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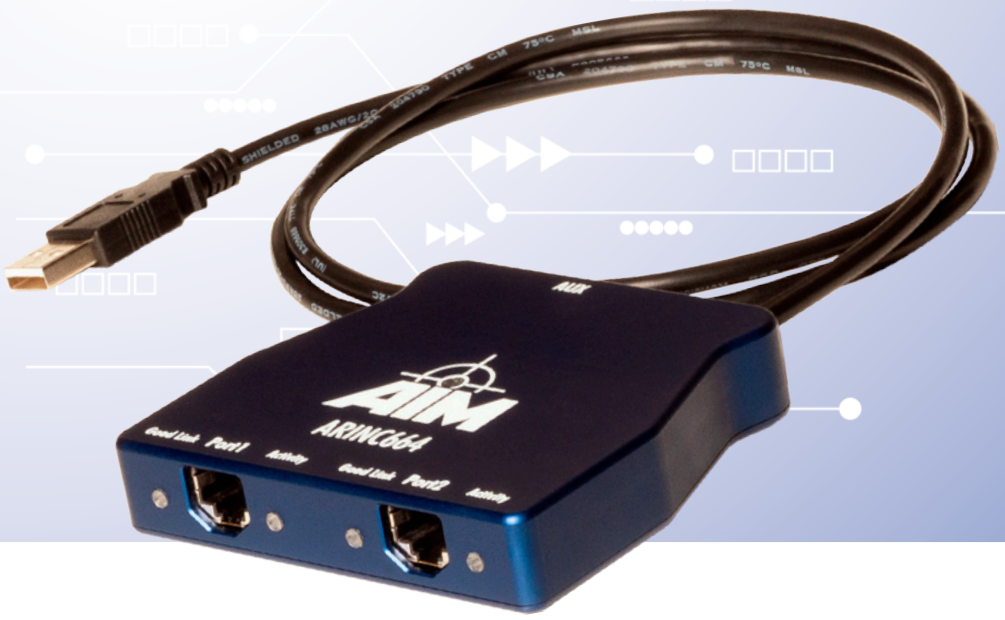
ASC-FDX-2

USB SmartCable™ for AFDX®/ARINC664P7 Test and Simulation

Data Sheet



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ASC-FDX-2

USB SmartCable™ for AFDX®/ARINC664P7 Test and Simulation

General Features

The ► **ASC-FDX-2** (AIM SmartCable™) USB2.0 module offers full function test, simulation, monitoring and analyzer functions for ► **AFDX®/ARINC664P7** (Avionics Full Duplex Switched Ethernet) networks implemented in an ultra compact form factor. Its unique onboard processing capability, memory resources, customized AFDX® MACs and IRIG-B time code decoder/generator gives AFDX® users a comprehensive feature set for the most demanding AFDX® applications.

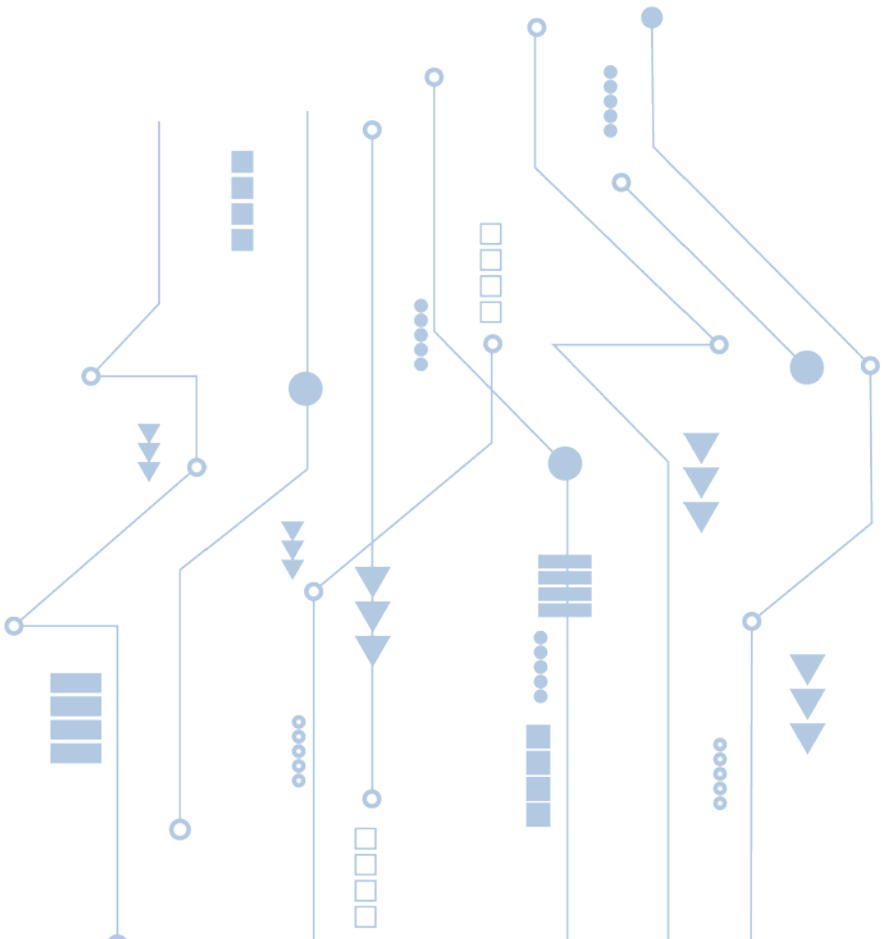
The ASC-FDX-2 module provides two AFDX® ports being configured as two single or one dual redundant port each implementing a 10/100Mbit/s full duplex Ethernet interface. Ports can operate concurrently in traffic simulator or receiver/monitor modes with support for AFDX® port related frame statistics. Virtual Link (VL) packet capturing and monitoring features are complimented with powerful trigger and filter capabilities. An integrated TAP mode enables analyzing network traffic in-line, with all onboard and PBA.pro features between two attached Ethernet devices.

