ISC-1780 Specifications

2025-03-14

Contents

ISC-1780 Specifications

These specifications apply to the monochrome and color ISC-1780.

> **Caution** Observe all instructions and cautions in the user documentation. Using the ISC-1780 in a manner not specified can damage the model and compromise the built-in safety protection. Return damaged models to NI for repair.

$$A = G \times \left(R + O + INL\right) \times \left(Range + \left(\frac{Noise \times 3}{\sqrt{N_{samples}}}\right)\right)$$

where

- A is the accuracy,
- G is the gain error,
- R is the reading,
- O is the offset error,
- INL is …..,
- Range is the range of.…, and
- $N_{samples}$ is the number of samples

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 valid at 23 °C unless otherwise noted.

To maintain IP67 conformity, all unused connectors on the ISC-1780 must be capped and the IP lens cover must be screwed firmly into place.

Physical Characteristics

To clean the ISC-1780, wipe it with a dry towel.

Weight	460 g (16.2 oz)
Lens Mount	C-mount
Smart Camera Length (including the connectors)	91 mm (3.58 in.)
Smart Camera Height (without lens cover)	54 mm (2.13 in.)
Smart Camera Height (including lens cover)	118 mm (4.65 in.)
Smart Camera Width	75 mm (2.95 in.)
Lens Cover Length (interior from the mounting flange to inside the clear top)	59.5 mm (2.34 in)
Lens Cover Maximum Lens Internal Clearance	
Length	59 mm (2.32 in)

Diameter	18 mm (0.71 in)
Connectors	
Network	8-pin female X-coded M12
VGA/USB	12-pin male M12
Power and Digital I/O	12-pin female M12

Power Requirements

Power consumption	10.8 W or 450 mA at 24 VDC
Rated current	0.6 A
Supply voltage	24 VDC ± 10%

Caution ⎓ The ISC-1780 can only be powered using a 24 VDC power source.

Processor

Type	Dual-Core Intel Celeron N2807
Frequency	1.58 GHz

Burst frequency (enabled by default)	2.16 GHz

Memory

System RAM	
Capacity	2 GB
Type	DDR3L SDRAM
Nonvolatile storage	
Capacity	32 GB

Operating System

Supported Operating Systems	NI Linux Real-Time 64-bit Windows 10 Enterprise 2016 LTSB 64-bit

Network Port

Speed	100/1000 Mbps
Standard	IEEE 802.3 Ethernet, 100Base-TX, and 1000Base-T

Digital Inputs

Number of channels	**(NI Linux Real-Time)** 3 general purpose inputs and 1 reserved input for safe mode **(Windows)** 4 general purpose inputs
Type	Current sinking or current sourcing
Input current (sink or source)	3.5 mA maximum
Input voltage	
Input voltage range	0 V to 24 V
Input voltage protection	26 V maximum
Input OFF voltage	0 to 4 V
Input ON voltage	11 to 24 V
OFF to ON response	6 µs
ON to OFF response	80 µs

Digital Outputs

Number of channels	3
Type	Current sinking
Operating voltage	24 V
Sink current	50 mA maximum
Leakage current	1 µA at 24 V maximum 1 mA at 26 V maximum
ON voltage	0.4 V at 2 mA 1.1 V at 25 mA 1.5 V at 50 mA
OFF to ON response	2 µs to reach 4 V, with 1 kΩ pull-up to 24 V
ON to OFF response	50 µs to reach 11 V, with 1 kΩ pull-up to 24 V
Output protection	
Operating voltage	26 V maximum
Protection type	PTC automatically resetting fuse

Time to trip	1 sec at 0.5 A

Analog Output

Type	0 to 10 V analog control output signal for lighting control (non-isolated), referenced to system power common (< 1 mA)

Image Sensor

Make and model	ON Semiconductor - Python family (NOIP1SN or NOIP1SE)
Type	CMOS
Optical format	1/4 in.
Resolution	640 x 480 (0.3 MP)
Frame rate	
Monochrome	Up to 292 fps
Color	Up to 147 fps
Pixel size	4.8 x 4.8 µm
Gain	0 to 19.4 dB

Shutter speed	50 µs to 4.2 s
External trigger latency	7.1 µs
External trigger to strobe output delay	9.1 µs

Environmental

Indoor use only.

Operating temperature	0 °C to 50 °C
Storage temperature	-20 °C to 85 °C
Relative humidity	10% to 90%, noncondensing
Pollution Degree	2
Overvoltage category	I
Maximum Altitude	2,000 m
Ingress protection	IP67
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 60068-2-34)	10 to 500 Hz, 5 G_{rms}
Swept Sine (IEC 60068-2-6)	10 to 500 Hz, 5 g

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

CE Compliance CE

- 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, 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 ISC-1780 in an application. Refer to the National Instruments Product Manuals Library at ni.com/manuals for the most recent versions of product documentation.

- ***ISC-178x Getting Started Guide***—Explains how to install and configure the software necessary to use the ISC-178x, and how to get started using the hardware.
- ***Power and I/O Accessory for ISC-178x Smart Cameras User Manual***—Contains installation and operation instructions for the Power and I/O Accessory for ISC-178x Smart Cameras.
- ***ISC-178x User Manual***—Contains detailed electrical and mechanical information about the ISC-178x.

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.

NI corporate headquarters is located at 11500 N Mopac Expwy, Austin, TX, 78759-3504, USA.