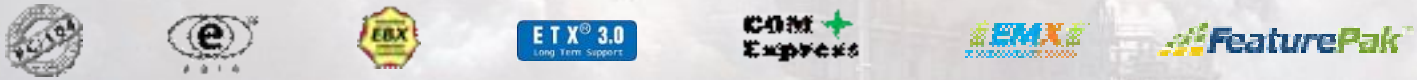
DIAMOND SYSTEMS

Corporate Overview

September 2013

Corporate Facts

- Founded: 1989
- Headquarters: Mountain View, CA, USA
- Customers: Over 600 active customers worldwide
- Technology Partners: 45 partners worldwide including distributors, resellers & system integrators
- Business Focus: Embedded Computing Solutions
  - Small form factor SBCs
  - COM-based solutions
  - PC/104 and FeaturePak I/O modules
- Target Markets: Aerospace/Defense, Energy, Transportation, Intelligent Traffic Systems, Industrial Automation, Medical, Test & Measurement
- Adherence to industry standards



The 4 Pillars of Diamond Systems

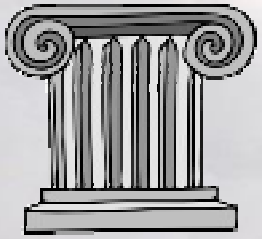
Diamond's Products and Solutions

- Analog
- Digital
- Serial
- Ethernet
- Power
- FPGA
- CAN
- Opto-isolation
- Etc.

- -40/+85°C
- MIL-STD shock & vibration
- Burn-in

- Standard product variants
- Full custom design
- Custom form factors

- 2-in-1 SBC + DAQ on one board
- EMX
- FeaturePak
- RSODIMM
- Conduction cooled SBCs
- Complete systems



I/O

Rugged

Custom

Innovation

Pillar 1: I/O

Analog

Digital

Ethernet

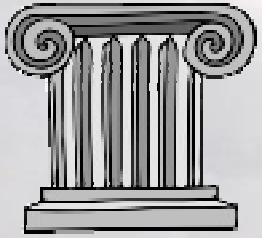
Serial

GPS & Wireless

WiFi

Power Supplies

Optoisolation & Relays



I/O

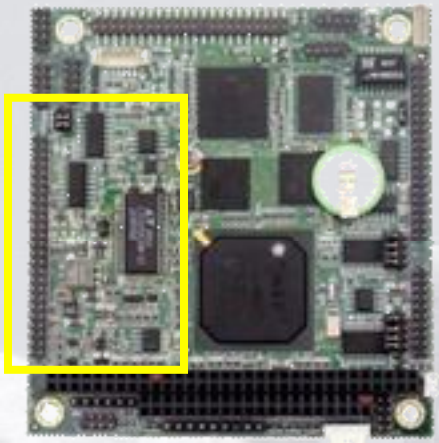
Wide range of I/O functionality in I/O modules as well as integrated onto SBCs

Pillar 2: Rugged

Rugged

- Extensive modifications to connectors
- Hardwired configuration
- Epoxy to hold components in place & increase stiffness
- Conformal coating
- Custom BIOS settings
- Full temperature screening
- Shock & vibration qualification testing

Pillar 3: Custom



Standard I/O

Custom I/O #1

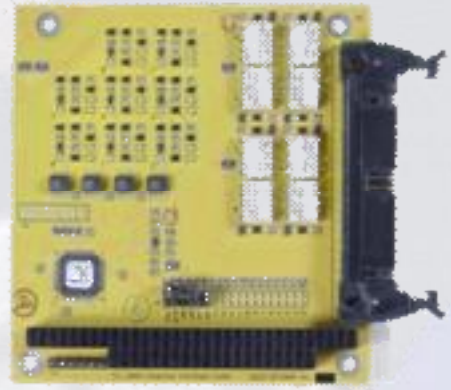
Custom I/O #2

"Semi-custom" SBC

- Repurpose existing SBC design for rapid time to market
- Replace standard analog I/O with customer-specific I/O
- Two projects completed already:
  - Ethernet switch + wide range input voltage
  - Audio circuit

