

10 Universal Signal Inputs CAN Controller

CANopen®

*Voltage, Current, PWM, Frequency/RPM, Counter, or Digital Inputs
5 V Reference*

EDS File for Configuration

P/N: AX030121A

Features

- 10 signal inputs user selectable as 0-5 V, 0-10 V, 0-20 mA, 4-20 mA, Frequency/RPM, PWM, Counter, and Digital
- 12, 24, or 48 VDC (nominal) power input
- 5 V reference voltage
- 1 CAN port (CANopen®) (SAE J1939 model P/N: AX030120A)
- EMC Compliance
- Rugged TE Deutsch enclosure and connectors
- Standard control logic
- EDS provided to interface with the device using standard CANopen® tools



Applications

The controller is designed to meet the rugged demands of construction equipment, power generator sets, and heavy-duty industrial machine control applications.

Ordering Part Numbers

10 Universal Signal Inputs, 1 CANopen® - P/N: **AX030121A**

SAE J1939 model - P/N: **AX030120A**

Accessories:

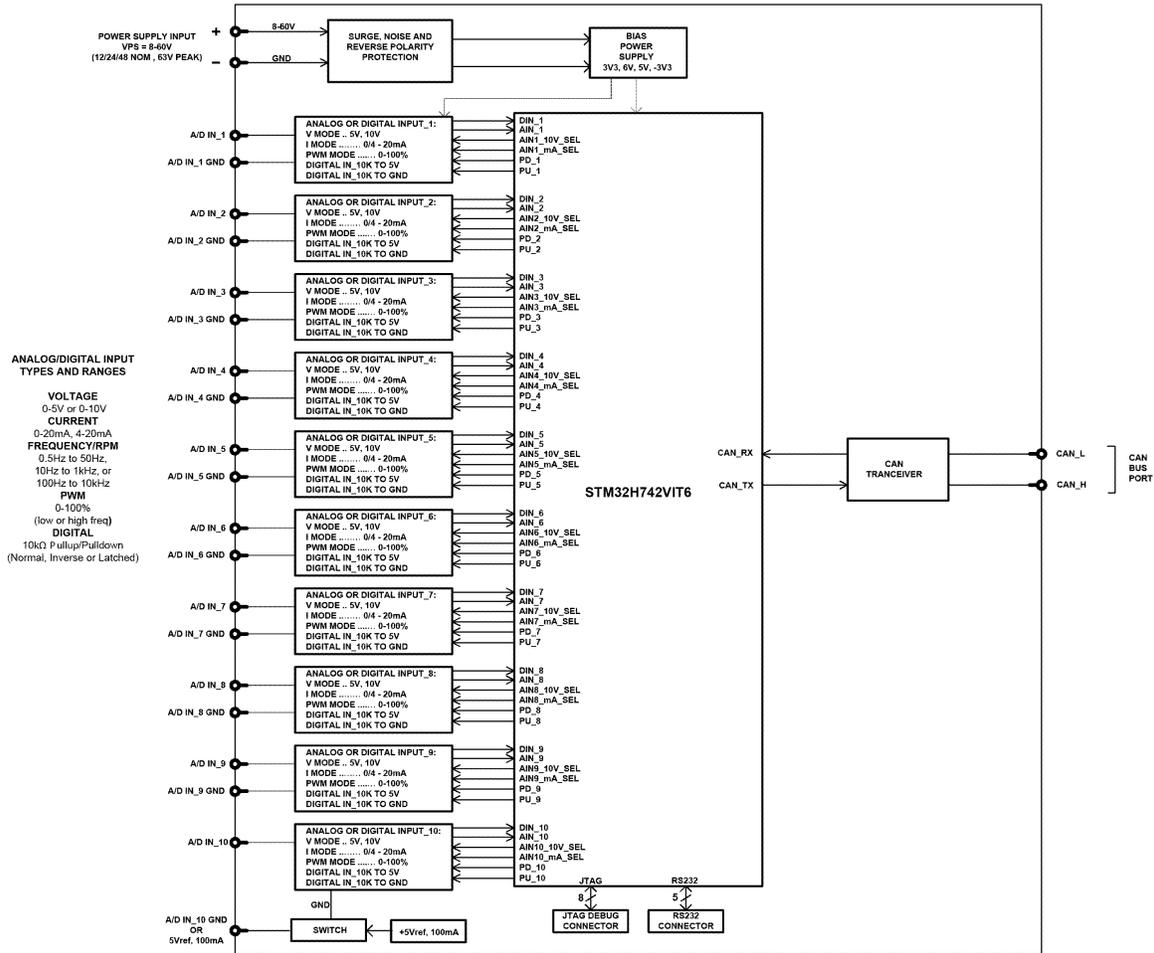
EDS File

PL-DTM06-12SA-12SB Mating Plug KIT

Description

The 10 Universal Signal Input Module accepts up to 10 analog or digital type inputs (0-5 V, 0-10 V, 0-20 mA or 4-20 mA, PWM, Frequency/RPM, Counter, or Digital). The modules can be connected to a variety of analog machine sensors or levers, PLCs, switches, PWM signals, etc. It interfaces with the machine's CAN network (CANopen®). Standard embedded software is provided. The rugged IP67 rated enclosure and a wide-ranging power supply input section for 12, 24, or 48 VDC power makes the module suitable for applications in the harsh environment of mobile equipment with on-board battery power. All objects are user configurable through Axiomatic-provided EDS file using commercially available CANopen® tools.

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

Power Supply Input	12, 24, or 48 VDC nominal operating voltage 8 to 60 VDC power supply range for voltage transients
Quiescent Current	114.9 mA @12 V; 59.6 mA @ 24 V; 29 mA @ 48 V (typical)
Surge and Transient Protection	Provided
Reverse Polarity Protection	Provided
Undervoltage Protection	Provided. Hardware shutdown at 5.7 V
Overvoltage Protection	Provided. Hardware shutdown at 62.5 V
Reference Voltage	5 V, 100 mA ±2 %

