

# High-Performance VME Interface to Multiple Avionics Databases

## Protocols

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

## Features

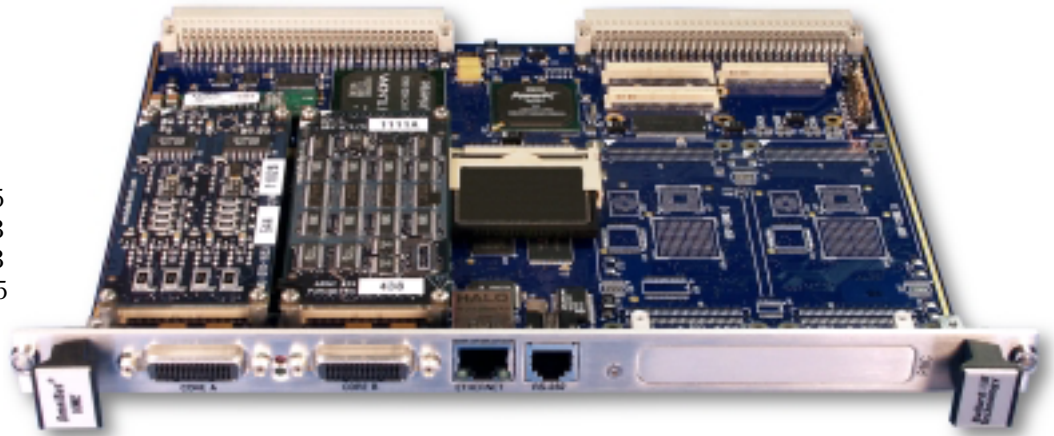
- High channel count
- Mixed protocols
- PowerPC user processor
- Ethernet and serial ports
- CompactFlash socket
- PMC site available
- IRIG time synchronization
- Extended temperature available
- Can be upgraded/reconfigured

## Description

The high-performance OmniBus VME may be used for simulating, monitoring, and testing avionics databases. OmniBus VME is a member of Ballard's OmniBus® product line, a family of avionics databus interfaces that 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. The OmniBus family has addressed these requirements through modularity and by adding multiple processors.

## Flexible Configuration

Through modularity, Ballard can provide unique, user-specified con-



figurations on short notice at minimum cost. The flexibility of this design allows more protocol and channel count combinations to be developed and stocked than is practical with fixed configurations. The unique OmniBus architecture offers higher performance than general-purpose modular systems. Modularity also means that users may upgrade or reconfigure their OmniBus with additional functionality, channels, and protocols as their requirements change.

## Multiple Processors

OmniBus modularity allows additional processors to be added as more channels and/or protocols are added. Because each module has its own DSP (see diagram on next page), OmniBus products provide high channel count and mixed protocol capability without relying on the host processor or risking data loss from an overloaded DSP. By including more channels, protocols, and processing power in a single product, OmniBus provides better economy of scale and requires less computer space (slots).

## User Processor

An on-board PowerPC® processor can be programmed by the user to off-load or run independently of the VME system processor. Users can upload programs and may save them in non-volatile on-board memory. The PowerPC can be configured to automatically boot and run without host intervention. OmniBus VME can function as a VME system controller or as an intelligent I/O board. Possible applications include data servers/converters, dynamic data generation/simulation, data filtering, and event triggering.

## Additional Capabilities

- OmniBus VME provides a 10/100 Ethernet port, serial RS-232 port, and CompactFlash® socket.
- In addition to normal operation through the VME backplane, the OmniBus VME may be controlled remotely through the Ethernet port.
- The VME interface is implemented with the Universe II from Tundra, which provides a wide range of address and data transfer modes.

- For additional flexibility, OmniBus VME can be ordered with a PrPMC-compatible PMC site that can operate in Monarch or non-Monarch modes.
- IRIG circuits allow 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 on board.
- All OmniBus products include various digital input and output signals.

