Technical Datasheet #TDAXRTD8

RTD Scanner

8 RTD Channels
CAN, SAE J1939
***with* Electronic Assistant®**
P/N: AXRTD8

The RTD module monitors 8 RTD inputs. The temperature information is provided to the engine control system over SAE J1939 CAN bus. All channels of temperature data are automatically sent over the CAN bus when power is applied with no additional programming or configuration required. Integral diagnostics determine RTD integrity and RTD inputs are isolated from each other. CAN communications are via an isolated CAN interface. During set-up, using an USB-CAN converter and a PC, the operator can configure the controller via the Electronic Assistant® to suit a wide variety of applications. The RTD module features rugged packaging and watertight Deutsch IPD connectors. Applications include power generator sets.

Ordering Part Numbers:

SAE J1939 version
RTD Module P/N: **AXRTD8** For a unit with application-specific setpoints, contact Axiomatic for an ordering p/n and quotation.
Mating Plug Kit: **AX070200** (8 pin socket, wedge, 8 contacts + 40 pin unkeyed socket, 40 contacts)
AX070502 Configuration KIT includes the following. USB-CAN Converter P/N: AX070501 1 ft. (0.3 m) USB Cable P/N: CBL-USB-AB-MM-1.5 12 in. (30 cm) CAN Cable with female DB-9 P/N: CAB-AX070501 AX070502IN CD P/N: CD-AX070502, includes: **Electronic Assistant®** software; EA & USB-CAN User Manual UMAX07050X; USB-CAN drivers & documentation; CAN Assistant (Scope and Visual) software & documentation; and the SDK Software Development Kit. **NOTE: To order this kit, you need only to specify P/N: AX070502.**

Technical Specifications

- Reads up to eight (8) Platinum RTD inputs with 2, 3, and 4 wire configurations for specific RTD's (IEC 0.00385, JIS 0.003916, US 0.003902, Legacy 0.003920, SAMA 0.003923)
- A user defined option permits other RTD's and uses the Callendar Van Dusen constants to define the sensor connected.
- Accuracy of +/- 1°C
- Burden is limited to less than 200 mA. Inrush does not exceed 800 mA.
- Isolation voltage is 1500 Vac (rms) or 2550V for 1 sec.
- System throughput has all 8 channels scanned in 900 milliseconds (100 mSec between readings).
- Overall drift with temperature is 15mOhm/°C (maximum)
- Optical isolation is 500VDC from input to ground. Three way isolation is provided for the CAN line, inputs and power supply.
- Easily selectable SPNs from a drop down list of the temperature SPNs supported by the SAE J1939
- User defined SPN and PGN's configurable with Electronic Assistant® to suit the application.
- Configurable ECU Instance in the NAME to allow for multiple ECU's on the same network
- Application-specific software versions are available on request.

