AXIOMATIC ELECTRONIC ASSISTANT CONFIGURATION KIT II
for Configuration of Axiomatic SAE J1939 Controllers and Firmware Reflashing
P/N: AX070505K

The Axiomatic Electronic Assistant Configuration Kit II, **AX070505K**, includes the AX070505 USB-CAN Converter II, 3 ft. (0.91 m) USB 2.0A to Micro USB B Cable P/N: CBL-USB2.0A-MICROB-0.9M, 12 in. (30 cm) CAN Cable with female DB-9 P/N: CAB-AX070501, and Installation Instructions to download the Axiomatic Electronic Assistant software; Axiomatic EA & USB-CAN User Manual UMAX07050X; USB-CAN drivers & documentation; CAN Assistant (Scope and Visual) software & documentation; and the SDK Software Development Kit from the Axiomatic website www.axiomatic.com.

The Axiomatic **USB-CAN Converter II** is intended to provide a communication link between a computer USB port and a CAN network to allow PC software to communicate with Axiomatic controls on the CAN network. The converter contains a high-speed USB port (up to 480Mbit/s) and one DB9 high-speed CAN port with configurable baud rates up to 1Mbit/s. All standard and extended CAN frames, including data and remote frames, are supported. Galvanic isolation of the CAN port ensures no electrical interference between the PC and equipment connected to the CAN port. The converter is powered from the USB port. The internal state of the converter is displayed by a LED indicator on the housing. The industrial temperature range (-40…+85 °C) is suitable for a field environment. The converter uses a proprietary communication protocol and requires Axiomatic drivers to be installed on the user's PC. All software from the Axiomatic Electronic Assistant suite: Axiomatic Electronic Assistant (EA), Axiomatic Electronic Assistant – Scope, and Axiomatic Electronic Assistant – Visual supports this converter. Axiomatic provides USB to CAN Converter SDK, p/n AX070501SDK, to support third-party software development. The converter firmware can be updated in the field through the USB port using Axiomatic USB-CAN Converter Firmware Update Tool.

The **Axiomatic Electronic Assistant** is a software configuration tool that runs on the *Windows*® operating system and is connected to a J1939 bus via an USB to CAN converter, AX070505. Upon being connected to the bus, the Axiomatic EA will find all Electronic Control Units (ECU) on the bus and recognize those manufactured by Axiomatic. Using this tool, a user can quickly configure an Axiomatic ECU for the desired performance over a wide variety of applications. Configurable properties of an Axiomatic ECU are divided into function blocks, namely Input Function Block, Output Function Block, Diagnostic Function Block, PID Control Function Block, Lookup Table Function Block, Programmable Logic Function Block, Math Function Block, DTC React Function Block, CAN Transmit Message Function Block and CAN Receive Message Function Block for example. Final setpoint configuration can be saved in a file which can be used to easily program the same configuration into another Controller.

Axiomatic **CAN Assistant – Scope** software monitors CAN messages in a text format and is able to send single frames to the CAN bus. It is useful for PC-based debugging of J1939, CANopen® or proprietary CAN devices. The **CAN Assistant – Visual** software presents J1939 application data in a user-friendly graphic and text format. The Axiomatic USB-CAN Converter includes a **Software Development Kit (SDK)**. The SDK is designed to allow independent software developers and system integrators to use Axiomatic USB-CAN Converter in their own applications.

Ordering Part Number: AX070505K
The AX070505K Configuration KIT includes the following.
AX070505 USB-CAN Converter II
3 ft. (0.91 m) USB 2.0A to Micro USB B Cable P/N: CBL-USB2.0A-MICROB-0.9M
12 in. (30 cm) CAN Cable with female DB-9 P/N: CAB-AX070501

Installation Instructions: Instructions to download the Axiomatic Electronic Assistant software; Axiomatic EA User Manual UMAX07050X; USB-CAN Converter User Manual UMAX070505; USB-CAN drivers & documentation; CAN Assistant (Scope and Visual) software & documentation; and the SDK Software Development Kit from the Axiomatic website www.axiomatic.com.)

