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**FD-11601**


# SAFETY, ENVIRONMENTAL, AND REGULATORY INFORMATION

## FD-11601


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

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.


## 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.


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


## Safety Guidelines

 **Caution** Do not operate the FD-11601 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 NI for repair.

 **Attention** Le FD-11601 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 NI pour réparation.

The FD-11601 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 VDC (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 *not* rated for measurements performed on circuits 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-11601 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

<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.

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.



**Mise en garde** Ne connectez pas le FD-11601 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.

## 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.

## Electromagnetic Compatibility Notices

Refer to the following notices for cables, accessories, and prevention measures necessary to ensure the specified EMC performance.



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

## Special Conditions for Marine Applications

Some models are approved for marine (shipboard) applications. To verify marine approval certification for a model, visit [ni.com/product-certifications](https://ni.com/product-certifications), search by model number, and click the appropriate link.



**Notice** In order to meet the EMC requirements for marine applications, install the model in a shielded enclosure with shielded and/or filtered power and input/output ports. In addition, take precautions when designing, selecting, and installing measurement probes and cables to ensure that the desired EMC performance is attained.

## Electromagnetic Compatibility Standards

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** 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** 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.



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



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

## Environmental Guidelines




**Notice** To meet the shock and vibration specifications in this document, you must panel mount the system.


# Environmental Characteristics


Refer to the *FD-11601 User Guide* for more information about meeting these specifications.

## Temperature and Humidity

Temperature	
Operating	-40 °C to 85 °C
Storage	-40 °C to 100 °C
Operating and storage humidity	Up to 100% relative humidity, condensing or noncondensing
Ingress protection	IP65/IP67
Pollution Degree	4
Maximum altitude	5,000 m

 **Note** Failure to follow the mounting instructions in the *FD-11601 User Guide* can cause temperature derating.

 **Note** M12 connectors must be mated to cables or have caps installed on them to meet IP65/IP67 requirements. Cover the unused connectors with the included plastic caps whenever water, dust, or dirt are present.

 **Note** Avoid long periods of exposure to sunlight.

## Shock and Vibration

Operating vibration	
Random	10 g RMS, 5 Hz to 2,000 Hz
Sinusoidal	10 g, 5 Hz to 2,000 Hz
Operating shock	100 g, 11 ms half sine, 3 shocks at 6 orientations, 18 total 40 g, 6 ms half sine, 4,000 shocks at 6 orientations, 24,000 total

## 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).


## 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
- IEC 60068-2-6 Sinusoidal operating vibration
- IEC 60068-2-27 Operating shock
- IEC 60068-2-30 Damp heat cyclic (12 + 12h cycle)
- IEC 60068-2-64 Random operating vibration

 **Note** To verify marine approval certification for a product, refer to the product label or visit [ni.com/certification](https://ni.com/certification) and search for the certificate.

# Power Requirements

 **Notice** The protection provided by the FD-11601 can be impaired if it is used in a manner not described in the *FD-11601 User Guide*.


## Voltage input range


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

## Device power consumption

Nominal	
With sensor power excitation off	7.0 W
With sensor power excitation on <sup>4</sup>	13.5 W
Maximum with sensor power excitation on <sup>4</sup>	16.0 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

# Physical Characteristics

Dimensions 198.5 mm × 77.4 mm × 47.1 mm (7.8 in. × 3.0 in. × 1.9 in.)

Weight 1.2 kg (42 oz)


## Input connection


Number	8
Type	5-pin A-coded M12 connectors

Torque for M12 connectors (power, Ethernet, input connections) 0.6 N · m (5.31 lb · in.)

# Maintenance

If you need to clean your device, wipe it with a dry towel.

 **Note** M12 connectors must be mated to cables or have caps installed on them to meet IP65/IP67 requirements. Cover the unused connectors with the included plastic caps whenever water, dust, or dirt are present.

 **Note** Avoid long periods of exposure to sunlight.

# CE Compliance

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)
- 2011/65/EU; Restriction of Hazardous Substances (RoHS)

<sup>4</sup> The total amount of power drawn by the device from the power input connector, including power delivered to external sensors.

## 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 device, including specifications, pinouts, and instructions for connecting, installing, and configuring your system.

- [FD-11601 User Guide](#)
- [FD-11601 Specifications](#)

## 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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