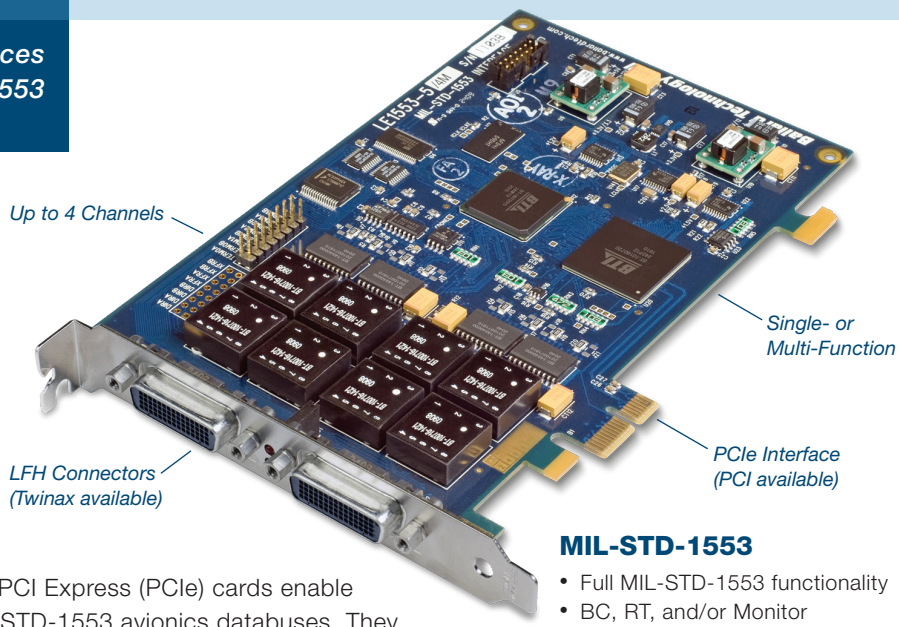
Technical Data Sheet

Lx1553-5 MIL-STD-1553 Interface

PCI and PCIe Interfaces to MIL-STD-1553



Features

Up to 4 MIL-STD-1553 Channels
16 Avionics Discrete I/O
IRIG A/B PWM and AM
32 MB Data Memory
Universal PCI and PCIe Interfaces

Description

The Lx1553-5 family of PCI and PCI Express (PCIe) cards enable computers to interface with MIL-STD-1553 avionics databuses. They provide extensive 1553 functionality and are used to communicate with, simulate, test, and monitor 1553 equipment and systems. The family includes a wide selection of models with different channel counts and capabilities.

These interface cards are easy to install and operate. Both PCI and PCIe versions are available, so the Lx1553-5 family is compatible with most modern desktop computers. They support maximum data throughput on all 1553 channels and have a large 32 MB built-in memory. With all its capability and versatility, the Lx1553-5 is suitable for a wide range of applications.

Hardware

Lx1553-5 interfaces have the latest 5th generation protocol engine and bus mastering to yield high performance. Power is obtained from the backplane bus—no supplemental power is needed. All cards are standard half size and include sixteen avionics level input/output discretes and IRIG time synchronization/generation. User software can indicate status by controlling the two LEDs.

Depending upon the hardware model, 1553 channels may be either single-function or multi-function. Single-function channels can be configured in software as either a Bus Controller (BC), a Bus Monitor (BM), or up to 32 Remote Terminals (RTs). Multi-function channels have protocol error injection capability and can simultaneously be a BC, BM, and up to 32 RTs.

Software

Users can develop their own software applications with 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 manipulating data. The Lx1553-5 can use applications developed for other Ballard devices. Code migrates seamlessly from BTIDriver compatible devices or through a translation driver from older Ballard devices.

Alternatively, Ballard's optional CoPilot software provides easy-to-use, interactive tools for databus test, analysis, and simulation. CoPilot simplifies project development and provides added productivity through virtual instrument displays, flexible monitoring and analysis tools, and a powerful scripting engine.

