Technical Data Sheet

AB2000 Avionics BusBox®

Embedded Computer for Rugged Applications

Available Interfaces

MIL-STD-1553	Ethernet
ARINC 429/575	USB 2.0 Host
ARINC 708/453	Flash Drive
ARINC 717/573	Discrete I/O
RS-232/423/422/485	PMC Expansion

Description

The Avionics BusBox 2000 (AB2000) series of products are small, lightweight, conduction cooled, embedded computers for rugged environments. These off-the-shelf computers have many built-in standard peripherals and interfaces for various avionics databuses, as well as PMC expansion capability. With the addition of application software, the AB2000 provides a readily available Commercial Off-The-Shelf (COTS) solution to challenging interface, bridging and control problems. The AB2000 is available in many configurations to meet a variety of needs.

Typical applications for the AB2000 include data and protocol conversion, databus and network bridging, data servers, data recorders, communications, power controllers, federated controllers and multiple net-centric applications. The AB2000 delivers outstanding performance for applications on the ground and in the air. They are ideal for helicopter, fixed wing and ground mobile platforms.

Architecture

At the heart of the AB2000 a user programmable PowerPC processor runs the software application and controls the various standard (serial, Ethernet, USB, and discrete) and avionics databus (MIL-STD-1553, ARINC 429/708/717, etc.) interfaces. The high level of functionality implemented in the hardware interface circuitry assures full use of the PowerPC processor for the software application.

Software

There are two ways software can operate the AB2000, either embedded or tethered. Embedded programs for the PowerPC processor are first developed on a host computer and then uploaded to the AB2000's non-volatile Flash memory. At power-on the embedded application boots from the Flash memory and runs without host intervention. The tethered case is where a separate computer runs the application and controls the AB2000 over Ethernet.

The included Software Development Kit (SDK) provides tools and examples to facilitate the development of software applications. The AB2000 uses Ballard's universal BTIDriver API, so application software for the AB2000 can be easily ported to or from other Ballard products. Although the AB2000 can be easily configured and run with only a few API calls, the comprehensive library includes a broad range of functions for specialized needs. The optional CoPilot software facilitates analysis and test for in-flight and other embedded applications.

Features

- Versatile Computer System
- PowerPC® Processor
- Standard Computer I/O
- Avionics Databuses
- PMC Expansion Slot

Validated

- Helicopter, Fixed Wing, Gnd Mobile
- Rugged: MIL-STD-810
- EMC Quiet: MIL-STD-461
- Low Power: 8w to 30w
- DO-160 Certified

Mechanical

- Small: 5.25 x 7.5 x 2.5 inch
- Lightweight: 3.5 lb (1.6 kg)
- Conduction or Convection Cooled
- MIL-STD Connectors
- Mounting Hardware (optional)

Software

- Universal BTIDriver™ API compatible
- Embedded Linux® SDK (included)
- VxWorks® and other RTOS BSPs (optional)
- CoPilot® Analysis & Test Software (optional)

Benefits

- Extensively validated
- A true COTS solution
- Seamless prototype to deployment
- Reduces project risk, time, and cost
- Single solution for many applications

Ballard TECHNOLOGY

The Avionics Databus Innovators

www.ballardtech.com

AB2000 Avionics BusBox

Available Interfaces

MIL-STD-1553

Up to 4 dual redundant channels
BC/RT/MON (Single or Multi-Function)
Hardware controlled transmit scheduling
CH/TA/SA filtering
Sequential monitor

ARINC 429

Up to 12 channels (Rx/Tx)
Periodic and asynchronous messages
Hardware controlled transmit schedule
Receive message filtering (Label/SDI)
Sequential monitor

ARINC 708

Up to 4 channels
Hardware controlled transmit schedule
Receive message filtering
Sequential monitor

ARINC 717

Up to 2 channels
Biphase/Bipolar
Transmit and receive
Sub-frame and super-frame support
64, 128, 256, 512, 1024, 2048, 4096, 8192 wps
Sequential monitor

RS-232/423/422/485

2 channels
Selectable baud rates
Optional handshake signals (232 mode)
Ethernet (TCP) serial server mode

Ethernet

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

USB 2.0 Host

2 ports
High-speed (480 Mb/s)

Avionics Discrete I/O

Up to 48 programmable Input/Output
Open/GND configuration

Base Model Specifications

The Avionics BusBox is available in a number of configurations. The following is a list of the standard product features.

Base Configuration

- PowerPC processor
- 64 MB SDRAM
- 16 MB Flash
- Real Time Clock (with 650+ hours of backup)
- 2 RS-232/423/422/485 (selectable)
- 1 Ethernet (10/100) port
- 2 USB 2.0 host ports
- 16 Avionics Discrete I/O
- IRIG A/B AM/DC TTL receiver
- Voltage and temperature monitoring
- Flash drive (512MB standard)
- Conduction cooled PMC site
- Power: 28 VDC nominal
- MTBF: 350,000+ hours

Environmental

Storage temperature: -55 to 100°C
Operating temperature: -40 to 71°C
Conduction or convection cooled
DO-160, MIL-STD-810, MIL-STD-461
(Contact factory for environmental test data)

Mechanical

Compact enclosure:
5.25 x 7.5 x 2.5 inch (139 x 186 x 63 mm)
Weight: 3.5 lbs (1.6Kg)
Horizontal & vertical mounting
(CAD installation drawings available)

Connectors

Base & databus I/O:
D38999/20FG35SA (79-pin)
PMC I/O: D38999/20FG35SB (79-pin)
Power: D38999/20FC4PN (4-pin)

Software

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

AB2000 Models

Ballard offers over 60 COTS AB2000 configurations. Contact the factory for detailed information and custom needs. The following are a few example configurations:

Model AB2280

Base Model features plus 4 dual redundant multi-function MIL-STD-1553 channels

Model AB2146

Base Model features plus 8R/4T ARINC 429 and 1R/1T ARINC 717 channels

Model AB2342

Base Model features plus 8R/4T ARINC 429, 1R/1T ARINC 708 and 1 dual redundant multi-function MIL-STD-1553 channel

Many more models are available.

Contact the factory.

Standard Accessories

Interconnect Kits

17019: Mating Connectors (J1, J2)
17020: Mating Connectors (J1, J2, J3)
17021 & 17027: Lab Connectivity & Power Supply Kits

Mounting Kits

17023: Horizontal Mounting Kit
17024: Vertical Mounting Kit

In response to customer requests, new features, functions and channel counts are added to AB2000 products regularly. For more information on the AB2000, or to request a quote, visit our web site:
www.ballardtech.com/AB2000

Ballard TECHNOLOGY

The Avionics Databus Innovators

Aerospace
Military
Commercial

Interfaces
Embedded Systems
Software

Ballard Technology is committed to quality and is AS9100 / ISO 9001 registered.

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