



ARINC 429 Product Overview

The AIT family of ARINC 429 products provide solutions for Test Instrumentation, Data Acquisition, Protocol Analysis, and Rugged/Embedded applications.

ARINC 429 ANALYZERS

AIT provides complete ARINC 429 Analyzer and Data Acquisition solutions with the *Flight Simulyzer™* application software. AIT's *Flight Simulyzer™* is an intuitive and easy-to-use Graphical User Interface (GUI) that allows users to capture and analyze ARINC data. Additionally, it supports simulation and generation of ARINC 429 traffic including error injection. *Flight Simulyzer™* can be used in conjunction with the AIT ARINC 429 USB module to provide a portable analyzer and simulator solution. Together with the AIT PCI and PXI modules, *Flight Simulyzer™* can be used to provide a desktop PC solution.

RUGGED/EMBEDDED SOLUTIONS

AIT's ARINC 429 PMC, XMC, and PC/104+ modules are rugged, reliable, full-featured interface modules designed to provide dependable ARINC 429 interfaces in the harshest environments. The rugged interface modules are provided with conduction cooled, extended temperature, and conformal coating options. Additionally, they are supported with RTOS (VxWorks, LynxOS, and others) device drivers and APIs.



ARINC 429 TEST INSTRUMENTATION

AIT's ARINC 429 hardware modules for PXI, PCI, PCI Express, VME, and VXI provide advanced features and functionality to support even the most demanding test and simulation applications.



- Four, eight, 16, or 32 software programmable Tx/Rx channels
- Programmable high/low speed operation
- Concurrent operation of all Tx/Rx channels
- Full error injection and detection
- Cyclic (rate-oriented) and acyclic label transmissions
- Block label transmissions
- Label selective trigger for capture/filtering
- Real-time recording and post analysis of multiple channels
- In-line data corruption
- Complete Software Development Kit (SDK) providing Device Drivers and APIs for C, C++, C#, VB.NET, and LabVIEW

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COMPLETE ARINC 429 SOLUTIONS

AIT proudly provides the industry's most capable ARINC 429 products coupled with market-leading customer support to ensure your long-term success!

ADVANCED MONITORING & DATA ACQUISITION

With large amounts of on-board memory (128 MB), an IRIG B time encoder/decoder for external clock synchronization, and a flexible triggering and filtering engine, the AIT ARINC 429 modules provide an advanced monitoring and data acquisition solution.

- High channel density with full monitoring of up to 32 channels concurrently (Up to 64 channels for VXI and VME modules)
- Hardware timestamping of all receives data with 1 ms resolution, with independent onboard clock or sync to external IRIG-B input
- Complex software configurable triggers and filters
- Full error detection
- Simultaneously receive data to chronological bus monitor and Label/SDI-specific buffers

IN-LINE DATA CORRUPTION

Link any receive channel to any transmit channel to provide a "pass through" data channel. Supports operation as an in-line data analyzer. Also, data corruption operations can be defined to selectively modify ARINC 429 label data to inject errors prior to re-transmission.

HIGH QUALITY HARDWARE MODULES

AIT's ARINC 429 modules utilize an FPGA based architecture to provide a flexible ARINC 429 compliant protocol engine which is also capable of supporting low level error injection and detection and which can easily support program-specific customizations when required.

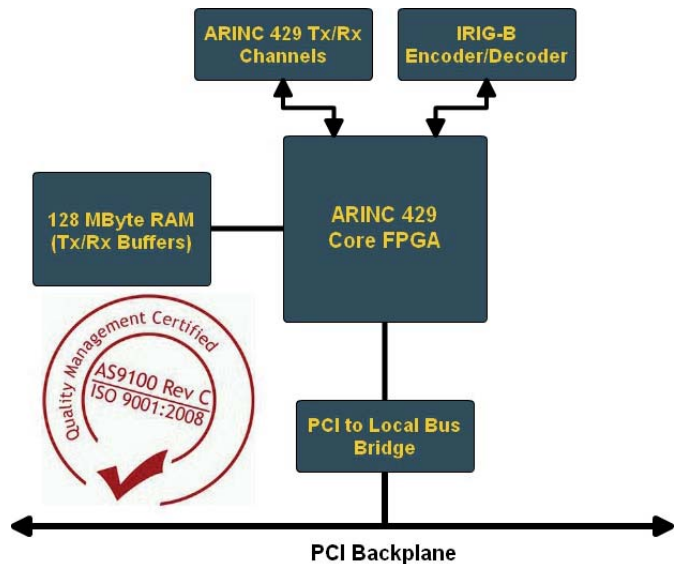
With years of experience supporting aerospace applications, AIT understands the importance of supporting the entire life span of programs and is committed to obsolescence mitigations as well as consistent, reliable, on-time product delivery.