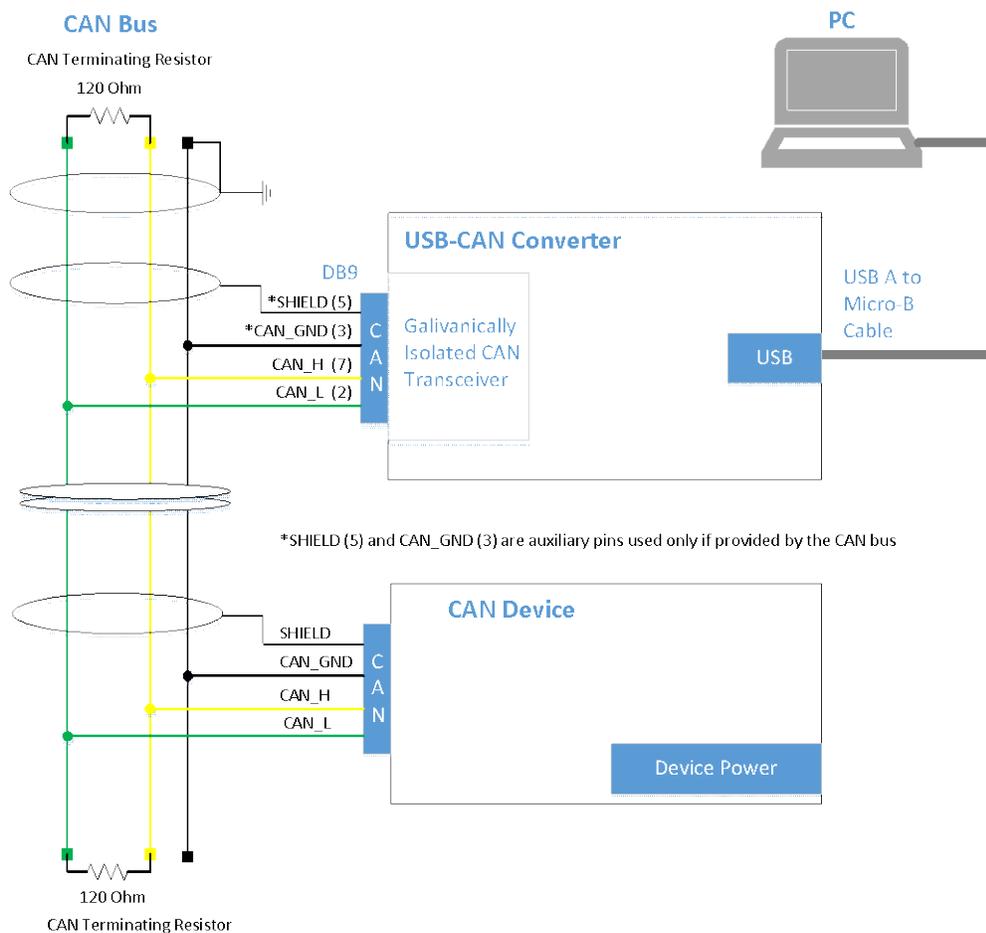**For more details on installation and use, refer to the user manual, UMAX070505.**

