Preliminary
Technical Datasheet #TDAX185001

Thermocouple Scanner

20 Thermocouple Channels
CANopen®
P/N: AX185001

Description: The Thermocouple Scanner monitors up to 20 thermocouples and provides the temperature information to the engine control system over CANopen® CAN bus. The channels are independently configurable as Type J, K, B, E, N, R, S or T thermocouples. Temperature information can include exhaust temperature, winding temperature, and fluid temperature monitoring. All 20 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 thermocouple integrity. All inputs are fully isolated from the CAN line, and from the power supply. During set-up, using an USB-CAN converter and a PC, the operator can configure the controller using standard CANopen tools to suit a wide variety of applications. Settings are saved to non-volatile memory upon command.

The Thermocouple Scanner features rugged packaging and watertight TE Deutsch connectors for an IP67 rating.

Applications: Control systems for industrial and marine power generator sets (stationary or portable)

Ordering Part Numbers:

20 Channel Thermocouple Module, CANopen® P/N: **AX181501**
EDS File
Mating Plug Kit P/N: **AX070200**

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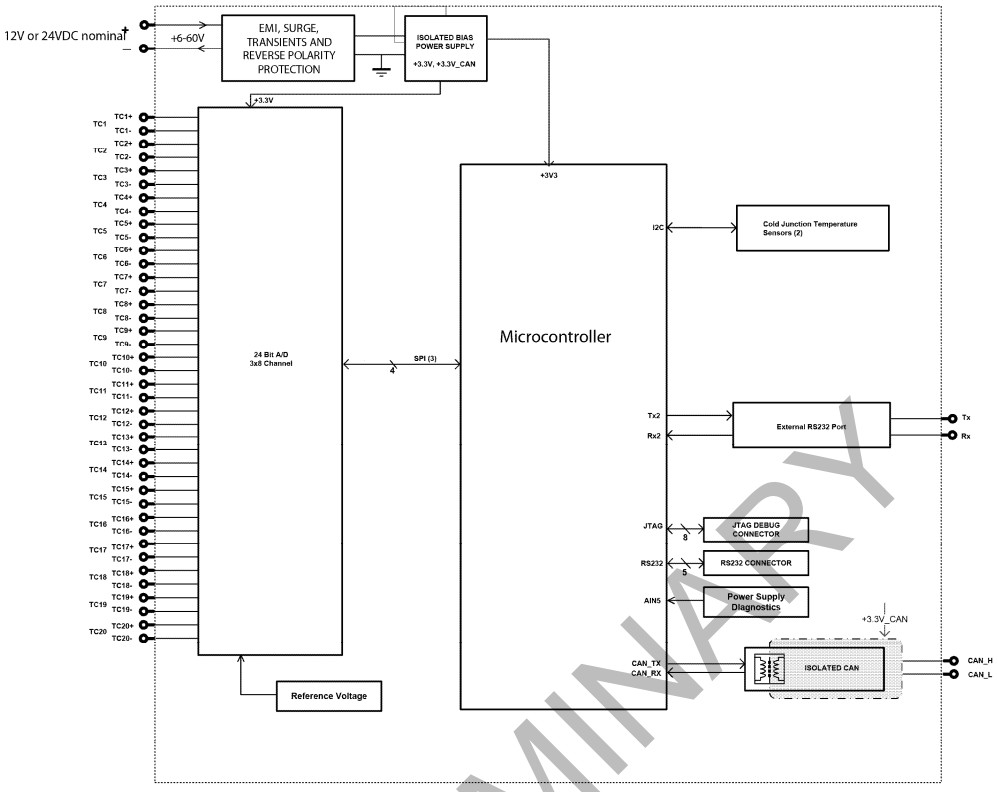
Block Diagram



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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 www.axiomatic.com/service.html.

