



MIL-STD-1553 Product Overview

The AIT family of MIL-STD-1553 products provide solutions for Test Instrumentation, Data Acquisition, Protocol Analysis, Embedded IP Solutions, and COTS applications.

MIL-STD-1553 TEST INSTRUMENTATION

The AIT MIL-STD-1553 hardware modules for PXI, PCI, PCI Express, VME, and VXI provide advanced features and functionality to support even the most demanding test and simulation applications.



All of the MIL-STD-1553 instruments are supported by the AIT MIL-STD-1553 SDK which provides C, C++, C#, VB.NET, and LabVIEW interfaces and drivers for Windows, Linux, LabVIEW Real Time, and other operating systems.

Key test features include:

- Simultaneous Simulation of BC, BM, and up to 31 RTs
- Up to ten trigger I/O lines available for synchronization to external equipment
- IRIG-B Input & Output for external time synchronization
- Software Programmable coupling modes (Direct, Transformer, Simulated Stub,...)
- Software Programmable output bus signal voltage levels
- Full Error Injection & Detection

MIL-STD-1553 ANALYZER SOFTWARE TOOLS

AIT provides complete MIL-STD-1553 Protocol Analyzer solutions with the *Flight Simulyzer™* application. AIT's *Flight Simulyzer™* is an intuitive and easy-to-use Graphical User Interface (GUI) application that allows users to capture and analyze MIL-STD-1553 bus data and to operate the BC, and RT simulation features of the MIL-STD-1553 modules.

Flight Simulyzer™ can be used in conjunction with the AIT MIL-STD-1553 USB module to provide a portable analyzer solution or with the AIT PCI, PCI Express, and PXI modules to provide desktop PC analyzer solutions.

EMBEDDED IP SOLUTIONS

AIT's Engineers have built a decade-strong reputation with our innovative custom embedded IP solutions. Using our hardware modules and software plus industry standard, commercial-off-the-shelf (COTS) hardware and software components as building blocks, AIT delivers complete system solutions supported with RTOS (VxWorks and others) device drivers and APIs.

COTS MODULES

AIT's MIL-STD-1553 PMC, XMC, and PC/104+ modules are rugged, reliable, full featured interface modules designed to provide dependable MIL-STD-1553 Interfaces in the harshest environments. These form factors are provided with conduction cooled, extended temperature, and conformal coating options. AIT guarantees quick delivery, obsolescence mitigation, competitive pricing, and world class customer support.

A Division of



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COMPLETE MIL-STD-1553 SOLUTIONS

AIT proudly provides the industry's most capable MIL-STD-1553 products coupled with market-leading customer support to ensure your long-term success!

FLEXIBLE & POWERFUL BUS CONTROLLER

The MIL-STD-1553 modules provide very flexible and powerful BC operations to support a variety of application needs. Key features include:

- Autonomous operation including software-controlled sequencing of bus commands
- Minor/major frame operation
- Acyclic command insertion/deletion
- Full error injection down to word and bit level
- Multi-buffering with real-time buffer updates
- Four microsecond inter-message gap time

SIMULATE MULTIPLE REMOTE TERMINALS

The AIT MIL-STD-1553 modules are capable of simultaneously supporting the simulation of up to 31 RT's while at the same time providing BC and Monitoring functions. Key Remote Terminal features include:

- Simulate up to 31 RTs including all sub-addresses simultaneously
- Programmable response time for each RT
- Full error injection down to word and bit level
- Multi-buffering with real-time buffer updates and separate buffers assigned to each RT

PROGRAMMABLE HIGH VOLTAGE DISCRETE I/O

Up to 10 fully programmable (input/output) discrete lines are available on the AIT MIL-STD-1553 modules. In support of MIL-STD-1760 applications each line can support up to 30V signalling (with external power).

ADVANCED DATA ACQUISITION & MONITORING

With large amounts of onboard memory (128MB), an IRIG-B time encoder/decoder for external clock synchronization, and flexible triggering and filtering functions, the AIT MIL-STD-1553 Bus Monitor provides an advanced monitoring and data acquisition solution.