Figure 1 - Connecting Axiomatic USB-CAN Converter AX070505 to a CAN Bus (from UMAX070505)
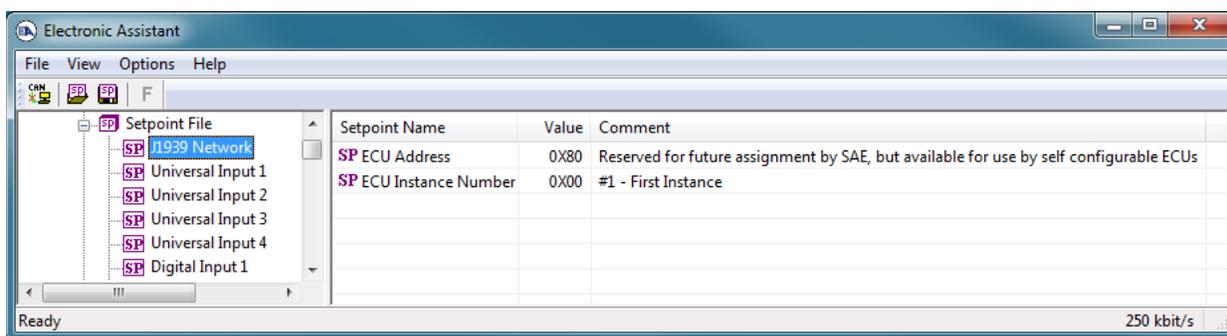
Figure 2 – Configuring an Axiomatic Controller for ECU Instance Number and Address using the Axiomatic Electronic Assistant