Inputs

Power Supply Input	12V or 24VDC nominal (9…60 VDC power supply range)
Supply Current	TBD mA at 12 V Typical TBD mA at 24 V Typical
Protection	Reverse polarity protection is provided. Power supply input section protects against transient surges and short circuits and is isolated from thermocouple inputs
Thermocouple Types	Up to 20 channels, independently configurable for B, E, J, K, N, R, S or T
Thermocouple Inputs	The device reads mV signals from the supported Thermocouples. B = 0 to 13.82 mV E = -9.835 to 76.373 mV J = -8.095 to 69.553 mV K = -6.458 to 54.886 mV N = -4.345 to 47.513 mV R = -0.226 to 21.101 mV S = -0.236 to 18.693 mV T = -6.258 to 20.872 mV Temperatures are configured to indicate the SAE J1939 SPN to be transmitted by that temperature input. Accuracy: +/- 1°C typical with cold junction compensation at ambient temperature Resolution: 0.001°C
Scan Rate	100ms per channel, total sweep time maximum 2.2 seconds

Common Mode Readings	Input range +/- 2.5V maximum Rejection is 120db (maximum) at 2.5Vp-p (50-60Hz)
Thermal Drift	4 ppm/°C of span (maximum)
Isolation	Digital isolation is 500VDC from input to ground. Three-way isolation is provided for the CAN line, inputs and power supply.
veraging	The average temperature of all the active channels can be broadcasted to the network.
Protection	Open circuit detection Frozen data detection Over or under temperature detection High temperature shutdown detection

Communication

CAN	1 CAN 2.0B port, protocol CANopen® Digital isolation is provided for the CAN line.
Network Termination	According to the CAN standard, it is necessary to terminate the network with external termination resistors. The resistors are 120 Ohm, 0.25W minimum, metal film or similar type. They should be placed between CAN_H and CAN_L terminals at both ends of the network.
RS-232	1 RS-232 port is available for debugging purposes. ASCII Text Format, 115200 Baud Rate Data – 8-bit, Parity – None, Stop – 1 bit. Flow Control – Xon/Xoff. Short circuit protection to ground.

General Specifications

Microprocessor	STM32F205VG 12-bit, 1 Mbyte Flash Memory
Control Logic	User programmable functionality
Diagnostics	Configurable Diagnostic Messaging parameters Diagnostic Log is maintained in non-volatile memory. Each thermocouple channel could be configured to send diagnostic messages to the network if the temperature goes out of range.
User Interface	EDS File Standard CANopen tools (not supplied)
UL and cUL Compliance	Pending
CE Compliance	2004/108/EC (EMC Directive) pending 2011/65/EU (RoHS Directive)
Vibration	Pending
Shock	Pending
Operating Temperature Range	-40 to 85 ºC (-40 to 185 ºF)
Storage Temperature Range	-50 to 120 ºC (-58 to 248 ºF)
Humidity	Protected against 95% humidity non-condensing, 30 ºC to 60 ºC
Protection	IP67 Pollution Degree 3 per UL508 *The marine type approval process tested to IP56.*
Weight	2.2 lbs. (1.00 kg)
Enclosure	Rugged aluminum housing, stainless steel end plates, neoprene gaskets 145.30 x 149.00 x 73.00 mm (5.72 x 5.86 x 2.87”) L x W x H Connectors, TE Deutsch P/N: 1 8-pin DT13-08PA, 1 40-pin DRC13-40PA It can be mounted directly on the power generator set or remotely.

