

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

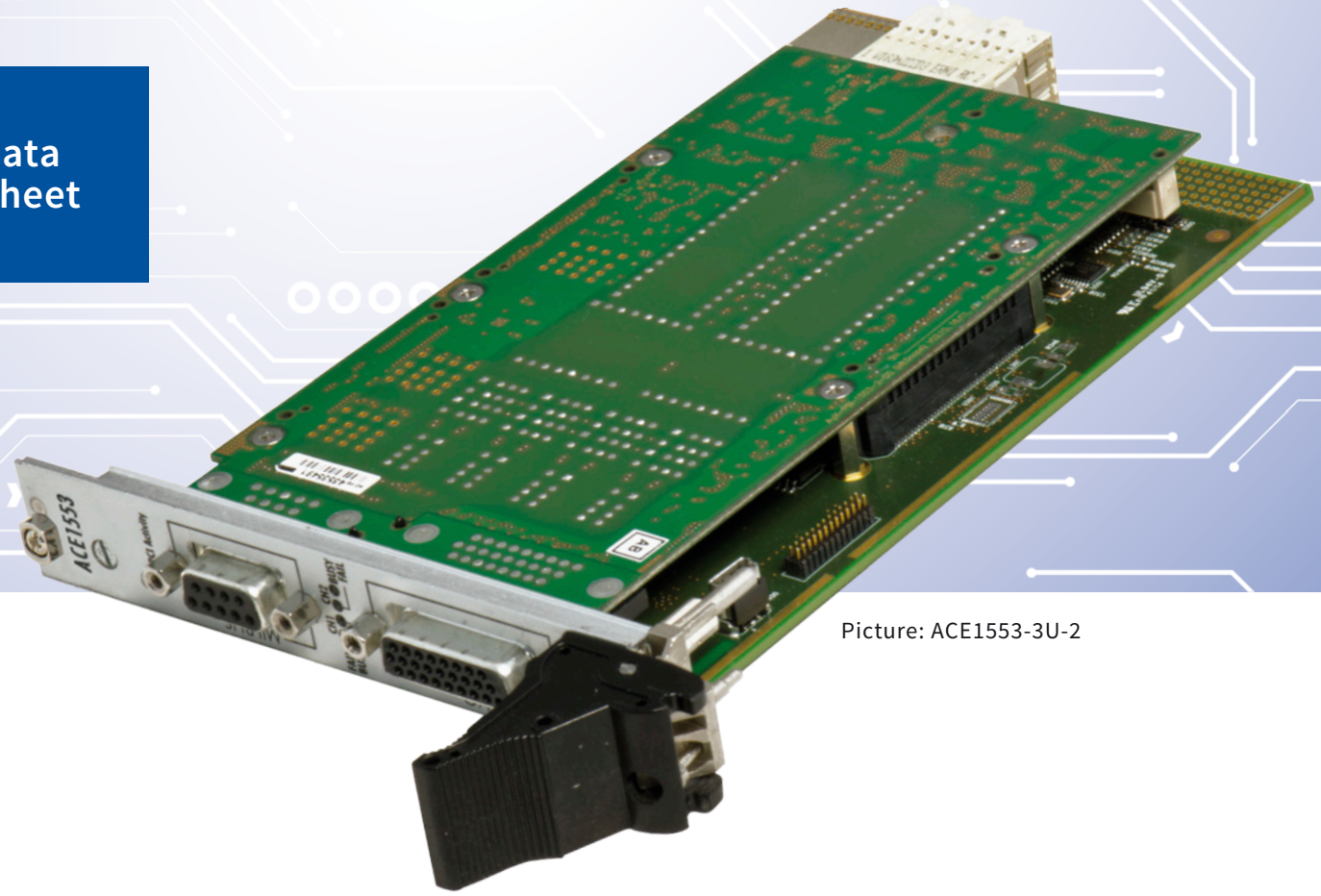
Visit our website - *Click HERE*

ACE1553-3U-x

Avionics Databus Solutions

Single, Dual or Quad Stream MIL-STD-1553A/B Test & Simulation Modules for CompactPCI-Express/ PXI-Express (3U)

