

6 Port Gigabit Automotive Ethernet Switch

P/N: AX141572

Applications

- Off-highway equipment
- Mining equipment
- Industrial trucks

Ordering Part Numbers

6-Port Gigabit Automotive Ethernet Switch - P/N: **AX141572**

Purchase 1x AX141572, 1x AX070169, and 6x AX070168 together as a kit under P/N: **AX141572K**.

Accessories:

- 1x Cable 5 m (16.4 ft.), 5-Pin M12 A-Coded Connector, Underterminated Leads - P/N: **AX070169**
- 6x Cable 2 m (6.5 ft.), 4-Pin M12 D-Coded Connector, Underterminated Leads - P/N: **AX070168**

Features

- 6x gigabit Automotive Ethernet ports (1 Gbps or 100 Mbps)
- Supports standard VLAN settings and advanced AVB/TSN features, including 802.1AS-2020 (gPTP) and AutoCDS 1.6 PTP profiles with credit based 802.1Qav and time aware 802.1Qbv shaping
- 12 or 24 V_{DC} input power (nominal) for connection to a battery
- Power Enable signal to power up the device (when it is constantly connected to the battery)
- Surge, reverse polarity, overvoltage, and undervoltage protection
- Power, Link/Activity, Speed, and Power LED indicators
- 1x 5-pin and 6x 4-pin M12 connectors
- IP67-rated enclosure suitable for harsh environments
- CE / UKCA marking
- Configurable by proprietary Automotive Switch Configuration Tool software from Infineon

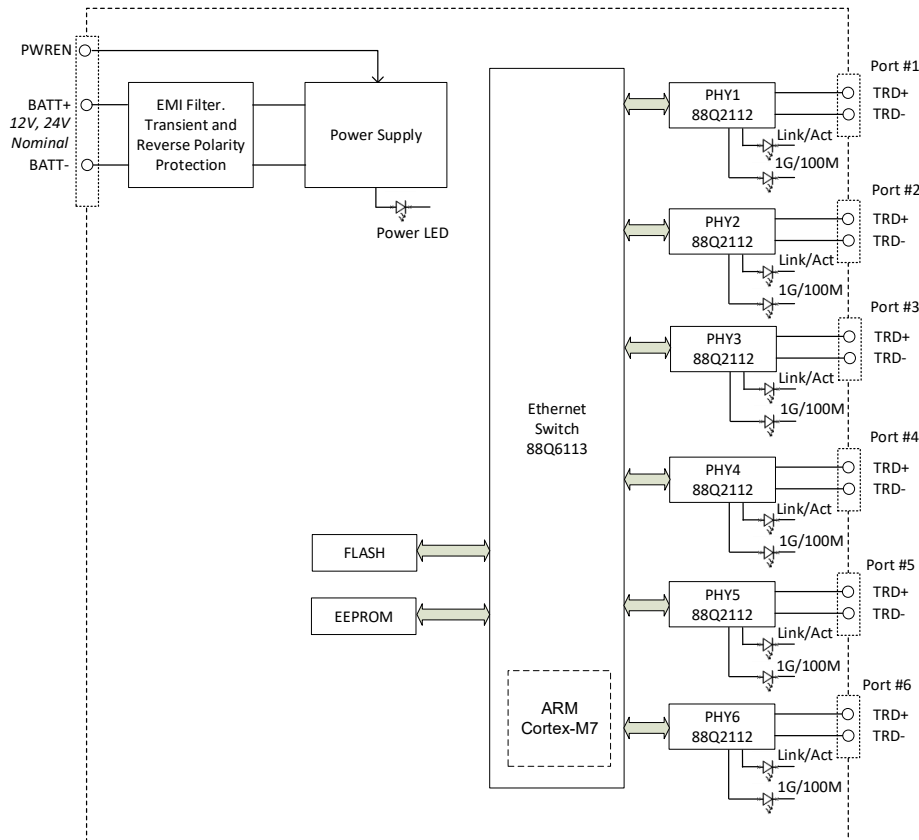


Figure 1.0 – Block Diagram

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/>.

