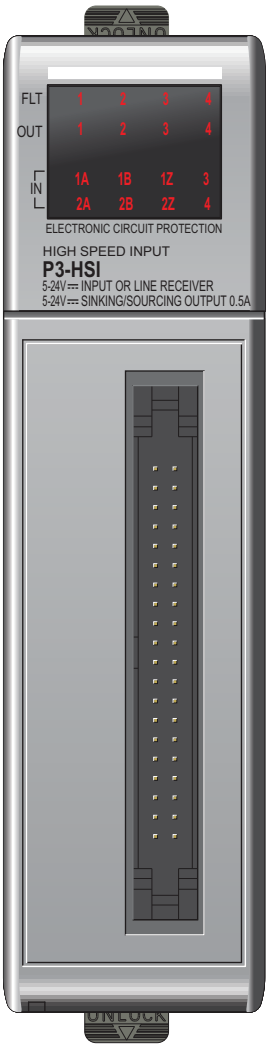
# Specialty Modules

## P3-HSI <--->

### High-Speed Input

The P3-HSI is a high-speed (1MHz) input module that has both differential and single ended inputs. This module accepts Pulse/Direction and Quadrature signals on each of the two independent input channels. It also provides four general purpose high-speed inputs and four general purpose 5-24 VDC 0.5 amp, outputs.




**No terminal block sold for this module; *ZIP*Link required.**

See Wiring Solutions for part numbers of *ZIP*Link cables and connection modules required with this I/O module.

| General Specifications | |
|---|---|
| Module Type | Intelligent |
| Modules per Base | No limit |
| I/O Points Used | None, mapped directly to tags in PAC |
| Surrounding Air Temperature | 0° to 60°C (32° to 140°F) |
| Storage Temperature | -20° to 70°C (-4° to 158°F) |
| Humidity | 5 to 95% (non-condensing) |
| Environmental Air | No corrosive gases permitted |
| Vibration | IEC60068-2-6 (Test Fc) |
| Shock | IEC60068-2-27 (Test Ea) |
| Field to Logic Side Isolation | 1800 VAC applied for 1 second |
| Insulation Resistance | >10 MΩ @ 500 VDC |
| Heat Dissipation | 5.76W |
| Enclosure Type | Open Equipment |
| Emissions | EN61000-6-4 (Conducted and radiated RF emissions) |
| Agency Approvals | UL508 file E157382, Canada & USA<br>CE (EN61131-2*) |
| Module Keying to Backplane | Electronic |
| Module Location | Any I/O slot in any local, expansion, or remote base in a Productivity3000 System. |
| Field Wiring | Use *ZIP*Link wiring system. See Wiring Solutions. |
| EU Directive | See the "EU Directive" topic in the Productivity3000 Help File. Information can also be obtained at: www.productivitypac.com |
| Weight | 113.4g (4 oz) |

*Meets EMC and Safety requirements. See the Declaration of Conformity for details.

| Power Specifications | |
|---|---|
| External Power | 24 VDC +10%/-15%, Class 2 |
| Maximum Voltage | 26.4 VDC |
| Minimum Voltage | 20.4 VDC |
| Current Consumption Excluding Outputs | 47 mA |
| Maximum Current Consumption Total of the 4 Status Outputs | 2A |

| Connector Specifications | |
|---|---|
| Connector Type | IDC style header with latch, Omron XG4A-4034 |
| Number of Pins | 40 point |
| Pitch | 0.1 in. (2.54 mm) |

| CPU | Firmware Required | Productivity Suite Required |
|---|---|---|
| P3-550 | Version 1.1.12.x or later | Version 1.6.x.x or later |