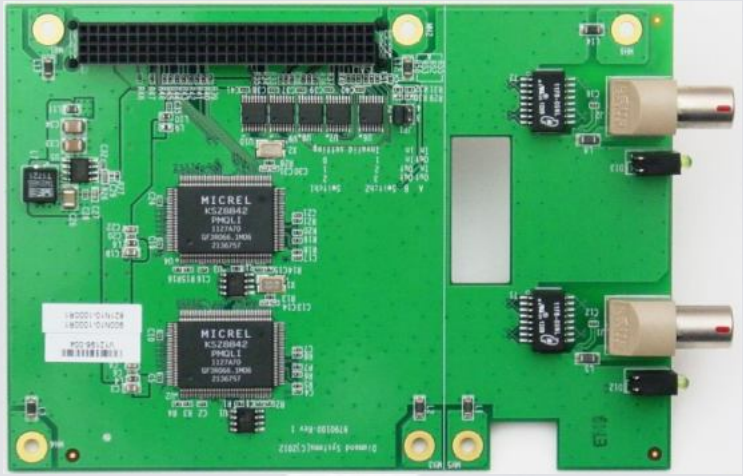
Custom

Pillar 3: Custom



Relays & Optoisolation

Serial Ports

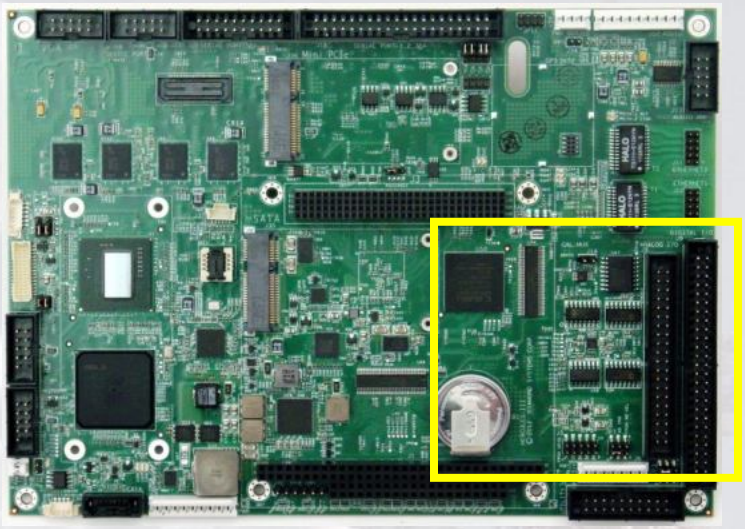


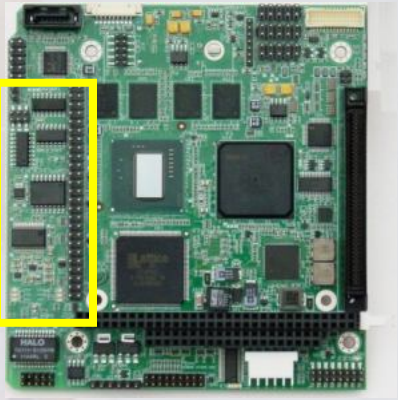
Ethernet

Customized I/O modules

Custom

Pillar 4: Innovation - 2-in-1 CPU + DAQ

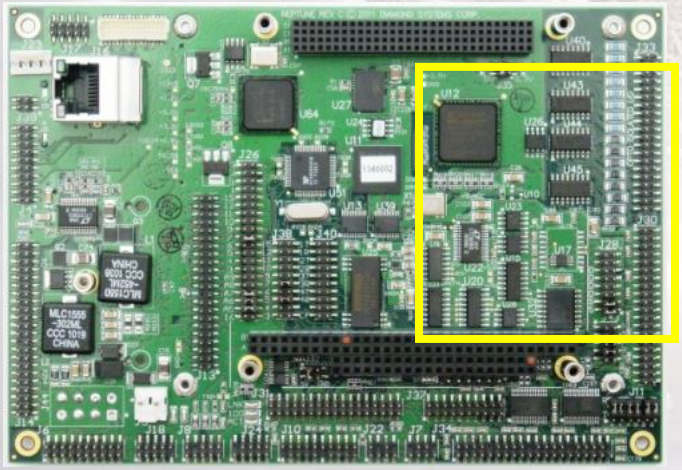




2 in 1

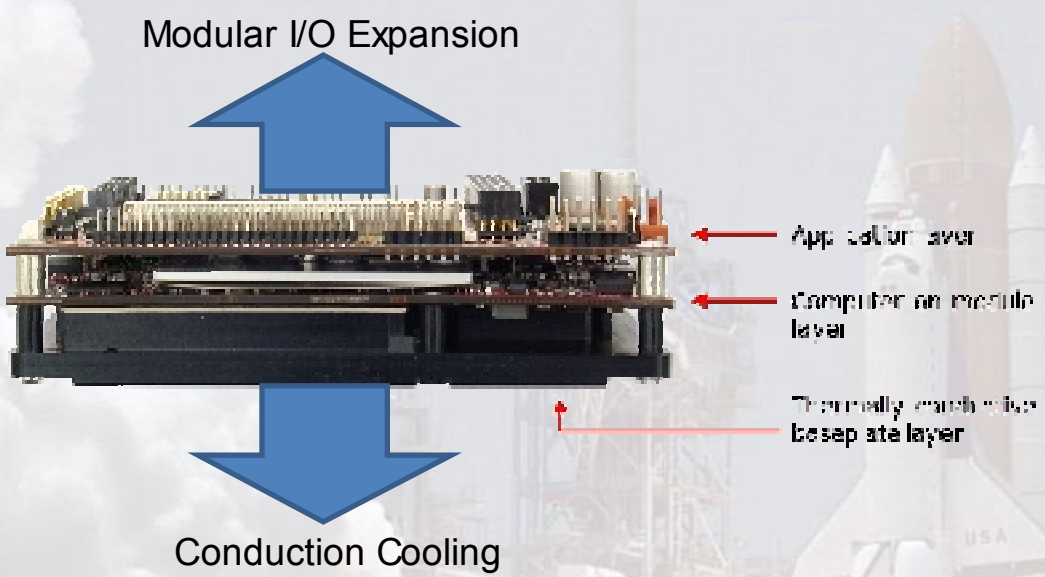
CPU + DAQ

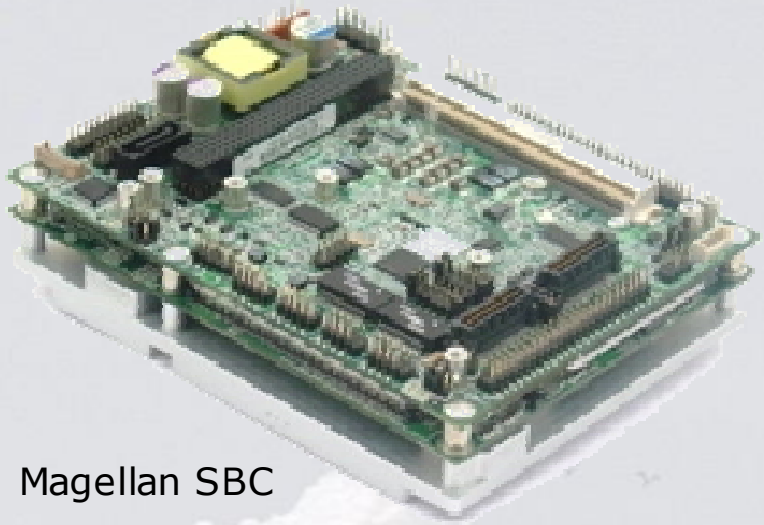
Embedding Diamond's analog I/O and other features directly onto PC/104, EPIC, & EBX form-factor SBCs



Innovation

Pillar 4: Innovation - Conduction Cooling





Magellan SBC

COM-based SBCs with conduction cooling

Combine COM modules with stackable I/O

ETX® 3.0 Long Term Support

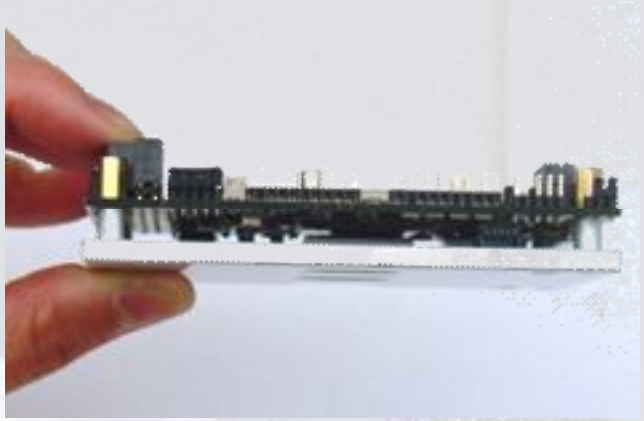
COM Express®

PC/104 Embedded PC Modules

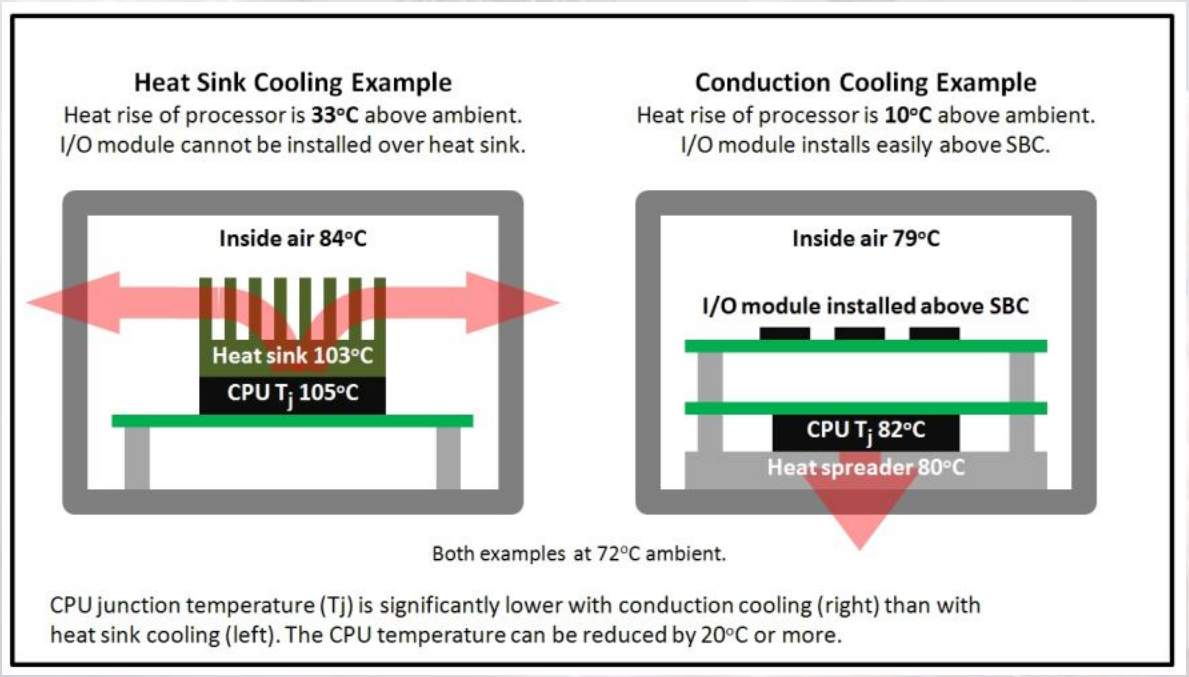
PCIe/104 Embedded PC Modules

Innovation

Pillar 4: Innovation - Conduction Cooling

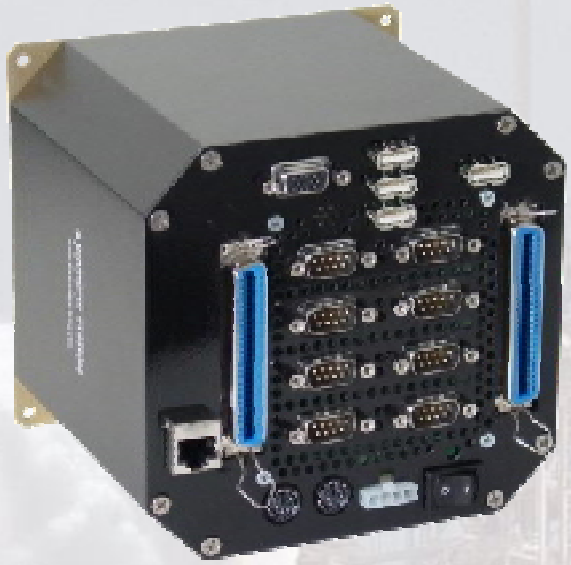


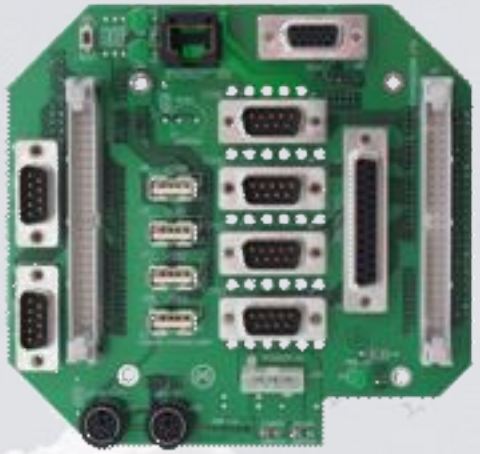
Conduction-cooled SBCs
Applying the COM-style conduction cooling to new PC/104-style stackable SBC designs, starting with Aurora



