

## IP405 High Voltage Digital Output

The IP405 controls up to 40 low-side switches (open-drain MOSFETs).

Operation of this module is very simple. Writing a "0" bit to a channel data register opens the switch to turn off a field device. Similarly, writing a "1" bit closes the switch to turn on the device. Each register can be read back to verify the value.

Loopback monitoring of critical control signals is easily accomplished by reading back output states using Acromag's IP400 Digital Input Module.

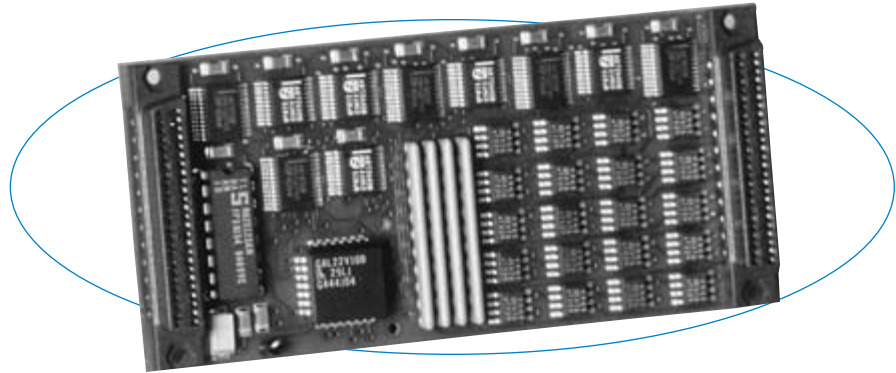
To ensure safe, reliable control under all conditions, the output operation is "fail-safe." That is, outputs are always off on power-up and are automatically cleared following a system software reset.

### Features

- 40 digital low-side switch outputs
- 0 to 60V DC output range
- High output current (up to 1A per channel)
- True logic operation
- Low drain-to-source ON resistance
- Failsafe power-up and system reset (open outputs)
- Output state readback capability (built-in)

### Benefits

- Latched buffers enable the user to read back the output channel registers for verification purposes.
- Loopback monitoring (with IP400) enables self-test and diagnostics to detect system faults.
- Low drain-to-source ON resistance ensures TTL logic-low compatibility at high currents and reduces power dissipation.
- Individual channels sink up to 1A DC continuous. No deration of output current required at high ambient temperatures.



When used together, the IP400 input module and IP405 output module simplify loop-back monitoring of your critical signals.

### Specifications

#### Digital Outputs

Output channel configuration: 40 open-drain DMOS MOSFETs with common source connection.

Voltage range: 0 to 60V DC, maximum.

Output ON current range: 0 to 1A DC, continuous (up to 10A total for all channels combined), 250mA DC, continuous (all channels on). No deration required at elevated ambients.

Turn on time: 320nS typical (varies with load).

Turn off time: 500nS typical (varies with load).

#### 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\*).

Access Times (8MHz clock):

All functions: 0 wait states (250nS cycle), except  
Channel register write: 1 wait state (375nS cycle).

Updates: Requires two 16-bit and one 8-bit writes to update all channels.

#### Environmental

Operating temperature: 0 to 70°C (IP405)  
or -40 to 85°C (IP405E model).

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

Relative Humidity: 5 to 95% non-condensing

MTBF: 901,313 hrs at 25°C, MIL-HDBK-217F, Notice 2.

Power:

+5V (±5%): 350mA maximum.

+12V (±5%) from P1: 8.5mA maximum.

-12V (±5%) from P1: 0mA (not used).

### Ordering Information

#### Industry Pack Modules

##### IP405

40 output channels.

##### IP405E

Same as IP405 plus extended temperature range.

For Industry Pack Carrier Cards, see Page 5.

#### Software (see Page 81)

##### IPSW-API-VXW

VxWorks® software support package

##### IPSW-API-QNX

QNX® software support package

##### IPSW-ATX-PCI

ActiveX®/OLE Controls 2.0 software package

##### IPSW-LINUX

Linux™ support (website download only)

For accessories information, see Page 87.