

4x Inputs, 4x Outputs Dual CAN Controller

2x CAN Ports (SAE J1939)

Designed for SIL2 and PLd Functional Safety Requirements

Wake-on-CAN Capability

4x Universal Inputs (Current, Voltage, PWM, or Digital)

4x Outputs (Proportional Current, Proportional Voltage, PWM, or Digital On/Off)

Configurable with the Axiomatic Electronic Assistant

P/N: AX022900

Features

- 4x universal inputs user selectable as follows.
 - Current
 - Voltage
 - PWM
 - Digital (active high or active low)
- 4x universal outputs user selectable as follows.
 - Proportional current
 - Proportional voltage
 - PWM
 - Digital on/off
- 2x CAN ports (SAE J1939)
- Wake-on-CAN capability to save power
- Works with 12 or 24 VDC battery power (7 to 35 VDC range)
- -40 to 85 °C operating temperature
- Rugged, IP67-rated TE Deutsch enclosure
- 1x 24-pin TE Deutsch connector
- Designed to meet the EMC requirements of ISO 13766-1:2018
- Designed for SIL2 and PLd functional safety requirements
- Configurable with Axiomatic Electronic Assistant



Applications

Off highway equipment

Ordering Part Numbers

4x Inputs, 4x Outputs Dual CAN Controller, SAE J1939 with Auto-Baud-Rate Detection
– P/N: **AX022900**

Accessories:

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

Axiomatic Electronic Assistant KIT: **AX070506K**

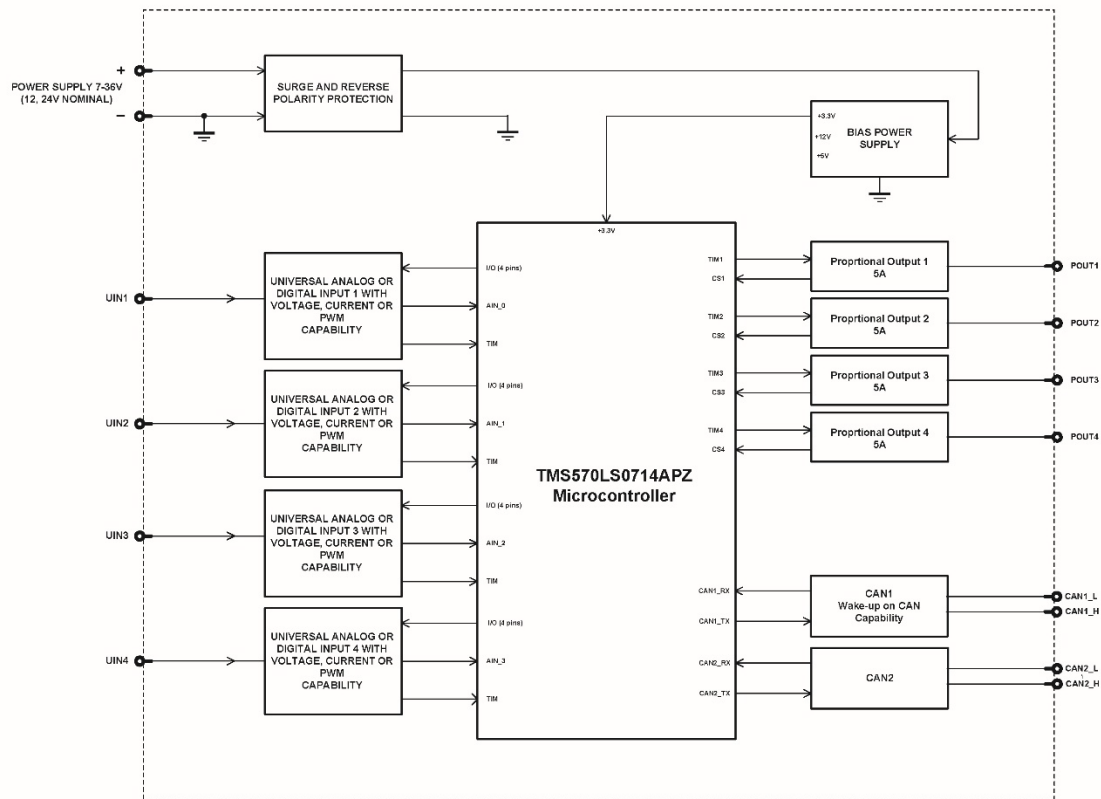
Description

The 4x Inputs, 4x Outputs Dual CAN Controller accepts 4x universal inputs and provides 4x proportional outputs. The inputs can be configured as current, voltage, PWM, or digital (active high or active low). The outputs can be programmed as proportional current, proportional voltage, PWM, or digital on/off.

