TECHNICAL DATASHEET #TDAX141200

CAN/Wi-Fi Converter

P/N: AX141200

Features:

- Wireless CAN to Ethernet link (Ethernet UDP or TCP)
- Operates in Wi-Fi or Wi-Fi Direct (P2P) mode
- CAN port (high speed, up to 1 Mbps) with configurable baud rate
- Operational 9 to 36 Vdc (12 Vdc or 24 Vdc)
- LED status indicator
- Integrated, TE Deutsch equivalent 8-pin connector
- Compact, fully sealed enclosure, IP67

Description:

The Wi-Fi to CAN Converter is a simple device converting CAN frames into UDP or TCP IP datagrams and sending them over a wireless Wi-Fi network. The device can also convert the received UDP or TCP datagrams into CAN frames.

The converter has one CAN port. It supports a high-speed CAN with a configurable baud rate up to 1Mbit/s and a dual-band 2.4 GHz and 5 GHz 802.11 a/b/g/n Wi-Fi. All standard and extended CAN frames, including data and remote frames, are supported.

The converter can work in: Station (STA), Access Point (AP), and Wi-Fi Direct (P2P) modes. The P2P mode operates only in 2.4 GHz frequency band. The wireless connection is provided by an internal antenna to maintain ruggedness. A three-color LED on the housing displays an internal state of the converter.

The converter contains a web server to setup configuration parameters and monitor the internal state of the converter using a web browser. The user can also update the converter firmware Over-The-Air (OTA) using the web browser.

The converter has two digital inputs. One of them is used to switch the converter to a default AP mode and then access it using a standard wireless device (e.g., a laptop or a smartphone). The second one can be used to disable all Wi-Fi communication.

A simple command-line `AxioDisc.exe` Windows application is provided to locate a converter on the LAN. To ensure low latency in processing CAN messages, the converter software runs under control of a real-time operating system.

Applications:

- Wireless CAN bus monitoring in off-highway and industrial equipment.
- Remote bi-directional CAN bus access over a wireless link.
- Wireless CAN bus extension – wireless bridge.

Ordering Part Numbers:

CAN/Wi-Fi Converter **–** P/N: **AX141200**

Accessories:
Mating Plug KIT – P/N: **AX070112**

Software Support Package (SSP) – P/N: **AX140910**
Downloadable from log-in section at www.axiomatic.com

