

# Dual-Channel Camera Link Image Acquisition

## NI PCIe-1430

- High-resolution, high-speed image acquisition for up to two base configuration Camera Link cameras
- Onboard programmable region of interest
- RTSI bus synchronization with data acquisition, motion, and CAN
- Additional I/O available through the NI Camera Link I/O Extension Board

### Operating Systems

- Windows Vista/XP/2000

### Recommended Software

- LabVIEW
- LabWindows™/CVI
- Measurement Studio
- Vision Development Module
- Vision Builder AI

### Driver Software (included)

- Vision Acquisition



## Overview and Applications

The National Instruments PCIe-1430 image acquisition board works with up to two base configuration Camera Link cameras and is used by machine and scientific imaging developers who need high-throughput digital imaging at a lower cost.

### Camera Link

Camera Link is an industrial high-speed serial data and cabling standard developed by National Instruments, camera vendors, and other image acquisition companies. Created for easy connectivity between the PC and the camera, Camera Link provides simple, flexible cabling for high-speed, high-resolution digital cameras. A Camera Link cable, a slender 26-pin cable with 24-bit data and clock, enables as well as controls signals. You can control camera functionality by asynchronous serial control or LVDS differential lines through a Camera Link cable. Camera Link offers future data rate capabilities up to 2.3 Gb/s. You can interchange Camera Link digital cameras from a variety of vendors with Camera Link image acquisition hardware.

### Digital I/O

Each NI PCIe-1430 includes one trigger line and two Camera Link connectors that work with any base configuration Camera Link camera. Additional I/O lines for advanced triggering, pulse-train outputs, and



Figure 1. Camera Link is a popular interface for high-resolution and high-speed cameras.

isolated digital I/O also are available with the NI Camera Link I/O Extension Board. Use the serial interface on the Camera Link connector to easily configure and control the camera with NI Vision Acquisition software and Measurement & Automation Explorer (MAX) configuration software. With this board, you can use the advanced triggering available to send strobe pulses and pulse trains.

### PCI Express

With the four-lane PCI Express configuration of the NI PCIe-1430, you can acquire from two base configuration Camera Link cameras at their maximum bandwidths without onboard memory. This data is streamed directly to PC memory so it can be processed along with synchronized data acquisition and/or motion.

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### Synchronize Vision, Data Acquisition, and Motion

Using the RTSI bus, you can develop applications for which vision, data acquisition, and motion are tightly integrated. With the NI PCIe-1430, you can route digital timing lines such as acquisition in progress or frame start across the RTSI bus to control the timing of your machine vision application.

### Camera Compatibility

The NI PCIe-1430 works with base configuration Camera Link cameras from Sony, Basler, and other camera manufacturers. Visit [ni.com/camera](http://ni.com/camera) for a current list of compatible cameras.

### Ordering Information

NI PCIe-1430 .....779479-01  
Includes Vision Acquisition software.

### Accessories

NI Camera Link I/O Extension Board .....779352-01  
Camera Link cable (2 m) .....187676-02

### **BUY NOW!**

For complete product specifications, pricing, and accessory information, call 800 813 3693 (U.S.) or go to [ni.com/vision](http://ni.com/vision).

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## Specifications

The following specifications apply to the NI PCIe-1430 image acquisition board. These specifications are typical at 25 °C, unless otherwise stated.

### External Connections

Number of external trigger I/O lines ..... 1

**Note:** External TTL lines on the 15-pin D-Sub connector become unavailable when the trigger source is set as an optically isolated input or an RS422 input in MAX.

External trigger lines  
Voltage range ..... 0 to 5 V (TTL)  
VIH min ..... 2.0 V  
VIL max ..... 0.8 V  
VOH min ..... 2.4 V at 8 mA source  
VOL max ..... 0.55 V at 8 mA sink  
Polarity ..... Programmable, active high or active low  
Power-on state ..... Input (high-impedance) 22.1 k $\Omega$  pull-down to ground  
Camera interface ..... Camera Link 1.1

### Clocks

Pixel clock frequency range ..... 20 to 85 MHz<sup>1</sup>

**Note:** The Camera Link specification requires cameras to transmit at a minimum of 20 MHz.

<sup>1</sup>This value corresponds to the serialized Camera Link cable transmission rate of 140 to 595 MHz.

### PCI Express Interface

PCI Express compliance ..... Version 1.0a  
Native link width ..... x4  
Up-plugging link width availability ..... x8, x16

**Note:** Some system devices limit data transfer rates for plug-in devices in an up-plugging configuration. Refer to the documentation provided by your computer manufacturer to determine if your computer will support a x4 plug-in device at a x4 data rate in a larger slot.