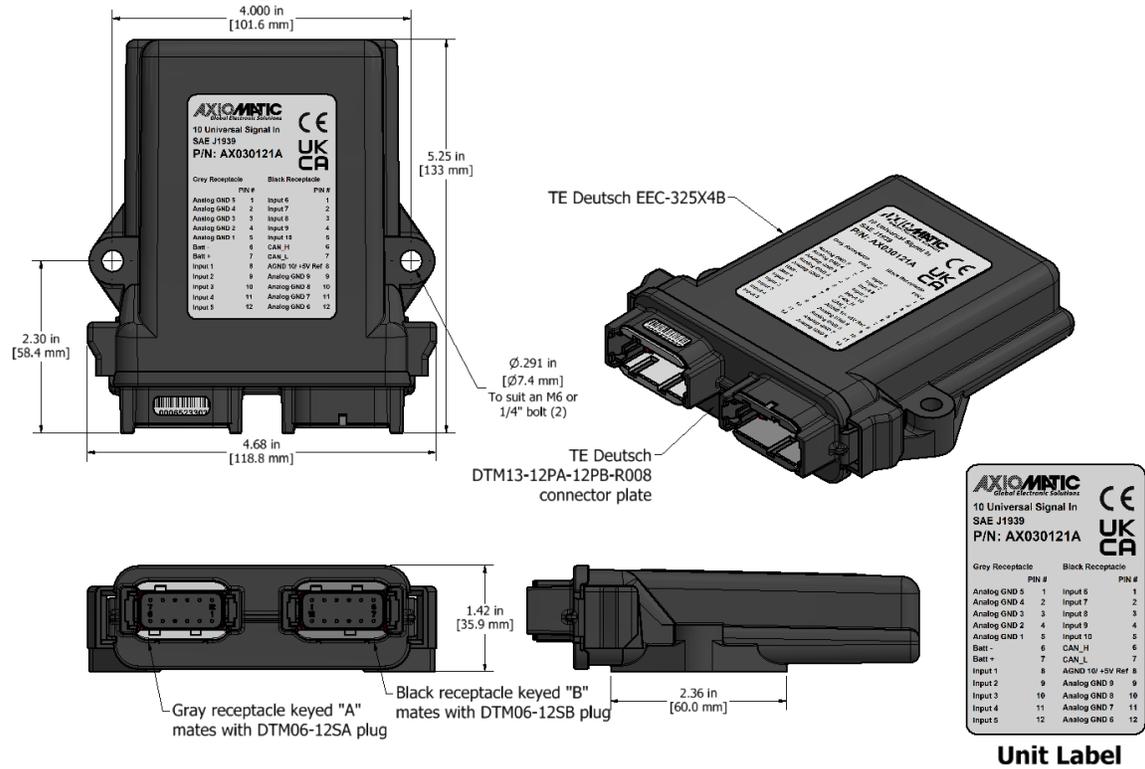
Inputs

Signal Inputs	<p>10 user selectable inputs (See Table 1.0.)</p> <ul style="list-style-type: none"> Analog (0-5 V, 0-10 V, 0-20 mA, 4-20 mA) PWM, 0-100 % Frequency/RPM Counter input 16-bit Digital 10 kΩ pull up/pull down (Normal, Inversed or Latched) (ON when input \geq 2V) <table border="1" data-bbox="557 428 1364 762"> <thead> <tr> <th>Input Types</th> <th>Min Range</th> <th>Max Range</th> <th>Units</th> </tr> </thead> <tbody> <tr> <td>Voltage Input 0 to 5 V</td> <td>0</td> <td>5</td> <td>V</td> </tr> <tr> <td>Voltage Input 0 to 10 V</td> <td>0</td> <td>10</td> <td>V</td> </tr> <tr> <td>Current Input 0 to 20 mA</td> <td>0</td> <td>20</td> <td>mA</td> </tr> <tr> <td>Current Input 4 to 20 mA</td> <td>4</td> <td>20</td> <td>mA</td> </tr> <tr> <td>Frequency Input</td> <td>0.8</td> <td>10,000</td> <td>Hz</td> </tr> <tr> <td>PWM Duty Cycle Input</td> <td>0</td> <td>100</td> <td>%</td> </tr> <tr> <td>Digital Input Normal Logic</td> <td>0</td> <td>1</td> <td>-</td> </tr> <tr> <td>Digital Input Inverse Logic</td> <td>0</td> <td>1</td> <td>-</td> </tr> <tr> <td>Digital Input Latched Logic</td> <td>0</td> <td>1</td> <td>-</td> </tr> <tr> <td>Counter Input Window Measure</td> <td>0</td> <td>250,000</td> <td>Pulses</td> </tr> <tr> <td>Counter Input Timed Pulses</td> <td>0</td> <td>250,000</td> <td>Pulses</td> </tr> <tr> <td>Counter