



# Artisan Scientific

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## IP440-x Isolated Digital Input

IP440 Industrial I/O Pack (IP) modules provide 32 optically isolated inputs to safely monitor a wide range of digital input voltage levels.

Isolation protects your computer system from noise, transient signals, and field wiring faults. The inputs are grouped into four 8-channel ports. Ports are isolated from the logic and each other.

Change-of-state interrupts are supported using paired channels. Debounce eliminates spurious interrupts from noise and switching transients for error-free edge detection.

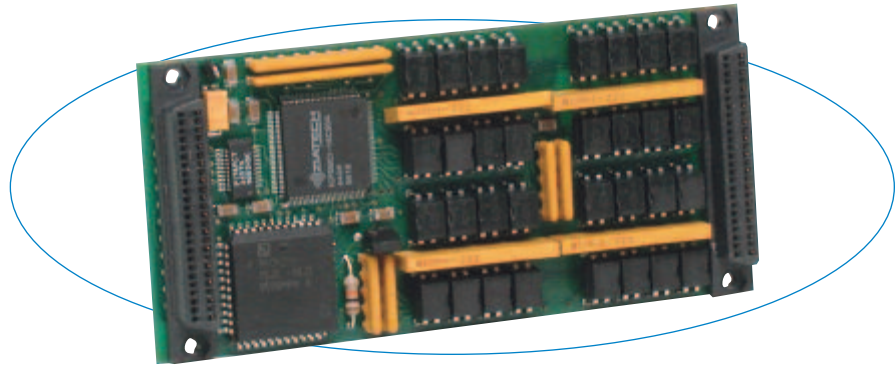
Closed-loop monitoring of critical control signals is easily accomplished using the IP440 in conjunction with Acromag's IP445 digital output module.

### Features

- 32 port-isolated input channels
- Three input ranges (different models):
  - IP440-1:  $\pm 4$  to  $\pm 18$ V DC or AC peak
  - IP440-2:  $\pm 16$  to  $\pm 40$ V DC or AC peak
  - IP440-3:  $\pm 38$  to  $\pm 60$ V DC or AC peak
- Interrupt support for each channel
- High speed processing (0 wait states)
- Programmable polarity of event interrupts (low-to-high or high-to-low transitions)
- Programmable debounce
- Input hysteresis
- Reverse polarity protection
- Software configuration (no jumpers or switches)

### Benefits

- Software configuration allows "on-the-fly" changes without removing modules.
- Pins are compatible with IP445 output module for loopback monitoring
- Loopback monitoring enables self-test and fault diagnostics to detect open switches or shorts.



When used together, the IP440 input module and IP445 output module simplify loop-back monitoring of your critical signals.

### Specifications

#### Digital Inputs

Input channel configuration: 32 optically isolated inputs.

Isolation: Logic and field connections are optically isolated. Individual ports are also isolated from each other. Input lines of individual ports share a common connection and are not isolated from each other. Logic and field lines are isolated from each other for voltages up to 250V AC or 354V DC on a continuous basis (unit will withstand a 1500V AC dielectric strength test for one minute without breakdown).

Bipolar input voltage range:

- IP440-1:  $\pm 4$  to  $\pm 18$ V DC or AC peak.
- IP440-2:  $\pm 16$  to  $\pm 40$ V DC or AC peak.
- IP440-3:  $\pm 38$  to  $\pm 60$ V DC or AC peak.

Input low-to-high threshold:

- IP440-1:  $\pm 2.3$ V typical.
- IP440-2:  $\pm 8$ V typical.
- IP440-3:  $\pm 16$ V typical.

Input response time:

- On to off: 35 $\mu$ S typical.
- Off to on: 15 $\mu$ S typical.

Interrupts: 32 channels configurable as below.

- High-to-low transitions
- Low-to-high transitions
- Change-of-state (two inputs required)

Debounce: Selectable for 3 to 4mS, 48 to 64 $\mu$ S, 0.75 to 1mS, or 6 to 8mS.

#### IP Compliance (ANSI/VITA 4)

Meets IP specifications per ANSI/VITA 4-1995.

IP data transfer cycle types supported:

- Input/output (IOSel\*), ID read (IDSel\*), Interrupt select (INTSel\*).

Access times (8MHz clock): 0 wait states (250ns cycle).

Updates: Requires four 8-bit reads to update all channels.

#### Environmental

Operating temperature: 0 to 70°C (IP440-1/2/3) or -40 to 85°C (IP440-1E/2E/3E models).

Storage temperature: -55 to 125°C (all models).

Relative humidity: 5 to 95% non-condensing.

MTBF: 336,846 hrs at 25°C, MIL-HDBK-217F, Notice 2.

Power:

- +5V ( $\pm 5\%$ ): 160mA maximum.
- $\pm 12$ V ( $\pm 5\%$ ): 0mA (not used).

### Ordering Information

#### Industry Pack Modules

##### IP440-1

Digital input,  $\pm 4$  to  $\pm 18$ V input range

##### IP440-1E

Same as IP440-1 plus extended temperature range

##### IP440-2

Digital input,  $\pm 16$  to  $\pm 40$ V input range

##### IP440-2E

Same as IP440-2 plus extended temperature range

##### IP440-3

Digital input,  $\pm 38$  to  $\pm 60$ V input range

##### IP440-3E

Same as IP440-3 plus extended temperature range

Acromag offers a wide selection of [Industry Pack Carrier Cards](#).

**Software** (see [software documentation](#) for details)

##### IPSW-API-VXW

VxWorks® software support package

##### IPSW-API-QNX

QNX® software support package

##### IPSW-API-WIN

Windows® DLL driver software support package

##### IPSW-LINUX

Linux™ support (website download only)

See [accessories documentation](#) for additional information.

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