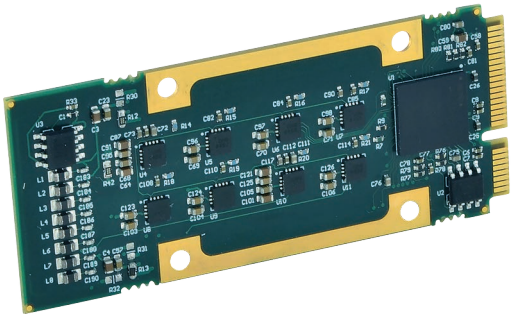
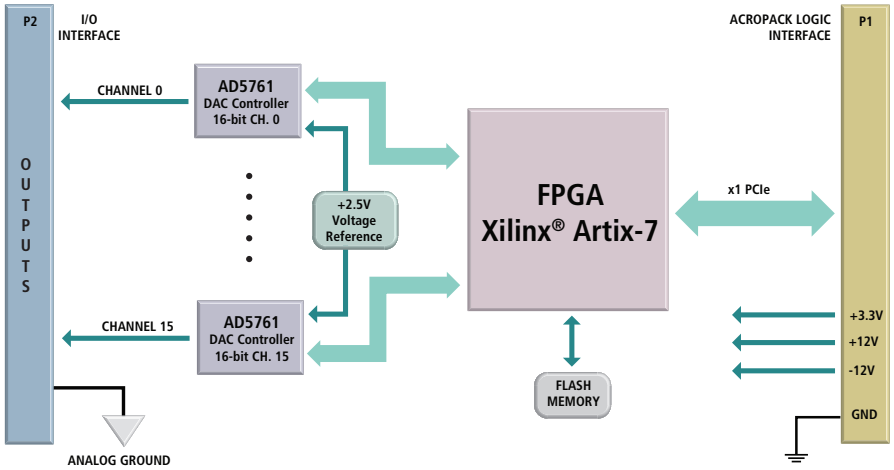
AcroPack® Modules

AP231 16-bit DAC Analog Voltage Output

CE 2 YEAR WARRANTY RoHS Compliant





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 strandoff 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

Acromag® THE LEADER IN INDUSTRIAL I/O

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AcroPack® Modules

AP231 16-bit DAC Analog Voltage Output

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, ±-3V, ±5V, ±10V.

Settling time
9uS - 20V step to 1 LSB at 16-bit resolution.
7.5uS - 10V step to 1 LSB at 16-bit resolution.

Maximum throughput rate
Outputs can be updated simultaneously or individually.
One channel: 7.5µS/conversion.
Sixteen channels simultaneously: 17µS/16 channels.

Calibrated system accuracy
Linearity error: ±2 LSB.
Offset error: ±0.0625 LSB.
Gain error: ±0.0625 LSB.
Total error: ±2.125 LSB (±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 ±5% 400mA Typical, 480mA Maximum.
+12 VDC ±5% 85mA Typical, 275mA Maximum.
-12 VDC ±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

APCe7010E-LF
PCIe AcroPack carrier, holds one AcroPack module, air-cooled.

APCe7020E-LF
PCIe AcroPack carrier, holds two AcroPack modules, air-cooled.

APCe7040E-LF
PCIe AcroPack carrier, holds four AcroPack modules, air-cooled.

VPX4500E-LF
3U VPX AcroPack carrier, holds three AcroPack modules, air-cooled.

VPX4500-CC-LF
3U VPX AcroPack carrier, holds three AcroPack modules, conduction-cooled.

XMCAP2020-LF
XMC AcroPack carrier; holds two AcroPack modules, 2-slots out front, air-cooled.

XMCAP2021-LF
XMC AcroPack carrier; holds two AcroPack modules, 2-slots out rear, air-cooled.

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

ISO9001
AS9100
MADE IN USA

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