

# **NI 5541**

## **User Manual and Specifications**

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# Electromagnetic Compatibility Guidelines

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This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) stated in the product specifications. These requirements and limits provide reasonable protection against harmful interference when the product is operated in the intended operational electromagnetic environment.

This product is intended for use in industrial locations. However, harmful interference may occur in some installations, when the product is connected to a peripheral device or test object, or if the product is used in residential or commercial areas. To minimize interference with radio and television reception and prevent unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Furthermore, any modifications to the product not expressly approved by National Instruments could void your authority to operate it under your local regulatory rules.



**Caution** To ensure the specified EMC performance, operate this product only with shielded cables and accessories.



**Caution** To ensure the specified EMC performance, the length of all I/O cables must be no longer than 3 m (10 ft).

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# About This Manual

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The *NI 5541 User Manual and Specifications* describes the features of the NI 5541 8-port switch/combiner and contains information about unpacking, connecting and cleaning the NI 5541. This document also contains specifications for the NI 5541.

## Related Documentation

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The following documents contain information that you might find helpful as you read this manual:

- IEEE 1101.1-1991, *IEEE Standard for Mechanical Core Specifications for Microcomputers Using IEC 603-2 Connectors*
- IEEE 1101.10, *IEEE Standard for Additional Mechanical Specifications for Microcomputers Using IEEE 1101.1 Equipment Practice*
- *Read Me First: Safety and Electromagnetic Compatibility*

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# Getting Started

This chapter describes how to unpack the NI 5541 and lists what you need to get started using the NI 5541.

## Unpacking

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Carefully inspect the shipping container and the NI 5541 for damage. Check for visible damage to the metal work. If damage appears to have been caused during shipment, file a claim with the carrier. Retain the packing material for possible inspection and/or reshipment.

## What You Need to Get Started

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You need the following items to set up and use the NI 5541:

- ☐ NI 5541 8-port switch/combiner
- ☐ AC power cable—refer to Table 1-1 for more information on the AC power cables supplied.

**Table 1-1.** AC Power Cables

Power Cable	Reference Standards
Standard 120 V (USA)	ANSI C73.11/NEMA 5-15-P/IEC83
Switzerland 220 V	SEV
Australia 240 V	AS C112
Universal Euro 230 V	CEE (7), II, IV, VII IEC83
North America 120 V	ANSI C73.20/NEMA 5-15-P/IEC83
United Kingdom 230 V	BS 1363/IEC83

- ☐ *Read Me First: Safety and Electromagnetic Compatibility*



If you are missing any of the items listed in Table 1-1, or if you received the incorrect AC power cable, contact National Instruments.

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# Safety and Configuration

This chapter describes safety information for the NI 5541 and how to connect the NI 5541 to a power source.

Before connecting the NI 5541 to a power source, read this chapter and the *Read Me First: Safety and Electromagnetic Compatibility* document included with your kit.

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## Safety Information



**Caution** Before undertaking any troubleshooting, maintenance, or exploratory procedure, carefully read the following caution notices.

This equipment contains voltage hazardous to human life and safety, and is capable of inflicting personal injury.

- **Grounding**—The NI 5541 requires a connection from the premise wire safety ground to the NI 5541 ground. The earth safety ground must be connected during use of this equipment to minimize shock hazards. Refer to the [Connecting Safety Ground](#) section for instructions on connecting safety ground.
- **Live Circuits**—Operating personnel and service personnel *must* not remove protective covers when operating or servicing the NI 5541. Adjustments and service to internal components must be undertaken by qualified service technicians. During service of this product, the MAINS<sup>1</sup> connector to the premise wiring must be disconnected. Dangerous voltages may be present under certain conditions; use extreme caution.
- **Explosive Atmosphere**—Do *not* operate the NI 5541 in conditions where flammable gases are present. Under such conditions, this equipment is unsafe and may ignite the gases or gas fumes.

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<sup>1</sup> MAINS is defined as a hazardous live electrical supply system that powers hardware. Suitably rated measuring circuits may be connected to the MAINS for measuring purposes.

- **Part Replacement**—Only service this equipment with parts that are exact replacements, both electrically and mechanically. Contact National Instruments for replacement part information. Installation of parts with those that are not direct replacements may cause harm to personnel operating the chassis. Furthermore, damage or fire may occur if replacement parts are unsuitable.
- **Modification**—Do *not* modify any part of the NI 5541 from its original condition. Unsuitable modifications may result in safety hazards.

