AIMVIEW

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AIM
RIGHT ON TARGET

Introduction

Welcome to the latest AIMView where we keep you up date with the latest developments from AIM.

For our regular readers, you may notice a new look to this edition and we hope this will further enhance your reading pleasure. In this issue we take a look at the latest product developments and enhancements we have been diligently working on since the last edition.

They say the best things come in small packages, and in our case the all new AIM USB SmartCables™ interfaces (ASC) provide small but powerful test tools for in the field or lab use. Our ANET family of Ethernet based interfaces has been extended to support multiple protocols (via a single ANET), dockable and ruggedized applications. Continuing with the rugged theme, some of our XMC cards have also been adapted for dedicated embedded applications too.

A number of new Software products include our stand alone and flexible ARINC615-3/4 data loading GUI software (EasyLOAD-429) as well as ARINC615-3/4 data loading library for use with customer applications. Leading the way and framing all our hardware products is the PBA.pro Test & Analysis software for Windows & Linux. New features and extended functionality gives our customers a true advantage to take hold of the very latest tools and technologies available.

We hope you enjoy this edition and welcome your feedback.

Yours sincerely

Douglas Ullah
Director of Sales & Marketing

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ASC429/ASC1553

Get connected with the new AIM SmartCables™

Connecting up to ARINC429 links and to the MIL-STD-1553 bus is simple and easy with the new USB based interfaces known as AIM SmartCables™ (ASC).
These lightweight, portable and low power interfaces provide powerful test, simulation and monitoring capabilities for in the field or in the lab applications.

AIM's SmartCable™ family includes the ASC429-x for ARINC429 and the ASC1553-A/ASC1553 for MIL-STD-1553, all designed as USB based interfaces operating from a single USB2.0 port (or higher) and being half-pocket sized, with a robust metal case. Both ASCs offer access to 8 (avionic level) General Purpose Discrete I/O signals and trigger input and trigger output, plus an IRIG-B time Encoder/Decoder providing a sinusoidal input/output and 'freewheeling' mode incorporated.

For ARINC429 applications the ASC429-x is available with 4Tx/8Rx or 2Tx/4Rx channels and software programmable for low rate (12,5kbps) and high rate (100kbps) operation. ASC429-6 and ASC429-12 offer functional replacements for the AIM APU429-4 and APU429-8 USB interfaces.

For MIL-STD-1553 applications, the ASC1553-A is a dual redundant MIL-STD-1553 interface with concurrent Bus Controller, Multiple RT Simulator (31) with a Mailbox and Chronological Monitor functions and a functional replacement for the APU1553-1.

For pure MIL-STD-1553 only applications, the model ASC1553 excludes the IRIG-B, Discrete and Trigger I/O capability.

Data bus protocol-related real-time capabilities over the USB interface are dealt with by having the necessary hardware, firmware and processing resources directly integrated within the almost standard D-Sub connector sized housing.

AIM's driver software is bundled into the price, supporting Windows, Linux and LabVIEW VIs. The PBA.pro (Light or Full Version) Data Bus Test & Analysis Software is available as an option, as well as the EasyLOAD-429, the AIM ARINC615-3 Data Loader Software (for Windows and Linux). ■

AXE429/AXE1553
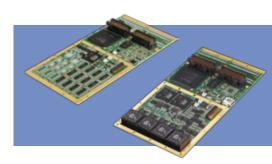# XMC Cards – Rugged and Ready

AIM is targeting rugged and embedded applications with the new AXE1553-x and AXE429-x – Conduction Cooled XMC cards for MIL-STD-1553/MIL-STD-1760 and ARINC429 applications

The new AXE card family uses the field proven AIM Common Hardware Core derived from the existing AXC1553-x/AXC429-x test and simulation cards, but delivers a lower power consumption needed for rugged environments and embedded applications. Compared to the standard XMC cards the AXE variants are qualified and provide:

- VITA-47 shock and vibration for class V3 in conduction cooled applications and class V2 in air-cooled applications
- Shock as specified in ANSI/VITA 47 for class OS2
- Conduction cooling and Rear I/O (no front Panel Connector)
- Conformal Coating (optional)

AXE1553-x modules handle up to 4 dual redundant MIL-STD-1553 channels. AXE429-x modules handle up to 32 fully programmable (Tx/Rx) ARINC429 channels.
Both modules offer 8 Open/Ground avionics level (+35V) Discrete I/O signals plus Trigger I/O as well as Transmit Inhibit provisions for Monitoring Only applications. The AXE1553 is also available as a Single Function variant.

An easy to use Application Programming Interface (API) is provided along with low level 32/64-bit operating system specific drivers for Windows 7/8/10, Linux and VxWorks ease systems integration task.

