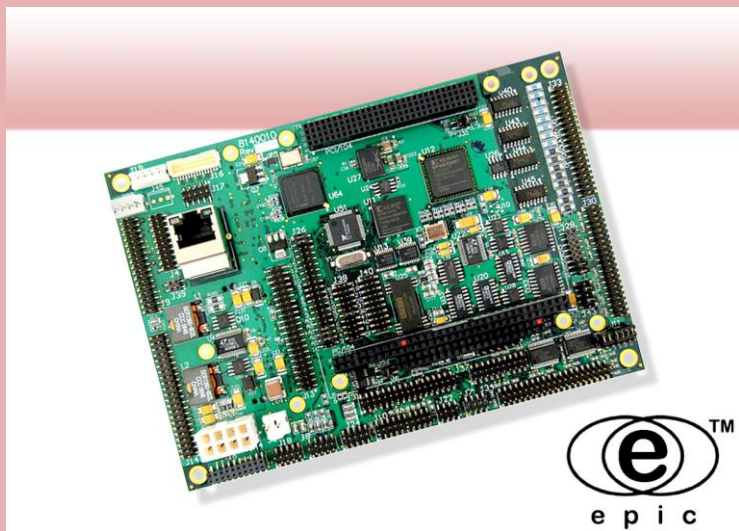


# NEPTUNE

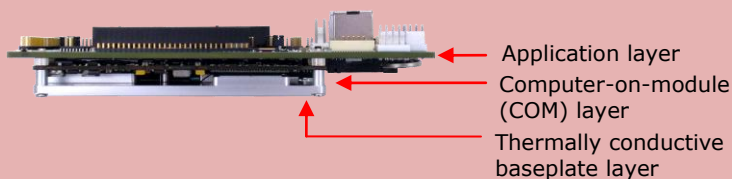


EPIC form-factor Embedded-Ready Subsystem with interchangeable ETX CPUs, integrated data acquisition, and PC/104-Plus expansion



## Highly Integrated Embedded-Ready Subsystem (ERS)

Neptune integrates an I/O application layer, COM layer, and thermal layer into a compact, EPIC form-factor board-level subsystem.



## Price/Performance Advantage

Neptune's configurable ETX COM CPU core allows you to match a Neptune ERS to the precise price/performance needs of your application.

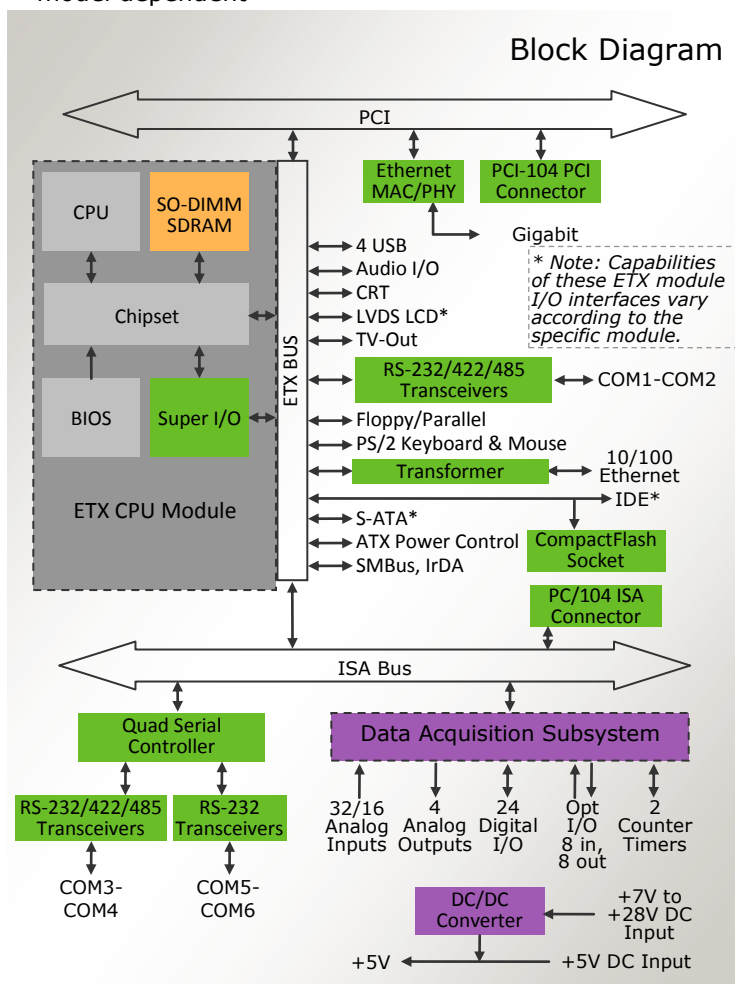
## Access to the Latest Technology

Neptune's ETX-based design provides you with access to the latest CPU and I/O technology while protecting your investment from CPU obsolescence via plug compatible ETX CPU modules.

