AVIONICS INTERFACES
From development and test to deployment, we’re with you all the way.

abaco.com/avionics
Abaco Systems’ avionics products have been flying on a wide range of military and commercial aircraft platforms for over 30 years, and are widely used in the development, simulation, testing and maintenance of aircraft, space, weapons- and ground systems. Our extensive experience in creating truly rugged solutions – which extends well beyond avionics - means that our products are often deployed in the harshest, most challenging environments.

Technologies

Our product portfolio supports the main aircraft interface technologies (MIL-STD-1553B and ARINC 429) that have been the standard for the past 50 years in the industry, as well as more recent Ethernet-based technologies such as AFDX/ARINC 664 and a broad range of newer standards such as PCI Express, XMC, AMC, USB and Thunderbolt 3.

All our interface board products have driver support for many operating systems provided with the board, including API source code examples so that users can tailor the code to suit their application.

Abaco Systems’ MIL-STD-1553 interface hardware represents the latest generation of bus products to feature high-speed encoding and decoding along with large onboard memory capacity. Each of our boards is designed to accurately buffer and record bus traffic with no data loss, all while simultaneously scheduling 1553 messages. Our FPGA-based products provide a long-term migration path with in-field firmware updates. Product evolution is supported with replacement products that provide long-term sustainability.

In addition, we also offer a complete line of laboratory- and embedded products that support a wide variety of commercial avionics protocols, including ARINC 429/575/582, ARINC 561, ARINC 573/717, ARINC 453/708, and CSDB.

Each of our ARINC 429 products supports maximum data throughput on all channels, and most provide on-board message scheduling, label filtering, multiple buffering options, time-tagging, error injection/detection and avionics-level I/O discretes.

For more than three decades, Abaco Systems has been a leader in avionics products for military and commercial aerospace applications.

Deterministic avionics protocols

Our line of AFDX/ARINC 664 Part 7 products is designed for data bus analysis of this next-generation, deterministic avionics protocol for real-time applications over Ethernet media. Data throughput is considerably increased with this 100Mbps technology and the design - explicitly for test applications - allows unconstrained data capture capability, pushing straight to the host computer memory. Data analysis can be via the Microsoft® Windows®-based BusTools application, or user-developed interfaces on Windows or Linux®. This technology is currently being used, for example, on the Airbus A380 and the Boeing 787 Dreamliner programs.

Perhaps more important than our fully-featured, cost-effective, high performance product range is the support for which Abaco Systems is renowned. Experienced and highly responsive engineer-to-engineer, field application and on-site technical support – together with a highly-developed customization capability - enables our customers to minimize risk, cost and time-to-deployment. This is backed by the industry’s leading programs designed to minimize long term cost of ownership and maximize return on investment over the multi-year lifetime of the typical avionics program.
Recognizing the critical importance of subsystems communications in aircraft, Abaco Systems has developed a range of products that deliver the required reliability, speed, and richness of features. Whether the system requires MIL-STD-1553, 10Mbps EBR/MMSI, ARINC 429 or ARINC/ARINC 664, Abaco Systems has a highly appropriate technology solution. Abaco Systems avionics interface boards are compatible with PCI, PCI Express®, CompactPCI®, PXI, Mini PCIe, PC/104-Plus, AMC, USB, PMC/CIA, ExpressCard, Thunderbolt 3, VME, VXI, PMC and XMC platforms.

Our MIL-STD-1553 interface hardware provides high-speed host interfaces, large onboard memory capacity, intelligent protocol processing and advanced board-level functionality. Bus traffic is accurately buffered and recorded with no data loss while simultaneously scheduling 1553 messages without host intervention.

Flexible APIs supporting many operating systems allow test and simulation users to maximize operational test and simulation or embedded environments. The user-friendly application programming interfaces, supporting many host operating systems, provide onboard management of transmit, receive, and data logging execution. Many of our ARINC 429 boards provide options for other commercial avionics protocols, such as ARINC 708 and 717.

High-speed Our ARINC 615 Data Loader provides Microsoft Windows-based ARINC 615-3/603 data loading via single- or multi-session interface software.

ARINC 664 is the new standard for redundancy-managed assured message traffic technology on Ethernet media. Our high-speed deterministic interface products allow unconstrained bandwidth testing of these buses on engines, flight controls and navigation systems.

With a proven track record in rugged products for military and commercial applications, Abaco Systems can provide rugged avionics interfaces to meet virtually any type of harsh environment requirement.