Input Trigger Pulses</td> <td>0</td> <td>1</td> <td>Pulses</td> </tr> </tbody> </table> <p>All inputs except for 16-bit Counter are sampled every 1ms. Analog Input types have a 12-bit resolution. Maximum input voltage is 43 V, and all inputs are protected from short circuit to +Vps. Maximum input current is 50 mA, protected by resettable fuse.</p>	Input Types	Min Range	Max Range	Units	Voltage Input 0 to 5 V	0	5	V	Voltage Input 0 to 10 V	0	10	V	Current Input 0 to 20 mA	0	20	mA	Current Input 4 to 20 mA	4	20	mA	Frequency Input	0.8	10,000	Hz	PWM Duty Cycle Input	0	100	%	Digital Input Normal Logic	0	1	-	Digital Input Inverse Logic	0	1	-	Digital Input Latched Logic	0	1	-	Counter Input Window Measure	0	250,000	Pulses	Counter Input Timed Pulses	0	250,000	Pulses	Counter Input Trigger Pulses	0	1	Pulses
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Input Impedance	<p>0-5 V: 1 MΩ 0-10 V: 170 kΩ 0-20 mA or 4-20 mA: 249 Ω Frequency/Digital Input: Pull Up/Pull Down 10 kΩ</p>																																																				
Scan Rate	<p>Each input is scanned in 100 μs. A complete scan of 10 inputs occurs with new measured values every 1 ms.</p>																																																				
Analog Grounds	<p>10 Analog Ground connections are provided. Grounds are connected internally.</p>																																																				

