

VEGA SBC FAMILY



COM Express COM-based Single Board Computers

Configurable COM Express CPUs and Integrated Autocalibrating Data Acquisition



Highly Integrated, Configurable SBC

The rugged Vega COM Express SBC family includes interchangeable COM Express COMs for scalability and long product life, high feature density in a compact size, integrated high-quality data acquisition, expandable I/O conduction cooled thermal solution for improved reliability, and rugged construction.

High Feature Density

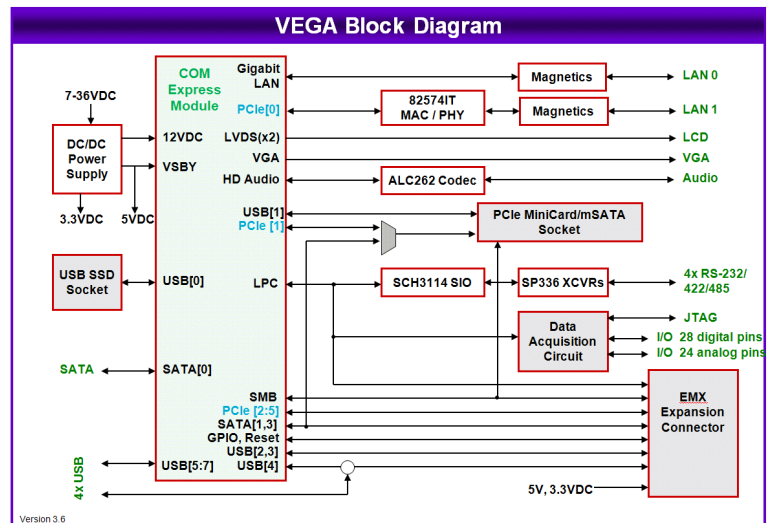
Vega's two-board COM + baseboard construction yields the highest feature density possible in a given footprint. Vega's highly integrated baseboard offers a wide range of I/O including a full data acquisition circuit and a highly efficient wide voltage power supply, making Vega compatible with most common vehicle and industrial power supply voltages.

The integrated data acquisition includes 16-bit A/D and D/A, digital I/O, and counters/timers all supported by Diamond's industry-leading Universal Driver data acquisition programming library.

Rugged Design

The Vega SBC family was designed with rugged applications in mind. With a wide operating temperature range, integrated heat spreader, thicker PCB, and latching I/O connectors, Vega SBCs are a perfect fit for rugged applications including aerospace/defense, industrial, medical and on-vehicle.

- ◆ Integrates functions of 5 PC/104 modules within the compact EMX Basic form-factor
- ◆ Choice of Intel 2.1GHz Core i7-3612QE or 1.7GHz Core i7-3517UE modules to match application requirements
- ◆ Wide range of I/O devices:
 - 2 Gigabit Ethernet ports
 - 4 USB 2.0 ports
 - 4 RS-232/422/485 ports
 - LVDS and VGA display interfaces
 - 1 SATA port
 - mSATA or USB flashdisk socket up to 64GB
 - High definition audio
- ◆ Best-in-class data acquisition featuring:
 - 16 16-bit analog inputs with Autocalibration
 - 2048 sample FIFO
 - 250KHz maximum sample rate
 - 8 16-bit analog outputs
 - 30 digital I/O lines
 - 8 32-bit counter/timers
 - 4 24-bit pulse width modulators
 - 8-channel waveform generator
- ◆ +7-36V DC/DC power supply
- ◆ EMX expansion bus & PCIe MiniCard socket
- ◆ COM Express form factor (125mm x 95mm)
- ◆ Extremely rugged -40°C to +85°C (-40°F to +185°F) operating temperature



