Preliminary
TECHNICAL DATASHEET #TDAX030350

RS-232 to CAN Converter with Two Digital Inputs

2 Digital Signal Inputs 2 Isolated CAN (SAE J1939) 1 RS-232 with Axiomatic Electronic Assistant

P/N: AX030350

Features:

- Two digital input signals
- Two isolated CAN SAE J1939 ports
- 1 RS-232 port
- 12 V or 24 V nominal power
- Compact enclosure
- 12-pin TE Deutsch equivalent connector
- Operates from -40°C to +85°C

Applications:

- Interfaces RS-232 satellite phones or GPS systems with CAN bus in on-road commercial vehicles

Ordering Part Numbers:

Two Digital IN CAN Controller, 2 SAE J1939 with auto-baud-rate detect, 1 RS-232: **AX030350**
Two Digital Inputs CAN Controller, 2 CANopen®, 1 RS-232: **AX030351**

Accessories:
Mating Plug Kit P/N: **PL-DTM06-12SA**
Axiomatic Electronic Assistant P/N: **AX070502, AX070505K** or **AX070506K**

Description:

The RS-232 to CAN Converter with Two Digital Inputs is a compact device for interfacing RS-232 satellite phones or GPS systems with CAN bus in on-road commercial vehicles.

The RS-232 serial port interface is provided with user-configurable frame forwarding system to convert serial port messages into CAN frames. Likewise, the two fully isolated CAN interfaces have user-configurable CAN ID filtering and frame forward system, to convert CAN frames into serial port messages. By default, the primary CAN port (CAN1) supports J1939 messaging and uses passive baud rate discovery to detect CAN network baud rate.

In addition, two digital signal inputs are provided. The inputs can be configured to measure frequency, PWM and digital signals. Measured input data can be sent to a SAE J1939 CAN Network or used to enable/disable frame forwarding.

A Windows-based Axiomatic Electronic Assistant (EA) is used to configure the controller via a USB-CAN (AX070501) device. Setpoint configuration can be saved in a file which can be used to easily program the same configuration into another device of the same P/N.

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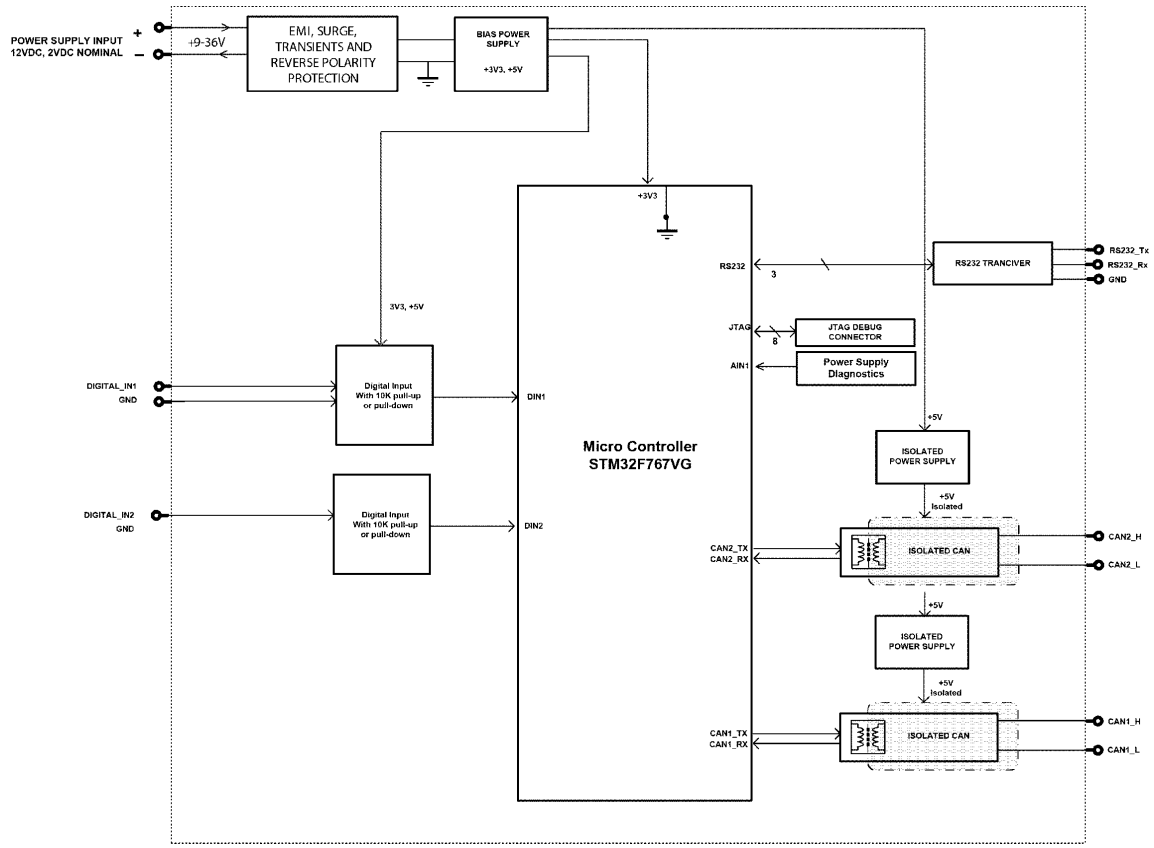
Block Diagram:



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 https://www.axiomatic.com/service/.

Power Supply

Power Supply Input	12 Vdc or 24 Vdc nominal operating voltage 9 Vdc to 36 Vdc power supply range
Reverse Polarity Protection	Protection up to -50 V
Undervoltage Protection	Shutdown at 6 Vdc
Overvoltage Protection	Protection up to 38 V

Input

Inputs	2 digital inputs user-programmable as frequency, RPM, PWM or digital signal inputs types
Frequency/RPM Input	0.5 Hz to 50 Hz; 10 Hz to 1 kHz; or 100 Hz to 10 kHz 0.01% resolution, +/- 0.1% error
PWM Input	Low frequency (0.50 Hz to 1 kHz) High frequency (100 Hz to 10 kHz) 0 to 100% DC 0.01% resolution, +/- 0.1% error
Digital Input Level	Accepts 5 V TTL Accepts up to Vps Threshold: Low <1 V, High >2.2 V

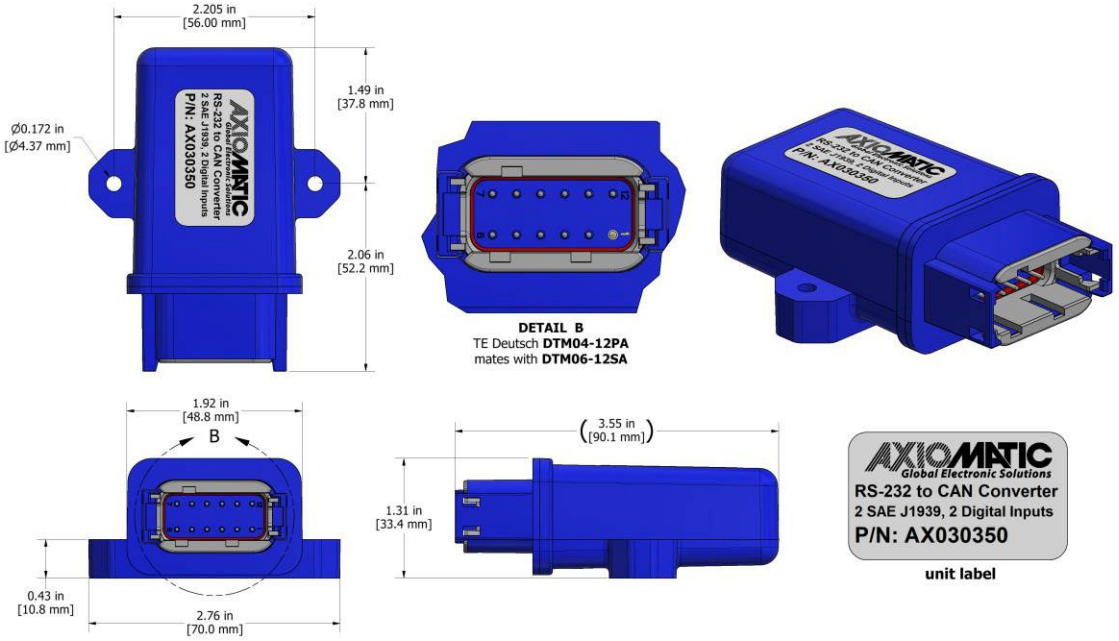
<table>
<tr><td>Digital Input</td><td>1 MΩ Impedance
Active high or active low with 10 kΩ pull-up or pull-down</td></tr>
<tr><td>Timer Input Functions</td><td>PWM input, frequency input or RPM input</td></tr>
<tr><td>Maximum and Minimum Ratings</td><td>
<table>
<tr><th>Characteristic</th><th>Min</th><th>Max</th><th>Units</th></tr>
<tr><td>Digital Input</td><td>0</td><td>36</td><td>Vdc</td></tr>
<tr><td>PWM Duty Cycle</td><td>0</td><td>100</td><td>%</td></tr>
<tr><td>PWM Low Frequency</td><td>10</td><td>1000</td><td>Hz</td></tr>
<tr><td>PWM High Frequency</td><td>100</td><td>10,000</td><td>Hz</td></tr>
<tr><td>PWM Voltage pk-pk</td><td>0</td><td>36</td><td>Vdc</td></tr>
<tr><td>RPM Frequency</td><td>0.5</td><td>10,000</td><td>Hz</td></tr>
</table>
</td></tr>
<tr><td>Input GND</td><td>1 provided</td></tr>
<tr><td>Protection</td><td>All inputs are protected against short to GND.
All inputs are protected against shorts to nominal Vps (36 Vdc).</td></tr>
</table>