All AIT ARINC 429 modules are designed and manufactured in accordance with AS9100 Rev C and ISO 9001:2008 compliant processes.

FLEXIBLE, HIGH-PERFORMANCE OUTPUT

The AIT FPGA based ARINC 429 protocol engine provides flexible and efficient output operations:

- Autonomous operation of labels, in rate-oriented and block transfer modes of operation
- Acyclic (on command) label transmission concurrently with scheduled output
- Full error injection for each label transfer including short gap, parity, bit count, encoding
- Multi-buffering with real-time buffer updates
- Programmable gap time between labels
- Programmable selection of High/Low speed operations on all channels
- Industry's highest channel density with up to 32 fully operational concurrently operating channels (Up to 64 channels for VXI and VME modules!)









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AIT ARINC 429 TEST INSTRUMENTATION HARDWARE MODEL GUIDE



MODEL FORM FACTOR	CHANNELS	KEY FEATURES
 PCI-C429 PCI or PCI-X	4, 8, 16, 32	<ul style="list-style-type: none"> • Programmable high/low speed operation • All Tx/Rx channels can operate concurrently at high speed rates • Full error injection and detection • External timestamp clock sync to IRIG-B
 PCIe-C429 PCI Express	4, 8, 16, 32	<ul style="list-style-type: none"> • Programmable high/low speed operation • All Tx/Rx channels can operate concurrently at high speed rates • Full error injection and detection • External timestamp clock sync to IRIG-B
 PXI-C429 PXI (3U)	4, 8, 16, 32	<ul style="list-style-type: none"> • Programmable high/low speed operation • All Tx/Rx channels can operate concurrently at high speed rates • Full error injection and detection • PXI triggers, star trigger, and PXI 10 MHz clock
 USB-429 USB 2.0	4, 8, 16	<ul style="list-style-type: none"> • Programmable high/low speed operation • All Tx/Rx channels can operate concurrently at high speed rates • Supports stand-alone operations via single USB connection to host without auxiliary power
 VXI-429 VXI	4, 8, 16, 32, 64	<ul style="list-style-type: none"> • Programmable high/low speed operation • All Tx/Rx channels can operate concurrently at high speed rates • Full error injection and detection • Two PMC sites for up to 64 channels
 VME-429 VME	4, 8, 16, 32, 64	<ul style="list-style-type: none"> • Programmable high/low speed operation • All Tx/Rx channels can operate concurrently at high speed rates • Full error injection and detection • Two PMC sites for up to 64 channels

AIT ARINC 429 RUGGED EMBEDDED HARDWARE MODEL GUIDE

MODEL FORM FACTOR	CHANNELS	KEY FEATURES
 PMC-429 PMC	4, 8, 16, 32	<ul style="list-style-type: none"> • Programmable high/low speed operation • All Tx/Rx channels can operate concurrently at high speed rates • Available conduction-cooled, extended temperature, and conformation coating
 PC104p-429 PC/104+	4, 8	<ul style="list-style-type: none"> • Up to eight channels fully programmable as Tx or Rx and as high or low speed • Two LVTTTL inputs, two LVTTTL outputs • Four discrete I/O lines supporting up to 30V signalling

AIT's ARINC 429 SOFTWARE DEVELOPMENT KIT

AIT's ARINC 429 SDK provides a complete suite of software tools and APIs to support intuitive and effective use of the features and functions of the AIT ARINC 429 hardware modules.

