# IC-3173 (IP67) Specifications

2025-03-14

# Contents

# IC-3173 Specifications

## 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 ***Characteristics*** unless otherwise noted.

## Conditions

Specifications are valid for the range 0 °C to 45 °C.

## Physical Characteristics

> **Caution** You can impair the protection provided by the IC-3173 (IP67) if you use it in a manner not described in this document.

To clean the IC-3173 (IP67), wipe it with a dry towel.

| | |
|---|---|
| Dimensions | 19.3 cm × 9.3 cm × 32.9 cm (7.6 in × 3.7 in × 12.6 in) |
| Weight | 4.990 kg (11 lbs) without plug caps, 5.075 kg(11 lbs, 3 oz) with all plug caps |

## Processor

| | |
|---|---|
| Type | Intel Core i7-5650U |
| Base frequency | 2.2 GHz |
| Maximum frequency | 3.1 GHz |
| On-die cache | 4 MB |

## Operating System

| | |
|---|---|
| Supported Operating Systems | NI Linux Real-Time 64-bit,<br>Windows Embedded Standard 7 64-bit |

## Memory

| | |
|---|---|
| **System RAM** | |
| Capacity | 8 GB |
| Type | DDR3L |
| Speed | 1600 MT/s |
| **Nonvolatile storage** | |

| | |
|---|---|
| Capacity | 4 GB, 32 GB, or 64 GB |

## Power Requirements

**Note** Supply voltages are measured at the IC-3173 (IP67) power connectors.

| | |
|---|---|
| **System power ($V_1$, $V_2$)** | |
| Supply voltage | 9 to 30 VDC, 21.6 to 30 VDC when using Power over Ethernet (PoE) |
| Maximum power input | 150 W |
| **Isolated-output power ($V_{ISO}$)** | |
| Supply voltage | 4.5 to 30 VDC |

## Reconfigurable FPGA

| | |
|---|---|
| Type | Xilinx Kintex-7 XC7K160T |
| Number of flip-flops | 202,800 |
| Number of 6-input LUTs | 101,400 |
| Number of DSP48E1 slices (18 × 25 multipliers) | 600 |
| Embedded block RAM | 11,700 kbits |

| | |
|---|---|
| Number of DMA channels | 32 |
| Number of logical interrupts | 32 |

## FPGA External Memory

| | |
|---|---|
| **DRAM** | |
| Density | 2 GB |
| Type | DDR3L |
| Maximum theoretical data rate | 5.33 GB/s |
| **SRAM** | |
| Density | 4.5 MB |
| Type | QDR-II+ |
| **Maximum sustainable data rate** | |
| Read | 3.15 GB/s |
| Write | 3.15 GB/s |
| Combined | 6.3 GB/s |

# Network Port

| | |
|---|---|
| Standard | IEEE 802.3 Ethernet, 10BASE-T, 100BASE-TX, 1000BASE-T |
| Interface | X-Code M12 |
| Speed | 10, 100, 1000 Mbps |

# PoE-Capable Network Ports

| | |
|---|---|
| Number of ports | 4 |
| Standards | IEEE 802.3 Ethernet, 10BASE-T, 100BASE-TX, 100BASE-T, IEEE 802.3af (PoE) compatible |
| Interface | X-Code M12 |
| Speed | 10, 100, 1000 Mbps |
| Supported PoE power classes | 0, 1, 2, 3 |
| PoE power output (per port) | 15.4 W |
| Recommended port for IEEE 1588 grandmaster connection | PoE1 |

## USB 3.0 Ports

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

## USB 2.0 Ports

| | |
|---|---|
| Number of ports | 1 |
| Type | USB 2.0, Hi-Speed |
| Speed | 480 Mbit/s |
| Maximum current | 1 A |

## DisplayPort

| | |
|---|---|
| Number of ports | 2 |
| Maximum resolution | 1920 × 1200 at 60 Hz |

| | |
|---|---|
| Maximum link rate | 1.62 Gbps per lane (RBR) |

## RS-485/422/232 Serial Port

| | |
|---|---|
| Interface | A-Code M12 |
| Maximum baud rate | 115,200 bps |
| Data bits | 5, 6, 7, 8 |
| Stop bits | 1, 1.5, 2 |
| Parity | Odd, Even, Mark, Space |
| Flow control | None |
| Wire mode | 4-wire, 2-wire, 2-wire auto |

## 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/Outdoor use.

| | |
|---|---|
| Ingress protection (IEC 60529) | IP67 |
| **Temperature (IEC 60068-2-1 and IEC 60068-2-2)** | |
| Operating | 0 °C to 45 °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) | 3 |
| Maximum Altitude | 2,000 m |
| Operating shock (IEC 60068-2-27) | 50 g, 3 ms half sine, 3 shocks per side<br>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 information technology equipment use:

- IEC 60950-1, EN 60950-1
- UL 60950-1, CSA C22.2 No. 60950-1

**Note** For UL and other safety certifications, refer to the product label or the

Online Product Certification section.

## Electromagnetic Compatibility

This product is designed to meet the requirements of the following electromagnetic compatibility standards for information technology equipment use:

- EN 55022 (CISPR 22): Class A emissions
- EN 55032 (CISPR 32): Class A emissions
- EN 55024 (CISPR 24): Immunity
- CISPR 35: Immunity
- AS/NZS CISPR 22: Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-003: Class A emissions

**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)

## 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.

## 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 ***Engineering a Healthy Planet*** 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.

## 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.

## 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`。(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-3173 (IP67) in an application. Refer to the National Instruments Product Manuals Library at http://www.ni.com/manuals for the most recent versions of product documentation.

- ***IC-317x Getting Started Guide*** —Explains how to install and configure the device.
- ***IC-317x User Manual*** —Contains connector pinouts, configuration information, mounting information, and answers to common troubleshooting questions.
- ***NI CVS I/O Accessory User Manual*** —Contains installation and operation instructions for the CVS I/O Accessory.

# NI Services

Visit ni.com/support to find support resources including documentation, downloads, and troubleshooting and application development self-help such as tutorials and examples.

Visit ni.com/services to learn about NI service offerings such as calibration options, repair, and replacement.

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

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