

Gigabit Automotive Ethernet / Gigabit Ethernet PoE Converter

P/N: AX141410

Applications

- Off-highway equipment
- Mining equipment
- Industrial trucks

Ordering Part Numbers

Gigabit Automotive Ethernet / Gigabit Ethernet PoE Converter – P/N: **AX141410**

Features

- 12 or 24 V_{DC} input power for connection to a battery
- 1x gigabit/standard Power-over-Ethernet (PoE) port (100 or 1000 Mbps)
- PoE follows IEEE 802.3af Type 1 Class 3 Mode B
- 1x gigabit/standard Automotive Ethernet (SPE) port (100 or 1000 Mbps)
- Surge, reverse polarity, input overvoltage, and input undervoltage protection
- Master or slave functionality of Automotive Ethernet and speed/bitrates configuration via RS-232 interface
- 3x LED indicators for Power, Ethernet, and Automotive Ethernet (SPE)
- 1x 4-pin, 1x 5-pin, and 1x 8-pin M12 connector
- Compact
- IP67-rated



Block Diagram

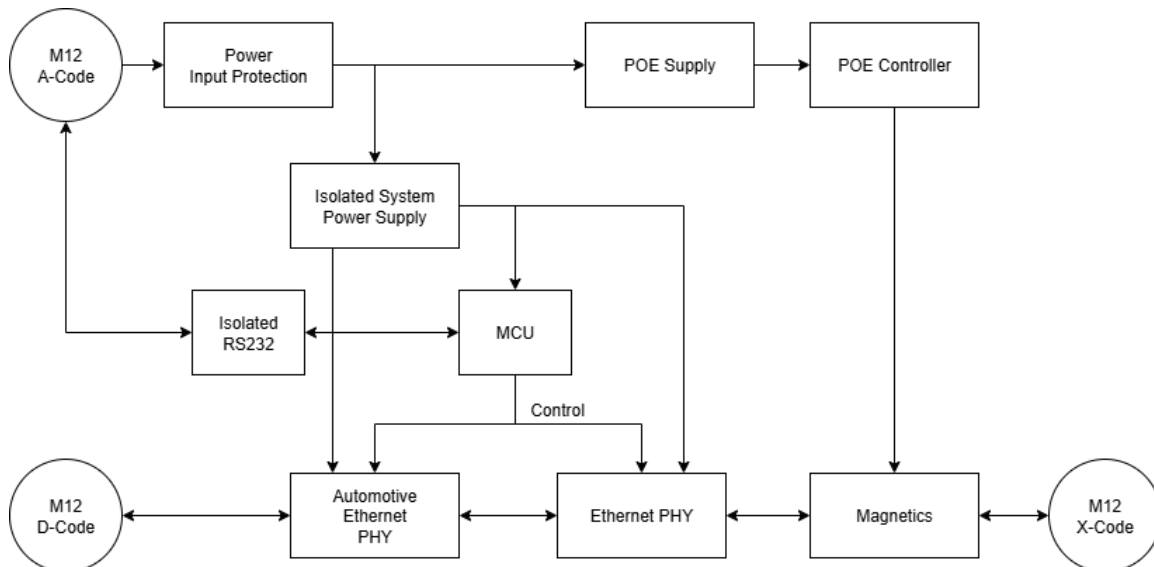


Figure 1.0 – Block Diagram

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/>.

Input

Power Supply Input	12 or 24 VDC nominal (9 to 36 VDC power supply range)
Quiescent Current	TBD mA @ 12 VDC; TBD mA @ 24 VDC
Protections	Surge and transient protection Reverse polarity protection Undervoltage protection provided. Shutdown at 6.5 V. Overvoltage protection provided. Shutdown at 60 V.

Gigabit Ethernet (Power-over-Ethernet / PoE)

Port Type	1x port 100 Mbit/s or 1 Gbit/s Auto-Negotiation Automatic Polarity Correction
Power-over-Ethernet (PoE)	15.4 W max. available at the port 12.95 W max. at the powered device
MDIX	Auto-MDI/MDIX (crossover)
PHY	Marvell 88EA1512 (100BASE-TX, 1000BASE-T)
Protocol	Ethernet IEEE 802.3af Type 1 Class 3 Mode B
Protection	ESD protection for signal lines

Gigabit Automotive Ethernet (Single Pair Ethernet / SPE)

Port Type	1x port 100 Mbit/s or 1 Gbit/s Automatic Polarity Correction (for 1 Gbit/s mode) Note: For 100 Mbps mode, polarity correction is not functional. Master / Slave mode and communication speed is configurable. Default Mode: Slave
PHY	Marvell 88Q2112 (100BASE-T1, 1000BASE-T1)
Protocol	Automotive Ethernet IEEE 802.3bw for 100BASE-T1 Automotive Ethernet IEEE 802.3bp for 1000BASE-T1
Protection	ESD protection for signal lines

