MIL-STD-1553 PC/104-*PLUS* CARD DATASHEET

DDC®
©Data Device Corporation
www.ddc-web.com

MODEL: BU-65578Cx

FEATURES

- PC/104-*Plus* or PCI-104
- Up to 4 Dual Redundant 1553 Channels
- 2 MB Memory w/parity per Channel
- 5 User-Programmable Digital I/O's
- IRIG-B Time Code Input
- 48-bit / 1 μs Time Stamp
- External Time-Tag Clock Input
- IRIG-106 Chapter 10 Monitor Format
- DMA Engine for Low CPU and PCI Utilization

- E^2MA BC/RT/MT Architecture
- API Compatible with Enhanced Mini-ACE® Plus SDK
- 8 MB Flash Memory
  - User Storage
  - Auto Initialization Capable
- Shock and Vibration Tested
- Built-In Self Test
- Linux®, VxWorks®, and Windows® 2000/XP Support
- Applications
  - Flight Data Recorders
  - Embedded Systems
  - Mission Computers
  - Communications Links
  - Munitions
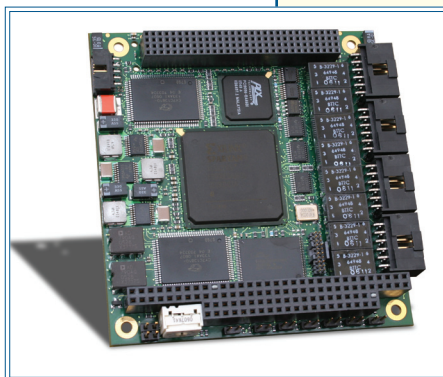
DESCRIPTION

The BU-65578Cx is a one to four channel MIL-STD-1553 card that provides new levels of performance and flexibility for PC/104-*Plus* or PCI-104 systems that interface to a MIL-STD-1553 data bus. The card uses DDC's Extended Enhanced Mini-ACE (E^2MA) architecture, which is API compatible with Enhanced Mini-ACE software. Standard features include 2MB of RAM per channel, 48-bit message time tagging, IRIG-B time stamp input, IRIG-106 Chapter 10 format, transformer coupling, triggers, extensive BC & RT frame structures, error detection, RT Status Bit and Mode Code responses, and advanced Bus Controller functionality.

Each channel is individually configurable as a Bus Controller (BC), Remote Terminal (RT), Bus Monitor (MT) or combined RT / Monitor. The advanced BC architecture provides a high degree of flexibility and autonomy by improving message schedule control, minimizing host overhead for asynchronous message insertion, facilitating bulk data transfers, double buffering, message retry, bus switching strategies, data logging, and fault reporting. The RT architecture provides flexibility in meeting all MIL-STD-1553B protocols. The card has an intelligent hardware offload DMA engine that dramatically reduces PCI bus and host CPU utilization while storing 1553 monitor data in a convenient and portable IRIG-106 Chapter 10 file format. The card includes the MIL-STD-1553 Enhanced Mini-ACE (EMACE) Plus C Software Development Kit (SDK) and drivers to support all modes of operation for Linux, VxWorks and Windows 2000/XP, including source code samples and detailed documentation.

APPLICATIONS

The BU-65578Cx is designed for harsh environments and can be used in either conduction or convection cooled applications. Its rugged construction makes it ideal for use in flight data recorders, displays, ground vehicles, mission computers, and avionics labs.
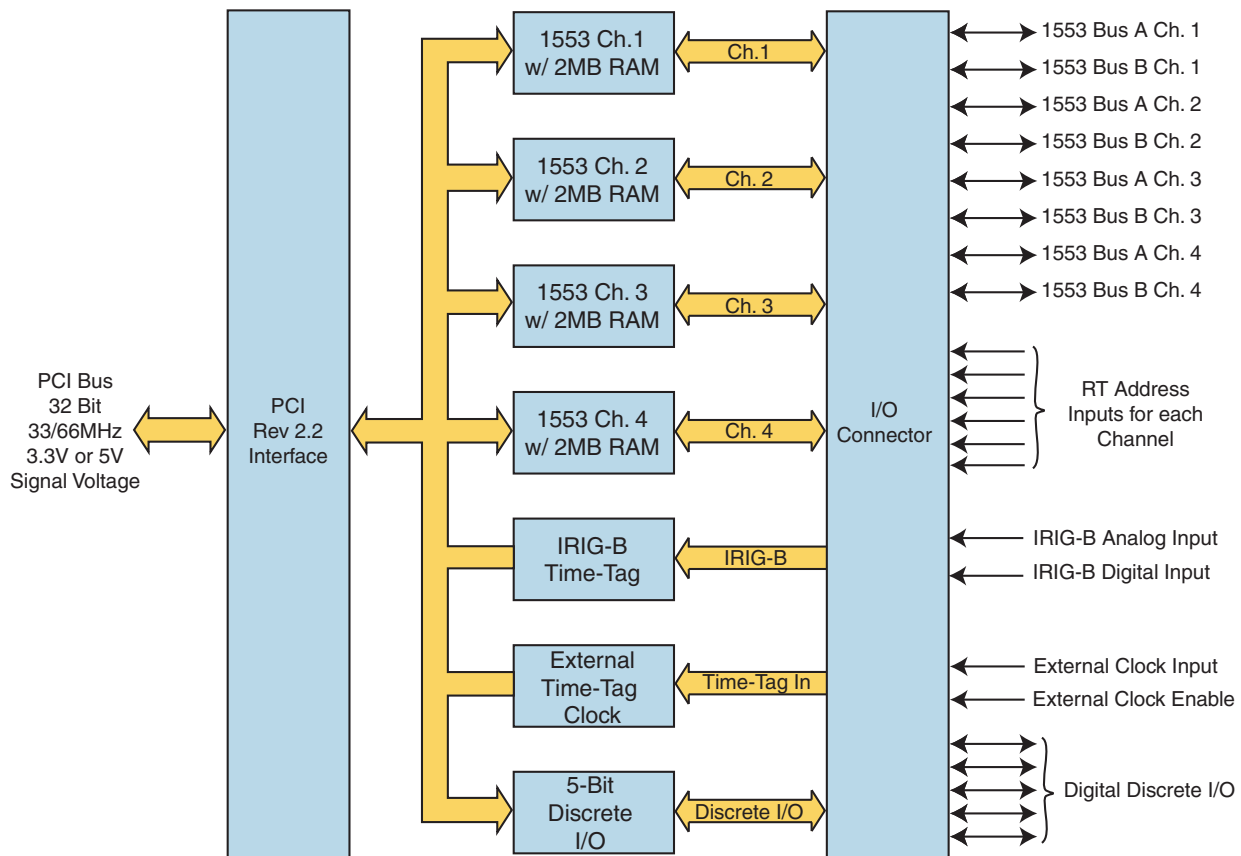
Make Sure the next Card you purchase has...

DDC On Board®

Quick Specifications

PARAMETER	MIN	TYP	MAX	UNITS	PARAMETER	MIN	TYP	MAX	UNITS
ABSOLUTE MAXIMUM RATINGS					**BU-65578C4**				
Supply Voltage					0% Transmit / Monitor		740	810	mA
+5V	-0.3		6.0	V	75% Transmitter Duty Cycle		2.0	2.2	A
+12V	0		18	V					
-12V	0		-18	V	**THERMAL**				
					Operating Temperature				
POWER SUPPLY REQUIREMENTS					BU-65578CX-200	-40		+85	°C
Voltages/Tolerance					BU-65578CX-300	0		+55	°C
+5V	4.75	5	5.25	V					
+12V	11.40	12.0	12.60	V	**Storage Temperature**	-55		+125	°C
-12V	-11.40	-12.0	-12.60	V					
CURRENT DRAIN					**PHYSICAL CHARACTERISTICS**				
BU-65578C1					**Size**				
0% Transmit / Monitor		230	300	mA			3.775 x 3.550 x 0.6		in.
75% Transmitter Duty Cycle		570	650	mA			(98.9 x 90.2 x 15.2)		(mm)
BU-65578C2					**Weight**				
0% Transmit / Monitor		400	470	mA	BU-65578C4		3.68		oz.
75% Transmitter Duty Cycle		1.0	1.1	A			104.4		(g)
BU-65578C3									
0% Transmit / Monitor		570	640	mA					
75% Transmitter Duty Cycle		1.5	1.6	A					

Note: For full specifications and additional information refer to the **BU-65578 PC/104-Plus Card Hardware Manual** (#MN-65578XX-001) and the **BU-69092 EMACE Plus SDK Software Manual** (#MN-69092SX-001).

Figure 1. BU-65578Cx Block Diagram

Figure 1. BU-65578Cx Block Diagram

PC/104-*Plus* for Embedded MIL-STD-1553

- PC/104-*Plus* Version 2.0 Compliant Card or PCI-104 Card
- 32-bit, 33/66 MHz PCI Local Bus Specification Revision 2.2 Compliant
- One to Four Dual Redundant MIL-STD-1553 Channels
- Transformer Coupled 1553 I/O
- 2 MB RAM with Parity per Channel
- 48-bit, 1 Microsecond Resolution, Time-Tag Distributed Among all 1553 Channels
- Five Digital Discrete I/Os
- 8 MB Flash Memory
- Shock and Vibration Tested

Bus Controller

- Control/Status Blocks for Individual Messages
- Minor and Major Frame Scheduling to Control Timing of 1553 Messages
- High and Low Priority Asynchronous Message Insertion
- Modify Messages or Data While BC is Running
- Conditional Messages or Subroutines Based on User Defined Conditions
- Multiple BC Retry Programmable Options
- Fully User-Definable Interrupts
- Error Detection as per MIL-STD-1553 Standard

Remote Terminal

- Choice of Sub-Address Single Message, Double Buffering, Circular Buffering or Global Circular Buffering
- Programmable Interrupt Conditions
- Stack with Descriptors for Individual Messages
- Message Status, Time Tag, Command Word, Data Words
- Programmable Command Illegalization
- Programmable Busy by Sub-Address
- Programmable RT Address via Hardware Connector or Software
- Option for RT AUTO-BOOT with BUSY Bit Set

Bus Monitor

- IRIG-106 Chapter 10 Compatibility
- Selective Message Monitor
- Filter Based on RT Address, T/R bit, Sub-Address
- Message Status, Time Tag, Command Word, Data Words
- Programmable Interrupt Conditions
- Simultaneous RT/Message Monitor Option

Supporting Software

- VxWorks Driver
  - Designed for Wind River's Version 5.x and 6.x
  - Version for Power PC and x86
- Linux Driver
  - Loadable Linux Kernel Version 2.6.x Driver Modules
  - Version for Power PC and x86
- Windows Driver
  - Plug and Play Windows 2000/XP Device Driver
- High Level MIL-STD-1553 EMACE Plus C SDK
- Abstracts all Low Level Bit Register and Memory Mapping
- Open/Access/Close Model

Built-In Self-Test Capability

- RAM Self Test
- Register Self Test
- Online Loopback Test
- Capability to Test Transmitter Timeout Function

Two Operating Temperature Ranges

- Industrial Operating Temperature Range:
  -40 to +85° C, BU-65578Cx-200
- Commercial Operating Temperature Range:
  0 to +55° C, BU-65578Cx-300
- Optional Heat Sink for Convection Cooled Applications Available (see ordering options)

ORDERING INFORMATION

BU-65578CX-2 X 0 X

Processing:

N = Acrylic Conformal Coating
U = Polyurethane Conformal Coating
Blank = No Conformal Coating

Test Criteria:

0 = none

Screening Options:

0 = Designed for Conduction Cooled Applications
A = Designed for Convection Cooled Applications

Operating Temperature Range:

3 = 0 to +55 °C
2 = -40 to +85 °C

I/O Options

1 = 1 MIL-STD-1553 Dual Redundant Channel
2 = 2 MIL-STD-1553 Dual Redundant Channels
3 = 3 MIL-STD-1553 Dual Redundant Channels
4 = 4 MIL-STD-1553 Dual Redundant Channels

Card Type:

C = PC/104-Plus, or PCI-104 Form Factor Card

Base Model Numbers:

65578 = PC/104-Plus MIL-STD-1553 Card
65577 = PCI-104 MIL-STD-1553 Card

Notes:
1. PC/104 (ISA) version is also available, see separate BU-65568C product brief.
2. These products contain tin-lead solder.

Included Software:

BU-69092Sx   MIL-STD-1553 EMACE Plus C Software Development Kit

0 = Windows 2000/XP
1 = Linux
2 = VxWorks

STANDARD DDC PROCESSING FOR DISCRETE MODULES/PC BOARD ASSEMBLIES		
TEST	**METHOD(S)**	**CONDITION(S)**
INSPECTION / WORKMANSHIP	IPC-A-610	Class 3
ELECTRICAL TEST	DDC ATP	—