

# SAFETY, ENVIRONMENTAL, AND REGULATORY INFORMATION

## FD-11603

### 8-Channel Voltage Input Device for FieldDAQ™

This document includes compliance precautions and connection information for the FD-11603.

## 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 C-UL certification.



**Warning**—Take precautions to avoid electrical shock.

## Safety Guidelines



**Caution** Do not operate the FD-11603 in a manner not specified in this user guide. Product misuse can result in a hazard. You can compromise the safety protection built into the product if the product is damaged in any way. If the product is damaged, return it to National Instruments for repair.



**Attention** Le FD-11603 ne doit en aucun cas être utilisé d'une autre façon que celle spécifiée dans ce guide de l'utilisateur. Une mauvaise utilisation du produit peut s'avérer dangereuse. Si le produit est endommagé de quelque manière que ce soit, la sécurité intégrée dans le produit risque d'être compromise. Si le produit est endommagé, renvoyez-le à National Instruments pour réparation.

The FD-11603 is rated for use in DRY or WET LOCATIONS. Hazardous voltages may not be connected to the device. A hazardous voltage is a voltage greater than 42.4 V peak voltage or 60 V DC in DRY LOCATIONS, and 22.6 V peak or 35 V DC in WET LOCATIONS.



**Caution** All wiring must be insulated for the highest voltage used.



**Attention** Tout le câblage doit être isolé pour la plus haute tension utilisée.

## Safety Voltages

Connect only voltages that are within the following limits:

### Channel-to-channel isolation

Continuous working voltage <sup>1</sup>	60 V DC (Dry Locations); 35 V DC (Wet Locations)
Transient overvoltage <sup>2</sup>	1,000 V RMS, verified by 5 s withstand

### Channel-to-earth ground isolation

Continuous working voltage	60 V DC (Dry Locations); 35 VDC (Wet Locations)
Transient overvoltage	1,000 V RMS, verified by 5 s withstand

### Overvoltage protection<sup>3</sup>

±30 V between any two pins on the connector

These test and measurement circuits are rated for measurements performed on circuits not directly connected to the electrical distribution system referred to as MAINS.

MAINS is a hazardous live electrical supply system to which equipment is designed to be connected to for the purpose of powering equipment. This product is rated 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.



**Warning** Do not connect the FD-11603 to signals or use for measurements within Measurement Categories II, III, or IV, or for measurements on MAINS circuits or on circuits derived from Overvoltage Category II, III, or IV which may have transient overvoltages above what the product can withstand. The product must not be connected to circuits that have a maximum voltage above the continuous working voltage, relative to earth or to other channels, or this could damage and defeat the insulation. The product can only withstand transients up to the transient overvoltage rating without breakdown or damage to the insulation. An analysis of the working voltages, loop impedances, temporary overvoltages, and transient overvoltages in the system must be conducted prior to making measurements.

<sup>1</sup> Working voltage rating is the highest RMS value of the AC or DC voltage across the insulation that can continuously occur when the equipment is supplied at rated voltage.

<sup>2</sup> Withstand rating is the highest RMS value of the AC or DC voltage the insulation can withstand without flashover or breakdown for a specified time.

<sup>3</sup> Temporary Overvoltage rating is the overvoltage of relatively long duration.

**Mise en garde** Ne connectez pas le FD-11603 à des signaux dans les catégories de mesure II, III ou IV et ne l'utilisez pas pour des mesures dans ces catégories, ou des mesures sur secteur ou sur des circuits dérivés de surtensions de catégorie II, III ou IV pouvant présenter des surtensions transitoires supérieures à ce que le produit peut supporter. Le produit ne doit pas être raccordé à des circuits ayant une tension maximale supérieure à la tension de fonctionnement continu, par rapport à la terre ou à d'autres voies, sous risque d'endommager et de compromettre l'isolation. Le produit risque de tomber en panne et son isolation risque d'être endommagée si les tensions transitoires dépassent la surtension transitoire nominale. Une analyse des tensions de fonctionnement, des impédances de boucle, des surtensions temporaires et des surtensions transitoires dans le système doit être effectuée avant de procéder à des mesures.

## Power Requirements

**Notice** The protection provided by the FD-11603 can be impaired if it is used in a manner not described in the *FD-11603 User Guide*.

### Voltage input range

$V_{in}$	9 V DC to 30 V DC
$V_{aux}$	0 V DC to 30 V DC

### Device power consumption

Nominal	6.0 W
Maximum	7.5 W

## Current Limits

**Caution** Exceeding the current limits may cause damage to the device. Stay below a maximum of 10 A shared between both Input and Aux terminals.

**Attention** Dépasser les limites d'intensité de courant risque d'endommager l'appareil. Restez en dessous d'un maximum de 10 A partagés entre les bornes Input et Aux.

### Power IN/OUT terminals

$V_{in}$	10 A maximum
$V_{aux}$	10 A maximum total (combined with $V_{in}$ )

Recommended external overcurrent protection 16 A, slow blow fuse

## Wiring External Power to the FieldDAQ Device

The FD-11603 requires an external power source as described in the [Power Requirements](#). The POWER LED identifies when the device is receiving adequate power for its tasks.

Complete the following steps to connect a power source to the FieldDAQ device.

1. Verify the power source is turned off.
2. If you are not using a pre-assembled cable, complete the following steps.
  - a) Connect the positive lead of the primary power source to the V terminal (pin 1) inside the power connector plug.
  - b) Connect the negative lead of the primary power source to the C terminal (pin 3) inside the power connector plug.
  - c) Connect the Chassis Ground terminal (pin 5) inside the power connector plug to earth ground. This terminal is internally connected to the C terminal.
  - d) (Optional) To power non-FieldDAQ devices through the power network, connect the leads of an additional auxiliary power source to the Aux1 (pin 4) and Aux2 (pin 2) terminals inside the power connector plug.
  - e) Assemble the rest of the plug sleeve.
3. Carefully align and connect the cable to the external power source and the power IN connector on the FieldDAQ device.
4. Turn on the external power source.

If the power source is connected to the power connector using long wiring with high DC resistance, the voltage at the power connector may be significantly lower than the specified voltage of the power source.

Refer to the [Power Requirements](#) section for information about the power supply input range. Refer to the [Safety Voltages](#) section for information about the maximum voltage from terminal to chassis ground.


# Preparing the Environment

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Ensure that the environment you are using the FD-11603 in meets the following specifications.

Operating temperature (IEC 60068-2-1, IEC 60068-2-2)	-40 °C to 85 °C
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 **Note** Failure to follow the mounting instructions in the *FD-11603 User Guide* can cause temperature derating.

Ingress protection (IEC 60529)	IP65/IP67
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Operating humidity

IEC 60068-2-30 Test Db	80% to 100% RH, condensing
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IEC 60068-2-78	10% RH to 90% RH, noncondensing
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Pollution Degree	4
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Maximum altitude	5,000 m
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 **Note** Refer to the *FD-11603 Specifications* for complete specifications.

## Connector Characteristics

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Torque for M12 connectors (power, Ethernet, input connections)	0.6 N · m (5.31 lb · in.)
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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 changes or modifications to the product not expressly approved by National Instruments could void your authority to operate it under your local regulatory rules.

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

## Where to Go Next

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The following documents contain information that you may find helpful as you use this document:

- *FD-11603 User Guide*
- *FD-11603 Specifications*

## Worldwide Support and Services

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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](https://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/global](https://ni.com/global) to access the branch office websites, which provide up-to-date contact information.

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