

Welcome to the autumn edition of AIMView Newsletter!

Introduction

Welcome to a rather special edition of the AIM View, having celebrated our 25th Anniversary since the foundation of the company back in 1989.

It is a time to reflect back over those years and also look forward to even more challenges ahead. Recently someone said to me, if you have to choose between culture and strategy, culture eats strategy for breakfast! Looking at when the company was founded, the culture is the same now, as it was then. That is, our goals and aim is to manufacture and supply, high quality, high performance technology solutions for the most demanding and challenging avionics test requirements, whilst maintaining our focus on our customers. This is at the core of our culture.

Having to support multi decade projects for aerospace and space applications requires a huge commitment to the market place and continual investment, mastering new avionics bus/ network architectures and support the legacy ones too. With the continual updating and changing host computer technologies, backplanes and operating systems, this creates further challenges!

Over the past 25 years, AIM has provided and installed a vast array of interface products, databus analyser software and customised systems for leading international defence



AIM - avionics testing for the future -Today

and aerospace projects. We believe the knowledge and know-how gained over the past 25 years will serve well both AIM and its valued customers as we move forward into the future.

A number of 'world's first' product solutions have been created by AIM in the last quarter century. Continuing with this trend, readers of AIM View Vol. 23 will find some very exciting news of more 'world's firsts' which sets us apart in the market.

We take this opportunity to thank each and every one of our customers for your business and loyalty to the AIM brand as we move forward into the future.

Yours truly Douglas Ullah
Director of Sales & Marketing



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The 'PBA.pro Engine' option for the AIM Ethernet based ANET avionics databus interface family

AIM to introduce new 1553 & 429 modules based for the PXI-Express/ cPCI-Express 3U form factor

Extended range of script package products for the PBA.pro™ Application Framework

AIM launched the first prototype docking unit at ITC-USA 2014

AIM to deliver 1 Gbps AFDX®/ ARINC664P7 Performance Modules

PBA.pro Fibre Channel Component now available for Linux

The PBA.pro Engine - 'PBA.pro in the Box'

by Joachim Schuler

AIM PBA.pro Engine

The 'PBA.pro Engine' option for the AIM Ethernet based ANET avionics databus interface family (MIL-STD-1553, ARINC429, STANAG3910/EFEX), brings the AIM PBA.pro™ Bus Analyser Application Software functionality right into the interface level.

The ANET embedded LINUX operating system runs the PBA.pro™ application without a Graphical User Interface (GUI), such that PBA.pro™ projects, simulation setups, databases for payload decoding and scripts can be executed right onboard the ANET interface. Control of the PBA.pro Engine is achieved over an Ethernet TCP/IP connection and any clients wishing to utilise the PBA.pro Engine do not require any native driver software. The major benefit is the ANET with the PBA.pro Engine can be used from any client Operating System (OS).

An embedded Web server and configuration application allows the setup and control of the

PBA.pro Engine inside the ANET via a web browser. PBA.pro elements to be executed via the PBA.pro Engine can be developed independently of the ANET by any standard PBA.pro license or PBA.pro 'No Target' licenses.

In addition the PBA.pro Engine control over Ethernet represents a high level application interface (API) for the ANET, which again can be utilised by any Ethernet and TCP/IP capable client. This offers a unique and efficient way to combine the AIM hardware and software capabilities.



contact AIM:

Databus Test Cards for PXI-Express are coming soon!
by Berthold Schweitzer

Databus test cards for PXI-Express

AIM is soon to introduce our new MIL-STD-1553 and ARINC429 modules based on the PXI-Express/ cPCI-Express 3U form factor. Using our field proven design, the modules including provisions for the PXI instrumentation bus and support for protocol testing, simulation and monitoring of MIL-STD-1553 and ARINC429 data buses. Three new modules will be available: The ACE1553-3U-1/2/-DS and ACE1553-3U-4 for MIL-STD-1553 and the ACE429-3U-4/8/16 for ARINC429 applications.

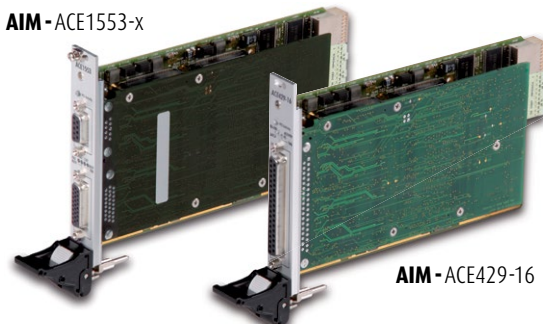
The ACE-3U design is based on the AIM's PCI-Express architecture and functionally compatible to the ACX product family. The integrated design uses low power RISC processors with 128MB of Global RAM and 128MB of ASP RAM plus a low power high speed FPGA with integrated PCI-Express bus interface (PCIe 1.1 x1). This reduces the module power consumption, which significantly increases the overall module reliability. An 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 AIM cards. The ACE-3U modules also integrates Avionic Level General Purpose Discrete I/O (GPIO) signals that can be used to generate strobe outputs or to sample external digital inputs.