MIL-STD-1553

- Full MIL-STD-1553 functionality
- BC, RT, and/or Monitor
- Dual-redundant channels
- Models available: Single-function and Multi-function
- Error injection (Multi-function only)
- Transformer and direct coupling
- On-board direct coupled terminators

Software

- Universal BTIDriver™ API compatible
- Efficient DMA monitoring
- Compatible with other Ballard hardware
- Translator for older Ballard devices
- CoPilot® software (optional)

Benefits

- Universal PCI and PCIe interfaces
- Powerful protocol engine
- Easy installation
- Free customer support for product life
- 3-year limited warranty standard
- RoHS compliant

Applications

- Product development and validation
- Production testing
- LRU and system simulation
- System analysis and integration testing
- Performance monitoring and analysis
- OEM test equipment

Ballard TECHNOLOGY

The Avionics Databus Innovators

www.ballardtech.com

Lx1553-5 MIL-STD-1553 Interface

MIL-STD-1553 Features

Bus Controller

Automatic or custom scheduling
Programmable: frame times, intermessage gaps, conditional retries, and branches
Run modes: continuous, loop N times, single-step
Start on software or external trigger
Aperiodic and one-shot messages
Sync out on all or selected messages
Programmable BC timeout values

Remote Terminal

Multi-terminal simulation (32 RTs)
Configurable 1553A or B response time
Programmable response time and status word bits
Auto Busy Bit option
Support for all 1553B mode codes
Selectable mode code subaddress
Enable broadcast on a per-RT basis
RT 31 as broadcast or valid RT
Configure/legalize selected SA/MCs
RT "Shadow Monitor" mode

Bus Monitor

Capture all 1553 traffic or filter by RT/SA
Capture and time-tag discrete I/O
Sequential record includes: command/status/data words, time-tag, errors, bus, and response time(s)
Efficient DMA monitor to host

Message Data

Comprehensive error detection
Guaranteed data integrity
Buffering schemes facilitate data handling:
Single buffers (default)
Circular lists transmit a repeated pattern
FIFO list buffers for sequential data
Data initialization options
Track activity by min, max, or elapsed time

Error Injection (Multi-Function only)

Trigger from software or an external signal
Inject errors in all or tagged messages
Parity, bit count, inverted sync, Manchester, gap, and word count (relative or absolute)

Other Features

Base Configuration

- Model dependent 1553 capability
- 16 Avionics Discrete I/O
- IRIG A/B input and output
- 2 user controlled LED indicators
- 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

Interrupts/Logging

Poll or use interrupts
Configurable event log
Programmable event logging/interrupts from messages, BC schedule, and buffers

Channel Details

All channels dual redundant – Bus A and B
Single-function: BC, 32 RTs, or Bus Monitor
Multi-function: Error injection, BC, 32 RTs, and Bus Monitor simultaneously
Transformer and direct coupling
Jumper for direct coupled termination

Specifications

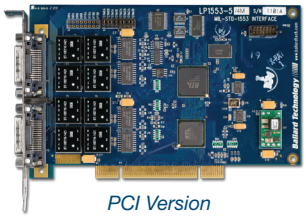
Component temperature: -40 to + 85 deg C
Storage temperature: -55 to +100 deg C
I/O Connectors: LFH or Twinax (BJ-770)
Dim: 4.2 x 6.9 inch (75 x 107 mm)

LP1553-5 (PCI)

PCI bus: 32-bit, 33/66 MHz, Universal signaling, bus mastering
Power: +5 and +12 VDC
MTBF: 2,000,000+ hours

LE1553-5 (PCIe)

PCIe bus: x1 lane, bus mastering
Power: +3.3 and +12 VDC
MTBF: 2,500,000+ hours



PCI Version

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
CoPilot analysis and test software (optional)
Call for latest language and OS support.

Ordering Information

Hardware

Includes manuals and software CD.
Part Number Example: L**E**1553-5/**1MT**

Form Factor
P = PCI, **E** = PCI Express
Channel Count
1, **2**, **3**, or **4**
Functionality
S = Single, **M** = Multi
Connectors
Blank = LFH, **T** = Twinax (1 ch. only)

CoPilot Systems

To include CoPilot, place "CP-" before the above Part Number.
Example: CP-LE1553-5/4M

Cables and Accessories

Order separately. Ballard offers a wide selection. Visit www.ballardtech.com or call for more information.

Ballard Technology is committed to quality and is AS9100 / ISO 9001 registered.

BR171-20100721

Ballard TECHNOLOGY

The Avionics Databus Innovators

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