Innovation

Pillar 4: Innovation - Cable-free Enclosures





Pandora enclosure
Original cable-free PC/104 enclosure system

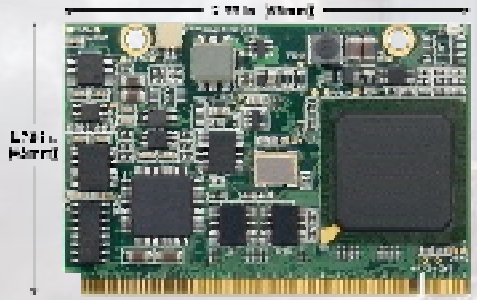
Octavio systems
Program to build custom-configured systems using off-the-shelf components

Innovation

Pillar 4: Innovation - Industry Standards

EMX EmbeddedXpress

Newest small form factor
Combines COM Express CPU modules with stackable I/O
The best of SBCs and COMs without the disadvantages of either



FeaturePak

Smallest PCIe I/O modules

RSODIMM™ RUGGED MEMORY

Simple modification to standard SODIMM for increased ruggedness

Innovation

"A World of Perfect Fit Solutions"

2-in-1 SBCs with Integrated Data Acquisition

- Compact
- Rugged
- Lightweight
- Cost effective

COM-Based SBCs

- Maximum product lifetime
- Highest feature density
- Scalable performance
- Fast time to market
- Conduction cooling

Stackable I/O

- Wide range of SBCs & I/O modules
- Easy system configuration
- Fast time to market
- Rugged solutions

COM Baseboards

- Maximum cost efficiency
- Scalable performance
- Long life
- Light weight

Choose your solution based on:

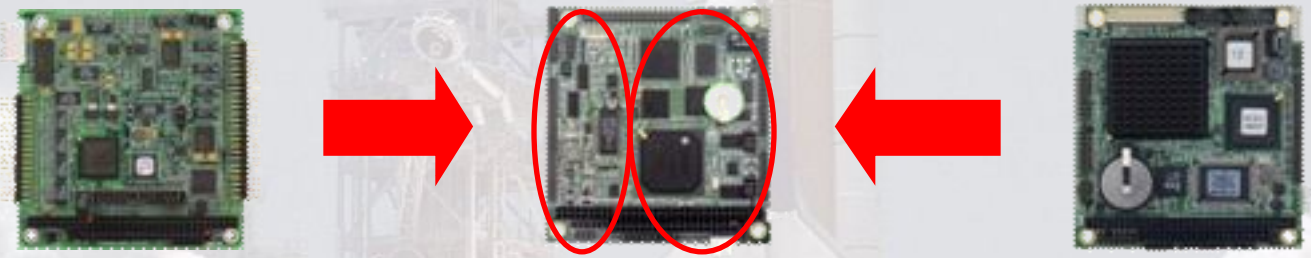
- System complexity
- Enclosure constraints
- Time to market
- Production volume
- Lifecycle requirements

All Diamond products can be customized to meet your application's requirements!

2-in-1 SBCs

Combines full-function SBC with complete analog & digital data acquisition circuit on a single board

CPU + DAQ



Data Acquisition Module

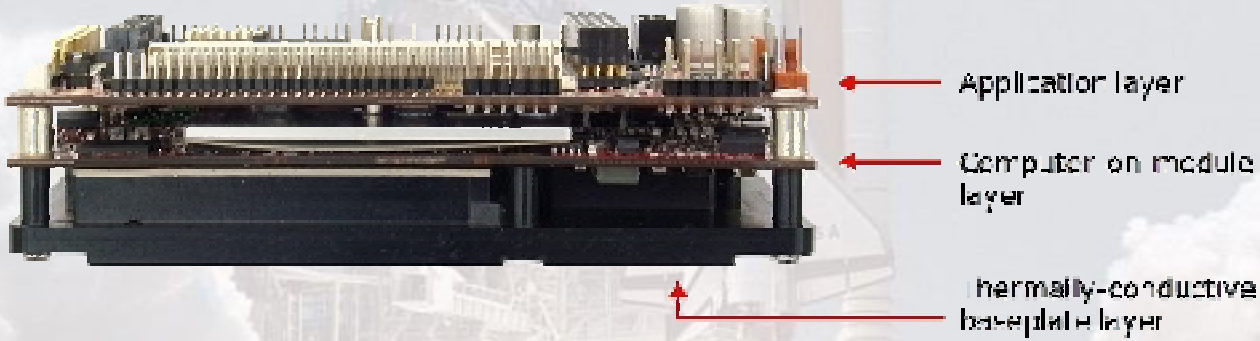
2-in-1 Highly Integrated SBC reduces size by 50%

SBC

Simplify development	Less boards to source & integrate
Smaller size	Fewer boards result in a smaller system
Less weight	Fewer boards result in less overall system weight
Shorter assembly time	Less boards to install and configure
Higher reliability	Fewer components and board interconnects

COM-Based SBCs

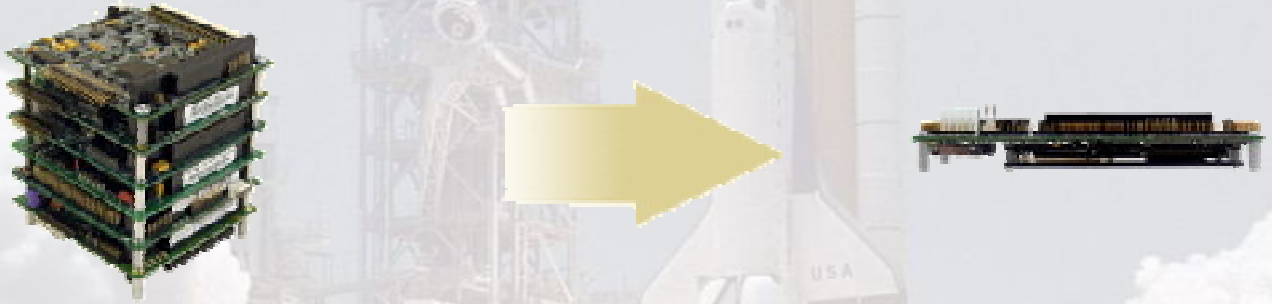
Combines the performance scalability and flexibility of computer-on-modules (COMs) with the expandability of stackable I/O modules



Maximum product lifetime	Easy to upgrade COM when the CPU becomes obsolete
Highest feature density	Highly integrated two board set in compact form factor
Scalable performance	Select the optimum price/performance COM; upgrade with a simple swap of the COM
Fast time to market	All components are off the shelf
Optimal thermal management	Heat spreader mates directly to enclosure or bulkhead for most efficient cooling

COM Baseboards

Perfect-fit solution for high volume applications or applications with specific packaging requirements



COM baseboard design reduces stack of PC/104 modules to compact SBC

Maximum cost efficiency	Everything on one board (except the processor)
Long product life	Long baseboard life spans multiple generations of COMs
Scalable performance	Same baseboard works with multiple COMs offering a choice of performance, power consumption, and price
Light weight	Fully featured baseboard with wealth of I/O; Most cables can usually be eliminated
Smallest size	System requires just two boards: COM + baseboard

Stackable I/O

Extensive line of rugged SBCs & I/O expansion modules including analog I/O, digital I/O, optoisolated inputs, relay outputs, counter/timers, serial ports, Ethernet, & GPS


