



Avionics Databus  
Solutions

# AMEE1553-x

Rugged Embedded MIL-STD-1553  
PCI Express Mini Card

Data  
Sheet



Picture: AMEE1553-2

# AMEE1553-x

## Rugged Embedded MIL-STD-1553 PCI Express Mini Card

### General Features

The AMEE1553-x is a ► **PCI Express Mini Card** targeted for embedded MIL-STD-1553B applications.

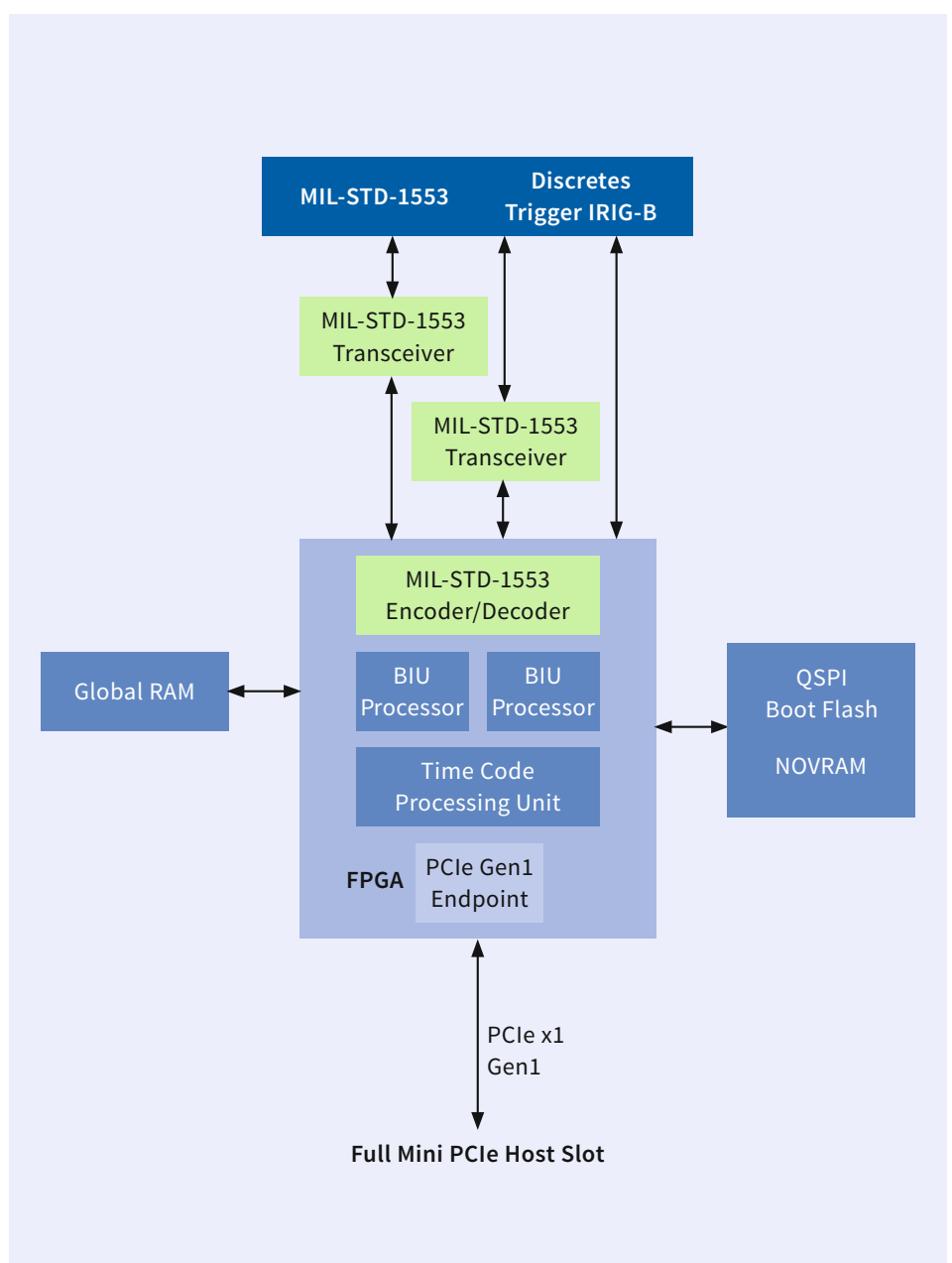
The ► **AMEE1553-x** module provides 1 or 2 dual redundant ► **MIL-STD-1553** interfaces, which act as Bus Controller, Multiple Remote and Chronological/Mailbox Monitor.