Power Supply

Parameter	Value	Remarks
Supply Voltage	9 to 36 V _{DC}	12 or 24 V – nominal
Standby Supply Current ¹	TBD mA	12 V – typical ⁴
	TBD mA	24 V – typical ⁴
Maximum Supply Current ²	TBD mA	12 V – typical ⁴
	TBD mA	24 V – typical ⁴
Shutdown Supply Current ³	0.1 mA	12 V – typical ⁴
	0.2 mA	24 V – typical ⁴
Power Enable Input (PWREN)	ON, if V _{PWREN} > 6 V	Can be connected to Battery +
	OFF, if V _{PWREN} < 0.5 V	Can be left open or connected to Battery -
	R _{PWREN} >> 10 kΩ	High impedance input
LED Indicator	Power ON	Green LED
Protection	Overvoltage, undervoltage, reverse polarity, transients/surge	Overvoltage hardware shutdown at TBD V, recovery at TBD V Undervoltage hardware shutdown at TBD V, recovery at TBD V Tolerates reverse polarity from TBD V

¹ All Automotive Ethernet ports are set at maximum speed and disconnected.

² All Automotive Ethernet ports are set at maximum speed and connected.

³ Power supply is disabled. Power Enable Input is left open.

⁴ At room temperature (25 °C).

Automotive Ethernet Switch

See User Manual UMAX141572.

Parameter	Value	Remarks
Number of Ports	6	Individually configurable
Switch Type	Unmanaged / managed ¹	Managed if configuration software is used ¹
Switching Capacity	12 Gbps	
Forwarding Rate	8.93 Mpps	
MAC Address Table	16k entries	16384 address database entries
Packet Buffer Memory	2 Mbit	
Jumbo Frame	10236 / 10240 bit	Tagged/untagged frames
QoS	8 priority queues	
	802.1p / DSCP QoS	
Port Type	1000BASE-T1	IEEE 802.3bp-2016. Default setting
	100BASE-T1	IEEE 802.3bw-2015
Port Speed	1 Gbps / 100 Mbps ²	1 Gbps default
Port Mode	Master / slave ²	Master default
Port LED Indicators	Yellow - Link / Activity	One set per port
	Green - Speed	
Configurable using software ¹		
Packet Forwarding	Static ATU Entries	Static MAC address translation
VLAN	Port-based VLANs	
	802.1Q Tag VLANs	4K VLAN IDs
	Port Mirroring	
Ingress Rate Limiting	8 IRL Resources	Per port
AVB/TSN	802.1AS-2020	gPTP
	AutoCDS 1.6	Avnu Alliance
	802.1Qav	Forwarding and Queuing for Time-Sensitive Streams. Credit Based Shaping
	802.1Qbv	Enhancements for Scheduled Traffic. Time Aware Shaping
	Static Stream Reservation	62 streams
Deep Packet Inspection	48-byte and 96-byte Depth	TCAM-based, 256 rules

¹ Automotive Switch Configuration Tool v4. Proprietary software from Infineon. NDA is required.

² Configurable by Automotive Switch Configuration Tool using runtime operation settings.

LED Indicators

Name	Status	Description
Link/Activity (LINK/ACT)	Off	No link
	Yellow	Link up
	Blinking Yellow	Link up and active
Speed (1G/100M)	Off	Link up at 100 Mbps or no link
	Green	Link up at 1 Gbps

General Specifications

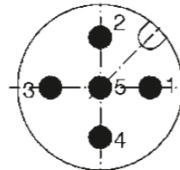
Parameter	Value	Remarks
Operating Temperature	-40 to 75 °C (-40 to 185 °F)	
Storage Temperature	-40 to 85 °C (-40 to 185 °F)	
Protection	IP67	IEC 60529. With mated connectors
Enclosure	Cast aluminum, anodized enclosure	Lexan overlay
Size	7.25 in. x 3.75 in. x 2.2 in. (184.2 mm x 95.3 mm x 56 mm)	L x W x H excluding connectors See dimensional drawing
Weight	1.41 lbs. (0.64 kg) preliminary	
Compliance	RoHS	

Power Connector

M12 socket, 5-pin, A coded, male connector, BINDER, P/N: 09-3441-126-05.

Use A-coded mating connectors compliant with IEC 61076-2-101:2012.

A mating cable is available from Axiomatic under P/N: **AX070169** (Cable 5 m (16.4 ft.), 5-pin M12 A-coded, Untermated Leads). 1x set is required.

Pin	Description	
1	Power Enable ¹	
2	Battery +	
3	Battery -	
4	Not used. Do not connect.	
5	Not used. Do not connect.	

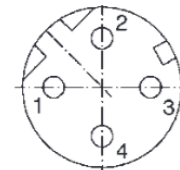
¹ Connect to Battery +, if not used.

Automotive Ethernet Connector

M12 socket, 4-pin, D-coded, female connector, BINDER, P/N: 99-3732-201-04.

Use D-coded mating connectors compliant with IEC 61076-2-101:2012.

A mating cable is available from Axiomatic under P/N: **AX070168** (Cable 2 m (6.5 ft.), 4-pin M12 D-coded, Untermated Leads). 6x sets are required.

