Preliminary
Technical Datasheet #TDAX143040

Fiber Optic / CAN Repeater, SAE J1939

P/N: AX143040

Applications

- Heavy equipment, utility equipment, lift equipment
- Bridge for CAN network extension over distance
- Galvanic isolation between two CAN networks for electrical safety

Ordering Part Numbers

Fiber Optic / CAN Repeater – P/N: **AX143040**

Accessories:
Axiomatic Electronic Assistant KIT – P/N: **AX070502** or **AX070506K**
Note: Fiber optic cables are not supplied.

Features

- Forwards messages between two Fiber Optic (FO) cables and a CAN (SAE J1939) network
- Data routing and message filtering options
- Can be used a bridge in different network topology configurations:
  - Unidirectional Ring: Multiple units connected in closed FO loop; frames circulate in one direction
  - Peer-to-Peer: Two units connected via FO
- 2-way isolation for fiber optic and CAN
- Vented IP20 enclosure with DIN rail mount

Block Diagram

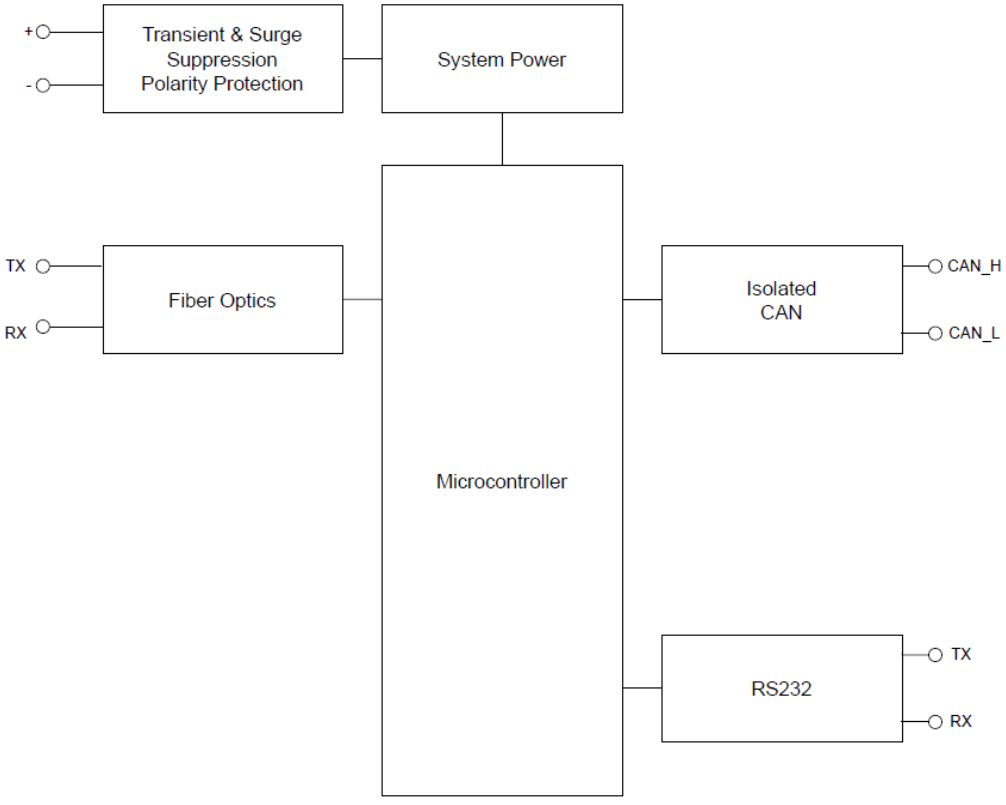

Figure 1.0 – Block Diagram

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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 Limitations & Return Materials Process as described on https://www.axiomatic.com/service/.

Power Supply

Power Supply Input	12 or 24 V_{DC} nominal (8 to 36 VDC range) Shutdown voltage is 8 V_{DC}.
Quiescent Current	35.0 mA @ 12 V_{DC}; 18.8 mA @ 24 V_{DC} (typical)
Protection	Reverse polarity protection Overvoltage protection up to 38 V

Fiber Optic

Fiber Optic	820 nm wavelength, 62.5/125 µm fiber size, ST connector
Fiber Optic Connectors	2x connectors (Broadcom P/N: HFBR-1412TZ and HFBR-2412TZ)
Fiber Optic Cable	Not supplied. An example of the cable can be Tripp Lite Model N302-003 Duplex Multimode 62.5/125 Fiber Patch Cable used in our test setups.