## Fast Time-to-Market

Neptune is a fully operational, off-the-shelf subsystem ready for deployment in your application. No custom baseboard development is necessary.

- ◆ Integrates the functions of six PC/104 modules within the compact EPIC form-factor
- ◆ ETX COM CPU core provides price/performance flexibility, reduces costs, and protects against product obsolescence
- ◆ Choice of Intel Atom or Core Duo LV CPUs
- ◆ Provides I/O connectors for a wide range of interfaces:
  - 10/100Mbps and Gigabit Ethernet LAN
  - IDE, SATA, CompactFlash, and floppy drives
  - Quad USB 2.0
  - Two RS-232 and four RS-232/422/485 serial ports
  - CRT, LVDS, and TV video output
  - PS/2 keyboard and mouse
- ◆ On-board 40W 8-28V DC/DC power supply
- ◆ Optional on-board data acquisition subsystem features multiplexed 32 channel 16-bit A/D with autocalibration, four 12-bit D/A, 24 digital I/O, 8 optoisolated inputs and outputs, and two counter/timers
- ◆ Expands via stackable PC/104-Plus (ISA & PCI) modules
- ◆ Operating temperature of -40°C to +85°C (-40°F to +185°F) or -20°C to +71°C (-2°F to +160°F), ETX COM model dependent



## Specifications

<b>Processor</b>	Choice of 1.6GHz Intel Atom N270 or 1.66GHz Intel Core Duo LV CPU
<b>Front side bus</b>	Atom N270: 533MHz; Core Duo LV: 667MHz
<b>Memory</b>	1GB or 2GB SO-DIMM DDR2 SDRAM
<b>Chipset</b>	Atom N270: 945GSE with ICH7M Core Duo LV: 945GME with ICH7M
<b>BIOS</b>	Phoenix-Award BIOS
<b>Mass storage</b>	2 SATA ports, support 1 device each 1 IDE port, supports 2 IDE devices On-board CompactFlash IDE Type II socket
<b>Serial ports</b>	4 RS-232/422/485 port (COM1-4) 2 RS-232 ports (COM5-6)
<b>USB ports</b>	4 USB 2.0 ports
<b>Networking</b>	1 10/100Base-T Ethernet from ETX CPU 1 Gigabit Ethernet from baseboard
<b>Display</b>	LCD (LVDS), VGA CRT, and TV output
<b>Keyboard/Mouse</b>	1 PS/2 keyboard and mouse
<b>Audio</b>	AC'97 audio CODEC; mic in, line in/out
<b>Watchdog timer</b>	Non-maskable interrupt or reset modes
<b>Other I/O</b>	SMBus, IrDA interfaces
<b>Expansion bus</b>	PC/104-Plus (ISA & PCI) interface
<b>Power supply</b>	8-28V 40W DC/DC power supply on-board
<b>Power input</b>	+5VDC +/- 5%
<b>Power consumption</b>	NPT-N270-1GA: 10.3W idle, 14.2W loaded NPT-945CDL-1GA: 14.2W idle, 23.5W loaded
<b>Operating temperature</b>	NPT-N270-xGA: -20°C to +71°C NPT-945CDL-xGA: -40°C to +85°C
<b>Operating humidity</b>	0 ~ 90% non-condensing
<b>Dimensions (L x W x H)</b>	NPT-N270-xGA: 4.5 x 6.5 x 1.77 in. (114mm x 165mm x 45mm) NPT-945CDL-xGA: 4.5 x 6.5 x 2.24 in. (114mm x 165mm x 57mm)
<b>Weight (with SO-DIMM)</b>	NPT-N270-xGA: 14.6oz (414g) NPT-945CDL-xGA: 22oz (624g)
<b>RoHS</b>	Compliant