General Specifications

<table>
<tr><td>Microcontroller</td><td>STM32F767VG</td></tr>
<tr><td>Isolation</td><td>300 Vrms
Isolation between CAN and power/inputs</td></tr>
<tr><td>Quiescent Current</td><td>80 mA @ 12 Vdc; 50 mA @ 24 Vdc</td></tr>
<tr><td>Control Logic</td><td>Standard embedded software is provided.
(Application-specific control logic or a set point file is available on request.)</td></tr>
<tr><td>Communications</td><td>2 isolated CAN ports (SAE J1939) (CANopen® on request)
1 RS-232 port</td></tr>
<tr><td>CAN Baud Rate</td><td>250 kbit/s, 500 kbit/s, 667 kbit/s, 1 Mbit/s auto-baud-rate detection</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_H and CAN_L terminals at both ends of the network.</td></tr>
<tr><td>User Interface and Software Reflashing</td><td>Axiomatic Electronic Assistant, P/N: AX070502, AX070505K or AX070506K, for Windows operating systems comes with a royalty-free license for use on multiple computers. It includes an Axiomatic USB-CAN converter to link the device's CAN port to a Windows-based PC.</td></tr>
<tr><td>Operating Conditions</td><td>-40°C to 85°C (-40°F to 185°F)</td></tr>
<tr><td>Storage Temperature</td><td>-55°C to 125°C (-67°F to 257°F)</td></tr>
<tr><td>Protection</td><td>IP67</td></tr>
<tr><td>Vibration</td><td>Pending</td></tr>
<tr><td>Shock</td><td>Pending</td></tr>
<tr><td>Weight</td><td>0.15 lb. (0.068 kg) preliminary</td></tr>
<tr><td>Enclosure</td><td>Molded enclosure, ultrasonically welded
Integral connector Nylon 6/6, 30% glass
3.55 in x 2.76 in x 1.31 in (90.1 mm x 70 mm x 33.4 mm)
L x W x H including integral connector
Refer to the Dimensional Drawing below.</td></tr>
<tr><td>Electrical Connections</td><td>Integral 12-pin receptacle (equivalent to TE Deutsch P/N: DTM04-12PA)
<table>
<tr><th>PIN #</th><th>FUNCTION</th></tr>
<tr><td>1</td><td>BATT -</td></tr>
<tr><td>2</td><td>CAN 2_H</td></tr>
<tr><td>3</td><td>CAN 2_L</td></tr>
<tr><td>4</td><td>RS-232_Rx</td></tr>
<tr><td>5</td><td>RS-232_Tx</td></tr>
<tr><td>6</td><td>CAN 1_H</td></tr>
<tr><td>7</td><td>CAN 1_L</td></tr>
<tr><td>8</td><td>Digital IN 2</td></tr>
<tr><td>9</td><td>Digital IN 1</td></tr>
<tr><td>10</td><td>GND</td></tr>
<tr><td>11</td><td>CAN 2_SH</td></tr>
<tr><td>12</td><td>BATT +</td></tr>
</table>
</td></tr>
<tr><td>Mating Plug Kit</td><td>P/N: PL-DTM06-12SA (includes 1 DTM06-12SA, 1 WM-12S, 12 0462-201-20141, 6 0413-204-2005 Sealing Plugs)</td></tr>
</table>

Mounting	Mounting holes are sized for #8 or M4 bolts. The bolt length will be determined by the end-user's mounting plate thickness. The mounting flange of the controller is 0.43 inches (10.8 mm) thick. If the module is mounted without an enclosure, it should be mounted vertically with connectors facing left or right to reduce the likelihood of moisture entry. CAN wiring is considered intrinsically safe. The power wires are not considered intrinsically safe and so in hazardous locations, they need to be located in conduit or conduit trays at all times. The module must be mounted in an enclosure in hazardous locations for this purpose. No wire or cable harness should exceed 30 meters in length. The power input wiring should be limited to 10 meters. All field wiring should be suitable for the operating temperature range. 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).

Dimensional Drawing



Note: CANopen® is a registered community trademark of CAN in Automation e.V

Form: TDAX030350-06/09/23