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Block Diagram

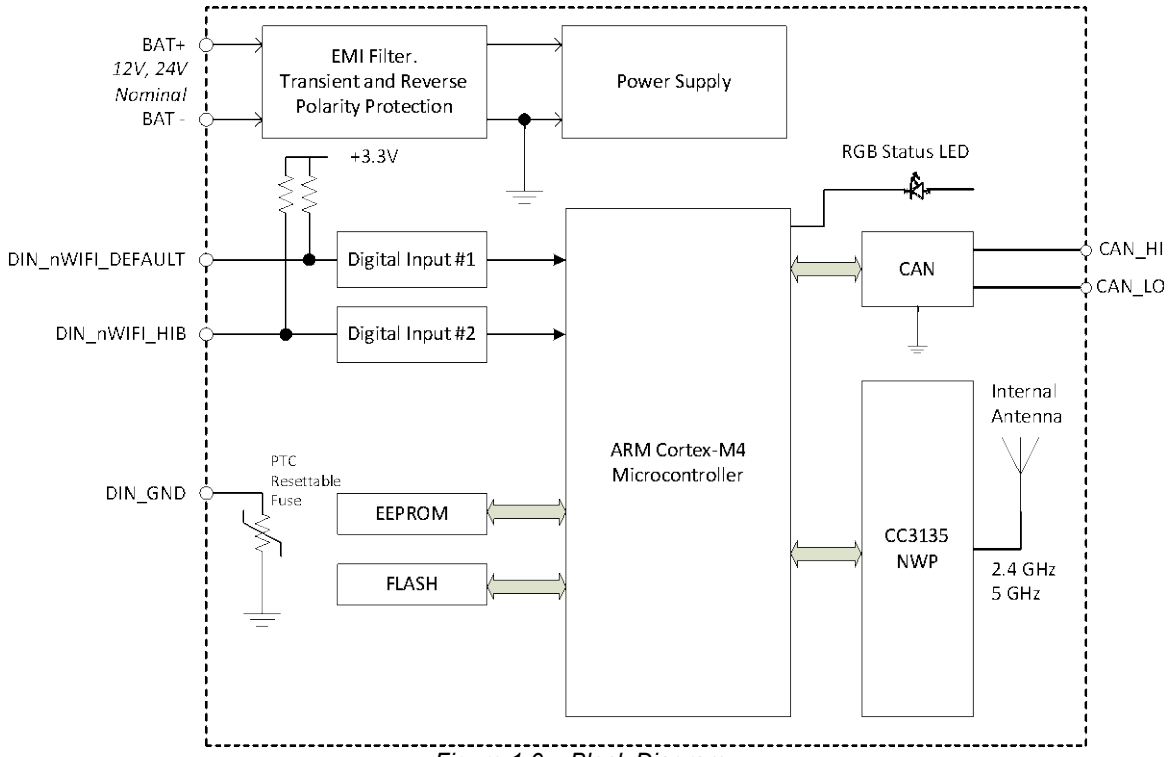

Figure 1.0 – Block Diagram

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

Power Supply Input

The power supply uses automotive battery power.

Parameter	Value	Remarks
Supply Voltage	9 to 36 Vdc	12 V, 24 V – nominal
Supply Current[1]	65 mA 35 mA	Maximum at 12 V Maximum at 24 V
Protection	Reverse Polarity, Overvoltage, Transients	

[1]CAN bus is connected. Wi-Fi is in station mode connected to an access point.

Wi-Fi Port

Parameter	Value	Remarks
Wireless Standards	802.11 a/b/g/n	802.11 a/b/g in Access Point mode
Frequency Ranges	2.4 GHz, 5 GHz	Available channels depend on the user selectable country/region of operation.
Antenna	Internal	
Communication Range	40 m	Reliable communication between two converters in open space
Connectivity Modes	Station, Access Point, Wi-Fi Direct (P2P)	Wi-Fi Direct is only supported in 2.4 GHz frequency range
Maximum Number of Stations	4	In Access Point mode
Maximum Number of Clients	1	In Wi-Fi Direct (P2P) GO mode
Security	Open, WEP, WPA/WPA2-PSK, PBC WPS in Wi-Fi Direct (P2P)	In Station and Access Point modes. PBC WPS in Wi-Fi Direct (P2P) Client and GO modes.
Firmware update	OTA	Using internal web server
Communication Protocols	IP, ICMP, ARP, UDP, TCP, HTTP, DHCP[2], Proprietary[1]	CAN messages are transmitted using a proprietary application protocol running on top of

Parameter	Value	Remarks
		the user selectable UDP or TCP transport protocol [1]. Internal web server uses HTTP protocol. The unit supports an Axiomatic proprietary discovery protocol [2]. DHCP can be used for dynamic address assignment in Station and Access Point modes. It is always used in Wi-Fi Direct (P2P) Client and GO modes.
Server Mode	Up to 10 bi-directional simultaneous connections	Up to 9 connections, if the Client mode is enabled
Client Mode	1 remote connection	Auto-connect to a remote server if connection is dropped or temporarily unavailable. Client mode can be disabled
Web server	Provided	Always enabled for converter configuration, diagnostics, and OTA firmware update
Internal Diagnostics	Health Status[1]	Internal health status of the converter is transmitted in heartbeat messages. It is also available from the web server
Wi-Fi Hibernation State	Provided	Controlled by an external digital input.

[1]Supported by *CAN-ENET Software Support Package* (SSP), P/N **AX140910**, v2.0.0+.
[2]Added in firmware version 3.00.

Reference documents describing proprietary protocols and *Health Status* field format are presented below. The documents are available upon request.

Reference Number	Document Name
[1]	O. Bogush, "Ethernet to CAN Converter Communication Protocol. Document version: 4", Axiomatic Technologies Corporation, April 5, 2021.
[2]	O. Bogush, "Ethernet to CAN Converter Discovery Protocol. Document version: 1A", Axiomatic Technologies Corporation, April 5, 2021.
[3]	O. Bogush, "Ethernet to CAN Converter Health Status. Document version: 3", Axiomatic Technologies Corporation, April 5, 2021.

CAN Port

Parameter	Value	Remarks
Number of Ports	1	
Port Type	High Speed, ISO 11898-2 compatible	120 Ω terminated twisted pair Shield connection is provided. External 120 Ω terminating resistor is required
Baud Rate	1000 kbit/s, 666.6(6) kbit/s, 500 kbit/s, 250 kbit/s, 125 kbit/s, 100 kbit/s, 83.3(3) kbit/s, 50 kbit/s, 20 kbit/s, 10 kbit/s	Programmable through the web interface
Protocol	CAN Bosch 2.0A and 2.0B	Data Frames and Remote Frames with Standard and Extended IDs are supported
Filtering	CAN ID Range/Mask	Disabled by default

CAN port does not contain 120 Ω termination resistor.

