

12 Digital Signal, 1 TC Inputs CAN Controller

12 Digital Signal Inputs

3 Universal Signal Inputs

1 TC Input

+5V Reference

SAE J1939

with Axiomatic Electronic Assistant

P/N: AX030340

Features:

- 12 digital inputs are user selectable from the following.
 - Active High/Active Low
- 3 universal signal inputs are selectable as: Voltage, Current, Resistance, Frequency, PWM or Digital.
- +5 V Reference to power sensors
- 1 TC input
- 12V, 24V or 48Vdc input power (nominal) with rugged surge protection
- 1 CAN (SAE J1939)
- CANopen® (P/N: AX030341)
- IP67
- CE/UKCA marking
- User configurable using Axiomatic Electronic Assistant



Applications:

- Engine controls for power generation, co-generation, stationary power
- Engine controls for commercial vehicles, off-highway equipment, etc.

Ordering Part Numbers:

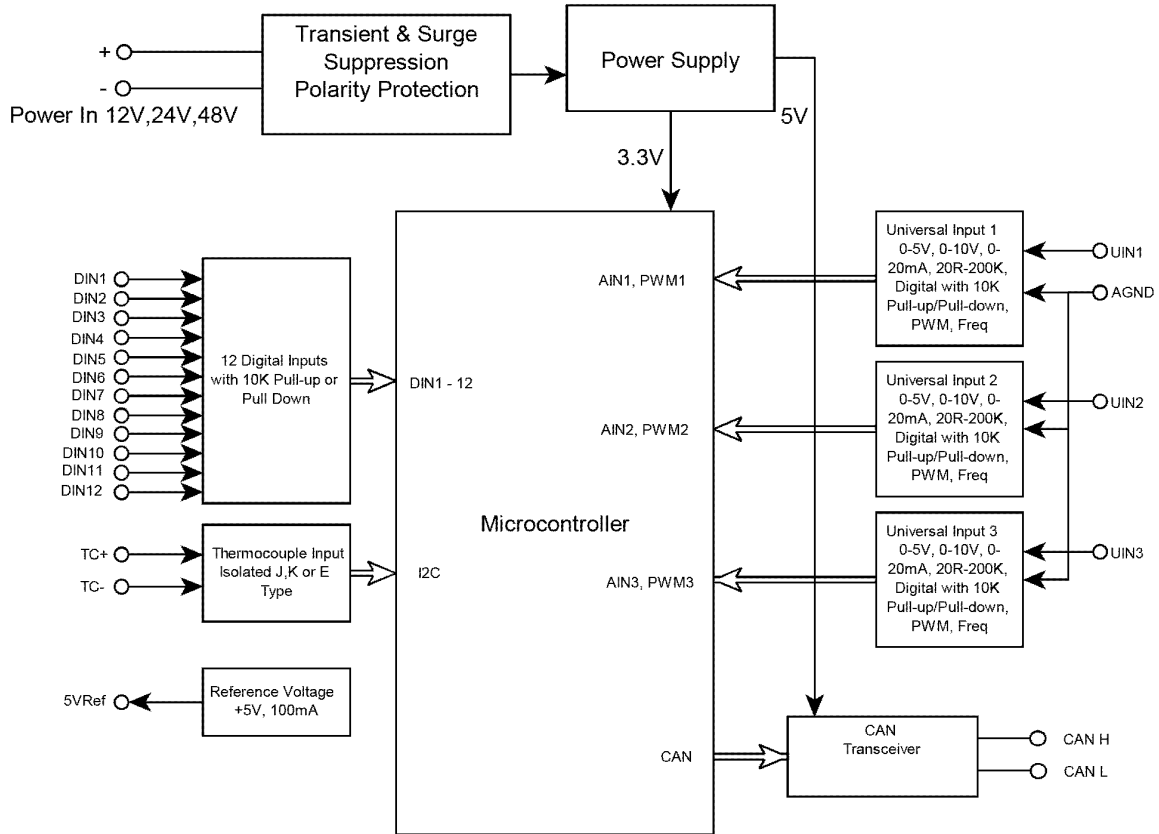
12 Digital Signal Inputs, 1 TC Input Controller, SAE J1939, Auto-baud-rate Detect: **AX030340**

12 Digital Signal Inputs, 1 TC Input Controller, CANopen®: **AX030341**

Electronic Assistant Configuration KIT, P/Ns: **AX070502**, **AX070505K**, or **AX070506K**

Accessories: **PL-DTM06-12SA-12SB** Mating Plug Kit

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:

