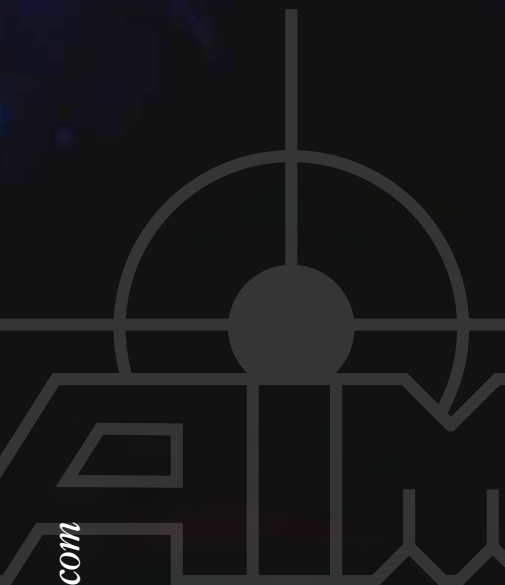




AXC429-x



4, 8, 16 or 32 Channel
ARINC429 Test & Simulation
Modules for XMC



General Features

The AXC429-x is a member of AIM's new family of PCI Express based XMC-Mezzanine (ANSI/ VITA 42.3) modules targeted to embedded ARINC429 applications. The AXC429-x offers full function test, simulation, monitoring and databus analyser capabilities and is available in configurations with 4, 8, 16 or 32 independent ARINC429 channels, fully software programmable for Receive (Rx) or Transmit (Tx) mode and configurable for high/ low bit rates. 4 channels are available on the AXC429-4, 8 channels on the AXC429-8, 16 channels on the AXC429-16 module and 32 channels on the AXC429-32.

The AXC429-4/8/16/32 also supports up to 8 discrete inputs and 8 discrete outputs which can be monitored or generated.

The AXC429-x is designed to be installed on either a host carrier board to adapt to buses like standard PCI/ PCIe, VME/ VPX, cPCI/ cPCIe or on an embedded host computer. The AXC429-x modules use a high performance RISC processor with 128MB of Global RAM whereby all channels can operate concurrently at ARINC429 high or low bit rates with the intelligence to process data in real time. An onboard IRIG-B time encoder/ decoder provides a sinusoidal output and 'free wheeling' mode for time tag synchronisation on the system level when using one or more AXC429-x or other AIM databus and network interfaces.

Full function driver software is delivered with the AXC429-x cards in comprehensive Board Software Packages (BSP's) for different Operating Systems. The optional PBA.pro™ Databus Test & Analysis Tool (for Windows & Linux) can also be purchased for use with AXC429-x cards.

