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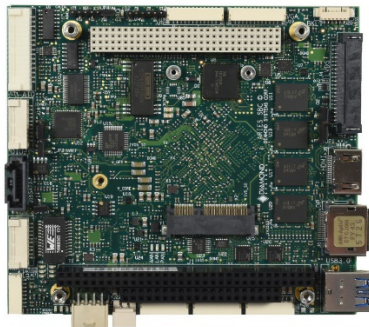


# Datasheet

## Diamond Systems

### Aries

Single Board Computer PC/104 CPU Module with Intel quad core E3845 or 1.46GHz dual core E3826 Bay  
Trail Processors



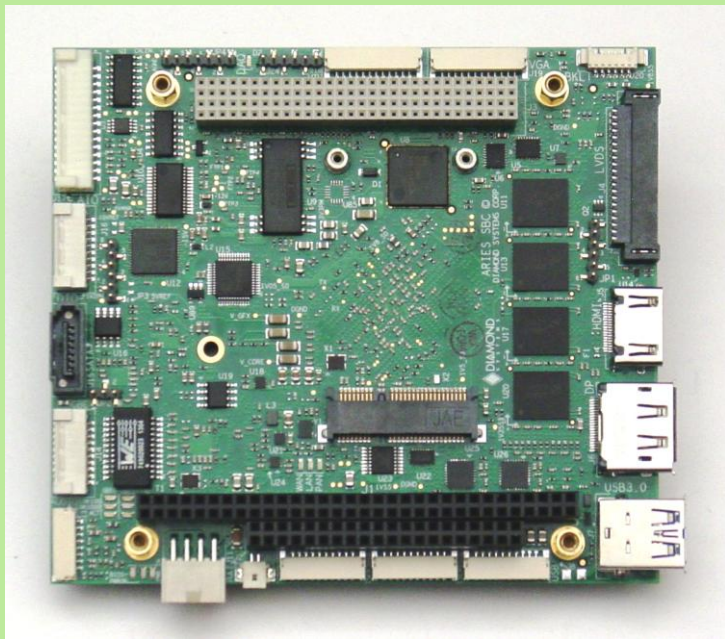
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# ARIES SBC Family

## Rugged Intel Bay Trail E3800 Series SBC with Soldered Memory and Data Acquisition



### Highly Integrated SBC

Aries is a compact, rugged, single board computer that features the Intel E3800 Bay Trail processor in an extended PC/104-Plus form factor. The full rectangular shape provides more coastline for I/O connectors than other boards its size. In this compact form factor, Aries includes a wide range of I/O plus data acquisition functionality, meeting the majority of today's connectivity requirements in a single board.

