

# PE1000 Interface Cards

## PCIe/104 · PCI/104-Express

### Multi-Protocol Databus Interfaces

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.

PE1000 interface cards are easy to install, integrate, and operate. High performance assures maximum data throughput on all channels. With all its capability and versatility, the PE1000 is ideal for a wide range of avionics embedded and test applications.

### Hardware

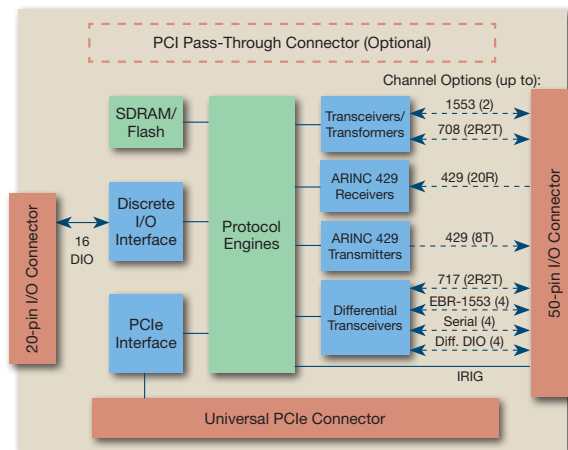
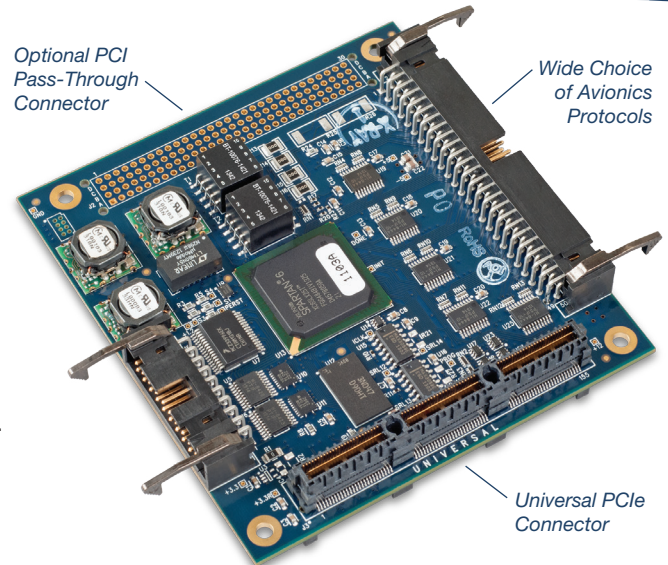
PE1000 interface cards use Ballard's time-tested 5th generation avionics protocol engines with bus mastering and a large 32 MB built-in memory to yield high performance. All models include sixteen avionics level input/output discretes and IRIG time synchronization/generation.

There is a wide choice of models — ranging from simple, single-protocol, low channel-count cards to complex, multi-protocol, high channel-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

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.

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.



PCIe/104 and PCI/104-Express Card Block Diagram

### Interfaces

- Up to 2 MIL-STD-1553 Channels
- Up to 20 ARINC 429 Receive Channels
- Up to 8 ARINC 429 Transmit Channels
- Up to 4 ARINC 708 Channels
- Up to 4 ARINC 717 Channels
- UP to 4 ports EBR-1553
- Up to 4 RS-422/485 Serial
- 16 Avionics Discrete I/O
- IRIG A/B PWM and AM

### Features

- Multiple protocol support
- Rugged extended-temperature design
- Single- or Multi-function 1553 models
- Easy-to-use software interface

### Software

- Universal BTIDriver™ API compatible
- Efficient DMA monitoring
- Compatible with other Ballard hardware

### Benefits

- Powerful protocol engine
- Easy installation
- Free customer support for product life
- RoHS compliant

### Applications

- Mission computers
- Embedded monitor/recorder systems
- LRU and system interfacing
- System analysis and integration testing
- Performance monitoring and analysis
- OEM equipment

# PE1000 Interface Cards

## PCIe/104 · PCI/104-Express

### Available 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 429/575

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 708/453

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

#### ARINC 717/573

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

#### Differential Discretes

Up to 4 Differential Discrete I/O

#### Enhanced Bit Rate 1553 (EBR-1553)

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

#### RS-422/485 Serial

Up to 4 channels  
Contact factory for availability



Ballard Technology is a member  
of the PC/104 Consortium.

### Astronics Ballard Technology

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### Specifications

#### Base Model Features

- Model dependent protocol capability
- 16 Avionics Discrete I/O
- Up to 4 Differential Discrete I/O
- IRIG A/B input and output
- 32 MB on-board memory

#### Avionics Discrete I/O

16 programmable inputs/outputs  
Output: Open/Gnd, 35 VDC, 200 mA (max),  
self monitoring, inductive load protected  
Log transitions to sequential record

#### Time-tag/IRIG

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

#### Environmental/Mechanical

Component temperature: -40 to + 85 deg C  
Storage temperature: -55 to +100 deg C  
Weight: approximately 3.5 oz (100 g)  
Dim: 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



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### 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.*

### Example Configurations

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

#### Model PE1490

Base Model features plus 2 dual-redundant  
multi-function MIL-STD-1553 and 12R8T  
ARINC 429 channels

#### Model PE1461

Base Model features plus 2 dual-redundant  
multi-function MIL-STD-1553, 8R8T ARINC  
429 and 2R2T ARINC 717 channels

#### Model PE1400

Base Model features plus 2 dual-redundant  
multi-function MIL-STD-1553 channels

#### Model PE1090

Base Model features plus 12R8T ARINC 429  
channels

#### Model PE1070

Base Model features plus 20R ARINC 429  
channels

#### Model PE1061

Base Model features plus 8R8T ARINC 429  
and 2R2T ARINC 717 channels

#### Model PE1661

Base Model 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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