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***sbRIO-9603***

## SAFETY, ENVIRONMENTAL, AND REGULATORY INFORMATION

### sbRIO-9603

#### Single-Board RIO Controller

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

## Regulatory Icons



**Notice** Take precautions to avoid data loss, loss of signal integrity, degradation of performance, or damage to the model.



**Caution** Take precautions to avoid injury. Consult the model documentation for cautionary statements when you see this icon printed on the model. Cautionary statements are localized into French for compliance with Canadian requirements.



**ESD Sensitive** Take precautions to avoid damaging the model with electrostatic discharge.



**Hot Surface** Take precautions to avoid physical burns.

## Safety Guidelines

### Developer and OEM Kits



**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.



**Caution** Fire, explosion, and severe burn hazard. This device contains a replaceable lithium battery. Do not insert improperly, recharge or disassemble the battery. Do not heat the battery or the device above 100 °C. Do not incinerate the battery or the device. Do not expose the battery contents to water. Take precautions to ensure correct polarity of the battery in the device.



**Attention** Risque d'incendie, d'explosion et de brûlures graves. Cet appareil contient une pile au lithium remplaçable. Insérer la pile correctement. Ne pas recharger ou démonter la pile. Ne pas chauffer la pile ou l'appareil à une température supérieure à 100 °C. Ne pas incinérer la pile ou l'appareil. Éviter tout contact du contenu de la pile avec de l'eau. Prenez des précautions pour vous assurer que la polarité de la batterie dans l'appareil est correcte.



**Caution** The device is designed for non-hazardous live signals. You must ensure that all signals connected to the device are isolated from hazardous live circuits and no unsafe voltages are present at the device inputs. Voltages that exceed the specifications could result in damage to the device.



**Attention** L'appareil est conçu pour les signaux en direct non dangereux. Vous devez vous assurer que tous les signaux connectés à l'appareil sont isolés des circuits dangereux sous tension et qu'aucune tension dangereuse n'est présente à ses entrées. Des tensions supérieures à celles mentionnées dans les spécifications peuvent endommager l'appareil.



**Caution** Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.



**Attention** Risque d'explosion si la pile est remplacée par un type de pile incorrect. Reportez-vous à la documentation de l'appareil sur [ni.com/manuals](http://ni.com/manuals) pour obtenir des informations sur le remplacement, l'élimination et le recyclage de sa pile.



**Caution** The battery must be replaced by a trained service technician. Refer to the device documentation on [ni.com/manuals](http://ni.com/manuals) for instructions for replacing the battery.



**Attention** La pile doit être remplacée par un technicien de maintenance qualifié. Reportez-vous à la documentation de l'appareil sur [ni.com/manuals](http://ni.com/manuals) pour obtenir des informations sur le remplacement, l'élimination et le recyclage de sa pile.





**Caution** If the device has been in use, it may exceed safe handling temperatures and cause burns. Allow the device to cool before handling it.



**Attention** Si l'appareil a été utilisé, il peut avoir atteint des températures trop élevées pour être manipulé en toute sécurité, ce qui peut provoquer des brûlures. Laissez l'appareil refroidir avant de le manipuler.

OEM Kits Only

 **Caution** The device will need to be mounted in suitable Fire and Mechanical end product enclosure; Exercise caution when placing the device inside an enclosure. Auxiliary cooling may be necessary to keep the device under the maximum ambient temperature rating for the device. Refer to the device specifications for more information about the maximum ambient temperature rating.


 **Attention** L'appareil devra être monté dans un boîtier pour le produit final répondant aux exigences de résistance mécanique et de protection incendie. Soyez prudent lorsque vous placez l'appareil dans un boîtier. Un système de refroidissement auxiliaire peut être nécessaire pour maintenir l'appareil en dessous de sa température nominale maximale. Reportez-vous aux spécifications de l'appareil pour obtenir plus d'informations sur la température nominale maximale.


Safety Voltages

Connect only voltages that are below these limits.


