choices. 0-2.5V 0-5V 0-10V -2.5 to +2.5V -5 to +5V -10 to +10V (With a 4-20 mA input, you need to order model USC-CVB225-B10V.) Voltage output current limitation is 30 mA. 4-20 mA 0-20 mA -20 to +20 mA With an analog input, the PWM signal output is fixed at 3,500 Hz, 5V amplitude and with the Duty Cycle scaled to the input. With a PWM input, the PWM output follows the input within the range of 0-5000Hz, 5V amplitude and the Duty Cycle output is the inverse of the input D.C. (0-100% D.C.). With a PWM input but a voltage output, the frequency follows the input frequency and the output Duty Cycle is the inverse of the input Duty Cycle. (Refer to Input and Output Selections Chart for input Duty Cycle.)
Load Impedance	2KOhm minimum, voltage output 500 Ohm maximum, current output
Linearity Error	0.01% of full-scale output
Accuracy	+/-0.05%/°C
Voltage Span	Adjustable from +/- 25% of full-scale input. (10 turn trim pot)
Voltage Zero	Adjustable from +/- 25% of full-scale input. (10 turn trim pot)
Current Span	Adjustable from +/- 10% of full-scale output. (10 turn trim pot)
Current Zero	Adjustable from +/- 7.5% of full-scale output. (10 turn trim pot)
Settling Time	<3.5 mSec to 0.1% of full-scale output.

Input and Output Selection Chart:

DIP SWITCH CONFIGURATIONS FOR MOST COMMONLY USED INPUT AND OUTPUT RANGES
For other configurations, contact manufacturer.

INPUT VOLTAGE	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
- / +2.5V	3 & 7	8	- / +2.5V	- / +20mA	10% / 90%
- / +2.5V	3 & 7	7	- / +5V	- / +20mA	10% / 90%
- / +2.5V	3 & 7	NONE	- / +10V	- / +20mA	10% / 90%

INPUT VOLTAGE	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
- / +5V	4 & 7	8	- / +2.5V	- / +20mA	10% / 90%
- / +5V	4 & 7	7	- / +5V	- / +20mA	10% / 90%
- / +5V	4 & 7	NONE	- / +10V	- / +20mA	10% / 90%

INPUT VOLTAGE	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
- / +10V	5 & 7	8	- / +2.5V	- / +20mA	10% / 90%
- / +10V	5 & 7	7	- / +5V	- / +20mA	10% / 90%
- / +10V	5 & 7	NONE	- / +10V	- / +20mA	10% / 90%

INPUT VOLTAGE	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
- / +10V	5 & 7	5, 6, 8	0 to +2.5V	+4 to +20mA	50% / 90%
- / +10V	5 & 7	5, 6, 7	0 to +5V	+4 to +20mA	50% / 90%
- / +10V	5 & 7	5, 6	0 to +10V	+4 to +20mA	50% / 90%

INPUT VOLTAGE	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
0 to +10V	5 & 7	5, 6, 8	0 to +2.5V	+4 to +20mA	50% / 90%
0 to +10V	5 & 7	5, 6, 7	0 to +5V	+4 to +20mA	50% / 90%
0 to +10V	5 & 7	5, 6	0 to +10V	+4 to +20mA	50% / 90%

INPUT VOLTAGE	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
0 to +10V	5 & 7	3, 5, 6	- / + 5V	+4 to +20mA	50% / 90%

INPUT VOLTAGE	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
0 to +5V	7	5, 6, 8	0 to +2.5V	+4 to +20mA	50% / 90%
0 to +5V	7	5, 6, 7	0 to +5V	+4 to +20mA	50% / 90%
0 to +5V	7	5, 6	0 to +10V	+4 to +20mA	50% / 90%

INPUT VOLTAGE	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
-5 to +5V	2, 4, 6	5, 6, 8	0 to +2.5V	+4 to +20mA	50% / 90%
-5 to +5V	2, 4, 6	5, 6, 7	0 to +5V	+4 to +20mA	50% / 90%
-5 to +5V	2, 4, 6	5, 6	0 to +10V	+4 to +20mA	50% / 90%

