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Find the *National Instruments FP-TB-1* at our website: ***Click HERE***

# Relay Modules for FieldPoint

## NI FP-RLY-420, NI FP-RLY-422

- 4 or 8 electromechanical relays
  - 8 form A (SPST), RLY-420
  - 4 form C (SPDT), RLY-422
- Switch 250 VAC, 120 VDC
- Switch 3 A, maximum
- 2,300 $V_{rms}$ bank isolation for transient overvoltage protection
- Hot swappable with autoconfiguration
- -40 to 70 °C operating range



| Module | Output Channels | Maximum Output Voltage | Output Current Rating (See Specifications) | Separate Ground Plane per Channel |
|---|---|---|---|---|
| FP-RLY-420 | 8 | 120 VDC, 250 VAC | 3 A | ✓ |
| FP-RLY-422 | 4 | 120 VDC, 250 VAC | 3 A | ✓ |

## Overview

The National Instruments FP-RLY-42x devices are versatile relay modules that you can use to control digital signals ranging from low voltages to 125 VDC and to 250 VAC. These modules are commonly used to control indicator lights, motors, and power circuits. All the modules include onboard diagnostics to ensure trouble-free installation and maintenance. Similar relay modules are available for Compact FieldPoint, see page 574 for more information.

## Relay Modules

NI FP-RLY-42x modules provide built-in module-to-module isolation to protect your FieldPoint system and controller or communication interface from high voltage levels. Each channel on an RLY-42x uses electrically isolated output relays so that each relay output has a separate ground plane and each channel can be used with a different voltage potential. Thus, you can connect one channel to a 24 VDC signal and another channel on the same module to 250 VAC.

All the channels on the relay modules feature LEDs that indicates the output state of each channel. The modules all feature a maximum switching frequency of 10 Hz (20 operations). Overall data throughput depends on software loop speeds and network speeds.

## Isolation

The FP-RLY-42x modules feature optical bank isolation with 2,300 $V_{rms}$ of breakdown isolation. In addition, the modules provide double insulation for up to 250 $V_{rms}$ of operational isolation. FieldPoint can safely be used in applications where hazardous voltages are present when used with FP-TB-x terminal base. These FieldPoint modules do not have channel-to-channel isolation.

## Power Requirements

Because the FP-RLY-42x are high power consumption modules, they could limit the number of I/O modules that you can connect to a single network interface module. Controllers and network interface modules supply up to 9 W to power I/O modules. The FP-RLY-420 requires up to 2.5 W and the FP- RLY-422 requires up to 1.5 W.

### Field I/O Connections

Each input channel on the FP-RLY-420 has two terminals:

1. Relay common terminal (IC)
2. Normally open terminal (NO)

Each channel on the FP-RLY-422 has three terminals:

1. Normally open terminal (NO)
2. Normally closed terminal (NC)
3. Relay common terminals (IC)

# Relay Modules for FieldPoint

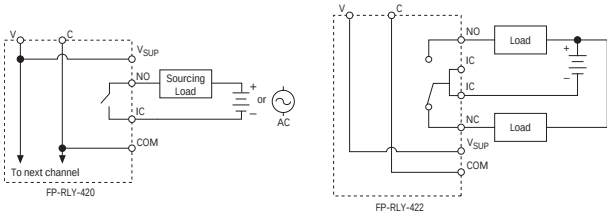



*figure 1. Wiring Schematics for RLY Modules*

## Ordering Information

NI FP-RLY-420 .....777518-420
NI FP-RLY-422 .....777518-422

**Recommended FieldPoint System Products**

NI FP-1601 .....777792-01
NI FP-TB-1 .....777519-01
NI PS-4 Power Supply .....778586-90
NI Developer Suite Standard Control Edition .....777905-03

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*Visit ni.com/info and enter fprly420, and/or fprly422.*

## Specifications

Typical for -40 to 70 °C unless otherwise noted.

### Relay Characteristics

Number of channels
- FP-RLY-420 ..... 8
- FP-RLY-422 ..... 4

Relay type
- FP-RLY-420 ..... SPST, normally open, nonlatching
- FP-RLY-422 ..... SPDT, nonlatching

Maximum switching capacity (resistive load)[1]
- AC ..... 3 A at 250 VAC
- DC ..... 3 A at 35 VDC
  2 A at 40 VDC
  1 A at 55 VDC
  0.4 A at 120 VDC

Minimum switching load ..... 10 mA at 5 VDC

Off-state leakage current (120 VDC/250 VAC)
- DC ..... 0.12 µA
- 50/60 Hz ..... 8 µA

DC path resistance
- Initial ..... ≤ 150 mΩ
- End of life ..... ≥ 1.0 Ω

Expected relay life
- Mechanical ..... 2 x $10^7$ operations/s (FP-RLY-420)
  1 x $10^7$ operations/s (FP-RLY-422)
- Electrical (at 30 cpm) ..... 300,000 operations at 3 A, 35 VDC
  100,000 operations at 3 A, 250 VAC

Operate time
- FP-RLY-420 ..... <10 ms
- FP-RLY-422 ..... 10 ms typ, 13 ms max

Release time
- FP-RLY-420 ..... <10 ms
- FP-RLY-422 ..... 5 ms typ, 7 ms max

Bounce time
- FP-RLY-420 ..... <4 ms
- FP-RLY-422 ..... 3 ms typ, 6 ms max

Contact material
- FP-RLY-420 ..... Gold-plated silver cadmium oxide
- FP-RLY-422 ..... Silver cadmium oxide

### Power Requirement (from Network Module)

- FP-RLY-420 ..... 2.5 W
- FP-RLY-422 ..... 1.5 W

### Physical Characteristics

LED indicators
- POWER (green) ..... Power on and self-test passed
- READY (green) ..... Module configured and ready
- <0...7> or <0...3> ..... On/off state of each contact

Dimensions (including terminal base) ..... 10.7 by 10.9 by 9.1 cm (4.2 by 4.3 by 3.6 in.)

Weight
- FP-RLY-420 ..... 160 g (5.6 oz)
- FP-RLY-422 ..... 180 g (6.4 oz)

### Isolation Voltage

Maximum isolation voltage ..... 250 $V_{rms}$, Installation Category II
Channel-to-channel isolation ..... No isolation between channels
Transient overvoltage ..... 2,300 $V_{rms}$

### Environment

Operating temperature ..... -40 to 70 °C
Storage temperature ..... -55 to 85 °C
Relative humidity ..... 10 to 90%, noncondensing

### Safety

This product is designed to meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:
- IEC 61010-1, EN 61010-1
- UL 3121-1, UL 61010C-1
- CAN/CSA C22.2 No. 1010.1

For UL, hazardous location, and other safety certifications, refer to the product label or to ni.com

### Electromagnetic Compatibility

CE, C-Tick, and FCC Part 15 (Class A) Compliant
Emissions ..... EN 55011 Class A at 10 m
FCC Part 15A above 1 GHz
Immunity ..... EN 61326:1997 +A2:2001, Table 1
For EMC compliance, you must operate this device with shielded cabling.

### 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

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/hardref.nsf/ and search by model number or product line.

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