

HELIOS



CPU + Data Acquisition on a single board

800MHz PC/104 SINGLE BOARD COMPUTER WITH INTEGRATED DATA ACQUISITION



- Low power, mid-range PC/104 expandable single board
- 2 in 1: Integrated CPU and data acquisition reduces size and cost, increases ruggedness
- Fully featured including support for four USB 2.0 ports, four serial ports, 10/100Base-T Ethernet, IDE hard drive, flashdisk and optional VGA CRT or flat panel display
- Optional data acquisition featuring multiplexed 16 channel 16-bit A/D with autocalibration, 4 12-bit D/A, up to 40 DIO and two counter/timers
- Extremely rugged with soldered RAM and -40°C to +85°C operating temperature computer

DESCRIPTION

Helios is a mid-performance PC/104 form factor single board computer combining a low power, highly integrated CPU with Diamond Systems' renowned high-accuracy data acquisition circuitry on a single board. Helios utilizes a Vortex86DX/SX integrated single chip CPU running at either 300MHz or 800MHz and comes with either 128MB or 256MB of DRAM soldered on-board to offer multiple price/performance levels for a wide range of applications.

Helios incorporates advanced features such as four USB 2.0 ports, an IDE hard drive interface, mounting capability for a solid state flashdisk up to 4GB, and optional VGA/LCD graphics. Helios also provides a 10/100Base-T Ethernet interface, four RS-232 serial ports (two have RS-422/485 multiprotocol capability) and PS/2 keyboard and mouse interfaces. Helios supports Linux, Windows CE and DOS.

Helios is extremely rugged, featuring on-board, soldered DRAM and -40°C to +85°C fan-less operation. Optional hardwired jumpers and latching connectors are available for increased resistance to shock and vibration. Conformal coating is available as an extra cost option.

CPU SPECIFICATIONS

| | |
|------------------------------|---|
| Processor | Vortex86DX/SX at 300 or 800MHz |
| Cooling | Heat sink, fan-less |
| Operating Temperature | -40°C to +85°C |
| Memory | 128MB or 256MB DRAM |
| Bus Interface | PC/104 (ISA) |
| Display Type | VGA CRT and LCD flat panel |
| Display Resolution | 1280X1024 maximum |
| USB Ports | (4) USB 2.0 |
| Serial Ports | (2) RS-232 (2) RS-232/422/485 |
| Networking | 10/100Base-T Ethernet |
| Mass Storage | (1) IDE UDMA-100 port, Flashdisk interface |
| Keyboard / Mouse | PS/2 |
| Dimensions | 3.550" x 3.775" (90mm x 96mm) |
| Weight | 2.5oz / 71g |
| Input power | 5V ±5% |
| Power consumption | 800MHz: 5.0W 300MHz: 3.5W |

FOR MORE INFORMATION

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DATA ACQUISITION

Helios's integrated data acquisition features include 16 analog inputs with 16-bit A/D and 100KHz sample rate, 4 12-bit analog outputs, up to 40 digital I/O lines, and 2 counter/timers. It uses an enhanced 2048-sample FIFO with programmable threshold for maximum flexibility and data reliability.

The analog circuitry utilizes Diamond Systems' industry-leading autocalibration technology to calibrate its A/D and D/A circuits. This means you get analog I/O performance with the maximum possible accuracy over the full operating temperature range of the product.

Diamond Systems' free Universal Driver containing data Acquisition programming software for Linux, Windows XP/CE, and DOS is included.

HELIOS DEVELOPMENT KIT

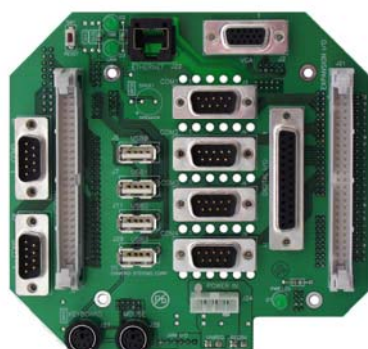
A Helios Development Kit is available with all the components you need to get started on your embedded design project. The kit contains a Helios board, flashdisk module with Linux installed, cable kit, panel I/O board, AC adapter, and software CD.

Transition Cables or PC-Style Connectors

All I/O on Helios is made available on 2mm pitch pin headers for use with low-cost cables. To enhance the use of Helios in harsh environments requiring outstanding resistance to shock and vibration, Diamond Systems offers our rugged Pandora PC/104 enclosure that provides a cable-free configuration via a small panel I/O board that installs directly on top of the Helios to instantly convert all I/O to PC-style connectors:



Pandora cable-free enclosure system for Helios CPU



Panel I/O board provides industry-standard I/O connectors for Helios

DATA ACQUISITION SPECIFICATIONS

| ANALOG INPUTS | |
|-------------------------|---|
| Number of inputs | 16 single-ended or 8 differential, user selectable |
| A/D resolution | 16 bits |
| Input ranges | ±10V, ±5V, ±2.5V, ±1.25V, 0-10V, 0-5V, 0-2.5V programmable |
| Max Sample Rate | 100KHz |
| Protection | ±35V on any analog input without damage |
| Nonlinearity | ±3LSB, no missing codes |
| On-board FIFO | 2048 samples, programmable threshold |
| A/D and D/A Calibration | Autocalibration with software support |
| ANALOG OUTPUTS | |
| Number of outputs | 4, 12-bit resolution |
| Output ranges | ±5V, ±10V, 0-5V, 0-10V |
| Output current | ±5mA max per channel |
| Settling time | 10µS max to 0.012% |
| Relative accuracy | ±2 LSB |
| Nonlinearity | ±2 LSB, monotonic |
| Reset | Reset to zero-scale or mid-scale (jumper selectable) |
| DIGITAL I/O | |
| No. of I/O lines | DV Models: 16 lines AV Models: 40 lines |
| Input voltage | Logic 0: -0.5V min, 0.8V max Logic 1: 2.0V min, 5.5V max |
| Input current | ±3µA max |
| Output voltage | Logic 0: 0.0V min, 0.4V max Logic 1: 2.4V min, 3.3V max |
| Output current | Logic 0: 12mA max per line Logic 1: -8mA max per line |
| 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

| Part Number | Description |
|--------------|--|
| HLV800-256AV | Helios SBC, 800MHz Vortex86SX, 256MB RAM, full data acquisition, VGA/LCD video |
| HLV800-256DV | Helios SBC, 800MHz Vortex86SX, 256MB RAM, digital I/O, VGA/LCD video |
| HLV300-128DV | Helios SBC, 300MHz Vortex86DX, 128MB RAM, digital I/O, VGA/LCD video |
| DK-HLV800-01 | Helios Development Kit with HLV800-256AV SBC, cables and software |
| C-HLV-KIT | Helios Cable Kit |