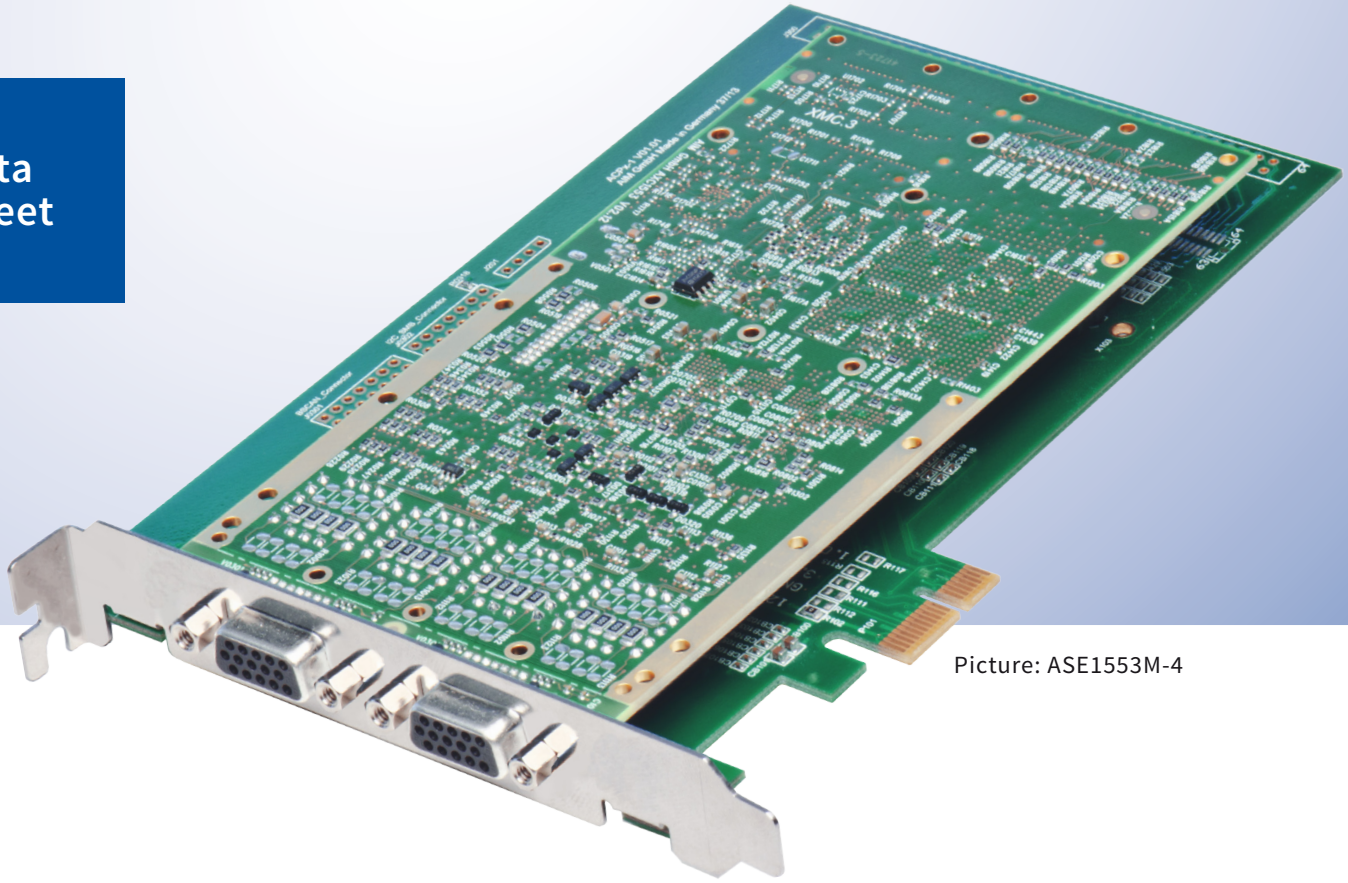
ASE1553M-x

Avionics Databus Solutions

Single Function MIL-STD-1553 Test & Simulation PCIe Card

Data Sheet



Picture: ASE1553M-4

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ASE1553M-x

Single Function MIL-STD-1553 Test & Simulation PCIe Card

General Features

The ASE1553M card offers a single Lane PCIe cost efficient solution for basic MIL-STD-1553 applications for lab environment.

