Preliminary
TECHNICAL DATASHEET #TDAX030355

RS-232 to CAN Converter with Two Digital Inputs

2 Digital Signa Inputs
2 Isolated CAN (SAE J1939)
1 RS-232 with Programmable "Frame Format"
Can convert CAN ID and CAN data into ASCII Format
Configurable with Axiomatic Electronic Assistant

P/N: AX030355

Features

- Two digital input signals
- Two isolated CAN SAE J1939 ports
- 1 RS-232 port with programmable "frame format" (1 delimiter byte and up to 4 start and end bytes can be added to the forwarded frames which makes it possible to parse the information at the RS-232 receiver.)
- Can convert CAN ID and CAN data into ASCII format to produce readable text, for example, to a serial terminal application on a PC
- 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

RS-232 to CAN Converter with Two Digital Inputs, SAE J1939, Auto-Baud-Rate Detection – P/N: **AX030355**

Accessories:
Mating Plug KIT P/N: **PL-DTM06-12SA**
Axiomatic Electronic Assistant P/N: **AX070502** 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 a user-configurable frame forwarding system to convert serial port messages into CAN frames. The "frame format" is programmable (1 delimiter byte and up to 4 start and end bytes can be added to the forwarded frames which makes it possible to parse the information at the RS-232 receiver.). 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. It can convert CAN ID and CAN data into ASCII format to produce readable text, for example, to a serial terminal application on a PC.

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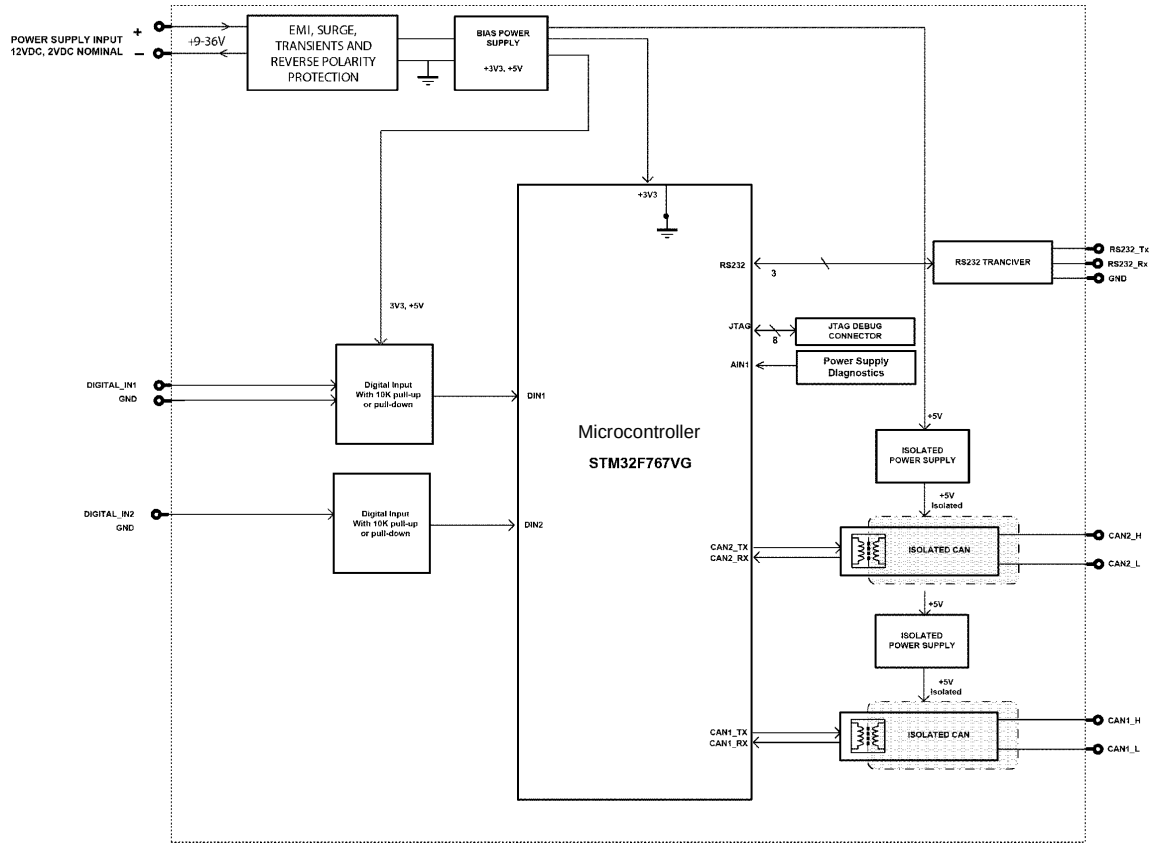
In addition, two digital signal inputs are provided. The inputs can be configured to measure frequency, PWM and digital signals. Measured input data can be sent to a SAE J1939 CAN Network or used to enable/disable frame forwarding.

A *Windows*-based Axiomatic Electronic Assistant (EA) is used to configure the controller. 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.

