DEVICE SPECIFICATIONS

IC-3121

Industrial Controller

This document provides the specifications for the IC-3121. Specifications are subject to change without notice. Refer to the National Instruments Product Manuals Library at *ni.com/manuals* for the most recent versions of product documentation.

Characteristics/Nominal Specifications describe basic functions and attributes of the device established by design.

Physical Characteristics

Caution You can impair the protection provided by the IC-3121 if you use it in a manner not described in this document.

To clean the IC-3121, wipe it with a dry towel.

Dimensions	10.8 cm × 6.1 cm × 13.0 cm (4.3 in × 2.4 in × 5.1 in)
Weight	911 g (2.01 lb)

Processor

Type	Quad Core Intel Atom Processor E3845
Frequency	1.91 GHz
On-die L2 cache	2 MB

Operating System

Supported Operating Systems	NI Linux Real-Time 64-bit Windows Embedded Standard 7 64-bit

Memory

System RAM	
Capacity	4 GB
Type	DDR3L
Speed	1333 MT/s
Nonvolatile storage	
Capacity	2 GB

Power Requirements

Note Supply voltages are measured at the IC-3121 power connectors.

System Power (V)	
Supply voltage	10.8 to 26.4 VDC
Maximum power input	24 W
Isolated Output Power (V_{ISO})	
Supply voltage	4.5 to 30 VDC

Reconfigurable FPGA

Type	Spartan-6 LX25
Number of flip-flops	30,064
Number of 6-input LUTs	15,032
Number of DSP48E1 slices (18 × 25 multipliers)	38
Embedded block RAM	52 (936 Kbits)
Number of DMA channels	32
Number of logical interrupts	32

Network Port

Standard	IEEE 802.3 Ethernet, 10BASE-T, 100BASE-TX, 1000BASE-T
Interface	RJ45
Speed	10, 100, 1000 Mbps

USB 3.0 Ports

Number of ports	2
Type	USB 3.0, SuperSpeed
Speed	5 Gbit/s
Maximum current	900 mA, per port

USB 2.0 Ports

Number of ports	2
Type	USB 2.0, Hi-Speed
Speed	480 Mbit/s
Maximum current	1 A, shared across both ports

VGA Port

Maximum resolution	1920 × 1200 at 60 Hz

TTL Inputs/Outputs

Number of channels	8
Type	Bidirectional
Output 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 low voltage	0.59 V maximum
Input high voltage	2.57 V minimum
Output low voltage	0.38 V maximum at 1.5 mA
Output high voltage	4.12 V minimum at 1.5 mA

Differential Inputs/Outputs

Number of channels	2
Types	Bidirectional RS-422/RS-485 or single-ended input
Maximum pulse rate	5 MHz, differential
Differential input threshold	±200 mV
Differential output voltage	2.0 V min (R_{LOAD} = 100 Ω, RS-422)
Input voltage range	0 V to 5.5 V
TTL-compatible single-ended logic levels	
Input low voltage	0.8 V
Input high voltage	2.0 V

Isolated Inputs

Type	Current sinking
Number of channels	8
Input voltage	
Input voltage range	0 V to 24 V
Input OFF voltage	0 V to 2.0 V
Input ON voltage	3.3 V to 24 V
Turn-on current	2.5 mA
Maximum pulse rate	100 kHz
Minimum pulse detected	10 µs
Input protection	
Reverse polarity protection	Yes, -30 V
Input voltage (channel to C_{ISO})	30 V maximum
Input current	3.3 mA, internally limited

Isolated Outputs

Type	Current sourcing
Number of channels	8
Supply voltage (V_{ISO})	
Supply voltage range (V_{ISO})	4.5 to 30 VDC
Reverse polarity protection	Yes, -30 V
Maximum output voltage drop	
V_{ISO} = 5 V	1.08 V at 35 mA
V_{ISO} = 24 V	1.18 V at 80 mA
Maximum output current	
V_{ISO} = 5 V	35 mA
V_{ISO} = 24 V	80 mA
Maximum current limit	345 mA
Minimum pulse rate	2.5 kHz (load of 100 kΩ, 300 pF)
Maximum pulse rate	20 kHz (load of 10 kΩ, 300 pF)
Minimum pulse generated	400 µs

Note The isolated outputs have a current limit which will turn off the outputs in case the limit is exceeded. The circuit resets when the output is turned off. Do not draw more than 100 mA from any 24 V isolated output. Do not draw more than 50 mA from any 5 V isolated output. Do not draw more than 640 mA combined from the V_{ISO} pins on the 44-pin D-SUB connector.

Environmental

Indoor use only.

Ingress protection (IEC 60529)	IP40
Temperature (IEC 60068-2-1 and IEC 60068-2-2)	
Operating	0 °C to 55 °C
Storage	-20 °C to 85 °C
Operating humidity (IEC 60068-2-56)	10% RH to 90% RH, noncondensing
Storage humidity (IEC 60068-2-56)	5% RH to 95% RH, noncondensing
Pollution degree (IEC 60664)	2

Maximum Altitude	2,000 m
Operating shock (IEC 60068-2-27)	50 g, 3 ms half sine, 3 shocks per side 30 g, 11 ms half sine, 3 shocks per side
Operating vibration	
Random (IEC 60068-2-64)	10 to 500 Hz, 5 g_{rms}
Swept Sine (IEC 60068-2-6)	10 to 500 Hz, 5 g

Safety

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 *Online Product Certification* section.

Electromagnetic Compatibility

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; Industrial 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 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.

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 For EMC declarations and certifications, and additional information, refer to the *Online Product Certification* section.

CE Compliance CE

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)

Online Product Certification

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for this product, 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*.

Battery Replacement and Disposal

Battery Directive This device contains a long-life coin cell battery. If you need to replace it, use the Return Material Authorization (RMA) process or contact an authorized National Instruments service representative. For more information about compliance with the EU Battery Directive 2006/66/EC about Batteries and Accumulators and Waste Batteries and Accumulators, visit *ni.com/environment/batterydirective*.

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.)

Where to Go Next

The following documents and resources contain information you may find helpful as you use the IC-3121 in an application. Refer to the National Instruments Product Manuals Library at *ni.com/manuals* for the most recent versions of product documentation.

- *IC-3121 Getting Started Guide*—Explains how to install and configure the device.
- *IC-3121 User Manual*—Contains connector pinouts, configuration information, and mounting information.

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.

A Declaration of Conformity (DoC) is our claim of compliance with the Council of the European Communities using the manufacturer's declaration of conformity. This system affords the user protection for electromagnetic compatibility (EMC) and product safety. You can obtain the DoC for your product by visiting *ni.com/certification*. If your product supports calibration, you can obtain the calibration certificate for your product at *ni.com/calibration*.

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.

376110B-01 December 11, 2017