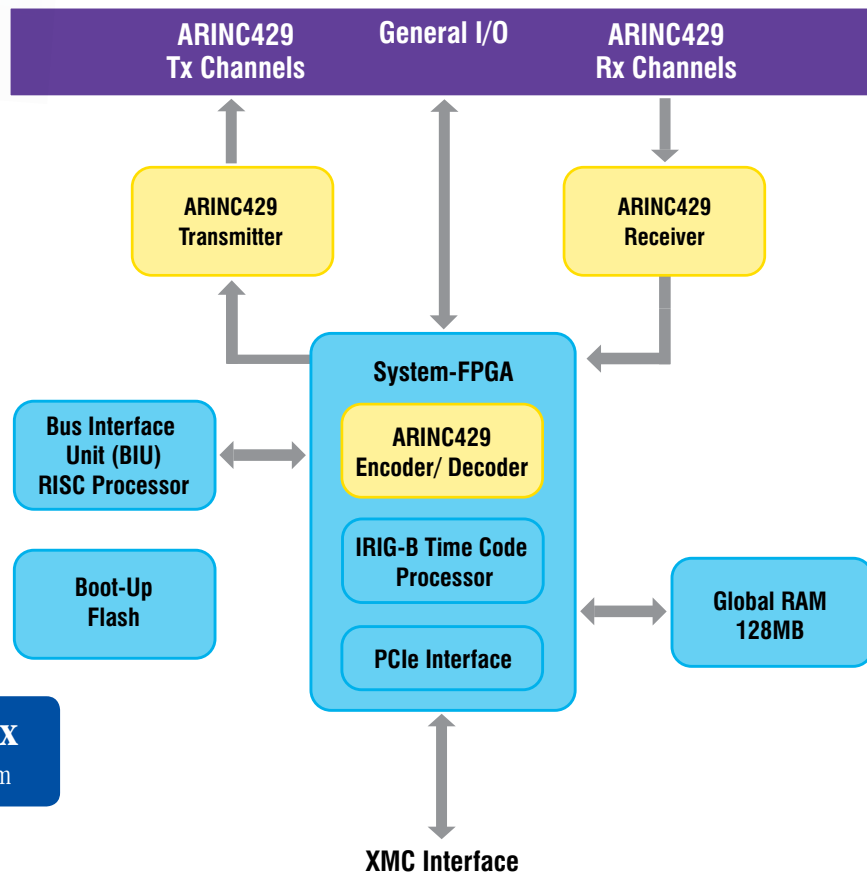


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Physical Interface on Front-and Rear-I/O



AXC429-x
Block Diagram

Transmit Channel Operation

AXC429-x modules provide real time simulation of up to 32 ARINC429 Transmitter Channels concurrently controlled by the onboard RISC Processor via instruction lists. Transmission rates are selectable for each channel at 12.5kbit/s or 100kbit/s with the associated rise/ fall time in accordance with the ARINC429 electrical specification.

- *Cyclic/ Acyclic Label Transmission and Channel Loop Mode*
- *Error Injection for each Label Transfer: Short Gap, Parity, Bit Count, Coding*
- *Programmable Gap between Labels: 0 to 255Bit*
- *Simulate Zero-jitter Scenarios using Virtual Label Transfers*
- *Multi-Buffering with Real Time Update supported per individual Label Transfer*
- *Reconstruction of previously recorded ARINC429 Traffic physically to the Bus with excellent Timing Accuracy (Physical Replay)*
- *Interrupt Generation on Label Transmit (configurable per Label Transfer)*



Receive Channel Operation

AXC429-x modules provide real time monitoring of up to 32 ARINC429 Receiver Channels concurrently controlled by an onboard RISC Processor.

- *Label Oriented Receive Mode (individual Buffers for each Label with Multi-Buffering and Real Time Updates)*
- *Chronological Receive Mode per Channel with 1 μ s Resolution Time Stamping*
- *Chronological Mode concurrent to Label Oriented Receive Mode*
- *Local (one Buffer per Channel) or Global Monitoring (one Buffer all Channels)*
- *Continuous or Single Shot Capturing Modes*
- *Support of SDI Handling*
- *Interrupt Generation on Label Reception (configurable per Label/ SDI)*
- *Complex Triggering and Filtering Functions*
- *Loop of received Data to configurable Transmit Channel with Label Data Modification Capability*
- *High Accuracy FPGA based Label Time Stamping*



Discretes

AXC429-x modules provide up to eight General Purpose Discrete I/O's (GPIO's). GPIO's can be used as simple digital inputs/ outputs or to sample a digital output of an external system or to generate strobes to an external system.

Loop-back & Pollution Mode

Receive and Transmit Channels can be paired to form a 'Loop-back' couple. Data received from the receiver channel are automatically transmitted on the selected transmitter channel with minimum delay. A special receiver Function Block mode can be used to modify (pollute) the received label prior to its re-transmission.

Physical Bus Replay

The AXC429-x cards can electrically reconstruct and replay previously recorded ARINC429 channels physically to the ARINC429 bus with excellent timing accuracy. Record files can be selected for Bus Replay. The additional capability to disable any or all ARINC429 labels from the replay enables smart systems integration and test to be performed.