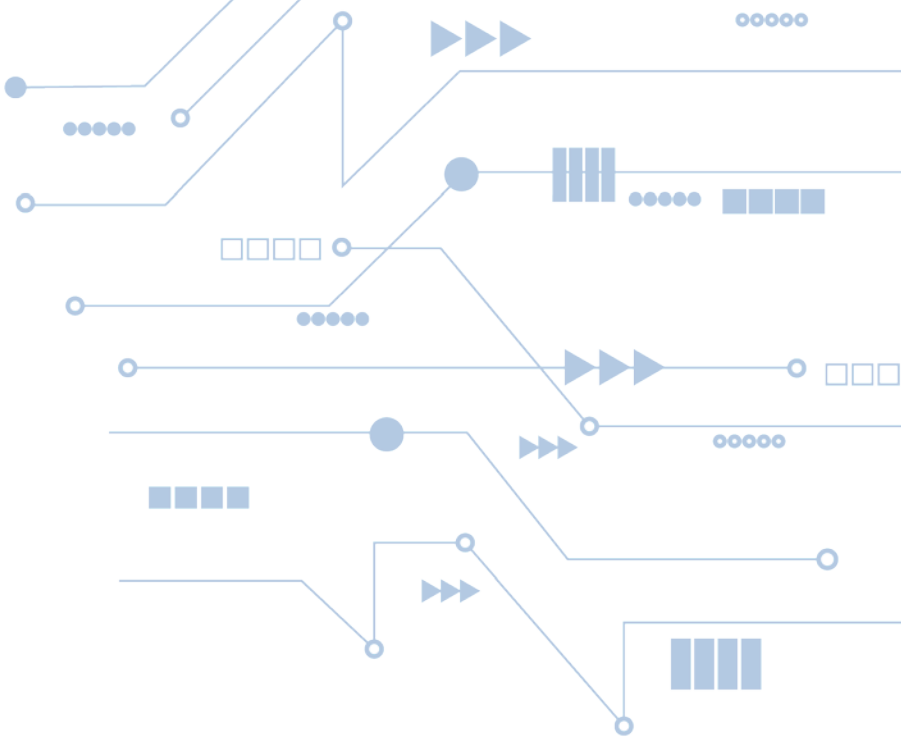
The ASC-FDX-2 utilizes a powerful System on Chip (SoC) device including programmable logic and a dual core processor. The extensive memory resources onboard allow to implement large receive buffers and complex transmit scenarios onboard.
An ► **AFDX®/ARINC664P7** specific physical bus interface implements two full duplex ports for connection to AFDX® networks.

The ASC-FDX-2 module is available with the optional PBA.pro analyzer software package for Windows and Linux.
Versions available for both, Airbus and Boeing variants of ARINC664P7.

Key Features

- Portable test, verification and simulation of AFDX®/ARINC664P7 End Systems, switches and networks
- Data Loading of AFDX®/ARINC664P7 End Systems via ARINC615-A protocol
- Support for single or redundant AFDX®/ARINC664P7 operation
- Support for Boeing ARINC664 extensions for EDE at the hardware interface layer (product option)
- Receive Modes: Chronological Monitoring and UDP Port/VL oriented reception of messages
- Transmission Modes: FIFO based sending scheduled by application, transmission of frame sequences with high-precision hardware scheduling, and End System simulation mode
- Physical Error Injection/Detection
- Provisions for Network Latency measurement and analysis
- IRIG-B Time Decoder
- Generic Tx/Rx Function Only versions available
- Powered via a single USB2.0 (or higher) port
- Network connection via 2x RJ45 connectors, USB via 1x USB Type A connector (also available with USB-C Cable upon Request)
- Compatible to AIM PBA.pro Software and EasyLoad615A DataLoader Application
- Replacement product for APU-FDX-2
- Software (API) compatibility to APU-FDX-2 (requires APU-FDX-2 update to actual BSP version at ASC-FDX-2 release date)
- Also available with USB-C Cable upon Request





Traffic Generation

The ASC-FDX-2 provides real time traffic generation on both ports concurrently. Transmitter operation allows users to fully program all fields of the AFDX® frame including the Virtual Link identifier, MAC source address, IP structure, UDP structure, Payload and Sequence number. Multiple modes of transmit sequencing are supported, these being FIFO/, generic and UDP port oriented transmissions. Users can program payload data with user defined or fixed data.