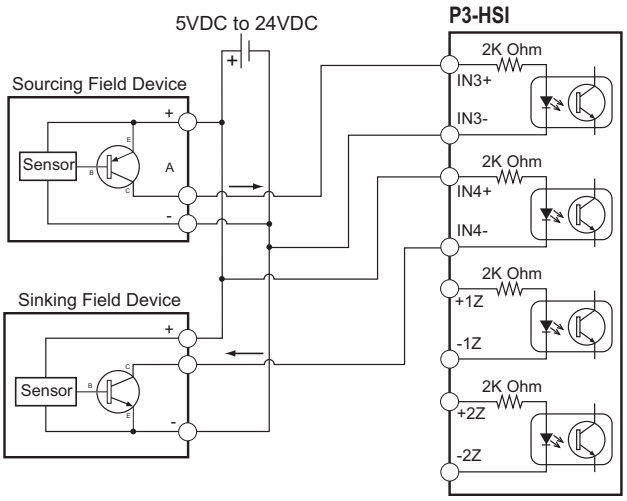
## P3-HSI (cont'd)

### Single Ended (5-24V) Input Specifications

| | |
|---|---|
| Status Input | Single ended inputs (8 pts: 1A, 1B, 1Z, 2A, 2B, 2Z, 3IN, 4IN) |
| Isolation | Each input is isolated from other circuits |
| Input Volts Range | 5-24 VDC |
| Input Volts Maximum | +/-34 VDC, limited by protection |
| Input Impedance | 1 kΩ min., 5 kΩ max. |
| Inputs Rated Current | 5-24 VDC, 16 mA<br>5.2 mA typ. @ 5 VDC<br>22 mA max. @ 34 VDC |
| Input Minimum ON Voltage | 4.5 VDC |
| Input Maximum OFF Voltage | 2.0 VDC |
| Input Minimum ON Current | 5.0 mA |
| Input Maximum OFF Current | 1.4 mA |
| OFF to ON Response Time | 1A, 1B, 2A, 2B: 0.48 µs<br>1Z, 2Z, 3IN, 4IN: 6 µs |
| ON to OFF Response Time | 1A, 1B, 2A, 2B: 0.48 µs<br>1Z, 2Z, 3IN, 4IN: 6 µs |
| Max. Input Frequency | 1A, 1B, 2A, 2B: 200 kHz*<br>1Z, 2Z, 3IN, 4IN: 200 kHz* |

* Inputs are not limited to this speed but single ended signals are not usually reliable above 200 kHz due to cabling capacitance.

**Status Inputs**

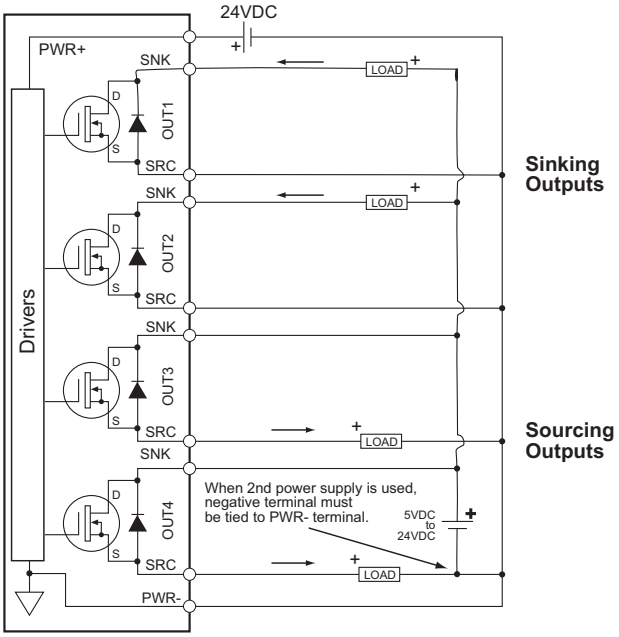



### Status Output Specifications

| | | |
|---|---|---|
| Status Outputs | 4 Outputs | |
| Output Signal Type, per Output | Current Sinking | Current Sourcing |
| Operating Voltage[1] | 5-24 VDC | 5-24 VDC[1] |
| Output Volts Maximum | 36 VDC | 26.4 VDC[1] |
| Output Current Maximum | 500 mA | 500 mA |
| Overcurrent Protection | Short circuit detect and current limit with automatic retry for each output | |
| Output Self Limiting Current | 1.2 to 2.4 amps | |
| Max. Inrush Current | Self limited | |
| Output Voltage Drop | 0.7 VDC @ 0.5A | 0.7 VDC @ 0.5A |
| Thermal Protection | Independent overtemperature protection each output | |
| Output Voltage Clamp During Inductive Switching | +45 VDC | -20 VDC |
| Maximum OFF to ON Response | 25 µs[2] | |
| Maximum ON to OFF Response | 25 µs[2] | |

Notes:
1. Operating voltage of current sourcing outputs must be no greater than external power.
2. Measured at 5 VDC operating voltage, 0.5A load curent.