Pin	Description	
1	TRD +	
2	Not used. Do not connect.	
3	TRD -	
4	Not used. Do not connect.	

Automotive Ethernet Cable Requirements

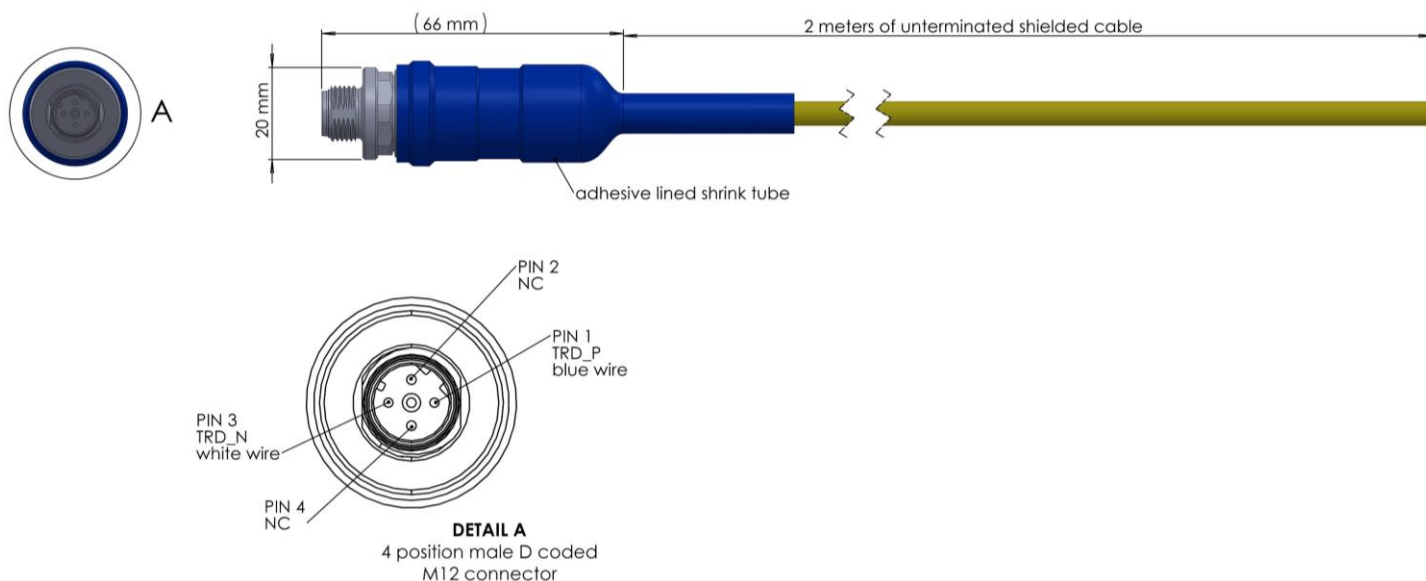
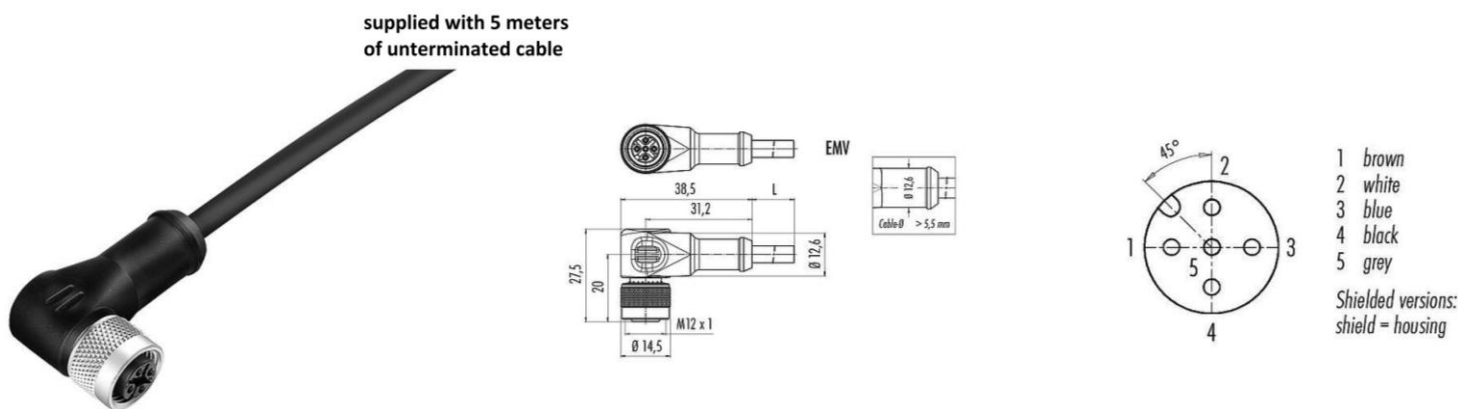