Data Sheet



Picture: ACE1553-3U-2

www.aim-online.com

ACE1553-3U-x

General Features

The ▸ **ACE1553-3U-x** is a member of AIM's new family of compactPCI-Express/PXI-Express modules for analysis, simulation, monitoring and testing of MIL-STD-1553A/B databuses.
The ACE1553-3U-x concurrently acts as Bus Controller, Multiple Remote Terminals (31) and Chronological/Mailbox Bus Monitor.
The ACE1553-3U-x-DS versions known as ▸ **MILScope™**, have an onboard A/D Converter on the first MIL-STD-1553 channel.
The MILScope™ option provides a unique capability to test and verify the MIL-STD-1553 waveform and detect faulty bus conditions without the need of an external oscilloscope.
A full range of MIL-STD-1553 protocol errors can be injected/detected. The ACE1553-3U-x modules can electrically reconstruct and replay previously recorded MIL-STD-1553A/B record files physically to the MIL-STD-1553A/B bus with excellent timing accuracy.
The ACE1553-3U-x offers an interface for 1, 2 or 4 dual redundant bus streams.
The module can be installed in standard cPCIe (3U) peripheral/hybrid slots and PXIe peripheral/hybrid slots. If installed in a PXIe slot, 8 PXI Trigger I/O and a PXI System Reference Clock (10MHz) based time tag mode are supported.
The ACE1553-3U-x modules use AIM's 'Common Core' hardware design utilising multiple RISC processors with 128MB of Global RAM and 128MB of ASP RAM.
The use of onboard processing and large memory enables autonomous operation with minimal interaction with the host PC for real time applications.
An onboard IRIG-B time encoder/decoder is provided with sinusoidal output and 'free-wheeling' mode for time tag synchronization on system level using one or more ACE1553-3U-x cards.
The Physical Bus Interface (PBI) provides programmable bus coupling modes and variable output amplitude to the MIL-STD-1553A/B bus.
Full function driver software is delivered with the ACE1553-3U-x cards in comprehensive Board Software Packages (BSP's) for different Operating Systems.
The optional PBA.pro™ Databus Test and Analysis Tool (for Windows and Linux) can also be purchased for use with ACE1553-3U-x modules.
Off the shelf test scripts are available to support the automatic execution of the ▸ **'AS4112 RT Production Test Plan'** (Protocol and Electrical Tests) and the AS4111 RT Validation Test Plan (Protocol Tests).

Bus Controller

The ACE1553-3U-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. 2x 400MHz RISC processors, 1 for each Single or Dual Channel Bus Interface Unit, provide true simulation of BC operations without host computer interaction.
Key Features of the Bus Controller Mode:
- 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
- Multi-Buffering with Real Time Data Buffer Updates
- Synchronization of BC Operation to external Trigger Inputs
- 4µs Intermessage Gaps
- Interrupt Generation on BC Transfer Events
- Start on external Trigger Input

Multiple Remote Terminal

The ACE1553-3U-x modules simulate up to 31 Remote Terminals, including all sub addresses on each MIL-STD-1553 channel, concurrently with BC and Chronological Monitor operation. Alternatively each of the 31 RT's can operate in message oriented Mailbox Monitor Mode to monitor Non-Simulated RT's.
Key features of the Remote Terminal Simulation Mode include:
- Programmable RT Response Time down to 4µs for each simulated RT
- 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
- Mailbox Monitor Mode
- Interrupt Generation on RT Events

Chronological Bus Monitor

The ACE1553-3U-x modules provide full bus monitoring and analysis with time tagging of all bus traffic with 1µs 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 at full Bus Rates
- Single Shot, Continous or Selective Capture Modes
- Autonomous Message Synchronization and Full Error Detection
- Two Static/Dynamic Complex Triggers with Sequencing
- Message Filter and Selection Capture
- Bus Activity Recording independent from Trigger and Capture Mode
- Time Tagging:
  - All Bus Traffic to 1µs
  - Intermessage Gaps and Response Time to 250ns
- External Trigger Outputs
- Programmable Response Time-Out

Physical Bus Replay

The ACE1553-3U-x cards can electrically reconstruct and replay previously recorded MIL-STD-1553A/B record files physically to the MIL-STD-1553A/B bus with excellent timing accuracy. The additional capability to disable any or all RT responses from the MIL-STD-1553A/B replay enables smart systems integration and test to be performed.