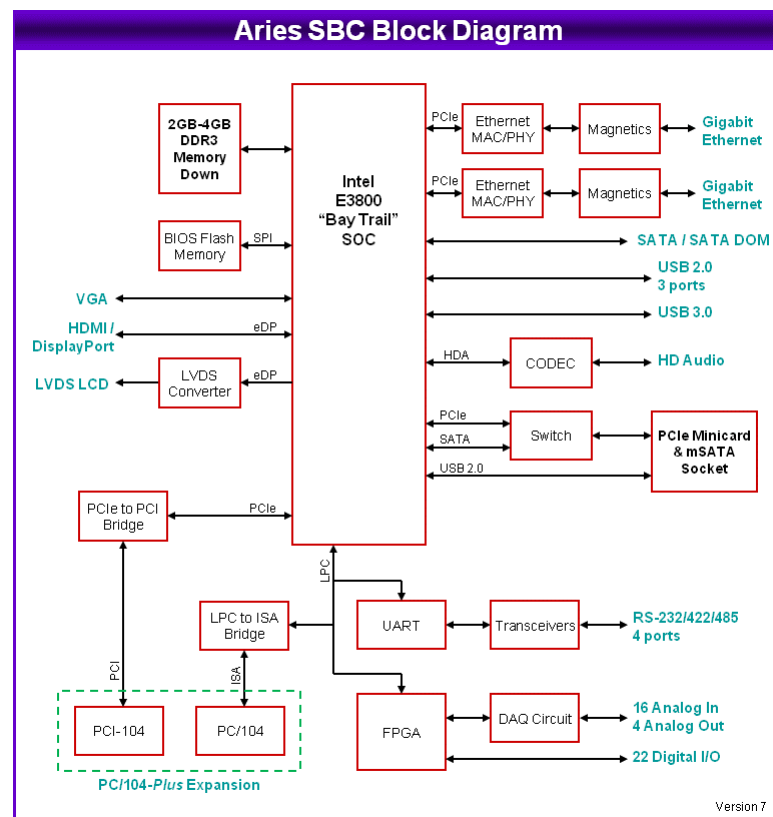
### Flexible I/O Expansion

Aries supports stackable I/O expansion with PC/104-Plus (ISA + PCI) I/O modules. Aries also provides a dual-use PCIe MiniCard / mSATA socket for additional I/O expansion. I/O modules featuring WiFi, Ethernet, analog I/O, digital I/O, and CAN are available in the PCIe MiniCard form factor, providing compact expandability without increasing the total height of the system.

### Rugged Design

The Aries SBC was designed with rugged applications in mind. With an operating temperature of -40°C to +85°C, soldered on-board memory, integrated heat spreader for efficient conduction cooling, 50% thicker PCB, and full suite of latching connectors, Aries is the perfect choice for vehicle and other harsh environment applications.

- ◆ 1.91GHz Intel quad core E3845 or 1.46GHz dual core E3826 Bay Trail CPU
- ◆ 2GB or 4GB 64-bit DDR3 SDRAM soldered on board
- ◆ I/O Support:
  - 3 USB 2.0 ports, 1 USB 3.0 port
  - 4 RS-232/422/485 ports with programmable protocol and line termination
  - 2 10/100/1000Mbps Ethernet ports
  - 1 SATA port for disk-on-module or external drive
  - 24-bit LVDS LCD display and VGA CRT
  - DisplayPort or HDMI with dual independent display
  - HD audio
  - Shared expansion socket auto-selects for either PCIe MiniCard or mSATA flashdisk modules
- ◆ Data Acquisition:
  - 16 16-bit analog inputs, 250KHz max sample rate
  - 4 16-bit analog outputs with waveform generator
  - 22 digital I/O lines with programmable direction
  - 8 counter/timers, 4 PWMs
- ◆ PC/104-Plus and PCIe MiniCard expansion capability
- ◆ PC/104-Plus extended form factor (4.5" x 4.0")
- ◆ Extremely rugged with soldered RAM and -40°C to +85°C (-40°F to +185°F) operating temperature