**Status Outputs**




### Differential (5V) Input Specifications

| | |
|---|---|
| Pulse Inputs | Differential inputs (6 pts: 1A, 1B, 1Z, 2A, 2B, 2Z) |
| Isolation | Each input is isolated from other circuits |
| Input Signal Type, per Channel Select | Differential |
| Input Volts | 5 VDC |
| Input Volts Maximum | +/-5.6 VDC, limited by protection |
| Input Impedance | 200Ω min., 500Ω max. |
| Inputs Rated Current | 5 VDC, 15 mA (8 mA typ., 15 mA max.) |
| Input Minimum ON Voltage | 3.0 VDC |
| Input Maximum OFF Voltage | 1.0 VDC |
| Input Minimum ON Current | 5.0 mA |
| Input Maximum OFF Current | 2.0 mA |
| OFF to ON Response Time | 1A, 1B, 2A, 2B: 0.48 µs<br>1Z, 2Z, 3IN, 4IN: 6 µs |
| ON to OFF Response Time | 1A, 1B, 2A, 2B: 0.48 µs<br>1Z, 2Z, 3IN, 4IN: 6 µs |
| Max. Input Frequency | 1A, 1B, 2A, 2B: 1 MHz<br>1Z, 2Z, 3IN, 4IN: 300 kHz* |

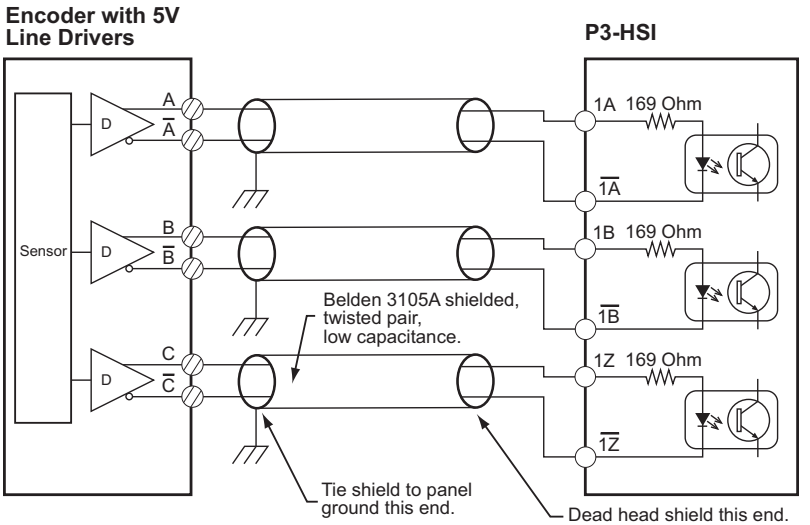
Note: The voltage difference between the input pairs must be between 3-5.6 volts.

* The Z pulse input (1Z & 2Z) is capable of capturing a 1 MHz wide pulse for the purpose of resetting an encoder count but a 3 microsecond pause (300 kHz) is required between pulses.

