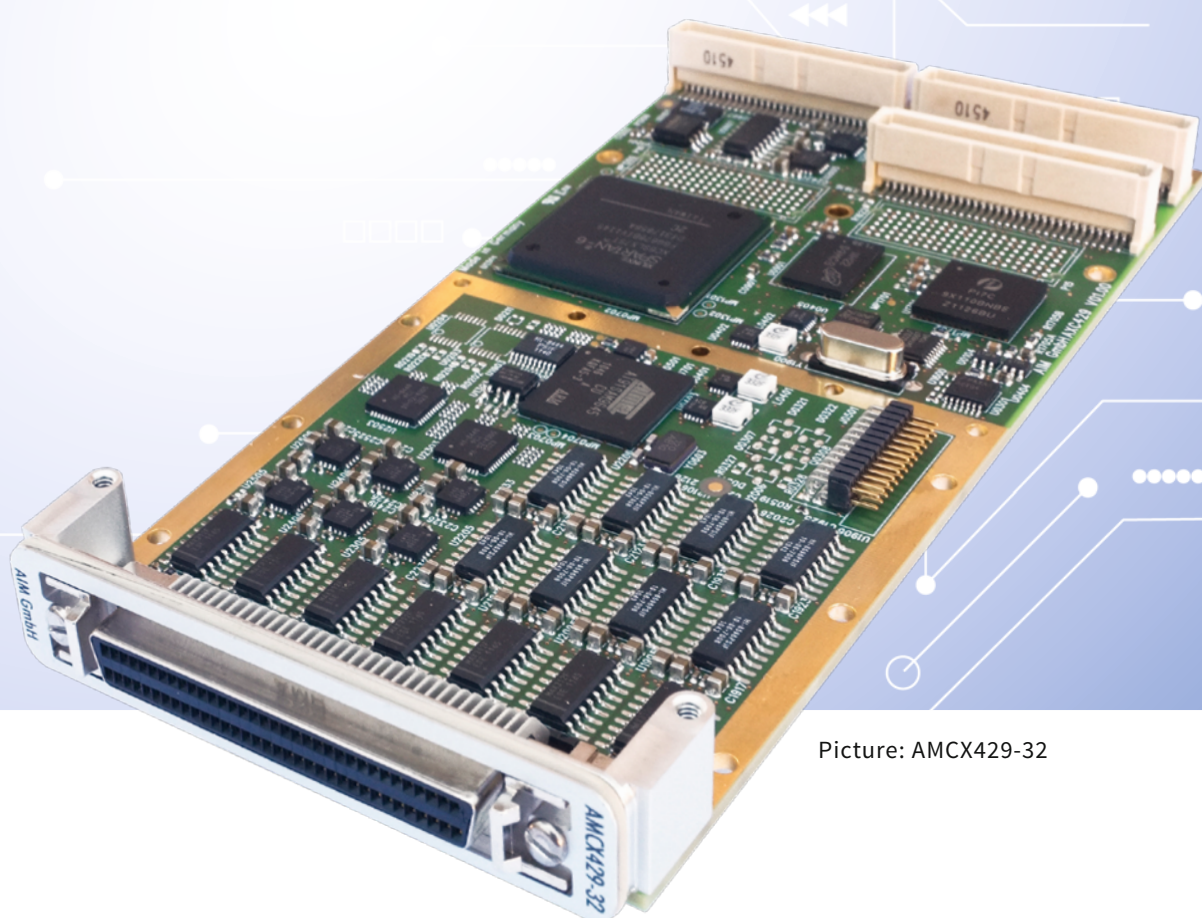


# AMCX429-x

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

Data  
Sheet



Picture: AMCX429-32

# AMCX29-x

## 8, 16 or 32 Channel ARINC429 Test & Simulation Modules for PMC

### General Features

The ► **AMCX429-x** card is a member of AIM's next generation of PMC modules targeted to embedded ► **ARINC429** applications.

The AMCX429-x offers full function test, simulation, monitoring and databus analyzer capabilities and is available in

configurations with 8, 16 or 32 independent ARINC429 channels, fully software programmable for Receive (Rx) or Transmit (Tx) mode and configurable for high/low bit rates.

8 channels on the AMCX429-8, 16 channels on the AMCX429-16 module and 32 channels on the AMCX429-32.

The AMCX429-8/16/32 also supports up to 8 discrete inputs and 8 discrete outputs which can be monitored or generated.

The AMCX429-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 AMCX429-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.