The ACE-3U modules can be used in standard CompactPCI-Express (3U) slots, PXI-Express slots and PXI hybrid slots. As true PXI-Express solutions, ACE-3U modules provide full Instrumentation Bus support (Trigger-Bus, Star Trigger Input, 10MHz Reference Clock Input which are fully software programmable) compliant with PXI-Express Hardware Specification Revision 1.0 ECN 1 and with PXI-Specification Revision 2.2. AIM's standard IRIG-B synchronous Time-Tagging Mode is enhanced by a special Time Tag Mode giving a Time Tag synchronous to the 10MHz PXI System

Reference Clock and controlled by the PXI Star Trigger Input or Trigger Bus Lines. The high level of integration offer solutions up to four MIL-STD-1553 channels, Digital Scope function for Single/ Dual channel MIL-STD-1553 or up to sixteen ARINC429 channels on a single 3U module.

The Application Programming Interface (API), which is fully compatible to the existing PXI board family, is bundled into the module price. The driver is compatible with 32/ 64-bit versions of Windows Vista/7/8 and Linux. LabVIEW VIs and LabVIEW RT drivers are included. Host applications can be written in C/C++ or C#.

AIM - ACE1553-x



The ACE1553-x or ACE429-x software support is also compatible with the entire AIM family of MIL-STD-1553/ ARINC429 interface cards and USB/ Ethernet interfaces. The powerful and industry standard PBA.pro™ Databus Test & Analysis Tool (for Windows & Linux) can also be used in combination with ACE1553-x (-DS) and ACE429-x modules. PBA.pro™ uses a modular, scalable and integrated component based design and covers a wide range of applications from stand-alone 'protocol analysers' to a complete 'systems test bench' or advanced 'avionics integration facility'. The low cost PBA.pro Light is also available as a dedicated MIL-STD-1553 or ARINC429 databus analyser, which can be upgraded to the PBA.pro™ full version if required.

Sounds like a 'Plan'
by Joachim Schuler

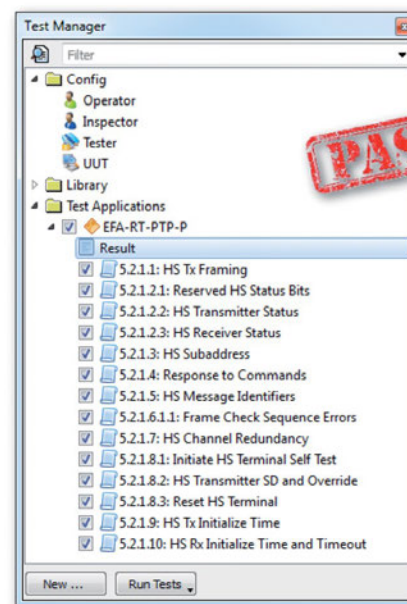
AIM has extended its range of script package products for the PBA.pro™ Application Framework with the introduction of a COTS version to support the Protocol Tests defined in the EFA-Bus Remote Terminal Production Test Plan (TRD-J-017-E).

AIM has previously developed PBA.pro™ based script packages to support the Industry Standard SAE AS4111/4112 (MIL-STD-1553 Remote Terminal Validation and Production Test Plans - Protocol only) and AS4112 electrical Tests.

Compliance Test script packages for **AFDX®/ ARINC664P7** End Systems and Switches have also been developed, so the introduction of this new script package is a natural extension of our 'script package' family.

As with all previous script packages our latest addition is implemented in the Python scripting language. For the script package to run, it requires the relevant AIM STANAG3910 Interface and the PBA.pro™ license to handle the STANAG3910 Resource and the PBA.pro Test and Script Manager.

Extended scripts for the PBA.pro application!



continued:
Sounds like a 'Plan'



With this new package, now obsolete and dedicated 'RT-PTP' application is replaced by using the PBA.pro™ based approach.