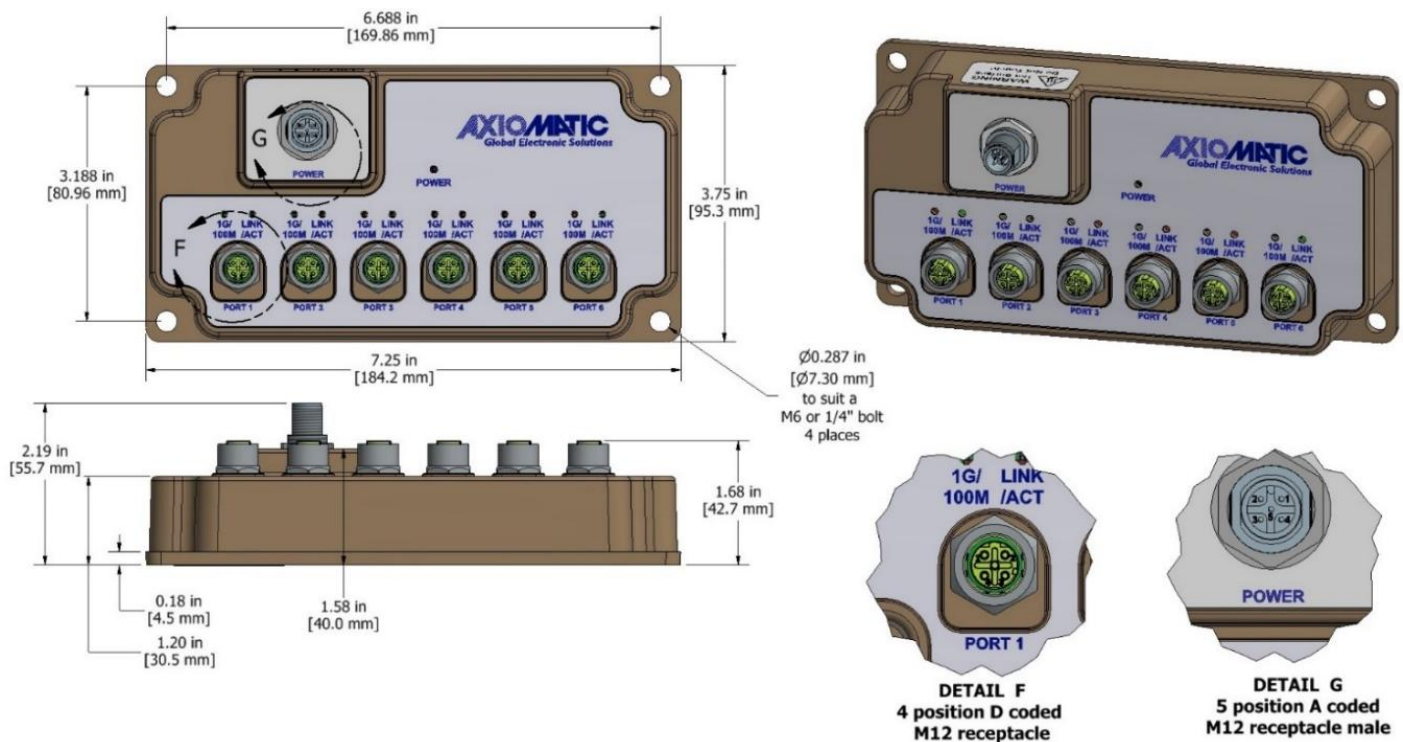
Automotive Ethernet utilizes a single balanced twisted pair with 100 Ω characteristic impedance. The cable characteristics should meet or exceed the appropriate Automotive Ethernet standard.

