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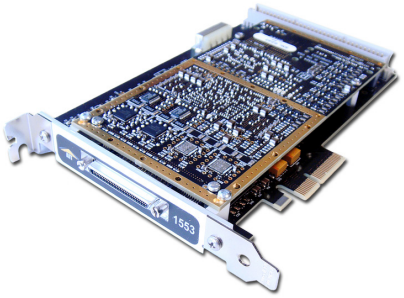
Find the *Teradyne PCIe-C1553-1* at our website: ***Click HERE***

AVIONICS INTERFACE TECHNOLOGIES
A Teradyne Company

PCIe-C1553

Single, Dual, or Quad Stream MIL-STD-1553A/B Test & Simulation PCI Express Module

AIT's PCIe-C1553-1/2/4 is part of a new family of PCIbus cards offering full function test, simulation, monitoring and databus analyzer functions for MIL-STD-1553A/B applications. One single dual-redundant MIL-STD-1553A/B stream on the PCIe- C1553-1 module (short length). Two independent dual-redundant MIL-STD-1553A/B streams are provided on the PCI-C1553-2 module (full length) and four independent dual-redundant MIL-STD-1553A/B streams are provided on the PCIe-C1553-4 module.



The PCIe-C1553 can be used for protocol testing and simulation of MIL-STD-1553A/B bus controller, multiple remote terminals and chronological monitoring at full bus load. All operations are performed concurrently with no degradation of performance in any operating mode. The PCIe-C1553 module incorporates full protocol error injection and detection features with software programmable output amplitude and bus coupling mode of the electrical bus signals. The module fully supports the protocol testing requirements defined by the Remote Terminal (RT) and Bus Controller (BC) production test plans according to SAE-AS 4112/4114.

The use of an application support processor (embedded PowerPC in the Xilinx FPGA) executing the driver software allows application specific functions to be processed onboard, significantly off-loading the host PC Processor and the PCIbus. This new concept allows users to implement system level functionality on a single interface card. A carrier card has an optional set of tranceivers allowing softwarecontrolled variable voltage and software-controlled relays for data coupling. Without this option, the carrier simply provides transformer and direct coupling on separate pinouts and fixed output voltage.

DRIVER SOFTWARE SUPPORT

Since the driver software resides on the PCIe-C1553 module, a high level application interface is provided that is compatible with Windows XP/Vista/7/8/10. Host applications can be written in MSVC, Visual Basic, Delphi, Borland C++ etc. LabVIEW/VI and LabWindows/CVI function panels are also provided.

EXTENDED FUNCTIONALITY CARRIER CARD

The Extended Functionality Carrier Card (-EF) provides programmable MIL-STD- 1553A/B transformer or direct bus coupling and variable output transceivers and a resistive bus termination to enable the direct connection of external BC or RT devices. The coupling mode to the external bus system is software programmable. Conduction-cooling is also available, according to primary and secondary ANSI/VITA-20-2001 (R2005) interfaces.

Key Features

- Dual redundant, single, dual, or quad stream configurations
- Concurrent BC, Multi-RTs, and BM operation
- Full error injection/detection capabilities
- FPGA-based Hardware Architecture
- Multi-level Trigger for Capture/Filtering
- Onboard IIRIG-B Time Encoder/Decoder with Free-wheeling mode
- Real-Time Recording and Physical Bus Replay
- ANSI Application Interface supporting C, C++, C#, and .net Development
- Device Driver Support: Windows, Linux, VxWorks, and LabView
- Flight Simulyzer™ 1553 GUI Bus Analyzer Software

ONBOARD PowerPC

An embedded PowerPC provides unique onboard processing functions typically provided by the host processing systems.

- Onboard driver software execution
- Control of RS232 debug port for firmware updates
- Dynamic data generation
- Automatic test sequence generation
- Onboard user application processing

IRIG-B TIME CODE ENCODER/DECODER

An onboard IRIG-B time code encoder and decoder allows synchronization of MILSTD- 1553A/B bus traffic using single or multiple PCIe-C1553 modules. Multiple modules can be synchronized using one common IRIG-B time source or the onboard time code generator of one module as the reference for accurate correlation of data across multiple MIL-STD-1553A/B data streams.

BUS CONTROLLER

AIT's PCIe-C1553 provides real-time bus controller functions on one, two, or four dual-redundant MIL-STD-1553A/B buses concurrently with multiple RT and chronological monitor operation.

- Autonomous operation including sequencing of minor/ major frames
- Support for acyclic message insertion/deletion
- Programmable BC Retry without host interaction
- Full error injection down to word and bit level (AS4112 compliant)
- Multi-buffering with real-time data buffer updates
- Synchronization of BC operation to trigger inputs

MULTIPLE REMOTE TERMINAL

The PCIe-C1553 simulates up to 31 RTs including all subaddresses on one, two, or four MIL-STD-1553A/B bus systems concurrently with BC and BM operation. Alternately, each of the 31 RTs can operate in a message oriented 'Mailbox Monitor Mode' to monitor non-simulated RTs.

- Programmable response time for each RT with fast RT response at 4 usecs
- Programmable and intelligent response to mode codes
- Full error injection down to word and bit level (AS4112 compliant)
- Multi-buffering with real-time data buffer updates

CHRONOLOGICAL BUS MONITOR

AIT's PCIe-C1553 offers single, dual, or quad stream bus monitoring and analysis with programmable trigger and capture features. The Chronological Bus Monitor (BM) provides accurate time tagging of all bus traffic to 1 -sec resolution including response time and gap time measurements down to 250 nsec resolution concurrently with BC and multiple RT operation.

- 100% data capture on up to four streams at full bus rates
- Autonomous message synchronization and full error detection
- Two static/dynamic complex triggers with sequencing
- Message filter and selective capture
- Bus activity recording independent from trigger and capture mode
- External trigger inputs and outputs
- Programmable response time-out

PHYSICAL BUS REPLAY

The PCIe-C1553 module is able to electrically reconstruct previously recorded MIL-STD-1553A/B databus traffic physically to the bus with excellent timing accuracy. Recorded data files can be selected for physical bus replay with the ability to disable any or all RT responses from the record file to perform systems integration and test.

Technical Data

System Interface	64-bit 33/66MHz PCIbus (Rev 2.2) compliant
Processors	Embedded PowerPC (250MHz)
Memory	Two banks of 128 MByte DDR2 SDRAM (one for Tx/Rx buffers, one for PowerPC)
Encoder/Decoder	One, two, or four MIL-STD-1553A/B encoder/ decoder with full error injection and detection capability
Time Tagging	14 Digit (400 days) absolute IRIG-B time, 1 msec resolution
Physical Bus Interface	One, two, or four MIL-STD-1553A/B trapezoidal transceivers, direct coupled stubs and transformer coupled stubs available at front panel or back panel connector
Connectors	68-pin VHDCI at front panel connector; all signals also available at rear I/O connector; 4x standard PMC connectors
I/O	Ten software programmable TTL I/O lines supporting up to 30V signaling with external reference supply
Dimensions	Standard single wide PMC; 143.7 x 74 mm; Hole and connector dimensions and locations per: ANSI/VITA 20-2001 (R2005)
Power Consumption	TBD
Operating Temp. Range	-40º C...+85º C ambient
Storage Temperature	-40º C...+85º C ambient
Humidity:	0 to 95% non-condensing

aviftech.com/PCIe-C1553

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