Power Supply Input	12V, 24V, 48Vdc nominal (8...80Vdc power supply range)
Surge and Transients	Surge and transient protection up to 120 V is provided.
Reverse Polarity	Reverse polarity protection is provided up to -80V.
Under-voltage	Under-voltage protection is provided. Hardware shuts down at 6V.
Over-voltage	Over-voltage protection is provided. Hardware shuts down at 85 V.
Quiescent Current	69mA@12V, 36mA@24V
+5V Reference	One +5VDC, +/- 0.5%, 100mA maximum

Inputs:

Digital Inputs	12 Digital Signal Inputs Active High or Active Low Refer to Table 1.0.
Universal Inputs	3 Universal Signal Inputs selectable as Voltage, Current, Resistance, Frequency, PWM or Digital Refer to Table 2.0.
TC Input	One (1) Type J, K or E The device reads mV signals from the supported Thermocouples. E = -9.835 to 76.373 mV J = -8.095 to 69.553 mV K = -6.458 to 54.886 mV (Other TC types are available on request.)

Resolution	Temperature data is measured with a resolution of 0.1 °C. When sending data to the J1939 bus, one-byte parameters have a resolution of 0.1°C/ bit, an offset of -40°C 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.
Drift	Overall drift with temperature is 50ppm/°C of span (maximum).
Accuracy	+/- 1 °C throughout the entire range of the thermocouple input
Input Functionality	Temperature is measured in °C with a 0.1°C resolution. All inputs send a message to the J1939 bus. There are 2 setpoints for the TC input channel. The TC input channel is configured to indicate the SAE J1939 SPN to transmit the temperature measured by that input. The Parameter Group Number (PGN) that will be used to send a temperature to the J1939 network is dependent on the Suspect Parameter Number (SPN) that was selected for that channel. Refer to Table 3.0 for a list of supported SPN's. Regardless of the SPN selected, temperature is always available for the associated PGN. The controller supports all the temperature SPNs as defined in J1939-71 as of January 2009. In order to allow for future expansion, the user can select a "User Defined" SPN (0) which enables a variety of setpoints associated with transmitting the data on the network. This allows the user to select the PGN, size (1 or 2 bytes), data index and repetition rate of the message that will broadcast the temperature for the TC input channel. To use the J1939 capabilities, refer to the user manual for details.
Measurement Rate	The measurement rate is 5 scans/Sec. The update rate is 200 mSec.
Common Mode	Common mode rejection is >110 db@ 5V p-p (programmable for either 50 or 60 Hz). Common mode input range is +/- 4 V minimum.
Ground	2 signal ground connections are provided.

Table 1.0 – Digital Inputs	
Digital Inputs	Up to 12 digital inputs are available. The digital inputs can be configured for any one of the following options. <ul style="list-style-type: none"> • Disable Input • Digital Input Active High • Digital Input Active Low Active High Min. 3V to +Vsupply Active Low GND to Max. 1.3V Pull up/ Pull down 10 KOhm Input voltage maximum is +Vps.
Protection	Protected against shorts to GND or +Vsupply

Table 2.0: Universal Inputs

Parameter	Value												
Universal Inputs	Three (3) Universal Signal Inputs are provided.												
Analog Input Modes	Voltage, Current, Resistance												
Voltage Input	<table border="1"> <thead> <tr> <th>Input Range</th> <th>Input Impedance</th> <th>Resolution</th> <th>Accuracy</th> </tr> </thead> <tbody> <tr> <td>0...5V</td> <td>204 kOhm</td> <td>12-bit</td> <td>+/- 1%</td> </tr> <tr> <td>0...10V</td> <td>136 kOhm</td> <td>12-bit</td> <td>+/- 1%</td> </tr> </tbody> </table>	Input Range	Input Impedance	Resolution	Accuracy	0...5V	204 kOhm	12-bit	+/- 1%	0...10V	136 kOhm	12-bit	+/- 1%
	Input Range	Input Impedance	Resolution	Accuracy									
	0...5V	204 kOhm	12-bit	+/- 1%									
0...10V	136 kOhm	12-bit	+/- 1%										
Current Input	<table border="1"> <thead> <tr> <th>Input Range</th> <th>Input Impedance</th> <th>Resolution</th> <th>Accuracy</th> </tr> </thead> <tbody> <tr> <td>0...20mA</td> <td rowspan="2">124Ohm</td> <td rowspan="2">12-bit</td> <td rowspan="2">+/- 1%</td> </tr> <tr> <td>4...20mA</td> </tr> </tbody> </table>	Input Range	Input Impedance	Resolution	Accuracy	0...20mA	124Ohm	12-bit	+/- 1%	4...20mA			
	Input Range	Input Impedance	Resolution	Accuracy									
	0...20mA	124Ohm	12-bit	+/- 1%									
4...20mA													
Resistive Input	<table border="1"> <thead> <tr> <th>Input Range</th> <th>Resolution</th> <th>Accuracy</th> </tr> </thead> <tbody> <tr> <td>Auto Range 20...250kOhm¹</td> <td>12-bit</td> <td>+/- 1%</td> </tr> </tbody> </table>	Input Range	Resolution	Accuracy	Auto Range 20...250kOhm ¹	12-bit	+/- 1%						
	Input Range	Resolution	Accuracy										
Auto Range 20...250kOhm ¹	12-bit	+/- 1%											
¹ Resistance <20 Ohm is measured as 0.													
Analog Update Rate	1.67ms minimum ¹ . ¹ Depends on the analog filter settings. In resistive mode also depends on the number of resistive inputs.												
Digital Input Modes	Discrete Voltage Level, Frequency, PWM Duty Cycle												
Input Polarity	Active High, Active Low												
Input Impedance	>1MOhm, High Z, 10kOhm pull down, 10kOhm pull-up to +6V												
Amplitude	Amplitude: 3.3V to +Vsupply												
Input Level	5V CMOS Compatible. A direct connection to the power supply is acceptable.												
Discrete Voltage Level	1ms sampling rate. Configurable debouncing												