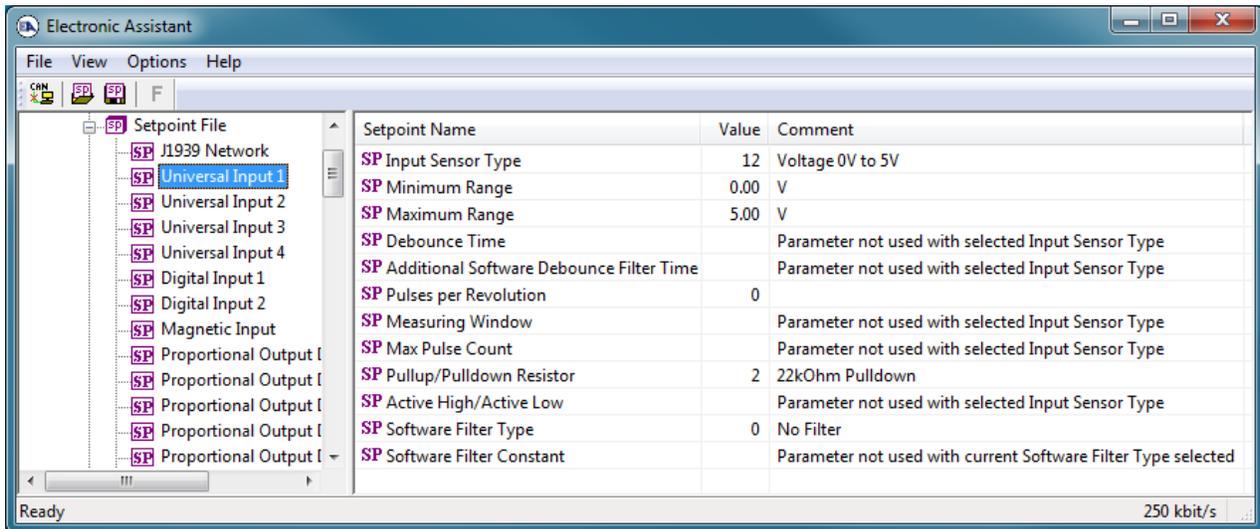
Figure 3 – Configuring an Axiomatic Controller's Universal Signal Inputs using the Axiomatic Electronic Assistant
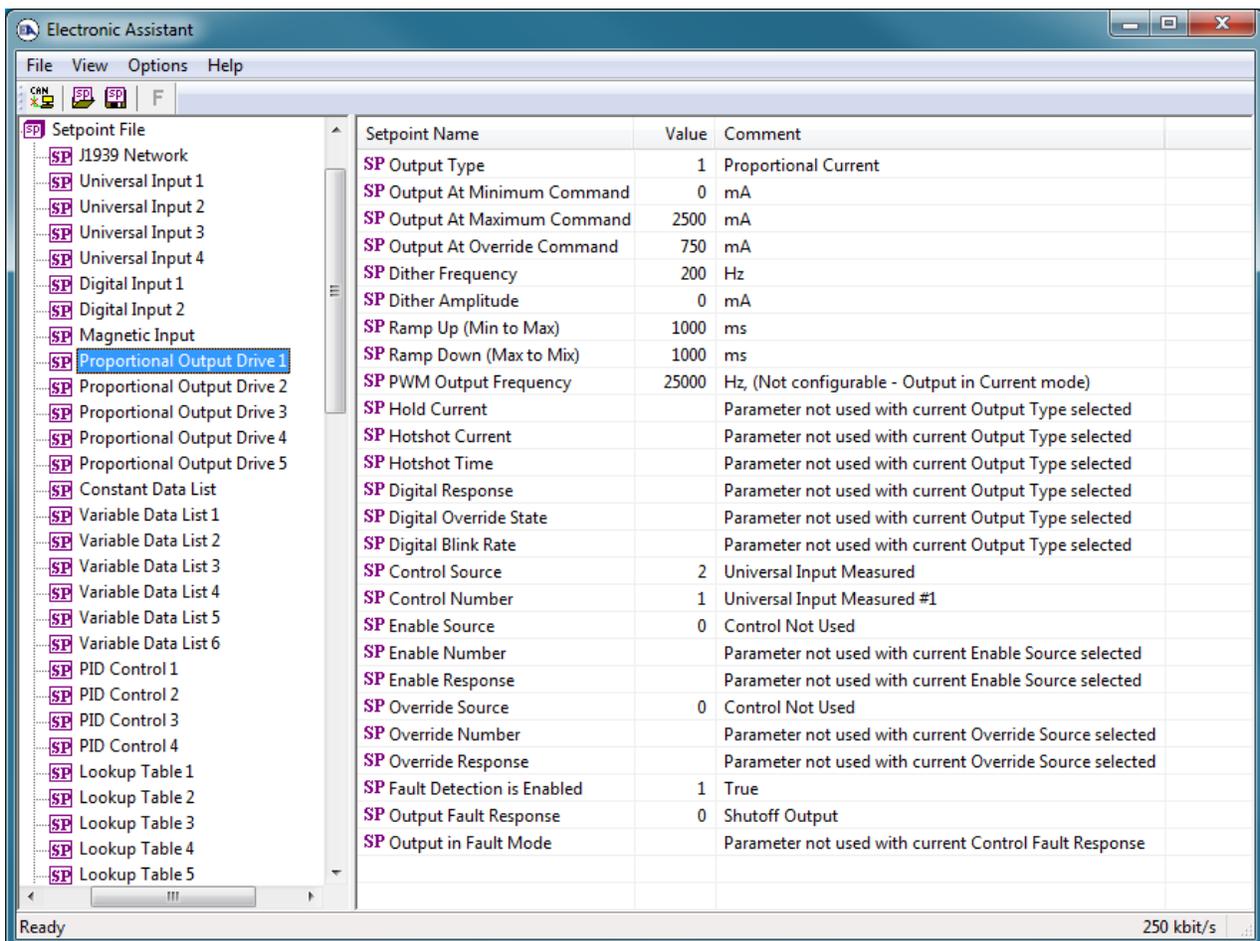

