PXIe-8523

4-Port, 100/1000BASE-T1 PXI Automotive Ethernet Interface Module

This document lists specifications for the PXIe-8523 4-port, 100/1000BASE-T1 PXI Automotive Ethernet interface module.

Definitions

Warranted specifications describe the performance of a model under stated operating conditions and are covered by the model warranty.

Characteristics describe values that are relevant to the use of the model under stated operating conditions but are not covered by the model warranty.

- *Typical* specifications describe the performance met by a majority of models.
- *Nominal* specifications describe an attribute that is based on design, conformance testing, or supplemental testing.

Specifications are *Typical* unless otherwise noted.

Conditions

Specifications are typical at 0 °C to 55 °C unless otherwise noted.

⚠ **Notice** The terminals or pins of this device are not protected from electromagnetic interference. As a result, this device may experience reduced measurement accuracy or other temporary performance degradation when connected cables are routed in an environment with radiated or conducted radio frequency electromagnetic interference.

NATIONAL INSTRUMENTS™

Bus Interface

Form factor	Gen 2 x4 PXI Express, specification rev 1.0 compliant
Slot compatibility	x1[1], x4, x8 and x16 PXI Express or PXI Express hybrid slots

Power Requirements

Voltage (V)	Current (A), Maximum (Typical)
+3.3	2.7 (2.2)
+12	1.5 (1.0)

Physical Characteristics

Dimensions (not including connectors)	16 cm x 10 cm (6.0 in. x 3.9 in.) 3U CompactPCI slot
Weight	200 g (7.1 oz)
Ports	4, 100/1000BASE-T1
I/O connectors	Weidmuller BLF 3.50, 3-position
Spring terminal wiring	
Wire gauge	0.14 mm^2 (26 AWG) to 1.5 mm^2 (16 AWG)
Wire strip length	8 mm (0.3 in.) of insulation stripped from the end
Ferrules	0.14 mm^2 (26 AWG) to 1.5 mm^2 (16 AWG), 8 mm barrel length
Connector securement	
Securement type	Screw flanges provided
Torque for screw flanges	0.2 N · m to 0.25 N · m (1.8 lb · in. to 2.2 lb · in.)
LED indicators	1 Link/Activity LED and 1 Status LED for each port

Note Refer to the *PXIe-8522/8523 User Manual* for additional information about I/O connectors and ferrules (included).

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[1] Limited performance due to PCIe bandwidth.

Network Interface

Port configuration	2 Taps or 4 endpoints
Tap latency	
100 Mbit/s	2 µs (typical)
1 Gbit/s	5.55 µs (typical)
Protocols	IEEE 802.3 Raw Ethernet, TCP/IP, UDP/IP, AVB (IEEE 802.1Qav, AVTP), IEEE 802.1AS

Note For information about using Taps and endpoints, refer to the *PXIe-8522/8523 User Manual*.

Timing and Synchronization

Network timekeeping	
Timing and synchronization protocol	802.1AS
Network synchronization accuracy	
100BASE-T1	< 1 µs
1000BASE-T1	< 3 µs
Timebases	
Local	100 MHz, shared by all ports, disciplined by PXI_Clk10 if available
Network	x4 125 MHz, 1 per port, independently disciplined by an external grand master (port is configured as a slave)[2] or the local timebase (port is configured as a master)
Trigger I/O source	PXI_Trig <0:7>
Trigger capability	
Input	
Timestamps[3]	x4 Timestamps, one per port; each captures both local time and network time[4]

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[2] If the port is not connected to an 802.1AS network, the network timebase falls back to local time.
[3] Each timestamp can be triggered by any PXI_Trig <0:7>.
[4] If no external network is available, use local time instead.

Output

	Time triggers	x4 Time triggers, one per port; generated from local time or network time
	Clocks	x4 1 MHz, one per port; 50% duty cycle; each disciplined by network time x4 1 Hz PPS (pulse per second), one per port; 50% duty cycle; each disciplined by network time

Note Clock outputs and time triggers can be exported on any PXI_Trig<0:7>.

Environmental Guidelines

Notice Indoor use only.

Environmental Characteristics

Operating Environment

Ambient temperature range	0 °C to 55 °C
Relative humidity range	10% to 90%, noncondensing
Altitude	2,000 m (800 mbar) at 25 °C ambient temperature
Pollution Degree	2

Storage Environment

Ambient temperature range	-40 °C to 71 °C
Relative humidity range	5% to 95%, noncondensing

Shock and Vibration

Operational shock	30 g peak, half-sine, 11 ms pulse
Random vibration	
Operating	5 Hz to 500 Hz, 0.3 grms
Nonoperating	5 Hz to 500 Hz, 2.4 grms

Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the *Commitment to the Environment* web page at *ni.com/environment*. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers At the end of the product life cycle, all NI products must be disposed of according to local laws and regulations. For more information about how to recycle NI products in your region, visit *ni.com/environment/weee*.

电子信息产品污染控制管理办法（中国 **RoHS**）

中国客户 National Instruments 符合中国电子信息产品中限制使用某些有害物质指令（RoHS）。关于 National Instruments 中国 RoHS 合规性信息，请登录 ni.com/environment/rohs_china。（For information about China RoHS compliance, go to ni.com/environment/rohs_china.）

Environmental Standards

This product meets the requirements of the following environmental standards for electrical equipment.

- IEC 60068-2-1 Cold
- IEC 60068-2-2 Dry heat
- IEC 60068-2-78 Damp heat (steady state)
- IEC 60068-2-64 Random operating vibration
- IEC 60068-2-27 Operating shock
- MIL-PRF-28800F
    - Low temperature limits for operation Class 3, for storage Class 3
    - High temperature limits for operation Class 2, for storage Class 3
    - Random vibration for non-operating Class 3
    - Shock for operating Class 2

Note To verify marine approval certification for a product, refer to the product label or visit *ni.com/certification* and search for the certificate.

Safety Compliance Standards

This product is designed to meet the requirements of the following electrical equipment safety standards for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA C22.2 No. 61010-1

Note For UL and other safety certifications, refer to the product label or the *Product Certifications and Declarations* section.

Electromagnetic Compatibility Standards

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326-1 (IEC 61326-1): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-003: Class A emissions

Note Group 1 equipment (per CISPR 11) is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.

Note In the United States (per FCC 47 CFR), Class A equipment is intended for use in commercial, light-industrial, and heavy-industrial locations. In Europe, Canada, Australia and New Zealand (per CISPR 11) Class A equipment is intended for use only in heavy-industrial locations.

CE Compliance $C \in$

This product meets the essential requirements of applicable European Directives, as follows:

- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)
- 2011/65/EU; Restriction of Hazardous Substances (RoHS)

Product Certifications and Declarations

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for NI products, visit *ni.com/ product-certifications*, search by model number, and click the appropriate link.