SBCs


Analog I/O


Digital I/O


Opto & Relay


Serial


GPS with LAN & Serial

Wide range of SBCs & I/O	SBCs with variety of price/performance options I/O modules with wide assortment of features
Easy system configuration	Adheres to industry standards for assured plug and play compatibility
Fast time to market	Off-the-shelf products complete with OS & drivers
Rugged solutions	Full extended temperature operation High resistance to shock & vibration SBCs with soldered on memory

PC/104

PC/104-Plus

EMX

DIAMOND SYSTEMS

Standard Product Variants

Component removal for cost or power reduction

Custom BIOS settings

- Custom configurations
- Default settings for battery-less applications
- Customer specific boot screen message

Custom FPGA code

- Unique I/O functionality
- Pre-processing of data
- Available on all FPGA-based products from Diamond

Custom I/O connectors

- Non-stackthrough PC/104 bus connectors
- Latching connectors
- Vertical vs. right-angle

Product bundling i.e. boards, flashdisks, cables, labelling & fully configured systems

Custom Designs

Applications which have:

- high volume (500+ per year)
- Functionality outside of Diamond's current product offering
- Size, cost, or features that cannot be satisfied with standard products

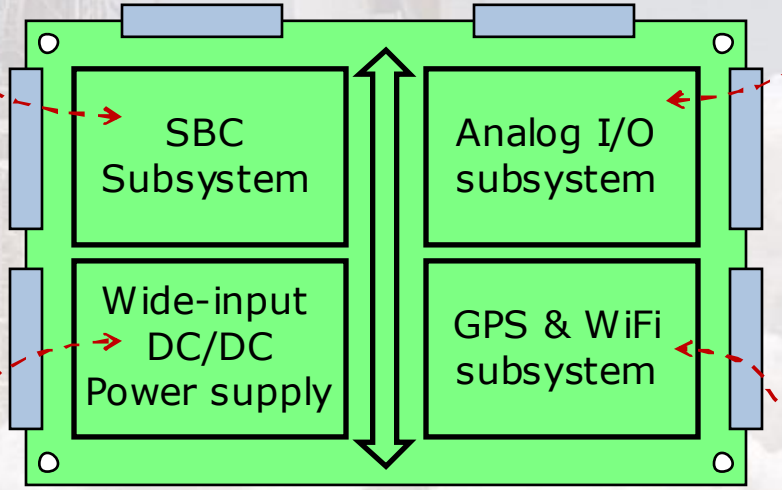
Design Approach

- Review customer design requirements / specification
- Reuse Diamond core technologies and/or work with third party partner
- Select baseline products or features that match closest to form, fit and function of customer's requirements as a starting point
- Agree on deliverables, timetable and cost with customer
- Develop and test prototypes
- Once prototype signed off, begin full production per plan

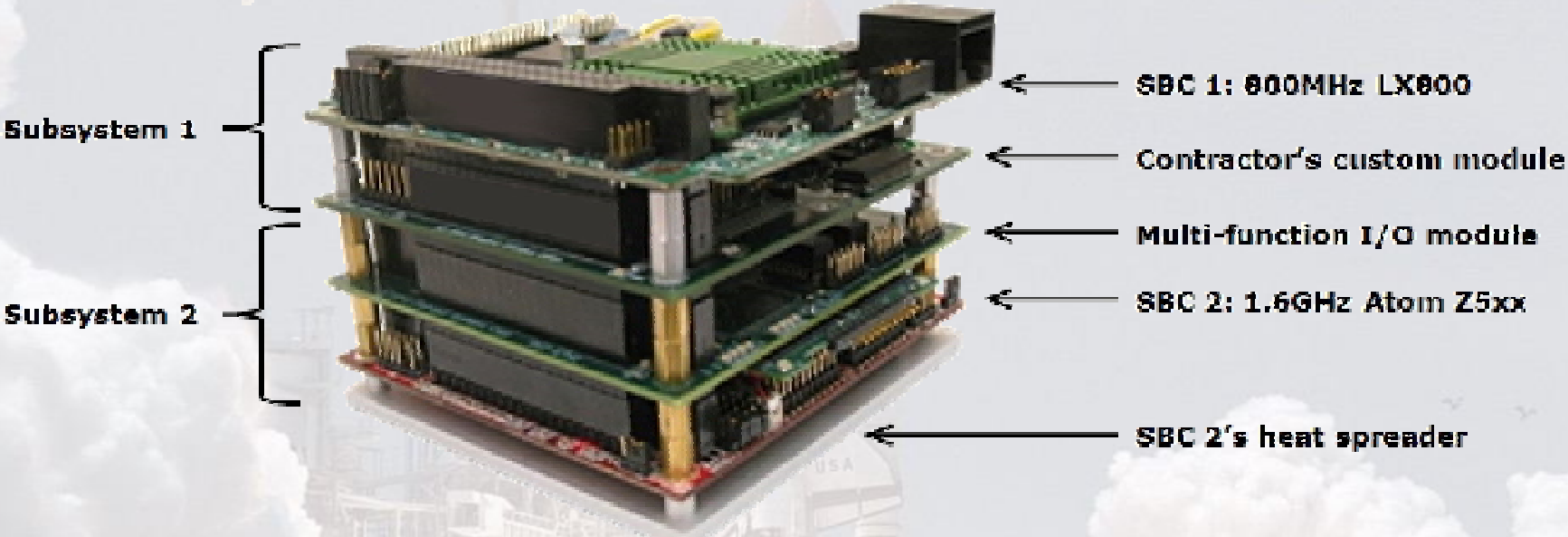
Custom Design Strategy

Treat our modular standard products as technology building blocks

Technology-cell based
custom SBC design



Perfect Fit Solution Example

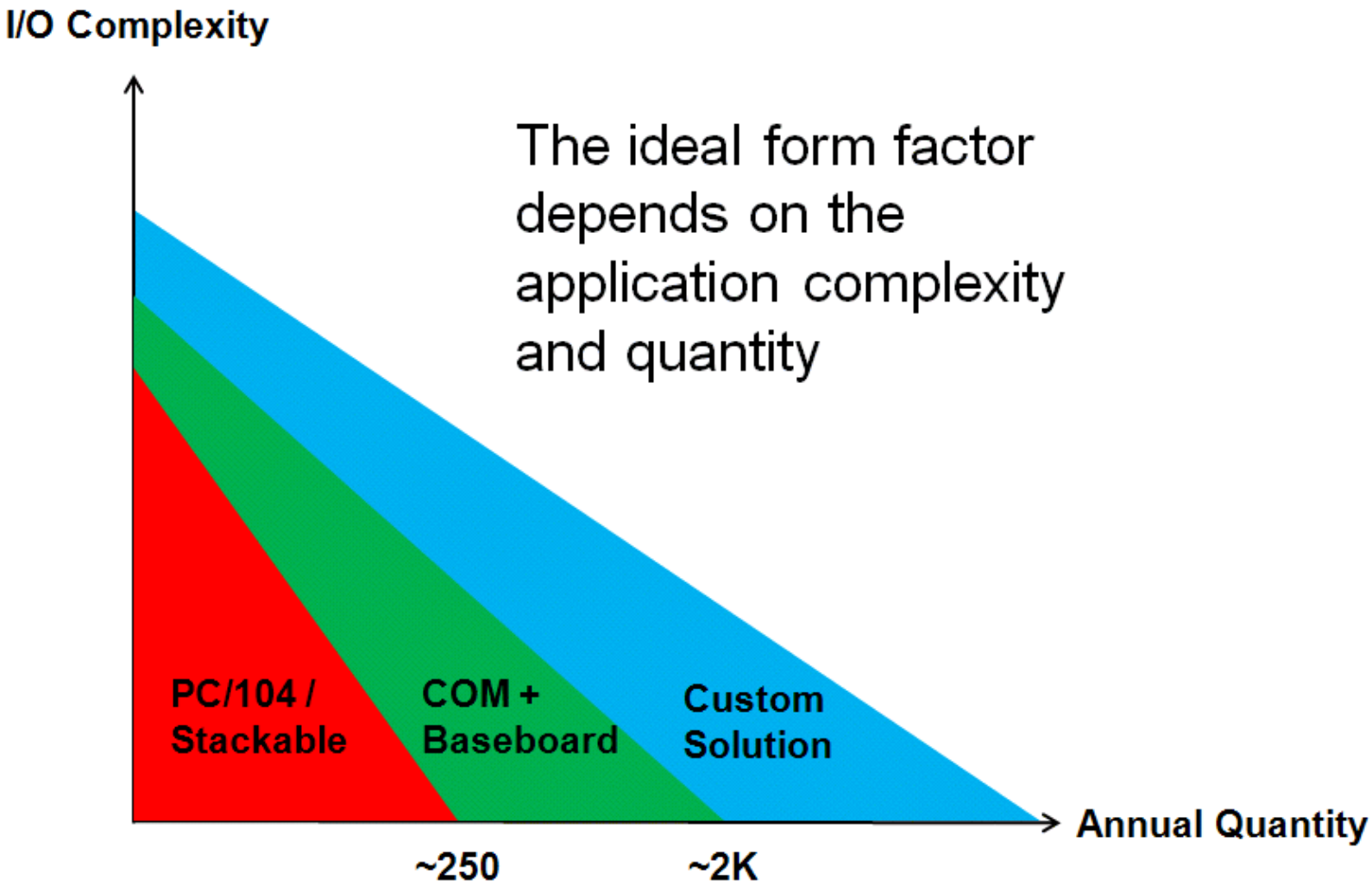


Board stack

3 custom-designed boards (2 SBC, 1 I/O) to satisfy customer's strict requirements