## Connecting Safety Ground

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**Caution** The NI 5541 is designed with a three-position inlet that connects the cord-set ground line to the NI 5541 ground. To minimize shock hazard, make sure the electrical power outlet you use to power the NI 5541 has an appropriate earth safety ground.

## Connecting to Power Source

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**Caution** Do *not* install the NI 5541 prior to performing the following power-on test.

To completely remove power, you *must* disconnect the AC power cable.

Attach input power through the rear AC inlet using the appropriate AC power cable supplied. Refer to [AC Power Cables](#) for more information on the AC power cables supplied.

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# Maintenance

This chapter describes basic maintenance procedures you can perform on the NI 5541.



**Caution** Disconnect the power cable prior to servicing the NI 5541.

## Cleaning

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Cleaning procedures consist of exterior and interior cleaning of the NI 5541.



**Caution** *Always* disconnect the AC power cable before cleaning or servicing the NI 5541.

### Interior Cleaning

Use a dry, low-velocity stream of air to clean the interior of the NI 5541.  
Use a soft-bristle brush for cleaning around components.

### Exterior Cleaning

Clean the exterior surfaces of the NI 5541 with a dry lint-free cloth or a soft-bristle brush. If any dirt remains, wipe with a cloth moistened in a mild soap solution. Remove any soap residue by wiping with a cloth moistened with clear water. Do not use abrasive compounds on any part of the chassis.



**Cautions** Avoid getting moisture inside the NI 5541 during exterior cleaning. Use only enough moisture to dampen the cloth.

Do *not* wash the front- or rear-panel connectors or switches. Cover these components while cleaning the chassis.

Do *not* use harsh chemical cleaning agents; they may damage the NI 5541. Avoid chemicals that contain benzene, toluene, xylene, acetone, or similar solvents.

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# Specifications

This appendix lists specifications for the NI 5541.



**Caution** Specifications are subject to change without notice.

## Electrical

### AC Input

Input voltage range.....	100 VAC to 240 VAC
Input protection .....	T2A 250V, slow-blow fuse
Input current rating.....	0.7 A
Operating voltage range <sup>1</sup> .....	88 VAC to 264 VAC
Input frequency .....	50 Hz/60 Hz
Operating frequency range <sup>1</sup> .....	47 Hz to 63 Hz
Efficiency .....	79% typical

## Physical

Dimensions.....	5.5 cm x 45 cm x 46 cm (2.17 in. x 17.72 in. x 18.11 in.)
Weight .....	8.4 kg (18.5 lb)

## Environmental

Maximum altitude .....	2,000 m (800 mbar) (at 25 °C ambient)
Measurement Category .....	II
Pollution Degree .....	2
For indoor use only.	

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<sup>1</sup> The operating range is warranted by design.

# Operating Environment

Ambient temperature range .....0 °C to 50 °C  
(Tested in accordance with  
IEC-60068-2-1 and  
IEC-60068-2-2. Meets  
MIL-PRF-28800F Class 3  
low temperature limit and  
MIL-PRF-28800F Class 2  
high temperature limit.)

Relative humidity range.....20 % to 90%, noncondensing  
(Tested in accordance with  
IEC-60068-2-56.)

# Storage Environment

Ambient temperature range .....-40 °C to 71 °C  
(Tested in accordance with  
IEC-60068-2-1 and  
IEC-60068-2-2. Meets  
MIL-PRF-28800F Class 3 limits.)

Relative humidity range.....10 % to 95%, noncondensing  
(Tested in accordance with  
IEC-60068-2-56.)



**Caution** The protection provided by the NI 5541 can be impaired if it is used in a manner not described in this document.

# Safety

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

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA 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; 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** 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 (€)

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

- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; 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](http://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](http://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 products *must* be sent to a WEEE recycling center. For more information about WEEE recycling centers, National Instruments WEEE initiatives, and compliance with WEEE Directive 2002/96/EC on Waste and Electronic Equipment, visit [ni.com/environment/weee](http://ni.com/environment/weee).

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- **System Integration**—If you have time constraints, limited in-house technical resources, or other project challenges, National Instruments Alliance Partner members can help. To learn more, call your local NI office or visit [ni.com/alliance](http://ni.com/alliance).
- **Declaration of Conformity (DoC)**—A 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](http://ni.com/certification).
- **Calibration Certificate**—If your product supports calibration, you can obtain the calibration certificate for your product at [ni.com/calibration](http://ni.com/calibration).

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