Control Software

Software Platform	Pre-programmed with standard logic. Refer to the user manual.

General Specifications

Microcontroller	ARM Cortex-M4
LED Indicator	Displays status Three-color LED (RBG)
User Interface	Web Server Refer to the User Manual
Compliance	Refer to Declaration of Conformity.
Vibration	TBA
Shock	TBA
Operating Conditions	-40°C to +85°C (-40°F to 185°F)
Environmental Protection	IP67
Weight	0.15 lb.
Enclosure and Dimensions	Molded enclosure, ultrasonically welded

	Nylon 6/6, 30% glass Integral connector 3.47 in x 2.76 in x 1.31 in (88.1 mm x 70 mm x 33 mm) L x W x H includes integral connector (Refer to Figure 1.0)
Electrical Connections	Integral 8-pin receptacle (equivalent to TE Deutsch P/N: **DT04-08PA**) **Pin #** / **Description** 1 – BATT - 2 – BATT + 3 – CAN_L 4 – CAN_H 5 – DIN_GND 6 – DIN_nWI-FI_DEFAULT (Active Low) 7 – Not used 8 – DIN_nWI-FI_HIB (Active Low) Digital inputs DIN_nWIFI_DEFAULT and DIN_nWIFI_HIB have internal pull-ups and are activated by connecting them to DIN_GND. When digital inputs DIN_nWIFI_DEFAULT and DIN_nWIFI_HIB are pulled down simultaneously at power-up, they activate procedure that restores NWP factory default configuration. (Available in firmware version 3.00 or higher.)
Mating Plug Kit	P/N: **AX070112** (includes 1 DT06-08SA, 1 W8S, 8 0462-201-16141, and 3 114017)

Dimensional Drawing

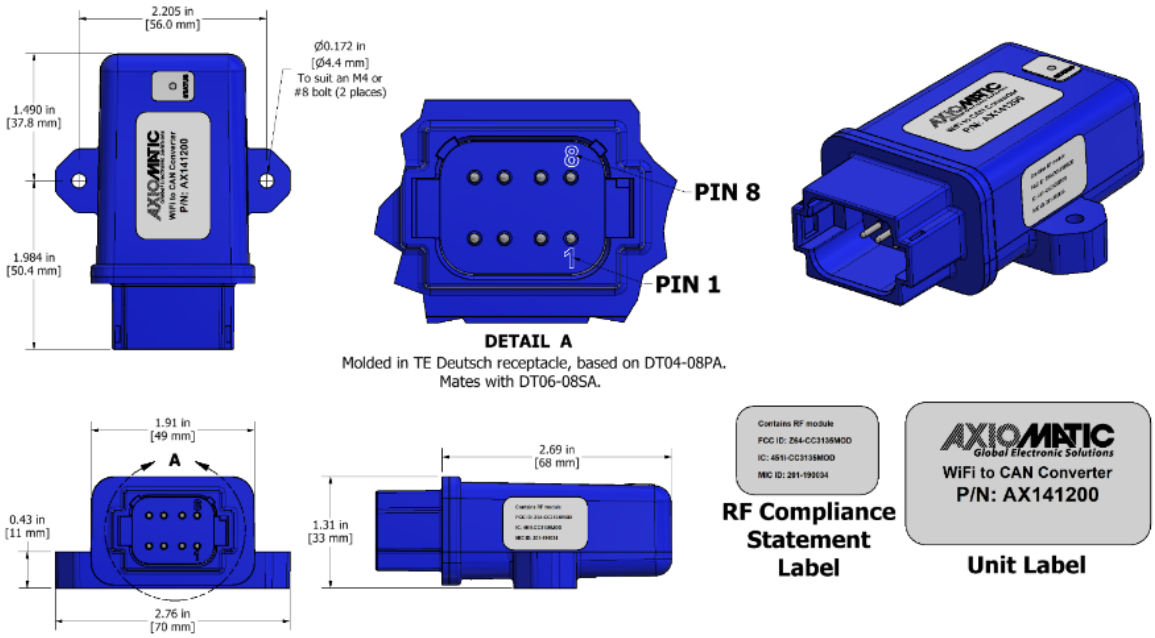

Figure 1.0 – Dimensional Drawing

Form: TDAX141200-06/29/23