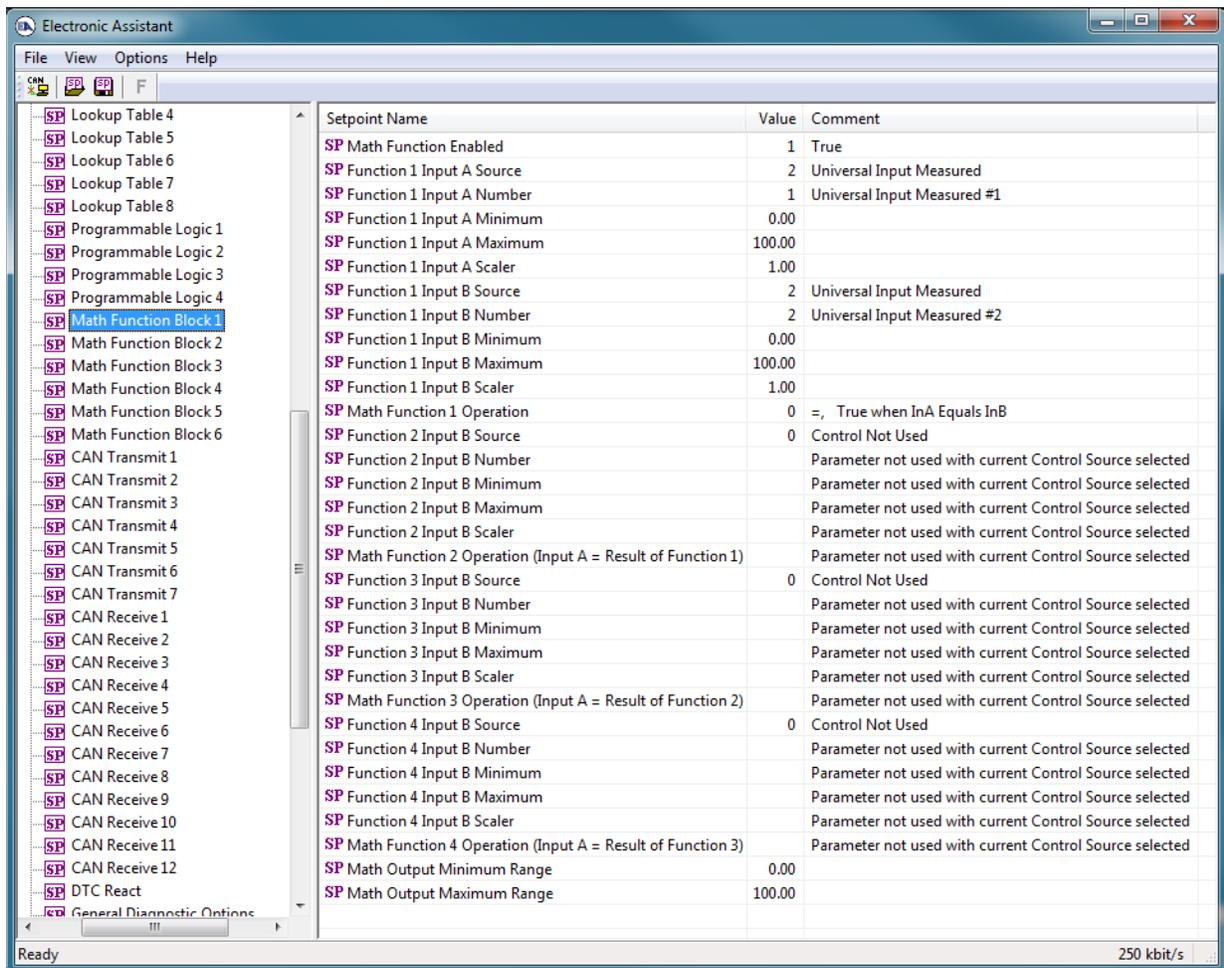*Figure 4 – Configurating an Axiomatic Controller's Outputs using the Axiomatic Electronic Assistant*