- Programmable timing and sequencing of frames
- Physical error injection – CRC, gap, size, alignment
- Logical error injection on layers 2, 3, 4
- Timing error injection – violation of Bandwidth Allocation Gap (BAG)
- UDP port simulation with traffic shaping and sequence numbering
- Onboard support for sampling and queuing ports

UDP/VL Receive Mode

The ASC-FDX-2 module ports can be configured to work in UDP/VL oriented receive mode. In this mode each UDP port has a separate buffer queue. Received frames are stored with frame headers containing time tag and status information. Frame header information can be stored and payload data optionally discarded for the testing of switches and the complete network. With the traffic shaping verification enabled, any violations are reported as errors in related frame headers.

- VL oriented filtering
- Time stamping of received packets with 100ns resolution
- Physical error detection, frame level - CRC, gap, size and alignment
- AFDX® specific error detection
- Traffic shaping verification
- Verification of MAC, IP and UDP headers
- VL oriented integrity checking

Chronological Receive Mode (Monitor Mode)

The ASC-FDX-2 module ports can be configured in chronological receive mode to sequentially receive frames and store them in a circular buffer. Powerful filtering, triggering, complex triggering and capture modes allows users to select only the frames, data and errors of interest. Monitor mode also provides activity monitoring and statistics for each VL recorded by the ASC-FDX-2 module. The interface modules report the number of frames received and the number of errors detected globally and in VL orientated format.

- VL orientated receive and filtering
- Chronological monitor with time stamping
- Massive onboard monitor buffer
- Inter frame gap time measurements with 40ns resolution
- Comprehensive triggering/filtering/capturing
- Physical error detection – CRC, gap, size and alignment
- AFDX® specific error detection

TAP Mode

The ASC-FDX-2 can operate in TAP mode in all network speeds. This allows to analyze the network traffic between two attached network devices. Inter-Message-Timing will not be changed in this operational mode and network data will not be modified ensuring full operation of attached ports.

IRIG-B Time Code Decoder

An onboard IRIG-B time code decoder allows to synchronize the clock to external clock masters.

Physical Bus Interface

The ASC-FDX-2 modules provide two AFDX® ports which can be used as two single channels or as one dual redundant channel AFDX® specific physical bus interface.

- Customized Media Access Controllers (MAC's optimized for AFDX®)
- 256MB DDR3 memory for firmware, receive and transmit buffers
- Physical interface and magnetics (COTS)
- 8-socket network interface connectors – RJ45

Driver Software Support

The driver software is supplied with the ASC-FDX-2 module. A full functional Application Programming Interface (API) is provided compatible with Windows and Linux. Host applications can be written in C/C++. A LabView/VI application interface is provided.

Technical Data

USB2.0 Interface
480Mbit USB2.0 Standard Interface (Revision 2.0)
Memory
256MB RAM
Processors
SoC Device with 2x 400 MHz processors
Time Tagging
46-bit absolute IRIG-B time with 100ns resolution
Encoder/Decoder
2 AFDX® specific Ethernet MAC's, integrated in SoC device
Inter Frame Gap generation and measurement with 40ns resolution
Physical Bus Interface
2 full duplex AFDX® ports configurable to 1 dual-redundant AFDX® port or to 1 TAP port
Connectors
2 x 8 way RJ45 connectors, 1 per AFDX® port

USB-Connector
fixed mounted cable with single USB Type A host Connector, USB-C cable upon Request
Auxiliary I/O Connector
15-pin high-density D-Sub connector for Discrete I/O, IRIG-B clock synchronization and Trigger I/O signals
Dimensions
88mm x 79mm x 17,5mm (W x L x H)
Supply Voltage
+5V from single USB2.0 (or higher) supply voltage
Power Consumption
2.5W max
Operating Temp. Range
Standard: 0ºC to +50ºC ambient
Extended: -15°C to +60°C
Storage Temp. Range
-40ºC to +85ºC
Humidity
5 up to 95% (non-condensing)

Ordering Information

ASC-FDX-2
Two port USB2.0 to AFDX®/ARINC664P7 interface:
Traffic Simulator, Receiver and Chronological Monitor;
Including USB cable, 1.0m, occupying 1 USB (2.0 or higher) port (USB powered);
Includes driver software for Windows and Linux; LabVIEW VI's included

ASC-FDX-2B
Two port USB2.0 to AFDX®/ARINC664P7 interface:
Traffic Simulator, Receiver and Chronological Monitor;
Including Boeing B787 specific extensions;
Including USB cable, 1.0m, occupying 1 USB (2.0 or higher) port (USB powered);
Includes driver software for Windows and Linux; LabVIEW VI's included

* AFDX® is a registered trademark of Airbus

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