

AX-1553-1/2/4/8

3U AND 6U CPCI 1553 A/B AVIONICS INTERFACES

- One, two, four, or eight MIL-STD-1553A/B Interfaces with full Error Injection and Detection
- 14 Digit (400 days) absolute IRIG-B Time Code Decoder / Generator, 1 usec resolution
- One, two, four, or eight MIL-STD-1553B Trapezoidal Transceivers
- Direct coupled Stubs and Transformer coupled Stubs available at front panel connector
- Ten software programmable TTL I/O lines supporting up to 30V signaling with external reference



DESCRIPTION

The AX-1553 module is a rugged, reliable, full featured, Compact PCI module designed to provide a stand-alone, MIL-STD-1553A/B interface for avionics applications. Up to four independent dual redundant MIL-STD-1553 databus streams are supported on the 3U AX-1553 module. Additionally, the AX-1553 offers full functional test, simulation, monitoring and databus analyzer functions for MIL-STD-1553A/B applications. Up to eight MIL-STD-1533 data bus streams are supported with the 6U module.

An onboard IRIG-B time code decoder and generator allows users to accurately synchronize single or multiple AX-1553 modules to a common time source.

The AX-1553 module is available in single or full function (RT simulation, monitoring, and bus controller) configurations.

FEATURES

The AX-1553 modules utilize a simple, reliable, high performance FPGA based hardware architecture which features an embedded onboard PowerPC and the highest data throughput rates in the industry – offering a flexible platform that can be easily adapted to meet a wide range of application needs. The AX-1553 cards are configured with two 128 MByte banks of onboard memory, providing ample capacity to support high volumes of data and complex simulations.

The AX-1553 modules offer both transformer coupling and direct coupling to the data buses. The modules are available in both 3U and 6U form factors, supporting up to 4 or 8 1553 data buses respectively.

Ten fully software programmable (as input or output) TTL discrete I/O lines are provided. TTL voltage levels can be externally set up to 30 Volts.

Bus Controller

The AX-1553 module 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. Bus controller functions include:

- 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
- 4 usec Intermassage Gaps

Multiple Remote Terminal

The AX-1553 module simulates up to 31 Remote Terminals including all sub-addresses on one, two, or four MIL-STD-1553A/B buses concurrently with BC and Chronological Monitor operation.

Alternatively, each of the 31 RTs can operate in a passive receive only mode to monitor non-simulated Remote Terminals. RT functions include:

- Programmable Response Time for each RT with fast RT Response at 4 usecs
- Programmable & Intelligent Response to Mode Codes
- Full Error Injection down to word and bit level (AS4112 Compliant)
- Multi-Buffering with Real-Time Data Buffer

AX-1553-1/2/4/8

IRIG-B Time Code Decoder

An onboard IRIG-B time code decoder and generator allows synchronized time tagging of multiple MIL-STD-1553A/B streams using single or multiple AX-1553 modules. AX-1553 cards can be synchronized to one common external IRIG-B time source or to the free-wheeling onboard Time Code Generator.

Discrete I/O

The AX-1553 module provides 10 fully programmable (as input or output) discrete lines. Each discrete line is capable of TTL signaling. Additionally, output lines can drive up to 30V signals with an external supply and input lines are able to accept up to 30V signals.

Physical Bus Replay

The AX-1553 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 a physical bus replay to perform systems integration and test with the ability to disable any or all RT responses from the recorded files.

Physical Bus Interface

The AX-1553 module provides Transformer Coupling and Direct Coupling for connection to the bus. Both coupling modes are available at the front panel connector.

Chronological Bus Monitor

The AX-1553 module offers full bus monitoring and analysis with time tagging of all bus traffic to 1 usec resolution including response time and gap time measurements down to 8 nsec concurrently with BC and Multiple RT operation. Bus monitoring features include:

- 100% Data Capture on two 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 Outputs
- Programmable Response Time-Out

SOFTWARE

The AX-1553 modules is supplied with a Board Support Package (BSP) for Windows 2000/XP/ME. An ATEasy driver, sample code, high level C and C++ interface libraries, and documentation is provided. To support an application program interface, the module is supplied with AIM-USA's MIL-STD-1553 Object Wrapper Layer

(OWL) C and C++ interface library. The MIL-STD-1553 OWL provides an intuitive and easy to use object oriented interface to the module.

APPLICATIONS

- Automatic Test Equipment (ATE)
- LRU and SRU test
- System level test

SPECIFICATIONS

TIMING	
SYSTEM INTERFACE	32-bit 33/66MHz PCIbus (Rev 2.2) compliant
PROCESSOR	Embedded PowerPC (250 MHz)
MEMORY	2 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
TIME TAGGING	14 Digit (400 days) absolute IRIG-B Time, 1 usec resolution
PHYSICAL BUS INTERFACE	One, two, four, or eight MIL-STD-1553B Trapezoidal Transceivers Direct coupled Stubs and Transformer coupled Stubs available at front panel connector
CONNECTOR	68-pin VHDCI at front panel connector
GENERAL PURPOSE I/O	Ten software programmable TTL I/O lines supporting up to 30V signalling with external reference
SIZE	3U and 6U cPCI modules
POWER CONSUMPTION	TBD
OPERATING TEMP. RANGE	Standard -40° C...+85° C ambient Conduction Cooling available (primary and secondary ANSI/VITA-20-2001 (R2005) interfaces)
STORAGE TEMP	-40° C...+85° C ambient
HUMIDITY	0 to 95% non-condensing

AX-1553-1/2/4/8

ORDERING INFORMATION

AX-1553-3U-1 AX-1553-3U-2 AX-1553-3U-4	3U Single, Dual, or Quad Stream, Dual Redundant MIL-STD-1553A/B 3U card. Supports BC, Multi-RT Simulator, and Chronological Monitor and IRIG-B. Time Code. -1: Single stream -2: Dual stream -4: Quad stream
AX-1553M-3U-1 AX-1553M-3U-2 AX-1553M-3U-4	3U Single, Dual, or Quad Stream single function module consisting of one of the following: 31 Monitor only RTs, Chronological Bus Monitor OR Bus Controller OR 31 Remote Terminal simulation, IRIG-B Time Code Decoder. -1: Single stream -2: Dual stream -4: Quad stream
AX-1553-6U-1 AX-1553-6U-2 AX-1553-6U-4 AX-1553-6U-8	6U Single, Dual, Quad, or Octal Stream, Dual Redundant MIL-STD-1553A/B -1: Single stream -2: Dual stream -4: Quad stream -8: Octal stream
AX-1553M-6U-1 AX-1553M-6U-2 AX-1553M-6U-4 AX-1553M-6U-8	6U Single, Dual, or Quad Stream single function module consisting of one of the following: 31 Monitor only RTs, Chronological Bus Monitor OR Bus Controller OR 31 Remote Terminal simulation, IRIG-B Time Code Decoder. -1: Single stream -2: Dual stream -4: Quad stream -8: Octal stream
-XT	Add for extended temperature operation Note: The AX-1553 module is designed for extended temperature operations. If the -XT option is selected, the module is individually tested for operation over the extended temperature range prior to shipment.

AX-1553-1/2/4/8

THIS PAGE INTENTIONALLY LEFT BLANK