**TBOLT-MA4™**

**Multi-Channel 1553 and ARINC Connectivity with Real-Time Thunderbolt™ 3 Technology**

**Full Featured, Native Thunderbolt 3 Appliance**

- Two Independent, Dual Redundant 1553 Busses
  - Dual or Full Function Modes
  - And/Or
- Eight ARINC-429/717 Channels
  - 4 RX/TX & 4 RX; First 2 Channels Share 717
- USB-C Connector – Must Use Thunderbolt 3 Rated Cable (not USB). End Point Device with No USB-C Feed Through.
- Supports Full Real-Time Control the Same as a PCI Express Card in a Server! Much Better than Non Real-Time USB or Carrier Based Solutions.
  - Full Hardware Interrupt Handler Support.
- AltaAPI SDK Provides Easy Integration – Use the exact same code as other Alta PCIe devices with DEVID change!
  - Windows 10 and Specific Linux Builds Only

**Optional J1 Cables:**
- 1553, ARINC and Auxiliary (Aux) Signals via J1 Honda Connector.
- Optional J1 Cables:
  - 1553 Jacks Only
  - 1553 Jacks with DB26 for ARINC and Aux
  - DB26 Only for ARINC and Aux
  - Aux Signals Include Avionics Discretes (6), Triggers, TTL and IRIG RX Clock

**Optional AltaView Windows Analyzer. Full 1553 or ARINC Control with Signal Capture.**

**AltaRTVal** 1553 Validation also Optional.

4901 Rockaway Blvd., Building A Rio Rancho, NM 87124 USA

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AltaCore-1553/ARINC
TBOLT-MA4 Appliance Specifications

General
- Thunderbolt 3 USB-C Connection ONLY
  - USB-C Thunderbolt 3 Spec Cables Only
- Physical: 110x89x17mm; 180grams
- 1-2 Dual Redundant Independent 1553 Busses
  - Optional 1533 Variable Voltage
- and/or 8 ARINC Channels: 4 RX/TX & 4 RX
  - TX Extra RX Load; Unpowered RX Drain
- One Megabyte RAM Buffering Per Channel/Bank
- USB 3.1 Spec 5V @ 3A Bus Power:
  - Idle 3.6W
  - 100% TX Load, Full Channels: ~10W
- 2 Temp Sensors: TX and FPGA
- Temp (C): 0-60 Operating; -55 to +120 Storage
- 5-95% humidity, non-condensing
- Transmit Inhibit Optional
- Flash Disable Factory Setting for Secure Mem
- 6 SE Avionics Discretes, One RS-485 Discrete, TTL Clock, Triggers
- IRIG-B DC or PAM RX
- Advanced Startup, User and Continuous BIT
- PCIe Hardware or Polling Interrupts

1553 BC & TX ARINC
- 1553 Framing, Subframing, Scheduling, Aperiodic
- ARINC TX Complete Frequency Control
- 1553 Legal and Reserved Mode Codes
  - 1553A and 1553B Support
- 64-Bit, 20 ns Time Tags
- Full Error Injection/Detection

1553 RT Features
- Circular Linked Data Buffers SAs and MCs
- Legal, Reserved, and 1553A Mode Codes
- 64-Bit, 20 ns Time Tags
- Full Error Injection/Detection

1553 Bus Monitor
- Sequential Monitor
- RT SA Map Monitor
- 64-bit, 20 ns Time Tags and IRIG Sync

ARINC RX Features – 3 RX Modes
- Channel Level Label/Word Tables
- Multi-Channel Data Tables for All Channels
- Channel Level Current Value Tables
- ARINC 717 Frame Support
- 64-Bit, 20 ns Time Tags

Playback/Signal Vector (BC or TX)
- Real Hardware Playback from Archive Files.
- Signal Vector Generation at 20/1000 (1553/ARINC) ns **INDUSTRY FIRST**
- 20 nSec 1553 Vectors and 1 us ARINC Vectors
- 8-bit, 50 ns 1553 and 1 uSec A/D Waveform Signal Capture. 1st Channel 1553 and First 2 RX of ARINC

Software – AltaAPI, AltaView & AltaRTVal
- Multi-Layer AltaAPI SDK Architecture – Windows 10, C/C++, .NET, LabVIEW/Windows, etc.
- Optional AltaView Analyzer & AltaRTVal Windows Applications.
  - Full Analyzer Integration Tool & RT Validation Tools
  - Multi Language Support
  - Linux Support for Specific Kernel Builds – Contact Factory for Kernel Support Details

Part Numbers (1553 and ARINC)
1553 Dual Function: BC/Monitor or mRT/Monitor
- TBOLT-MA4-1D8 or TBOLT-MA4-2D8
1553 Full Function: BC, mRT and Monitor
- TBOLT-MA4-1F8 or TBOLT-MA4-2F8
- For 1553 Only Substitute “-1D0” example
- For ARINC Only Substitute “-0D8” example

Options: Add -N for NVRAM Write Protection, -F for Conformal Coating, -I for TX Inhibit; -V 1553 Variable Voltage, -A for AltaView Analyzer and -B for AltaRTVal Software.
Example: TBOLT-MA4-2F8-ABFINV

2m J2 USB-C Thunderbolt 3 Rated Cable Provided

Optional J1 1553/ARINC Cables:
- PCCD-CAB-1553-1-01 or PCCD-CAB-1553-2-01
  - Single or Dual Channel 1553 Jacks Only
- HTKCB-AUX01: DB26 Only for ARINC and Aux
- HTKCB-1-AUX01: Single Channel 1553 w/ DB26
- HTKCB-2-AUX01: Dual Channel 1553 w/ DB26

5 Year Limited Warranty!
EU and China RoHS Compliant
Non-Public Telecom/CE Device/Non Safety-Mission

Alta Data Technologies LLC
4901 Rockaway Blvd., Building A
Rio Rancho, NM 87124 USA
www.altadt.com
alta.sales@altadt.com
888-429-1553 or 505-994-3111

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