Preliminary
TECHNICAL DATASHEET #TDAX142100A

Protocol Converter

Ethernet / RS-422 / 2 RS-232 / CAN (SAE J1939)

P/N: AX142100A

Features:

- Fast and bidirectional data exchange between an Ethernet, an RS-422 bus, two RS-232 buses and a CAN network (SAE J1939)
- ASCII to PLC gateway
- 1 Isolated CAN port (CAN 2.0B)
- 1 RS-422 port (can be used as RS-485)
- 2 RS-232 serial ports
- 1 Ethernet interface (TCP communication at user configurable port)
- Power, Link and Speed LED indicators
- Operational from 9 to 36 VDC (12 or 24 VDC nominal)
- Fully sealed enclosure with a rugged IP67 protection rating
- Suitable for high vibration environments
- 1 8-pin M12 connector, 1 12-pin M12 connector
- Compact size
- User configurable using a web browser

Applications:

Communications interface between legacy ASCII systems and PLCs

Ordering Part Number:

Protocol Converter, Ethernet / RS-422 / 2 RS-232 / SAE J1939 CAN, P/N: **AX142100A**

The unit can also be purchased as a KIT, P/N: **AX142100AK**. It includes Protocol Converter AX142100A and mating wire harnesses AX070531 and AX070533.

Accessories:
AX070531: 1.7 m (5.5 ft.), 8-pin M12 A-coded, Unterminated Leads, Ethernet Jack, Ethernet and Power Cable

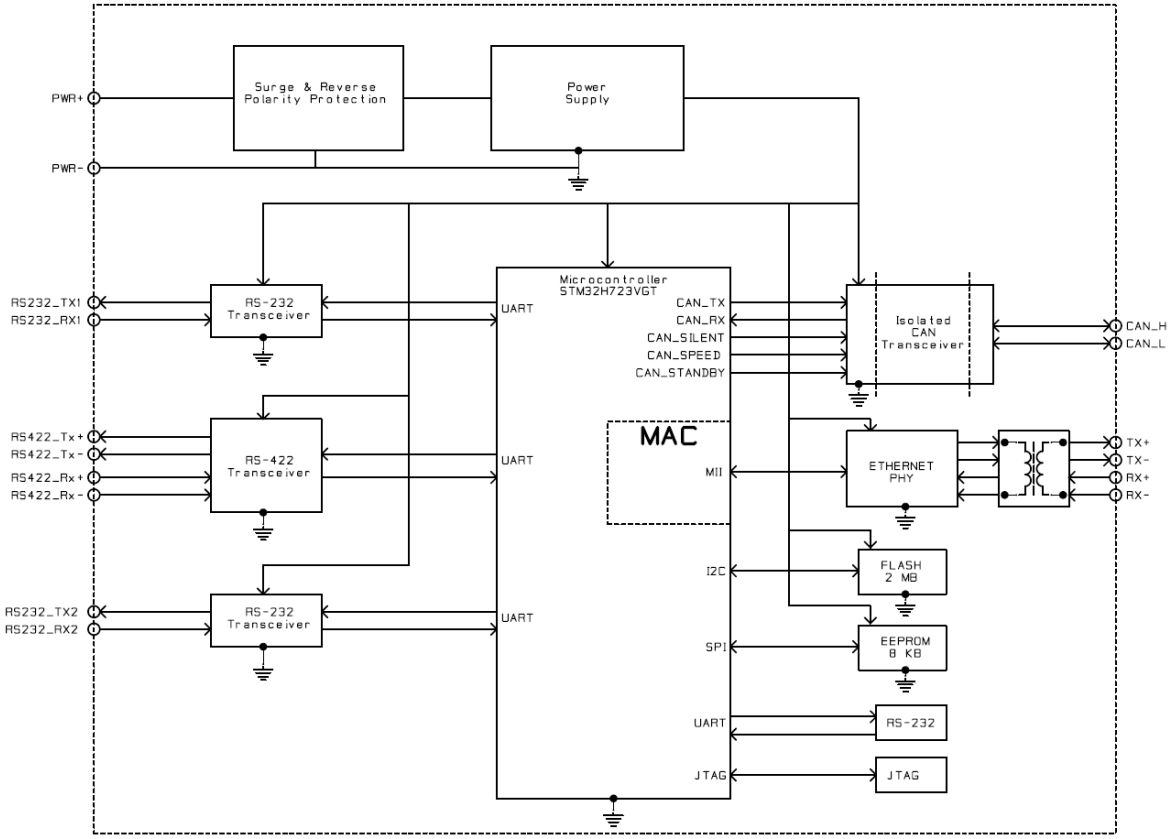
AX070533: RS-232, RS-232 (RS-485), RS-422 Cable 1.5 m (5 ft.), 12-pin M12, Unterminated Leads, CAN Cable

Axiomatic Electronic Assistant Configuration KIT P/N: **AX070502** or **AX070506K**

Axiomatic Technologies Oy
Höytämöntie 6
33880 LEMPÄÄLÄ, Finland
Tel. +358 103 375 750
salesfinland@axiomatic.com
www.axiomatic.fi

Axiomatic Technologies Corporation
1445 Courtneypark Dr. E.
Mississauga, ON Canada L5T 2E3
Tel. 1 905 602 9270
sales@axiomatic.com
www.axiomatic.com

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/.