This means, that any existing PBA.pro™ based STANAG3910 Analyser systems can be cost effectively converted into a powerful and more comprehensive STANAG3910 test system by the user simply adding the script package with an extension license and by a Test and Script Manager option (if not already present). Furthermore, all PBA.pro™ compatible AIM STANAG3910 Interfaces, right-back to the 'API' PCI Interface generation can be re-used for the execution of the test plan scripts, saving interface hardware investment. All single test cases of the test plan are reflected as corresponding items, which live in the PBA.pro Test and Script Manager setup tree congruent to the test plan

paper procedure for ease of use by the operator. All the standard PBA.pro's Test and Script Manager features such as report generation, enable/ disable single test cases, adding operator and UUT information (which is taken in to the report) and others are available to maximise on documentation and reproducibility of the test results.

As a glance into the future and to support more complex fibre optical tests with this newly supported test plan, AIM can offer (on request) solutions using additional hardware and a baseline of scripts tailored for the UUT (Unit Under Test).

For AIM, the support of this EFA-Bus test plan adds a further building block, extending our leadership position and experience in the STANAG3910 test equipment business.

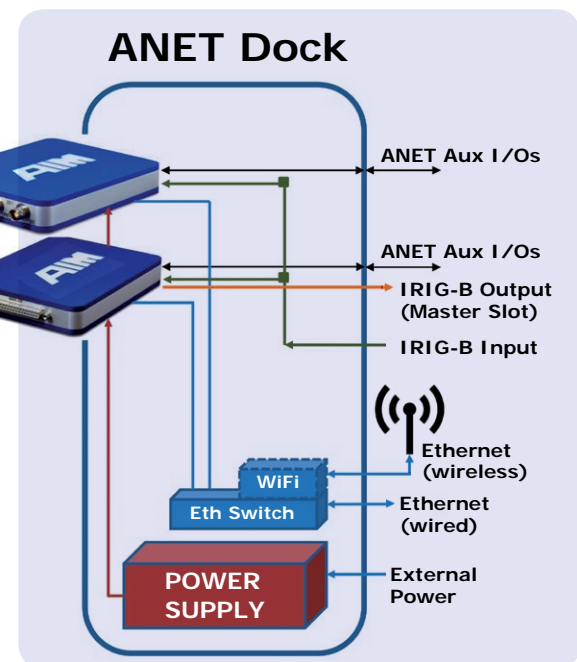
The 'Dock and ANET' Show! by Joachim Schuler

Prototype Docking Unit for Ethernet Interfaces

At the ITC 2014 San Diego, AIM launched the first prototype docking unit for family of AIM ANET Ethernet based avionics interfaces for MIL-STD-1553, ARINC429 and STANAG3910. The ANET family was introduced as a flexible and scalable interface platform with an unique embedded LINUX System on a Chip (SOC)-processor with a Standard Ethernet interface for the connection to a host platform or integration into networked infrastructures. The added values of the ANET with onboard Scripting and PBA.pro Engine (see additional article in this issue) have already been published in more detail and are available for the ANET product.

Specifically, the capability of the ANET for the integration into networked infrastructures drove the requirements for packaging multiple ANET units in order to achieve minimal cabling overheads and to support a high degree on portability and flexibility. Furthermore, the separation of the 'Control' device and the 'Bus Interfaces' can be supported by gaining more flexibility with respect to the 'Control' device, which can be any Windows or LINUX based platform e.g. Laptop. The basic requirements for the 'Control' device is the availability of a standard Ethernet Port (wired or wireless) with suitable performance. Since the performance and system capabilities can expand very quickly, the separation of the 'Interfaces' and the 'Control' device offers easy management of obsolescence issues on the 'Controller' side. Implementation is accomplished by simply upgrading the 'Controller' with a more state-of-the-art platform saving investments for the 'Interface' hardware.

Therefore AIM decided to design a docking station concept for the ANET units to offer a hosting platform having a single power supply and a single wired Ethernet connection as two of the main design goals. A further option is a common wireless Ethernet add-on considered in the design. This has given birth to our



first, 4-ANET-Slot desktop docking station prototype ('Tower', 18x18x32cm) with built-in industrial grade components for mains power supply, an Ethernet switch and a WLAN router. Access to ANETs IRIG-B, Trigger, Discrete I/O and USB connection are also included.

Due to the modular design, other form factors like 19' rack mounted units and even ruggedised docks and many other package styles become a possibility. To assure a solid docking connection, the ANETs (for the use in the docking station) are configured with an industrial grade connector on the rear panel. An ANET adapter kit will convert dock-able ANETs into 'Stand-alone' configurations just like the current and standard ANETs with COTS connectors.