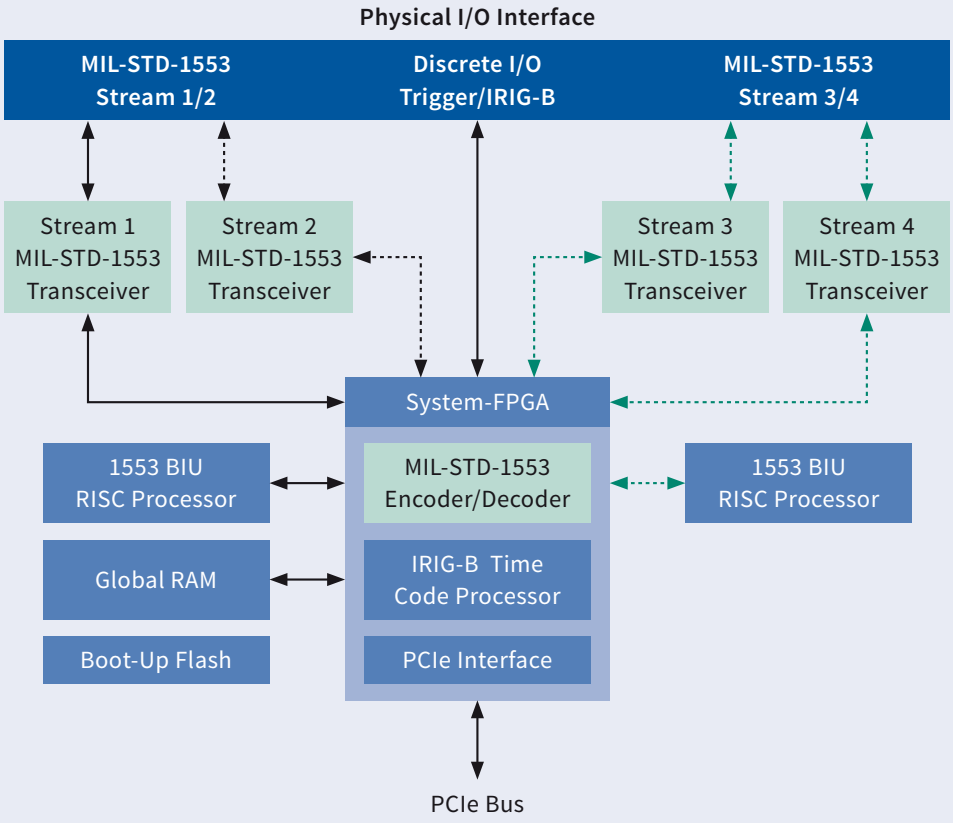
The card provides up to 4 dual redundant MIL-STD-1553 Streams that operate each in a single function mode to support Bus Controller (BC), BC and Bus Monitor, Multi-Remote Terminal (Multi-RT), Multi-RT and Bus Monitor, or Bus Monitor only operation.

The board provides transformer coupling and fixed output amplitude to the MIL-STD-1553A/B bus.

The card also includes 2 Open/Ground Avionics Level Discrete I/O signals (4-stream variant only) in addition to IRIG-B I/O and Trigger I/O. The onboard IRIG-B time encoder/decoder is included with sinusoidal output and free-wheeling mode for time synchronization for systems using 1 or more cards.

Driver software is delivered with the cards in comprehensive Board Software Packages (BSP's) for different operating systems. The optional PBA.pro databus Test and Analysis Software for Windows and Linux is also available for use with ASE1553M modules.

For more advanced features like concurrent BC/MRT/BM functionality and programmable MIL-STD-1553A/B bus frontend features see the AIM APE1553 product.



ASE1553M-x Block Diagram

Key Features

- Up to 4 Dual Redundant Single Function MIL-STD-1553 Streams
  - Bus Monitor
  - Bus Controller
  - Bus Controller and Bus Monitor
  - Multi-Remote Terminal
  - Multi-Remote Terminal and Bus Monitor
  - 1553 Transformer Bus Coupling (fixed Output Amplitude)
- IRIG-B Input and Output
- 2 Open/Ground Avionics Level Discrete I/O (4 Stream Variant only)
- 1 Trigger I/O per 1553 Stream
- 128MB Global RAM onboard for Data Scheduling and Buffering
- High Performance RISC Processors onboard
- Host CPU Offload for low CPU Utilization
- Hard Real Time Precision and Timing
- DMA Engine for optimized Bus Transfers and low PCIe Bus Utilization
- MSI and Regular HW Interrupt Support