All specifications are typical at nominal input voltage and 25°C unless otherwise specified.

Power

Power Supply Input	12 or 24 VDC nominal (9 to 36 VDC)
Quiescent Current	150 mA @ 12 V; 90 mA @ 24 V typical
Surge Protection	95 VDC
Under-Voltage Protection	Hardware shutdown at 6 VDC
Over-Voltage Protection	Hardware shutdown at 45 VDC
Reverse Polarity Protection	Provided up to -36 VDC

Functionality

Conversion Platform	The Protocol Converter comes pre-programmed with standard protocol conversion logic for bidirectional data exchange between an Ethernet (proprietary TCP communications), an RS-422 bus, two RS-232 buses and a CAN network (SAE J1939). Data is forwarded “as-is” between the different serial ports. Also, CAN/Ethernet data is forwarded directly to serial interfaces with the configuration allowing the user to specify the CAN message ID (or TCP port) to listen for data to be forwarded.
Ethernet	1 10/100 Mbit Ethernet compliant port 10BASE-T, 100BASE-Tx (auto-negotiation and full-duplex supported) Auto-MDIX
RS-422	1 RS-422 port Baud rate: up to 10.5 Mbit/s Note: RS-422 connections can be used as RS-485. See pinout.

RS-232	2 RS-232 ports for serial communications Three-wire Baud rate: up to 400 kbit/s
ASCII Features	Maximum Number of ASCII devices: 2 Serial Communications Port 0: RS422 Serial Communications Port 1: RS232 Message Queue Size: Configurable
CAN	1 SAE J1939 port Isolated Baud rate: 250 kbit/s (default)

General Specifications

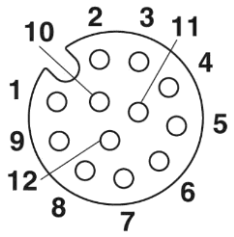
Microcontroller	STM32H723VGT 32-bit, 1 MB flash memory
Isolation	CAN isolation: 330 Vrms
Web Interface	Refer to the User Manual. The functionality of the web interface includes but is not limited to the following. o Specify CAN message filters and CAN message IDs to be received o Link RS-232 or RS-422 to CAN bus and Ethernet o Define CAN node ID and baud rate o Define Ethernet parameters (IP address, netmask) o Configure message queues
User Interface	Axiomatic Electronic Assistant (P/N: **AX070502** or **AX070506K**) for *Windows* operating systems comes with a royalty-free license for use on multiple computers. It requires an Axiomatic USB-CAN converter to link the device's CAN port to a *Windows*-based PC. The functionality of the Axiomatic Electronic Assistant includes IP address configuration and firmware reflashing.
LED Indicators	Power LED GREEN = Power ON RED = Fault condition GREEN/RED = Power OFF 2 GREEN LEDs for Ethernet LINK/ACT: ON means connection (LINK) Flashing means activity (ACT) OFF means Ethernet connection is down 10/100: Transmission Speed 100 Mbit/s = ON Transmission Speed 10 Mbit/s = OFF
Compliance	RoHS
Operating Temperature	-40°C to 70°C (-40°F to 158°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Weight	0.172 lb. (0.078 kg)
Protection	IP67
Enclosure and Dimensions	Nylon 6/6, 30% glass fill Ultrasonically welded 4.19 in x 1.81 in x 1.31 in (106 mm x 46mm x 33 mm) L X W X H includes integral connectors Flammability rating: UL 94V-0 Refer to dimensional drawing below.

<table>
<tr><td>Electrical Connections</td><td>

CAN / **RS-232** / **RS-422 Connector**
1 Phoenix Contact M12 12-pin connector (A-coded), Female P/N: 1441833

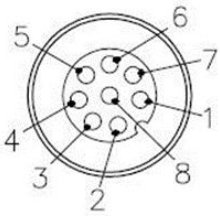
Note: To use RS-422 as RS-485, connect the Tx+ and Rx+ pin to D+ on the RS-485 connector. Also connect the Tx- and Rx- to pin D-.

