

TECHNICAL DATASHEET #TDAX080000  
**48V-24V DC/DC Converter**  
**240 Watts (24VDC)**  
**Isolated, Rugged**  
**P/N: AX080000K**

**Features:**

- 48V-24V DC/DC Converter
- Input operating voltage range from 35 to 95VDC
- Conditioned output of 24VDC  $\pm$  2%, 240 Watts
- No minimum load requirement
- Switch mode operation delivers high efficiency
- Active reverse polarity protection
- Input to output isolation
- Robust, rugged and highly reliable
- Compact size for ease of mounting in confined spaces
- Connects via a 4-pin plug with 2 meter lead wires
- Suitable for moist, high shock and vibration environments
- Operational from -40 to 50°C
- IP67 protection



**Applications:**

SCADA Systems  
Remote Terminal Units (RTU)  
Switchgear  
Motor Control Centers  
Machine Control Systems

Charging Battery Based Power Supply Systems  
Power Conditioning for Controls & Instrumentation  
Off-Highway Equipment Control Systems  
Marine Auxiliary and Propulsion Systems  
Telecommunications, Data communications

These applications are found in a variety of industries including telecom and datacom equipment or industrial power systems, electric utilities, oil & gas, water/wastewater and mobile equipment.

**Description:** The DC-DC Converter provides clean 24VDC power suitable for instrumentation and control networks or process equipment. For operation under the most harsh and demanding conditions, the unit is fully sealed and enclosed to protect against moisture, shock and vibration. Power from a battery or other source in the range of 35-95VDC is converted to a 24VDC regulated to 2%. Input to output isolation is provided. The unit is designed with extremely rugged surge and transient suppression in addition to sustained over/under voltage protection. With a nominal nameplate rating of 240 Watts of output power, the DC-DC Converter has an efficiency rated at >90%.

**Ordering Part Numbers:**

Converter with Wire Harness KIT:  
**AX080000K** (KIT AX080000 Converter, AX070103 Wire Harness)

Items can also be ordered individually.

Converter: **AX080000**  
Mating Wire Harness, 2 m: **AX070103**  
Mating Plug Kit: **AX070117**

## Block Diagram

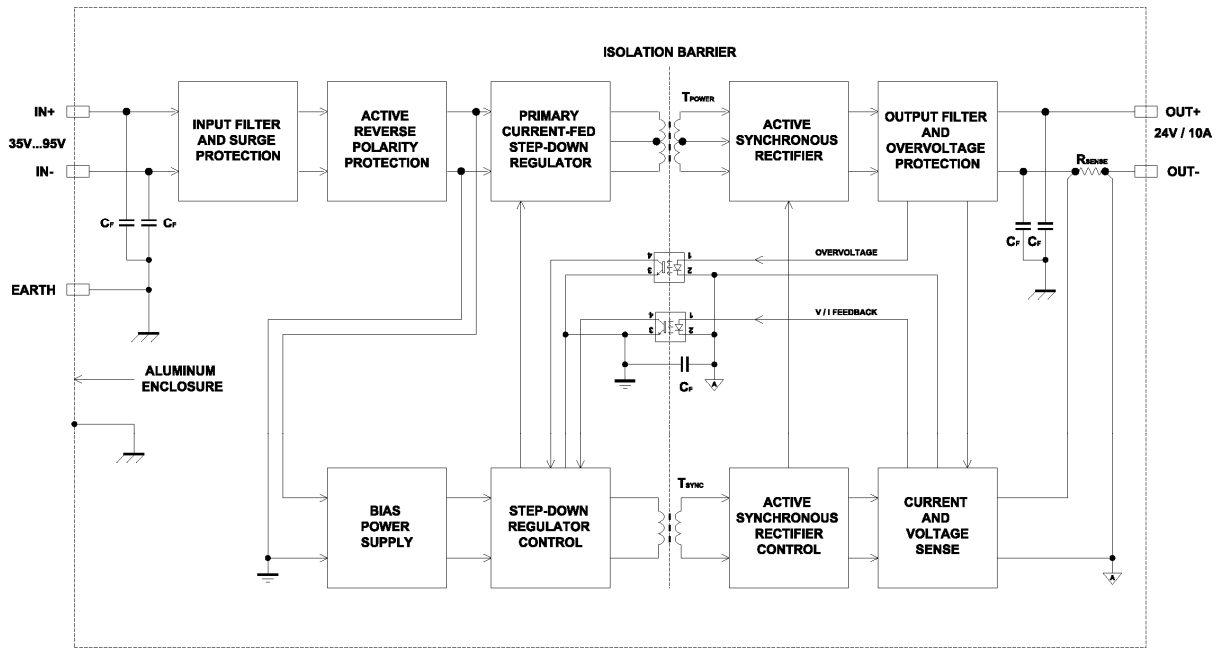
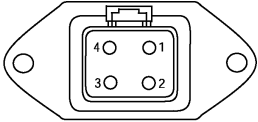


Figure 1.0 48-24V DC/DC Converter - Block Diagram

## Technical Specifications:

All specifications are typical at nominal input voltage and 25 degrees C unless otherwise specified.