Parameter	Value				
Input					
Frequency Input	Input Number	Counter Resolution	Frequency Range	Resolution	Accuracy
	Universal Input #1...3	16-bit	100Hz...20kHz	<0.0017...0.17%	<0.5%
			10Hz...1kHz		
			1Hz...100Hz		
PWM Duty Cycle Input	Input Number	Counter Resolution	Frequency Range	Resolution	Accuracy
Universal Input #1...3	16-bit	100Hz...20kHz	0.01%	+/- 1%	
		10Hz...1kHz			
		1Hz...100Hz			
0...100% Duty Cycle Range. DC is included. 1 MOhm impedance					
Protection	+36V maximum. Positive voltage only. No reverse polarity protection.				

Table 3.0: Supported Suspect Parameter Numbers

SPN	Description	Size	PGN	Rate	Index	Priority
52	Engine Intercooler Temperature	1	65262	1000	7	6
75	Steering Axle Temperature	1	65273	1000	1	6
79	Road Surface Temperature	2	65269	1000	7	6
90	Power Takeoff Oil Temperature	1	65264	100	1	6
105	Engine Intake Manifold 1 Temperature	1	65270	500	3	6
110	Engine Coolant Temperature	1	65262	1000	1	6
120	Hydraulic Retarded Oil Temperature	1	65275	1000	2	6
169	Cargo Ambient Temperature	2	65276	1000	5	6
170	Cab Interior Temperature	2	65269	1000	2	6
171	Ambient Air Temperature	2	65269	1000	4	6
172	Engine Air Inlet Temperature	1	65269	1000	6	6
173	Engine Exhaust Gas Temperature	2	65270	500	6	6
174	Engine Fuel Temperature 1	1	65262	1000	2	6
175	Engine Oil Temperature 1	2	65262	1000	3	6
176	Engine Turbocharger Oil Temperature	2	65262	1000	5	6
177	Transmission Oil Temperature	2	65272	1000	5	6
242	Tire Temperature	2	65268	1000 0	3	6
412	Engine Exhaust Gas Recirculation 1 Temperature	2	65188	1000	7	6
441	Auxiliary Temperature 1	1	65164	0	1	7
442	Auxiliary Temperature 2	1	65164	0	2	7
578	Drive Axle Temperature	1	65273	1000	4	6
1122	Engine Alternator Bearing 1 Temperature	1	65191	1000	1	7
1123	Engine Alternator Bearing 2 Temperature	1	65191	1000	2	7
1124	Engine Alternator Winding 1 Temperature	1	65191	1000	3	7
1125	Engine Alternator Winding 2 Temperature	1	65191	1000	4	7
1126	Engine Alternator Winding 3 Temperature	1	65191	1000	5	7
1131	Engine Intake Manifold 2 Temperature	1	65189	500	1	6
1132	Engine Intake Manifold 3 Temperature	1	65189	500	2	6
1133	Engine Intake Manifold 4 Temperature	1	65189	500	3	6
1135	Engine Oil Temperature 2	2	65188	1000	1	6
1136	Engine ECU Temperature	2	65188	1000	3	6
1137	Engine Exhaust Gas Port 1 Temperature	2	65187	1000	1	6
1138	Engine Exhaust Gas Port 2 Temperature	2	65187	1000	3	6