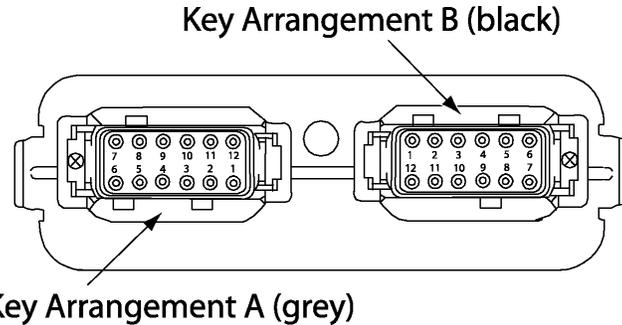
General Specifications

Microcontroller	STM32H742VIT6
Control Logic	<p>Refer to the User Manual UMAX030121A for details on the standard embedded control logic.</p> <p><i>For application-specific control logic, contact Axiomatic.</i></p> <p>Summary: Configurable properties of the controller are divided into function blocks, namely input function block, lookup table function block, programmable logic function block, math function block, set-reset latch function block, conditional logic block, and CAN receive message function. Input function block includes properties used to select input sensor functionality. Diagnostics can be seen through the CANopen EMCY objects and CAN messages. The Math Programmable Logic, and Conditional Logic function blocks give the user an opportunity to process inputs with basic mathematical or logical functions. The Lookup Table and Set-Reset Latch function blocks allow for further logical customization</p> <p>The software was designed to provide flexibility to the user with respect to messages sent from the module (ECU) over the CAN bus, by providing Configurable Input Parameters and Configurable PDO Communication and Mapping Parameters.</p>
Communications	<p>1 CAN port (CANopen®)</p> <p>Baud rates: 10 kbit/s, 20 kbit/s, 50 kbit/s, 125 kbit/s, 250 kbit/s, 500 kbit/s, 800 kbit/s, and 1 Mbit/s</p> <p>An SAE J1939 model is available (P/N: AX030120A).</p>
CAN Response Time	<p>The maximum recommended transmit rate for any TPDO is 10ms.</p> <p>Response time of feedback on the CAN to changes at the I/O will be a combination of the I/O type's response time and the configurable software filtering, delays, etc.</p>
Network Termination	<p>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 High and CAN Low terminals at both ends of the network.</p>
User Interface	<p>An EDS file is provided to interface with the device using standard CANopen® tools.</p>
Compliance	<p>ISO 13766-1:2018 (CE / UKCA marking)</p> <p>RoHS</p>
Protection	<p>IP67, Unit is conformal coated in its enclosure.</p>
Operating Temperature	<p>-40 to 85 °C (-40 to 185 °F)</p>
Storage Temperature	<p>-50 to 125 °C (-58 to 257 °F)</p>
Vibration	<p>MIL-STD-202H, method 204, test condition C 10 g peak (Sine)</p> <p>MIL-STD-202H, method 214A, test condition I/B 7.56 Grms (Random)</p>
Shock	<p>MIL-STD-202H, method 213B, test condition A 50 g peak</p>
Enclosure and Dimensions	<p>High Temperature Nylon Enclosure – (TE Deutsch P/N: EEC-325X4B)</p> <p>Flammability Rating: UL 94V-0</p> <p>4.63 in. x 5.24 in. x 1.417 in. (118.80 mm x 133.00 mm x 36.00 mm)</p> <p>(W x L x H excluding mating plugs)</p>
Weight	<p>0.55 lb. (0.25 kg)</p>
Electrical Connections	<p>24-pin receptacle (TE Deutsch P/N: DTM13-12PA-12PB-R008)</p>
Mating Plug Kit	<p>PL-DTM06-12SA-12SB Mating Plug Kit (includes TE Deutsch P/Ns DTM06-12SA and DTM06-12SB, with 2 wedgelocks WM12S, and 24 contacts 0462-201-20141).</p> <p>20 AWG wire is recommended for use with contacts 0462-201-20141.</p>
Mounting	<p>Mounting holes sized for ¼ in. 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 in. (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. 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 in. or 15 cm) and strain relief (12 in. or 30 cm).</p>

Dimensional Drawing



Electrical Connections



FRONT VIEW 24 PIN RECEPTACLE

Grey Connector		Black Connector	
Pin #	Function	Pin #	Function
1	Analog Ground 5	1	Input 6
2	Analog Ground 4	2	Input 7
3	Analog Ground 3	3	Input 8
4	Analog Ground 2	4	Input 9
5	Analog Ground 1	5	Input 10
6	Battery -	6	CAN_H
7	Battery +	7	CAN_L
8	Input 1	8	Analog Ground 10 or +5V Reference
9	Input 2	9	Analog Ground 9
10	Input 3	10	Analog Ground 8
11	Input 4	11	Analog Ground 7
12	Input 5	12	Analog Ground 6

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

Form: TDAX030121A – 02/27/2026