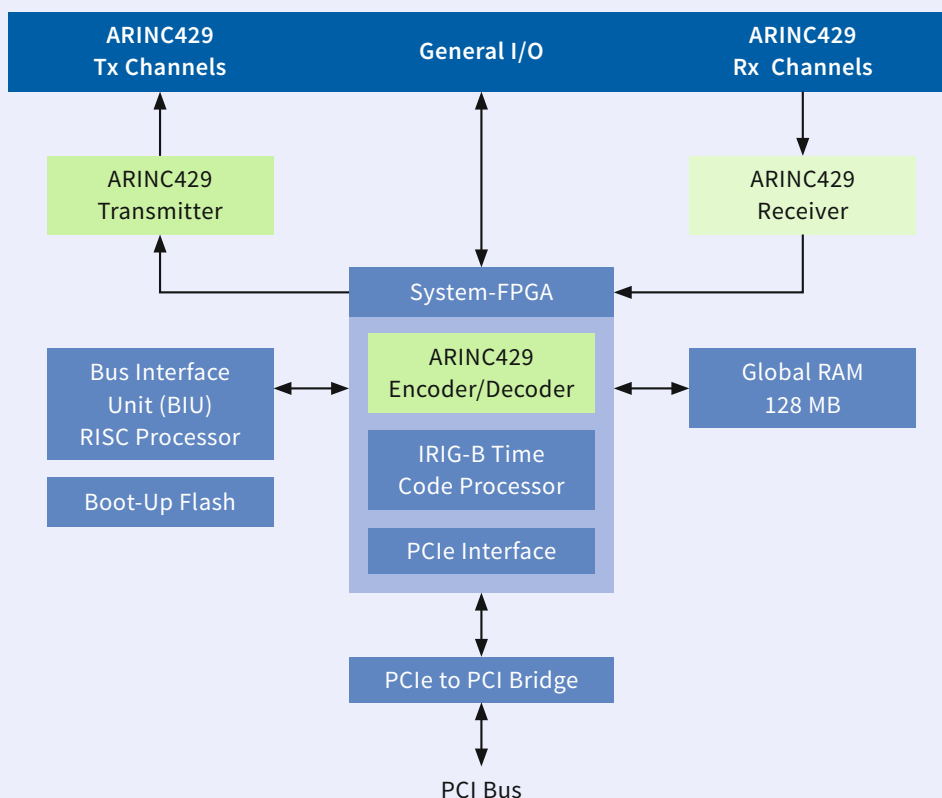
An onboard IRIG-B time encoder/decoder provides a sinusoidal output and free-wheeling mode for time tag synchronization on the system level when using one or more AMCX429-x or other AIM databus and network interfaces.

Full function driver software is delivered with the AMCX429-x cards in comprehensive Board Software Packages (BSPs) for different Operating Systems.

The optional ► **PBA.pro™** Databus test and analysis tool (for Windows and Linux) can also be purchased for use with AMCX429-x cards.

### AMCX429-x Block Diagram

#### Physical Interface on Front- and Rear-I/O



## Transmit Channel Operation

AMCX429-x modules provide real time simulation of up to 32 ARINC429 Transmitter channels concurrently controlled by the on-board 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.

Key Features of the Bus Controller Mode include:

- 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 255-bit
- 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

AMCX429-x modules provide real time monitoring of up to 32 ARINC429 Receiver channels concurrently controlled by an onboard RISC Processor.

Key Features of the Remote Terminal Simulation Mode include:

- Label Oriented Receive Mode (individual Buffers for each Label with Multi-Buffering and Real Time Updates)
- Chronological Receive Mode per Channel with 1µs 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

AMCX429-x modules provide up to 8 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 AMCX429-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

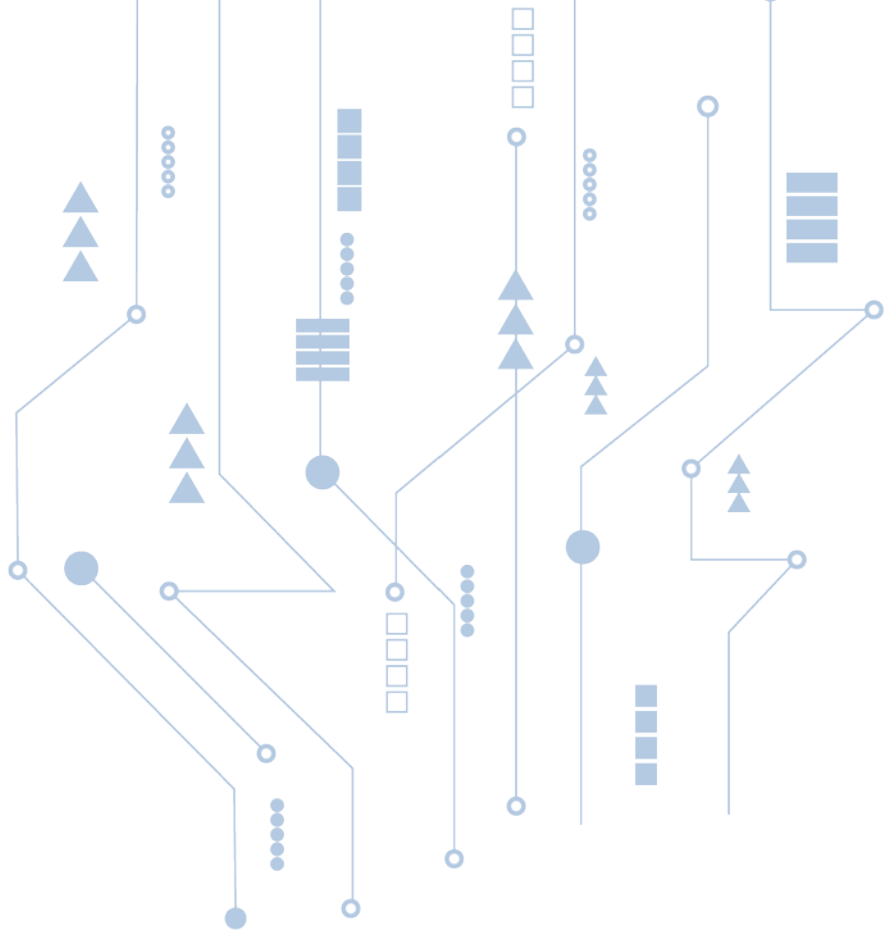
AMCX429-x cards have integrated ARINC429 line transmitters/receivers and selectable transmission rate for each channel independently. All ARINC429 channels are available at the front plate output connector or at the Rear-I/O connector.