Figure 5 – Configuring an Axiomatic Controller's Math Function Block using the Axiomatic Electronic Assistant

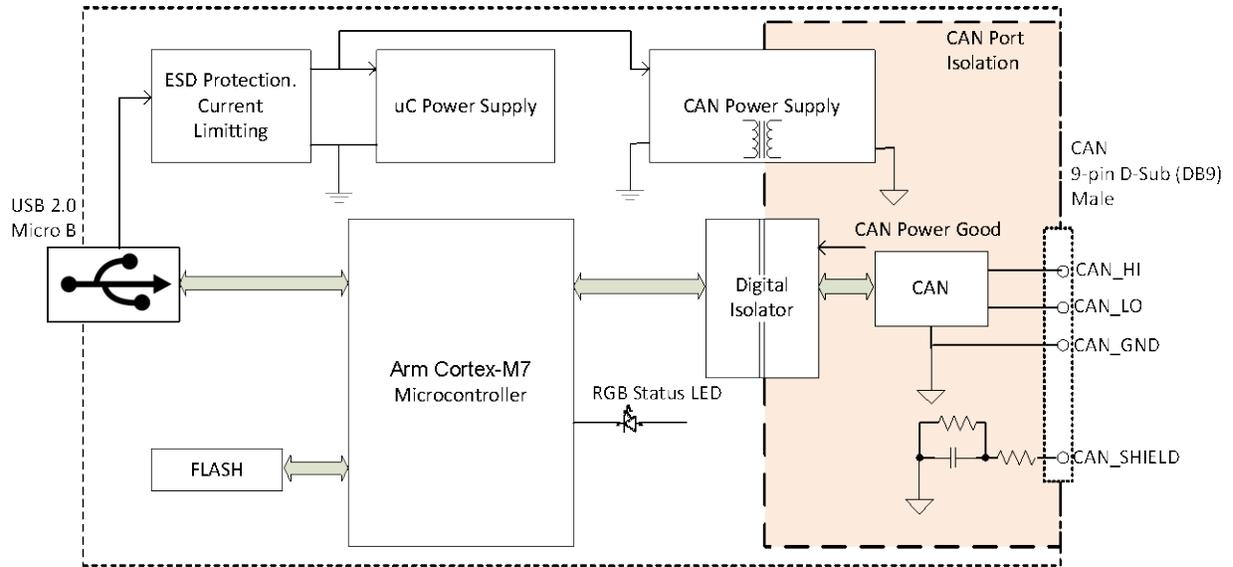## Technical Specifications – Axiomatic Electronic Assistant KIT II:

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/.

AX070505K, Configuration KIT	**AX070505K**, Configuration KIT includes the following. AX070505 USB-CAN Converter 3 ft. (0.91 m) USB 2.0A to Micro USB B Cable P/N: CBL-USB2.0A-MICROB-0.9M 12 in. (30 cm) CAN Cable with female DB-9 and 3 unterminated wires P/N: CAB-AX070501 *The cable is provided for test bench purposes only and is not intended for a permanent machine installation.* Installation instructions to download software and UMAX070505 user manual from the Axiomatic website www.axiomatic.com.

Drivers, Firmware Update Tool, and SDK for AX070505	The converter uses a proprietary communication protocol and requires Axiomatic drivers to be installed on the user's PC. The following Windows® software is used together with the USB to CAN converter and available for download from Axiomatic website www.axiomatic.com. **Contact sales@axiomatic.com for the password.**

Axiomatic P/N	Description
Not Assigned	USBCANDrivers, USB-CAN Converter Drivers
AX070505UT	USB-CAN Converter Firmware Update Tool
AX070501SDK	USB-CAN Converter SDK (Software Development Kit)

Axiomatic Electronic Assistant Software and Documentation	All software from the Axiomatic Electronic Assistant suite: Axiomatic Electronic Assistant (EA), Axiomatic Electronic Assistant – Scope, and Axiomatic Electronic Assistant – Visual supports this converter. Axiomatic provides the USB to CAN Converter SDK, p/n AX070501SDK, to support third-party software development. **The following software and documentation can be downloaded from the Axiomatic website – www.axiomatic.com. Contact sales@axiomatic.com for the password.** **1. The Axiomatic Electronic Assistant (EA)** The Axiomatic Electronic Assistant (EA) runs on any modern PC with the Microsoft Windows® 10 operating systems or higher. It comes with a royalty-free license for use.

System Requirement	Windows® XP or higher 32-bit or 64-bit operating system
Display	VGA (XGA or better with 1024 x 768 recommended)
Setup and Configuration	User Manual **UMAX07050X**
Supported Hardware Converters	Axiomatic AX070501 Axiomatic USB-CAN Converter or AX070505 Axiomatic USB-CAN Converter II Axiomatic AX140900 Axiomatic Ethernet-CAN Converter ESD C.2064.02 USB-CAN-Mini

2. Axiomatic EA User Manuals: UMAX07050X

3. USB-CAN drivers & documentation UMAX070505

4. CAN Assistant – Scope software (P/N: AX070501SCO) & documentation (UMAX070501SCO)
This software monitors CAN messages in a text format.