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

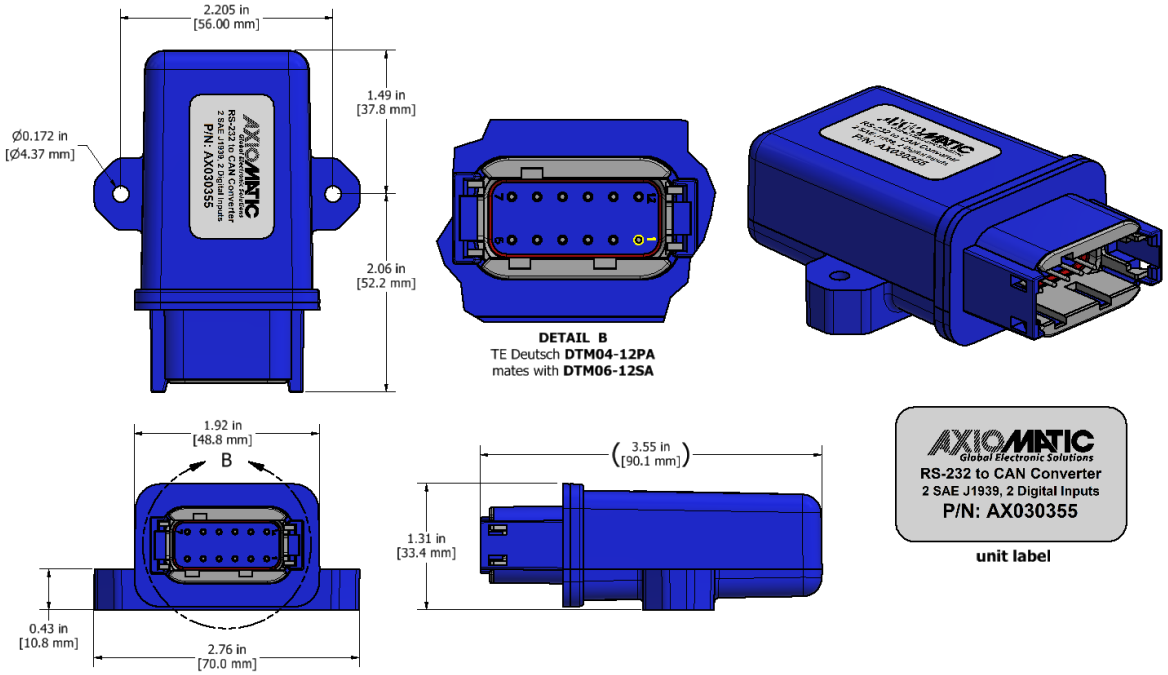
Power Supply

Power Supply Input	12 Vdc or 24 Vdc nominal operating voltage 9 Vdc to 36 Vdc power supply range
Quiescent Current	80 mA @ 12 Vdc; 50 mA @ 24 Vdc typical
Maximum Current Draw	150 mA at 12 Vdc
Reverse Polarity Protection	Protection up to -50 V
Undervoltage Protection	Shutdown at 6 Vdc
Overvoltage Protection	Protection up to 38 V

Input

Inputs	2 inputs user programmable as timer inputs (frequency/RPM, PWM) or digital signal inputs
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 PWM Voltage (pk-pk): 0-36V
Digital Input	1 MΩ Impedance Active high or active low with 10 kΩ pull-up or pull-down
Digital Input Levels	Accepts 5 V TTL Accepts up to Vps Threshold: Low <1 V, High >2.2 V
Input Ground	1 provided
Protection	All inputs are protected against short to Ground. All inputs are protected against shorts to nominal Vps.

Dimensional Drawing



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>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)
Can convert CAN ID and CAN data into ASCII format to produce readable text, for example, to a serial terminal application on a PC

1 RS-232 port with programmable "frame format" (1 delimiter byte and up to 4 start and end bytes can be added to the forwarded frames which makes it possible to parse the information at the RS-232 receiver.)</td></tr>
<tr><td>CAN Baud Rate</td><td>100 kbit/s, 125 kbit/s, 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</td><td>Axiomatic Electronic Assistant - P/N: AX070502 or AX070506K</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>Compliance</td><td>RoHS</td></tr>
<tr><td>Weight</td><td>0.15 lb. (0.070 kg)</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>Battery -</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 Input 2</td></tr>
<tr><td>9</td><td>Digital Input 1</td></tr>
<tr><td>10</td><td>Ground</td></tr>
<tr><td>11</td><td>CAN 2 Shield</td></tr>
<tr><td>12</td><td>Battery +</td></tr>
</table></td></tr>
<tr><td>Mating Plug Kit</td><td>Axiomatic P/N: PL-DTM06-12SA (includes TE Deutsch P/Ns: 1x DTM06-12SA, 1x WM-12S, 12x 0462-201-20141, 6x 0413-204-2005 Sealing Plugs)</td></tr>
<tr><td>Mounting</td><td>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).</td></tr>
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Form: TDAX030355-12/17/2024