## IRIG-B Time Encoder/Decoder

AMCX429-x cards include an onboard IRIG-B time encoder/decoder with sinusoidal output and free-wheeling mode for time tag synchronization. This allows synchronization of multiple AMCX429-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 AMCX429-x card as the reference for the correlation of data across multiple ARINC429 channels.

## Driver Software

The Driver Software is supplied with the AMCX429-x module. A full function Application Programming Interface (API) is provided compatible with Windows and Linux. Host applications can be written in C and C++ or C#. A LabView/VI application interface is provided.



## Technical Data

### System Interface

32-bit/66MHz capable PCIbus (Rev. 2.2) compliant

### Processors

1x 400MHz RISC Processor

### Memory

128MB Global RAM (DDR-RAM),  
2x8Mbit serial flash memory for BIU,  
64Mbit serial flashmemory 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 1s resolution

### Trigger/General Purpose Discretes

AMCX429-8/16:

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

AMCX429-32:

1 Trigger Output available on front connector

### Physical Bus Interface

Up to 32 ARINC429 transmitters and 32 ARINC429 line receivers for a total of 32channels. All channels are user programmable RX or TX

### Connectors

68-pin, Mini D-Sub; signals are also available at Rear-I/O connector;  
3x standard PMC connectors;  
P11 and P12 for 32-bit PCI bus;  
P14 for Rear I/O

## Ordering Information

### AMCX429-8

8 Channel ARINC429 PMC 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

### AMCX429-16

16 Channel ARINC429 PMC Module:  
Software Programmable Receiver/  
Transmitter Channels;  
IRIG-B Time Encoder/Decoder,  
128MB Global RAM, 4Trigger Inputs and  
4 Trigger Outputs, 8 General Purpose  
Discrete In- and Outputs

### AMCX429-32

32 Channel ARINC429 PMC Module:  
Software Programmable Receiver/  
Transmitter Channels;  
IRIG-B Time Encoder/Decoder,  
128MB Global RAM, 1 Trigger Output  
on Rear-I/O

### ACC-1

CompactPCI (3U) Carrier Module  
with one PMC slot

### ACC-2

CompactPCI (6U) Carrier Module  
with two PMC slots

### AVC-2

VME (6U) Carrier Module with  
two PMC slots

### ACP-1

PCI Carrier Module with one PMC slot

For PCI/PCI-Express Carrier Modules  
with one PMC slot please contact the  
factory

### Dimensions

149mm x 74mm standard PMC format

### Power Consumption

3 to 5.5W idle

3.3 to 8.8W operating

Depending on number of channels  
and individual load

### Operating Temperature Range

Standard: 0°C to +70°C ambient

Extended: -40°C to +85°C

Conduction cooling available

### Storage Temperature

-40°C to +85°C

### Humidity

0 to 95% non-condensing

### ► AIM Office Contacts:

#### AIM GmbH

Sasbacher Str. 2  
D-79111 Freiburg / Germany  
Phone +49 (0)761 4 52 29-0  
Fax +49 (0)761 4 52 29-33  
sales@aim-online.com

#### AIM GmbH – Munich Sales Office

Terofalstr. 23a  
D-80689 München / Germany  
Phone +49 (0)89 70 92 92-92  
Fax +49 (0)89 70 92 92-94  
salesgermany@aim-online.com

#### AIM UK Office

Cressex Enterprise Centre, Lincoln Rd.  
High Wycombe, Bucks. HP12 3RB / UK  
Phone +44 (0)1494-446844  
Fax +44 (0)1494-449324  
salesuk@aim-online.com

#### AIM USA LLC

Seven Neshaminy Interplex  
Suite 211 Trevose, PA 19053  
Phone 267-982-2600  
Fax 215-645-1580  
sales@aim-online.us