INPUT PWM	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
PWM 0 to 5 kHz 50 to 90%	7 & 8	1, 5, 6, 7	0 to +10V	+4 to +20mA	Follows Input 50 to 90%

INPUT PWM	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
PWM 0 to 5 kHz 50 to 90%	8	7	0V to +5V	Not Used	Follows Input 50 to 90%

INPUT PWM	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
PWM 0 to 5 kHz 10 to 90%	8	NONE	-10V to +10V	-/+20mA	Follows Input 10 to 90%

INPUT CURRENT	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
0 to +20mA	7	8	0 to +2.5V	0 to +20mA	50% / 90%
0 to +20mA	7	7	0 to +5V	0 to +20mA	50% / 90%
0 to +20mA	7	------	0 to +10V	0 to +20mA	50% / 90%

INPUT CURRENT	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
0 to +20mA	7	5, 6, 8	0 to +2.5V	4 to +20mA	50% / 90%
0 to +20mA	7	5, 6, 7	0 to +5V	4 to +20mA	50% / 90%
0 to +20mA	7	5, 6	0 to +10V	4 to +20mA	50% / 90%

INPUT CURRENT	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
- / +20mA	7	8	- / +2.5V	- / +20mA	10% / 90%
- / +20mA	7	7	- / +5V	- / +20mA	10% / 90%
- / +20mA	7	5, 6	- / +10V	- / +20mA	10% / 90%

INPUT CURRENT	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
4 to +20mA	7	8	0 to +2.5V	0 to +20mA	50% / 90%
4 to +20mA	7	7	0 to +5V	0 to +20mA	50% / 90%
4 to +20mA	7	------	0 to +10V	0 to +20mA	50% / 90%

INPUT CURRENT	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
4 to +20mA	7	5, 6, 8	0 to +2.5V	4 to +20mA	50% / 90%
4 to +20mA	7	5, 6, 7	0 to +5V	4 to +20mA	50% / 90%
4 to +20mA	7	5, 6	0 to +10V	4 to +20mA	50% / 90%

INPUT CURRENT	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
4 to +20mA	7	3, 8	- / +1.25V	0 to +20mA	50% / 90%
4 to +20mA	7	3, 7	- / +2.5V	0 to +20mA	50% / 90%
4 to +20mA	7	3	- / +5V	0 to +20mA	50% / 90%

INPUT CURRENT	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
4 to +20mA	7	3, 5, 6, 8	- / +1.25V	4 to +20mA	50% / 90%
4 to +20mA	7	3, 5, 6, 7	- / +2.5V	4 to +20mA	50% / 90%
4 to +20mA	7	3, 5, 6	- / +5V	4 to +20mA	50% / 90%

NB. Adjust current zero pot for offset of 4 mA.

NOTE: Order Model USC-CVB225-B10V when applying a 4-20 mA input and a +/- 10V output.