Abaco Systems ARINC interface board products, traffic analysis software packages and data loader products offer a high degree of functionality and performance for test and simulation or embedded environments. The user-friendly application programming interfaces, supporting many host operating systems, provide onboard management of transmit, receive, and data logging execution. Many of our ARINC 429 boards provide options for other commercial avionics protocols, such as ARINC 708 and 717.

High-speed Our ARINC 615 Data Loader provides Microsoft Windows-based ARINC 615-3/603 data loading via single- or multi-session interface software.

ARINC 664 is the new standard for redundancy-managed assured message traffic technology on Ethernet media. Our high-speed deterministic interface products allow unconstrained bandwidth testing of these buses on engines, flight controls and navigation systems.

With a proven track record in rugged products for military and commercial applications, Abaco Systems can provide rugged avionics interfaces to meet virtually any type of harsh environment requirement.

Abaco Systems ARINC interface board products, traffic analysis software packages and data loader products offer a high degree of functionality and performance for test and simulation or embedded environments. The user-friendly application programming interfaces, supporting many host operating systems, provide onboard management of transmit, receive, and data logging execution. Many of our ARINC 429 boards provide options for other commercial avionics protocols, such as ARINC 708 and 717.
Optional conformal coating available

Bundled with the BusTools ARINC GUI

Optional support for one Rx and one Tx ARINC 717, ARINC 573 channels

Bundle with the BusTools ARINC GUI

Optional conformal coating available

RAR-USB
ARINC 429 USB adapter
Available with up to 16 Rx and five Tx channels
Eight bi-directional I/O discretes
Standard with IRIG-B signal receiver (AM or DC/TTL) / generator (DC/TTL)
Optional support for one Rx and one Tx ARINC 717, ARINC 573 channels
Bundled with the BusTools ARINC GUI
Optional conformal coating available

Optional IRIG-B receiver/generator

RAR-PCIE
4-lane PCI Express board
Available with up to 16 Rx and 16 Tx channels
16 input and 16 output avionics discretes
Optional support for 1 Rx and 1 Tx ARINC 717, ARINC 573 channels
Optional IRIG-B receiver/generator
Optional conformal coating available

RAR-XMC
High density ARINC interface for XMC
Available with up to 16 Rx and 16 Tx channels
Optional with 16 fixed Rx and 16 programmable channels on P16 or 15 fixed Rx and 15 programmable on P14
P14 or P16 conduction cooled rear I/O or front I/O
Programmed applications have four input and four output avionics discretes and front I/O has two input and two output avionics discretes
Optional support for 1 Rx and 1 Tx ARINC 717, ARINC 573
Standard with IRIG-B signal receiver (AM or DC/TTL) / generator (DC/TTL)
Optional conformal coating available

RAR15X and RARXF
ARINC 429 XMC and MIL-STD-1553 rear and front I/O module
Two or four dual-redundant MIL-STD-1553A/B
10 fixed ARINC 429 receive channels
Eight fixed ARINC 429 transmit channels or can be programmable receive/transmit channels
P14 or P16 conductive cooled rear I/O or front I/O
Front I/O available in conformal coated and ruggedized configurations
Fixed volt
Up to 12 bi-directional avionics level discretes individually configurable as 1553 output or input triggers
Hardware RT addressing
Available on 4-lane PCI Express carrier card
Available in a portable, rugged Thunderbolt 3 based enclosure

RAR-PCI Express board
Available with up to 16 Rx and 16 Tx channels
16 input and 16 output avionics discretes
Optional support for 1 Rx and 1 Tx ARINC 717, ARINC 573 channels
Optional IRIG-B receiver/generator
Optional conformal coating available

RCEI-830A
High density ARINC interface for PMC
Available with up to 16 Rx and 16 Tx channels
P14 rear I/O or front I/O
Optional support for one Rx and one Tx ARINC 717, ARINC 573 channels
Optional IRIG-B receiver/generator
Bi-directional discretes available
Available in ruggedized, conformal coated, extended temp and conductive cooling configurations
Available on PCI, PCI Express and CompactPCI carrier cards
Available in a portable, rugged Thunderbolt 3 based enclosure

RAR-MPCIe
ARINC High density Mini PCI Express interface card
Up to 8 Rx and 4 Tx ARINC 429 channels
Four input/output bi-directional discretes supporting avionics-level voltages
Independent, software-programmable bit rates for all channels
Support for 2-wire ARINC 573, 575, and 717
High-level software API included for Microsoft Windows
Supports maximum data throughput on all channels simultaneously

We help our customers reduce program risk from design to decommissioning while also reducing costs both in development and deployment with our unique, flexible and proven Product Lifecycle Management (PLM) and Program Management (PM) services.