5. CAN Assistant – Visual software (P/N: AX070501VIS) & documentation (UMAX070501VIS)
This software graphs J1939 application messages in real time.

6. Software Development Kit (SDK) (P/N: AX070501SDK) & documentation (UMAX070501SDK)
for *Windows*® operating system

Specifications: USB-CAN Converter AX070505

The AX070505 converter is intended to provide a communication link between a computer USB port and a CAN network to allow PC software to communicate with Axiomatic controls on the CAN network. It is designed to be a drop-in replacement of the Axiomatic USB-CAN Converter, p/n AX070501, with a smaller housing and a faster USB port.

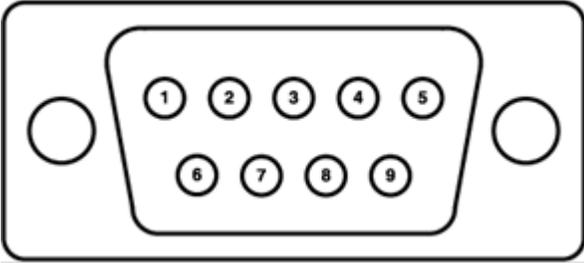| Microcontroller	ST Micro ARM 7 family
LED Indicator	Three-color RGB LED Status of Operation, USB, CAN, Bootloader Mode, etc. *Refer to User Manual UMAX070505 for details.*
Operating Temperature	-40 to 85 °C (-40 to 185 °F)
Dimensions	Hammond P/N: 1553WBGY ABS Plastic Enclosure with Soft Plastic Grip, UV stabilized, Flame Rating UL94-V-0 Refer to Figure 6. 4.62 in x 3.11 in x 0.98 in (117 mm x 79 mm x 25 mm)
Weight	AX070505 KIT: 0.65 lb. (0.295 kg) USB-CAN Converter, AX070505: 0.30 lb. (0.136 kg)
Rating	IP40

DETAIL A
DB9 CAN connector

DETAIL B
USB 2.0 Micro-B
connector
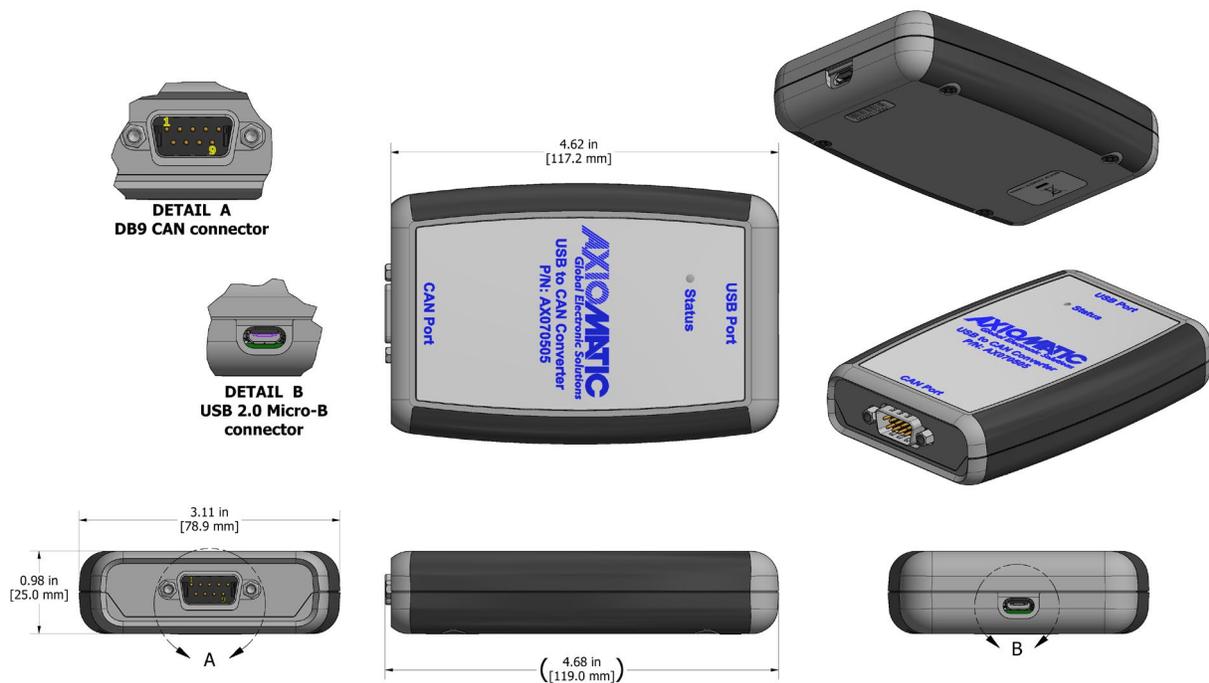
Figure 6 – AX070505 Dimensions

