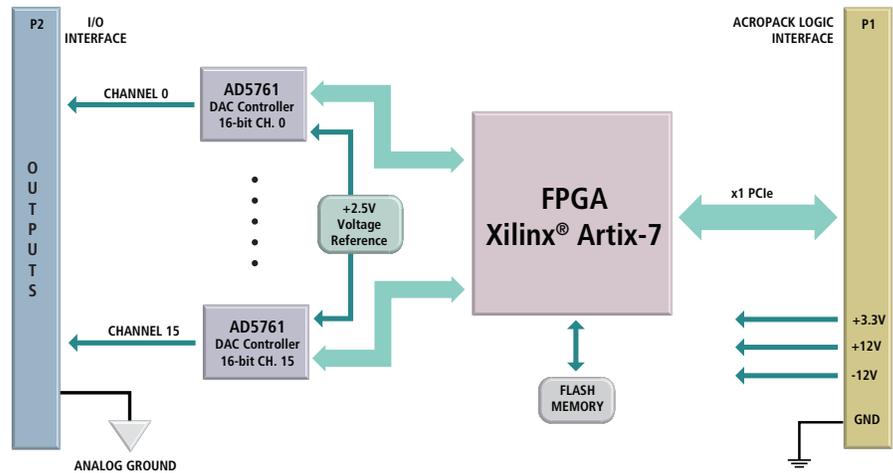
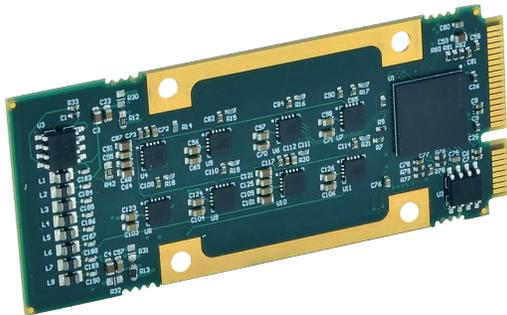


AcroPack® Modules

AP200 Series Analog Voltage Output



16-bit DAC ♦ 16 Channels Voltage Output ♦ Wide Temperature Range ♦ PCIe Bus Interface

Description

Model: AP231-16E-LF

The AcroPack® product line updates our popular Industry Pack I/O modules with a PCIe interface format. This COTS tech-refresh design offers a compact size, low-cost I/O, the same functionality and memory map of the existing IP modules in a rugged form factor. Combine different AcroPack modules on one carrier for a simplified modular approach to system assembly.

The AP231 outputs analog voltage signals to drive up to 16 devices. When used with a carrier that holds two AcroPack AP modules, up to 32 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.

Designed for COTS applications these analog output modules deliver high-density, high-reliability, and high-performance at a low cost.

AcroPack modules are RoHS compliant and ideal for military, defense, automation, aerospace, scientific, and development labs industries.

The AP231 modules are 70mm long, 19.05mm longer than the full length mini PCIe card. The board's width is the same as mPCIe board and use the same mPCIe standard board hold down standoff and screw keep out areas.

A down facing 100 pin Samtec connector will mate with the carrier card. Fifty of these signals are available as field I/O signals.

The AP231 supports 6 independent software selectable output ranges plus capabilities to monitor the status of each output.

Key Features & Benefits

- PCI Express Generation 1 interface
- Independent 16-bit D/A converters per channel
- Mix and match countless I/O combinations in a single slot.
- Sample software and diagnostics
- Double-buffered DACs
- Built-in calibration coefficients
- Independent selectable output ranges
- 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.
- Alarm function
- Solid-down connector I/O interface
- Wide temperature range
- PCIe, VPX and XMC carriers
- Linux®, Windows®, and VxWorks® support



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Performance Specifications

■ Analog Output

Output configuration

16 non-isolated bipolar/unipolar differential outputs. Each channel is paired with a signal return reference.

D/A Resolution

16 bits.

Output ranges

Unipolar: 0V to 5V, 0V to 10V.

BiPolar: -2.5V to 7.5V, $\pm 3V$, $\pm 5V$, $\pm 10V$.

Settling time

9 μ S - 20V step to 1 LSB at 16-bit resolution.

7.5 μ S - 10V step to 1 LSB at 16-bit resolution.

Maximum throughput rate

Outputs can be updated simultaneously or individually.

One channel: 7.5 μ S/conversion.

Sixteen channels simultaneously: 17 μ S/16 channels.

Calibrated system accuracy

Linearity error: ± 2 LSB.

Offset error: ± 0.0625 LSB.

Gain error: ± 0.0625 LSB.

Total error: ± 2.125 LSB ($\pm 0.0032\%$ FSR) maximum.

Data format (left-justified)

Straight Binary or Two's Complement.

Output at reset

0 volts.

Output current

10mA (maximum). This corresponds to a minimum load resistance of 1K ohms with a 10V output.

Short circuit protection

Indefinite at 25°C.

Alarm function

Software readable for brownout, short-circuit and temperature exceeding 150 degrees C conditions.

■ PCI Express Base Specification

Conforms to PCIe base specification

Revision 2.1.

Lanes

1 lane in each direction.

Bus Speed

2.5 Gbps (Generation 1).

Memory

4k space required.

1 base address register.

■ Environmental

Operating temperature

-40 to 70°C.

-40 to 85°C.

(requires an AcroPack heatsink conduction-cool kit)

Storage temperature

-55 to 150°C.

Relative humidity

5 to 95% non-condensing.

MTBF

4,094,686 hrs. at 25°C, MIL-HDBK-217F, notice 2.

Power

+3.3 VDC $\pm 5\%$ 400mA Typical, 480mA Maximum.

+12 VDC $\pm 5\%$ 85mA Typical, 275mA Maximum.

-12 VDC $\pm 5\%$ 50mA Typical, 200mA Maximum.

■ Physical

Length

70mm.

Width

30mm.

Ordering Information

AcroPack® Modules

[AP231-16E-LF](#)

16 voltage outputs, 16-bit DAC

(Note: Acropack modules are compatible only with the carriers listed below)

Accessories

[AP-CC-01](#)

Conduction-cool kit

Carrier Cards

See Acromag.com/AcroPack-Carriers for a full list of AcroPack carrier cards.

Software (see software documentation for details)

[APSW-API-VXW](#)

VxWorks® software support package.

[APSW-API-WIN](#)

Windows® DLL driver software support package.

[APSW-API-LNX](#)

Linux® support (website download only).



AP-CC-01 Conduction-Cool Kit