Port Speed	Cable Type	Segment Type	Frequency Range	Maximum Cable Insertion Loss ¹	Maximum Distance	Automotive Ethernet Standard
1 Gbps	UTP, STP	B (Optional Segment)	1-600 MHz	8.5 dB @ 100 MHz	40m	IEEE 802.3bp-2016
				13.8 dB @ 250 MHz		
				22.3 dB @ 600 MHz		
	UTP	A (Automotive Segment)	1-600 MHz	6.1 dB @ 100 MHz	15m	
				9.9 dB @ 250 MHz		
				15.9 dB @ 600 MHz		
100 Mbps	UTP	-	1-66 MHz	2.6 dB @ 10 MHz	15m	IEEE 802.3bw-2015
				4.9 dB @ 33 MHz		
				7.2 dB @ 66 MHz		

¹ At maximum cable length. For other cable characteristics see the appropriate Automotive Ethernet standard.

Depending on the application, the following cable standards can be used for selecting the Ethernet cable.

Application	Cable Standard
Automotive	OPEN Alliance TC9, Channel and Components Requirements for 1000BASE-T1 Link Segment Type A (STP). OPEN Alliance TC9, Channel and Components Requirements for 1000BASE-T1 Link Segment Type A (UTP).
Commercial and Industrial	ISO/IEC TR 11801-9906 (T1-B cable type or better for 100BASE-T1, 1000BASE-T1 Type A, B) IEC 61156-11 (Horizontal floor wiring. T1-B cable type parameters) IEC 61156-12 (Work area wiring. T1-B cable type parameters)



Description

The AX141572 is designed for industrial and automotive applications requiring high performance 1 Gbps (1000BASE-T1) or 100 Mbps (100BASE-T1) Automotive Ethernet connectivity. In the default configuration, the device operates as an unmanaged switch with six 1000BASE-T1 ports in Master mode. For managed switch operations, the device can be configured using a proprietary Automotive Switch Configuration Tool (ASCT) that can be acquired through NDA with Infineon. Windows and Linux versions are available.

The switch core is based on Infineon automotive Ethernet switch 88Q6113 paired with six Infineon PHY transceivers 88Q2112. The device is controlled by Infineon 88Q6113 switch firmware running on its internal ARM Cortex M7 CPU. The flash memory and EEPROM are used to store the firmware and configuration parameters of the switch. The device configuration supports standard VLAN settings and advanced AVB/TSN features, including 802.1AS-2020 (gPTP) and AutoCDS 1.6 PTP profiles with credit based 802.1Qav and time aware 802.1Qbv shaping.

A separate Power Enable digital signal is used to power-up the device in applications where the switch is constantly connected to the battery. The internal state of the switch is displayed by LED indicators on the front panel of the housing.

Note:

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 single 2-wire twisted pair cable.

Form: TDAX141572-08/05/2026

OUR PRODUCTS

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CANopen I/O Modules
Current/Voltage/PWM Converters
DC/DC Power Converters
Engine Temperature Scanners
Ethernet/CAN Converters, Gateways
Ethernet Switches
Fan Drive Controllers
Gateways, CAN/Modbus, RS-232
Gyroscopes, Inclinometers
Hydraulic Valve Controllers
Inclinometers, Triaxial
I/O Controls
LVDT Signal Converters
Machine Controls
Media Converters
Modbus, RS-422, RS-485 Controls
Motor Controls, Inverters
Power Supplies, DC/DC, AC/DC
PWM Signal Converters/Isolators
Resolver Signal Conditioners
SAE J1939 I/O Modules
Service Tools
Signal Conditioners, Converters
Strain Gauge CAN Controls
Surge Suppressors

OUR COMPANY

Axiomatic provides electronic machine control components to the off-highway, commercial vehicle, electric vehicle, power generator set, material handling, renewable energy and industrial OEM markets. ***We innovate with engineered and off-the-shelf machine controls that add value for our customers.***

QUALITY DESIGN AND MANUFACTURING

We have an ISO9001 registered R&D, electronics design and manufacturing facility in Canada.

Sales offices are in Canada, USA, Australia and Finland.

COMPLIANCE

Product compliance details can be found in the product literature and/or on axiomatic.com. Any inquiries should be sent to sales@axiomatic.com.

SAFE USE

All products should be serviced by Axiomatic. Do not open the product and perform the service yourself.



This product can expose you to chemicals which are known in the State of California, USA to cause cancer and reproductive harm. For more information go to www.P65Warnings.ca.gov.

TECHNICAL SUPPORT

Contact technical support by emailing support@axiomatic.com.

WARRANTY, APPLICATION APPROVALS/LIMITATIONS

Axiomatic Technologies Corporation reserves the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. 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 at <https://www.axiomatic.com/service/>.

SERVICE

All products to be returned to Axiomatic require a Return Materials Authorization Number (RMA#) from rma@axiomatic.com. Please provide the following information when requesting an RMA number:

- Serial number, part number, Runtime hours, description of problem
- Wiring set up diagram, application and other comments as needed

DISPOSAL

Axiomatic products are electronic waste. Please follow your local environmental waste and recycling laws, regulations and policies for safe disposal or recycling of electronic waste.

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