Preliminary
TECHNICAL DATASHEET #TDAX080311

Isolated 24V/24V, 350W DC-DC Converter

CAN Interface (CANopen®)

10 to 40 VDC Input
24 VDC, 350 W Output
ENABLE Signal
EDS File for Configuration
P/N: AX080311

Features

- Isolated
- 24 VDC nominal input (10 to 40 VDC range)
- 24 VDC, 350 W output (derated for input <16 VDC)
- Typical efficiency of 94%
- ENABLE pin to turn the output ON/OFF
- 1x isolated CAN port (CANopen®)
- Input voltage and output voltage feedback are measured (Can be sent over CAN bus too)
- Output current limit can be set through CAN or set to vary with the measured input voltage
- Delayed shutdown command via CAN with configurable countdown time
- ENABLE pin has a user-configurable de-glitch time (Keeps the output ON for a set time after the ENABLE pin is turned OFF).
- Error checking on input and output voltage (Follows DS-453 codes)
- Microcontroller goes to sleep to conserve power when the output is OFF
- Input inrush current limit
- Reverse battery, over and under-voltage protection
- Short circuit and overcurrent protection
- Thermal protection for over-temperature
- Operates from -40 to 85 °C (-40 to 185 °F)
- Designed for EMI/EMC compliance
- Sealed, anodized, IP67-rated enclosure with a 12-pin connector
- EDS file provided to use with standard CANopen® tools for configuration

Applications

- Agricultural equipment
- Lift equipment
- Mining equipment
- Municipal vehicles
- Off-highway equipment
- Utility vehicles

Ordering Part Numbers

Isolated 24V/24V, 350W DC-DC Converter, CANopen® - P/N: **AX080311**

Accessories:
EDS File
Mating Wire Harness - P/N: **AX070173** *(For details, refer to the General Specifications below.)*

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Description

The AX080311 is an isolated 24 VDC to 24 VDC converter with 350 W output power. It has a regulated output of 24 VDC and 15 A with a typical efficiency of 94 %. It can operate from 10 to 40 VDC. A CANopen® connection allows for real time diagnostics, controlled shutdowns, and other helpful features. Wake-on-CAN functionality can be used to reduce power consumption. A hardware ENABLE connection is also provided. It comes with overcurrent, short-circuit, over-temperature, reverse polarity, and over/under-voltage protection. The unit is IP67 rated and operates from -40 to 85 °C (-40 to 185 °F).

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 Limitations & Return Materials Process as described on https://www.axiomatic.com/service/.

Input Specifications

Operating Voltage	24 VDC (nominal) 10 to 40 VDC (range)
Maximum Current	26 ADC @ 11 VDC and 11 A load 16 ADC @ 24 VDC and 15 A load 10 ADC @ 40 VDC and 15 A load
Reverse Polarity Protection	Provided
Undervoltage Protection	Shutdown at 8.5 VDC Recovers at 11.5 VDC
Overvoltage Protection	Shutdown at 44 VDC Recovers at 42 VDC
Enable Input	Isolated to primary and secondary Working range: 5 to 24 V (High) to turn on the unit. Current needed is typically 2 mA.

Output Specifications

Nameplate Rating (Power)	350 W (nominal)
Current	15 ADC (continuous) Derated for input voltage below 16 VDC due to thermal considerations (See figure 1)
Voltage	24 VDC ±2 % @ 11 to 24 VDC input 23 to 24 VDC @ 10 to 11 VDC input
Ripple Voltage	$V_{O(RIPPLE)} \leq 0.1\ V_{PP}$
Turn-on-Time	600 ms typical (at full load)
Stability	Stable at all loads (no minimum load requirement)
Transient Response	500 mV/ms (50 to 100 % load)
Short Circuit Current	Protection provided Self-recovery 18 A current limit (Derated for input voltage below 16 VDC)

