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# PXle-8523

# Specifications

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2025-07-23



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# PXle-8523 Specifications

## PXle-8523 Specifications

This document lists specifications for the PXle-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.

# PXIe-8523 Pinout

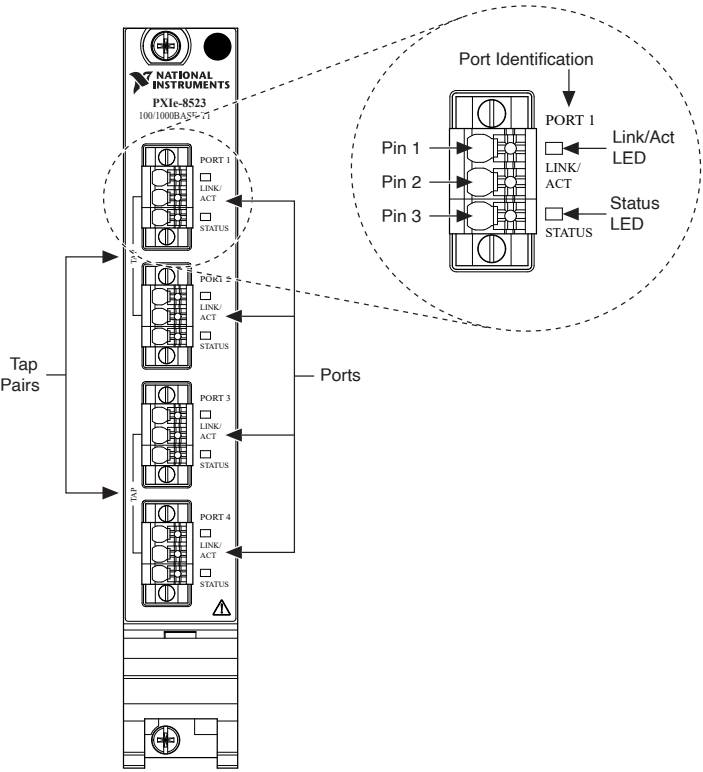


Table 1. PXIe-8523 Pinout Signal Descriptions

| Pin Number | Signal Type | Signal Direction | Signal Description | Signal Required |
|------------|-------------|------------------|--------------------|-----------------|
| 1          | TRX_P       | Bi-directional   | Transceiver plus   | Required        |
| 2          | TRX_M       | Bi-directional   | Transceiver minus  | Required        |
| 3          | Shield      | —                | Shield             | Optional        |

## Bus Interface

|                    |                                                                          |
|--------------------|--------------------------------------------------------------------------|
| Form factor        | Gen 2 x4 PXI Express, specification rev 1.0 compliant                    |
| Slot compatibility | x1 <sup>1</sup> , x4, x8 and x16 PXI Express or PXI Express hybrid slots |

1. Limited performance due to PCIe bandwidth.

## 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 <sup>2</sup> (26 AWG) to 1.5 mm <sup>2</sup> (16 AWG)                     |                                                      |
| Wire strip length                     | 8 mm (0.3 in.) of insulation stripped from the end                                |                                                      |
| Ferrules                              | 0.14 mm <sup>2</sup> (26 AWG) to 1.5 mm <sup>2</sup> (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 *PXle-8522/8523 User Manual* for additional information about I/O connectors and ferrules (included).

## Network Interface

|                    |                                                                                  |
|--------------------|----------------------------------------------------------------------------------|
| Port configuration | 2 Taps or 4 endpoints                                                            |
| <b>Tap latency</b> |                                                                                  |
| 100 Mbit/s         | 2 $\mu$ s (typical)                                                              |
| 1 Gbit/s           | 5.55 $\mu$ s (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 *PXle-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) <sup>2</sup> or the local timebase (port is configured as a master) |                |
| Trigger I/O source                  |                                                                                                                                                                                   | PXI_Trig <0:7> |
| Trigger capability                  |                                                                                                                                                                                   |                |
| Input                               |                                                                                                                                                                                   |                |
| Timestamps <sup>3</sup>             | x4 Timestamps, one per port; each captures both local time and network time <sup>4</sup>                                                                                          |                |
| 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                                                                                    |                |

2. If the port is not connected to an 802.1AS network, the network timebase falls back to local time.



**Note** Clock outputs and time triggers can be exported on any PXI\_Trig<0:7>.

## Environmental Guidelines



**Notice** Indoor use only.

## Environmental Characteristics

Table 2. 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                                               |

Table 3. Storage Environment

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

Table 4. Shock

|                   |                                   |
|-------------------|-----------------------------------|
| Operational shock | 30 g peak, half-sine, 11 ms pulse |
|-------------------|-----------------------------------|

Table 5. 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.

- Each timestamp can be triggered by any PXI\_Trig <0:7>.
- If no external network is available, use local time instead.

For additional environmental information, refer to the ***Engineering a Healthy Planet*** web page at [ni.com/environment](https://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.

#### EU and UK Customers

-  **Waste Electrical and Electronic Equipment (WEEE)**—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](https://ni.com/environment/weee).

#### 电子信息产品污染控制管理办法（中国RoHS）

-  **中国RoHS**—NI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NI中国RoHS合规性信息，请登录 [ni.com/environment/rohs\\_china](https://ni.com/environment/rohs_china)。(For information about China RoHS compliance, go to [ni.com/environment/rohs\\_china](https://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](https://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 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

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](https://ni.com/product-certifications), search by model number, and click the appropriate link.