Physical Bus Interface

AXC429-x cards have integrated ARINC429 line Transmitters/ Receivers and selectable transmission rate for each channel independently. All ARINC429 channels are available at the front plate output connector or at the Rear-I/O connector.

IRIG-B Time Encoder/ Decoder

AXC429-x cards include an onboard IRIG-B time encoder/ decoder with sinusoidal output and 'free-wheeling' mode for time tag synchronisation. This allows synchronisation of multiple AXC429-x cards or any IRIG-B compatible modules to one common external IRIG-B time input source or to the onboard time code generator of one AXC429-x card as the reference for correlation of data across multiple ARINC429 channels.

Driver Software

The Driver Software is supplied with the AXC429-x module. A full function Application Programming Interface (API) is provided compatible with Windows XP/Vista/7 and Linux. Host applications can be written in C and C++ or C#. A LabView/VI application interface is provided.

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Technical Data

System Interface: Single Lane (PCIe x1), 2.5Gb/s PCI Express V1.1 compliant;

Compliance: ANSI/ VITA 42.3 - 2006

Processors: One 400MHz RISC Processor

Memory: 128MB Global RAM (SSRAM), 2x8-Mbit serial flash memory for BIU, 64-Mbit serial flash memory for LCA

Encoder/Decoder: up to 32 Encoders/ Decoders with full error injection and detection

Time Tagging: Sinusoidal 46-bit absolute IRIG-B Time stamping with 1 μ s resolution

Trigger/ General Purpose Discretes:

AXC429-4/8/16:

4 Trigger Inputs and 4 Trigger Outputs
8 General Purpose Discrete Inputs
8 General Purpose Discrete Outputs
(Discretes with avionics level for In and Out)
All I/O's available on Front- and Rear-I/O connector

AXC429-32:

1 Trigger Output available on front and XMC Rear-I/O connector

Physical Bus Interface: Up to 32 ARINC429 Transmitters and 32 ARINC429 Line Receivers for a total of 32 Channels. All channels are user programmable RX or TX

Connector: 68-pin, Mini D-Sub for ARINC429; XMC connector P15 for single Lane 2.5Gb/s PCI Express Bus; XMC connector P16 for Rear-I/O or PMC connector P14 for Rear-I/O

Dimensions: 149mm x 74mm Standard XMC Format

143.75 x 74mm Conduction Cooled Format

Power Consumption: tbd.

Operating Temp. Range: Standard 0°C ... +70°C ambient
Extended -40°C... +85°C ambient
Conduction cooling available

Storage Temp: -40°C ... + 85°C ambient

Humidity: 0 to 95% non-condensing

Ordering Information

AXC429-4

4 Channel ARINC429 XMC Module:

Software Programmable Receiver/ Transmitter Channels; IRIG-B Time Encoder/ Decoder, 128MB Global RAM, 4 Trigger Inputs and 4 Trigger Outputs, 8 General Purpose Discrete In- and Outputs

AXC429-8

8 Channel ARINC429 XMC Module:

Software Programmable Receiver/ Transmitter Channels; IRIG-B Time Encoder/ Decoder, 128MB Global RAM, 4 Trigger Inputs and 4 Trigger Outputs, 8 General Purpose Discrete In- and Outputs

AXC429-16

16 Channel ARINC429 XMC Module:

Software Programmable Receiver/ Transmitter Channels; IRIG-B Time Encoder/ Decoder, 128MB Global RAM, 4 Trigger Inputs and 4 Trigger Outputs, 8 General Purpose Discrete In- and Outputs

AXC429-32

32 Channel ARINC429 XMC Module:

Software Programmable Receiver/ Transmitter Channels; IRIG-B Time Encoder/ Decoder, 128MB Global RAM, 1 Trigger Output available on front and XMC Rear I/O connector

Note: please select Rear-I/O connector on the order (XMC connector P16 or PMC connector P14)

