

## Interfaces

- Mil-Std-1553
- Discrete I/O
- IRIG
- PCI or PCI Express (PCIe)

## Features

### Hardware

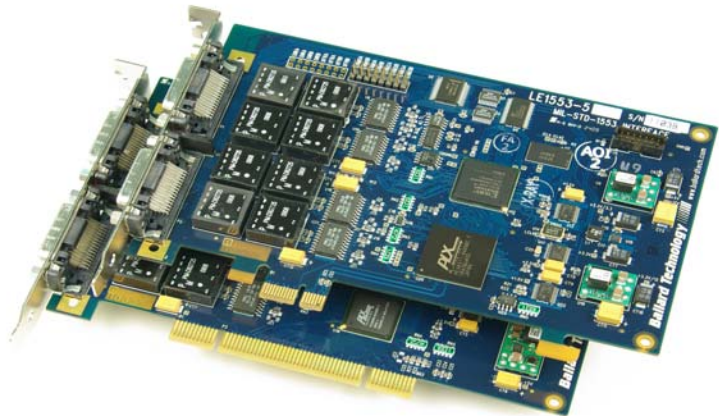
- 1 to 4 dual-redundant MIL-STD-1553 channels
- Single-function or multi-function
  - Single-function: BC or RT(s) or monitor
  - Multi-function: BC and RT(s) and monitor
- Transformer and direct coupled connections with user selectable direct termination
- 16 Avionics discrete I/O
- Large 32 MB on-board memory
- IRIG A/B PWM and AM synchronization
- 48 bit, 1 uSec hardware time-tagging
- RoHS compliant design

### Software

- Universal BTIDriver™ API
- Translation DLL for use in place of other Ballard hardware
- CoPilot® analysis, simulation, & test software supported (optional)
- DMA monitor mode

## Benefits

- Universal PCI or x1 PCIe for maximum flexibility
- Unified BTIDriver API compatible with most other Ballard products
- Plug and play installation
- Powerful protocol engines offload host application
- All power drawn from backplane (no auxiliary cabling required)



## LP1553-5 and LE1553-5 Family of Products

### Description

The LP1553-5 (PCI) and LE1553-5 (PCIe) are personal computer expansion cards for communicating with MIL-STD-1553 systems. These feature-rich interfaces provide programmable data buffers and deep built-in memory. Models offer 1 to 4 dual redundant MIL-STD-1553 channels, 16 input/output avionics level discretes, and IRIG time synchronization/generation. MIL-STD-1553 capability includes BC, RT, and/or Monitor. Avionics discretes can be used as general purpose I/O or linked in hardware to 1553 databus activity as triggers or syncs.

The Lx1553-5 model line supports maximum data throughput on all 1553 interfaces. Each channel is independently configurable as Bus Controller, Remote Terminal(s), or Bus Monitor. Messages can be captured by a sequential monitor for all channels, or via RT map monitoring. Notification of databus activity is handled through the on-board Event Log, which can be processed by polling or via an interrupt. To dramatically reduce the host CPU processing, the sequential monitor has a DMA mode that automatically moves records to host memory through PCI/PCIe bus mastering.

### Hardware

The Lx1553-5 products are half size compliant cards. Avionics transition cabling is available from the unit's I/O connectors to standard 1553 cable connections. The universal PCI or PCI Express interfaces available make the Lx1553-5 compatible with virtually all modern desktop, rackmount, and server computers.

### Software

Users can develop their own applications using the included BTIDriver API. With only a few function calls, a program can operate the Lx1553-5 and process messages to and from the avionics databuses. Functions include routines for transmitting, receiving, scheduling, recording, time-tagging, and data manipulation.

Ballard's easy-to-use CoPilot 1553 graphical software (optional) incorporates these functions and provides added productivity through virtual instrument displays, flexible monitoring and analysis tools and a powerful scripting engine.