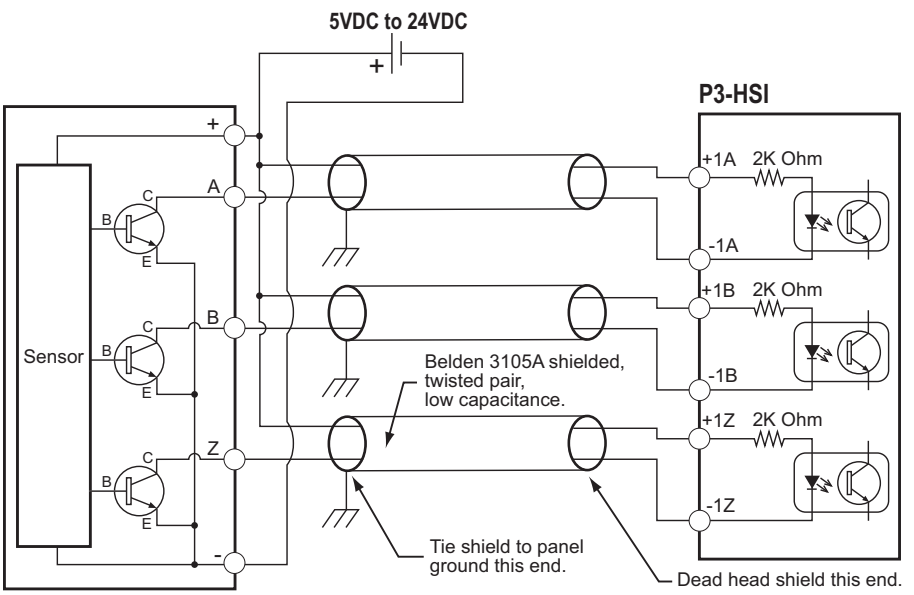
## P3-HSI (cont'd)

### 5V Encoder Inputs

To prevent damage to P3-HSI 5V inputs, do not exceed 6.8V or 30 mA on inputs 1A, $\overline{1A}$, 1B, $\overline{1B}$, 1Z, $\overline{1Z}$, 2A, $\overline{2A}$, 2B, $\overline{2B}$, 2Z, & $\overline{2Z}$.

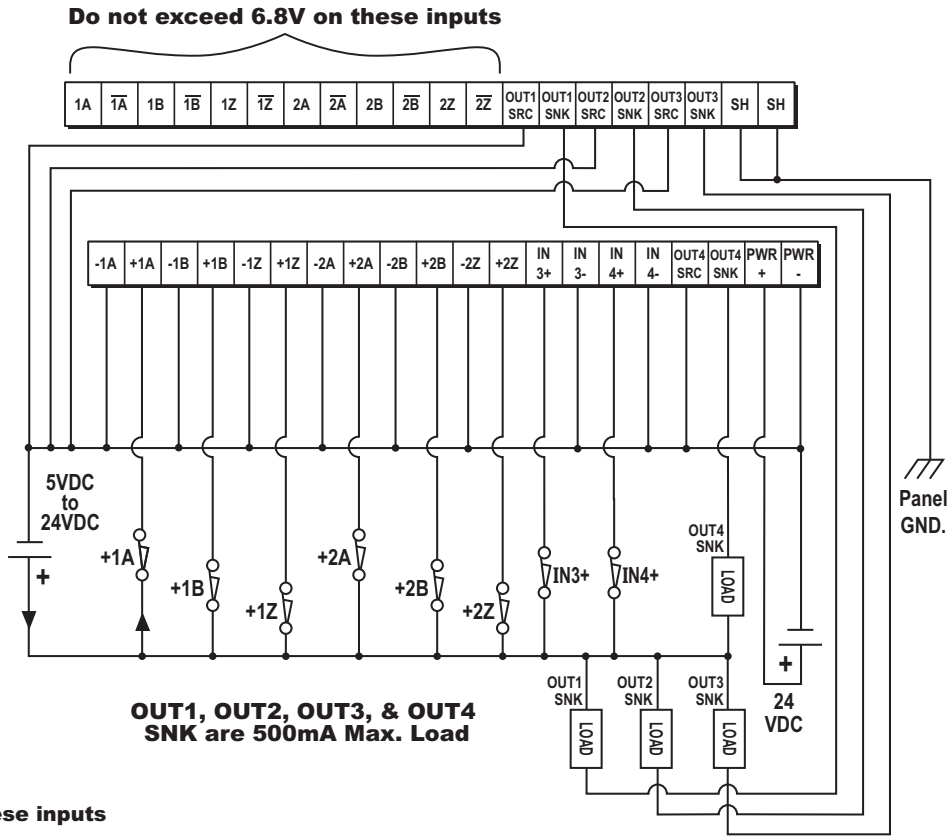



### 24V Encoder Inputs



## P3-HSI (cont'd)

### Sinking I/O Wiring Diagram




### Sourcing I/O Wiring Diagram