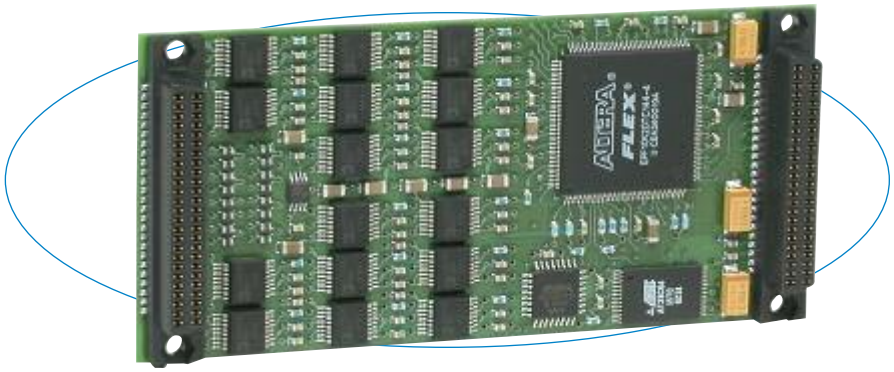
Acromag
THE LEADER IN INDUSTRIAL I/O



# IP231-x
# 16-Bit D/A, Analog Output



*The IP231 features individual D/A converters on each channel for better performance.*

The IP231 outputs analog voltage signals to drive up to 16 devices. When used with a carrier that holds four IP modules, up to 64 voltage outputs can be obtained from a single card cage slot.

Each output channel has its own 16-bit D/A converter (DAC). Individual DACs are faster, and they eliminate glitches typically caused by the re-acquisition process of sample and holds found on multiplexed output boards.

Individual channels also have double-buffered data latches. You can select to update each output when it is written to, or to update all outputs simultaneously. Simultaneous outputs better simulate linear movements in motion processes.

## Features

- 8 or 16 analog voltage output channels
- Independent 16-bit D/A converters per channel with an 13µS settling time
- Bipolar voltage (non-isolated) outputs: -10 to +10 volts
- Double-buffered DACs
- High load capability (5mA output current)
- Built-in calibration coefficients

## Benefits

- Outputs reset to 0 volts.
- Internally stored calibration coefficients ensure accuracy.
- Software provides easy selection of transparent or simultaneous output modes.
- Double-buffered DACs allow new data to be written to each channel before the simultaneous trigger updates the outputs.

## Specifications

### Analog Outputs

Output configuration: 8 or 16 single-ended.

D/A Resolution: 16 bits.

Output range: Bipolar, -10 to +10V.

Settling time: 13µS.

Maximum throughput rate:
Outputs can be updated simultaneously or individually.
One channel: 13µS/conversion.
Sixteen channels simultaneously: 13µS/16 channels.

System accuracy: 0.00305% of 20V span maximum corrected error (i.e. calibrated) at 25°C with the output unloaded.

Linearity error: ±2 LSB (maximum).

Data format: Bipolar Offset Binary.

Output at reset: 0 volts.

Output current: -5 to 5mA (maximum). This corresponds to a minimum load resistance of 5K ohms with a 10V output.

### IP Compliance (ANSI/VITA 4)

Meets IP specifications per ANSI/VITA 4-1995.

IP data transfer cycle types supported:
Input/output (IOSel*): DAC data, control registers, DAC offset and gain calibration coefficients.
ID read (IDSel*).

Access Times (8MHz clock):
ID EEPROM read: 0 wait states (250nS cycle).
DAC channel data write: 2 wait states (500nS cycle).
DAC offset/gain coeff. read: 1 wait state (375nS cycle).
Control register access: 1 wait state (375nS cycle).

### Environmental

Operating temperature: 0 to 70°C (IP231-8/16) or -40 to 85°C (IP231-8E/16E models).

Storage temperature: -55 to 100°C (all models).

Relative humidity: 5 to 95% non-condensing

MTBF: 3,445,793 hrs. at 25°C, MIL-HDBK-217F, notice 2.

Power:
+5V: 45mA.
+12V: 200mA.
-12V: 180mA.

## Ordering Information

### Industry Pack Modules

**IP231-8**
Eight voltage outputs

**IP231-8E**
Same as IP231-8 plus extended temperature range.

**IP231-16**
Sixteen voltage outputs

**IP231-16E**
Same as IP231-16 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-WIN**
Windows® DLL driver software support package

**IPSW-API-LNX**
Linux™ support (website download only)

*See accessories documentation for additional information.*

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