[www.ballardtech.com](http://www.ballardtech.com)

### LP1553-5 and LE1553-5 Specifications

#### MIL-STD-1553 Interfaces

##### Bus Controller

- Automatic schedule based on message rates or custom schedule, including:
  - Multiple frames with programmable frame times
  - Programmable BC timeout values
  - Programmable inter-message gaps
  - Conditional retries and branches
- Schedule operation modes:
  - Continuous until halted
  - Specified number of loops
  - Single stepped, software or external
- Start on software or external trigger
- Programmable sync out on all or selected messages
- Aperiodic and one shot messages
- Multi-buffered messages to allow data offload into hardware

##### Remote Terminal

- Multi-terminal simulation (31 RT)
- Configurable 1553A or B response time
- User-specified response time
- Programmable status word bits
- Auto Busy Bit option
- Multi-buffered messages to allow data offload into hardware
- Support for all 1553B mode codes
- Selectable mode code subaddress
- Enable broadcast on a per-RT basis
- RT 31 as broadcast or valid RT
- RT map monitor (shadow)

##### Bus Monitor

- Concurrent with terminal simulation
- Capture all traffic or filter by RT/SA
- Capture data plus error information, time tag, active bus, RT response time

Note: Technical data subject to change without notice. Please see Ballard Technology website for the latest information.

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#### Features and Descriptions

##### Configuration

- Universal PCI interface (LP) or x1 PCIe interface (LE)
- 1-4 channels Single-function
- 1-4 channels Multi-function
- 16 avionics discrete I/O
- IRIG A/B input and output
- User LED indicators

##### Channel Details

- Channels are dual redundant, bus A and bus B
- Single-function channels are software configurable as BC, 31 RTs, or Bus monitor
- Multi-function channels are software configurable as BC, 31 RTs and Bus Monitor
- Channels support transformer or direct coupling with jumper-selectable on-board termination

##### IRIG

- IRIG A or B, AM, PWM and PPS modes
- Generate or synchronize (AM synchronize only)
- Synchronize hardware time-tags

##### Avionics Discrete I/O

- 16 avionics level inputs/outputs
- Self monitoring
- Record state transitions and time-tags to sequential record (concurrent with avionics bus activity)

##### Environmentals

- -40 to +70 deg C operational
- -55 to +100 deg C storage

##### Mechanical

- Compliant half card (6.9 x 4.2 in.) (both PCI and PCIe)
- Weight: 4.55 oz

##### Power (typical)

- PCI: +5V: 620mA; +12V: 2mA
- PCIe: +3.3V: 1120mA; +12V: 65mA

##### Connectors

- Avionics I/O: Molex™ LFH60 (/T twinax models have BJ77)

##### MTBF

- LP1553-5 (PCI) 2,000,000+ hrs
- LP1553-5 (PCIe) 2,500,000+ hrs

#### Software

- Ballard BTIDriver Unified API
- CoPilot analysis, simulation, and test software (optional)
- Windows® and Linux® Driver software
- Translation DLLs for prior Ballard products
- Contact factory for other operating systems.

#### Accessories

- LFH60 to standard 1553 transition cables

#### Ordering Information

Note: Part number with “LP” indicates PCI, “LE” indicates PCIe.

Substitute as appropriate for “Lx” below.

Part Number	Description
Lx1553-5/1S	(1) single-function channel
Lx1553-5/2S	(2) single-function channels
Lx1553-5/3S	(3) single-function channels
Lx1553-5/4S	(4) single-function channels
Lx1553-5/1M	(1) multi-function channel
Lx1553-5/2M	(2) multi-function channels
Lx1553-5/3M	(3) multi-function channels
Lx1553-5/4M	(4) multi-function channels

Single channel versions of the Lx1553-5 are available with twinax connectors:

Lx1553-5/1ST	(1) single-function channel
Lx1553-5/1MT	(1) multi-function channel

#### CoPilot Systems

All of the PCI/PCIe devices can be ordered with Ballard Technology’s easy-to-use CoPilot software. To order, prefix the part numbers with “CP-“

##### Example:

CP-LE1553-5/2M	2 channel PCIe multi-function 1553 with CoPilot software
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