- Full monitoring of all bus traffic to 1 microsecond resolution
- Response and gap time measurements down to 8 nanosecond resolution
- Full error detection (AS4116 compliant)
- Complex triggering
- Message filter and selective capture

MIL-STD-1553 BUS REPLAY

The 1553 modules can replay previously recorded bus data with precise timing. Additionally, the user can selectively filter which RTs are replayed to support system integration tasks where the "real" RT is present on the bus.

FLEXIBLE PROGRAMMABLE BUS COUPLING

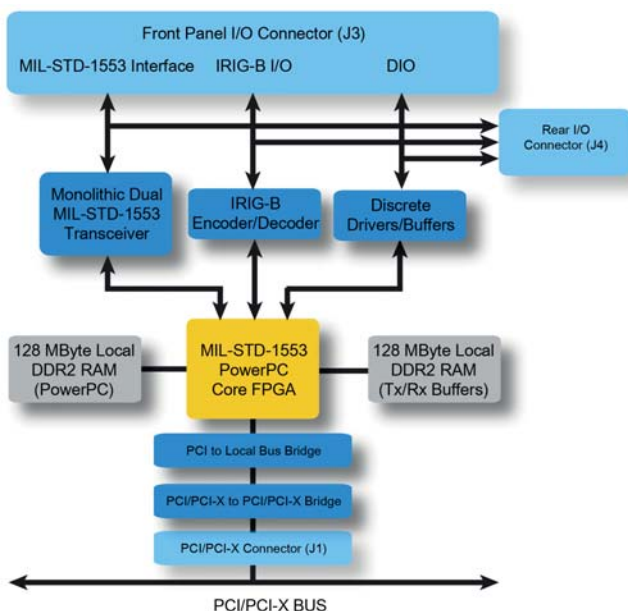
Extended function modules provide software programmable coupling to the MIL-STD-1553 bus via the same front panel connections. Transformer, Direct, and Bus Network (allowing direct, connection without external couplers, to the UUT). coupling modes are supported. An isolated mode is also software selectable allowing disconnection of the module from the bus without physically removing cable connections.

Additionally, with the extended function modules, the user application can select the output amplitude of the MIL-STD-1553 signal.

HIGH QUALITY HARDWARE MODULES

AIT's ARINC MIL-STD-1553 modules utilize an FPGA based architecture to provide a flexible MIL-STD-1553 compliant protocol engine which is also capable of supporting low level error injection and detection and which can easily support program-specific customizations when required.

With years of experience supporting aerospace applications, AIT understands the importance of supporting the entire life span of programs and is committed to obsolescence mitigations as well as consistent, reliable, on-time product delivery. All AIT MIL-STD-1553 modules are designed and manufactured in accordance with AS9100 Rev C and ISO 9001:2008 compliant processes.



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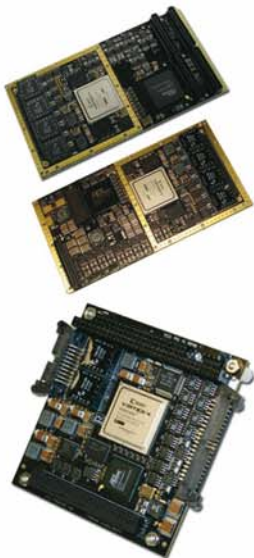
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AIT MIL-STD-1553 TEST INSTRUMENTATION HARDWARE MODEL GUIDE