For rugged conduction cooled applications, AIM offers the VME64x (6U) Generic Carrier Card for PMC (PCIbus Mezzanine Card) with 2 PMC Slots, model AVC-2-CC variant. ■

Brand New:

ANET-M2A12 – Mixed Protocol ANET

The AIM ANET Ethernet based interface family now includes a new member, combining MIL-STD-1553 and ARINC429 data bus test and simulation capability in 1 ANET device.

Various combinations are available with a maximum of 2 dual redundant MIL-STD-1553 streams and up to 12 ARINC429 Channels. The MIL-STD-1553 section offers concurrent Bus Controller, Multiple RT Simulator (31) with a Mailbox and Chronological Monitor functions. The MIL-STD-1553 front-end has a fixed amplitude and transformer coupled interface.

All the ARINC429 channels are fully software programmable for Tx/Rx mode as well as Lo (12.5kBit/s) and Hi Speed (100kBit/s) operation. Standard ANET features like IRIG-B I/O, Discrete I/O, Trigger I/O and a general purpose USB2.0 port for hosting USB devices are also available for the mixed protocol ANET, with access via the compatible Auxiliary connector. The Ethernet Interface supports 10/100/1000 Ethernet links. To ease connection, the data bus I/O is via standard D-Sub connectors. The MIL-STD-1553 I/O is offered via a 9-pin D-Sub (compatible to existing AIM standard breakout cables with Twinax connectors) and the ARINC429 via a 26-Pin HD D-Sub.

Since the API interface of the mixed protocol ANET are compatible to the APIs of the individual MIL-STD-1553 and ARINC429 ANET interfaces, an efficient migration path for existing application software e is fully supported.

Other common and powerful ANET features like the on board Python scripting and optional PBA.pro Engine (for execution in the box) are available.

The PBA.pro Test & Analysis Software for Windows and Linux supports the mixed protocol ANET using the standard resource components for MIL-STD-1553 and ARINC429. All other optional and powerful PBA.pro features like the Database Manager (for payload decoding) and the Test and Script Manager (for automation) are on offer.

The nomenclature for the mixed protocol ANET takes into consideration the number of MIL-STD-1553 Bus streams and ARINC429 channels in the ANET-MxAy product name,

with x = MIL-STD-1553 Bus streams (1, 2) and y = ARINC429 Channels (4, 8, 12).

The ANET-M2A12 is available in the Standard AIM ANET housing as well as in a rugged housing variant (See the ANET Functional Concept feature in this issue).

For more information, please contact your local AIM Representative or direct office near you. ∎

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At a Glance

The ANET Functional Concept

With the first of AIM's Ethernet based interfaces (ANET1553) being introduced back in 2013, the ANET family has been successively extended over the last years. ANET variants are now available for interfacing to ARINC429, STANAG3910/EFEX (with optical or electrical front ends) and now for mixed protocol support with MIL-STD-1553/ARINC429. (See the mixed protocol ANET-M2A12 feature in this issue).

Originally designed as standalone use, quickly followed the dockable variant having been derived from a simple rear panel modification of the standalone version. Up to 4 of these dockable ANETs can be hosted in ADocks which are available in 2 variants. The "Tower" is for bench/table top use and "Rack" for 19" rackmount applications. Both 'ADock' variants come with an integrated power supply, Ethernet Switch and optional WiFi router.

More recently, 2 new ANET family related features have become available, the ANET table top adaptor for the dockable ANETs and a Rugged Housing variant. These new ANET features complete and extend the

ANET functional concept and idea to offer our customers the maximum flexibility and choice to support their specific requirements.

The ANET table top adaptor has been introduced which transforms a single dockable ANET into a standalone mode, away from hosting applications outside the ADock. The connectors of the ANET table top adapter are compatible to the standard standalone ANET devices, and no functional restrictions compared to the native standalone variant.

To address more rugged applications in harsh environments, the ANET is now offered in a rugged housing. In addition to the repackaging of the ANET PCBs, the rugged ANETs have

a wide range 9…36VDC power input capability with an optional MIL-STD-704 power input. The rugged ANET can be started up by simply applying DC power, without any need for an explicit power button. The default rugged housing ANET offers sealed standard connectors which are basically compatible to the standard ANET variants (D-Sub for all Data Bus I/O and Auxiliary Signals, an USB Type A and RJ-45 for Ethernet). The Power connector for the rugged version uses a lockable push-pull connector type.