Includes novel SSD & backup battery mounting

Different Solutions for Different Customers



The Diamond Advantage

Full support for embedded systems projects

- From design to manufacturing, system integration & support

Broad product selection

- SBCs & I/O
- Wide in-house technology base



Rugged design

- Wide temperature operation
- Shock & vibration qualification testing

Customization capabilities

- Standard product variants
- Full custom designs – Perfect Fit Solutions


Quality – ISO certified

Commitment to industry standards

Industrial Automation: Semiconductor

Semiconductor Wafer Transfer Device *USA*

Requirements

- Drop-in replacement of obsolete PC/104 SBC
- Must run DR DOS
- Low cost
- Long product life: Intel "Copy Exact" requirement

Diamond Solution

- **Helios SBC** met performance, size and cost requirements
  - Helios ran DR DOS operating system out of the box
  - BIOS change supported customer's application software with no code changes
  - Pre-programmed 128MB flashdisk with bootable DR DOS and application
  - Deliver kit including SBC, pre-loaded flashdisk and cable
- Helios is a drop-in replacement with more functionality at a lower cost

Military/Defense: On-Vehicle Electronics

Weapons Control System *Europe*

Requirements

- Small SBC with on-board PC I/O
- Graphical display interface
- Ruggedness, both temperature and shock/vibration
- Long product life SBC

Diamond Solution

- Customized **Athena II SBC** developed to meet the requirements
  - Added latching connectors and conformal coating for ruggedness
  - Replaced PC/104 connectors with higher reliability connectors
  - Replaced jumper blocks with zero-ohm resistors
  - Applied epoxy adhesive to BGA chips to improve resistance to vibration
  - Created pre-programmed flashdisk with bootable VxWorks image
  - Full temperature screening for all boards
- Passed MIL-STD-810E 514.4 vibration specification

Industrial Automation: Process Control

PLC and Distributed Control Systems *Egypt*

Requirements

- Off-the-shelf embedded computer to control the systems
- Easy to design with and flexible implementation
- Excellent price/performance
- Data acquisition, both analog input and analog output
- Extended temperature operation and resistant to shock and vibration

Diamond Solution

- **Athena II SBC** met performance and cost requirements
  - Multiple models support multiple end product configurations
  - On-board data acquisition critical for field data collection
  - Rugged characteristics met requirements of harsh environment

Transportation: Intelligent Traffic Systems

Traffic Signal and Signage Management System *Australia*

Requirements

- Ruggedized SBC to control remote field processor units
- Replacement of old SBC with increased processing power and lower cost
- Environmental issues:
  - Wide temperature, high humidity, dust, insects

Diamond Solution

- Fully integrated custom system with **Athena II SBC**
  - Customized system to meet customer's exact requirements
    - RAM reduced to 128MB to reduce cost
    - Designed custom panel I/O board and enclosure
    - Integrated a pre-programmed 128MB flashdisk with bootable Linux and application software
  - Athena II's rugged specifications met customer's need
- Diamond delivers turnkey systems ready to deploy in the field

Test & Measurement: Instrumentation

Portable Gas Analyzer *USA*

Requirements

- Compact, rugged single board computer
  - Good CPU performance at low cost
  - Support for a wide variety of display types
- Rugged analog output module
- Able to withstand temperature extremes from Antarctica to a volcano top

Diamond Solution

- **Pluto single board computer**
  - Intel Atom CPU offered great performance at a low cost
  - Highly integrated SBC in ETX COM form-factor
  - VGA CRT and LVDS support
  - -40°C to +85°C operating temperature

- **Ruby-MM-1612-XT analog output module**
  - Compact PC/104 size, high throughput, low cost
  - Both analog output and digital I/O on-board
  - -40°C to +85°C operating temperature

Transportation: Locomotives

Locomotive Control Console *China*

Requirements

- Upgraded SBC with more performance at a low cost
- Optoisolated serial ports for protection
- CAN bus to interface to locomotive on-board network
- Rugged: Wide temperature, high shock &vibration

Diamond Solution

- **Pluto Intel Atom SBC**
  - Excellent performance upgrade in a small footprint
  - Rugged LCD display supported
- Custom **Emerald-MM serial I/O module**
  - Optoisolation added to serial ports to improve reliability
  - TTL interfaces for device and sensor connections
  - Latching connectors

- **Janus-MM CANbus I/O module** interfaced the control console to distributed systems throughout the locomotive

- All products support -40°C to +85°C operating temperature and are highly resistant to shock and vibration

Single Board Computer Overview

PC/104 SBCs

Helios

- 800MHz Vortex86DX CPU
- Integrated DAQ*
- Low power, low cost

Rhodeus

- 500MHz AMD LX800 CPU
- Low cost

Aurora

- 1.6GHz Intel Atom Z530 or 1.1GHz Atom Z510 CPU
- Rugged SO-DIMM
- Conduction cooling

Athena III

- 1GHz or 1.6GHz Atom E-Series CPU
- Integrated DAQ*
- Compatible with Athena II

EBX SBCs

Hercules III

- 1.6GHz Atom E680 CPU
- Integrated DAQ*
- On-board power supply

PC/104-*Plus* SBCs

Pegasus

- 500MHz AMD LX800 CPU
- Soldered RAM - Rugged

EMX SBCs

Altair

- 1.6GHz Atom E680 CPU
- EMX stackable I/O
- MiniPCIe socket

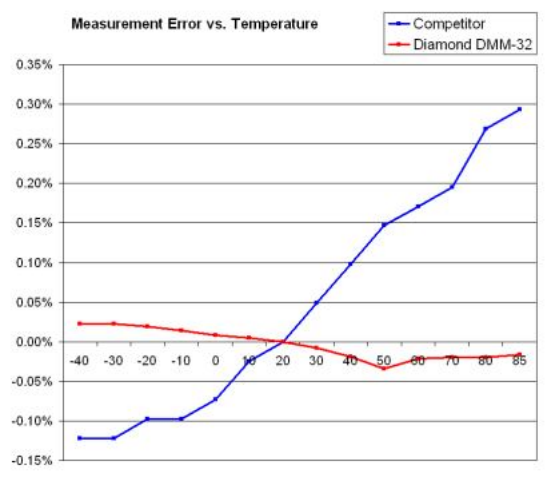
* **DAQ** = data acquisition (analog and digital I/O)

Athena III Single Board Computer

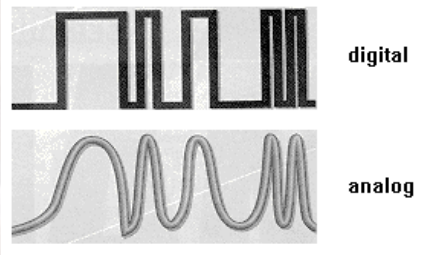
- 1.0GHz E640T / 1.6GHz E680T Atom CPU
- 1GB / 2GB memory soldered on-board
- 1 Gigabit Ethernet port
- 4 USB 2.0 ports
- 4 RS-232/422/485 ports
- PS/2 keyboard & mouse
- LVDS and VGA display interfaces
- 1 SATA port
- 24 digital I/O lines on all models
- HD audio
- Support for USB flashdisk up to 8GB
- Watchdog timer
- PC/104 (ISA) I/O expansion
- Operating temperature -40°C to +85°C (-40°F to +185°F)
- MIL-STD-202G 12G shock and vibration (target)