The AMEE1553-x supports 6 avionic discrete input and 2 avionic discrete in-/output signals to be monitored or generated. In addition 2 trigger inputs and 2 trigger outputs are provided.

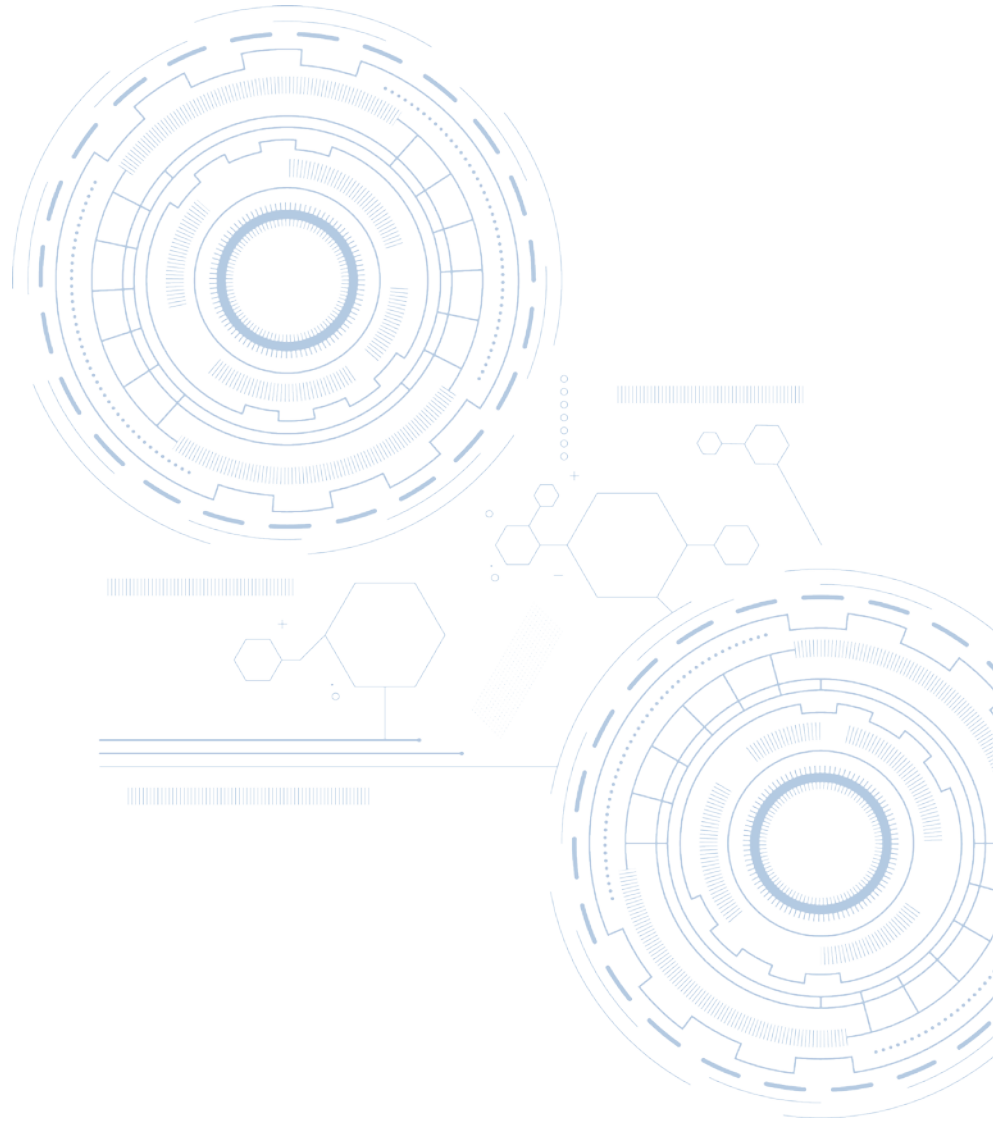
An onboard high-precision free-wheeling IRIG-B time decoder supports time tagging on all AMEE1553-x models and allows users to accurately synchronize modules to a common IRIG-B time source.

The AMEE1553-x offers transformer coupling to the databus. With the provided onboard flash memory the components boot up autonomously after power up. Therefore the cards are well prepared for embedded applications requiring fast and autonomous boot up to operational mode.