Input Specifications		Output Specifications	
Power Source	48 VDC nominal	Nameplate Rating (Output Power)	240 Watts nominal 260 Watts maximum
Operating Voltage Range	35 – 95VDC continuous	Output Current	10A continuous (nominal @24VDC) 11A maximum (in current mode)
Maximum Input Current	7.5 Amps DC	Output Voltage	24VDC $\pm$ 2%
Reverse Voltage Protection	Provided	Output Voltage Ripple	$V(\text{RIPPLE}) \leq 250 \text{ mVpp}$
		Turn-on Time (with full load)	250 msec max/5% of final value
		Turn-on Overshoot	None
		Stability	Stable at all loads (no minimum load requirement)
		Transient Response	200mV/1.5ms (No Load to Full Load) 100mV/1ms (50% - 100% Load)
		Short Circuit Current	Protection provided Self recovery 11A current limit

<b>General Specifications</b>																			
Isolation	Isolated from input, output and chassis ground 500V between primary and secondary																		
Efficiency	<table border="1"> <thead> <tr> <th>Average Efficiency @24V, 10A</th> <th>BATT+ Volts</th> </tr> <tr> <th>%</th> <th>Volts</th> </tr> </thead> <tbody> <tr> <td>91.83</td> <td>31.6</td> </tr> <tr> <td>92.01</td> <td>31.99</td> </tr> <tr> <td>92.33</td> <td>32.99</td> </tr> <tr> <td>92.41</td> <td>34</td> </tr> <tr> <td>92.57</td> <td>35</td> </tr> <tr> <td>92.62</td> <td>36.02</td> </tr> <tr> <td>92.66</td> <td>37</td> </tr> </tbody> </table>	Average Efficiency @24V, 10A	BATT+ Volts	%	Volts	91.83	31.6	92.01	31.99	92.33	32.99	92.41	34	92.57	35	92.62	36.02	92.66	37
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Operating Temperature	-40 to 50°C (-40 to 122°F)																		
Storage Temperature	-50 to 125°C (-58 to 257°F)																		
Humidity	0-99% relative humidity (non-condensing)																		
Protection rating	IP67																		
Electrical Connection	<p>4 pin Deutsch connector P/N: DTP04-4P-L012 <u>Pin Out:</u></p>  <p>1 Input + 2 Input - 3 Output - 4 Output +</p>																		
Mating Wire Harness	<p>A mating plug wire harness assembly is available. P/N: <b>AX070103</b> (The mating plug assembly is comprised of Deutsch P/N: DTP06-4S, WP4S and four contact sockets 0462-203-12141 with 2 meters (6.5 ft.) of 12 AWG lead wires, unterminated.) <u>Mating Wire Harness Pin Out:</u> Red – Input + Black – Input – Black/White – Output – Red/White – Output +</p>																		
Weight	5.70 lbs. (2.58 kg)																		
Grounding	<p>Protective Earth (PE) must be connected to the grounding stud to reduce the risk of electric shock. The conductor providing the connection should have a ring lug and wire larger than or equal to 4 mm<sup>2</sup> (12 AWG). The ring lug should be placed between the nut and a star washer. (To secure the ground strap, use a 8-32 “K-LOK” locknut, stainless steel, 3/8” O.D.)</p> <p>All chassis grounding should go to a single ground point designated for the machine and all related equipment.</p> <p>The ground strap that provides a low impedance path for EMI should be a ½ inch wide, flat, hollow braid, no more than 12 inches long with a suitable sized ring lug for the module’s grounding lug. It may be used in place of the PE grounding conductor and would then perform both PE and EMI grounding functions.</p>																		

<p>Mounting</p>	<p>Mounting ledges include holes sized for ¼ inch or M6 bolts. The bolt length will be determined by the end-user's mounting plate thickness. Typically ¾ inch (20 mm) is adequate.</p> <p>If the module is mounted without an enclosure, it should be mounted vertically with connectors facing left and right to reduce likelihood of moisture entry.</p> <p>All field wiring should be suitable for the operating temperature range of the module.</p> <p>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).</p>
<p>Packaging and Dimensions</p>	<p>Aluminum enclosure with encapsulation  7.20 x 5.90 x 3.02 inches 182.88 x 149.86 x 76.84mm  (W x L x H)</p> <p>Dimensions: inches/mm</p>
<p>Installation</p>	<ol style="list-style-type: none"> <li>1. A maximum 30A fuse is recommended in the primary circuit to provide protection for the primary wiring.</li> <li>2. Use four ¼-20 1-inch screws to mount the converter.</li> <li>3. Ground the unit to chassis ground by attaching a ground strap to the ground stud and locking washer found on the housing (<i>see mechanical drawing</i>).</li> <li>4. Snap the plug connector into the mating receptacle mounted on the converter.</li> <li>5. Connect the wiring to power and output terminal blocks (provided by customer).</li> <li>6. Once the load is ready to receive power, turn on the power source to the converter.</li> </ol>
<p>Configuration</p>	<ul style="list-style-type: none"> <li>• For standard operation connect one unit as per the electrical connection pin out.</li> <li>• For telecom applications, connect Vin<sub>input+</sub> to V<sub>output-</sub> and to the system ground. Apply -48V to the Vin<sub>input-</sub> terminal. Use V<sub>output+</sub> as +24V output to the load. Note: Output is no longer isolated from the input in this application.</li> </ul>

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](http://www.axiomatic.com/service.html).

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