1139	Engine Exhaust Gas Port 3 Temperature	2	65187	1000	5	6
1140	Engine Exhaust Gas Port 4 Temperature	2	65187	1000	7	6
1141	Engine Exhaust Gas Port 5 Temperature	2	65186	1000	1	6
1142	Engine Exhaust Gas Port 6 Temperature	2	65186	1000	3	6
1143	Engine Exhaust Gas Port 7 Temperature	2	65186	1000	5	6
1144	Engine Exhaust Gas Port 8 Temperature	2	65186	1000	7	6
1145	Engine Exhaust Gas Port 9 Temperature	2	65185	1000	1	6
1146	Engine Exhaust Gas Port 10 Temperature	2	65185	1000	3	6
1147	Engine Exhaust Gas Port 11 Temperature	2	65185	1000	5	6
1148	Engine Exhaust Gas Port 12 Temperature	2	65185	1000	7	6
1149	Engine Exhaust Gas Port 13 Temperature	2	65184	1000	1	6
1150	Engine Exhaust Gas Port 14 Temperature	2	65184	1000	3	6
1151	Engine Exhaust Gas Port 15 Temperature	2	65184	1000	5	6
1152	Engine Exhaust Gas Port 16 Temperature	2	65184	1000	7	6
1153	Engine Exhaust Gas Port 17 Temperature	2	65183	1000	1	6
1154	Engine Exhaust Gas Port 18 Temperature	2	65183	1000	3	6
1155	Engine Exhaust Gas Port 19 Temperature	2	65183	1000	5	6
1156	Engine Exhaust Gas Port 20 Temperature	2	65183	1000	7	6
1157	Engine Main Bearing 1 Temperature	2	65182	1000	1	6
1158	Engine Main Bearing 2 Temperature	2	65182	1000	3	6
1159	Engine Main Bearing 3 Temperature	2	65182	1000	5	6
1160	Engine Main Bearing 4 Temperature	2	65182	1000	7	6
1161	Engine Main Bearing 5 Temperature	2	65181	1000	1	6
1162	Engine Main Bearing 6 Temperature	2	65181	1000	3	6
1163	Engine Main Bearing 7 Temperature	2	65181	1000	5	6
1164	Engine Main Bearing 8 Temperature	2	65181	1000	7	6
1165	Engine Main Bearing 9 Temperature	2	65180	1000	1	6
1166	Engine Main Bearing 10 Temperature	2	65180	1000	3	6
1167	Engine Main Bearing 11 Temperature	2	65180	1000	5	6
1172	Engine Turbocharger 1 Compressor Inlet Temperature	2	65178	1000	1	6
1173	Engine Turbocharger 2 Compressor Inlet Temperature	2	65178	1000	3	6
1174	Engine Turbocharger 3 Compressor Inlet Temperature	2	65178	1000	5	6
1175	Engine Turbocharger 4 Compressor Inlet Temperature	2	65178	1000	7	6
1180	Engine Turbocharger 1 Turbine Inlet Temperature	2	65176	1000	1	6
1181	Engine Turbocharger 2 Turbine Inlet Temperature	2	65176	1000	3	6
1182	Engine Turbocharger 3 Turbine Inlet Temperature	2	65176	1000	5	6
1183	Engine Turbocharger 4 Turbine Inlet Temperature	2	65176	1000	7	6
1184	Engine Turbocharger 1 Turbine Outlet Temperature	2	65175	1000	1	6
1185	Engine Turbocharger 2 Turbine Outlet Temperature	2	65175	1000	3	6
1186	Engine Turbocharger 3 Turbine Outlet Temperature	2	65175	1000	5	6
1187	Engine Turbocharger 4 Turbine Outlet Temperature	2	65175	1000	7	6
1212	Engine Auxiliary Coolant Temperature	1	65172	500	2	6
1636	Engine Intake Manifold 1 Air Temperature (High Resolution)	2	65129	1000	1	6
1637	Engine Coolant Temperature (High Resolution)	2	65129	1000	3	6
1638	Hydraulic Temperature	1	65128	1000	1	6
1687	Auxiliary Heater Outlet Coolant Temperature	1	65133	1000	1	6
1688	Auxiliary Heater Input Air Temperature	1	65133	1000	2	6
1800	Battery 1 Temperature	1	65104	1000	1	6
1801	Battery 2 Temperature	1	65104	1000	2	6
1802	Engine Intake Manifold 5 Temperature	1	65189	500	4	6
1803	Engine Intake Manifold 6 Temperature	1	65189	500	5	6

