

USB Interface to Avionics Databuses



Protocols Supported

- MIL-STD-1553
- ARINC 429/575
- ARINC 708/453
- ARINC 717/573
- Space Shuttle
- Mixed Protocols

Features

- Versatile and easy to use
- Portable
- Easily accessible
- Host-controlled or stand-alone
- Controlled via USB or serial (RS-232) interface
- API and driver software included
- Graphical software available

USB Advantages

- Easy to install (plug-and-play)
- Hot swappable
- Share with colleagues (easily moved)
- Use with portable or desktop computer
- USB ports are readily available and expandable

Description

Ballard Technology's BUSBox® is a family of versatile avionics databus interfaces. Through a BUSBox, any computer with a USB or RS-232 serial port can communicate over or monitor an avionics databus. A family of over forty BUSBox models support a variety of avionics protocols and provide many functionality options. The BUSBox may be controlled with CoPilot®, Ballard's interactive graphical user interface, or an application-specific software program.

A BUSBox can support one or more military and commercial avionics databus protocols. Multi-protocol BUSBoxes provide savings and simplicity over using separate interfaces for each protocol. A BUSBox may be upgraded later with additional channels or capabilities. Though the BUSBox is normally controlled through a USB or serial port, custom models are available for stand-alone operation as data converters.

The BUSBox offers many advantages over alternative avionics databus interfaces. It is plug-and-play and may be installed without opening or even powering down the computer, making it easy to share and move around between different portable and desktop computers. Using inexpensive USB hubs and BUSBoxes, a single computer can communicate with or monitor an unlimited number of avionics databuses. The BUSBox is small and can sit conveniently on the desktop, tucked away out of sight, or be mounted in various ways.

Custom gate arrays and a powerful Digital Signal Processor (DSP) in the BUSBox handle the avionics databus protocol without host intervention. The large on-board memory and flexible message buffering schemes ensure data integrity. Only data for messages of interest need to be passed to/from the host over the USB or serial interface.

Applications

The BUSBox is versatile enough to be used in many different test and operational applications—essentially anywhere a computer needs to interface with an avionics databus. Typical applications include research and development, production and acceptance testing, system simulation, maintenance, flight test, and on-board/in-flight avionics.

Software

The easiest way to use the BUSBox is with the powerful, graphical program called CoPilot, available as an optional package. CoPilot supports and greatly simplifies tasks associated with defining and scheduling messages and with capturing and analyzing data.

Alternatively, software developers can use the bundled Application Program Interface (API) that enables quick and easy development of custom applications. With only a few API calls, a program can configure the BUSBox and process messages to/from the avionics databus. Although most tasks require only a few API functions, the comprehensive library includes a broad range of tools for specialized needs.

Models and Protocols

MIL-STD-1553: All 1553 models provide Bus Controller (BC), Remote Terminal (RT), and Monitor operation and support all 1553 message types. Advanced models can simultaneously operate as the BC, Monitor, any number of RTs, and selectively inject protocol errors.

ARINC 429: Combinations of transmit and receive channels are available for a total of 2, 4, or 8 ARINC 429 channels. Receive channels have error and speed detection and extensive filtering. Transmit channels automatically maintain transmit intervals and allow selective error injection and concurrent aperiodic labels.

Others: Interfaces for ARINC 708 (weather radar), and ARINC 717 (flight data recorder) are also available.

Combinations: Models are available with different mixes of protocols. Some of the more popular combinations of protocols are ARINC 429 with ARINC 717, ARINC 429 with ARINC 708, and MIL-STD-1553 with ARINC 429.

Custom: The BUSBox may be easily adapted to custom requirements. A display and keypad are available.

Ordering Information

Contact customer support at Ballard Technology for ordering information on standard and custom BUSBox products. Included with each BUSBox is a USB cable, power supply, API libraries, and manuals.

Technical Specifications: BUSBox

Avionics Protocols (model dependent)

MIL-STD-1553
ARINC 429/575
ARINC 708/453
ARINC 717/573
Mixed Protocols

DSP Core: 100 MHz

Memory: 1 MB

Time-Tag:

32-bit
Selectable range/resolution

USB Interface

USB Rev. 1.1 compliant
Speed: 12 Mbps
Plug-and-play

RS-232 Interface

9-pin D-sub connector
Speeds up to 115.2 Kbaud

Software

Easy-to-learn API
Drivers: Windows 98/Me/2000/XP
Optional graphical interface (CoPilot)

Size

178 x 140 x 39 mm
7.5 x 5.5 x 1.5 in.

Power

6 V DC (115 V AC adapter supplied)

Ballard//////
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Specializing in avionics databuses

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ARINC 429/575/629/708/717
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