<table>
<tr><th>PIN #</th><th>Description</th></tr>
<tr><td>1</td><td>RS-422 RX+</td></tr>
<tr><td>2</td><td>RS-422 TX+</td></tr>
<tr><td>3</td><td>RS-422 RX-</td></tr>
<tr><td>4</td><td>RS-232 TX 2</td></tr>
<tr><td>5</td><td>RS-232 RX 2</td></tr>
<tr><td>6</td><td>CAN_L</td></tr>
<tr><td>7</td><td>CAN_H</td></tr>
<tr><td>8</td><td>RS-232 TX 1</td></tr>
<tr><td>9</td><td>RS-232 RX 1</td></tr>
<tr><td>10</td><td>RS-422 TX-</td></tr>
<tr><td>11</td><td>Ground</td></tr>
<tr><td>12</td><td>Ground</td></tr>
</table>



Ethernet / **Power Connector**
1 Phoenix Contact M12 8-pin connector (A-coded), Female P/N: 1441817

<table>
<tr><th>PIN #</th><th>Description</th></tr>
<tr><td>1</td><td>Power +</td></tr>
<tr><td>2</td><td>Power -</td></tr>
<tr><td>3</td><td>Power -</td></tr>
<tr><td>4</td><td>Ethernet TX-</td></tr>
<tr><td>5</td><td>Ethernet RX+</td></tr>
<tr><td>6</td><td>Ethernet TX+</td></tr>
<tr><td>7</td><td>Power +</td></tr>
<tr><td>8</td><td>Ethernet RX-</td></tr>
</table>



</td></tr>
<tr><td>Mating Connectors</td><td>Not supplied
Mating connectors should meet the following standard for M12 connectors, IEC 61076-2-101:2012. They should be A-coded.</td></tr>
<tr><td>Mating Cables</td><td>**AX070531** (1.7 m (5.5 ft.), 8-pin M12 A-coded, Unterminated Leads, Ethernet Jack, Ethernet and Power Cable) mates with the Ethernet / Power Connector

AX070533 (RS-232, RS-232 (RS-485), RS-422 Cable 1.5 m (5 ft.), 12-pin M12, Unterminated Leads, CAN Cable) mates with the CAN / RS-232 / RS-422 / RS-485 Connector</td></tr>
<tr><td>Mounting</td><td>Mounting holes sized for #10 or M5 bolts</td></tr>
</table>

Dimensional Drawings

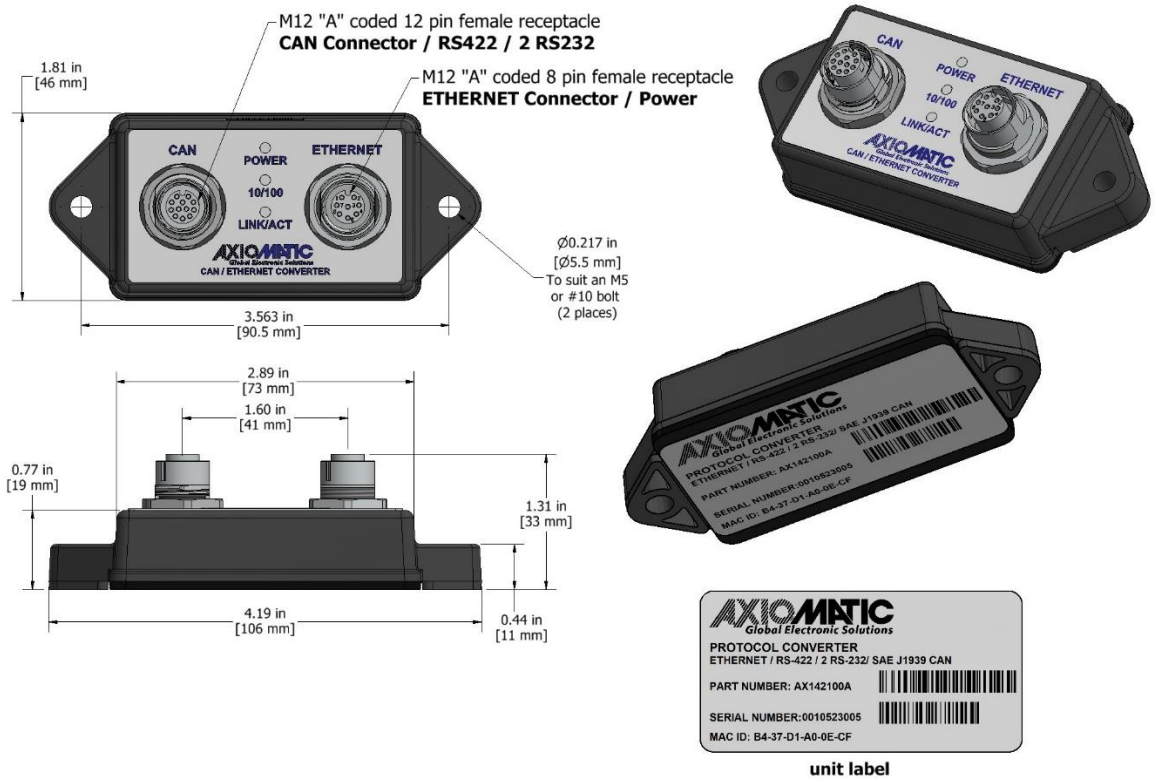
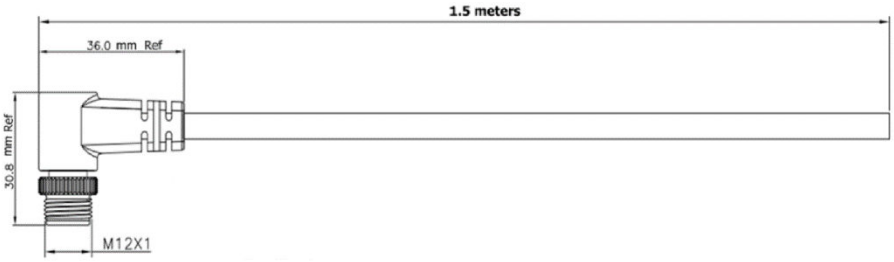