See the 'Dock and ANET' show get a full overview and see the endless possibilities and flexibility offered with the AIM ANET Ethernet based solutions today!



AIM - ANET Dock

AIM USA - AIM Delivers 1 Gbps AFDX®/ ARINC664P7 Performance

by Bill Wargo

AIM to provide 1Gbps performance modules!



AIM - APE GNET

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AFDX®/ARINC664P7 have been used extensively on major commercial aircraft and on some military aircraft for many years now. The ARINC664 specification has initially defined full duplex 10 and 100 Mbps operation only. The demand for more data and the increased complexity of avionics systems is now driving designers to the higher 1Gbps (Gigabits per second) data rate. However, since little work has been done in this area, the companies that are looking to use this technology are now in a research and development phase to prove the feasibility of designing and deploying these systems. AIM-USA was recently contacted by a major avionics systems manufacturer who was working on their first research and development project to test the viability of achieving the specified data rates. The problem that this customer faced was that they had no equipment capable of testing the basic system performance at these rates - until they called AIM. AIM, the pioneer and leader in **AFDX®/ARINC664P7** based test and simulation products had developed 1Gbps test hardware and software 5 years ago to support a similar European feasibility project. AIM supplied standard product, our APE-GNET **AFDX®/ARINC664/GigE** interface module for PCIe, PBA.pro™ and fdXplorer software to enable the customer to prove that full line rate communication, recording and processing is viable at these higher data rates.

Utilizing the AIM system, the customer was able to send packets with 'wire speed', the maximum allowable by the spec, with a timing accuracy of 100 µsec. The data packets were defined using the AIM software, sent and received by the APE-GNET module, and simultaneously recorded in real time for later analysis. On receiver side the interface offers a time stamping with 100ns resolution, which can be synchronized to an external IRIG-B. This level of capability allowed the customer to quickly and successfully

complete this stage of the program.

The AIM 1Gbps **AFDX®** test hardware, APE-GNET, also comes with the compatible Application Programming Interface (API) so that existing 10/100 **AFDX®/ARINC664** customer applications, which are already based on the AIM API, can be efficiently migrated to the APE-GNET and Windows as well as under LINUX.



In addition to the packed/frame oriented modes for low level **AFDX®** protocol verification that was utilized for this program, the operating modes for the simulation of End Systems, based on traffic generation and reception via **AFDX®** communication ports (UDP) and Virtual links (VLs), is supported and fully transparent via the API to customer applications as well as for the AIM application software tools like PBA.pro™ and fdXplorer. This capability means that the system utilized here is easily adaptable to higher levels of performance testing as new requirements develop.

AIM will continue to support this customer and the rest of the industry, as they move to this next level of performance. We are constantly upgrading our capabilities and technology in this area, and view these projects as valuable experience to assure that we understand and can solve the issues confronting the systems designers.

Did You Know?



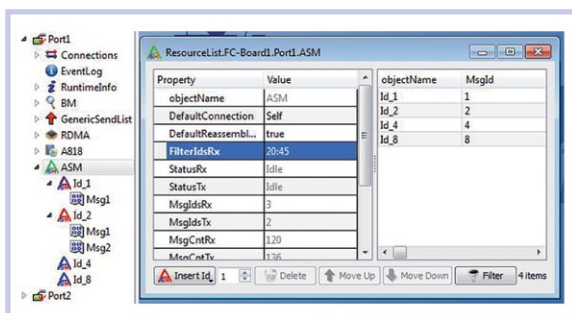
PBA.pro and Fibre Channel moves on at pace!

by Roland Fuchs

AIM is pleased to announce that PBA.pro Fibre Channel Component is now available for Linux platforms!

In addition the Anonymous Subscriber Messaging (ASM) protocol is supported within the PBA.pro Fibre Channel Component too.

The ASM Message Receiver is based on the chronological Bus Monitor, adding ASM specific Message-Reassembly, Activity and Filter functions. Most functions are handled right on the board level providing best performance. The PBA.pro Recording View holds reassembled ASM-Messages with up to 16MB payload and normal FC2 frames in mixed mode. The ASM Message Transmitter offers powerful complex Transmit-Scenarios and multiple payload buffers can be defined for one ASM Message ID and scheduled with differing timings. Message ID's and payload buffers can be created, modified or deleted on the fly.



ASM specific parameters can be defined in the optional PBA.pro Database Manager Component and all ASM payloads can be encoded or decoded in Engineering Units. To take a closer look at how the latest PBA.pro™ and Fibre Channel products can streamline your test needs, contact your local Representative or AIM office near you.

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