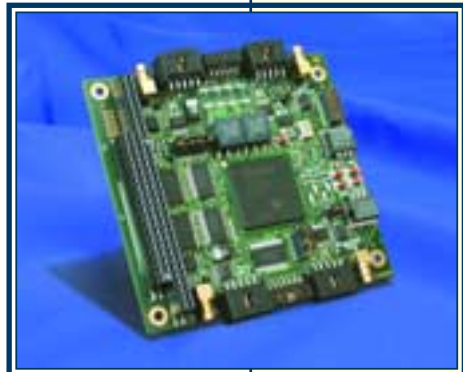# Enhanced Bit Rate EBR-1553 PC/104 Card Series

MODEL: BU-65580C1/ BU-65581CX

FEATURES

- 10Mbps SAE MMSI/EBR-1553 Channel (Optional 4-Ports)
- Optional 1Mbps MIL-STD-1553 Channel
- CANbus Interface Supporting MMSI Serial Addressing (Optional 4-Ports)
- Optional 4-Port Hub Controller Interface for EBR-1553/CANbus Channels
- 12 Discrete I/O Signals
- 5-Bit Addressable External Hub Port Controller
- Enhanced Mini-ACE BC/RT/MT Architecture
- Up to 192 Kbytes SRAM
- Software Compatible with ACE and Enhanced Mini-ACE™ (EMACE) Libraries
- Windows®, DOS and VxWorks® Software Drivers

- Segmented or Flat Address Mode
- Highly Autonomous Bus Controller Architecture (EMACE RTL)
    - 20 Instruction Set
    - Hub Port Selection
    - Conditional Operations
    - Subroutine Capability
    - User Definable Interrupts
    - General Purpose Queue
- RT Buffering Options
    - Single Buffering
    - Double Buffering
    - Circular Buffering
    - Global Circular Buffering
- Applications
    - Miniature Munitions/Store Interface (MMSI)
   - Embedded Systems

DESCRIPTION

The BU-65580CX series cards offers a COTS solution for interfacing between an embedded PC/104 processor card and a 10Mbps MMSI/EBR-1553 bus. EBR-1553, or Enhanced Bit Rate 1553, is a higher speed 10Mbps standard data bus based on the MIL-STD-1553 data bus. Although originally targeted at the new Miniature Munitions/Store Interface data bus, EBR-1553 also offers a migration path for software developed for DDC's popular ACE series of products on the MIL-STD-1553 bus to the higher speed EBR-1553 bus.

DDC has implemented a 4-port Hub EBR-1553 data bus with supporting CANbus interface on its new BU-65581C4 card.

This multi-function card additionally supports a concurrent 1Mbps MIL-STD-1553 channel and provides a discrete I/O port with twelve discrete I/O signals. Discrete I/O lines may be configured to serve as a 5-bit address controller to an external Hub Port interface.

The BU-65580CX series includes two addressing modes to provide consistency of compatibility with both Intel and Motorola platforms. The hardware is supplied with the BU-69090 series software for DOS® and VxWorks®. This library supports all enhanced modes of operation. The card also supports all legacy modes of operation via the BUS-69080 series ACE library for Windows® 2000/XP (BUS-69083S0) and DOS (BUS-69080S0). ACE Menu GUI support is available for Windows 2000/XP (BUS-69085S0).
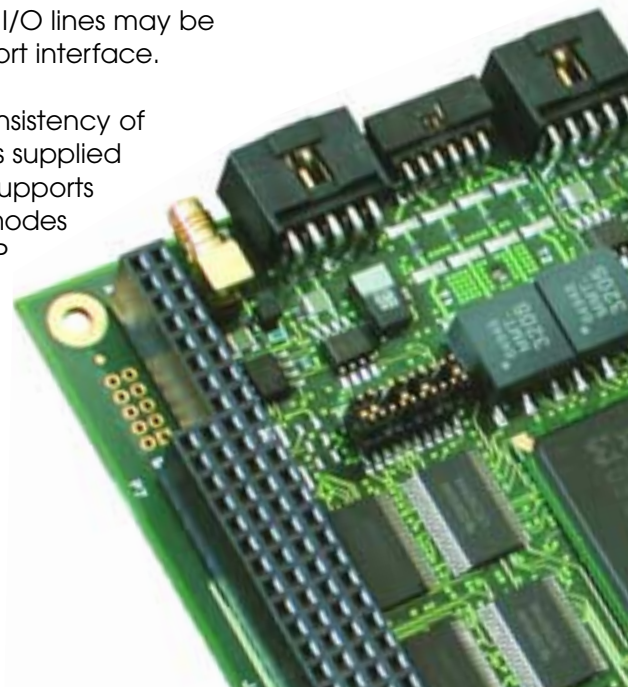
BU-65581C4 Block Diagram

Figure 1
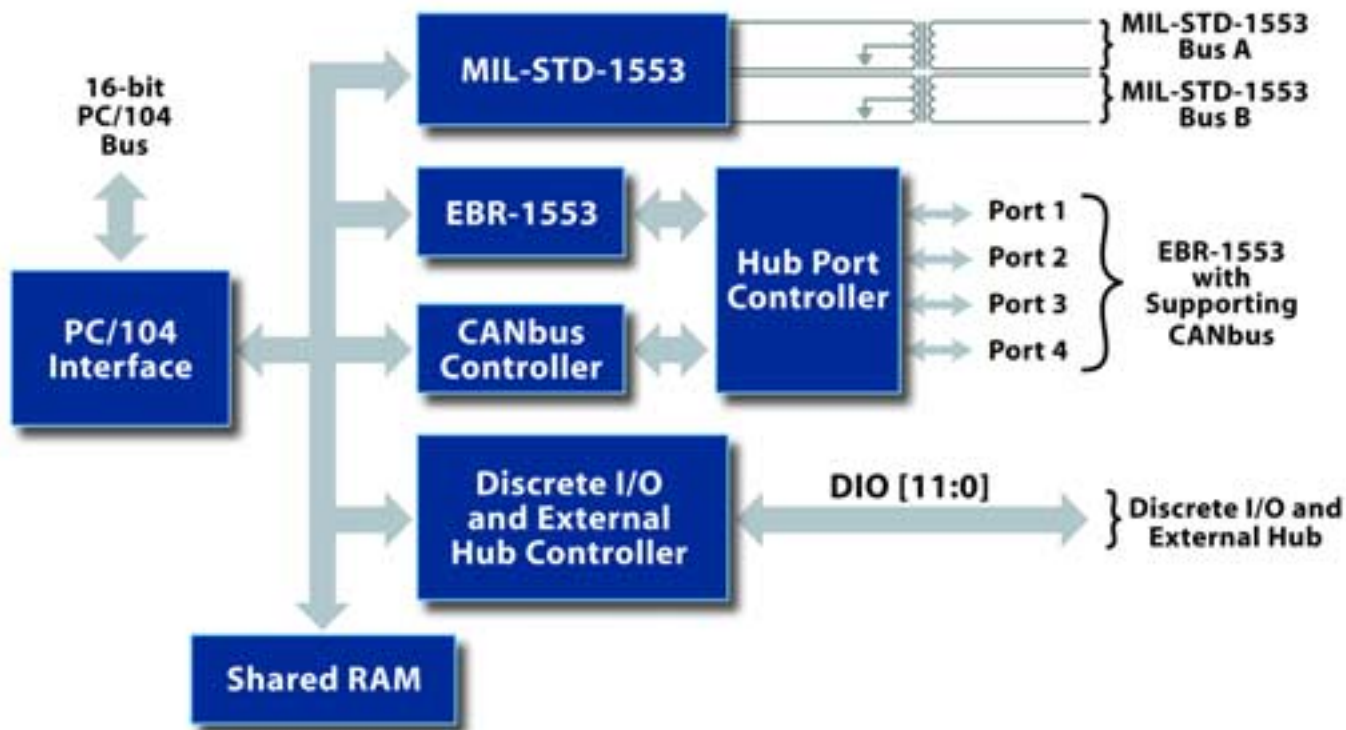
COTS Solution for Embedded EBR-1553
- Convection Cooled PC/104 (Version 2.4) Card
- Four SAE MMSI EBR-1553 Channels
- Four EBR-1553 supporting CANbus interfaces
- One MIL-STD-1553 Channel
- 12 Discrete I/O's
- CANbus Loop-Back Test Interface
- Free Library, GUI, Windows 2000/XP, DOS and
  VxWorks Software Available

RT Hardware Architecture
- Choice of Single Message, Double Buffering,
  Circular Buffering, or Global Circular Buffering
- 32-Entry Interrupt Status Queue
- 50% and 100% Circular Buffer Rollover Interrupts
- Stack with Descriptors for Individual Messages
    - Message Status, Time Tag, Command
      Word, Data Pointer
- RT Address Selectable via supporting CANbus or
  Software Programmable
- Programmable Command Illegalization
- Programmable Busy by Sub-address
- Interrupts on All Messages, or Individual Sub-addresses
  and/or Mode Codes
- Available with Option for RT AUTO-BOOT with BUSY Bit Set
- Compatible with ACE and Mini-ACE applications

PC/104 Interface
- 16-bit PC/104 Fully Addressable Interface
- "Segmented" (16KB) Addressing Mode for Intel Processors
- "Flat" (192 KB) Addressing Mode for Motorola Processors

Two Temperature Ranges
- Commercial Temperature Range
    - Board Operating Temp, 0° to +55°C
    - Storage Temp, -55° to +125°C
- Industrial Temperature Range
    - Board Operating Temp, -40° to + 85°C
    - Storage Temp, -55° to +125°C

BC Hardware Architecture
- Highly Autonomous Message Sequence Control
- Defined Set of 20 Instructions
- Control/Status Blocks for Individual Messages
- Minor and Major Frame Scheduling
- Asynchronous Message Insertion
- Conditional Branching and Subroutines
- General Purpose Queue: Message Status, Time,
  Immediate and Indirect Data
- Fully User-Definable Interrupts
- Hub Port Selection Op Code
- Legacy Mode for Compatibility with ACE and
  Mini-ACE Applications

Monitor Hardware Architecture (MIL-STD-1553 Channel)
- Selective Message Monitor
    - Filter Based on RT address, T/R bit, Sub-address
- Command Stack
    - Message Status, Time Tag, Command Word,
      Data Pointer
- Data Stack
    - All Monitored Words Following (first) Command Word
- 50% and 100% Rollover Interrupts for Command & Data Stacks
- 32-Entry Interrupt Status Queue
- Simultaneous RT/MT Option

Autonomous Built-In Self-Test Capability
- RAM Self-Test
- Online Loop-Back Test
- Capability to Test Transmitter Timeout Function

BU-69090 Series Enhanced Mini-ACE (EMACE) RTL Software
- Complete Application Programmer Interface (API)
- DOS (BU-69090S4) and VxWorks (BU-69090S2) Drivers
- High-Level Register/Memory Initialization Routines
- For All Modes, Creation of Consolidated Status + Data Structures for Individual Messages in Host Memory
- Memory Management Software
- Open/Access/Close Model
- Memory Allocation Performed Transparent to Application Program
- Management of Data Structures in Card RAM and Host Memory

BUS-69080 Series ACE RTL Software
- Complete Runtime Library (RTL) and API
- Complete Legacy ACE RTL Support
- Windows 2000/XP (BUS-69083S0) and DOS (BUS-69080S0) Drivers
- ACE Menu GUI for Windows 2000/XP (BUS-69085S0)

BC Software
- Supports Full Use of BC Instruction Set (EMACE RTL)
- Manages Creation of Data Blocks
- Creates BC Messages
- Create and Start BC Frames
- Creation of Message Control/Status Blocks
- Host Buffer Memory Consolidation

RT Software
- Allocates RT Data Blocks
- Map Data Blocks to Sub-addresses
- Command Illegalization
- Read Consolidated Message Structures from Host Buffers
- Initialize and Manage Circular Buffers

Monitor Software
- Enable Monitor Filtering for Specified Address/T-R/ Sub-addresses
- Copy Monitored Messages into Consolidated Structure in Host Buffers
- Read Last Unread Message from Host Buffer
- Read Most Recent Message from Host Buffer

DOS Driver
- For Pentium Processing Platform
- Source Code Provided

VxWorks Driver
- Designed for Version 5.4 of Wind River VxWorks
- Source Code Provided
- For Intel, developed on Pentium

Support of Offline Development Environment
- Allows Development on Desktop PC
- Generates Binary Image and 'C' Header Files
- Results in Reduced Embedded Code Size
- Reduces Computational Resource Requirements
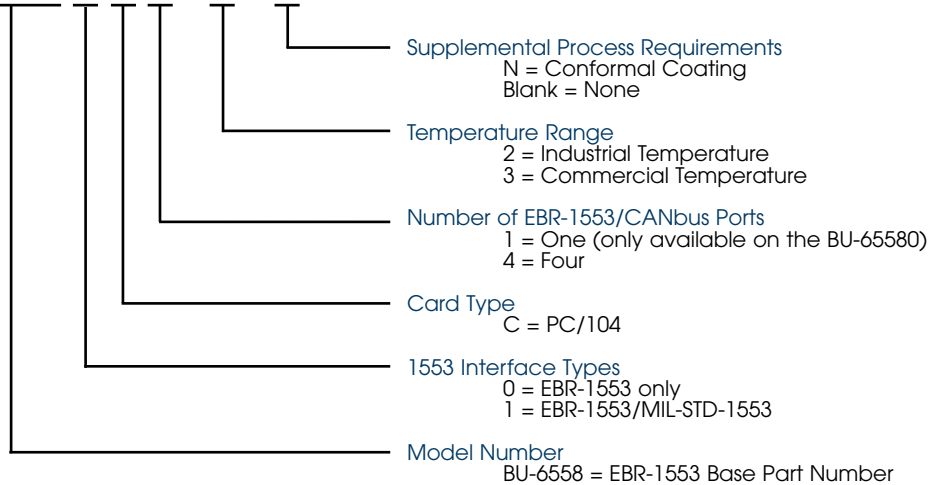- Reduces Software Validation and Documentation Requirements

Specifications

PARAMETER	MIN	TYP	MAX	UNITS	PARAMETER	MIN	TYP	MAX	UNITS
ABSOLUTE MAXIMUM RATINGS					**THERMAL**				
Supply Voltage	-0.3		6.0	V	Dissipation (@5.25v VCC/+85° C)				
					0% Transmit/Monitor			3.69	W
POWER SUPPLY REQUIREMENTS					75% Duty Transmitter Cycle			4.06	W
Voltages/Tolerance	4.75	5	5.25	V	(EBR-1553 Channel)				
					75% Duty Transmitter Cycle			5.62	W
Current Drain (@5.0v VCC/+25° C)					(MIL-STD-1553 Channel)				
0% Transmit/Monitor		319		mA					
75% Duty Transmitter Cycle		390		mA	Board Operating Temperature				
(EBR-1553 Channel)					BU-6558XCX (Commercial)	0		+55	°C
75% Duty Transmitter Cycle		700		mA	BU-6558XCX (Industrial)	-40		+85	°C
(MIL-STD-1553 Channel)					Storage Temperature				
					BU-6558XCX	-55		+125	°C
					PHYSICAL CHARACTERISTICS				
					Size	3.775 X 3.550 X 0.6			in.
						(95.9 X 90.2 X 15.2)			(mm)
					Weight		4.4		oz.
							(125)		(g)

Ordering Information

BU-6558 X C X - X00N

Supplemental Process Requirements
N = Conformal Coating
Blank = None

Temperature Range
2 = Industrial Temperature
3 = Commercial Temperature

Number of EBR-1553/CANbus Ports
1 = One (only available on the BU-65580)
4 = Four

Card Type
C = PC/104

1553 Interface Types
0 = EBR-1553 only
1 = EBR-1553/MIL-STD-1553

Model Number
BU-6558 = EBR-1553 Base Part Number

Note:
1- These products contain tin-lead solder

Included Software

BU-69090SX - Enhanced Mini-ACE Runtime Library Software and Drivers

2 = VxWorks
4 = DOS

BU-6908X50 - Enhanced Mini-ACE Runtime Library Software and Drivers

0 = DOS
3 = Windows 2000/XP
5 = ACE Menu for Windows 2000/XP