The AX022900 features two CAN ports (SAE J1939) with auto-baud-rate detection. CAN 1 port also has wake-on-capability. It can be configured by the user over CAN bus through the Axiomatic Electronic Assistant KIT.

This device accepts 12 or 24 VDC nominal for battery powered machine applications. It carries an IP67 rating. The rugged enclosure with 24-pin TE Deutsch header is suitable for harsh environments. It operates from -40 to 85 °C (-40 to 185 °F). The unit is designed to meet the EMC requirements of ISO 13766-1:2018 and the functional safety requirements of SIL2 and PLd.

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 Input	12 or 24 V _{DC} nominal 7 to 35 V _{DC} power supply range Maximum supply current must not exceed 15 A @ 24 V at any time
Quiescent Current	TBD mA @ 12 V _{DC} ; TBD mA @ 24 V _{DC} typical
Protection	Reverse polarity protection up to -80 V Surge and transient protection Undervoltage shuts down at 6 V. Overvoltage shuts down at 36 V.

Inputs

Universal Inputs	4x universal signal inputs configurable as follows.	
	Current	Range: 0-20 mA, 4-20 mA Resolution: 1 mA Accuracy: ±0.5 % error Current Sensing Resistor: 249 Ω
	Voltage	Ranges: 0-5 V, 0-10 V Resolution: 1 mV Accuracy: ±0.5 % error Impedance: 204 kΩ (0-5 V), 134 kΩ (0-10 V)
	PWM	Duty Cycle: 0-100 % Frequency Range: 1 Hz to 10 kHz Accuracy: ±1 % error Impedance: 204 kΩ
	Digital	Active high or active low Configurable 10 kΩ pull-up or pull-down resistor High: Min. 3.5 V to +Vps Low: Max. 1.5 V
	12-bit analog to digital (voltage or current type)	
Protection	Protected against shorts to Ground or +Vps	
Scan Rate	1 ms	

Outputs

Proportional Outputs	4x proportional outputs programmable as follows.	
	Proportional Current	Range: Up to 5 A Resolution: TBD mA Accuracy: ±2 % error
	Proportional Voltage	Ranges: Up to Vps Resolution: TBD mV Accuracy: ±5 % error
	PWM	Duty Cycle: 0-100 % Frequency Range: 1 Hz to 10 kHz Accuracy: ±2 % error
	Digital On / Off	Sourcing from power supply or sinking to Ground
	Half-bridge, current sensing output High frequency drive Selectable: High side sourcing up to 5 A or low side sinking down to 5 A Load at supply voltage must not draw more than 5 A.	
Protection	Overcurrent protection Short-circuit protection in hardware	

General Specifications

Microcontroller	TMS570LS0714APZ 32-bit RISC flash microcontroller 768 KB of flash with Error Correction Code (ECC) 128 KB of RAM with ECC 64 KB of flash for emulated EEPROM with ECC
Control Logic	Standard embedded software is provided. (Application-specific control logic or a set point file is available on request.)
Response Time	1 ms
Communications	2x CAN ports (SAE J1939) Supported baud-rates: 250 kbit/s, 500 kbit/s, 667 kbit/s, and 1 Mbit/s with auto-baud-rate detection
Wake-on-CAN	Wake-on-CAN capability (using CAN port #1)
Network Termination	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.
User Interface	Axiomatic Electronic Assistant - P/N: AX070506K
Compliance	Designed for SIL2 and PLd functional safety requirements RoHS
Protection	IP67
Operating Conditions	-40 to 85 °C (-40 to 185 °F)
Storage Temperature	-50 to 125 °C (-58 to 257 °F)
Weight	TBD lb. (TBD kg)
Enclosure	TE Deutsch Enclosure (P/N: EEC-325X4B) High Temperature Nylon housing 4.68 in. x 5.25 in. x 1.42 in. (119 mm x 133 mm x 36 mm) (W x L x H excluding mating plugs)
Electrical Connections	1x 24-pin header, TE Deutsch P/N: DTM13-12PA-12PB-R008 (comprises 1x 12-pin Key A connector and 1x 12-pin Key B connector) Refer to Table 1.0.
Mating Connectors	A mating plug KIT is available under P/N: PL-DTM06-12SA-12SB . It includes the TE Deutsch P/Ns: 1x DTM06-12SA (grey), 1x DTM06-12SB (black), 2x WM12S wedgelocks, 24x 0462-201-20141 contacts, and 18x 0413-204-2005 plugs. 20 AWG wire is recommended for use with contacts 0462-201-20141.
Installation	Mounting holes sized for 1/4 in or M6 bolts. The bolt length will be determined by 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).