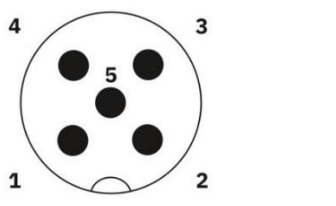
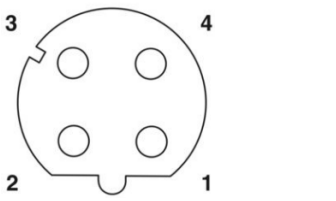
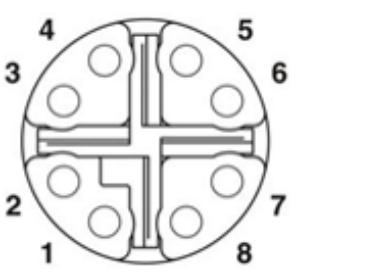
User Interface

RS-232	1x 3-wire RS-232 port Baud rate: 115200 bit/s User interface for configuration or troubleshooting of speed and Automotive Ethernet Master / Slave modes Any terminal emulator that supports serial communication may be used to interface.
Protection	ESD and EFT protection for signal lines

LED Indicators

LEDs	3x bicolor (green / red) LEDs				
	LED Name	Green	Red	Yellow	LED State
	POWER	Power & PoE on	PoE error	Power on, PoE off	Solid
	ENET	1 Gbps	100 Mbps	N/A	Solid = Link Blinking = Activity
	SPE	1 Gbps	100 Mbps	N/A	Off = No Link

General Specifications

Microcontroller	STM32G0B1KCU7 256 kB flash memory, 144 kB RAM																																									
Compliance	RoHS																																									
Protection	IP67																																									
Operating Conditions	-40 to 70 °C (-40 to 158 °F)																																									
Storage Temperature	-40 to 85 °C (-40 to 185 °F)																																									
Enclosure	Injection molded enclosure and cover, laser welded PA66, 30% glass fiber reinforced Flammability Rating: UL 94 HB 4.2 in. x 3.1 in. x 1.5 in. (106.9 mm x 77.7 mm x 37.2 mm) L x W x H including connectors See dimensional drawing.																																									
Weight	0.31 lb. (0.14 kg)																																									
Electrical Connections	Power / RS-232 Connector 1x Phoenix Contact M12 5-pin connector (A-coded), Male, P/N: 1441888 <table><thead><tr><th>Pin</th><th>Description</th></tr></thead><tbody><tr><td>1</td><td>RS-232 Ground</td></tr><tr><td>2</td><td>Battery +</td></tr><tr><td>3</td><td>Battery -</td></tr><tr><td>4</td><td>RS-232 TX</td></tr><tr><td>5</td><td>RS-232 RX</td></tr></tbody></table> SPE / Automotive Ethernet Connector 1x Phoenix Contact M12 4-pin connector (D-coded), Female, P/N: 1441875 <table><thead><tr><th>Pin</th><th>Description</th></tr></thead><tbody><tr><td>1</td><td>TRD +</td></tr><tr><td>2</td><td>Do not connect</td></tr><tr><td>3</td><td>TRD -</td></tr><tr><td>4</td><td>Do not connect</td></tr></tbody></table> PoE / Ethernet Connector 1x Phoenix Contact M12 8-pin connector (X-coded), Female, P/N: 1237405 <table><thead><tr><th>Pin</th><th>Description</th></tr></thead><tbody><tr><td>1</td><td>DA +</td></tr><tr><td>2</td><td>DA -</td></tr><tr><td>3</td><td>DB +</td></tr><tr><td>4</td><td>DB -</td></tr><tr><td>5</td><td>DD + / PoE -</td></tr><tr><td>6</td><td>DD - / PoE -</td></tr><tr><td>7</td><td>DC - / PoE +</td></tr><tr><td>8</td><td>DC + / PoE +</td></tr></tbody></table>		Pin	Description	1	RS-232 Ground	2	Battery +	3	Battery -	4	RS-232 TX	5	RS-232 RX	Pin	Description	1	TRD +	2	Do not connect	3	TRD -	4	Do not connect	Pin	Description	1	DA +	2	DA -	3	DB +	4	DB -	5	DD + / PoE -	6	DD - / PoE -	7	DC - / PoE +	8	DC + / PoE +
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7	DC - / PoE +																																									
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Mating Cables	Use Cat5e cable for PoE The typical maximum wire harness length for Automotive Ethernet cabling is 15 m.																																									

