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: 0.0305% 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.
- All data types supported:
  - Input/output (I/OData?): 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.
- 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-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.

All trademarks are the property of their respective owners.