General Specifications

Microcontroller	STM32F413CGU6 1 MB flash memory, 320 KB RAM
Isolation	300 Vrms 2-way isolation for fiber optic and CAN
Control Logic	Refer to the user manual.
CAN	1x isolated CAN port (SAE J1939) Supported Baud Rates: 125 kbit/s, 250 kbit/s, 500 kbit/s, 667 kbit/s, and 1 Mbps with auto-baud-rate detection The auto-baud-rate detection feature can be disabled to set the baud rate to a fixed value.
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.
LED Indicators	2x bicolour reg/green LEDs Solid Red = FO Connected Solid Green = CAN Connected Blinking = Network activity (transferring / receiving) Alternating Red/Green = Bootloader mode
User Interface	Axiomatic Electronic Assistant – P/N: AX070502 or AX070506K
Compliance	RoHS
Protection	IP20 (for PCB) IP54 (for FO connectors)
Operating Conditions	-40 to 85 °C (-40 to 185 °F)
Storage Temperature	-55 to 125 °C (-67 to 257°F)
Vibration and Shock	The enclosure has the following vibration rating. IEC 60068-2-6: 2007-12 (Sine), 2 g peak (Sine) IEC 60068-2-27: 2008-02, 15 g The fiber optic connectors have the following vibration rating from the manufacturer. A7a Mechanical Shock MIL-STD-883 Method 2002B 1500g, 0.5ms, 5 shocks/axis, 6 axis A7b Vibration MIL-STD-883 Method 2007A 20G, 20-2000Hz, 4 min/cycle, 4 cycles/axis, 3 axis
Weight	0.25 lb. (0.11 kg)
Enclosure	Phoenix Contact DIN Rail Housing ME MAX 22,5 3-U1 KMGY – P/N:2201538 Polyamide, UL94V0, cULus recognized, China RoHS 4.47 in. x 4.57 in. x 0.89 in. (113.7 mm x 116 mm x 22.6 mm) L x H x W does not include mating connectors. Refer to the dimensional drawing for details.
Mounting	DIN rail mount TH 35-7.5 The unit is intended to be mounted within a control housing without vibration isolators. It should not be mounted directly on an engine.

Electrical Connections

2x Phoenix Contact spring clamp connectors PSPT 2,5/ 4-ST KMGY (P/N: 2202344)
Use 24-14 AWG wires.

Connector J1		Connector J2	
Pin	**Function**	**Pin**	**Function**
1	Battery +	1	CAN Shield
2	Battery -	2	CAN Shield
3	RS-232 RX	3	CAN High
4	RS-232 TX	4	CAN Low

