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Right on Target

AIM-USA

AMC1553-x



Single, Dual or Quad Stream
MIL-STD-1553A/B Test and
Simulation Module for PMC



data sheet



Right on Target

Avionics Databus Solutions

AMC1553-x

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product guide



General Features

The AMC1553 family of PCI Mezzanine (PMC) modules provide full function Test, Simulation, Monitoring and Databus analyser functions for MIL-STD-1553A/B applications.

One, two or four independent dual redundant MIL-STD-1553A/B Databus streams are provided on the Multi Channel AMC1553-x modules. (See rear page for Part Numbers and ordering information).

An onboard, sinusoidal, IRIG-B time code encoder/ decoder allows users to accurately synchronize multiple modules to a common time source.

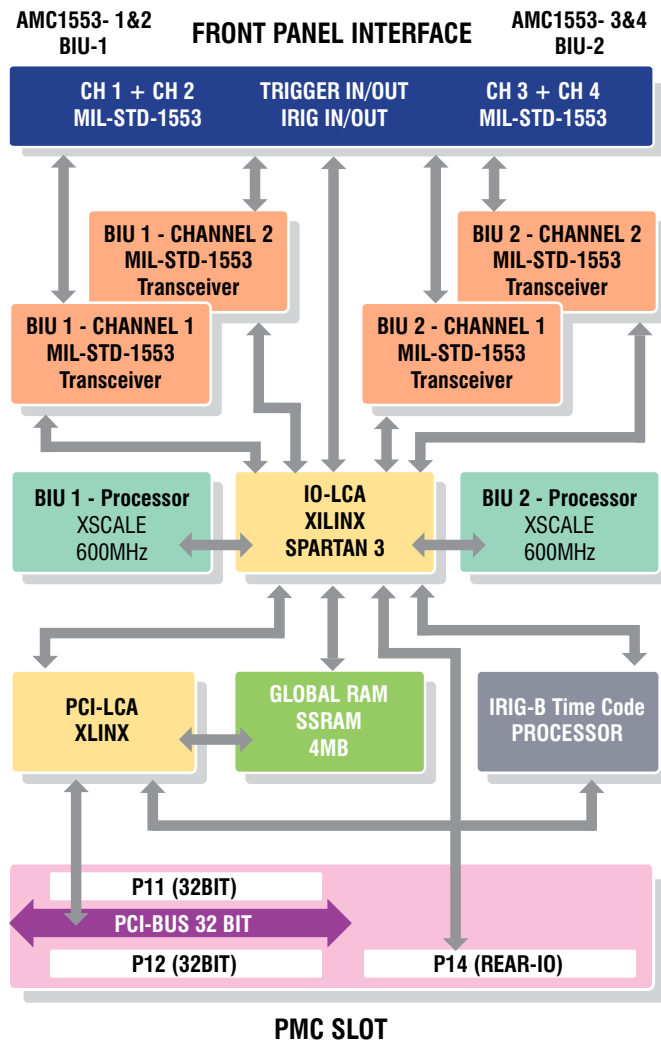
The AMC1553-x modules use two high performance RISC processors, each of them supporting one Dual Channel Bus Interface Unit (BIU2), each implementing two independent MIL-STD-1553A/B Channels. The AMC1553-x offers Transformer coupling to the MIL-STD-1553A/B Databus.

AMC1553-x cards operate with the optional **PBA.pro™** Databus Test & Analysis Tool (for Windows & Linux) and **PBA-2000/ ParaView** Databus Analyzer/ Visualiser Software (for Windows). Full function driver software is delivered with the AMC1553-x cards.



AMC1553-x

Functional
Block Diagram



Bus Controller

The AMC1553-x modules provide real time Bus Controller functions on each independent, dual redundant MIL-STD-1553A/B Databus Channel, concurrently with Multiple RT and Chronological Bus Monitor operation. Two 600MHz RISC processors, one for each Dual Channel Bus Interface Unit (BIU₂), provide true simulation of BC operations, without Host Computer interaction.

Key Features of the Bus Controller Mode include:

- *Autonomous operation including sequencing of Minor/ Major Frames*
- *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 external trigger inputs*

Multiple Remote Terminal

The AMC1553-x modules simulate up to 31 Remote Terminals, including all sub addresses on each MIL-STD-1553A/B Channel, concurrently with BC and Chronological Monitor Operation. Alternatively each of the 31 RT's can operate in message orientated Mailbox Monitor Mode to monitor Non Simulated RT's.

Key features of the Remote Terminal Simulation Mode include:

- *Programmable Response Time for Each RT*
- *Programmable & 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

The AMC1553-x modules provide full bus monitoring and analysis with time tagging of all bus traffic to 1 μ s resolution including response time and gap time measurement down to 250ns concurrently with BC and Multi RT operation.

Key features of the Chronological Bus Monitor:

- *100% Data Capture on each Channel*
- *Autonomous message synchronization and Full Error Detection*
- *Two Dynamic Complex Triggers with sequencing*
- *Message Filter and Selection Capture*
- *Bus Activity recording independent from trigger and capture mode*
- *External Trigger Outputs*
- *Programmable Response Timeout*

Physical Bus Interface

The AMC1553 modules provide Transformer Coupling Bus mode for connection to the MIL-STD-1553A/B Bus stub.