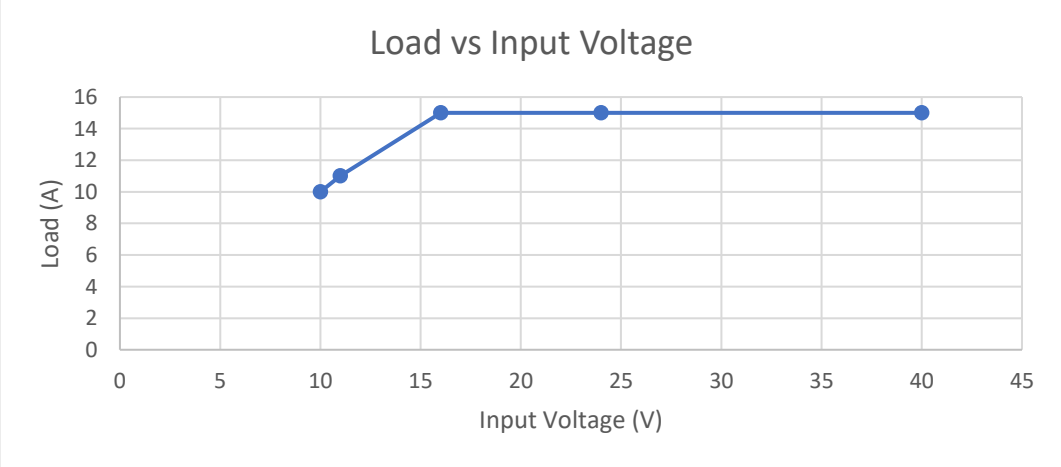

Figure 1 - Load vs Input Voltage

General Specifications

<table>
<tr><td>Microcontroller</td><td>STM32G0B1KCU7
32 bit, 256 KB flash memory, 144 KB RAM</td></tr>
<tr><td>Efficiency</td><td>94 % (See figure 2)</td></tr>
<tr><td>Isolation</td><td>700 VDC minimum (All to chassis)
700 VDC minimum (Primary to secondary)</td></tr>
<tr><td>Response Time</td><td>Inputs are measured and output is updated about every 1 ms</td></tr>
<tr><td>Communications</td><td>1 isolated CAN port (CANopen®)
Baud rates: 10 kbit/s, 20 kbit/s, 50 kbit/s, 125 kbit/s, 250 kbit/s, 500 kbit/s, 667 kbit/s, and 1 Mbit/s</td></tr>
<tr><td>Network Termination</td><td>It is necessary to terminate the network with external termination resistors. The resistors are 120 Ω, 0.25 W minimum, metal film or similar type. They should be placed between CAN High and CAN Low terminals at both ends of the network.</td></tr>
<tr><td>User Interface</td><td>EDS file is provided to use with standard CANopen® tools for configuration.</td></tr>
<tr><td>Compliance</td><td>RoHS</td></tr>
<tr><td>Protection</td><td>IP67</td></tr>
<tr><td>Operating Conditions</td><td>-40 to 85 °C (-40 to 185 °F)</td></tr>
<tr><td>Storage Temperature</td><td>-55 to 125 °C (-67 to 257 °F)</td></tr>
<tr><td>Enclosure</td><td>Cast aluminum enclosure
8 in. x 5.83 in. x 2.49 in. (202 mm x 148 mm x 63.2 mm)
(L x W x H excluding mating plugs)
Refer to the dimensional drawing.</td></tr>
<tr><td>Weight</td><td>3.953 lbs. (1.793 kg)</td></tr>
<tr><td>Electrical Connections</td><td>12-pin receptacle (TE Deutsch P/N: DTM13-12PA)
<table>
<tr><th>Pin</th><th>Description</th></tr>
<tr><td>1</td><td>Output +</td></tr>
<tr><td>2</td><td>CAN High</td></tr>
<tr><td>3</td><td>Enable +</td></tr>
<tr><td>4</td><td>Input +</td></tr>
<tr><td>5</td><td>Input +</td></tr>
<tr><td>6</td><td>Input +</td></tr>
<tr><td>7</td><td>Input -</td></tr>
<tr><td>8</td><td>Input -</td></tr>
<tr><td>9</td><td>Input -</td></tr>
<tr><td>10</td><td>Enable -</td></tr>
<tr><td>11</td><td>CAN Low</td></tr>
<tr><td>12</td><td>Output -</td></tr>
</table></td></tr>
<tr><td>Mating Wire Harness</td><td>A mating wire harness is available from Axiomatic under P/N: AX070173. The wire harness comprises 14 AWG unterminated wires and TE Deutsch P/N DT06-12SA, W12S, and 12x 0462-201-16141. The pin out and respective colors of the wires are shown below.
<table>
<tr><th>Pin</th><th>Colors</th><th>Description</th></tr>
<tr><td>1</td><td>White/Red</td><td>Output +</td></tr>
<tr><td>2</td><td>Yellow</td><td>CAN High</td></tr>
<tr><td>3</td><td>Blue</td><td>Enable +</td></tr>
<tr><td>4</td><td>Red</td><td>Input +</td></tr>
<tr><td>5</td><td>Red</td><td>Input +</td></tr>
<tr><td>6</td><td>Red</td><td>Input +</td></tr>
<tr><td>7</td><td>Black</td><td>Input -</td></tr>
<tr><td>8</td><td>Black</td><td>Input -</td></tr>
<tr><td>9</td><td>Black</td><td>Input -</td></tr>
<tr><td>10</td><td>Green</td><td>Enable -</td></tr>
<tr><td>11</td><td>White/Green</td><td>CAN Low</td></tr>
<tr><td>12</td><td>White/Black</td><td>Output -</td></tr>
</table></td></tr>
</table>

