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AVI1553-1/2

Single/Dual Stream MIL-STD-1553A/B Test & Simulation Module for VMEbus

General Features

The AVI1553-1/2 is part of a new family of VMEbus cards offering full function Test, Simulation, Monitoring and databus analyser functions for MIL-STD-1553A/B applications. Two independent dual redundant MIL-STD-1553A/B streams are provided on the AVI1553-2 module (fully equipped) and one dual redundant MIL-STD-1553A/B stream is provided on the AVI1553-1 module (partially equipped) outlined as a 6U VME standard module. An on-board IRIG-B time decoder and generator allows users to accurately synchronise single or multiple AVI1553-1/2 modules to a common time source. The use of an Application Support Processor (ASP) executing the Driver Software allows user specific test routines to be processed on-board, significantly off-loading the host VME processor. This new concept allows users to implement application specific system level functionality on a single interface card. To provide I/O and processing expansion capabilities a PMC slot is available on the AVI1553-1 card. The AVI1553-1/2 uses a 'Common Core' hardware design utilising multiple RISC processors. A Physical Bus Interface (PBI) daughter board provides MIL-STD-1553A/B bus connections including a resistive terminated bus network.

Bus Controller

The AVI1553-1/2 provides real time Bus Controller functions on one or two dual redundant MIL-STD-1553A/B databus systems concurrently with Multiple Remote Terminal and Chronological Monitor operation. A 200MHz RISC Processor provides true simulation of Bus Controller operations without host computer interaction.

- 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
- Synchronisation of BC operation to external trigger inputs
- 4 µsec Intermessage Gaps

Multiple Remote Terminal

The AVI1553-1/2 simulates up to 31 Remote Terminals including all sub-addresses on one or two MIL-STD-1553A/B bus systems concurrently with BC and Chronological Monitor operation. Alternatively each of the 31 RT's can operate in a message oriented 'Mailbox Monitor Mode' to monitor non-simulated RT's.

- Programmable RT Response Time down to 4 µsec for each simulated 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 ACI1553-1/2 offers full bus monitoring and analysis with time tagging of all bus messages with 1 µs resolution and response time and gap time measurements with 250 nsec resolution concurrently with BC and Multiple RT operation.

- 100% Data Capture at full bus rates
- Autonomous message synchronisation and Full Error Detection
- Two Static/ Dynamic Complex Triggers with up to 8 sequences
- Message Filter and Selective Capture
- Bus Activity recording independent from trigger and capture mode
- External Trigger Outputs

- Programmable Response Time Out

Physical Bus Replay

The AVI1553-1/2 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 recorded file to perform systems integration and test.

IRIG-B Time Code Decoder

An on-board IRIG-B time decoder and generator allows synchronization of MIL-STD-1553A/B bus traffic using single or multiple AVI1553-1/2 modules. Multiple AVI1553-1/2 modules can be daisy chained using one common IRIG-B time source or the on-board Time code generator of one AVI1553-1/2 module as the reference for accurate correlation of data across all MIL-STD-1553A/B streams.

Application Support Processor

The 150 MHz ASP provides unique on-board processing functions typically provided by host VME processing systems.

- Driver Software Execution on the board
- Control of RS232C debug Port for Firmware Updates
- Dynamic Data Generation
- Automatic Test Sequence Generation
- User Application processing on the board

Physical Bus Interface

One or two Physical Bus Interface (PBI) daughter boards provide each data stream with a dual redundant MIL-STD-1553A/B transformer or direct coupled bus connection with variable output transceivers plus a resistive terminated bus network to enable the direct connection of external BC or RT devices. The coupling to the external bus is software programmable.

Driver Software Support

A host Application Interface Driver Software package with source code written in 'C/ C++' is provided to allow easy integration to the VME Processor application environment such as PPC, VxWorks, 680x0 or IRIX. The full function Driver includes Bus Controller, Multiple Remote Terminal, Dynamic Data, Bus Replay and Bus Recording operations and encapsulate initialization, configuration & VMEbus access to the AVI1553-1/2.

Technical Data

Sub-System Interface:
32/64 bit VMEbus Master & Slave

- MBLT,BLT,ADOH,RMW and LOCK support
- A32,A24 and A16 Addressing

Processors:
One 32 bit StrongARM 200MHz Processor
One MIPS IDT-79RV4640 150MHz Processor

Memory:
2 MByte Global RAM
16 MByte ASP RAM

Encoder/Decoder:
One MIL-STD-1553A/B Encoder and Decoder per BIU with full error injection & detection

Time Tagging:
46 Bit absolute IRIG-B Time with 1 µsec resolution

Physical Bus Interface (PBI):
MIL-STD-1553A/B Transceivers with Variable Output Amplitude and a Programmable Bus Coupling and on-board terminated Bus Network.

Connectors:
2 x 96 pin VMEbus backplane connector
1 x 9 way D-Sub Connector on each PBI for MIL-STD-1553A/B databus connection
1 x 15 way D-Sub Connector on each PBI for TTL Trigger I/O connection
1 x 9 way D-Sub Connector (common) for Time Code I/O and RS232 connection

Dimensions:
233,5.00 mm x 160.00 mm x 20.00 mm

Power Consumption:
12 Watts typical @ 5VDC
17,5 Watts typical @ 5VDC

Operating Temp. Range:
Standard: 0°C...+45°C ambient
Extended: -15°C...+60°C ambient

Storage Temp. Range:
-40°C...+85°C ambient

Humidity:
0 to 95% non-condensing

Ordering Information

AVI1553-1
Single Stream, Dual Redundant VMEbus to MIL-STD-1553A/B Interface. BC, Multi-RT Simulator with Mailbox & Chronological Monitor including IRIG-B Time Decoder with Variable Output transceivers. 2MByte Global RAM, 16MByte ASP RAM

AVI1553S-1
Single Stream, Dual Redundant VMEbus to MIL-STD-1553A/B Interface. BC, Multi-RT Simulator with Mailbox Monitor only including IRIG-B Time Decoder with Fixed Output Transceivers. 2MByte Global RAM, 16 MByte ASP RAM

AVI1553-2
Dual Stream, Dual Redundant VMEbus to MIL-STD-1553A/B Interface. BC, Multi-RT Simulator with Mailbox & Chronological Monitor including IRIG-B Time Decoder with Variable Output transceivers. 2MByte Global RAM, 16MByte ASP RAM

AVI1553S-2
Dual Stream, Dual Redundant VMEbus to MIL-STD-1553A/B Interface. BC, Multi-RT Simulator with Mailbox Monitor only including IRIG-B Time Decoder with Fixed Output Transceivers. 2 MByte Global RAM, 16 MByte ASP RAM.

ACB1553-1-PCI

Ready Made Adapter Cable (2.0 metres) from D-Sub to two Twinax, Bus A/B

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