The PLM program recognizes the typical multi-year – multi-decade, even – nature of many avionics programs, and provides our customers with a range of options that can mitigate the impact of obsolescence, with the ability to ensure that parts are available throughout the program’s lifetime.

Long-established
Our long-established PLM team maintains close contact with component suppliers and industry groups such as the Component Obsolescence Group to constantly monitor technology developments and component obsolescence issues. At the heart of the program is a dedication to providing both progressive and defensive long term support.

Progressive support begins on the design table, with embedded products being designed for maximum compatibility or upgradeability even before they are qualified for a system. The list of critical components will include only those elements for which vendors have committed to a long-term production run. After a product is launched, defensive PLM provides the technical support and service to keep the product running, as well as ensuring that sufficient supplies of spare parts are available to avoid the premature obsolescence of a system or even an entire platform. When technology obsolescence occurs, Abaco Systems’ Health Check program is designed to alert customers and provide possible solutions such as a last-time buy of the components, an appropriate replacement component, a redesign of the original product for form-, fit-, and function compatibility, or technology insertion earlier than planned.

Risk elimination
Our Program Management process is designed to eliminate the many potential risks in program development. From development of product requirements and program schedule to product qualification and release for production, we work closely with our customers to demonstrate our design and manufacturing progress as measured against the program baselines and forecasts.

Abaco Systems products leverage proven commercial technologies, as this represents less risk for our customers and greater assurance of long term program success than in-house developed or custom technologies.

Price change risk is eliminated because our initial quote remains the price until delivery. In addition, our contract change management service ensures that every change has been formally approved by our customer and that a separate purchase order has been executed to reflect that change.
We offer a wide range of intelligent MIL-STD-1553 interface hardware to meet demanding application needs. Our 1553 product line combines high-speed encoding/decoding, large onboard memory, intelligent protocol processing and advanced board level functionality. This enables accurate buffering and recording of bus traffic with no data loss while simultaneously scheduling 1553 messages without host intervention.

We offer a wide range of intelligent MIL-STD-1553 interface hardware to meet demanding application needs. Our 1553 product line combines high-speed encoding/decoding, large onboard memory, intelligent protocol processing and advanced board level functionality. This enables accurate buffering and recording of bus traffic with no data loss while simultaneously scheduling 1553 messages without host intervention.

### ARINC 429

Our ARINC solutions provide feature-rich functionality, ease of use and exceptional performance for embedded, test- and simulation applications. Most interfaces offer individual channel programmability for source or sink, and an optional IRII B receive time stamp. The PCI and PMC interfaces offer on-board transmit channel listen feature. They provide a user-friendly design to the host system with on-board management of transmit, receive, and data logging execution.

<table>
<thead>
<tr>
<th>Form Factor</th>
<th>Operating Module</th>
<th>Analyser</th>
<th>Temp Range</th>
<th># Channels</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAX-MPICB</td>
<td>Mini PCI Express</td>
<td>BusTools</td>
<td>Core</td>
<td>1 or 2</td>
</tr>
<tr>
<td>RAX-USB</td>
<td>USB</td>
<td>BusTools</td>
<td>Core</td>
<td>1 or 2</td>
</tr>
<tr>
<td>P15C-1553-G2</td>
<td>PCI-Express</td>
<td>BusTools</td>
<td>Core</td>
<td>1 to 4</td>
</tr>
<tr>
<td>P15G-1553-G2</td>
<td>PCI-Express</td>
<td>BusTools</td>
<td>Core CC</td>
<td>1 to 4</td>
</tr>
<tr>
<td>R15-EC-G2</td>
<td>Express Card</td>
<td>BusTools</td>
<td>Core</td>
<td>1 or 2</td>
</tr>
<tr>
<td>R15-AMC</td>
<td>Single-Multi-Function</td>
<td>BusTools</td>
<td>Core</td>
<td>1 to 2</td>
</tr>
<tr>
<td>R15-USB</td>
<td>USB</td>
<td>BusTools</td>
<td>Core</td>
<td>1 or 2</td>
</tr>
<tr>
<td>R15-ECG</td>
<td>Express Card</td>
<td>BusTools</td>
<td>Core</td>
<td>1 or 2</td>
</tr>
<tr>
<td>R15-AMG</td>
<td>Single-Multi-Function</td>
<td>BusTools</td>
<td>Core</td>
<td>1 to 2</td>
</tr>
</tbody>
</table>

### COMMON FEATURES

- 1 MB shared RAM per channel
- Supports MIL-STD 1553-3/603 in native
- I2C interface – simultaneous Bus Controller and Bus Monitor operational modes
- I2C interface – simultaneous Bus Controller and Bus Monitor or simultaneous 31 Remote Terminals and Bus Monitor operational modes
- Single function – Bus Controller or 31 Remote Terminals or Bus Monitor operational mode
- Supports Microsoft Windows GUI bus analyzer
- High level API libraries for Microsoft Windows 7, 8, 8.1, 10, Solaris®, VxWorks®, LynxOS®, LynxOS-2®, Solarus®, LabWindows/CV, LabWindows/CVI, LabWindows/DC/VI, Visual Basic and in source code with example programs.
- IRII B Receiver (AM or DC/TTL)/Generator (DC/TTL) capability
- 64-bit, 25 nanosecond message timetagging; 45-bit SAE GDF message synchronization capability also available (contact sales for further information)
- labWindows/CV/Visual Basic and in source code with example programs.
- LabWindows/CV/Visual Basic and in source code with example programs.
- Conditional BC branching on real-time message data or status
- Error injection/detection; BIT; RT map monitoring; I/O discretes that support avionics-level voltages
- Supports MIL-STD-1760 start up timing
- SAE AS4111 5.2 Protocol Validation

### ARINC 429

<table>
<thead>
<tr>
<th>Form Factor</th>
<th>Operating Module</th>
<th>IRIG Time Code</th>
<th>Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAX-MPICB</td>
<td>Mini PCI Express</td>
<td>60/8, 80 and 94</td>
<td>ARINC 429: 605, 717, 573, 2-wire</td>
</tr>
<tr>
<td>RAX-USB</td>
<td>USB</td>
<td></td>
<td>ARINC 429: 627, 717, 573, 2-wire</td>
</tr>
<tr>
<td>RCM-533</td>
<td>PCI</td>
<td>2 to 4</td>
<td>ARINC 429: 573, 717, 572, 717</td>
</tr>
<tr>
<td>RAX-PICB</td>
<td>PCI-Express</td>
<td>2 to 4</td>
<td>ARINC 429: 627, 717, 573, 2-wire</td>
</tr>
<tr>
<td>RCM-105</td>
<td>PCI-Express</td>
<td>2 to 12</td>
<td>ARINC 429: 573, 627, 572, 717</td>
</tr>
<tr>
<td>RCM-715A</td>
<td>PCI-Express</td>
<td>2 to 12</td>
<td>ARINC 429: 572, 573, 582, 717</td>
</tr>
<tr>
<td>RCM-EC</td>
<td>Express Card</td>
<td>2 to 1</td>
<td>ARINC 429: 573, 572, 627, 717</td>
</tr>
<tr>
<td>RCM-OPC</td>
<td>PCI-Express/OPC</td>
<td>2 to 12</td>
<td>ARINC 429: 573, 572, 582, 717</td>
</tr>
<tr>
<td>RCM-80A</td>
<td>PCI-Express</td>
<td>2 to 10</td>
<td>ARINC 429: 573, 572, 582, 717</td>
</tr>
<tr>
<td>RM-306</td>
<td>VME</td>
<td>1 to 1</td>
<td>ARINC 429: 572, 717</td>
</tr>
</tbody>
</table>

### COMMON FEATURES

- Dedicated, fully independent, receive and transmit channels
- High performance processing and large, shared memory buffers
- I/O discretes that support avionics-level voltages
- 32 bit time tagging and optional IRIG B
- Multiple receive buffering modes and on-board transmit channel listen feature
- Multiple protocols available on some board

### DATALOADING ARINC615

Our ARINC 615 Data Loader provides Microsoft Windows-based ARINC 615-3/603 data loading via single- or multi-session interface software.

### AVIONICS CORE

Our FlightCORE1553 (FC-SMF) and FlightCORE 1553 (FC-C2R) leverage the capacity, performance and cost-effectiveness of programmable logic devices to provide a wide range of protocol communications options such as System-on-a-Chip and integrated I/O. The rugged FlightCORE products afford a variety of configurations of IP Core, including lightweight, re-AP required, 1Mbps 1553, 10Mbps multi-drop EBR, and 10Mbps point-to-point MMS, and can be operated in single or full function modes.