A common Application Programming Interface (API) supports all AIM MIL-STD-1553 modules.



AMEE1553-2 Block Diagram



## Key Features

- Robust and low power ► **PCI Express Mini Card** implementing a Single/Dual Stream MIL-STD-1553 Interface
- Single/Dual Stream, Dual Redundant Implementation
- 31-pin Screw Lock I/O Connector
- Bus Controller, 31 Remote Terminals and Bus Monitor
- Full Error Detection Capability
- Triggering for Capturing/Filtering
- Real Time Recording at 100% Bus Loads
- Discretes 6x In, 2x In/Out, Trigger 2x In, 2x Out and IRIG-B Input and IRIG-B Output (~3Vpp)

## Bus Control Features

- Autonomous Operation
- Sequencing of multiple Minor and Major Frames
- Acyclic Message Insertion/Deletion
- Programmable BC Retry without Host Interaction
- Multi-Buffering with Real Time Data Buffer Updates
- Synchronization of BC Operation to external Trigger Input
- Interrupt Generation on BC Transfer Events

## Multiple Remote Terminal Features

- Programmable RT Response Time 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

## Chronological Bus Monitor

- 100% Data Capture of Bus Traffic
- Autonomous Message Synchronization and Full Error Detection
- Dynamic Complex Trigger 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
- Programmable Response Time-Out
- Trigger In- and Output

## Physical Bus Interface

- 1 or 2 Dual Redundant MIL-STD-1553 Bus Interfaces
- Transformer Coupling

## IRIG-B Time Decoder

The card provides an analog IRIG-B input and a time decoder with free-wheeling mode for time tag synchronization of multiple cards to one common IRIG-B time input source.

## Discrete-I/O

- 6 Avionic Discrete Inputs, 2 Avionic Discrete Inputs/Outputs

## Driver Software Support

- Common Application Programming Interface (API)
- Drivers for Windows and further Operating Systems (contact Factory)

## Technical Data

### Express Interface

Single Lane Full PCI Express Mini Card, compatible with the PCI Express Base Specification rev. 2.1

### Memory

2MByte

### Processor Core

Multiple FPGA based embedded Processors for MIL-STD-1553 Protocol Handling and Time Synchronization

### Time Tagging

46-bit absolute IRIG-B formatted

### Discrete I/O

6 Avionic Discrete Inputs only, 2 Avionic Discrete Inputs/Outputs (Output 3.3V)

### Trigger I/O

BC/BM Trigger Input and Output Line (Input Level up to 5V, Output Level 3.3V)

### Encoder/Decoder

1 or 2 MIL-STD-1553 Encoder/Decoder with full Error Detection

### Physical Bus Interface

1 or 2 MIL-STD-1553B Trapezoidal Transceiver; Transformer coupled

### Connector

Male 31-pin Screw Lock I/O Connector (mating Female Connector Information on Request)

### Dimensions

PCI Express Mini Card (F2 Standard)  
50.95mm x 30mm

**Note:** max. Standard Height (top) is exceeded by the MIL-STD-1553 Transceiver Devices and Front Connector

### Supply Voltage

Standard PCI Express Mini Card Supply  
+3.3V, +1.5V

### Power Consumption

@3.3V aux: 3.4W with 50% Busload on both MIL-Bus-1553 Streams

### Operating Temperature Range

-40°C to +85°C

### Storage Temperature Range

-55°C to +105°C

### Humidity

5 up to 95% (non-condensing)

## Ordering Information

### AMEE1553-1

Single Stream, Dual Redundant  
PCI Express Mini Card

### AMEE1553-2

Dual Stream, Dual Redundant  
PCI Express Mini Card

### Common Features:

- BC, Multi RT Simulator with Mailbox and Chronological Monitor
- **No** Error Injection and **No** Replay Functionality

IRIG-B Time Decoder, 6 Avionic Discrete In, 2 Avionic Discrete In/Out and Trigger 2x In/2x Out; 2MB Global RAM All I/O (1553, Disretes, Trigger, IRIG-B) via 31-pin Screw Lock Connector.

Including Driver Software for Windows and Linux (for others please contact factory)

### Single Function versions available:

- Chronological & Mailbox Monitor OR
- BC and Chronological & Mailbox Monitor OR
- Multi-RT and Chronological & Mailbox Monitor

### Options

#### Tx Inhibit

Available as assembly option, add suffix **-I** to Part Number

#### Conformal Coating

Available as costed option, add suffix **-COAT** to Part Number

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