NI PCIe-1477

Base, Medium, Full, and Extended Configuration Camera Link Frame Grabber

The following specifications are typical at 25 °C unless otherwise noted.

⚠️ **Caution**   Observe all instructions and cautions in the user documentation. Using the model in a manner not specified can damage the model and compromise the built-in safety protection. Return damaged models to NI for repair.

⚠️ **Attention**   Suivez toutes les instructions et respectez toutes les mises en garde de la documentation utilisateur. L'utilisation d'un modèle de toute autre façon que celle spécifiée risque de l'endommager et de compromettre la protection de sécurité intégrée. Renvoyez les modèles endommagés à NI pour réparation.

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.

Features

Supported camera standard	Camera Link 2.1
Supported configurations	Base, Medium, Full, 72-bit, 80-bit
Camera connectors	Two 26-pin SDR
General-purpose digital I/O connectors	One 15-pin high-density female D-SUB

Pixel clock	20 MHz to 85 MHz
Camera power	Dual Power over Camera Link (PoCL) with SafePower

Bus Interface

Form factor	x8 PCIe, specification v2.0 compliant
Slot compatibility	x8, and x16 PCIe slots
Up-plugging availability	x16

Note Some system devices limit data transfer rates for plug-in devices in an up-plugging configuration. Refer to the documentation provided by the computer manufacturer to determine if your computer will support a x8 plug-in device at a x8 data rate in a larger slot.

Reconfigurable FPGA

FPGA type	Kintex-7 325T
Number of flip-flops	407,600
Number of 6-input LUTs	203,800
Number of DSP48 slices (25×18 multipliers)	840
Embedded block RAM	16,020 kbits

TTL I/O

Number of channels	6
Type	Bidirectional
Voltage range	0 V to 5 V
Maximum pulse rate	2 MHz
Minimum pulse detected	500 ns
Power-on state	Input (high-impedance), 10 kΩ pull-up to 5 V
Logic levels	
Input high voltage	2.57 V, minimum
Input low voltage	0.59 V, maximum

Output high voltage	4.12 V, minimum at 1.5 mA source
Output low voltage	0.37 V, maximum at 1.5 mA sink

Differential I/O

Number of channels	2
Type	Bidirectional (RS-422) or single-ended
Maximum pulse rate	5 MHz, differential
Differential input threshold	±0.2 V, maximum, RS-422 compatible
Differential output voltage	2.0 V min (R_{LOAD}= 100 Ω)
Single-ended input voltage range	0 V DC to 5.5 V DC
TTL-compatible single-ended logic levels	
Input high voltage	2.0 V, minimum
Input low voltage	0.8 V, maximum

Isolated Input

Number of channels	2
Type	Current sinking
Input voltage range	0 V to 30 V
Input ON voltage	3.5 V to 30 V
Input OFF voltage	0 V to 2 V
Turn-on current	7.1 mA; 14 mA, maximum
Maximum pulse rate	100 kHz
Minimum pulse detected	10 μs
Reverse polarity protection	Yes, -30 V

FPGA External Memory

Type	DDR3L SDRAM
Density	2,048 MB
Theoretical data rate	10.66 GB/s, maximum

Clocks

Pixel clock frequency range	20 MHz to 85 MHz[1]

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

Serial Interface

Baud rates supported	9.6, 19.2, 38.4, 57.6, 115.2, 230.4, 460.8, or 921.6 kbps

RTSI

Number of channels	8

Camera Link I/O Extension

This extension I/O is available with the addition of the Camera Link I/O Extension Board (e.g., part number 780869-01 for PCIe or 779352-01 for PCI). See the appropriate *Camera Link I/O Extension Board User Guide* on *ni.com/manuals* for additional details and specifications.

Extension supported	Yes
TTL I/O	8
Isolated inputs	3
Isolated outputs	3
Quadrature encoder inputs	1 (two RS-422 or single-ended inputs)

Power Requirements

On-board voltage	+3.3 V (3.0 A); +12 V (1.9 A)
Auxiliary voltage[2]	+12 V (1.2 A)

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[1] This value corresponds to the serialized Camera Link cable transmission rate of 140 to 595 MHz.
[2] Sourced from ATX 12 V power supply.

Power Over Camera Link (PoCL)

Powered connectors	2
Voltage	12 V, nominal
Power output	4 W, maximum (per connector)
SafePower	Supported

Physical Characteristics

Printed Circuit Board (PCB) dimensions	16.8 cm × 11.2 cm (6.6 in. × 4.4 in.)
Weight	180 g (6.35 oz)

Environment

The NI PCIe-1477 is intended for indoor use only.

Note Clean the device with a soft, non-metallic brush. Make sure the device is completely dry and free from contaminants before returning it to service.

Operating Environment

Operating temperature, local	0 °C to 55 °C (IEC 60068-2-1 and IEC 60068-2-2)
Operating humidity	10% to 90% RH, noncondensing (IEC 60068-2-78)

Storage Environment

Ambient temperature range	-20 °C to 70 °C (IEC 60068-2-1 and IEC 60068-2-2)
Relative humidity range	5% to 95% RH, noncondensing (IEC 60068-2-78)

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[3] For PCI Express adapter cards with integrated air movers, NI defines the local operational ambient environment to be at the fan inlet. For cards without integrated air movers, NI defines the local operational ambient environment to be 25 mm (1 in.) upstream of the leading edge of the card. For more information about the local operational ambient environment definition for PCI Express adapter cards, visit *ni.com/info* and enter the Info Code `pcielocalambient`.

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-001: 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 $C \, \epsilon$

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

- 2014/35/EU; Low-Voltage Directive (safety)
- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)

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/certification*, search by model number or product line, and click the appropriate link in the Certification column.

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 *Minimize Our Environmental Impact* 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.）

Worldwide Support and Services

The NI website is your complete resource for technical support. At *ni.com/support*, you have access to everything from troubleshooting and application development self-help resources to email and phone assistance from NI Application Engineers.

Visit *ni.com/services* for information about the services NI offers.

Visit *ni.com/register* to register your NI product. Product registration facilitates technical support and ensures that you receive important information updates from NI.

NI corporate headquarters is located at 11500 North Mopac Expressway, Austin, Texas, 78759-3504. NI also has offices located around the world. For support in the United States, create your service request at *ni.com/support* or dial 1 866 ASK MYNI (275 6964). For support outside the United States, visit the *Worldwide Offices* section of *ni.com/niglobal* to access the branch office websites, which provide up-to-date contact information.