

# CM1-BT1

Extreme Rugged™ PC/104 Single Board Computer  
with Intel® Atom™ Processor System-on-Chip

NEW



## Features

- Single-core Intel® Atom™ Processor System-on-Chip
- Up to 4GB DDR3L at 1333MHz
- Supports VGA and LVDS
- 2x GbE
- 1x SATA 3Gb/s (optional 2x SATA), 3x USB 2.0, 8x GPIO
- Extreme Rugged™ operating temperature: -40°C to +85°C
- Supports Smart Embedded Management Agent (SEMA) functions

## Specifications

### Core System

CPU	Single-core Intel® Atom™ Processor System-on-Chip Atom™ E3815 (1C), 1.46 GHz, 400/- (No Turbo), 5W Supports: single, Out-of-Order Execution (OOE) processor cores, Intel® VT-x, Intel® SSE4.1 and SSE4.2, Intel® 64 architecture, IA 32-bit, PCLMULQDQ Instruction DRNG, Intel® Thermal Monitor (TM1 & TM2)  Note: Availability of features may vary between processor SKUs.
Memory	Up to 4GB DDR3L-1066/1333 MHz DDR3L SO-DIMM
Embedded BIOS	AMI EFI with CMOS backup in 8MB SPI BIOS
Cache	Primary 32 KiB, 8-way L1 instruction cache and 24 KiB, 6-way L1 write-back data cache
Expansion Busses	PC/104 (ISA)
SEMA Board Controller	Supports: Voltage/Current monitoring, Power Sequence debug support, AT/ATX mode control, Logistics and Forensic information, Flat Panel Control, General Purpose I°C, Failsafe BIOS (dual BIOS), Watchdog Timer and Fan Control
Debug Headers	40-pin multipurpose flat cable connector  Note: Use in combination with DB-40 debug module providing BIOS POST code LED, BMC access, SPI BIOS flashing, Power Testpoints, Debug LEDs

### Video

GPU Feature Support	7th generation Intel® graphics core architecture with four execution units Supports two independent displays 3D graphics hardware acceleration Supports for DirectX 11, OCL 1.1, OGL ES Halt/2.0/1.1, OGL 3.2 Video decode hardware acceleration including support for H.264, MPEG2, MVC, VC-1, WMV9 and VP8 formats Video encode hardware acceleration including support for H.264, MPEG2 and MVC formats
LVDS	Single/dual channel 18/24-bit LVDS from eDP
VGA	Yes

### Audio

Chipset	Intel® HD Audio integrated in SoC
Audio Codec	ALC886

### Ethernet

Intel® MAC/PHY Interface	2x Intel® i210 (MAC/PHY) Ethernet controller 10/100/1000 GbE connection
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### I/O Interfaces

USB	3x USB 2.0 (1x on mSATA)
SATA	1x SATA 3Gb/s shared with mSATA (optional 2nd SATA 3GB/s port w/o mSATA support)
GPIO	8x
Serial	2x RS-232/485 (with full handshake) + 2x RS-232/485 (TX,RX,CTS,RTS only)

### LPC

LPC UART NCT5104D (Nuvoton)

### Power

Standard Input	ATX = 5V±5% / 5Vsb ±5% AT = 5V±5%
Management	ACPI 5.0 compliant
Power States	C1-C6, S0, S3, S4, S5 (Wake on USB S3/S4, Wake on LAN S3/S4/S5)
ECO mode	Supports deep S5 (ECO mode) for power saving

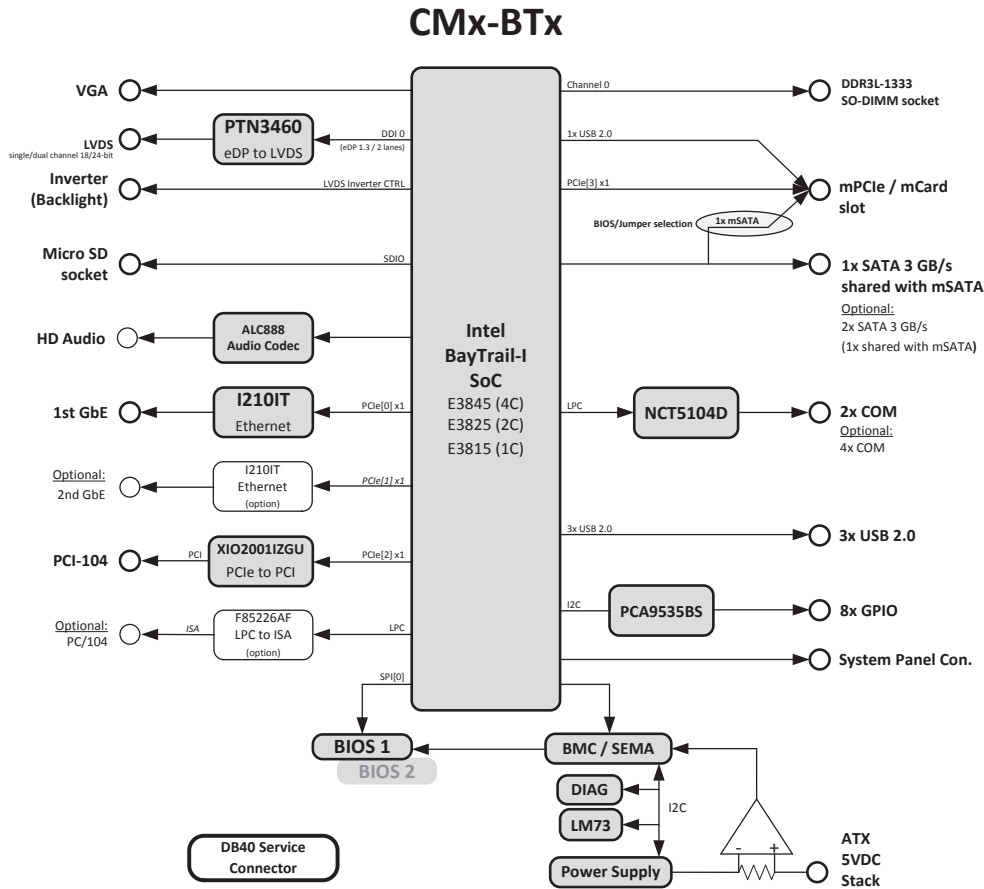
### Mechanical and Environmental

Form Factor	PC/104 Version 2.6
Dimension	90 mm x 96 mm
Operating Temperature	Standard: 0°C to +60°C Extreme Rugged™: -40°C to +85°C
Humidity	5-90% RH operating, non-condensing 5-95% RH storage (and operating with conformal coating)
Shock and Vibration	IEC 60068-2-64 and IEC-60068-2-27 MIL-STD-202F, Method 213B, Table 213-I, Condition A and Method 214A, Table 214-I, Condition D
HALT	Thermal Stress, Vibration Stress, Thermal Shock and Combined Test

### Operating Systems

Standard Support	Windows 7/8 32/64-bit, Linux 32/64-bit
Extended Support (BSP)	WEST/8, WEC7, Linux, QNX, VxWorks

# Functional Diagram



# Ordering Information

## Modules

Model Number	Description/Configuration
CM1-BT1-E3815	PC/104, Atom E3815 (1C), 1.46 GHz, Single Core, incl. heat spreader, Standard operating temperature: 0°C to +60°C

## Accessories

Model Number	Description/Configuration
tbd	ETT screening -40°C to +85°C
CMx-BTx-X-10	CMx-BTx cable kit
CMx-BTx-TM-10	Passive low profile heatsink for CMx-BTx
CMx-BTx-TM-20	Active low profile heatsink for CMx-BTx (with fan)
DDR3L memory	Verified 2GB, 4GB DDR3L SODIMM memory available

# CMx-BTx Standard Variant Comparison

Model Number	CM1-BT1-E3815	CM2-BT2-E3825	CM3-BT4-E3845	CM3-BT1-E3815
Form factor	PC/104	PC/104-Plus	PCI-104	PCI-104
PCI Bus (PCI-104)	No	Yes	Yes	Yes
ISA Bus (PC/104)	Yes	Yes	No	No
CPU	E3815	E3825	E3845	E3815
CPU cores	1	2	4	1
VGA	1x	1x	1x	1x
LVDS	1x	1x	1x	1x
SATA	config 1: 2, config 2: 1	config 1: 2, config 2: 1	config 1: 2, config 2: 1	config 1: 1, config 2: 0
mSATA	0, 1	0, 1	0, 1	0, 1
mPCIe	1, 0	1, 0	1, 0	1, 0
MicroSD card slot	1x	1x	1x	0x
GbE	2x	2x	2x	1x
COM	4x	4x	4x	2x
GPIO	8x	8x	8x	8x
HD Audio	1x	1x	1x	1x
USB 2.0	3x	3x	3x	3x