MULTIPLE OPERATING SYSTEMS

The ARINC 429 SDK provides Drivers and APIs for a variety of Operating System platforms:

- Microsoft Windows XP and Windows 7
- Linux
- VxWorks
- LabVIEW Real-Time
- Other RTOS's on request (LynxOS, Integrity, ...)

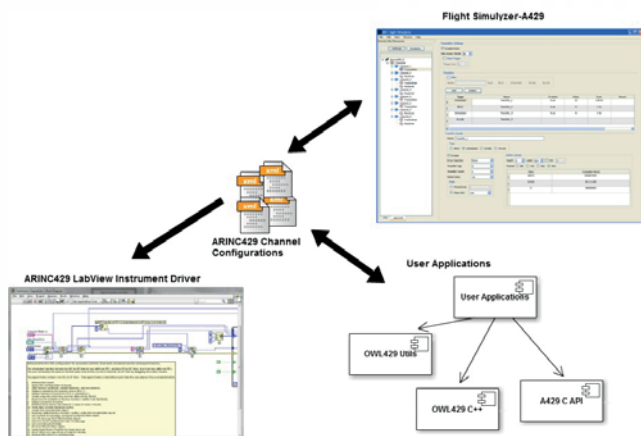
MULTIPLE PROGRAMMING LANGUAGES

Whether your integrating the AIT ARINC 429 solutions into a legacy C based application or using the latest .NET or LabVIEW application development environments, we've got you covered with APIs for:

- ANSI C
- C++/Visual C++
- C#
- VB.NET
- LabVIEW (VIs)

EASY INTEGRATION

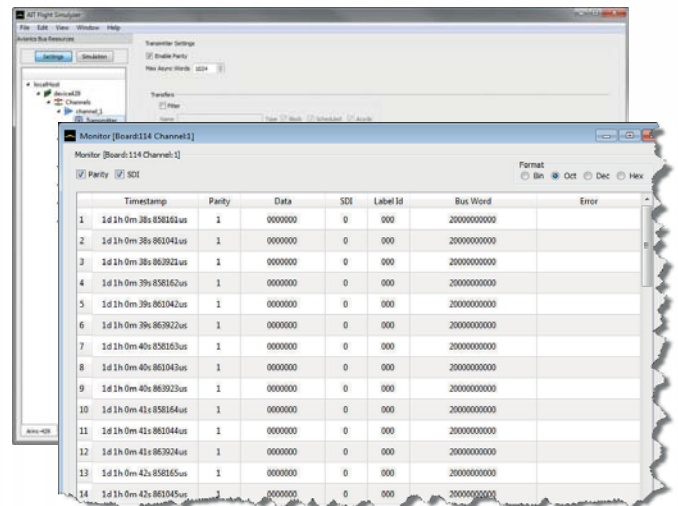
The ARINC 429 SDK is built around a common ARINC 429 Configuration Data core format which allows application designers to specify ARINC 429 output and input configurations (e.g. output label transmit rates, input label filters, ...) using an intuitive XML format which is formally defined in an XML Schema. This common configuration data format can be used to configure AIT's Flight Simulyzer analyzer application, the LabVIEW Instrument Driver component of the SDK, as well as the C++, C#, and BV.NET software APIs.



INTUITIVE & EASY-TO-USE ANALYZER

AIT's *Flight Simulyzer™* is a Graphical User Interface (GUI) application that is easy to use and ready to go, right out of the box. It allows you to start capturing, analyzing, and simulating ARINC 429 data on multiple channels in just a few clicks. Additional key features of *Flight Simulyzer™* include:

- Capture and analyze data from multiple ARINC 429 input channels
- Define and execute complex simulations of multiple rate-oriented Labels
- Simulate output data on multiple channels
- Receive data to Label/SDI specific buffers
- Send Acyclic Labels on command
- Update, Modify, View ARINC 429 data on-the-fly
- Multi-protocol support, capture, analyze, and simulate MIL-STD-1553 bus data



LabVIEW Real-Time INSTRUMENT DRIVER

The ARINC 429 SDK includes AIT's ARINC 429 LabVIEW Instrument Driver which is an easy to use driver that has been certified Compatible with LabVIEW and distinguished as a best-in-class add-on product. The driver has been tested and verified, by National Instruments, to properly integrate with LabVIEW.



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