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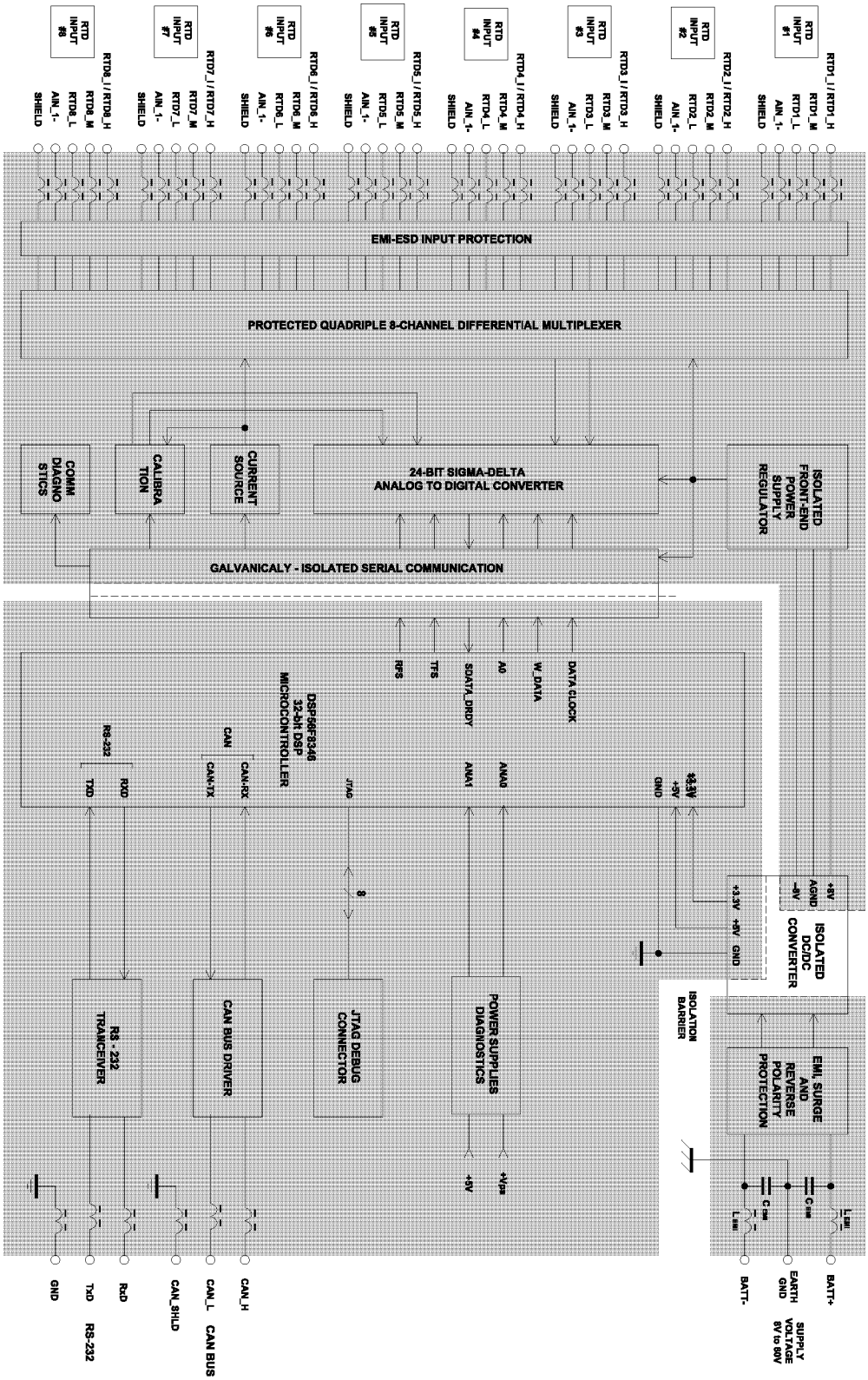
Block Diagram



SAE J1939 Profile

- For J1939 compliance, all modules comply with the applicable portions of the following:
  SAE J1939-21, December 2006, Data Link Layer
  SAE J1939-71, January 2009, Vehicle Application Layer
  SAE J1939-73, September 2006, Application Layer – Diagnostic
  SAE J1939-81, May 2003, Network Management
- Customer specific proprietary extensions can also be included in the SAE J1939 profile.
- All module functionality can be divided into three distinctive parts: basic functionality, extended functionality and auxiliary functionality.

Suspect Parameter Numbers (SPN's) and PGN's

- Temperatures have a configuration that indicates the SAE J1939 SPN is transmitted by that temperature input.
- The SPN drop list includes all temperature SPNs from the J1939-71 standard published up to January of 2009. If an SPN is not supported by the drop list, the user can select a zero SPN, which then allows them to define the SPN and PGN per the application requirements.
- One byte parameters have a resolution of 1°C/bit and a range of -40°C to 210°C.
- Two byte parameters have resolution of 0.03125°C/bit and a range of -273°C to 1735°C.
- Averaging of temperatures for active channels can be enabled.
- The Parameter Group Number (PGN) that will be used to send a temperature to the J1939 network will be entirely dependent on the Suspect Parameter Number (SPN) that was selected for that channel. In all cases, the PGN is a PDU2 type. Each PGN has a predefined priority and repetition rate associate with it.

Diagnostics

- Configurable Diagnostic Messaging parameters
- Diagnostic Log is maintained in non-volatile memory.
- Each RTD channel could be configured to send diagnostic messages to the network if the temperature goes out of range.
- When sending an "Active Diagnostic Trouble Code" (DM1) or a "Previously Active Diagnostic Trouble Codes" (DM2) message, the controller will use the appropriate Diagnostic Trouble Code (DTC). As defined by the standard, this is a combination of the Suspect Parameter Number (SPN), the Failure Mode Indicator (FMI), Occurrence Count (OC) and the SPN Conversion Method (CM).