Athena III DAQ Features

16 single ended / 8 differential analog inputs
16-bit A/D resolution
Programmable input ranges
200KHz sample rate
512 sample FIFO
Autocalibration for highest accuracy



4 12-bit analog outputs
2 counter / timers
24 digital I/O (also on non-DAQ models)
Autocalibration with Universal Driver



100% Compatible with Athena II DAQ

CPU + DAQ

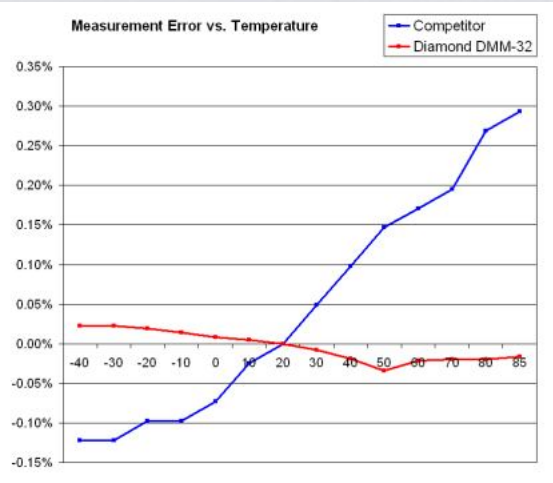
Hercules III SBC Features

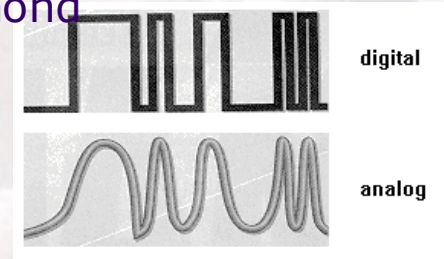
- EBX form factor 5.75” x 8.00”
- 1.6GHz Intel Atom E680T CPU
- 1GB or 2GB rugged SDRAM
- 2 Gigabit Ethernet
- 5 USB 2.0 ports; 1 USB device port
- 4 RS-232/422/485 ports; 2 RS-232 ports
- PS/2 keyboard & mouse
- LVDS and VGA display interfaces
- 1 SATA port; mSATA flashdisk socket
- 1 CAN port
- 7-40V DC/DC power supply
- PC/104-*Plus* (ISA + PCI) I/O expansion
- PCIe MiniCard socket; GPS socket
- Operating temperature -40°C to +85°C (-40°F to +185°F)
- MIL-STD-202G 12G shock and vibration (target)

CPU + DAQ

Hercules III DAQ Features

- 32 16-bit single ended analog inputs
- Programmable input ranges
- 250KHz sample rate
- 2048 sample FIFO
- Autocalibration for highest accuracy
  - Custom FPGA code
    - •Unique I/O functionality
    - •Pre-processing of data
    - •Available on all FPGA-based products from Diamond
- 4 12-bit analog outputs
- 40 digital I/O lines
- 4 PWM circuits
- Watchdog timer
- 2 counter / timers





100% Compatible with Hercules II DAQ

CPU + DAQ

DIAMOND SYSTEMS

Atlas SBC

PCI/104-Express SBC

- 1.86GHz Intel Atom N2800 or 1.6GHz N2600 CPU
- 2GB or 4GB onboard 64-bit DDR3 SDRAM
- 1 Gigabit Ethernet; 4 USB 2.0 ports
- 4 RS-232/422/485 ports; 2 RS-232 ports
- USB keyboard & mouse
- 24-bit LVDS and VGA display interfaces
- 1 SATA port; mSATA flashdisk mounting location
- HD audio
- Screw terminals for power input
- PCI-104 I/O expansion
- Dimensions 116mm x 96mm (4.55” x 3.775”)
- Operating temperature -40°C to +85°C (-40°F to +185°F)
- MIL-STD-202G 12G shock and vibration (target)

Quantum Baseboard

PCI/104-Express QSeven Carrier

- 2 RS-232/422/485 ports; 2 RS-232 ports
- PS/2 keyboard & mouse
- VGA display interface
- 4 12-bit analog inputs; 10 digital I/O
- 2 counter/timers; 4 PWMs
- 1 SD socket; mSATA flashdisk mounting location
- +6V to +34VDC wide voltage power input
- PCI-104 non-stackthrough I/O expansion
- PCIe/104 1-bank I/O expansion connector
- PCIe MiniCard socket
- Dimensions 116mm x 96mm (4.55” x 3.775”)
- Operating temperature -40°C to +85°C (-40°F to +185°F)

Quantum-GT40E SBC

PCI/104-Express AMD G-Series SBC

- 1GHz AMD G-T40E CPU
- 2GB SDRAM on-board
- 1 Gigabit Ethernet
- 2 RS-232/422/485 ports; 1 RS-232 ports
- PS/2 keyboard & mouse; HD audio
- Dual channel 18/24-bit LVDS; VGA display interface; 1 DDI
- 4 12-bit analog inputs; 10 digital I/O
- 2 counter/timers; 4 PWMs
- 2 SATA ports; mSATA flashdisk mounting location
- +6V to +34VDC wide voltage power input
- PCI-104 non-stackthrough I/O expansion
- PCIe MiniCard socket
- Dimensions 116mm x 96mm (4.55” x 3.775”)
- Operating temperature -40°C to +85°C (-40°F to +185°F)

Octavio Systems

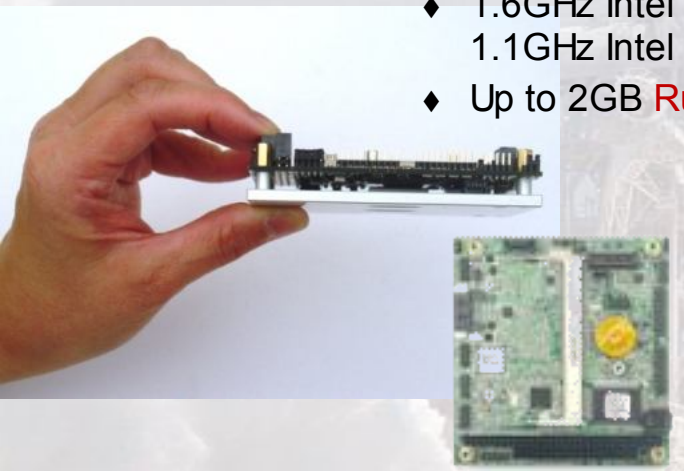
- Box-level SBC
  - Atom E680T or Vortex86DX CPU
  - 10/100 or gigabit Ethernet
  - 4 USB 2.0 ports
  - 4 RS-232/422/485 ports
  - PS/2 keyboard & mouse
  - VGA CRT display
  - Data acquisition:
    - 16 16-bit analog inputs
    - 4 12-bit analog outputs
    - 24 digital I/O
  - Linux 2.6.23 bootable image
  - 5-10W power consumption, +5VDC +-5%
  - -40°C to +80°C operating temperature
  - 5.5 x 5.75 x 1.7 in. (138 x 145 x 43 mm)

Conduction Cooled SBC Overview

PC/104 + Sumit™ SBCs

Aurora

- 1.6GHz Intel Atom Z530 or 1.1GHz Intel Atom Z510 CPU
- Up to 2GB Rugged SODIMM



Heat spreader 2.8" (~70mm) mounting holes ALL SBCs!!!