High Speed USB Port			
	Parameter	Value	Remarks
	USB Standard	USB 2.0 High-Speed (HS) or Full-Speed (FS)	Data rate: In HS - up to 480 Mb/s In FS - up to 12 Mb/s
	Connector	USB 2.0 Micro-B receptacle	USB Micro device receptacle
	Supply Voltage	4.3…5.5V	5V nominal. Provided by USB port
		6V	Short-time overvoltage
	Supply Current	100 mA/300 mA	Current limit in Non-Configured/Configured state
		150 mA	Maximum steady current in Configured state at 5V
		2.5 mA	Maximum current in Suspended state at 5V
	ESD Protection	±8 kV / ±15 kV	IEC 61000-4-2, Contact / Air, Data lines
		±30 kV	IEC 61000-4-2, Contact, Power lines
	Communication Protocol	Proprietary	Supported by Axiomatic Electronic Assistant (EA) suite. Windows® Drivers and SDK are provided

Parameter	Value	Remarks
DB-9 High Speed CAN Port Number of Ports	1	Galvanically Isolated
Port Isolation	400 VAC 3 kV DC	Functional Isolation, IEC 60950-1 Isolation Withstand Voltage, 1 minute
ESD Protection	±15 kV	IEC 61000-4-2, Contact
Maximum Bus Fault Voltage	±32 V	Maximum steady-state voltage on the CAN bus the transceiver can tolerate
Common Voltage	±30 V	Maximum receiver common mode input voltage
Connector	9-pin D-sub (DB9), Male	DIN 41652, IEC 60807-3
Pinout	CANopen®	CIA 303-1
Port Type	High Speed, ISO 11898-2 compatible	Connected to 120Ohm terminated twisted pair, baud rate up to 1 Mbit/s. External 120Ohm terminating resistor is required. Shield connection is provided if shielded cable is used
Baud Rate	1000, 800, 667, 500, 250, 125, 100, 50, 20, 10 or a custom value	[kbit/s]
Protocol	CAN Bosch 2.0A and B	Data Frames and Remote Frames with Standard and Extended IDs are supported

DB-9 Connections

CAN: 9 pole DSUB male (DB-9)

Pin #	Description
7	CAN_H
2	CAN_L
3	CAN_GND
5	CAN_SHIELD
1, 4, 6, 8, 9	Not Connected

Configuration Cable CAB-AX070501

CAB-AX070501
Unterminated cable with female DB-9, 12 inches (30 cm)
This is a temporary cable for initial configuration and is not suitable for use during machine operation.

Wires have the following marking:

Green (or Red)	CAN_L
Yellow (or White)	CAN_H
Black	CAN_GND

[1]CAB-AX070501 is provided for evaluation purposes only. The user is responsible for connecting the converter to the CAN network using a reliable wire harness with electrical parameters compatible with the CAN network.

USB Cable CBL-USB2.0A-MICROB-0.9M

CBL-USB2.0A-MICROB-0.9M
Standard commercially available cable
3 ft. (0.91 m) USB 2.0A to Micro USB B Cable

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Form: TDAX070505K-07/04/23