The MIL-STD-1553A/B output voltage level is of fixed amplitude. All MIL-STD-1553A/B signals are provided at the front panel output connectors or Rear-IO Connector. (Direct coupling can be provided instead of Transformer coupling/ Configuration options available at time of order).

Physical Bus Replay

The AMC1553-x modules can reconstruct previously recorded MIL-STD-1553A/B Databus traffic physically to the Bus. Recorded data files can be selected for a physical Bus replay to perform system integration and test with the ability to disable any or all RT responses from the recorded files.

Trigger/ Discrete Signals

The Front I/O connectors provide one trigger Input and one trigger Output (shared between Bus Controller and Bus Monitor) for each MIL-STD-1553A/B channel. Additionally two user programmable Discrete I/O signals can be accessed via Front I/O. The PMC's Rear I/O Interface provides three separate trigger Inputs and three trigger Outputs for Bus Controller, Remote Terminal and Bus Monitor for each MIL-STD-1553A/B channel. All eight onboard Discrete I/O signals, which are user programmable for Input or Output can be accessed via Rear I/O. Voltage level amplitude of all Trigger signals and Discrete I/O's is TTL compatible.

IRIG-B Time Code Decoder

AMC1553-x Modules have an onboard IRIG-B time decoder and generator, with sinusoidal output and free wheeling mode for time tag synchronization. This allows synchronization of multiple modules to one common external IRIG-B time input source. Alternatively the onboard time code generator of one AMC1553-x module in the system can provide a timing reference for correlation of data captured across multiple databus streams.

Driver Software

The AMC1553-x modules are supplied with a BSP (Board Software Package) for Windows 2000/XP/Vista and embedded VME systems (e.g.VxWorks) comprising system drivers, application interface libraries, sample code and manuals. The VME BSP is provided in source code for integration support to the usual Operating Systems.



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Right on Target

Technical Data

System Interface: 32bit/ 33MHz PCIbus (Rev. 2.2) compliant

Processors: Two 600MHz RISC Processors

Memory: Up to 4MB Global RAM (SSRAM)

Encoder/ Decoder: Up to four MIL-STD-1553A/B Encoder/ Decoder with full Error Injection and Detection

Time Tagging: Sinusoidal 46bit absolute IRIG-B Time stamping with 1µs resolution

Trigger/ Discretes: Full Trigger configuration on Rear-IO PMC Connector P14. One Trigger Input and Trigger Output for each Channel are available with two Discretes on the front panel connector

Physical Bus Interface: Up to four MIL-STD-1553B Trapezoidal Transceivers. Transformer coupled Stubs, three Trigger I/O's per channel and 8 General Purpose Discrete I/O's available at Rear IO Connector:

- Two 15-way (female) HD-Sub
- Four Independent MIL-STD-1553A/B Channels
- One Trigger Input and Output per channel
- IRIG-B Time Code In/ Out
- 3 x Standard PMC Connectors
- P11 & P12 for 32bit PCI Bus
- P14 for Rear-I/O

Dimensions: 149 x 74 mm Standard PMC Format

Thermal Conduction Cooling: Enhanced Thermal performance for Conduction Cooling in Extended temperature range

Power Consumption: Min. Power: 3.5W (Idle Mode)
Max. Power: 9W (100% Bus Operation)
(Typical Values for AMC1553-4)

Operating Temp. Range: Standard 0°C ... +70°C ambient
Extended temperature range -40°C...+85°C
Conduction cooled versions available

Storage Temp: -40°C...+85°C

Humidity: 0 to 95% non-condensing

Ordering Information

AMC1553-1 Single Stream, Dual Redundant MIL-STD-1553A/B PMC Module:
BC, Multi-RT Simulator with Mailbox & Chronological Monitor; IRIG-B Time Decoder, 1MB Global RAM

AMC1553-2 Dual Stream, Dual Redundant MIL-STD-1553A/B PMC Module:
BC, Multi-RT Simulator with Mailbox & Chronological Monitor; IRIG-B Time Decoder, 2MB Global RAM

AMC1553-4 Quad Stream Dual Redundant MIL-STD-1553A/B PMC Module:
BC, Multi-RT Simulator with Mailbox & Chronological Monitor; IRIG-B Encoder/ Decoder, 4MB Global RAM, 8 General Purpose Discrete I/O's

Simulator Only versions available
BC, Multi RT Simulator with Mailbox Monitor

Single Function versions available
Chronological Monitor & Mailbox Monitor OR Bus Controller OR Multi RT and Mailbox Monitor

ACB-HD15-1 Cable (2.0m) from 15-pin HD-Sub to two Twinax Connectors

ACB-HD15-1-F Cable (2.0m) from 15-pin HD-Sub to two Twinax Connectors and 9-pin D-Sub Connector for Trigger I/O, IRIG-B and Discretes

ACB-HD15-2 Cable (2.0m) from 15-pin HD-Sub to four Twinax Connectors

ACB-HD15-2-F Cable (2.0m) from 15-pin HD-Sub to four Twinax Connectors and 9-pin D-Sub Connector for Trigger I/O, IRIG-B and Discretes

ACC-1 CompactPCI (3U) Carrier Module with one PMC slot

ACC-2 CompactPCI (6U) Carrier Module with two PMC slots

AVC-2 VME (6U) Carrier Module with two PMC slots

ACP-1 PCI Carrier Module with one PMC slot