MODEL/ FORM FACTOR	CHANNELS	COUPLING	KEY FEATURES
PCI-C1553 PCI, PCI-X	1, 2, or 4	Transformer, Direct, Bus Stub	<ul style="list-style-type: none"> • IRIG-B input/output • Programmable coupling and bus signal voltage • Ten discrete I/O lines
PCIe-C1553 PCI Express	1, 2, or 4	Transformer, Direct, Bus Stub	<ul style="list-style-type: none"> • IRIG-B input/output • Programmable coupling and bus signal voltage • Ten discrete I/O lines
PXI-C1553 PXI (3U)	1, 2, or 4	Transformer, Direct, Bus Stub	<ul style="list-style-type: none"> • IRIG-B input/output • Programmable coupling and bus signal voltage • Ten discrete I/O lines • PXI triggers, including 10 MHz star trigger
USB-1553 USB 2.0	1 or 2	Transformer, Direct,	<ul style="list-style-type: none"> • Supports standalone operations via single USB connection to host without auxiliary power
VXI-1553-T VXI	1 or 2	Transformer, Direct, Bus Stub	<ul style="list-style-type: none"> • Supports legacy applications with twinax front panel connectors and supporting VXI 'Plug & Play' driver
VME-1553 VME	1, 2, 4, or 8	Transformer, Direct, Bus Stub	<ul style="list-style-type: none"> • IRIG-B input/output • Programmable coupling and bus signal voltage • Ten discrete I/O lines

AIT MIL-STD-1553 RUGGED EMBEDDED HARDWARE MODEL GUIDE



PMC-1553 PMC	1, 2, or 4	Transformer, Direct	<ul style="list-style-type: none"> • Available conduction-cooled with extended temperature and conformal coating options
XMC-1553 XMC	1, 2, or 4	Transformer, Direct	<ul style="list-style-type: none"> • Available conduction-cooled with extended temperature and conformal coating options
PC104p-1553 VME	1 or 2	Transformer, Direct	<ul style="list-style-type: none"> • Simultaneous operation of BC, BM, and up to 31 RTs • Four discrete I/O lines

AIT's MIL-STD-1553 SOFTWARE DEVELOPMENT KIT

AIT's MIL-STD-1553 SDK provides a complete suite of software tools and APIs to support most efficient use of the features and functions of the AIT MIL-STD-1553 hardware modules.

MULTIPLE OPERATING SYSTEMS

The MIL-STD-1553 SDK provides Drivers and APIs for a variety of Operating System platforms:

- Microsoft Windows XP and Windows 7
- Linux
- VxWorks
- LabVIEW Real-Time
- Other RTOS's on request (LynxOS, Integrity, ...)

MULTIPLE PROGRAMMING LANGUAGES

Whether your integrating the AIT ARINC 429 solutions into a legacy C based application or using the latest .NET or LabVIEW application development environments, we've got you covered with APIs for:

- ANSI C
- C++/Visual C++
- C#
- VB.NET
- LabVIEW (VIs)

LabVIEW INSTRUMENT DRIVER

AIT's MIL-STD-1553 LabVIEW Instrument Driver is an easy-to-use, "Compatible with LabVIEW" Instrument Driver which provides high level Virtual Instruments (VIs) that support quick prototyping and deployment of MIL-STD-1553 applications.

The AIT MIL-STD-1553 Instrument Driver has been certified by National Instruments to be "Compatible with LabVIEW". This means that users are ensured of the highest quality, usability, and integration with National Instrument's LabVIEW.

INTUITIVE, EASY-TO-USE MIL-STD-1553 ANALYZER

AIT's *Flight Simulyzer*[™] is an intuitive, easy-to-use, and affordable MIL-STD-1553 analyzer/simulator that allows users to capture, analyze, replay, and simulate MIL-STD-1553 bus data. *Flight Simulyzer*[™] is ready to go, right out of the box. Start capturing and simulating bus data in just a few clicks of the mouse. Key features include:

- Bus Monitor captures and recordings
- Simulate Bus Controller and Remote Terminals (up to 31)
- Operate multiple bus channels (and MIL-STD-1553 modules) simultaneously
- Replay previously captured bus data
- Full error injection and detection
- MIL-STD-1553 A/B Mode Code operations
- Also supports ARINC 429 and ARINC 664 operations

EASY INTEGRATION

The MIL-STD-1553 SDK is built around a common MIL-STD-1553 Configuration Data core format which allows application designers to specify MIL-STD-1553 bus interface configuration data using an intuitive XML format which is formally defined in an XML Schema. This common configuration data format can be used to configure AIT's *Flight Simulyzer*[™] analyzer application, the LabVIEW Instrument Driver component of the SDK, as well as the C++, C#, and VB.NET software APIs.



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