ETX-based SBCs

Neptune Family

- Choice of Intel Atom & Core Duo ETX CPUs
- Integrated DAQ*
- Wide Input Voltage Range
- PC/104-*Plus* expansion

Pluto Family

- Choice of Intel Atom & Core Duo ETX CPUs
- CompactFlash socket
- PC/104-*Plus* expansion

COM Express-based SBCs

Magellan

- COM Express CPU
  - Intel Core2 Duo + 965 with 12VDC input, or
  - 1.1GHz Atom Z510 with 7-34VDC input
- -40°C to +85°C operation

* **DAQ** = data acquisition (analog and digital I/O)

I/O Overview

Analog I/O Modules

Diamond-MM Family

- 16-32 12-bit analog inputs
- 2-4 12-bit analog outputs
- 8-24 digital IO channels

FeaturePak DAQ1616

- 16 16-bit analog inputs
- 16 16-bit analog outputs
- 56 digital I/O
- 2 counter / timers; 4 PWMs

Analog Output Modules

Ruby-MM-1616A Family

- 4-16 16-bit analog outputs
- 48 digital IO channels

Networking Modules

Mercator II

- 4 10/100 LAN ports
- 24 digital I/O

Digital I/O Modules

GPIO-MM & Onyx-MM

- Up to 96 DIO channels
- Up to 10 counter/timers
- FPGA-based design for flexibility

FeaturePak GPIO96

- 96 buffered programmable digital I/O
- 8 32-bit counter / timers
- 4 24-bit pulse width modulators

Serial Port Modules

Emerald-MM Family

- 4-8 configurable serial ports
- RS-232/422/485 protocols

PCIe MiniCard Modules

DS-MPE Family

- 4-port high speed serial
- 4-port opto-isolated serial
- 32 line GPIO

DIAMOND SYSTEMS

I/O Overview

Communications Modules

Janus-MM

- Dual CANbus interfaces
- Sockets for GPS & GSM wireless modules

Corona

- Wireless
- Dual LAN
- Dual USB
- SATA SSD drive socket
- SDVO to VGA converter for Aurora

Epsilon

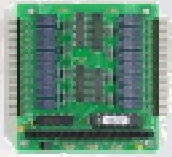
- 8-port Gigabit Ethernet switch
- Standalone configuration
- Optional PC/104 stackthough connector

EMX I/O Modules

EMX-ESG777, EMX-ESG624 & EMX-ESG200

- Dual Gigabit Ethernet
- 6 serial ports
- 14 GPIO lines
- GPS receiver socket

Opto & Relay Modules



Pearl-MM & OPMM-1616

- 8 or 16 relays
- 8-16 Optoisolated inputs
- 30VDC input

Power Supply Modules

Jupiter-MM Family

- 25-50W output power; ±5V, ±12V
- 7-30VDC input range

Universal Driver

Software toolkit with C programming support for most products with on-board data acquisition

- Analog I/O
- Digital I/O
- Counter / timers
- Watchdog timers

Key Features

- Multi-board operation, up to 16 boards
- Consistent API
- Autocalibration with software commands
- User interrupts, yours and ours
- Extensive programming examples
- Counter/timer & watchdog timer support
- Low-level register read/write support

Universal Driver 7.0

- New kernel to support Windows 7 and later
- Based on Intelligraphics "IGXFlex" driver development kit
- Uses Microsoft KMDF technology for portability across Windows OSes
- Supports Windows 7, Windows Embedded 7, Windows XP, and Windows 2000
- 100% backward compatible with existing driver 6.02 and earlier; same user API
- Simply recompile application with new dscud.lib and existing code will work without any changes
- Enhanced performance and efficiency
- Windows installer included
- Boards appear in Device Manager
- Linux support to come ~1 month later

Universal Driver Software Support

Universal Driver Version	Linux	Windows XP	Windows Embedded Standard	Windows Embedded CE	QNX	RTLinux	Windows 7
7.00*	2.4.xx 2.6.23	✓	✓	6.0 R2	6.4.0		✓
6.02/6.03	2.4.xx 2.6.23	✓	✓	6.0 R2	6.4.0		
6.00/6.01	2.4.xx 2.6.23	✓	✓	6.0 R2			
5.92	2.4.xx 2.6.7	✓	✓	4.2 5.0			
5.91	2.4.xx 2.6.7	✓	✓	4.2 5.0	6.x	2.1 2.2	

Universal Driver Version	LabView for Windows	Visual Basic
7.00*		VB.NET
6.xx		
5.92	✓	VB 6.0 VB.NET

* Under development

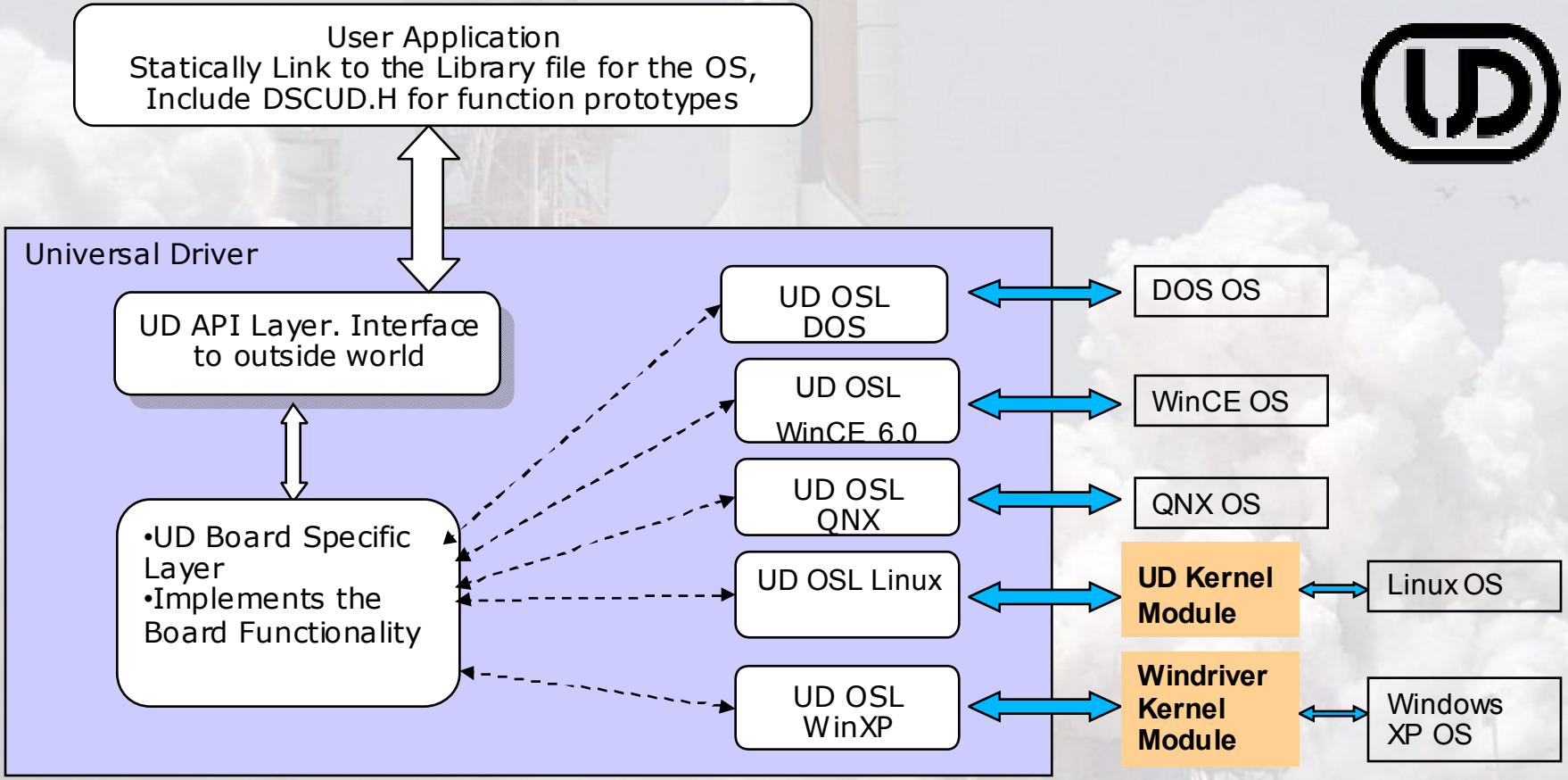
Universal Driver Overview

3 Tier Architecture – OS Independent Interface

API and Board Support layer re-used for every OS

OS Layer specific for every OS

Online user manual with function description, code examples, error codes & more



Universal Driver & SBC Demo Programs

Set of demo application programs which explains how to use the Universal Driver functions and develop applications quickly on the DAQ boards

Command Line Demos – Provided in Source Code format in C language along with the build files for various Operating Systems

AD demos include, AD Sample, AD Scan, AD Interrupts and more for single channel, multiple channels

DA demos include D/A settings to various modes and D/A output functionality.