### 10MHz 1553

This advanced solution is typical for stores management, while providing up to 10 times the data throughput. This interface is an excellent choice for flight controls, actuators, electro-pneumatic controllers or similar applications of standard 1553 requiring higher data rates.

### 10MBIT 1553

Our FlightCORE1553 (FC-SMF) and FlightCORE 1553 (FC-C2R) leverage the capacity, performance and cost-effectiveness of programmable logic devices to provide a wide range of protocol communications options such as System-on-a-Chip and integrated I/O. The rugged FlightCORE products afford a variety of configurations of IP Core, including lightweight, re-AP required, 1Mbps 1553, 10Mbps multi-drop EBR, and 10Mbps point-to-point MMS, and can be operated in single or full function modes.
AFDX ARINC 664

AFDX is a deterministic protocol for real-time application on Ethernet media, also known as ARINC 664 Part 7. AFDX is intended for aircraft flight critical interfaces, including Engines, Flight Controls, Navigation Systems. With both hardware-based and software loadable AFDX, we support AFDX across evolving platforms to protect your avionics investment.

AFDX is a deterministic protocol for real-time application on Ethernet media, also known as ARINC 664 Part 7. AFDX is intended for aircraft flight critical interfaces, including Engines, Flight Controls, Navigation Systems. With both hardware-based and software loadable AFDX, we support AFDX across evolving platforms to protect your avionics investment.

**COMMON FEATURES**

- Includes AFDX and low-level software. Developer’s Kit at no additional charge.
- Includes AFDX and ARINC 664 dual port interface (two independent 10/100 Mbps duplex ports)
- Includes high-level API libraries for operating environments including Microsoft Windows XP/2000, Linux, LABVIEW and in source code with example programs.
- Advanced software support
- Advanced transmission features
- Advanced reception features
- Advanced software support

**LABVIEW SUPPORT AND PCI/COMPAITIBLE PRODUCTS**

Abaco Systems offers an integrated link between National Instruments LabVIEW System Design Software and our avionics product offerings for MIL-STD-1553, ARINC 429 and ARINC 664 data buses. Users can rapidly build custom applications and complex VIs (Virtual Instruments) that can be used in the LabVIEW environment to provide graphical access to Abaco Systems’ extensive API (Application Programming Interface). Support for LabVIEW Real-Time Software is also available.

**Databus Analyzers**

Abaco Systems has developed a powerful set of avionics databus analyzer application software that allow users to monitor and control receive, transmit, logging and analysis functions of avionics systems. Included in our BusTools software applications is a suite of tools for laboratory, in-flight, flight line or any other situation that requires real-time data acquisition and analysis.

**Data Bus Analyzers**

Our powerful avionics databus analyzer application software gives you simplified control over receive, transmit, logging and analysis functions. You can analyze bus traffic, quickly generate or modify messages and view received data in engineering units. Our BusTools provide a full suite of advanced features for use in the laboratory, in flight, on the flight line, or in any application requiring real-time data acquisition and analysis.

**Analysis, simulation, maintenance**

BT-ARINC provides bus analysis, simulation, maintenance and data logging of the ARINC 429, 575, 561/6-wire, 717 and CSDB databus protocols. With comprehensive monitoring, data logging and simulation of all bus loading activity, the user is able to simultaneously control, log and display data from a single Windows-based program on PCI, PCI Express, PMC, ExpressPCI, ExpressCard and PCMCIA platforms.

For Windows XP- or 2000-based GUI applications, BT-AFDX provides traffic monitoring, analysis and simulation under the ARINC 664 Avionics Full Duplex Switched Ethernet (AFDX) protocol. This software enables the user to view, log, analyze and generate AFDX traffic at the adapter, end system, virtual link and port levels. BT-AFDX can be used with our robust PMC or ExpressCard interface boards.

**Software support only available for Goleta-based cards. Contact factory for listing of supported products**

**BT-ARINC**

Software support only available for Goleta-based cards. Contact factory for listing of supported products

**BT-AFDX**

Software support only available for Goleta-based cards. Contact factory for listing of supported products
WE INNOVATE. WE DELIVER. YOU SUCCEED.

GLOBAL COVERAGE

Americas:
866-OK-ABACO or +1-866-652-2226

Asia & Oceania:
+81-3-5544-3973

Europe, Africa, & Middle East:
+44 (0) 1327-359444

Locate an Abaco Systems Sales Representative visit: abaco.com/products/sales

abaco.com | @AbacoSys

©2019 Abaco Systems. All Rights Reserved. All brands, names or trademarks are property of their respective owners. Specifications are subject to change without notice.