Physical Bus Interface

A Physical Bus Interface (PBI) daughter board provides software programmable transformer or direct coupling with software programmable variable output transceivers and a terminated bus network to enable the direct connection of a single BC or RT device. The coupling to the external bus is software programmable.

MILScope™
(optional)

The ACE1553-3U-x-DS versions integrate on 1 channel of the PBI a 2 channel differential Analog to Digital Converter (ADC) providing 50Msamples for primary and secondary data acquisition or 100Msamples for either the primary or secondary bus. Accurate measurements of physical bus parameters such as rise/fall time, overshoot, undershoot, pulse width and amplitude, can be triggered by the complex trigger of the Bus Monitor.

Trigger-/General Purpose Discrete I/O Signals

The Front-I/O connectors provide one BC-, RT- and BM-trigger input and one BC-, RT- and BM-trigger output for each MIL-STD-1553A/B channel. Additionally up to 5 user programmable General Purpose Discrete I/O signals can be accessed via Front-I/O. Voltage levels of all trigger signals and General Purpose Discrete I/O's are TTL compatible whereas the General Purpose Discrete I/O's are designed to handle avionics level as well.

IRIG-B Time Encoder/Decoder

ACE1553-3U-x modules include an onboard IRIG-B Time Encoder/Decoder with sinusoidal output and 'free-wheeling' mode for time tag synchronization. This allows synchronization of multiple ACE1553-3U-x modules to one common IRIG-B time input source or to the onboard time code generator of 1 ACE1553-3U-x module as the reference for correlation of data across multiple MIL-STD-1553A/B streams. If installed in a PXIe peripheral/hybrid slot the input source can alternatively be switched from IRIG-B to the PXI System Reference Clock (10MHz) on the Instrumentation Bus to have a Time Tag synchronous to the PXI System Reference Clock.

PXI Instrumentation Bus

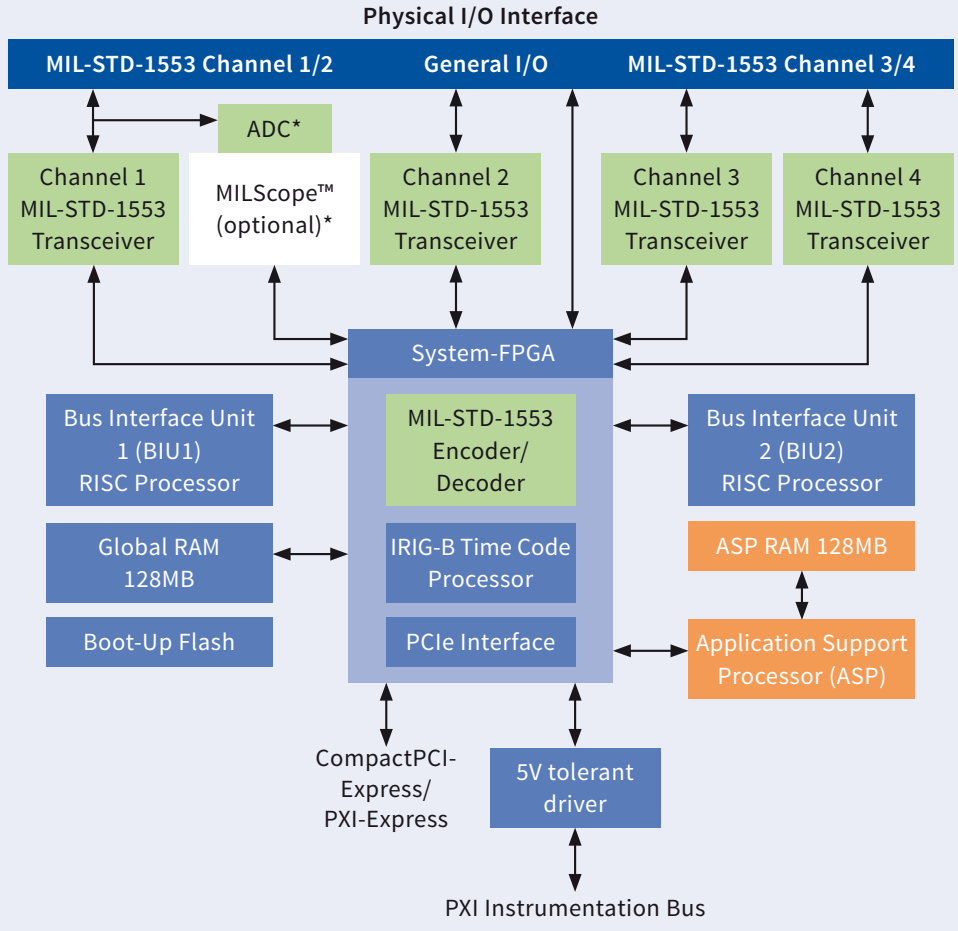
The PXI Hardware Specification adds electrical features for instrumentation by providing additional triggering and system clock capabilities. The ACE1553-3U-x is compliant with the PXI Specification Revision 2.2 providing additional triggering and system clock capabilities on the Instrumentation Bus:

- BC, RT and BM Trigger Inputs/Outputs available on the PXI Trigger Bus (software programmable)
- PXI System Reference Clock synchronous Time Tag Mode
- Time Tag Clear via PXI STAR Trigger Input

The ACE1553-3U-x is a hybrid slot compatible peripheral module.

Driver Software

The Driver Software is supplied with the ACE1553-3U-x module. A full function Application Programming Interface (API) is provided compatible with Windows and Linux. Host applications can be written in C/C++ or C#. A LabView/VI application interface as well as LabViewRT drivers are provided.



ACE1553-3U-x
Block Diagram

** ACE1553-3U-1/2-DS only*

Technical Data

System Interface
cPCIe/PXIe Bus Master and Slave, compliant with Single Lane, 2.5Gb/s PCI Express V1.1

Processors
1x or 2x 400MHz RISC Processors for BIU(s) and 1x 400MHz Application Support Processor (ASP)

Memory
128MB Global RAM (DDR2-RAM), 128MB ASP RAM (DDR2-RAM), 2x 8Mbit serial flash memory for BIUs, 64Mbit serial flash memory for LCA and 256MB flash memory for the ASP

Encoder/Decoder
Up to 4 MIL-STD-1553A/B Encoder/Decoder with full error injection and detection

Time Tagging
Sinusoidal 46-bit absolute IRIG-B Time stamping with 1µs resolution, sinusoidal IRIG-B output and 'free-wheeling' mode; PXI System Reference Clock time tag mode

PXI Instrumentation Bus
8 PXI Trigger Bus port, PXI STAR Trigger Input, PXI System Reference Clock Input (10MHz)

Trigger/General Purpose Discretes
One BC-, RT- and BM-Trigger input and one BC-, RT- and BM-Trigger output for each channel available with up to 5 General Purpose Discrete I/O's (avionics level) on the front panel connector

Physical Bus Interface
1, 2 or 4 MIL-STD-1553A/B Transceiver with variable Output Amplitude, Programmable Bus Coupling modes with onboard terminated Bus Network

Connectors
ACE1553-3U-1/2:
9-way D-Sub for Bus connections, 26-way High Density D-Sub for Trigger, General Purpose Discrete I/O and IRIG-B Time Code I/O
ACE1553-3U-4:
2x 15-way High Density D-Sub for Bus connections, Trigger, General Purpose Discrete I/O and IRIG-B Time Code I/O