### Serial Interface

Baud rates supported ..... 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, or 9600 b/s; 19.2, 38.4, 56, or 115.2 kb/s

### Power Requirements

Voltage ..... +12 V (1.25 A)<sup>1</sup>

<sup>1</sup>If you are using special firmware add-ons, this value is subject to change. Consult your firmware upgrade documentation for specific requirements.

### Physical Characteristics

Dimensions ..... 10.7 by 17.5 cm (4.2 by 6.9 in.)  
Weight ..... 205 g (7.23 oz)

## Environment

The NI PCIe-1430 is intended for indoor use only.

Operating temperature ..... 0 to 40 °C<sup>1</sup>  
Storage temperature ..... -20 to 70 °C  
Relative humidity ..... 5 to 90%, noncondensing  
Pollution degree ..... 2  
Approved at altitudes up to 2,000 m.

<sup>1</sup>This temperature value was determined through testing the device in a Dell Precision 470 workstation with two adjacent plug-in devices each dissipating 11.6 W.

## Safety

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

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA 61010-1

**Note:** For UL and other safety considerations, refer to the product label, or visit [ni.com/certification](http://ni.com/certification), search by model number or product line, and click the appropriate link in the Certification column.

## Electromagnetic Compatibility

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

- EN 61326 EMC requirements; Minimum Immunity
- EN 55011 Emissions; Group 1, Class A
- CE, C-Tick, ICES, and FCC Part 15 Emissions; Class A

**Note:** For EMC compliance, operate this device according to product documentation.

## CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

- 73/23/EEC; Low-Voltage Directive (safety)
- 89/336/EEC; Electromagnetic Compatibility Directive (EMC)

**Note:** Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit [ni.com/certification](http://ni.com/certification), search by model number or product line, and click the appropriate link in the Certification column.

## Waste Electrical and Electronic Equipment (WEEE)

### EU Customers

At the end of their life cycle, all products must be sent to a WEEE recycling center.

For more information about WEEE recycling centers and National Instruments WEEE initiatives, visit [ni.com/environment/weee.htm](http://ni.com/environment/weee.htm).

# NI Services and Support



NI has the services and support to meet your needs around the globe and through the application life cycle – from planning and development through deployment and ongoing maintenance. We offer services and service levels to meet customer requirements in research, design, validation, and manufacturing. Visit [ni.com/services](http://ni.com/services).

## Training and Certification

NI training is the fastest, most certain route to productivity with our products. NI training can shorten your learning curve, save development time, and reduce maintenance costs over the application life cycle. We schedule instructor-led courses in cities worldwide, or we can hold a course at your facility. We also offer a professional certification program that identifies individuals who have high levels of skill and knowledge on using NI products. Visit [ni.com/training](http://ni.com/training).

## Professional Services

Our Professional Services Team is composed of NI applications engineers, NI Consulting Services, and a worldwide National Instruments Alliance Partner program of more than 600 independent consultants and

integrators. Services range from start-up assistance to turnkey system integration.

Visit [ni.com/alliance](http://ni.com/alliance).



## OEM Support

We offer design-in consulting and product integration assistance if you want to use our products for OEM applications. For information about special pricing and services for OEM customers, visit [ni.com/oem](http://ni.com/oem).

## Local Sales and Technical Support

In offices worldwide, our staff is local to the country, giving you access to engineers who speak your language. NI delivers industry-leading technical support through online knowledge bases, our applications engineers, and access to 14,000 measurement and automation professionals within NI Developer Exchange forums. Find immediate answers to your questions at [ni.com/support](http://ni.com/support).

We also offer service programs that provide automatic upgrades to your application development environment and higher levels of technical support. Visit [ni.com/ssp](http://ni.com/ssp).

## Hardware Services

### NI Factory Installation Services

NI Factory Installation Services (FIS) is the fastest and easiest way to use your PXI or PXI/SCXI combination systems right out of the box. Trained NI technicians install the software and hardware and configure the system to your specifications. NI extends the standard warranty by one year on hardware components (controllers, chassis, modules) purchased with FIS. To use FIS, simply configure your system online with [ni.com/pxiadvisor](http://ni.com/pxiadvisor).

### Calibration Services

NI recognizes the need to maintain properly calibrated devices for high-accuracy measurements. We provide manual calibration procedures, services to recalibrate your products, and automated calibration software specifically designed for use by metrology laboratories. Visit [ni.com/calibration](http://ni.com/calibration).

### Repair and Extended Warranty

NI provides complete repair services for our products. Express repair and advance replacement services are also available. We offer extended warranties to help you meet project life-cycle requirements. Visit [ni.com/services](http://ni.com/services).



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