V terminal to C terminal

30 V DC, maximum, Measurement Category I

 **Caution** Do not connect the model to signals or use for measurements within Measurement Categories II, III, or IV.

 **Attention** Ne connectez pas le modèle à des signaux et ne l'utilisez pas pour effectuer des mesures dans les catégories de mesure II, III ou IV.


Measurement Category I is for measurements performed on circuits not directly connected to the electrical distribution system referred to as *MAINS* voltage. MAINS is a hazardous live electrical supply system that powers equipment. This category is for measurements of voltages from specially protected secondary circuits. Such voltage measurements include signal levels, special equipment, limited-energy parts of equipment, circuits powered by regulated low-voltage sources, and electronics.

 **Note** Measurement Categories CAT I and CAT O are equivalent. These test and measurement circuits are for other circuits not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV.

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.


EMC Guidelines


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 changes or modifications to the product not expressly approved by NI could void your authority to operate it under your local regulatory rules.

EMC Notices

 **Notice** Product installation requires either special considerations or user-installed, add-on devices. See the product installation instructions for further information.

 **Notice** Do not tighten or loosen the terminal screws on the power connector while the model is powered on.


 **Notice** Operate this product only with shielded cables and accessories. Do not use unshielded cables or accessories unless they are installed in a shielded enclosure with properly designed and shielded input/output ports and connected to the product using a shielded cable. If unshielded cables or accessories are not properly installed and shielded, the EMC specifications for the product are no longer guaranteed.


 **Notice** The length of USB-C and MIO cables must be no longer than 3 m (10 ft).


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-003: 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 in non-residential 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.


 **Notice** For EMC declarations and certifications, and additional information, refer to the [Product Certifications and Declarations](#) section.


## Environmental Guidelines


 **Notice** This model is intended for use in indoor applications only.


 **Notice** The OEM Kit may require a heat sink or air flow to remain within the maximum allowed temperature ranges. You can mount the Thermal Kit for CompactRIO Single Board Controller with NI-DAQmx heat spreader on the NI sbRIO model.

 **Notice** The Development Kit must be used with the Thermal Kit for CompactRIO Single Board Controller with NI-DAQmx.

 **Notice** The model's thermal performance is greatly influenced by several factors, including resource utilization, mounting, and adjacent power dissipation. These factors can substantially affect the achievable external ambient temperature at which the maximum local and reported temperatures are reached. NI recommends you validate your system to ensure local and reported temperatures remain within maximum allowed temperature ranges. In some applications, additional thermal design may be necessary.

 **Notice** Exercise caution when designing an enclosure for the model. Auxiliary cooling may be necessary to keep the model within the specified operating temperature range.

 **Notice** For information about and examples of environmental and design factors that can affect the thermal performance of NI sbRIO systems, visit [ni.com/r/sbriocooling](http://ni.com/r/sbriocooling).


 **Notice** For model-specific guidelines about enabling proper thermal design, refer to the *CompactRIO Single Board Controller with DAQmx Hardware Installation Manual* on [ni.com/manuals](http://ni.com/manuals).

## Kit Identification

Kit Name	Contents	Part Number	Environmental Notes
Development Kit	Includes the CompactRIO Single-Board Controller plus additional accessories to quickly access I/O and begin prototyping a system, including the Thermal Kit for CompactRIO Single-Board Controller with DAQmx (787331-01).	Development Kit part numbers end with -01.	It is acceptable to operate units from this kit in a desktop environment without an enclosure.
OEM Kit	Includes the CompactRIO Single-Board Controller without accessories.	OEM Kit part numbers end with -02.	This kit should be purchased after initial system prototyping when greater quantities are needed. It is expected to operate units from this kit in an enclosure with a valid thermal solution. Refer to the <i>CompactRIO Single-Board Controller with NI-DAQmx System Development Manual</i> for more information about mounting and designing a thermal solution.

## Local Ambient Temperature


Local ambient temperature is the maximum temperature of the room, environment, or enclosure in which the model is installed.


 **Note** For more information about designing a thermal solution, validating temperature, and measuring both local ambient temperature and operating temperature, refer to the *CompactRIO Single-Board Controller with NI-DAQmx Hardware Installation Manual* on [ni.com/manuals](http://ni.com/manuals).