BC Features

- Autonomous Operation including Sequencing of multiple Minor and Major Frames
- Support for Acyclic Message Insertion/ Deletion
- Support for Instructions for Synchroniza-tion to external Events and Timing Control
- Programmable BC Retry without Host Interaction
- Multi-Buffering with Real Time Data Buffer Updates
- Synchronization of BC Operation to external Trigger In- and Outputs
- 4µs Intermessage Gaps
- Interrupt Generation on BC Transfer Events

Multi-RT Features

- Programmable RT Response Time down to 4µs for each simulated RT
- Programmable and intelligent Response to Mode Codes
- Multi-Buffering with Real Time Data Buffer Updates
- Mailbox Monitor Mode
- Interrupt Generation on RT Events

BM Features

- 100% Data Capture on all Streams at full Bus Rates
- Single Shot, continuous or selective Capture Modes
- Autonomous Message Synchronization and Full Error Detection (see APE1553 for Error Injection)
- Static/Dynamic Complex Triggers with Sequencing
- Message Filter and Selective 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 In- and Output
- Programmable Response

IRIG-B Time Encoder/Decoder

- Onboard, free-wheeling IRIG-B formatted Time Encoder/Decoder for Time Tagging
- Amplitude modulated sinusoidal IRIG-B Output
- Synchronization with multiple AIM Modules or any IRIG-B compatible Module

Discrete I/O

- 2 bi-directional Open/Ground Avionics Discrete I/O Signals (4-Stream Variant only)

Driver Software Support

- An Application Programming Interface (API) is provided along with low Level 32/64-bit Operating System specific Drivers for Windows 7/8/10, Linux
- Contact factory for other Operating Systems
- Host Applications can be written in C, C++, or C#. LabVIEW/VI Application Interfaces as well as LabVIEW-RT Drivers are also provided

PBA.pro Support (optional)

- Full Graphical Analyzer
- Support for Windows and Linux
- Modular, scalable and integrated Software Interface
- Automation and Customization via Python Scripts
- Full Database Manager for ICD Decode (Engineering Unit Conversion)
- Supports multiple Protocols such as MIL-STD-1553, ARINC429, Fibre Stream, Ethernet, etc.

Technical Data

Single Lane PCIe Interface
Compatible with PCI-Express Standard (Release 1.1)
Memory
128MB RAM
Processor
SoC Device with 2x 400MHz Processors
Time Tagging
46-bit absolute IRIG-B formatted
Discrete I/O
2 Open/Ground Avionics Level
+35V Discrete I/O (4 Stream Variant only)
Trigger I/O
1 Trigger input and Trigger output for each 1553 Stream available
Encoder/Decoder
MIL-STD-1553 Encoder/Decoder with full Error Detection Support
Physical Bus Interface
Transformer coupled MIL-STD-1553 Bus with fixed Output Amplitude
Operating Temperature Range
0°C to +55° C
Storage Temperature Range
-40°C to +85°C

Relative Humidity
0 to 95% non-condensing
Power Consumption
2.7W (1553 idle 4 Stream)
6.5W (1553 100% Duty Cycle 4Stream)

Connector
1x 15-pin (female) High Density D-Sub Connector for 1 or 2 Stream 1553 Card
2x 15-pin (female) High Density D-Sub Connectors for 4 Stream 1553 Card

Ordering Information

ASE1553M-1
1 Dual Redundant Single Function MIL-STD-1553 Stream

ASE1553M-2
2 Dual Redundant Single Function MIL-STD-1553 Streams

ASE1553M-4
4 Dual Redundant Single Function MIL-STD-1553 Streams

Optional Cables
ACB-HD15-1:
1 Stream 1553 Card Cable with no AUX Connector
ACB-HD15-2:
2 Stream 1553 Card Cable with no AUX Connector
Note: for 4 Stream Cards use 2x ACB-HD15-2
ACB-HD15-1-F:
1 Stream 1553 Card Cable with AUX Connector for IRIG-B, Discrete I/O and Trigger I/O
ACB-HD15-2-F: 2 Stream 1553 Card Cable with AUX Connector for IRIG-B, Discrete I/O and Trigger I/O
Note: for 4 Stream Cards use 2x ACB-HD15-2-F

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
salesusa@aim-online.com

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