The OmniBus® Family

Multi-Protocol

High-Performance Interfaces to Multiple Avionics Databuses

Protocols

- MIL-STD-1553
- ARINC 429/575
- ARINC 708/453
- ARINC 717/573
- RS-232/422/485
- Discrete I/O
- Custom

Platforms

- PCI
- cPCI/PXI
- VME
- BUSBox
  - USB
  - Ethernet

Features

- High channel count
- Mixed protocols
- User processor (PowerPC)
- IRIG synchronization

Description

Ballard's OmniBus® family of avionics databus interfaces takes flexibility and power to a new level. With the demand for products with high channel counts and multi-protocol capability comes the need for more processing power, not only for handling the protocol but also for running the user's application. Ballard has addressed these requirements through modularity and by adding multiple processors.

Flexible Configuration

OmniBus modularity allows additional processors to be added as more channels and/or protocols are added. Previous generations were single-protocol products implemented with protocol-specific circuitry and a single processor (usually a DSP). Ballard has always been careful to provide sufficient processing power in the on-board DSP to handle the protocol processing for all buses while fully loaded without relying on the host processor. Though more channels could be provided by adding more protocol-specific circuitry, data could be lost when the DSP becomes overloaded. In the old configuration, applications needing a large number of channels or different protocols would require several individual products with their added cost of computer space (slots) and poor economy of scale.

Each OmniBus module has its own DSP that can handle all channels and protocols connected to it (see diagram on next page). Therefore, OmniBus modularity provides a high channel count and mixed protocol capability without the risk of overloading the DSP. The more channels and protocols there are, the more DSPs there are. If OmniBus capability were to be provided without modularity, a large number of different protocol and channel count combinations would need to be developed and stocked. Through modularity, Ballard can provide unique user-specified configurations on short notice at minimum cost.

User Processor

An on-board PowerPC® processor can be programmed by the user to off-load the host computer.

Ballard Technology

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Possible applications include dynamic data generation/simulation, data filtering, and event triggering. Programs for the PowerPC processor are uploaded from the host and, if desired, may be saved in non-volitile on-board Flash mem-ory. Applications can be configured to automatically boot from Flash memory and run on the PowerPC processor without host intervention.

Additional Features

The IRIG circuit allows channels, boards, and other equipment to be synchronized to a standard clock time. The IRIG time can come from an outside source or be generated by one of the OmniBus modules.

All modules have various digital input and output signals.

OmniBus products are available for industrial temperatures. Commercial temperature versions are standard.

Software

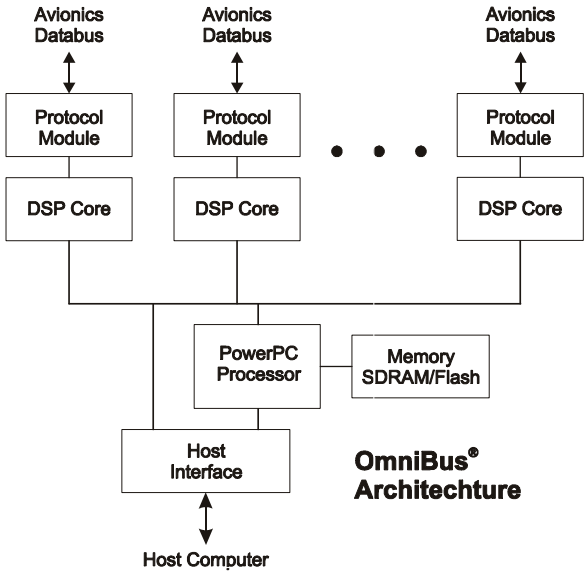
The easiest way to use an OmniBus product is with CoPilot®, Ballard's Windows®-based software (available separately). Because CoPilot can host multiple cards, channels, and databuses (MIL-STD-1553, ARINC 429, and ARINC 708), it is the ideal tool for OmniBus. CoPilot auto-detection, engineering units conversions, and other features increase user productivity. The Plus version of CoPilot adds graphical displays, a powerful scripting engine, and software and hardware playback.

Alternatively, software developers can use the included Application Program Interface (API) to quickly develop custom applications. Although an OmniBus product can be easily configured and run with only a few API calls, the comprehensive library includes a broad range of tools for specialized needs.

Driver software is included for Windows® 95/98/NT/Me/2000/XP. Call for availability of drivers for other operating systems (Linux, VxWorks®, etc.).

Ordering Information

Contact Customer Support at Ballard Technology for ordering information on OmniBus products.



OmniBus® Architechture

OmniBus Configurations:

Channel Count per Module

Protocol	*Maximum Channels*
1553	2 (both dual redundant)
429	16 (various R/T combinations)
708	4 (2R/2T)
717	Mix (biphase and bipolar)

Module Count per Platform

Platform	*Modules*
PCI (short)	2
cPCI/PXI	2 (3U); 4 (6U)
VME	4 (6U)
BUSBox	2

Example Configurations for 2 Modules

- Up to 4 MIL-STD-1553 channels
- Up to 32 ARINC 429 channels
- 1 or 2 MIL-STD-1553 channels plus up to 16 429 channels
- Up to 16 ARINC 429 channels plus 2 or 4 ARINC 708 channels
- Up to 24 ARINC 429 channels plus 8 ARINC 717 channels

Example Configurations for 4 Modules

- Up to 8 MIL-STD-1553 channels
- Up to 64 ARINC 429 channels
- 1 or 2 MIL-STD-1553 channels plus up to 48 ARINC 429 ch.
- Up to 48 ARINC 429 channels plus 2 or 4 ARINC 708 channels
- Up to 40 ARINC 429 channels plus 2 or 4 ARINC 708 channels plus 8 ARINC 717 channels

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