## Environmental Characteristics

Local ambient temperature

Development Kit	-40 °C to 40 °C
OEM Kit	-40 °C to 60 °C

 **Note** (Development Kit) Local ambient temperature can exceed 40 °C if the battery case temperature is monitored and does not exceed 85 °C.

 **Note** (OEM Kit) Local ambient temperature can exceed 60 °C if the battery case temperature is monitored and does not exceed 85 °C.

Humidity

Operating	10% RH to 90% RH, noncondensing
Storage	5% RH to 95% RH, noncondensing

Pollution Degree	2
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Maximum altitude	5,000 m
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## 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 *Commitment to the Environment* web page at [ni.com/environment](https://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](https://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](https://ni.com/environment/batterydirective).

## Battery Recycling

The model contains a replaceable battery. Products containing lithium must be disposed of or recycled in accordance with all local laws and site regulations. For more information about disposing of or recycling this device's battery, refer to <https://www.rayovac.com/>.

## 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](https://ni.com/environment/rohs_china)。(For information about China RoHS compliance, go to [ni.com/environment/rohs\\_china](https://ni.com/environment/rohs_china).)

## Environmental Standards

This product meets the requirements of the following environmental standards for electrical equipment.


- IEC 60068-2-1 Cold
- IEC 60068-2-2 Dry heat

## Physical Characteristics

Weight	107 g (3.8 oz)
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## Power Requirements

The sbRIO-9603 requires a power supply connected either to the power connector or through the VIN, filtered pins through the RMC. Refer to the *Connecting the sbRIO-96xx to Power* section in the *CompactRIO Single Board Controller with DAQmx Hardware Installation Manual* on [ni.com/manuals](https://ni.com/manuals) for information about connecting the power supply. Refer to the *CompactRIO Single Board Controller with DAQmx System Development Manual* on [ni.com/manuals](https://ni.com/manuals) for more information about how to power the sbRIO-9603 through the RMC.

 **Notice** Exceeding the power limits may cause unpredictable device behavior.

### Recommended power supply

Development kit	NI PS-10 Desktop Power Supply (included in kit) Condor STD-24050 120 W, 24 V DC
OEM kit	55 W, 24 V DC, maximum
Voltage input range	9 V DC to 30 V DC
Reversed-voltage protection	30 V DC
Power consumption with RMC	55 W, maximum
Replacement battery	
Manufacturer	Rayovac
Model	BR1632
Cell chemistry system	Lithium Carbon Monofluoride (Li/CF)

## Physical Characteristics

Weight	107 g (3.8 oz)
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## Maintenance

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Clean the hardware with a soft, nonmetallic brush. Make sure that the hardware is completely dry and free from contaminants before returning it to service.

## CE Compliance

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

- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)
- 2011/65/EU; Restriction of Hazardous Substances (RoHS)

## Export Compliance

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This model is subject to control under the U.S. Export Administration Regulations (15 CFR Part 730 et. seq.) administered by the U.S. Department of Commerce's Bureau of Industry and Security (BIS) ([www.bis.doc.gov](http://www.bis.doc.gov)) and other applicable U.S. export control laws and sanctions regulations. This model may also be subject to additional license requirements of other countries' regulations.

Additionally, this model may also require export licensing before being returned to NI. The issuance of a Return Material Authorization (RMA) by NI does not constitute export authorization. The user must comply with all applicable export laws prior to exporting or re-exporting this model. See [ni.com/legal/export-compliance](http://ni.com/legal/export-compliance) for more information and to request relevant import classification codes (e.g. HTS), export classification codes (e.g. ECCN), and other import/export data.

## Product Certifications and Declarations

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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](http://ni.com/product-certifications), search by model number, and click the appropriate link.

## Additional Resources

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Visit [ni.com/manuals](http://ni.com/manuals) for more information about your model, including specifications, pinouts, and instructions for connecting, installing, and configuring your system.

## Worldwide Support and Services

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The NI website is your complete resource for technical support. At [ni.com/support](http://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](http://ni.com/services) for information about the services NI offers.

Visit [ni.com/register](http://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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