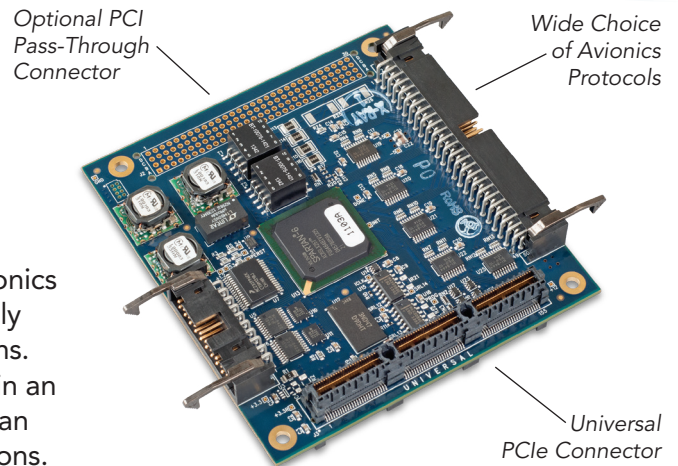# PE1000

PCIe/104 & PCI/104-Express Avionics Interface Cards

The PE1000 family of PCIe/104™ and PCI/104-Express™ cards enable embedded computers to interface with a variety of avionics databuses. These rugged cards provide the capability to reliably communicate with and monitor avionics equipment and systems. The family includes models with single and multiple protocols in an assortment of channel counts and functionality. A single card can provide all the avionics functionality needed for most applications.

Optional PCI Pass-Through Connector

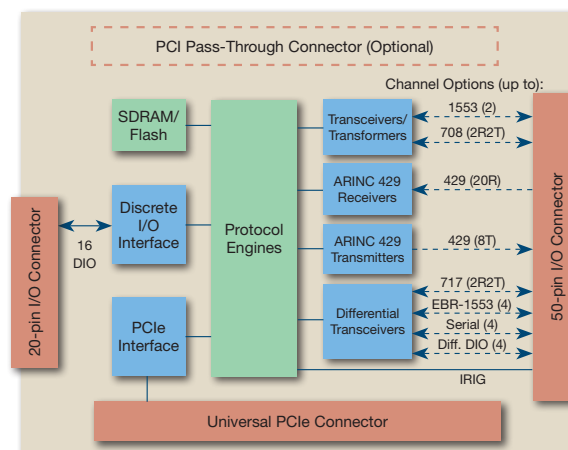*Wide Choice of Avionics Protocols*

Universal PCIe Connector

Multi-Protocol Databus Interfaces

PE1000 interface cards use Ballard's time-tested 5th generation avionics protocol engines with bus mastering and a large 32 MB built-in memory to yield high performance. All models include sixteen avionics level input/output discretes and IRIG time synchronization/generation.

There is a wide choice of models—ranging from simple, single-protocol, low channel-count cards to complex, multi-protocol, high chan-nel-count cards. Equivalent models are available in both PCIe/104 and PCI/104-Express. Extended temperature range is standard, and conformal coating is an option. This wide selection allows the most cost effective solution to be used on each application.

Software Capabilities

Users can develop their own software applications with the included BTIDriver™ API. With only a few function calls, a program can operate the interface card and process messages to and from the avionics databuses. Functions include routines for transmitting, receiving, scheduling, recording, time-tagging, and manipulating data.

KEY FEATURES

- Multiple protocol support
- Rugged extended-temperature design
- Single- or Multi-function MIL-STD-1553 models
- Easy-to-use software interface
- RoHS compliant
- Wide range of avionics I/O:
  - MIL-STD-1553
  - ARINC 429, 708, 717
  - EBR-1553
  - RS-422/485/232 Serial
  - Avionics Discrete I/O
  - IRIG A/B PWM and AM

The interface card can use applications developed for other Ballard devices. Code migrates seamlessly from BTIDriver compatible devices or through a translation driver from older Ballard devices.

PE1000 Card Block Diagram

Avionics Interfaces

MIL-STD-1553

Up to 2 dual-redundant channels
BC/RT/MON (Single- or Multi-Function)
Hardware controlled transmit scheduling
CH/TA/SA filtering
Sequential monitor

ARINC 429

Up to 20 receive channels
Up to 8 transmit channels
Periodic and asynchronous messages
Hardware controlled transmit scheduling
Receive message filtering (Label/SDI)
Sequential monitor

ARINC 708

Up to 4 channels (2R2T)
Hardware controlled transmit scheduling
Receive message filtering
Sequential monitor

ARINC 717

Up to 4 channels (2R2T)
Biphase/Bipolar
Transmit and receive
Sub-frame and super-frame support
64,128,256,512,1024,2048,4096,8192wps
Sequential monitor

RS-422/485/232 Serial

Up to 4 ports
Selectable baud rates

Avionics Discrete I/O

16 programmable inputs/outputs
Input: Open/GND
Output: Open/GND, 200 mA (max)
Log transitions to sequential record

Differential Discrete I/O

Up to 4 programmable inputs/outputs

Enhanced Bit Rate 1553 (EBR-1553)

Up to 4 ports (1 channel)
Contact factory for availability

Specifications

Standard Features

- Model dependent protocol capability
- 16 avionics discrete I/O
- Up to 4 differential discrete I/O (except 20-channel ARINC 429 models)
- IRIG A/B input and output
- 32 MB on-board memory

Time-Tag/IRIG

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

Environmental

Component temperature: -40 to 85°C
Storage temperature: -55 to 100°C

Mechanical

Weight: approx. 3.5 oz (100 g)
Dimensions: 3.6 x 3.8 inch (90 x 96 mm)

PCIe Bus

PCie x1 Link
Power: +3.3 and +12 VDC
Supports Type 1 and Type 2 hosts

Connectors

Protocol I/O & IRIG connector
   - AMP 50-pin latching header
   - IDC Socket: 2-1658526-4 Mate
   - Wire Socket: 1-102387-0 Mate
   - Wire Contacts: 87667-5
Discrete I/O connector
   - AMP 20-pin latching header
   - IDC Socket: 1-1658526-3 Mate
   - Wire Socket: 102387-4 Mate
   - Wire Contacts: 87667-5

Software

Universal BTIDriver API for C/C++,
C#, VB, VB.Net, and LabVIEW
MS Windows® and Linux® OS drivers
Translation DLLs for older Ballard devices
Call for latest language and OS support

PE1000 Models

Numerous protocol combinations are available. Contact factory for ordering information, options, and custom needs. Following are a few example configurations:

Example configurations:

- **Model PE1490** – Standard features plus 2 dual-redundant multi-function MIL-STD-1553 and 12R8T ARINC 429 channels
- **Model PE1461** – Standard features plus 2 dual-redundant multi-function MIL-STD-1553, 8R8T ARINC 429 and 2R2T ARINC 717 channels
- **Model PE1400** – Standard features plus 2 dual-redundant multi-function MIL-STD-1553 channels
- **Model PE1090** – Standard features plus 12R8T ARINC 429 channels
- **Model PE1070** – Standard features plus 20R ARINC 429 channels
- **Model PE1061** – Standard features plus 8R8T ARINC 429 and 2R2T ARINC 717 channels
- **Model PE1661** – Standard features plus 2R2T ARINC 708, 8R8T ARINC 429 and 2R2T ARINC 717 channels

Many other configurations are available, contact factory for more information.

Options

- Conformal coating (Parylene)
- PCI/104-Express compatibility (PCI™ pass-through)

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