2433	Engine Exhaust Gas Temperature - Right Manifold	2	65031	500	1	6
2434	Engine Exhaust Gas Temperature - Left Manifold	2	65031	500	3	6
2629	Engine Turbocharger 1 Compressor Outlet Temperature	2	64979	1000	1	6
2630	Engine Charge Air Cooler 1 Outlet Temperature	2	65129	1000	7	6
2799	Engine Turbocharger 2 Compressor Outlet Temperature	2	64979	1000	3	6
2800	Engine Turbocharger 3 Compressor Outlet Temperature	2	64979	1000	5	6
2801	Engine Turbocharger 4 Compressor Outlet Temperature	2	64979	1000	7	6
2986	Engine Intake Valve Actuation System Oil Temperature	2	65129	1000	5	6
3031	Aftertreatment 1 SCR Catalyst Tank Temperature	1	65110	1000	2	6
3241	Aftertreatment 1 Exhaust Gas Temperature 1	2	64948	500	1	6
3242	Aftertreatment 1 Diesel Particulate Filter Intake Gas Temperature	2	64948	500	3	6
3245	Aftertreatment 1 Exhaust Gas Temperature 3	2	64947	500	1	6
3246	Aftertreatment 1 Diesel Particulate Filter Outlet Gas Temperature	2	64947	500	3	6
3249	Aftertreatment 1 Exhaust Gas Temperature 2	2	64946	500	1	6
3250	Aftertreatment 1 Diesel Particulate Filter Intermediate Gas Temperature	2	64946	500	3	6
3275	Aftertreatment 2 Exhaust Gas Temperature 1	2	64945	500	1	6
3276	Aftertreatment 2 Diesel Particulate Filter Intake Gas Temperature	2	64945	500	3	6
3279	Aftertreatment 2 Exhaust Gas Temperature 3	2	64944	500	1	6
3280	Aftertreatment 2 Diesel Particulate Filter Outlet Gas Temperature	2	64944	500	3	6
3283	Aftertreatment 2 Exhaust Gas Temperature 2	2	64943	500	1	6
3284	Aftertreatment 2 Diesel Particulate Filter Intermediate Gas Temperature	2	64943	500	3	6
3468	Engine Fuel Temperature 2	1	64930	500	5	4
3515	Aftertreatment 1 SCR Catalyst Reagent Temperature 2	1	64923	1000	1	6
3823	Transmission Torque Converter Oil Outlet Temperature	2	64917	1000	2	6
3831	Aftertreatment 1 Secondary Air Temperature	2	64877	500	3	6
3834	Aftertreatment 2 Secondary Air Temperature	2	64876	500	3	6
4076	Engine Coolant Temperature 2	1	64870	1000	1	6
4151	Engine Exhaust Gas Temperature Average	2	64851	500	1	5
4152	Engine Exhaust Gas Temperature Average - Bank 2	2	64851	500	3	5
4153	Engine Exhaust Gas Temperature Average - Bank 1	2	64851	500	5	5
4193	Engine Coolant Pump Outlet Temperature	1	64870	1000	2	6
4288	Engine Exhaust Valve Actuation System Oil Temperature	2	64870	1000	4	6
4289	Aftertreatment 1 Three Way Catalytic Converter Intake Gas Temperature	2	64838	500	1	6
4290	Aftertreatment 1 Three Way Catalytic Converter Outlet Gas Temperature	2	64838	500	3	6
4295	Aftertreatment 2 Three Way Catalytic Converter Intake Gas Temperature	2	64837	500	1	6
4296	Aftertreatment 2 Three Way Catalytic Converter Outlet Gas Temperature	2	64837	500	3	6
4337	Aftertreatment 1 SCR Dosing Reagent Temperature	1	64833	500	3	6
4360	Aftertreatment 1 SCR Catalyst Intake Gas Temperature	2	64830	500	1	6
4363	Aftertreatment 1 SCR Catalyst Outlet Gas Temperature	2	64830	500	4	6
4368	Aftertreatment 1 SCR Catalyst Reagent Tank 2 Temperature	1	64829	1000	2	6
4390	Aftertreatment 2 SCR Dosing Reagent Temperature	1	64827	500	3	6
4413	Aftertreatment 2 SCR Catalyst Intake Gas Temperature	2	64824	500	1	6
4415	Aftertreatment 2 SCR Catalyst Outlet Gas Temperature	2	64824	500	4	6
4420	Aftertreatment 2 SCR Catalyst Reagent Temperature 2	1	64822	1000	1	6
4427	Aftertreatment 2 SCR Catalyst Tank Temperature	1	64821	1000	2	6
4434	Aftertreatment 2 SCR Catalyst Reagent Tank 2 Temperature	1	64820	1000	2	6
4750	Engine Exhaust Gas Recirculation 1 (EGR1) Cooler Intake	2	64879	0	3	6