Figure 1.0 - Dimensional Drawing of AX142100A



M12 12 PIN MALE CABLE		
PIN	FUNCTION	WIRE COLOR
1	RS422_RX+	BLACK
2	RS422_TX+	BROWN
3	RS422_RX-	RED
4	RS232_TX2	ORANGE
5	RS232_RX2	YELLOW
6	CAN_L	DARK GREEN
7	CAN_H	BLUE
8	RS232_TX1	PURPLE
9	RS232_RX1	GREY
10	RS422_TX-	WHITE
11	GND	PINK
12	GND	LIGHT GREEN

Specifications:
Standard:IEC 61076-2-101
Current rating:4A(3,4,5PIN);2A(8PIN);1.5A(12PIN)
Voltage rating:250V(3,4,PIN);60V(5PIN);30V(8,12PIN)
Contact Resistance:5ohm Max.
Insulation Resistance:10M ohm Min., DC 450V
Operating Temperature:-40°C~80°C
IP Rating: IP67 in Locked Condition

Figure 2.0 - AX070533 Mating Cable

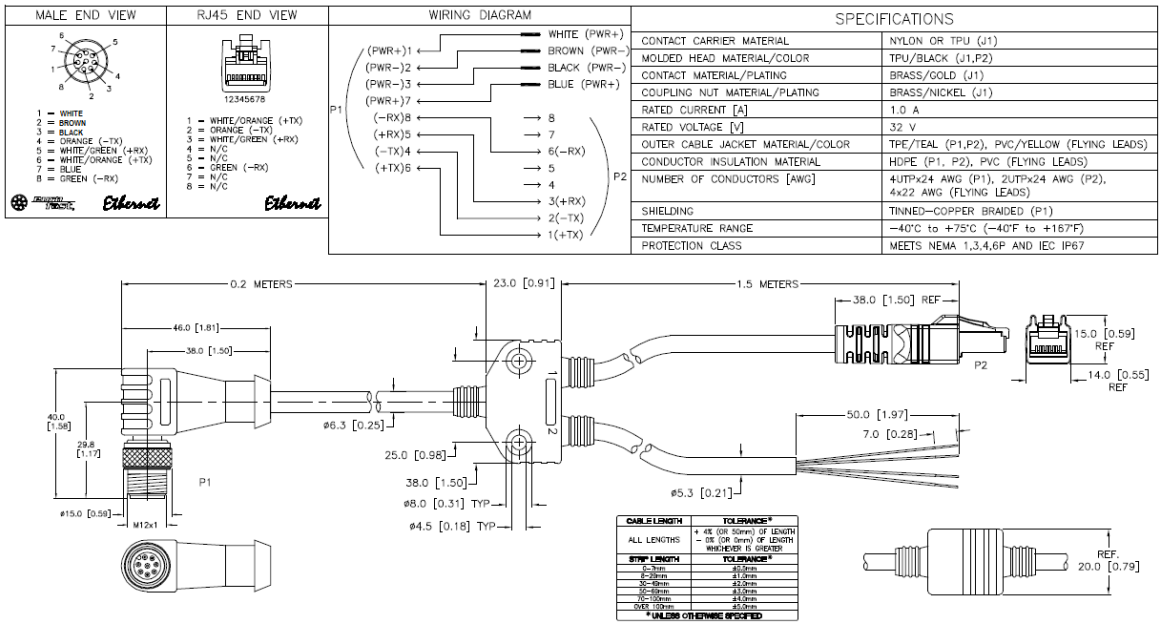


Figure 3.0 - AX070531 Mating Cable

Form: TDAX142100A-09/19/2024