

Avionics Databus Solutions

# ASE1553M-x

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.

#### **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 Synchronization 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**

- $\bullet$  Programmable RT Response Time down to  $4\mu s$  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 drivers for Windows and 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)

## **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

#### 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

#### **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

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Specifications are subject