	Temperature					
4753	Aftertreatment 1 Gas Oxidation Catalyst Intake Gas Temperature	2	64802	500	1	6
4754	Aftertreatment 1 Gas Oxidation Catalyst Outlet Gas Temperature	2	64802	500	3	6
4759	Aftertreatment 2 Gas Oxidation Catalyst Intake Gas Temperature	2	64801	500	1	6
4760	Aftertreatment 2 Gas Oxidation Catalyst Outlet Gas Temperature	2	64801	500	3	6
4765	Aftertreatment 1 Diesel Oxidation Catalyst Intake Gas Temperature	2	64800	500	1	6
4766	Aftertreatment 1 Diesel Oxidation Catalyst Outlet Gas Temperature	2	64800	500	3	6
4771	Aftertreatment 2 Diesel Oxidation Catalyst Intake Gas Temperature	2	64799	500	1	6
4772	Aftertreatment 2 Diesel Oxidation Catalyst Outlet Gas Temperature	2	64799	500	3	6
4809	Aftertreatment 1 Warm Up Diesel Oxidation Catalyst Intake Temperature	2	64794	500	1	6
4810	Aftertreatment 1 Warm Up Diesel Oxidation Catalyst Outlet Temperature	2	64794	500	3	6
5020	Engine Exhaust Gas Recirculation 1 (EGR1) Mixer Intake Temperature	2	64870	1000	6	6
5148	Low Voltage Disconnect Temperature	1	64769	500	4	6
5255	Engine Exhaust Gas Recirculation 2 (EGR2) Temperature	2	64767	1000	1	6
5256	Engine Exhaust Gas Recirculation 2 (EGR2) Mixer Intake Temperature	2	64767	1000	3	6
5258	Engine Exhaust Gas Recirculation 2 (EGR2) Cooler Intake Temperature	2	64766	0	1	6
5280	Engine Charge Air Cooler 1 Precooler Intake Temperature	2	64759	1000	1	6
5281	Engine Charge Air Cooler 1 Precooler Outlet Temperature	2	64759	1000	3	6
5283	Engine Charge Air Cooler 1 Intake Temperature	2	64758	1000	1	6
5284	Engine Charge Air Cooler 1 Ambient Air Temperature	2	64758	1000	3	6
5286	Engine Charge Air Cooler 2 Precooler Intake Temperature	2	64757	1000	1	6
5287	Engine Charge Air Cooler 2 Precooler Outlet Temperature	2	64757	1000	3	6
5289	Engine Charge Air Cooler 2 Intake Temperature	2	64756	1000	1	6
5290	Engine Charge Air Cooler 2 Outlet Temperature	2	64756	1000	3	6
5291	Engine Charge Air Cooler 2 Ambient Air Temperature	2	64756	1000	5	6
5315	Aftertreatment 2 Warm Up Diesel Oxidation Catalyst Intake Temperature	2	64749	500	1	6
5316	Aftertreatment 2 Warm Up Diesel Oxidation Catalyst Outlet Temperature	2	64749	500	3	6
5456	Aftertreatment 1 Hydrocarbon Doser Intake Fuel Temperature	1	64869	500	6	6

Output Specifications

CAN Messages	SAE J1939
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Control Logic:

Software Platform	Pre-programmed with standard logic. Refer to the user manual. (Application-specific control logic is available on request.)
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<p>Function Blocks</p>	<p>Standard embedded software is provided and is configurable using the Axiomatic Electronic Assistant (EA). The user can configure the control logic using the following Function Blocks.</p> <p>For more details on control logic, refer to the User Manual.</p> <ul style="list-style-type: none"> • The Input Function Block allows the user to configure the input type. Normal, inverse and latched options are available for Universal and Digital input types. Pull-up or Pull-down resistors can be enabled or disabled for Frequency, PWM or Digital Input types. Frequency/RPM or PWM input types have a Debounce setpoint to select an input capture filter. Digital inputs can be configured as Active High or Active Low. Minimum and maximum range setpoints define the range of the signal input as a control source. Input filtering is selectable. • The Constant Data Function Block allows for a list of constant data values to be used by the other function blocks. The EA configures the constant data points. • The Variable Data Function Block allows for measured process parameters to be stored in a variable memory. • The Diagnostic Function Block supports SAE J1939 DM1, DM2, DM3, DM11 messages. Fault diagnostics are not available for the digital input types. In addition to input/output faults, the controller can detect and react to power supply fault, over temperature fault and communication fault. • Simple Math Function Blocks allow the user to define basic algorithms. Each block can take up to 2 input signals and performs one function which is then scaled according to an associated limit and scaling setpoints. • The Simplified Timer Function Block allows the user to toggle between two signal sources for a user configurable delay time. • The Set-Reset Block implements Set-Reset logic with user configurable Set and Reset sources. • The Simple Conditional Blocks implement conditional logic using up to 4 signal sources. • The DTC React Function Block allows for a received DTC from another device on the CAN network to disable an output or act as an input to a function block. • The CAN Transmit Function Block sends any output from another function block to the CAN network. Each CAN Transmit Message has several setpoints. Refer to the User Manual for details. By default, all messages are sent on Proprietary B PGN's as broadcast messages. • The CAN Receive Message Function Block is designed to take any SPN from the CAN network and use it as an input to another function block. <p>The EA will allow for the selection of any ECN Address from 0 to 253 (default is 128). Setpoint configuration files can be saved and used to program additional controllers.</p>
<p>FMI</p>	<p>There are four FMIs associated with each thermocouple channel and include the following functions: High Temperature Shutdown; High Temperature Warning; Low Temperature Warning; and Thermocouple Open Circuit.</p>
<p>Diagnostics</p>	<p>The controller stores diagnostic data in a non-volatile log. There are four diagnostic log entries associated with each input channel. Each entry is a record of the SPN, FMI and OC for any fault that has occurred. There are eight setpoints associated with if and how the ECU will send diagnostic messages for each channel. For more details refer to the user manual.</p>