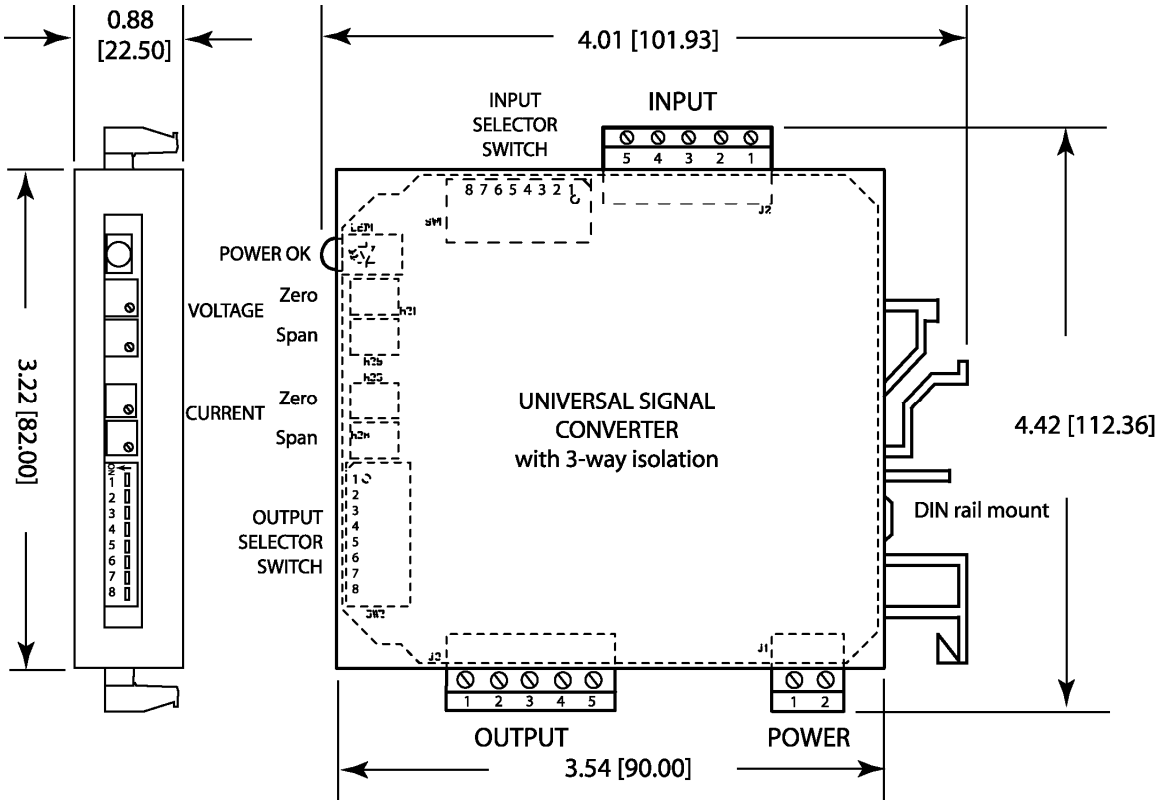
INPUT CURRENT	INPUT SWITCH	OUTPUT SWITCH	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT PWM
4 to +20mA	1,7	NONE	- / +10V	Not Used	Not Used
4 to +20mA	1,7	NONE	- / +10V	Not Used	Not Used
4 to +20mA	1,7	NONE	- / +10V	Not Used	Not Used

NB. Adjust current zero pot for offset of 4 mA.

General Specifications

Quiescent Current	30 mA @24VDC
Fusing	Resettable fuse is integrated into design.
LED	ON = Power OK
Electrical Connections	2-5mm plug-in screw terminal for power (Phoenix P/N: 1754449) 5-5mm plug-in screw terminal for input (Phoenix P/N: 1754504) 5-5mm plug-in screw terminal for output (Phoenix P/N: 1754504) Accept 2.5mm^2 solid or 1.5mm^2 stranded and terminated
Packaging and Dimensions	DIN rail mount Camden Electronics UL 94V0 Lexan enclosure (CVB225) 0.88 x 3.23 x 3.54 inches 22.5 x 82.0 x 90.0 mm (W x L x H excluding mating plug-in screw terminals)
Operating Conditions	-40 to 85°C (-40 to 185°F)
Weight	0.20 lbs. (0.09 kg)
Protection	IP00 Unit is conformal coated within the housing. For harsh environments, place converter in a protective control panel.

Dimensions and Connections:



Screw Terminal Connections

#	Power Supply Input	#	Input	#	Output(s)
1	Power +	1	Voltage_IN	1	Voltage_OUT
2	Power -	2	Voltage_IN_GND	2	Voltage_OUT_GND
		3	Current_IN	3	Current_OUT
		4	Current IN_GND (and PWM_IN_GND)	4	Current_OUT_GND (and PWM_OUT_GND)
		5	PWM IN	5	PWM_OUT

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.

Form: TD2014AX-06/07/10