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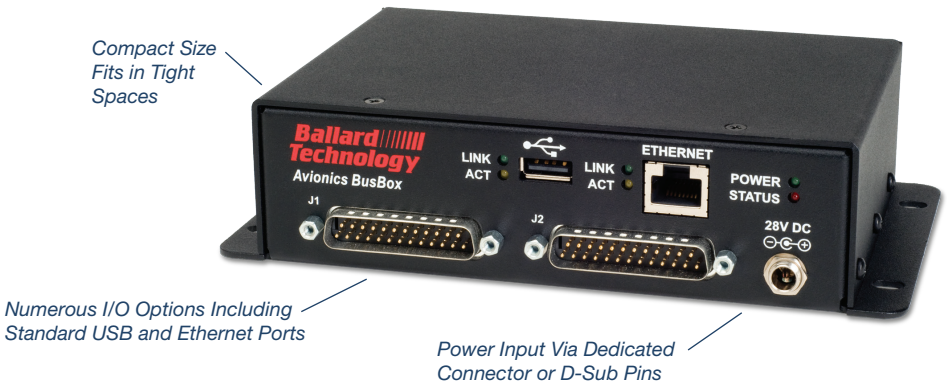
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AB1000 Avionics BusBox®

Available Interfaces

MIL-STD-1553
ARINC 429/575
RS-232/422/485
Ethernet
USB 2.0 Host
CompactFlash® Disk
Discrete I/O



Small and Lightweight Embedded Computers

The AB1000 is a family of cost-effective, embedded computers designed for use on airborne and ground vehicle platforms. These compact versatile computer systems include many built-in standard peripheral and avionics databus interfaces. A Commercial Off-The-Shelf (COTS) AB1000 coupled with application specific software provides a quick and easy solution to challenging interface, bridging, and control problems.

Typical applications for the AB1000 include data and protocol conversion, databus and network bridging, data servers, data recorders, communications, power controllers, federated controllers and multiple net-centric applications. USB and Ethernet ports allow the AB1000 to easily connect with other computers, devices, or networks to further expand system capabilities. The AB1000 delivers outstanding performance for use on the ground or in the air, and is easily integrated into today's modern aircraft, UAVs, and ground mobile platforms.

Architecture

At the heart of the AB1000 is a user-programmable PowerPC processor. It runs the software application and controls standard interfaces, such as Ethernet, USB and serial. Protocol processing for the avionics interfaces is off-loaded to dedicated interface circuitry, maximizing PowerPC processor resources for the user application.

Software

There are two ways software can operate the AB1000: embedded or tethered. Embedded programs are developed on a host computer and then uploaded to the AB1000's non-volatile Flash memory. At power-on the embedded application boots from the Flash memory and runs without host intervention. In tethered operation, a separate computer runs the application and controls the AB1000 over Ethernet.

The included Software Development Kit (SDK) provides tools and examples to facilitate the development of software applications. The AB1000 uses Ballard's universal BTIDriver API, so application software for this device is easily ported to or from other Ballard products. Although the AB1000 can be configured and run with only a few API calls, the comprehensive library includes a broad range of functions for specialized needs. Optional CoPilot® software facilitates analysis and test for in-flight and other embedded applications.

Features

- Versatile computer system
- PowerPC® processor
- 64 MB SDRAM
- 16 MB Flash
- Real time clock
- High resolution timer
- Embedded Linux operating system
- Avionics databuses

Mechanical

- Small: 4.0 x 6.0 x 1.7 in
- Lightweight: 22 oz (624 g)

Software

- Universal BTIDriver™ API compatible
- Embedded Linux® SDK (included)
- VxWorks® and other RTOS BSPs (optional)
- CoPilot® analysis & test software (optional)

Benefits

- Very compact to fit in small spaces
- Powerful protocol engine
- Mixed protocol saves system space
- Free customer support for product life

Applications

- Protocol converter
- Data server (Ethernet)
- Data recorder
- Remote monitor
- Ethernet-to-avionics bridge
- Remote control/monitoring interface

AB1000 Avionics BusBox®

Available Interfaces

MIL-STD-1553

1 dual-redundant channel
BC/RT/MON (Single- or Multi-Function)
Hardware controlled transmit scheduling
TA/SA message filtering
Sequential monitor

ARINC 429

6 channels
Periodic and asynchronous messages
Hardware controlled transmit scheduling
Receive message filtering (Label/SDI)
Sequential monitor

RS-232/422/485

2 channels
Selectable baud rates
Optional handshake signals (232 mode)

Ethernet

1 port
Auto-sensing 10/100 Mb/s
TCP/IP, UDP
Built-in Telnet, FTP, and Web servers

USB 2.0 Host

1 port
High Speed (480 Mb/s)
Mass storage devices

Avionics Discrete I/O

4 Outputs/6 Inputs
Outputs: Open/GND
Inputs: Open/GND or 28V/Open

Time-tag/IRIG

48-bit hardware time-tag (1µs resolution)
IRIG A or B, PWM, and PPS
Generate or synchronize
Synchronize hardware time-tags

Specifications

The AB1000 is available in numerous configurations that all share the base model features below:

Base Model Features

- PowerPC processor
- 64 MB SDRAM
- 16 MB system flash
- Real-time clock (with 650+ hours of backup)
- CompactFlash slot – factory populated with 512 MB CompactFlash (with power fail protection)
- High resolution timer for time-tagging events (1µs)
- 2 RS-232/422/485 (selectable)
- 1 Ethernet (10/100) port
- 1 USB host port
- 6 Open/GND discrete inputs
- 4 Open/GND discrete outputs
- 28 VDC supply (industrial grade)
- MTBF: 450,000+ hours

Environmental

Component temperature: -40 to +85°C
Storage temperature: -55 to 100°C
Vibration tolerant construction

Mechanical

Compact enclosure:
4.0 x 6.0 x 1.7 inch (102 x 153 x 44 mm)
excluding connectors and flange
Weight: 22 oz (624 g)

Software

Embedded Linux OS and SDK (included)
Universal BTIDriver API compatible
CoPilot analysis & test software (optional)

AB1000 Models

Ballard offers several AB1000 configurations with different protocol combinations. Contact factory for ordering information, accessories, and custom needs. A few example configurations are shown below:

Model AB1150

Base Model features plus 4R/2T ARINC 429, and 1 dual-redundant multi-function MIL-STD-1553 channel

Model AB1140

Base Model features plus 4R/2T ARINC 429 channels

Model AB1110

Base Model features plus 1 dual-redundant multi-function MIL-STD-1553 channel

Model AB1100

Base Model features

Standard Options

AB1000 models can be customized with the following standard options. Please contact factory for more information.

- Conformal coating
- Larger CompactFlash
- Transmit disable
- Hardware write-protect memory
- Power input on D-Sub pins

Astronics Ballard Technology
11400 Airport Road
Everett, WA 98204 USA
Phone: +1.425.339.0281 800.829.1553
E-mail: sales@ballardtech.com
www.ballardtech.com

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