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Find the *National Instruments cFP-RLY-425* at our website: ***Click HERE***

FieldPoint Operating Instructions

cFP-RLY-425

Eight-Channel SPST Relay Module

These operating instructions describe how to install and use the National Instruments cFP-RLY-425 relay module. For information about configuring and accessing the cFP-RLY-425 over a network, refer to the user manual for the FieldPoint network module you are using.

Features

The cFP-RLY-425 is a Compact FieldPoint relay output module with the following features:

- Eight single-pole single-throw (SPST) relay channels
- Switches up to 5 A at 18 VDC or 150 VAC, 0.2 A at 125 VDC, or 3 A at 250 VAC
- –40 to 70 °C operation
- 250 V_{rms} CAT II continuous channel-to-channel and channel-to-ground isolation, verified by 2,300 V_{rms} 1 minute dielectric withstand test
- Hot swappable

Power Requirement

The cFP-RLY-425 is powered by the FieldPoint network module through the backplane bus. The cFP-RLY-425 requires up to 1.45 W of power,[1] which may limit the number of I/O modules that you can connect to a single network module.

Before you configure a FieldPoint system that uses a cFP-RLY-425 module, calculate the total power consumption of the I/O modules on the FieldPoint bank. Power requirements are listed in the *Specifications* sections of the operating instructions for each I/O module. The network module user manual lists the maximum

[1] 1.45 W is the maximum power requirement. Most applications require less power.

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pply. Make sure the total
odules in the bank is less
om the network module.

2000 network module,
cFP-DI-300 modules. The
FP-RLY-425 requires
uires 0.185 W. Three
I-300 modules require a

W) = 5.28 W

e 9 W maximum.

25

act FieldPoint backplane
power to the module.
wered backplane does not

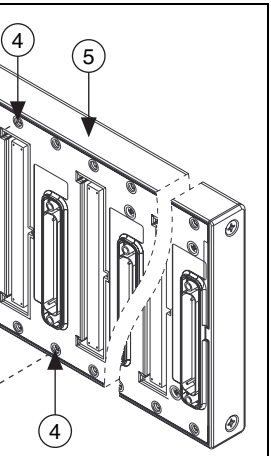
igure 1 and complete the

FP-RLY-425 with the holes
keys on the cFP-RLY-425

425 on the backplane.

river with a shank of at least
captive screws to 1.1 N · m
oating on the screws

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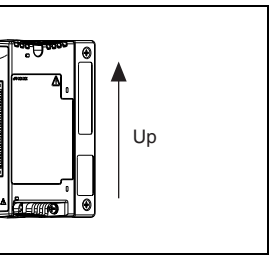
crew Holes
FP Backplane

cFP-RLY-425

bright

y, mount the Compact
ule vents are at the top and

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ystem Upright

25 has two terminals, CH*x*

us voltage wiring is
personnel adhering to local
ous voltage is a voltage
VDC.

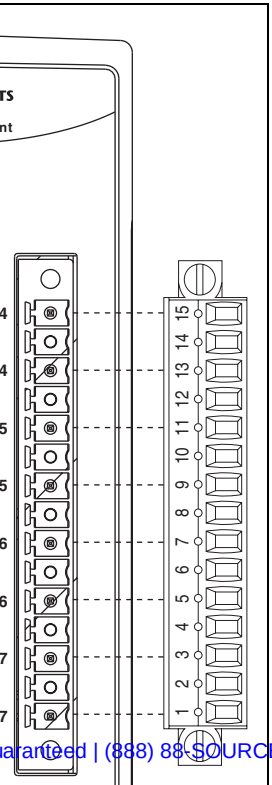
COM*x* pins are on two
. Table 1 lists the terminal
annel.

signments

rminal Numbers	
	COM*x*
	L3
	L7
	L11

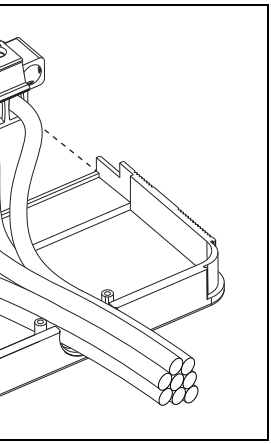
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left connector are for
-1 on the right connector are
to orient the two connectors



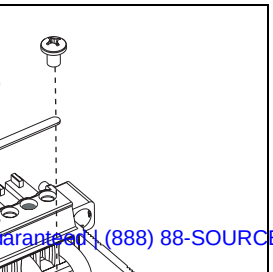
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e connector in the shell as
use the half of the shell with

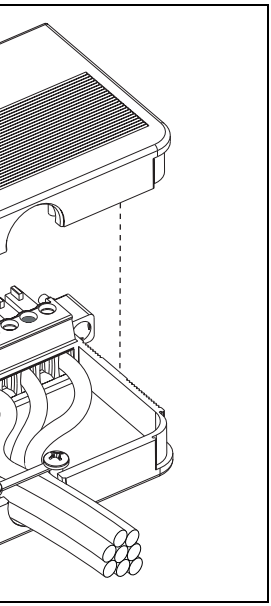


nal Connector in the Shell

n Figure 5.