## Data Acquisition Specifications

### ANALOG

<b>Number of inputs</b>	32 16-bit channels (SE or differential)
<b>Input ranges</b>	±10V, ±5V, ±2.5V, ±1.25V, 0-10V, 0-5V, 0-2.5V, 0-1.25V programmable
<b>Max sample rate</b>	250KHz
<b>On-board FIFO</b>	1024 samples, programmable threshold
<b>A/D and D/A calibration</b>	Autocalibration with software support
<b>Number of outputs</b>	4, 12-bit resolution
<b>Output ranges</b>	±5V, ±10V, 0-5V, 0-10V
<b>Output current</b>	±5mA max per channel
<b>Settling time</b>	7µS max to 0.01%
<b>Relative accuracy</b>	±1 LSB

### DIGITAL I/O

<b>Number of I/O lines</b>	24 lines
<b>Output voltage</b>	Logic 0: 0.0V min, 0.33V max Logic 1: 2.4V min, 5.0V max
<b>Output current</b>	Logic 0: 12mA max per line Logic 1: -4mA max per line
<b>Optoisolated I/O</b>	8 inputs, 8 outputs; 5-24V

### COUNTER / TIMERS

<b>A/D Pacer clock</b>	24-bit down counter
<b>Clock source</b>	10MHz on-board clock or external signal
<b>General purpose</b>	16-bit down counter

## Key Features

Neptune is a high performance, highly integrated board-level embedded-ready subsystem in the compact, EPIC SBC form-factor. Neptune's CPU core consists of an ETX CPU module mounted on its bottom side, an approach that improves thermal management and increases the space for I/O functions and connectors. This innovative design has enabled Neptune to integrate additional serial and Ethernet controllers, a complete set of peripheral interface header connectors, and PC/104-Plus expansion.

Neptune's baseboard includes connectors and interfaces for keyboard, mouse, USB, serial, parallel, Ethernet, audio, and various mass storage devices. It supports the connection of a wide variety of displays, including CRTs, LVDS-interfaced flat panels, and televisions. Neptune also has a 40W DC/DC on-board power supply.

## Data Acquisition

In addition to its comprehensive embedded-PC system core, Neptune also integrates Diamond's industry-leading data acquisition (DAQ) I/O subsystem, featuring 32 A/D and 4 D/A channels, 24 DIO lines, and 8 opto-isolated digital inputs and outputs.

## Software Support

Neptune runs Linux and Windows XP and XP Embedded. Diamond's industry-leading Universal Driver software is also included at no extra charge. It provides a C programming library for the integrated data acquisition circuit, and demo programs to assist in rapid application development.

## Development Kit

Complete Neptune Development Kits are available, with all the components you need to get started on your embedded design project. Each kit contains a Neptune ERS, cable kit, and software CD.

## Ordering Information

NPT-N270-2GA	Neptune ERS, 1.6GHz Atom N270 CPU, 2GB SO-DIMM SDRAM, DAQ, heatspreader
NPT-N270-2GN	Neptune ERS, 1.6GHz Atom N270 CPU, 2GB SO-DIMM SDRAM, no DAQ, heatspreader
NPT-N270-1GA	Neptune ERS, 1.6GHz Atom N270 CPU, 1GB SO-DIMM SDRAM, DAQ, heatspreader
NPT-N270-1GN	Neptune ERS, 1.6GHz Atom N270 CPU, 1GB SO-DIMM SDRAM, no DAQ, heatspreader
NPT-945CDL-2GA	Neptune ERS, 1.66GHz Core Duo LV CPU, 2GB SO-DIMM SDRAM, DAQ, heatspreader
NPT-945CDL-2GN	Neptune ERS, 1.66GHz Core Duo LV CPU, 2GB SO-DIMM SDRAM, no DAQ, heatspreader
NPT-945CDL-1GA	Neptune ERS, 1.66GHz Core Duo LV CPU, 1GB SO-DIMM SDRAM, DAQ, heatspreader
NPT-945CDL-1GN	Neptune ERS, 1.66GHz Core Duo LV CPU, 1GB SO-DIMM SDRAM, no DAQ, heatspreader
DK-NN270	Neptune N270 Development Kit: NPT-N270-1GA, cable kit, OS drivers
DK-N945CDL	Neptune 945 Development Kit: NPT-945CDL-1GA, cable kit, OS drivers
C-NPT-KIT	Neptune Cable Kit for all on-board I/O