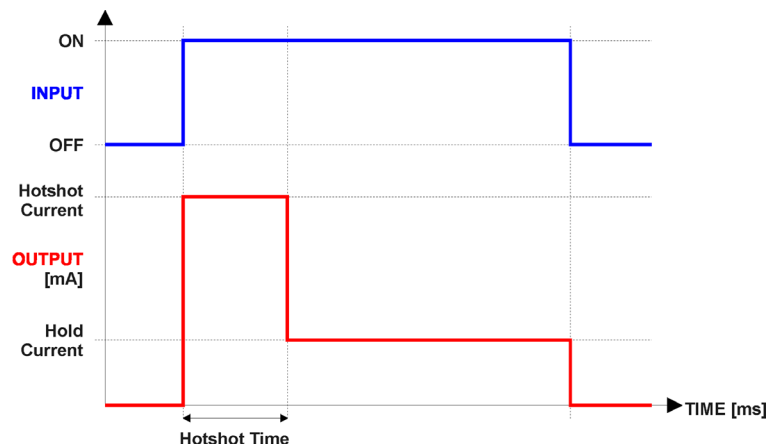


Figure 1 – Hotshot Digital Profile

Dimensional Drawing

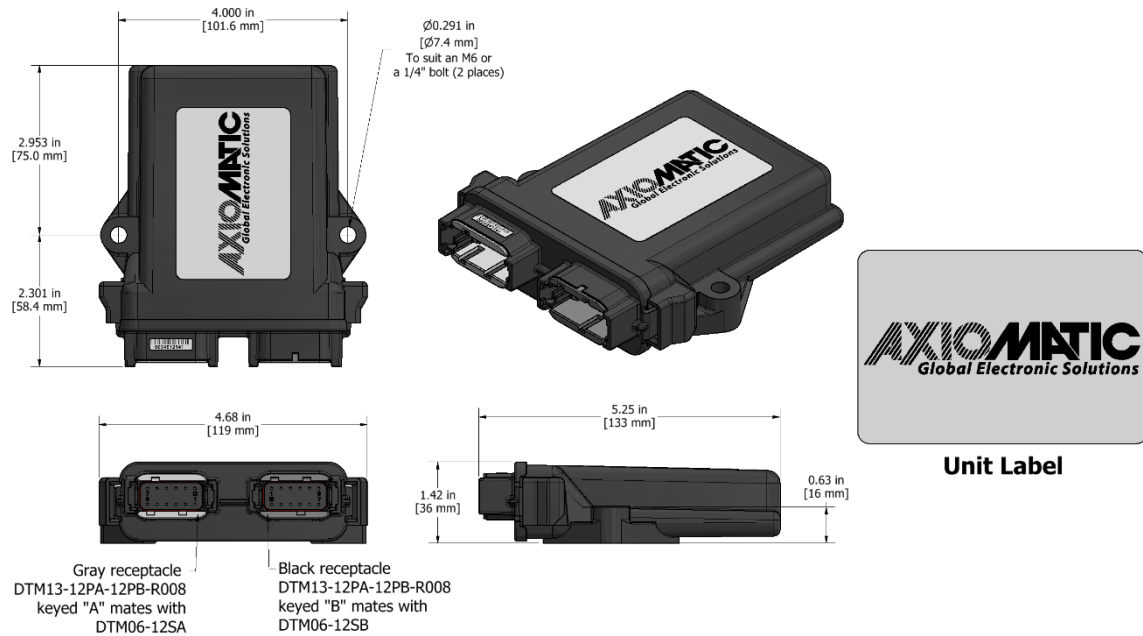


Figure 2 – Dimensional Drawing

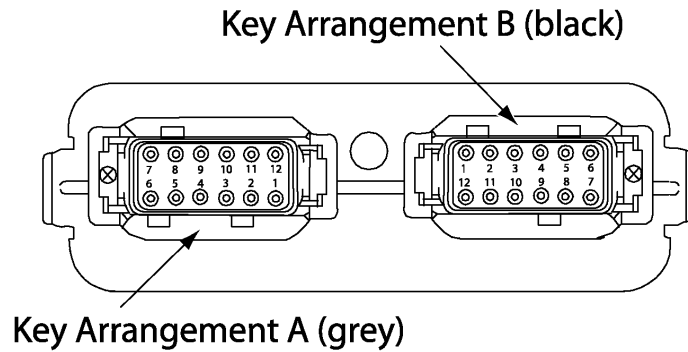


Table 1.0 Electrical Pin Out			
Grey Connector		Black Connector	
Pin	Function	Pin	Function
1	Ground	1	Universal Input 1
2	Ground	2	Universal Input 2
3	Ground	3	Universal Input 3
4	Ground	4	Universal Input 4
5	Battery -	5	CAN High
6	Battery -	6	CAN Low
7	Battery +	7	CAN Low
8	Battery +	8	CAN High
9	Proportional Output 1	9	Ground
10	Proportional Output 2	10	Ground
11	Proportional Output 3	11	Ground
12	Proportional Output 4	12	Ground

Form: TDAX022900-10/13/2026

OUR PRODUCTS

AC/DC Power Supplies
Actuator Controls/Interfaces
Automotive Ethernet Switches
Battery Chargers
CAN Controls, Routers, Repeaters
CAN/WiFi
CAN/Bluetooth (Classic, BLE)
CAN bus Routers
CANopen I/O Modules
Current/Voltage/PWM Converters
DC/DC Power Converters
Engine Temperature Scanners
Ethernet/CAN Converters, Gateways
Ethernet Switches
Fan Drive Controllers
Gateways, CAN/Modbus, RS-232
Gyroscopes, Inclometers
Hydraulic Valve Controllers
Inclometers, Triaxial
I/O Controls
LVDT Signal Converters
Machine Controls
Media Converters
Modbus, RS-422, RS-485 Controls
Motor Controls, Inverters
Power Supplies, DC/DC, AC/DC
PWM Signal Converters/Isolators
Resolver Signal Conditioners
SAE J1939 I/O Modules
Service Tools
Signal Conditioners, Converters
Strain Gauge CAN Controls
Surge Suppressors

OUR COMPANY

Axiomatic provides electronic machine control components to the off-highway, commercial vehicle, electric vehicle, power generator set, material handling, renewable energy and industrial OEM markets. ***We innovate with engineered and off-the-shelf machine controls that add value for our customers.***

QUALITY DESIGN AND MANUFACTURING

We have an ISO9001 registered R&D, electronics design and manufacturing facility in Canada.

Sales offices are in Canada, USA, Australia and Finland.

COMPLIANCE

Product compliance details can be found in the product literature and/or on axiomatic.com. Any inquiries should be sent to sales@axiomatic.com.

SAFE USE

All products should be serviced by Axiomatic. Do not open the product and perform the service yourself.



This product can expose you to chemicals which are known in the State of California, USA to cause cancer and reproductive harm. For more information go to www.P65Warnings.ca.gov.

TECHNICAL SUPPORT

Contact technical support by emailing support@axiomatic.com.

WARRANTY, APPLICATION APPROVALS/LIMITATIONS

Axiomatic Technologies Corporation reserves the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. 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 at <https://www.axiomatic.com/service/>.

SERVICE

All products to be returned to Axiomatic require a Return Materials Authorization Number (RMA#) from rma@axiomatic.com. Please provide the following information when requesting an RMA number:

- Serial number, part number, Runtime hours, description of problem
- Wiring set up diagram, application and other comments as needed

DISPOSAL

Axiomatic products are electronic waste. Please follow your local environmental waste and recycling laws, regulations and policies for safe disposal or recycling of electronic waste.

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