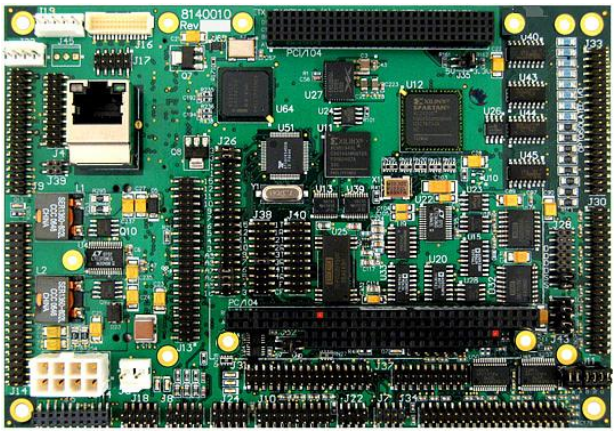
NEPTUNE

EPIC FORM-FACTOR EMBEDDED COMPUTER WITH INTEGRATED DATA ACQUISITION



- Integrates the functions of up to six PC/104 modules within the compact EPIC SBC form-factor
- ETX CPU core provides price/performance flexibility, reduces costs, and protects against product obsolescence
- Choice among Intel® Atom, Celeron, Core Duo, or Core 2 Duo CPUs to match application requirements
- Best-in-class analog data acquisition with autocalibration
- 5V/7-28V DC-to-DC power supply eases system integration
- Stackable PC/104-*Plus* expansion maximizes system flexibility

DESCRIPTION

Neptune introduces a new concept in small form-factor board-level embedded computing.

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 CPU, system I/O, industry-leading data acquisition, both 10/100Mbps and gigabit Ethernet, and a wide-input DC/DC power supply within the compact and modularly expandable EPIC single-board computer (SBC) form-factor.

Thanks to Neptune's flexible architecture, you can select from a wide range of ETX-based CPUs to meet each application's specific performance, power, and cost requirements. Available processors include Intel's Atom, Celeron, Core Duo, and Core 2 Duo – in both LV and ULV technologies. What's more, Neptune's on-board PC/104-*Plus* expansion socket facilitates the addition of custom or off-the-shelf ISA and PCI interfaced add-on modules, helping you satisfy your application's precise requirements.

DATA ACQUISITION SUBSYSTEM

In addition to its comprehensive embedded-PC system core, Neptune also integrates Diamond's industry-leading data acquisition I/O subsystem, featuring 32 A/D and 4 D/A channels, 24 DIO lines, and 8 opto-isolated digital inputs and outputs. Furthermore, the task of putting this advanced functionality to work in real-world applications is eased by the inclusion of Diamond's Universal Driver software for C programming under Windows and Linux.

Processor	Choice of Intel® Atom, Celeron, Core Duo, and Core 2 Duo LV and ULV
Memory	200-pin SO-DIMM socket Supports up to 2GB DDR2 SDRAM
Graphics	VGA CRT interface LCD flat panel interface (LVDS) LCD backlight control TV output port
Audio	AC'97 audio CODEC; mic in, line in/out
Mass storage	1 IDE port; supports two devices 2 SATA ports; support one device each
Ethernet	10/100Mbps port gigabit port with on-board RJ-45 jack
Keyboard/Mouse	PS/2 keyboard/mouse ports (USB keyboard/mouse also supported)
USB	4 USB 2.0 ports
Parallel/Floppy	Floppy and parallel port (shared interface)
Serial Ports	4 RS-232/422/485 COM ports 2 RS-232/TTL COM ports
Data Acquisition Subsystem	16-bit A/D, 32 single-ended / 16 differential 4 12-bit D/A channels 24 digital I/O lines 8 opto-isolated digital inputs and outputs 2 counter/timers
Solid State Disk	Socket for Type I/II CompactFlash Mounting position for IDE FlashDisk
Other	SMbus, I^2C bus, IrDA serial interface, PC speaker interface, watchdog timer
Supply Voltage	5V or 7-28V DC
Operating Temp.	Atom CPU version: -20° to +70° C Other CPU versions: -40° to +85° C
Form-factor	EPIC format (4.53 x 6.50 in.)

AUTOCALIBRATION FOR BEST MEASUREMENT ACCURACY

Diamond's top-performing autocalibration circuitry lets you calibrate the analog circuits under software control at any time, maintaining maximum accuracy despite varying conditions. Temperature- and time-dependent measurement drift is eliminated, since the system can be calibrated as often as desired in just a few seconds, to ensure accurate readings in all environmental conditions.

OPERATING SYSTEM SUPPORT

Neptune supports operation under Windows XP and Linux 2.6. Contact Diamond for information regarding support for other OSes.

NEPTUNE ACCESSORIES

Panel I/O Board

Neptune's Panel I/O Board (pictured below) plugs directly onto a row of pin headers on Neptune to provide cable-free access to standard system I/O interfaces: serial ports, USB, Ethernet, PS/2, VGA and power input.

Cable Kit

The Neptune Cable Kit provides cables for all the I/O features on Neptune including those on the panel I/O board. All cables are also available separately.

Development Kits

Neptune quick-start development kits provide everything needed for rapid application development, including:

- Neptune boardset with selected ETX CPU module, RAM, and heat-spreader pre-installed
- 512MB FlashDisk module with embedded Linux and data acquisition software
- Panel I/O board
- Cable kit
- AC power adapter
- Complete support software and documentation

THERMAL MANAGEMENT

Neptune's ETX processor module is located on its bottom side. An integrated heat-spreader makes thermal contact with the ETX module's heat generating components and provides a flat surface on the bottom of the assembly, for mating to the system enclosure. This approach facilitates efficient removal of heat from the CPU without the need for a fan.

ORDERING INFORMATION

Part Number	Description
NPT-N270-1GA	Neptune with 1.6GHz Atom CPU, 1GB SDRAM, heat-spreader, and data acquisition subsystem
NPT-N270-1GN	Neptune with 1.6GHz Atom CPU, 1GB SDRAM, and heat-spreader; no data acquisition subsystem or variable input DC/DC power supply
DK-NN270	Neptune N270 Development Kit: includes NPT-N270-1GA, C-NPT-KIT, PNL-NPT-KIT, flashdisk with Linux, documentation and software CD
NPT-945CDL-1GA	Neptune with 1.66GHz CoreDuo LV CPU, 1GB SDRAM, heat-sink, and data acquisition subsystem
NPT-945CDL-1GN	Neptune with 1.66GHz CoreDuo LV CPU, 1GB SDRAM, and heat-sink; no data acquisition subsystem or variable input DC/DC power supply
DK-N945CDL	Neptune N270 Development Kit: includes NPT-945CDL-1GA, C-NPT-KIT, PNL-NPT-KIT, flashdisk with Linux, documentation and software CD
C-NPT-KIT	Neptune Cable Kit
PNL-NPT-01	Neptune Panel I/O Board
PNL-NPT-KIT	Neptune Panel I/O Board with cables
SDK-NN270-LNX **SDK-N945-LNX**	Neptune Linux Software Development Kits with Linux BSB on FlashDisk and CD, documentation
SDK-NN270-XPE **SDK-N945-XPE**	Neptune N270 Software Development Kits with Windows XP Embedded BSP on FlashDisk and CD, documentation

Visit Diamond's website for an updated list of models (CPU, speed, SDRAM) currently offered.