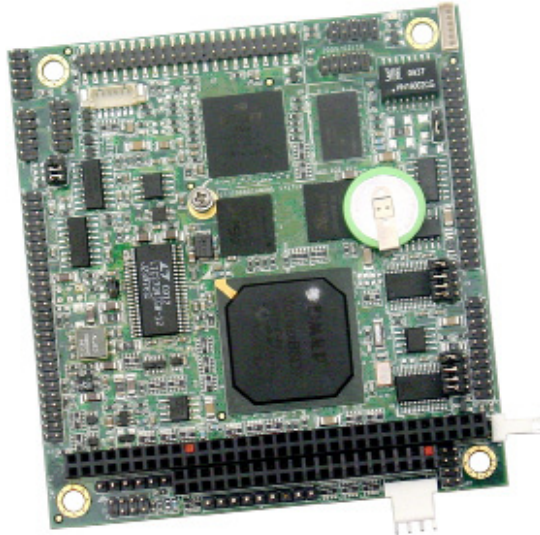# Helios™ PC/104 SBC

Rugged PC/104™ Single Board Computer featuring integrated data acquisition, Ethernet, and CRT/LCD video

Highly Integrated SBC

Helios™ combines all the functionality of a single board computer with a complete analog and digital data acquisition circuit into a single board, offering the most functionality available in the PC/104 form-factor

Price/Performance Advantage

The Vortex86DX system-on-a-chip offers an excellent balance of performance, power consumption and price, making Helios an ideal choice for a wide variety of embedded computing applications.

Rugged Design

Helios was designed with rugged applications in mind. From its operating temperature of -40°C to +85°C to its soldered SDRAM, Helios thrives in extreme environments.

Fully Integrated Systems

Helios is available as a complete system, with your choice of operating system, in a specially-designed enclosure that eliminates all cables and provides a rugged, compact, wide-temperature box PC ready for application download and deployment.

Software Support

Helios runs Linux, Windows CE™, and DOS. All necessary drivers are shipped with the product. Diamond's Universal Driver software provides a C programming library for the integrated data acquisition circuit, and it includes demos and sample code for each supported OS to assist in rapid application development.

Development Kit

A complete Helios Development Kit is available with all of the components you need to get started on your embedded design project. The kit contains a Helios SBC, flashdisk with Linux pre-loaded, cable kit, AC adapter, and software CD.

Key Features

- ◆ Low-power PC/104-expandable SBC

- ◆ Vortex86DX CPU at 1GHz or 800MHz

- ◆ 2-in-1 design (CPU + DAQ) reduces size and cost, increases ruggedness, and enhances reliability

- ◆ 256MB soldered-on DRAM

- ◆ Comprehensive set of I/O interfaces:
  - four USB 2.0 ports
  - two RS-232/422/485 and two RS-232 serial ports
  - 10/100Mbps Ethernet
  - IDE port for hard drive or solid-state flashdisk
  - 2MB on-board flashdisk with FreeDOS pre-loaded
  - VGA CRT or LVDS LCD display
  - 16 digital I/O lines

- ◆ Optional data acquisition subsystem with multiplexed 16-channel, 16-bit A/D with autocalibration, four 12-bit D/A, 24 additional digital I/O, and two counter/timers

- ◆ PC/104 form factor with stackthrough PC/104 (ISA) bus

- ◆ Extremely rugged with soldered-on DRAM and -40°C to +85°C (-40°F to +185°F) operating temperature

Octavio-HLV Embedded Application Server

HELIOS: PC/104 Single Board Computer

SPECIFICATIONS

Processor	Vortex86DX at 1GHz or 800MHz
Cooling	Heat sink, fanless
Memory	256MB DDR2 DRAM
Expansion bus	PC/104 (ISA)
Display type	VGA CRT or LVDS LCD
Display resolution	1280x1024 maximum
USB ports	4 USB 2.0
Serial ports	2 RS-232/422/485, 2 RS-232
Networking	10/100Base-T Ethernet
Mass storage	1 IDE UDMA-100 port, flashdisk interface
Keyboard/Mouse	PS/2
Audio	Speaker out
Input power	5V ±5V%
Power consumption	HLV800-256AV: 5.4W
Operating temperature	-40°C to +85°C (-40°F to +185°F) (800MHz) -40°C to +71°C (-40°F to +160°F) (1GHz)
Dimensions	3.55" x 3.78" (90mm x 96mm)
Weight	Model DV: 2.5oz / 71g Model AV: 3.1oz / 88g
MTBF	HLV800-256AV: 65,535 hours

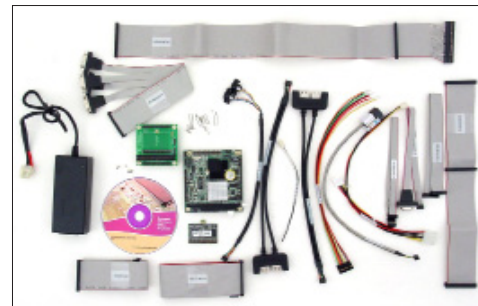## DATA ACQUISITION SPECIFICATIONS

ANALOG

Number of Inputs	16 single-ended or 8 differential, user selected
A/D resolution	16 bits
Input ranges	±10V, ±5V, ±2.5V, ±1.25V, 0-10V, 0-5V,
Max sample rate	250KHz
Protection	±35V on any analog input without damage
Nonlinearity	±3LSB, no missing codes
On-board FIFO	2048 samples, programmable threshold
A/D, D/A calibration	Autocalibration with software support
Number of outputs	4, 12-bit resolution
Output ranges	±5V, ±10V, 0-5V, 0-10V
Output current	±5mA max per channel
Settling time	10mS max to 0.012%
Relative accuracy	± 2 LSB
Nonlinearity	±2 LSB, monotonic
Reset	Reset to zero-scale or mid-scale (jumper

DIGITAL (for standard 16 DIO lines)

Number of I/O lines	Model AV: 40 lines
Input voltage	Logic 0: 0V min, 0.8V max
Input current	1mA at 3.3V, -5mA at 0V
Output voltage	Logic 0: 0.0V min, 0.55V max
Output current	Logic 0: 64mA max at 0.55V

COUNTER/TIMERS

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

ORDERING INFORMATION

HLV800-256AV	Helios SBC, 800MHz Vortex86DX, 256MB RAM, full data acquisition, VGA/LCD video, -40/+85°C
HLV800-256DV	Helios SBC, 800MHz Vortex86DX, 256MB RAM, digital I/O, VGA/LCD video, -40/+85°C
HLV1000-256AV	Helios SBC, 1GHz Vortex86DX, 256MB RAM, full data acquisition, VGA/LCD video, -40/+71°C
HLV1000-256DV	Helios SBC, 1GHz Vortex86DX, 256MB RAM, digital I/O, VGA/LCD video, -40/+71°C
DK-HLV800A-01	Helios Development Kit with HLV800-256AV SBC, cables, and Linux software
SDK-HLV-LNX	Helios Linux Software Development Kit
SDK-HLV-WCE	Helios Windows CE Software Development Kit
C-HLV-KIT	Helios Cable Kit for all on-board I/O

Helios Development Kit

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