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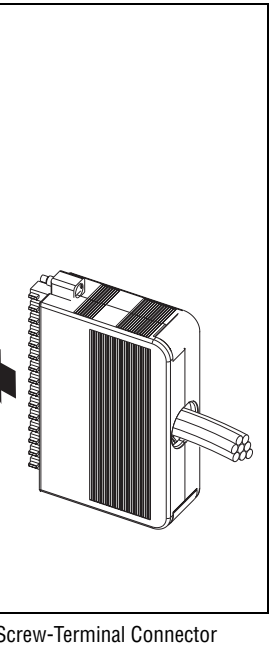
onnector Shell

hown in Figure 7.



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-425 as shown in Figure 8,
connector.



Screw-Terminal Connector

cFP-RLY-425

LY-425 as shown in Figure 9.
cting fuse (F 5 A L 250V) at
dule and the load from

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ngle-pole single-throw)
up state is OFF (open) to
e, the CH*x* and COM*x* relay
t. In the ON state, there is an
tween the CH*x* and COM*x*
.[1] For example, if the current
x and COM*x* terminals can

witch depends on the voltage,
perature. Refer to the
nation.

nductive Loads

o the relays, a large
r at relay switching time
luctive load. These flyback
y contacts and greatly

nstalling a flyback diode
l oxide varistor (MOV)

rnal protection MOVs to
being applied across the
een the CH*x* and COM*x*
onal Instruments
rcuit across each inductive
mall leakage current, which
n.

rmation about selecting and
ports to ni.com and
witches»Software»

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initial configuration information to the cFP-RLY-425. After the cFP-RLY-425 receives this initial information, the green **READY** indicator lights and the module is in normal operating mode.

Isolation and Safety Guidelines

Caution Read the following information before attempting to connect the cFP-RLY-425 to any circuits that may contain hazardous voltages.

This section describes the isolation of the cFP-RLY-425 and its compliance with international safety standards. The field wiring connections are isolated from the backplane and the inter-module communication bus. The isolation barriers in the module provide 250 V_{rms} Measurement Category II continuous isolation, verified by 2,300 V_{rms}, 1 minute dielectric withstand test. The cFP-RLY-425 provides *double insulation* (compliant with IEC 61010-1) for working voltages of 250 V_{rms}[1]. Safety standards (such as those published by UL and IEC) require the use of double insulation between hazardous voltages and any human-accessible parts or circuits.

Never try to use any isolation product between human-accessible parts (such as DIN rails or monitoring stations) and circuits that can be at hazardous potentials under normal conditions, unless the product is specifically designed for such an application, as is the cFP-RLY-425.

Even though the cFP-RLY-425 is designed to handle applications with hazardous potentials, follow these guidelines to ensure a safe system:

- You *must* connect the protective earth (PE) ground terminal on the cFP-BP-*x* backplane to the system safety ground. The backplane PE ground terminal has the following symbol stamped beside it: ⏚. Connect the backplane PE ground terminal to the system safety ground using 14 AWG (1.6 mm) wire with a ring lug. Use the 5/16 in. panhead screw shipped with the backplane to secure the ring lug to the backplane PE ground terminal.

[1] *Working voltage* is defined as the signal voltage plus the common-mode voltage. *Common-mode voltage* is the voltage of the module with respect to ground.

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- The cFP-RLY-425 is a UL Recognized component. The entire Compact FieldPoint system must be installed in a UL Listed, suitably rated NEMA or IP enclosure for safe use.