CAN Network Communications

- Incorporates a SAE J1939 port with software selectable slew rate on the transceiver
- Has two configurable "slew rates" to accommodate different CAN (SAE J1939) connections (It is capable of working both on the standard J1939 link between an engine controller and a generator controller, and on a J1939 accessory module link from a generator controller in power gensets.)
- Node address is auto configurable as per J1939-81 and/or via user configuration (with EA).
- Optical isolation is provided for the CAN line
- Includes a watchdog timer to require a reboot when the microprocessor locks
- Monitored parameters and diagnostics are user selectable from a drop down list in the EA.
- Monitored parameters and diagnostics are read-only over the network
- Averaging of temperatures for active channels can be enabled.
- Units are pre-configured with default values at the factory. Refer to the user manual.
- The bit-rate is 250 kbit/s. Other bit-rates (125 kbit/s, 500 kbit/s or 1 Mbit/s) can be factory programmed on request. Contact Axiomatic for an ordering p/n.
- All parameter locations have default values that do not conflict.
- Module is fully functional during configuration and communications
- Parameter values and diagnostic error codes are retained when the modules are de-energized.
- RS-232 port
- Refer to the user manual for further details on the communications.

Configuration

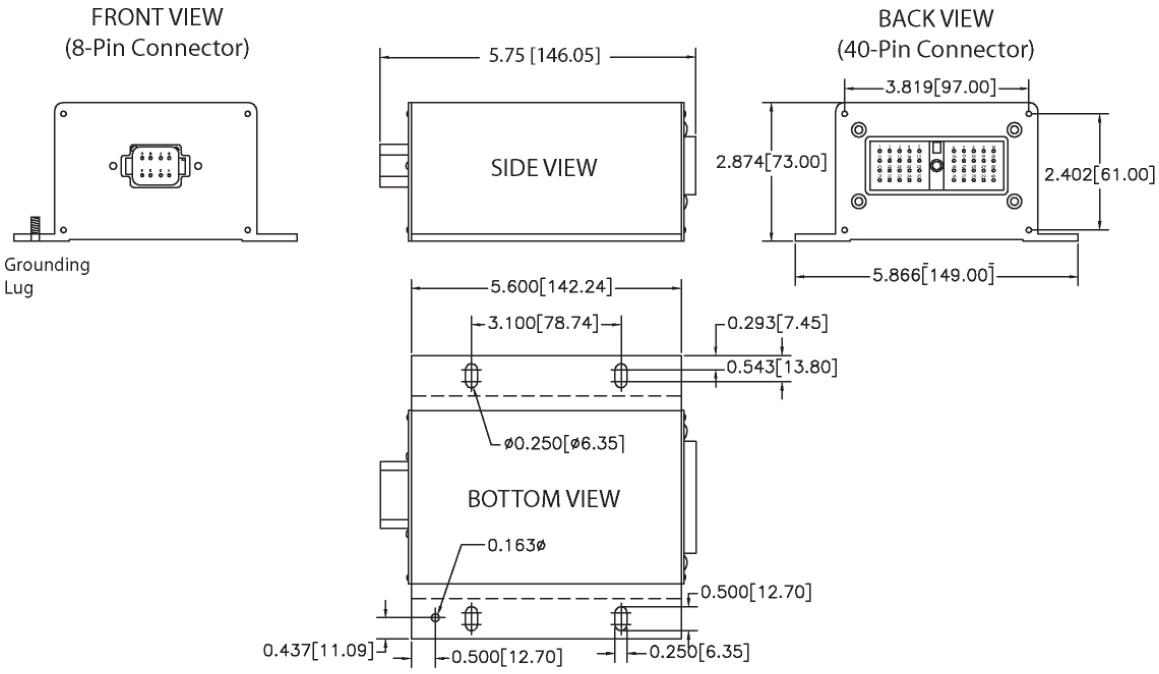
- Electronic Assistant® for *Windows* operating systems comes with a royalty-free license for use. The Electronic Assistant® requires an USB-CAN converter to link the device's CAN port to a PC for initial configuration. An Axiomatic USB-CAN Converter and the EA software are provided as a KIT (p/n AX070502).
- A customer's proprietary service tool, using the J1939 network, can be accommodated on request.