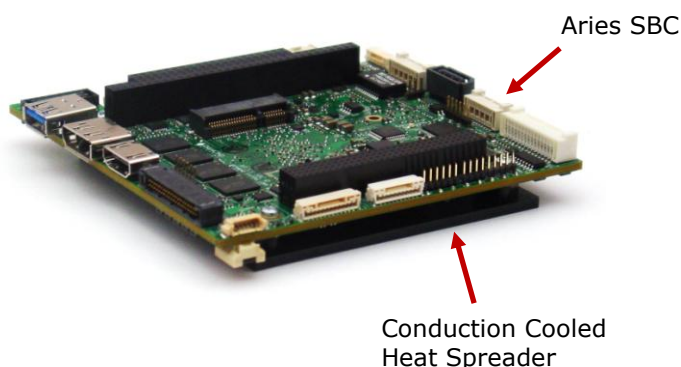


# Aries: Intel E3800 PC/104-Plus SBC

## Specifications

<b>Processor</b>	1.91GHz quad core Intel E3845 CPU or 1.46GHz dual core Intel E3826 CPU
<b>Memory</b>	2GB or 4GB onboard 64-bit DDR3 SDRAM
<b>Display type</b>	24-bit LVDS LCD flat panel interface VGA CRT Display port or HDMI
<b>Display resolution</b>	LVDS: 2560 X 1600 maximum VGA: 2560 X 1600 maximum Display Port: 2560 x 1600 maximum HDMI: 1920 x 1080 maximum
<b>USB ports</b>	3 USB 2.0, 1 USB 3.0
<b>Serial ports</b>	4 RS-232/422/485 ports
<b>Networking</b>	2 Gigabit Ethernet
<b>Mass storage</b>	1 SATA v2.0 port for external hard drive or SATA DOM 1 mSATA Disk Module interface*
<b>Analog inputs</b>	16 16-bit
<b>Input ranges</b>	±10V, ±5V, ±2.5V, ±1.25V, 0-10V, 0-5V, 0-2.5V programmable
<b>Sample rate</b>	250KHz maximum
<b>On-board FIFO</b>	2048 samples, programmable threshold
<b>DAQ calibration</b>	Autocalibration values stored in EEPROM
<b>Analog outputs</b>	4 16-bit
<b>Output ranges</b>	±10V, ±5V, 0-10V, 0-5V programmable
<b>Digital I/O</b>	22 lines independently programmable
<b>PWM</b>	4 24-bit pulse width modulators
<b>Counter/timers</b>	8 32-bit counter/timers
<b>Keyboard/mouse</b>	USB
<b>Audio</b>	HD Audio CODEC with stereo line out, line in and microphone
<b>WDT</b>	Programmable watchdog timer
<b>Other</b>	Voltage monitor Operating hour counter
<b>Expansion socket</b>	PCIe MiniCard socket*
<b>Expansion bus</b>	PC/104-Plus (ISA + PCI)
<b>Input power</b>	+5VDC +/-5%
<b>Power consumption</b>	8.5W idle (E3845 CPU) 8.0W idle (E3826 CPU)
<b>Operating temperature</b>	-40°C to +85°C (-40°F to +185°F)
<b>Shock</b>	MIL-STD-202G compatible
<b>Vibration</b>	MIL-STD-202G compatible
<b>Dimensions</b>	4.5" x 4.0" (115.5mm x 101.5mm)
<b>Weight</b>	8.6oz (243.8g) with heat spreader
<b>RoHS</b>	Compliant

\*shared interface, can use only one



Diamond's family of Aries PC/104-Plus SBCs combines excellent CPU performance, a wealth of PC I/O, and on-board data acquisition circuitry at a competitive price. Available PC I/O includes USB 2.0/3.0, RS-232/422/485, dual Gigabit Ethernet, and a SATA port. The data acquisition circuit includes 16 16-bit analog inputs, 4 16-bit analog outputs and 22 digital I/O lines configurable as counter/timers and pulse width modulators.

A shared PCIe MiniCard / mSATA socket is provided to add either additional I/O or a flashdisk of up to 64GB in capacity. This shared socket auto selects the appropriate interface after identifying the installed module.

## Software Support

Aries SBCs run Linux, Windows Embedded Standard 7, and 8. Both Linux and Windows Embedded 7 Software Development Kits are available with bootable images and drivers to get you started on your design project right out of the box.

## Development Kits

Complete Development Kits with a bootable operating system are available with all the components you need to get started on your embedded design project. The kit contains an Aries SBC, 32GB MLC SATA-DOM flashdisk with your choice of Windows Embedded 7 or Linux pre-loaded, cable kit, AC adapter, and software CD.

## Ordering Information

<b>ARS3845-4GA</b>	Aries SBC, 1.91GHz E3845 CPU, 4GB DDR3 SDRAM, analog I/O & digital I/O
<b>ARS3845-4GN</b>	Aries SBC, 1.91GHz E3845 CPU, 4GB DDR3 SDRAM, digital I/O
<b>ARS3826-2GA</b>	Aries SBC, 1.46GHz E3826 CPU, 2GB DDR3 SDRAM, analog I/O & digital I/O
<b>ARS3826-2GN</b>	Aries SBC, 1.46GHz E3826 CPU, 2GB DDR3 SDRAM, digital I/O
<b>DK-ARS-WE7</b>	Aries Development Kit with ARS3845-4GA SBC, cables and Windows Embedded 7 OS
<b>DK-ARS-LNX</b>	Aries Development Kit with ARS3845-4GA SBC, cables and Linux OS
<b>SDK-ARS-WE7</b>	Aries Windows Embedded 7 Software Development Kit
<b>SDK-ARS-LNX</b>	Aries Linux Software Development Kit
<b>CK-ARS-01</b>	Aries Cable Kit for all on-board I/O
<b>ACC-HS104-12.7</b>	Heat Sink Accessory

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