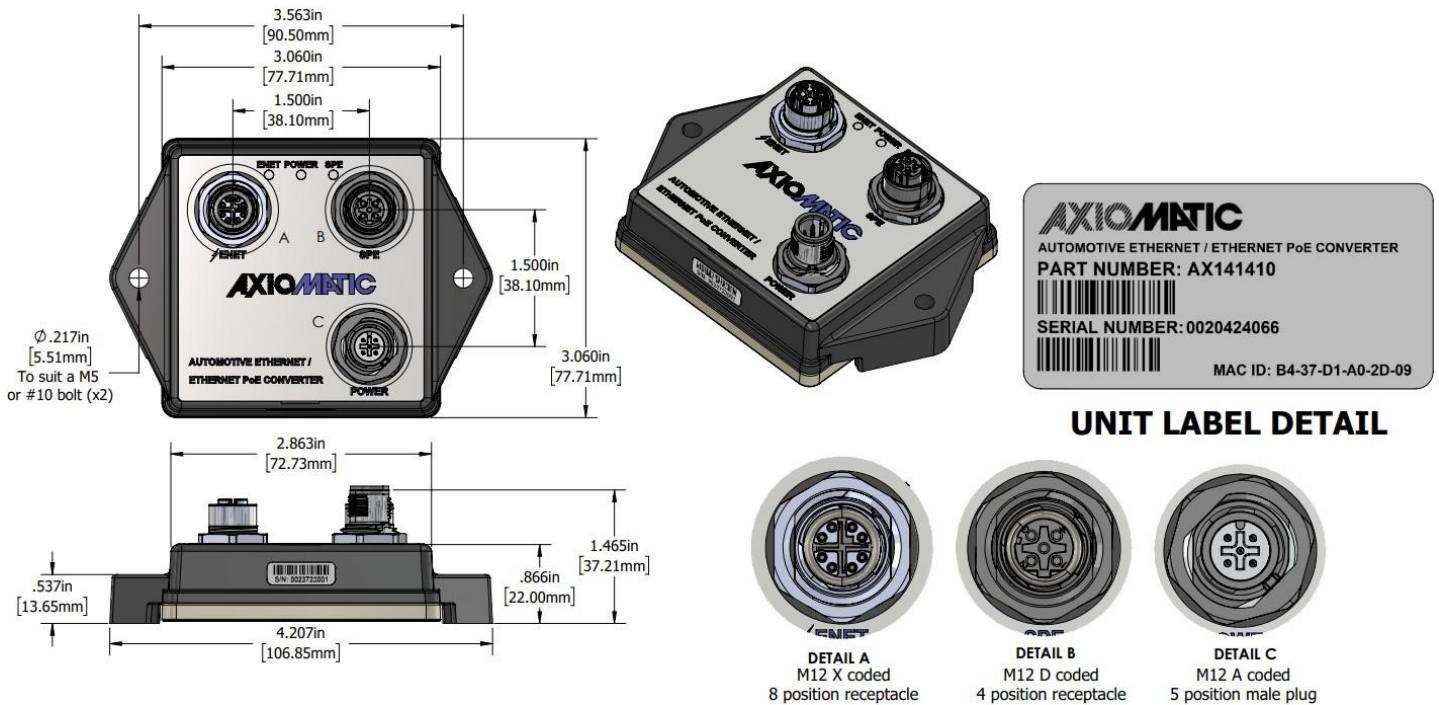
Description

The AX141410 converter provides bi-directional, physical layer conversion between Gigabit Ethernet (1000BASE-T) and Gigabit Automotive Ethernet (1000BASE-T1) via PHY transceivers. No packets are stored or modified in this device. The Ethernet port supports Power-over-Ethernet (PoE). The converter supports a baud rate of 100 Mbit/s and 1000 Mbit/s. Status LEDs provide information on connection link and communication. The converter is designed for the harsh environments of off-highway or industrial equipment.

The unit is configured via the RS-232 port to act as a Master or Slave for Automotive Ethernet. The Master mode works if the connected device has its transceiver set to slave mode. The Slave mode works when the connected device has its transceiver set to master mode. The speed/bitrate of the end-to-end communication through the device can also be set through the RS-232 interface. It can either be 100 Mbps or 1 Gbps.

The Institute of Electrical and Electronic Engineers (IEEE) 802.3bp standard (also known as 1000BASE-T1) is a 1000 Mbps Automotive Ethernet standard aimed at increasing data throughput, meeting strong automotive emissions standards, and reducing cabling weight and cost in automotive networking. Automotive Ethernet networks use a 2-wire twisted pair cable. Therefore, Automotive Ethernet is also called Single Pair Ethernet (SPE).

Dimensional Drawing



Form: TDAX141410-07/13/2026