Power Supply Input

- Accepts 8…60VDC power (12V, 24V or 48V nominal)
- Overvoltage capability is 96VDC for 1 hour @ 85°C
- Reverse polarity protection is provided.
- Power supply input section protects against transient surges and short circuits and is isolated from RTD inputs

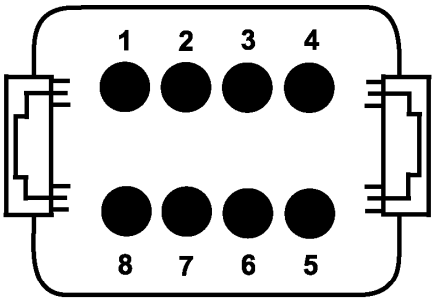
Packaging and Dimensions

- Can be mounted directly on the power generator set or remotely
- Compact size (see mechanical drawing)
- Encapsulated in a rugged aluminum housing with watertight Deutsch connectors
- IP65 rating
- Suitable for moist, high shock, vibrating and non hazardous environments
- Designed to be mounted directly on an engine without vibration isolators
- -40 to 85 deg C (-40 to 185 deg F) operating temperature range (For ambient temperatures exceeding 85°C, the temperature scanner may deviate in accuracy an additional ±1°C. Note also if the ambient temperature were to exceed 120°C, the device would NOT be expected to return to proper operation.)
- The ambient storage temperature range is -50°C to +120°C.
- It is protected against 95% humidity non-condensing, 30°C to 60°C.
- Weight is 4.10 lbs. (1.86 kg)



Dimensions: inches [mm]

Typical Connections – Power and CAN bus (*RTD module*):

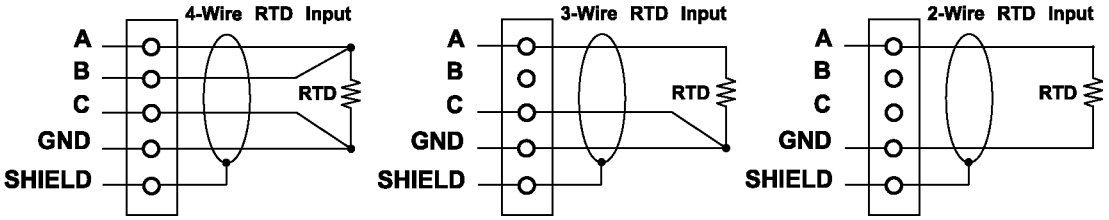


FRONT VIEW
MODULE MOUNTED CONNECTOR
DEUTSCH P/N: DT13-08PA

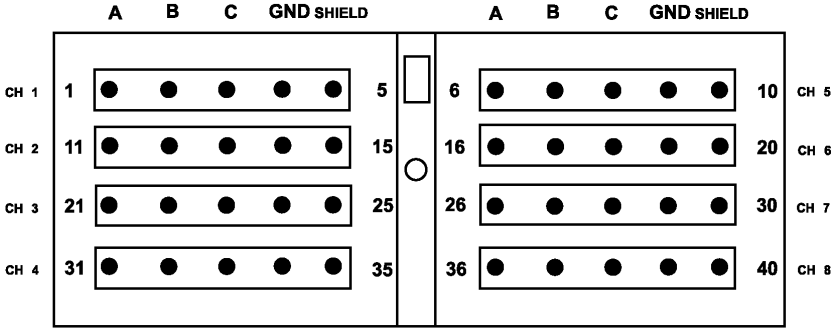
1 = PWR+		5 = SHIELD	
2 = CAN-H		6 = RS-232	GND
3 = CAN-L		7 = RS-232	TXD
4 = PWR-		8 = RS-232	RXD

(Mating plug is DT06-08SA with wedgelock W8S and sockets 0462-201-16141.)

Typical Connections – RTD Module:



RTD MODULE - PIN OUT



FRONT VIEW OF
MODULE MOUNTED CONNECTOR

Nov. 3/03 AJW

Mating Connector Part Number:
Deutsch IPD p/n DRC16-40SA or DRC18-40SA with sockets 0462-201-16141

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.

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