If you would like to discuss how these ANET extensions can serve your requirements, please contact your local AIM office or an AIM Representative near you. ■
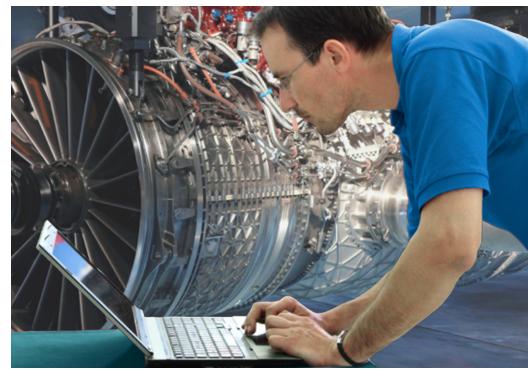
EasyLOAD-429

Lighten your Load with our new flexible ARINC615-3/4 Loading Solutions
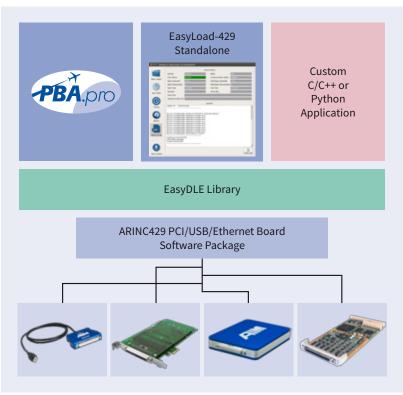
A new and enhanced way to load Airborne Computer Systems using the legacy ARINC615-3/4 protocol over ARINC429 is now possible with the EasyDLE (Data Loading Engine). It's available as a Software library for Windows and Linux Operating Systems enabling users to integrate into their custom applications. Standard AIM ARINC429 interface devices (available in a wide variety of form factors) support the EasyDLE library.

The key benefit of our new library over existing products is the fact it can simulate multiple Data Loader instances at once, plus handle concurrent load processing on different ARINC615 buses (ARINC429 Tx/Rx pairs). Each bus can be configured with a unique set of response timeouts for the various protocol handling stages. Users can configure the protocol parameters like the number of retries and the timeout values providing a high level of flexibility and adaptation of the EasyDLE to match any unit to be loaded. Users are also free to write their own loader applications in C/C++ or simply by using the library's object-oriented Python programming interface.

AIM has extended the PBA.pro Databus Test & Analysis Software to support the EasyDLE, enabling users to quickly set-up, configure and perform 615-3/4 Data Loading via a Graphical User Interface. The PBA.pro extension attaches to the PBA.pro ARINC429 component, which provides avionics engineers the ability to investigate loading failures by capturing, decoding and visualizing the ARINC615 and any ARINC429 bus traffic. A standalone 615-3/4 Data Loader application, the EasyLoad-429, is also available. All the above is supported under Windows 7/8/10 and Linux.
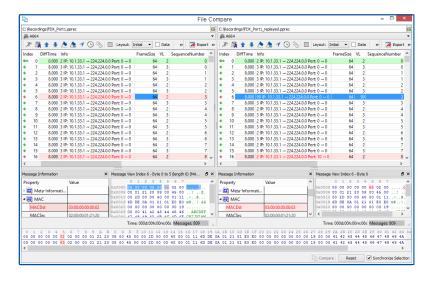
For more than a decade, AIM's industry standard EasyLOAD-615A Dataloader for ARINC615A (over Ethernet and AFDX/ARINC664P7) has supported the aviation industry and we are pleased to extend our family of Data Loaders to support the legacy ARINC615-3/4 standard! ◼
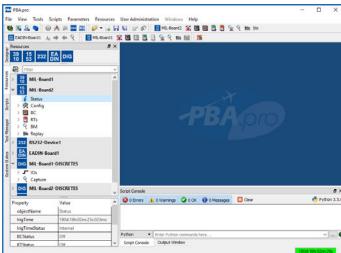
Innovative Features

PBA.pro – What's New

The latest and upcoming release of PBA.pro introduces many new features and a first taste of the on-going facelift to ease your work. Besides other improvements, specifically analysis and evaluation of recording files are taken into account.

New feature for PBA.pro Client

With the PBA.pro Client a new feature has been introduced, which allows users to have multiple PCs (Windows/LINUX) on an Ethernet network which can operate as PBA.pro Clients for monitoring of avionics bus data.
The data is acquired by a standard PBA.pro licence (Master) running with the –NET option, acting as a kind of server. Such a PBA.pro Server can be any PC running a corresponding PBA.pro license and handling locally or remotely AIM mounted interfaces. The PBA.pro Clients can currently handle MIL-STD-1553 and ARINC429 traffic.
Each PBA.pro Client offers the built-in Designer Component (functionality) as well as support for Scripting and EU Conversion. The PBA.pro Client concept also supports AIM ANET devices with the optional PBA.pro Engine, so that smart and flexible test and monitoring systems can be implemented.