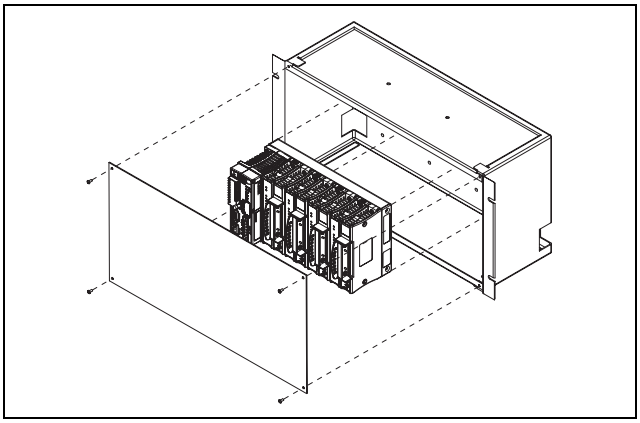


Figure 10. Installing the Compact FieldPoint System in an Enclosure

- As with any hazardous voltage wiring, make sure that all wiring and connections meet applicable electrical codes and commonsense practices. Mount terminal bases and backplanes in an area, position, or cabinet that prevents accidental or unauthorized access to wiring that carries hazardous voltages.
- Do *not* use the cFP-RLY-425 as the only isolating barrier between human contact and working voltages higher than 250 V_{rms}.
- Operate the cFP-RLY-425 only at or below Pollution Degree 2. Pollution Degree 2 means that only nonconductive pollution occurs in most cases. Occasionally, however, condensation can cause temporary conductivity.
- Do *not* operate FieldPoint products in an explosive atmosphere or where there may be flammable gases or fumes. If you need to operate FieldPoint products in such an environment, the FieldPoint products *must* be in a suitably rated enclosure.
- Operate the cFP-RLY-425 at or below Measurement Category II. Measurement Category II is for measurements performed on circuits directly connected to the low-voltage installation. This category refers to local-level distribution, such as that provided by a standard wall outlet. Do not use this module with voltages in Measurement Categories III or IV.

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Specifications

The following specifications are typical for a range of –40 to 70 °C unless otherwise noted. All specifications are subject to change without notice.

Relay Characteristics

Number of channels 8

Relay type ..... SPST, nonlatching, normally open

Maximum switching capacity (resistive load)

- At 250 VAC ..... 3 A
- At 150 VAC ..... 5 A
- At 0 to 18 VDC ..... 5 A
- At 125 VDC ..... 0.2 A

Maximum switching power on each channel ..... 750 VA, 90 W

Minimum switching load ..... 1 mA at 5 VDC

Maximum current through all channels ..... 200 A^2

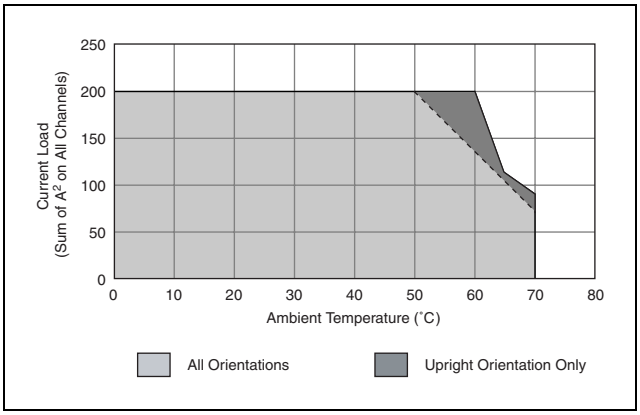


Figure 11. Maximum Current on All Channels by Ambient Temperature

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A each, the total current is
11, the module can output
perature up to 60 °C.

each and six channels carry
$6(2\ A)^2 = 74\ A^2$. The module
mbient temperature up to

≤50 mΩ

ically remains low for
d of relay life, the path
1 Ω. Load ratings apply
cification before the end of

0.03 µA
µA

$\times 10^7$ operations

$.5 \times 10^5$ operations
$.5 \times 10^5$ operations
$\times 10^4$ operations

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READY indicators
201 g (7.1 oz)

.45 W at –40 to 70 °C

annel isolation
250 V_{rms}, Measurement
Category II
2,300 V_{rms}, 1 minute

ndoor use only. For outdoor
aled enclosure.
-40 to 70 °C
-55 to 85 °C
10 to 85% RH,
noncondensing
2,000 m; at higher altitudes
he isolation voltage ratings
must be lowered
2

quirements of the following
ment for measurement,

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model number or product line, and click the appropriate link in the Certification column.

Electromagnetic Compatibility

Emissions ..... EN 55011 Class A at 10 m
FCC Part 15A above 1 GHz

Immunity ..... EN 61326:1997 + A2:2001, Table 1

CE, C-Tick, and FCC Part 15 (Class A) Compliant

CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

Low-Voltage Directive (safety) 73/23/EEC

Electromagnetic Compatibility Directive (EMC) 89/336/EEC

Note Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit `ni.com/certification`, search by model number or product line, and click the appropriate link in the Certification column.

Where to Go for Support

For more information about setting up the FieldPoint system, refer to these National Instruments documents:

- FieldPoint network module user manual
- Other FieldPoint I/O module operating instructions
- FieldPoint terminal base and connector block operating instructions

Go to `ni.com/support` for the most current manuals, examples, and troubleshooting information.

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the calling instructions or dial 512 795 8248. For telephone support outside the United States, contact your local branch office:

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Finland 385 0 9 725 725 11, France 33 0 1 48 14 24 24,
Germany 49 0 89 741 31 30, India 91 80 51190000,
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Japan 81 3 5472 2970, Korea 82 02 3451 3400,
Lebanon 961 0 1 33 28 28, Malaysia 1800 887710,
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New Zealand 0800 553 322, Norway 47 0 66 90 76 60,
Poland 48 22 3390150, Portugal 351 210 311 210,
Russia 7 095 783 68 51, Singapore 1800 226 5886,
Slovenia 386 3 425 4200, South Africa 27 0 11 805 8197,
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