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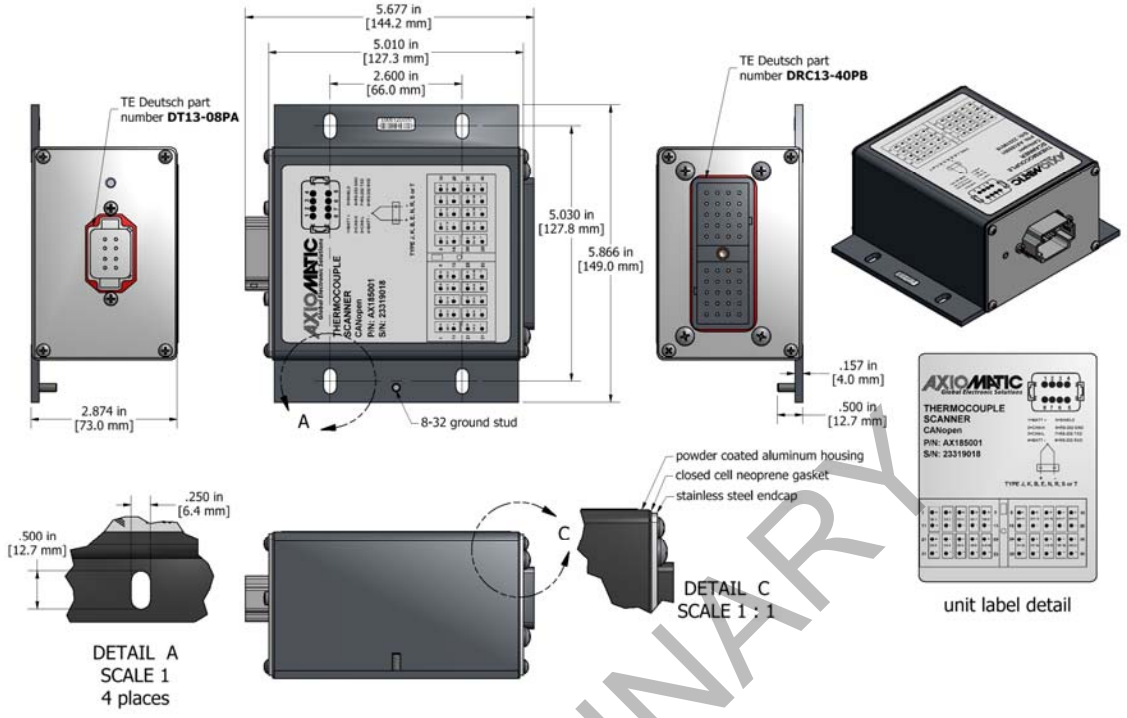
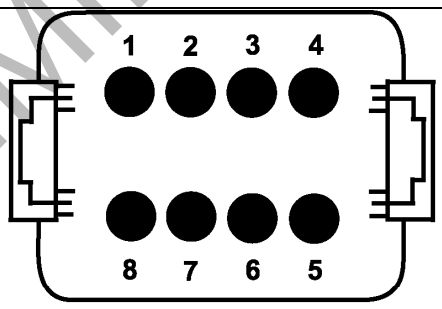
Dimensional Drawing



Electrical Pin Out – Power and CAN	 **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.)

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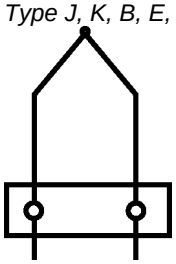
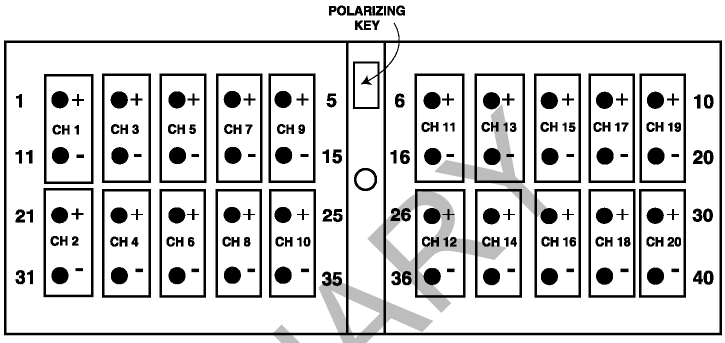
Electrical Pin Out - Thermocouples	*Type J, K, B, E, N, R, S or T*  + -  **FRONT VIEW OF MODULE MOUNTED CONNECTOR DEUTSCH P/N: DRC13-40PA** **Mating Connector Part Number:** TE Deutsch p/n DRC16-40SE-A or DRC18-40SA or DRC16-40S with sockets 0462-201-16141
Mating Plug Kit **AX070200**	This kit includes the following items. These items are also available from a local TE Deutsch distributor. *NB. The sealing plugs are only needed in cases where pins are not used.* A crimping tool from TE Deutsch is required to connect wiring to the sockets, P/N: HDT 48-00 or equivalent (not supplied).

TE Deutsch P/N:	***Description:***
0462-201-16141	48 16AWG SOCKETS SOLID 16-20AWG WIRE 6mm
114017	24 SEALING PLUGS SIZE 12-16 CAVITIES 12-18 AWG
DRC16-40S	40-PIN PLUG, No Key
DT06-08SA	DT SERIES PLUG 8 CONTACT
W8S	WEDGELOCK FOR DT 8 PIN PLUG

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

TDAX185001-11/25/20