General Specifications

Microcontroller	STM32F427VI, 32-bit, 2MByte flash memory
Isolation	Full isolation of TC input channel from the CAN line, other inputs and power supply. 200Vrms
CAN Interface	<p>1 CAN port (SAE J1939) (CANopen® model is AX030341)</p> <p>The software was designed to provide flexibility and provides the following.</p> <ul style="list-style-type: none"> • Configurable ECU Instance in the NAME (for multiple ECU's on the network) • Configurable SPN for each channel • Configurable Diagnostic Messaging Parameters, as required • Diagnostic Log, maintained in non-volatile memory <p><i>Note: Configurable parameters are also called setpoints.</i></p> <p>The controller is compliant with Bosch CAN protocol specification, Rev.2.0, Part B, and the following J1939 standards.</p> <ul style="list-style-type: none"> o SAE J1939-21, December 2006, Data Link Layer o SAE J1939-71, January 2009, Application Layer o SAE J1939-73, September 2006, Application Layer – Diagnostic SAE J1939-81, May 2003, Network Management
Baud Rate	SAE J1939, 250kbit/s, 500kbit/s, 667kbit/s, 1Mbit/s. Automatic Baud Rate Detection
Protection for CAN port	Short circuit to ground
User Interface	The Axiomatic Electronic Assistant KIT includes the USB-CAN Converter, cables and Axiomatic EA Software. The Axiomatic Electronic Assistant is for Windows operating systems. It comes with a royalty-free license for use.
Compliance	CE/UKCA marking: EMC Directive RoHS Directive Exempt from Low Voltage Directive
Vibration	Random Vibration: 7.65 Grms peak Sinusoidal Component: 10 g peak Based on MIL-STD-202G, Methods 204G and 214A
Shock	50 g half sine pulse, 6 x 6ms per axis Based on MIL-STD-202G, Method 213B, Test Condition A
ISO 11898	120Ohm terminated twisted pair, baud rate up to 1Mbit/s. External 120Ohm termination is required.
Operating Temperature	-40 to 85 °C (-40 to 185 °F)
Storage Temperature	-50 to 125 °C (-58 to 257 °F)
Protection	IP67, PCB is conformal coated and protected by the enclosure.
Weight	0.55 lb. (0.23 kg) (preliminary)
Enclosure and Dimensions	High Temperature Nylon Enclosure – (equivalent TE Deutsch P/N: EEC-325X4B) Flammability Rating: UL 94V-0 Refer to dimensional drawing.