Move your project files – by 1 click

Entire projects - including all files like database, script or designer dialog files – can be exported to a standard zip file and imported by 1 click, for example on another system.
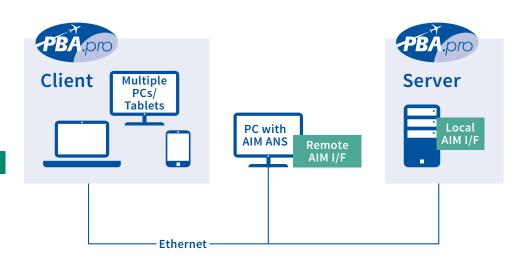
Optimized start-up options

A new, improved and more flexible PBA.pro offers extended resource selection displays to start PBA.pro with different, predefined options.
You can use this display to dynamically select your local or network resources or to automatically load projects or script files according to the current user case.
Furthermore, a new filter button area, some modern Resource Icons and the improved tree appearance helps to organise yourself with a tidy and clearly arranged GUI.
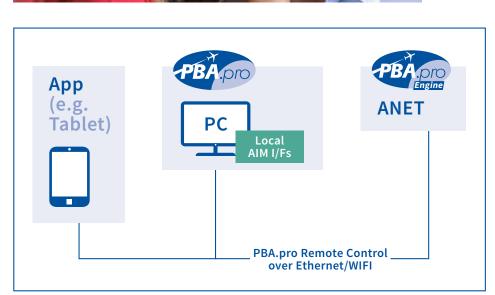
New Analysis functions

Comprehensive extensions of online and offline Analysis functions are offered with the latest version e.g.:
- Quick data and column access
- Intuitive "Event Marker" creation and access
- Vertical and horizontal splitters for 1 recording view
- Introduced a new "Minimal" Layout and a so called "Info" column, showing the most important information of a message as very compact table
- Physical replay of parameter values or raw data using a CSV file
- ARINC429 data decoding to Williamsburg and ARINC615-3/4
- Built-in message and recording file compare tool ■

PBA.pro – Did You Know

Based on the powerful remote control interface of the PBA.pro, AIM has introduced the first Windows/LINUX Apps, designed to run on portable tablet devices.
The Apps communicate via a wired, wireless or local TCP/IP socket based PBA.pro remote control interface with either a full PBA.pro or a PBA.pro Engine.
This offers new and very interesting user cases to display information or remotely controlling your PBA.pro system.

A615 Data Loader
As a first App an "A615 Data Loader" has been designed to fully remote control and monitor ARINC615-3/4 data loader tasks, based on the AIM's ARINC429 hardware, e.g. the ANET429 or ASC429.

Parameter Viewer
Furthermore, a "Parameter Viewer" App has been implemented which monitors and displays live engineering unit data on your portable device with just a few clicks.

Remote control interface
Did you also know, that the PBA.pro (Engine) remote control interface is open and published for use by customer applications? ■

App principle communication concept

The PBA.pro Guide
see here:
> www.aim-online.com/

PBA.pro Engine Applications

A615 Data Loader App with ANET429 (via WiFi connection) or ASC429 (USB)

AIM-USA

Acromag & AIM-USA offer rugged systems with avionics data bus communications!

Acromag, a leader in board and embedded system-level solutions for commercial, industrial and military applications announces the integration and proven interoperability of avionics databus support for MIL-STD-1553 and ARINC429 into their ARCX Product Platform. These small form factor computers feature a 4th Generation Intel Core CPU and single or double PMC/XMC site.

"We are focused on providing capabilities that our customers ask for," states Russ Nieves, Director of Embedded Solutions Sales at Acromag. "We are making it as easy as possible for our customers to add avionics I/O capability by integrating AIM cards into our ARCX Product Platform."

AIM MIL-STD-1553 and ARINC429 cards were integrated into the conduction cooled rugged system while integrating AIM's drivers and the board support package with a Linux operating system and developing a Rear Transition Module (RTM) to provide an I/O path to the rugged 38999 circular connectors. All 64 pins of the Pn4 connector on the board were routed to the rugged circular connector to provide access to all the user I/O signals including discrete I/O, IRIG-B and Triggers in addition to MIL-STD-1553 and ARINC429.

Since the AIM hardware has real time processors on board any operating system can be supported with this configuration and still allow for reliable deterministic data bus

operation, as AIM offers drivers for all commonly used operating systems. This integration provides a cost and schedule savings for customers developing avionics based systems and also allows Acromag and AIM, as leading designer and manufacturer of high performance avionics interface cards, to offer turnkey system level solutions for rugged embedded applications with field proven databus support. The ARCX can be offered as a fully-tested, prepackaged platform that provides the functionality and I/O required by avionics applications with AIM hardware inside.

AIM boards include multiple processors on the hardware with 128MB or more of global memory to ensure real time performance with fast deterministic access time while offloading the host processor to increase performance and reduce power dissipation.

"We are committed to the databus communications market for both embedded and test applications for all avionics protocols" states Bill Wargo, President of AIM-USA. "The combination of AIM hardware and the Acromag system gives you a turnkey, fully tested, rugged system level solution." ■

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