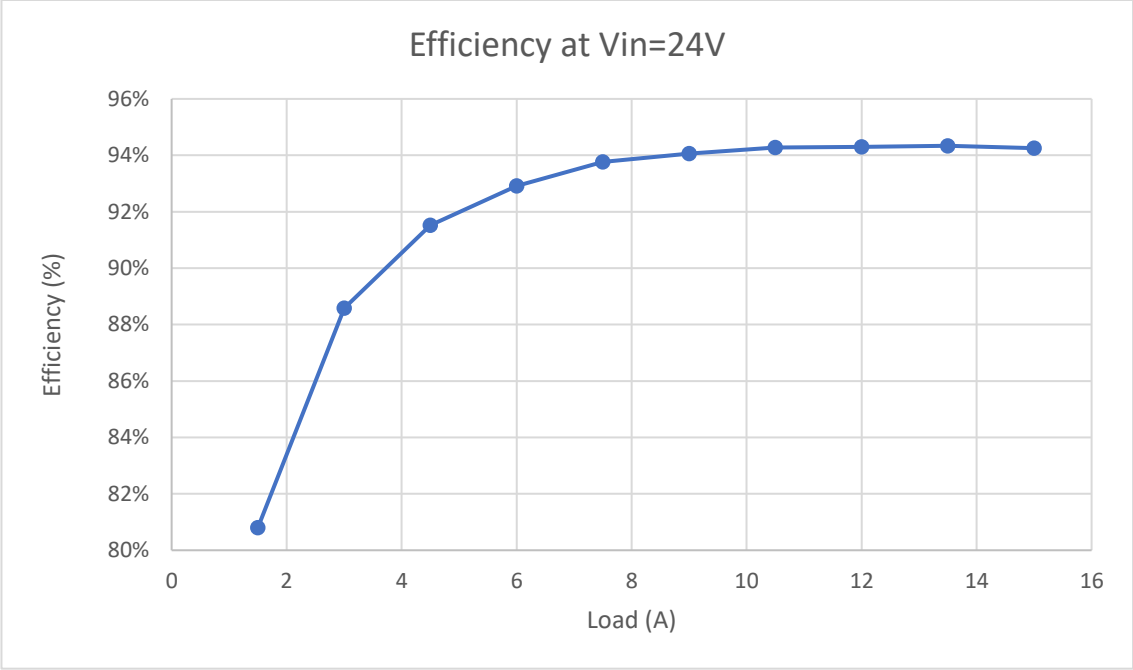

Figure 2 - Efficiency at 24 V input

Dimensional Drawing

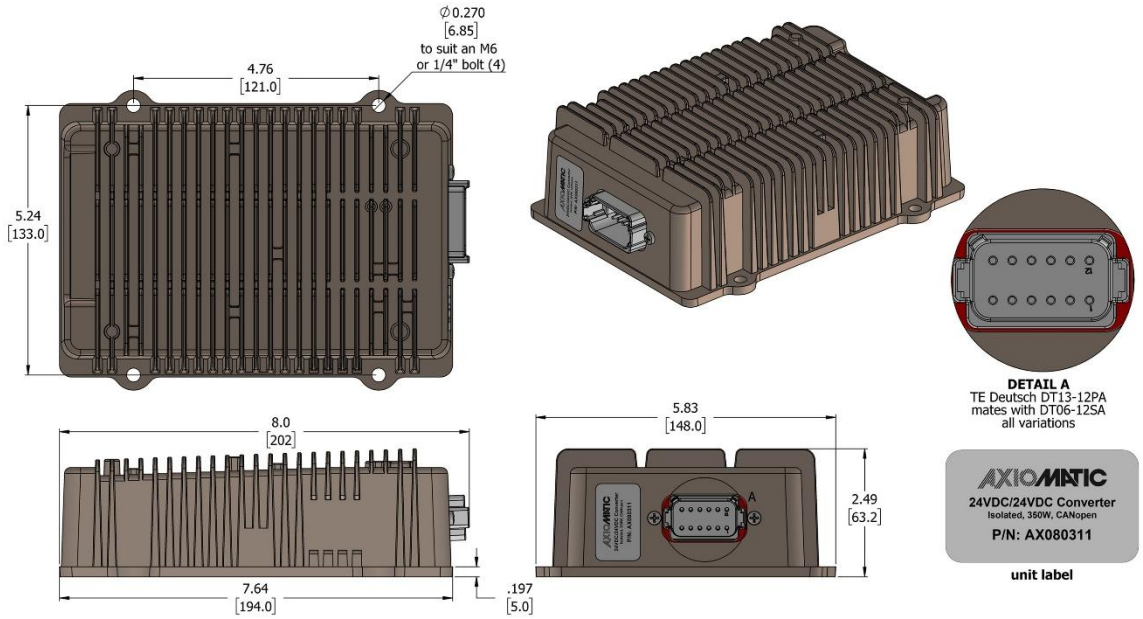

Figure 3 – Dimensional Drawing of AX080311