PXIe Module connections
XJ3 High-Speed Advanced Differential Fabric (ADF) connector for PXIe/cPCIe-Bus interface; XJ4 (eHM) Connector for instrumentation signals (Trigger Bus, Star Trigger Input, 10MHz System Reference Clock)

Dimensions
100mm x 160mm – cPCIe/PXIe Standard 3U card

Power Consumption
ACE1553-3U-1: 1.6W @3.3V, 4.4W @12V
ACE1553-3U-2: 1.7W @3.3V, 6.6W @12V
ACE1553-3U-4: 2.6W @3.3V, 8.7W @12V (@50% Busload)

Operating Temp. Range
Standard 0°C to +45°C ambient
Extended temperature range
-15°C to +65°C

Storage Temperature
-40°C to +85°C

Humidity
0 to 95% non-condensing

Ordering Information

ACE1553-3U-1/2
Single or Dual Stream, Dual Redundant cPCIe/PXIe (3U) to MIL-STD-1553A/B Interface: BC, Multi RT Simulator with Mailbox & Chronological Monitor; IRIG-B Time Encoder/Decoder, 5 General Purpose Discrete I/O's; 128MB Global RAM, 128MB ASP RAM

ACE1553-3U-1/2-DS
Single or Dual Stream, Dual Redundant cPCIe/PXIe (3U) to MIL-STD-1553A/B Interface: BC, Multi RT Simulator with Mailbox & Chronological Monitor; IRIG-B Time Encoder/Decoder, 5 General Purpose Discrete I/O's; Digitising Scope for Waveform Analysis & Measurement; 128MB Global RAM, 128MB ASP RAM

ACE1553-3U-4
Quad Stream, Dual Redundant cPCIe/PXIe (3U) to MIL-STD-1553A/B Interface: BC, Multi RT Simulator with Mailbox & Chronological Monitor; IRIG-B Time Encoder/Decoder, 2 General Purpose Discrete I/O's; 128MB Global RAM, 128MB ASP RAM

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

Single Function versions available:
Chronological & Mailbox Monitor or BC and Chronological & Mailbox Monitor or Multi RT and Chronological & Mailbox Monitor

ACB-PCI-1
Ready Made Adapter Cable (2.0m): From D-Sub to 2 Twinax Connectors PL-75 for all variants of ACE1553-3U-1 cards

ACB-PCI-2
Ready Made Adapter Cable (2.0m): From D-Sub to 4 Twinax Connectors PL-75 for all variants of ACE1553-3U-2 cards

ACB-HD15-2
Ready Made Adapter Cable (2.0m): From 15-pin HD-Sub to 4 Twinax Connectors PL-75 for all variants of ACE1553-3U-4 cards

ACB-HD15-2-F
Ready Made Adapter Cable (2.0m): From 15-pin HD-Sub to 4 Twinax Connectors PL-75 and 9-pin D-Sub Connector for Trigger-I/O, IRIG-B and Discrete I/O's for all variants of ACE1553-3U-4 cards

Note:
For all variants of ACE1553-3U-4 cards use 2 of ACB-HD15-2/ACB-HD15-2-F Adapter Cable

▸ AIM Office Contacts:

AIM GmbH
Sasbacher Str. 2
D-79111 Freiburg / Germany
Phone +49 (0)761 4 52 29-0
Fax +49 (0)761 4 52 29-33
sales@aim-online.com

AIM GmbH – Munich Sales Office
Terofalstr. 23a
D-80689 München / Germany
Phone +49 (0)89 70 92 92-92
Fax +49 (0)89 70 92 92-94
salesgermany@aim-online.com

AIM UK Office
Cressex Enterprise Centre, Lincoln Rd.
High Wycombe, Bucks. HP12 3RB / UK
Phone +44 (0)1494-446844
Fax +44 (0)1494-449324
salesuk@aim-online.com

AIM USA LLC
Seven Neshaminy Interplex
Suite 211 Trevose, PA 19053
Phone 267-982-2600
Fax 215-645-1580
sales@aim-online.us

© AIM 2023
ACE1553-x_01Sep23
Specifications are subject to change without notice.

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP