Features

Performance for Industrial IoT Applications
- Intel® Atom™ Processor (single, dual & quad-core)
- Up to 8 GB DDR3-LV System RAM
- Hardware-based Intel® Virtualization Technology
- Higher per watt performance

Rugged Design for Demanding Environments
- -40°C to +85°C Operating Temperature Range
- EBX Form Factor
- Shock and Vibration Tested
- Latching connectors

Fast Graphics at High Resolutions
- Intel Low Power Gen7 Graphics Engine
- Multiple Displays Supported
- Full-HD and 3D Graphics acceleration

Enhanced Security and Content Protection
- Hardware-assisted Intel AES NI
- Secure Boot capable

Connectivity and I/O for Embedded Systems
- Dual Ethernet
- 8x USB 2.0
- 48 GPIO
- Four Serial Ports
- PS/2 keyboard, mouse, LPT

Expansion Options
- PC/104 and PC/104-Plus
- 2x Mini-PCIe Sockets, 1x MSATA

Product Description

WinSystems' EBC-C413 is an EBX-compatible Single Board Computer (SBC) that uses Intel's Atom Bay Trail SOC (System on a Chip) processor. It includes a SODIMM socket supporting up to 8 GB of DDR3 system memory and one high-speed storage interface configurable as SATA or CFAST as needed for OS and application software. Additional expansion is available through MiniPCIe, mSATA, and PC/104-Plus interfaces.
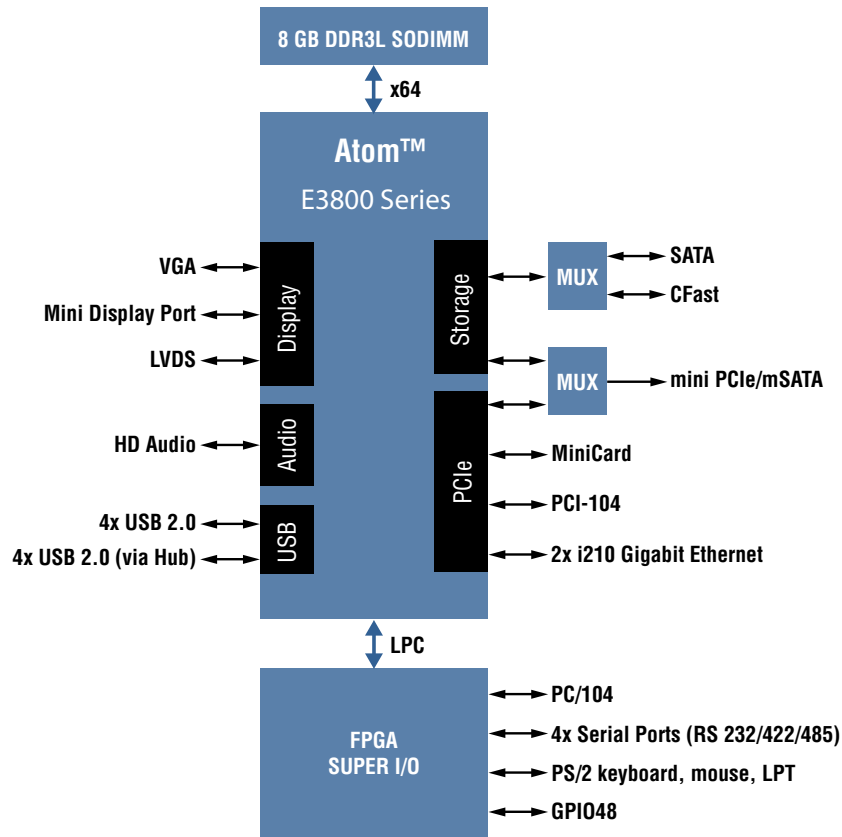
This SBC is a full-featured unit with onboard I/O that supports CRT/DisplayPort/LVDS video simultaneously, dual Gigabit Ethernet ports, eight USB 2.0 ports, four serial RS-232/422/485 UARTs, 48 digital I/O lines, HD audio, watchdog timer, PS/2 keyboard and mouse controllers, and LPT. It also has two MiniPCIe sockets, PC/104 and PC/104-Plus connectors for additional I/O expansion.

The EBC-C413 supports Linux, Windows® 10 desktop, Windows 10 IoT, and other x86-compatible real-time operating systems. Drivers are available from the WinSystems' website.
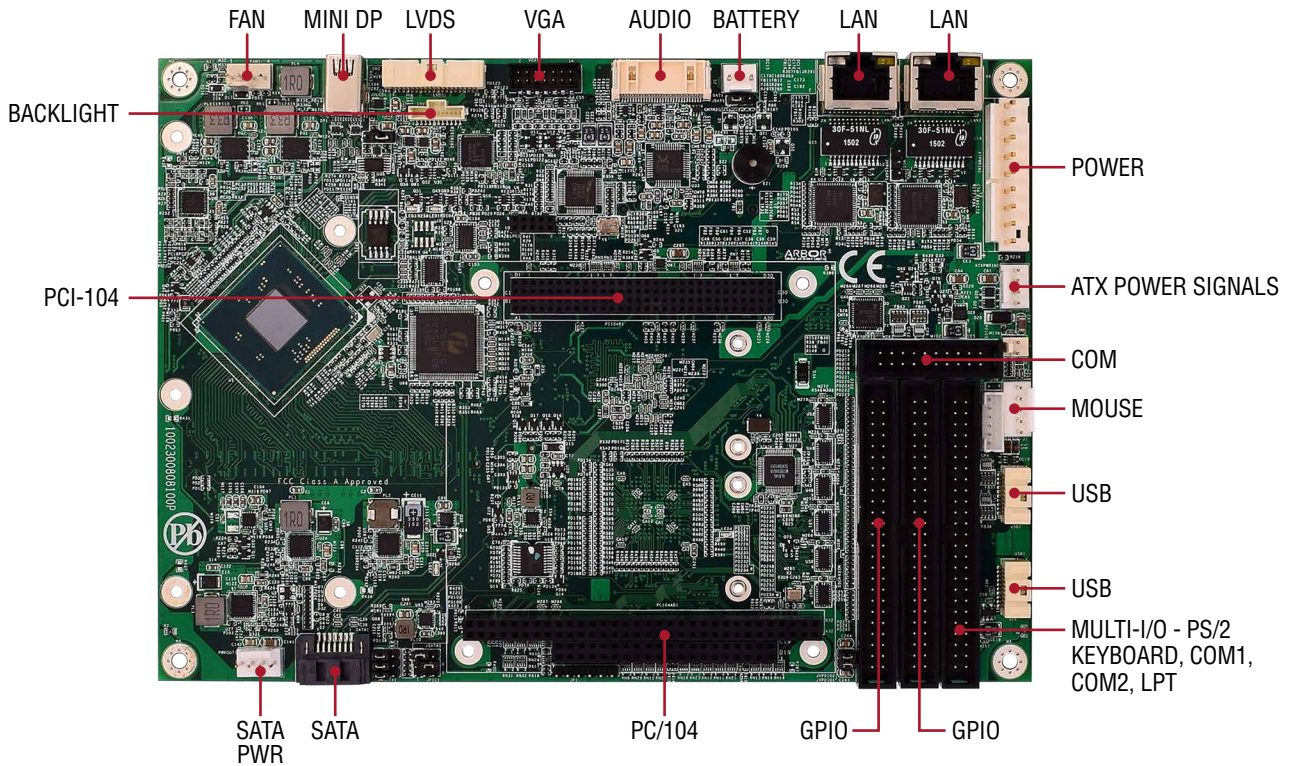
The EBC-C413 is designed for long-term availability.

This board replaces and is a performance upgrade to WinSystems' EBC-384 and EBC-855. It is designed for highperformance industrial, medical, communications, and military or commercial off-the-shelf (Mil/COTS) applications.

EBC-C413

Block Diagram

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                    ┌──────────────────────┐
                    │  8 GB DDR3L SODIMM   │
                    └──────────────────────┘
                               ↕ x64

                    ┌──────────────────────┐
                    │      Atom™           │
                    │    E3800 Series      │
                    │                      │
      VGA ←──── ┌─────────┐     ┌─────────┐   ┌─────┐ ←── SATA
                │ Display │     │ Storage │──→│ MUX │
 Mini Display Port ←──────┤     │         │   └─────┘ ←── CFast
                │         │     │         │
      LVDS ←────┤         │     │         │   ┌─────┐
                └─────────┘     │         │──→│ MUX │──→ mini PCIe/mSATA
                                │         │   └─────┘
  HD Audio ←──── ┌─────────┐    │         │
                 │  Audio  │    ┌─────────┐ ──→ MiniCard
                 └─────────┘    │  PCIe   │ ──→ PCI-104
 4x USB 2.0 ←─── ┌─────────┐    │         │ ──→ 2x i210 Gigabit Ethernet
4x USB 2.0 (via Hub) ←─────┤USB │    └─────────┘
                 └─────────┘
                    └──────────────────────┘
                               ↕ LPC

                    ┌──────────────────────┐
                    │      FPGA            │ ──→ PC/104
                    │    SUPER I/O         │ ──→ 4x Serial Ports (RS 232/422/485)
                    │                      │ ──→ PS/2 keyboard, mouse, LPT
                    │                      │ ──→ GPIO48
                    └──────────────────────┘
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Connectors

WINSYSTEMS, INC. | 2890 112th Street, Grand Prairie, Texas 75050 | 817-274-7553 | info@winsystems.com | www.winsystems.com

EBC-C413

Technical Specifications

PROCESSOR	Intel® Atom™ E3815 Single-core (1.46 GHz)	Intel® Atom™ E3825 Dual-core (1.33 GHz)	Intel® Atom™ E3845 Quad-core (1.91 GHz)
OS COMPATIBILITY	• Linux, Windows, DOS and other x86 compatible OS		
MEMORY	• Up to 8 GB of DDR3 SODIMM (Socketed)		
BIOS	• UEFI - Insyde BIOS		

DISPLAY	• Dual, simultaneous video output supports two active displays from the 3 different interfaces
	  – Analog VGA resolution up to 2560x1600
	  – LVDS resolution up to 1920x1200
	  – DisplayPort		

STORAGE	• 1 SATA (2.0) channel • mSATA socket (Shared with MiniPCIe) • CFast Memory Socket		

NETWORK INTERFACE	• Two 1000 Mbps using the Intel i210 LAN controller
	  – Supports Wake on LAN on both channels
	  – Status & Activity LEDs for both Ethernet controllers		

ONBOARD I/O	• Digital I/O: 48 Bidirectional GPIO; 24 with event sense • Serial I/O: 4 serial ports (RS-232/422/485) • PS/2 keyboard and mouse controller • Printer I/O: LPT interface with SPP/EPP support • Speaker output for beep tones	• RTC with optional battery back up • 8 USB 2.0 ports • Watchdog Timer: Adjustable from 1 second to 255 minute reset • HD Audio supported Realtek ALC888S-VD2-GR	
EXPANSION BUS	• PC/104 and PC/104-Plus • 2x Mini PCIe (1x shared mSATA or MiniPCIe)		
POWER	+5V DC required Maximum: 1.6A / Typical: 1.2A Suspend (S3): ~350mA	+5V DC required Maximum: 1.9A / Typical: 1.5A Suspend (S3): ~350mA	+5V DC required Maximum: 2.2A / Typical: 1.8A Suspend (S3): ~350mA
ENVIRONMENTAL	• Operational from -40°C to 85°C • RoHS compliant • Random Vibration Testing: MIL-STD-202G, Method 214A, Condition D 0.1g/Hz (11.95g rms), 20 minutes per axis, 3 axis • Mechanical Shock Testing: MIL-STD-202G, Method 213B, Condition A 50g half-sine, 11 ms duration per axis, 3 axis		
MECHANICAL	Dimensions: 5.75 x 8.00 inches (146 x 203 mm) Weight: 1.19 Lbs (0.540 Kg) with heatsink	Dimensions: 5.75 x 8.00 inches (146 x 203 mm) Weight: 1.19 Lbs (0.540 Kg) with heatsink	Dimensions: 5.75 x 8.00 inches (146 x 203 mm) Weight: 1.19 Lbs (0.540 Kg) with heatsink

Order Information

SBC PART NUMBER	**EBC-C413-3815-0** Intel E3815 Single-core 1.46 GHz	**EBC-C413-3825-0** **EBC-C413-3825-0-NA (no audio)** Intel E3825 Dual-core 1.33 GHz	**EBC-C413-3845-0** **EBC-C413-3845-0-NA (no audio)** Intel E3845 Quad-core 1.91 GHz
SODIMM OPTIONS	• 2GB DDR3 PC3-1600 LV SDRAM SODIMM 204-PIN – SODIMM204-3-16-2G • 4GB DDR3 PC3-1600 LV SDRAM SODIMM 204-PIN – SODIMM204-3-16-4G • 8GB DDR3 PC3-1600 LV SDRAM SODIMM 204-PIN – SODIMM204-3-16-8G		

CABLES	• CBL-SET-413-2 cable and accessories set includes:
	  – ADP-IO-USB-001 – Dual 8-pin, 2 mm, four USB ports
	  – BAT-LTC-E-36-16-1 – External 3.6 V, 1650 mAH battery
	  – CBL-173-G-1-1.0 – Serial COM3 and COM4 cable
	  – CBL-234-G-1-1.375 – Video CRT cable
	  – CBL-236-G-2-1.5 – EBC power cable
		– CBL-247-G-1-1.0 – Multi-I/O cable
		– CBL-343-G-1-1.375 – PS/2 cable
		– CBL-AUDIO2-102-12 – Audio 2x 15 cable
		– CBL-RST-402-18 – Reset harness
		– CBL-USB4-002-12 – Four USB to two, 8-pin 2mm connectors	

OPTIONAL BATTERY	• BAT-LTC-E-36-16-1 (External 3.6 V, 1650 mAH) • BAT-LTC-E-36-27-1 (External 3.6 V, 2700 mAH)		
CFAST SSD	• CFAST-A-1G-SI – 1 GB • CFAST-A-2G-SI – 2 GB • CFAST-A-4G-SI – 3 GB	• CFAST-A-8G-SI – 8 GB • CFAST-A-16G-SI – 16 GB	
mSATA OPTIONS	• MSATA-A-8G-MI – 8GB Industrial MLC mSATA • MSATA-A-16G-MI – 16GB Industrial MLC mSATA • MSATA-A-32G-MI – 32GB Industrial MLC mSATA • MSATA-A-64G-MI – 64GB Industrial MLC mSATA	• MSATA-A-128G-MI – 128GB Industrial MLC mSATA • MSATA-A-256G-MI – 256GB Industrial MLC mSATA • MSATA-A-512G-MI – 512GB Industrial MLC mSATA	

Expansion and Customization Options

WinSystems provides additional cables, expansion cards, power supplies, and solid state drives to complete your embedded computing solution including data acquisition, communications, location, and other features via PCIe/104 and M.2 interfaces. Our Application Engineers are available to guide you through product selection and customized options.

Contact an Application Engineer or visit our website for more information.

WINSYSTEMS®

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Rev. 210811