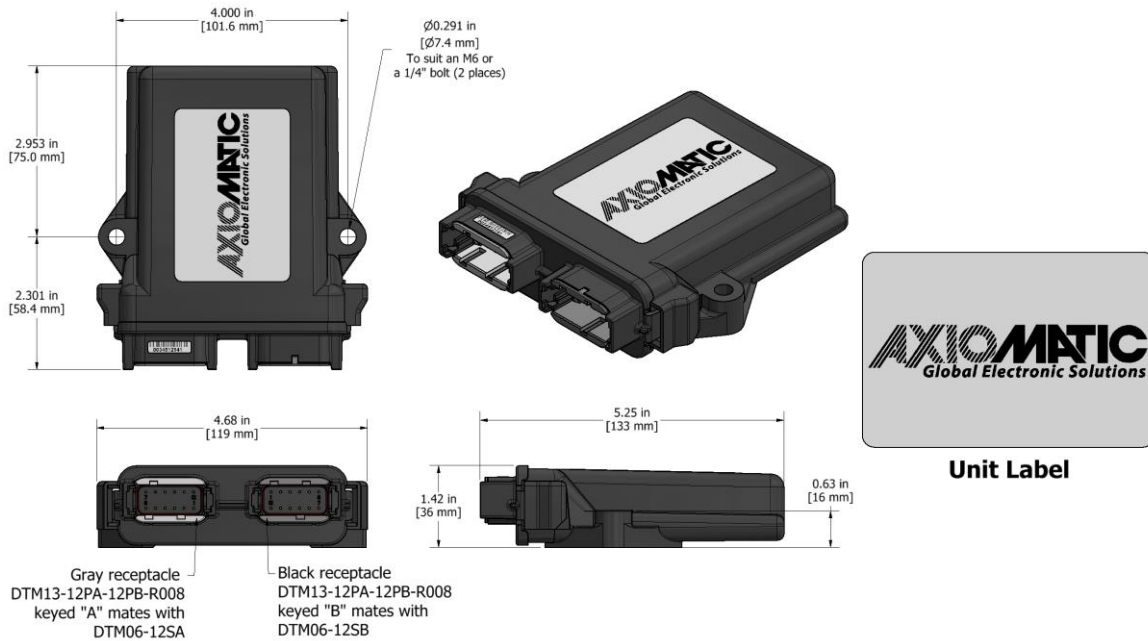


Figure 1.0 – Dimensional Drawing

Electrical Connections																																																					
<p>24 pin receptacle (equivalent TE Deutsch P/N: DTM13-12PA-12PB-R008) Mating plug: equivalent to the TE Deutsch P/Ns: DTM06-12SA and DTM06-12SB, with 2 wedgelocks (WM12S) and 24 contacts (0462-201-20141). 20 AWG wire is recommended for use with contacts 0462-201-20141.</p> <p>Key Arrangement B (black)</p> <p>Key Arrangement A (grey)</p> <p>FRONT VIEW 24 PIN RECEPTACLE</p> <table border="1"> <thead> <tr> <th colspan="2">Grey Connector</th> <th colspan="2">Black Connector</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Digital Input 10</td> <td>1</td> <td>CAN_H</td> </tr> <tr> <td>2</td> <td>Digital Input 9</td> <td>2</td> <td>CAN_L</td> </tr> <tr> <td>3</td> <td>Digital Input 8</td> <td>3</td> <td>Universal Input 1</td> </tr> <tr> <td>4</td> <td>Digital Input 7</td> <td>4</td> <td>Universal Input 2</td> </tr> <tr> <td>5</td> <td>Digital Input 6</td> <td>5</td> <td>Universal Input 3</td> </tr> <tr> <td>6</td> <td>Power+</td> <td>6</td> <td>+5V Reference</td> </tr> <tr> <td>7</td> <td>Power -</td> <td>7</td> <td>Universal IN GND</td> </tr> <tr> <td>8</td> <td>Digital Input 5</td> <td>8</td> <td>TC_Input -</td> </tr> <tr> <td>9</td> <td>Digital Input 4</td> <td>9</td> <td>TC_Input +</td> </tr> <tr> <td>10</td> <td>Digital Input 3</td> <td>10</td> <td>Input GND</td> </tr> <tr> <td>11</td> <td>Digital Input 2</td> <td>11</td> <td>Digital Input 11</td> </tr> <tr> <td>12</td> <td>Digital Input 1</td> <td>12</td> <td>Digital Input 12</td> </tr> </tbody> </table>		Grey Connector		Black Connector		1	Digital Input 10	1	CAN_H	2	Digital Input 9	2	CAN_L	3	Digital Input 8	3	Universal Input 1	4	Digital Input 7	4	Universal Input 2	5	Digital Input 6	5	Universal Input 3	6	Power+	6	+5V Reference	7	Power -	7	Universal IN GND	8	Digital Input 5	8	TC_Input -	9	Digital Input 4	9	TC_Input +	10	Digital Input 3	10	Input GND	11	Digital Input 2	11	Digital Input 11	12	Digital Input 1	12	Digital Input 12
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<p>Mounting</p>	<p>Mounting holes sized for ¼ inch or M6 bolts. The bolt length will be determined by the end-user's mounting plate thickness. The mounting flange of the controller is 0.63 inches (16 mm) thick. If the module is mounted without an enclosure, it should be mounted vertically with connectors facing left and right to reduce likelihood of moisture entry. The 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.</p> <p>All field wiring should be suitable for the operating temperature range.</p> <p>Install the unit with appropriate space available for servicing and for adequate wire h (6 inches or 15 cm) and strain relief (12 inches or 30 cm).</p>
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Notes:

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Form: TDAX030340-05/31/23