Counter/Timer demos include:

Running a specific counter at a desired frequency

DIO demos include:

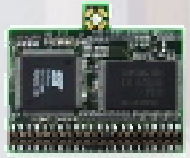
- Output a byte value to a DIO port
- Read input from a DIO port
- Configure the ports to either input or output direction

SBC demos provide source code and executables for controlling various interfaces like the DIO lines, Watchdog timer and other interfaces not covered by the UD demos

Software Development Kits

Software Development Kits let you rapidly experience the OS running on your Diamond SBC with little or no configuration effort

- Available for Linux, Windows Embedded Standard, Windows Embedded 7, and Windows CE



- Bootable OS image on flashdisk or CompactFlash

- Universal Driver with demo programs

- Quick Start guide and User manual

- CD with back up image

  For Linux: also root file system, kernel source, & tool chain

Software Development Kits (SDKs)

Software Development Kits for quick evaluation of the hardware as well as software offering of the SBC

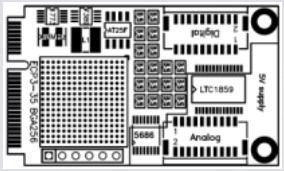
SBC	Linux	Win CE	XPe/7	QNX
Athena III	2.6.23	6.0 R2	✓	
Aurora	2.6.31 Ubuntu 10.4		✓	
Altair				
Helios	2.6.23	6.0 R2		
Hercules III	2.6.23	6.0 R2	✓	
Magellan	Ubuntu 10.4		✓	
Neptune	2.6.23		✓	
Pegasus	2.6.23	6.0 R2		
Pluto	2.6.23		✓	
Rhodeus	2.6.23	6.0 R2		

PCIe MiniCards

DS-MPE-GPIO

- 32 buffered DIO lines
- Configurable for:
  - Up to 4 24-bit PWMs
  - 4 programmable counters
- High current output
- +3.3VDC input power
- OS support for:
  - Windows 7, XP, CE
  - Linux 2.6
- Universal Driver support
- Dimensions 50.95mm x 30mm
- Operating temp -40°C to +85°C

DS-MPE-DAQ0804



- 8 16-bit SE analog inputs
- 100KHz max sample rate
- 4 16-bit analog outputs
- 14 digital I/O configurable as:
  - 4 24-bit PWMs
  - 8 32-bit counter/timers
- +3.3VDC input power
- OS support for:
  - Windows 7, XP, CE
  - Linux 2.6
- Universal Driver support
- Dimensions 50.95mm x 30mm
- Operating temp -40°C to +85°C

Epsilon-8100

Managed 14-Port Gigabit Ethernet Switch

- Standalone or autonomous operation
- 12 Gigabit copper Ethernet ports
- 1 1G SFP socket; 1 1G/2,5G SFP socket
- DSCP remarking for IPv4 & IPv6 frames
- Programmable multi-layer classifier
- 8K MAC addresses; 4K VLANs
- Flexible link aggregation (IEEE 802.3ad)
- Full-duplex flow control (IEEE 802.3X)
- Multicast & broadcast storm control
- Multiple protocol support: IEEE 802.1d, .1w, .1s, .1X
- Built-in MIPS microcontroller for configuration & management
- RS-232 port for out-of-band management
- +7V to +40VDC wide voltage input
- Dimensions 95mm x 125mm
- Operating temperature -40°C to +85°C (-40°F to +185°F)

DIAMOND SYSTEMS

Raptor Perfect-Fit Rugged Systems

New line of compact, rugged perfect-fit systems

Standard off-the-shelf products

- Application-ready CPU platform
- Standalone Gigabit Ethernet switch

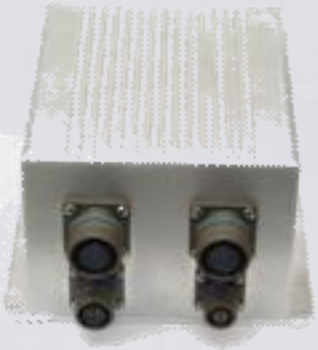
Fully customizable

Applications

- Military vehicles
- Traffic control
- Mining
- Commercial transportation
- Underwater / marine

Enclosure Features

- Two standard sizes
  - 7 x 5.5 x 3.75” (not including flanges)
  - 7 x 5.7 x 2” (not including flanges)
  - Customizable



- One-piece extruded aluminum T6061 chassis
- HBW or anodized finish
- Sealed construction, IP67 rated
- EMI shielding
- Commercial & MIL style connectors
- MIL-STD-202G 12G shock and vibration

Raptor Embedded Application Server

- Based on Vega EMX Basic SBC
- 1.4GHz i7-2610 or 1.5GHz Celeron 827 CPU
- 2 Gigabit Ethernet ports
- 4 USB 2.0 ports
- 4 RS-232/422/485 ports
- VGA output
- 16 16-bit A/D, 4 12-bit D/A
- 24 GPIO lines
- mSATA flashdisk up to 64GB
- Runs Windows 7 or Linux
- EMX expansion
- +5VDC or 8-36VDC input voltage
- Operating temperature -40°C to +85°C (-40°F to +185°F)
- MIL-STD-202G 12G shock and vibration

Raptor Gigabit Ethernet Switch

- Based on Epsilon 8-port Gigabit Ethernet switch
- Layer 2+ managed switch
- 8 copper 10/100/1000Mbps ports

- VLAN capability
- Jumbo frame support
- Network partitioning
- Flexible link aggregation
- Web-based and RS-232 management interface

- +5VDC or 7-36VDC input voltage
- Operating temperature -40°C to +85°C (-40°F to +185°F)
- MIL-STD-202G 12G shock and vibration

DIAMOND SYSTEMS

Corporate Overview

September 2013

Perfect Fit Solutions

- Optimize the selection of features & methods to create the best solution for customer
- Solution can be a board, a board set, or a complete system
- Primarily consists of hardware
- Can include light software & firmware:
  - BSP development
  - BIOS customization
  - FPGA customization
- Capture additional content in the customer's application
- Reduce commoditization & ability to be designed out

Athena III & Athena II Differences

Feature	Athena III	Athena II
CPU	Intel Atom E640T	VIA Mark
CPU Speed	1.0GHz standard	500MHz or 800MHz
Memory	1GB on-board standard	256MB on-board
USB Ports	4 USB 2.0	4 USB 1.1
Serial Ports	4 RS-232/422/485	2 RS-232; 2 RS-232/422/485
Ethernet	1 Gigabit	1 10/100Base-T
Mass Storage – Internal	USB flashdisk up to 8GB	IDE flashdisk up to 4GB
Mass Storage – External	1 SATA	1 IDE UDMA-33
Digital I/O	24 DIO standard	Optional 24 DIO with DAQ
Analog I/O	16 16-bit A/D @ 200KHz 4 12-bit D/A	16 16-bit A/D @ 100KHz 4 12-bit D/A
LVDS Resolution	24-bit	16-bit
Operating temperature	-40°C to +85°C	-40°C to +70°C or -40°C to +85°C
Performance rating (Passmark)	160 @ 1.0GHz	56 @ 800MHz
Power consumption	9.4W	10.0W

Hercules III & Hercules II Comparison

Feature	Hercules III	Hercules II
CPU	Intel E680T Tunnel Creek	VIA Mark Corefusion
CPU Speed	1.6GHz	800MHz
Memory	1GB or 2GB DRAM	512MB on-board
USB Ports	5 USB 2.0, 1 USB device port	4 USB 1.1
Serial Ports	2 RS-232 + 4 RS-232/422/485	2 RS-232 + 2 RS-232/485
Ethernet	2 Gigabit	1 10/100Base-T
Mass Storage – Internal	mSATA flashdisk up to 64GB	IDE flashdisk up to 4GB CompactFlash socket
Mass Storage – External	1 SATA	1 IDE UDMA-100
Display	LVDS LCD + VGA	LVDS LCD + VGA
Expansion	PC/104-*Plus*, GPS socket, PCIe MiniCard socket	PC/104-*Plus*
CAN bus port	1	No
System controller	10 GPIO, 4 A/D, 4 PWM, MTBF counter, wake on timer	No
Data Acquisition	32 16-bit A/D @ 250KHz, 4 12-bit D/A, 40 Digital I/O	32 16-bit A/D @ 250KHz, 4 12-bit D/A, 40 Digital I/O
Operating temperature	-40°C to +85°C	-40°C to +85°C / -20°C to +71°C

- Higher CPU performance and greater memory capacity
- Improved I/O and expansion options
- Support for new technologies
- No legacy support for IDE

DIAMOND SYSTEMS