Dimensional Drawing

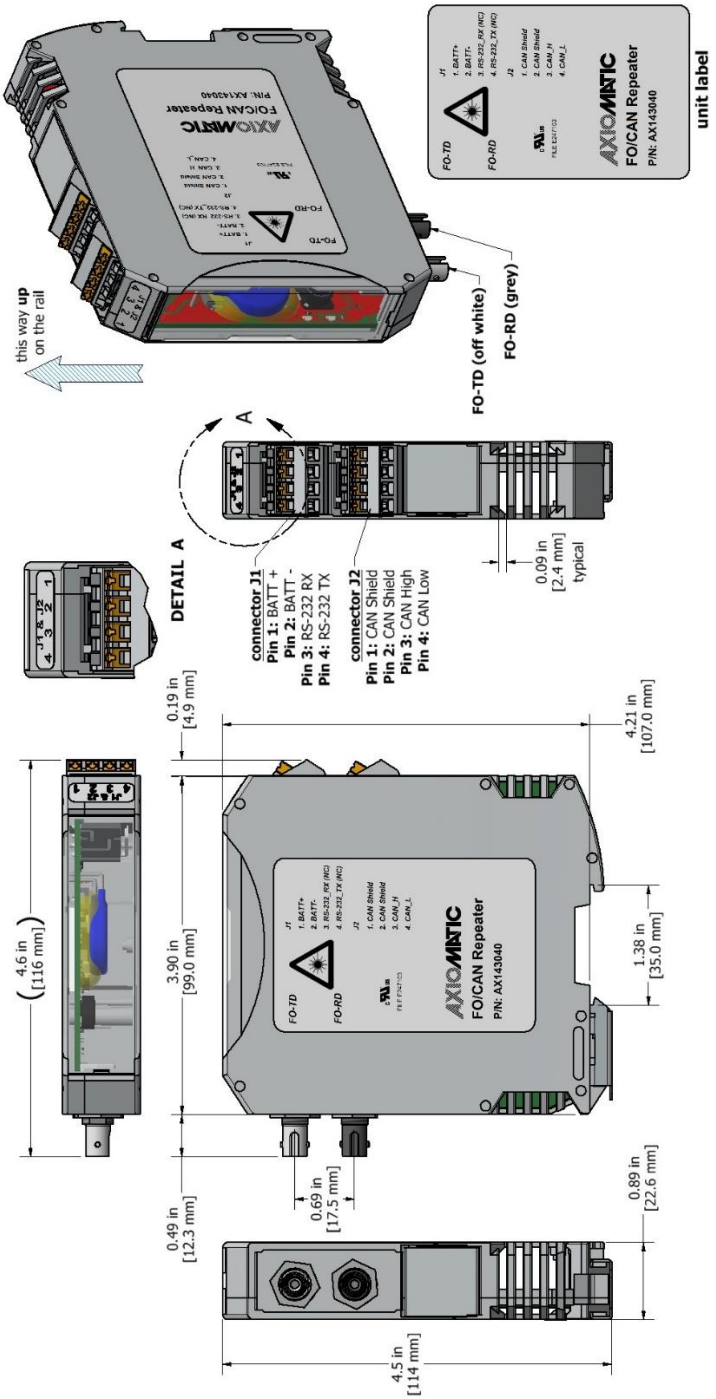

Figure 2.0 – Dimensional Drawing

Description

The Fiber Optic / CAN Repeater forwards messages between two Fiber Optic cables and a CAN (SAE J1939) network, based on a custom routing configuration. The device is configurable over CAN using the Axiomatic Electronic Assistant KIT. Setpoint configuration can be saved in a file which can then be utilized to apply the same configuration to other AX143040 units. The CAN port features auto-baud-rate detection. The unit has 2-way isolation for fiber optic and CAN. It comes in a vented IP20 enclosure with DIN rail mount.

Two network topology configurations for use of the repeater as bridge are shown below.

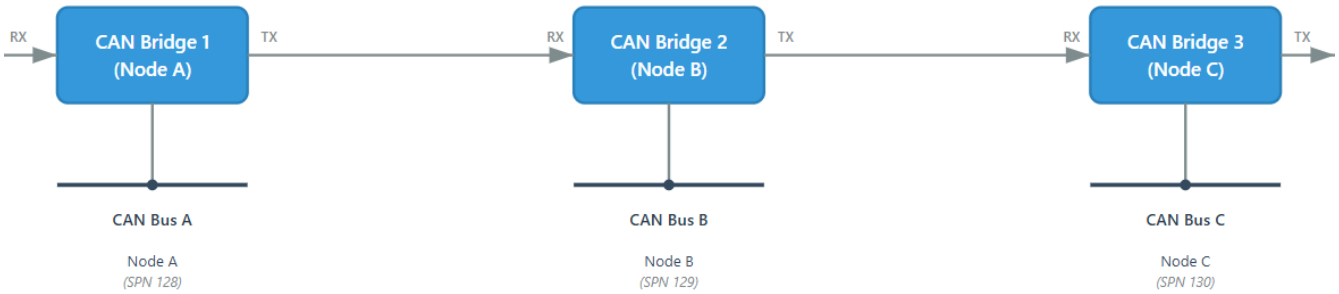

Figure 3.0 – Unidirectional Ring Topology

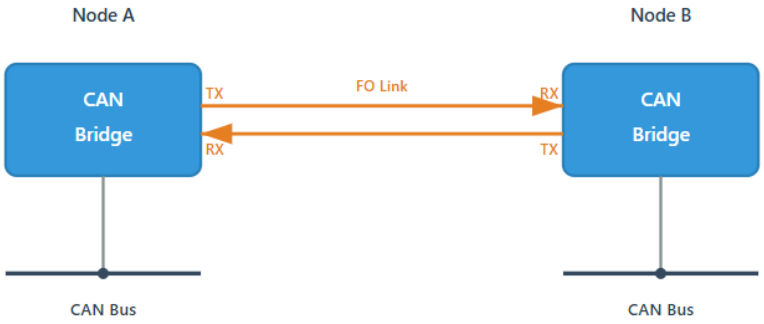

Figure 4.0 – Peer-to-Peer Topology (Node-to-Node or Point-to-Point)

Form: TDAX143040-06/04/2026