## Software

Software developers can use the included BTIDriver™ API library to quickly develop custom applications. Although each OmniBus product can be easily configured and run with only a few API calls, the comprehensive library includes a broad range of functions for spe-

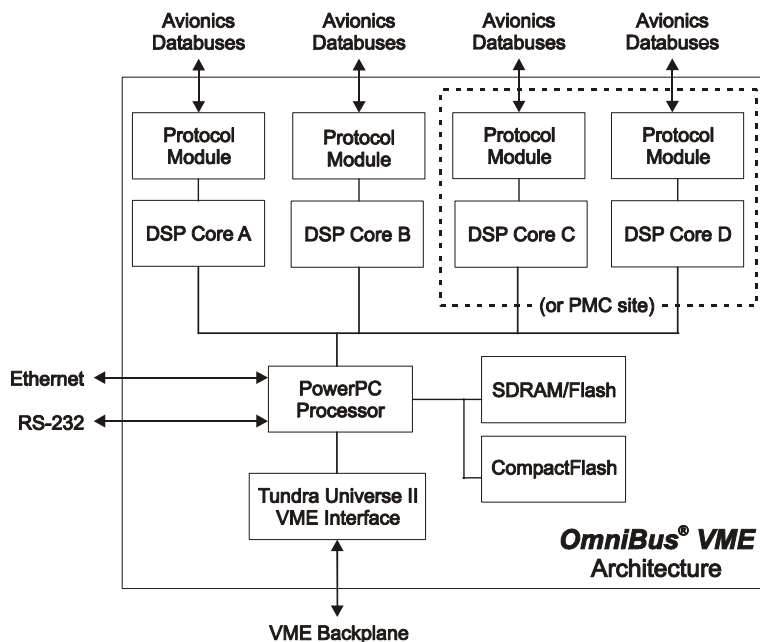
cialized needs. All OmniBus products run Ballard's universal BTI-Driver API, so applications developed for one platform or product can be easily ported to another.

Source-level drivers are included for interfacing to the OmniBus VME board. An SDK is available for experienced Linux users to develop software for the PowerPC.

## Ordering Information

The order number for an OmniBus product is a combination of the board part number and module part number(s). For example, a 152-xxx-xxx is an OmniBus VME with two protocol modules and a PMC site (xxx = module P/N).

| P/N | Description                 |
|-----|-----------------------------|
| 152 | two-core VME with PMC site  |
| 154 | four-core VME (no PMC site) |



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### OmniBus Products:

- OmniBus PCI
- OmniBus cPCI
- OmniBus VME
- OmniBusBox (Ethernet/USB)

### OmniBus Protocols:

- MIL-STD-1553
- ARINC 429
- ARINC 708
- ARINC 717

## OmniBus VME Configurations:

### Channel Count per Module

| Protocol | Maximum Channels                   |
|----------|------------------------------------|
| 1553     | 2 (both dual redundant)            |
| 429      | 16 (various R/T combinations)      |
| 708      | 4 (2R/2T)                          |
| 717      | 4R/4T (biphase/bipolar selectable) |

### Example Configurations for 2 Modules

- Up to 4 MIL-STD-1553 channels
- Up to 32 ARINC 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
- 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

## Technical Specifications:

### Interfaces

Tundra Universe II VME:

- A32/A24/A16 master and slave
- D64/D32/D16/D08 master and slave
- MBLT, BLT, ADOH, RMW, LOCK, location monitors

PMC site (P/N 152 only):

- PrPMC compatible
- Monarch or non-Monarch modes

Ethernet: 10/100 auto-speed sensing

RS-232: Two ports (on single RJ12)

CompactFlash slot: Type I/II

IRIG modes: A and B

### Software

BTIDriver™ API included (VB, C/C++, LabVIEW®)

CoPilot® available (Windows® software)

Source-level OS drivers included

Embedded Linux installed; SDK available

### Main Board

Processor: IBM PowerPC® (405GPr), 333 MHz

Memory: 64 MB SDRAM, 4 MB Flash

DIO: 2 inputs, 2 outputs (additional 3 inputs and 3 outputs per core)

Other: real-time clock (200+ hrs. backup)

### Physical

Size: 6U x 4HP (233 x 160 x 20 mm)

Weight: 3.5 lbs. (1.6 kg)

### Connectors

60-pin Molex® LFH™ (per core)

Various cables and connectors available

### Power

Contact Ballard Technology for details

### Environmental

Temperature: 0–55° C (extended temperatures available)

Humidity: 0–95% (non-condensing)

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