Vega: COM Express SBC with COM Express CPU

CPU Specifications

Processor	2.1GHz Intel Core i7-3612QE or 1.7GHz Intel Core i7-3517UE
Chipset	PCH QM67 or PCH HM65
Memory	Up to 8GB DDR3 SO-DIMM
BIOS	AMI PnP Flash BIOS
Mass storage	1 SATA port mSATA or USB flashdisk supports up to 64GB
Serial ports	4 RS-232/422/485 ports
USB ports	4 USB 2.0 ports
Keyboard / mouse	USB keyboard and mouse
Networking	2 Gigabit Ethernet ports; 1 on COM Express module, 1 via Intel 82574IT on baseboard
Display	Supports dual independent displays LCD flat panel interface (LVDS) VGA CRT up to 2048 x 1536
Audio	HD Audio Realtek ALC262 CODEC; mic in, stereo in/out
Watchdog timer	Non-maskable interrupt or reset modes
I/O expansion	EMX bus or PCIe MiniCard socket
Input power	+7-36V DC/DC power supply
Power consump	VEGA-3612QE-4GA: 14.52W at 12V typical VEGA-3517UE-4GA: 13.93W at 12V typical
Operating temp	-40°C to +85°C (-40°F to +185°F)
Shock	MIL-STD-202G, Method 213B compatible
Vibration	MIL-STD-202G, Method 214A compatible
Dimensions	Core i7: 4.92 x 3.74 x 1.4" (125 x 95 x 36mm)
Weight	VEGA-3517UE-4GN: 14.4oz (408g) Vega baseboard with DAQ: 277,880 hours Core i7-3612QE - 146,217 hours at 25°C Core i7-3517UE COM - 146,217 hrs at 25°C
MTBF	
RoHS	Compliant

Data Acquisition

Vega's integrated data acquisition circuit includes 16 analog inputs with 16-bit A/D and 250KHz maximum sample rate, eight 16-bit analog outputs, 30 digital I/O lines, four 24-bit pulse width modulators, 8-channel waveform generator, a watchdog timer, and eight 32-bit counter/timers. It uses an enhanced 2048-sample FIFO with programmable threshold for maximum flexibility and data reliability.

Software Support

The Vega SBC family supports Linux, Windows Embedded Standard 7, and Windows Embedded CE operating systems. Windows Embedded Standard 7 and Linux Software Development Kits are available with a bootable OS image and drivers. Diamond's Universal Driver software is also included. It provides a C programming library for the integrated data acquisition circuit, demo programs, and example code to assist in application development.

Data Acquisition Specifications

ANALOG I/O	
Number of inputs	16 single-ended or 8 differential, selectable
A/D resolution	16 bits
Input ranges	±10V, ±5V, ±2.5V, ±1.25V, 0-10V, 0-5V, 0-2.5V programmable
Sample rate	250KHz maximum
Protection	±35V on any analog input without damage
Nonlinearity	±3LSB, no missing codes
On-board FIFO	2048 samples, programmable threshold
DAQ calibration	Autocalibration values stored in EEPROM
Number of outputs	8, 16-bit resolution
Output ranges	±5V, ±10V, 0-5V, 0-10V
Output current	±5mA max per channel
Settling time	7µS max to 0.01%
Relative accuracy	±1 LSB
Nonlinearity	±1 LSB, monotonic
Reset	Reset to zero-scale or mid-scale
PWM	4 24-bit pulse width modulators
Waveform	8-channel waveform generator
DIGITAL I/O	
Digital I/O lines	30 lines, programmable direction
Input voltage	Logic 0: 0.0V min, 0.8V max Logic 1: 2.0V min, 5.0V max
Input current	±1µA max
Output voltage	Logic 0: 0.0V min, 0.33V max Logic 1: 2.4V min, 5.0V max
Output current	Logic 0: 12mA max per line Logic 1: -4mA max per line
COUNTER / TIMERS	
Watchdog timer	Non-maskable interrupt or reset modes
General purpose	8 32-bit counter/timers
Clock source	10MHz on-board clock or external signal

Ordering Information

VEGA-3612QE-4GA	Vega SBC, 2.1GHz Intel Core i7-3612QE CPU, 4GB RAM, full data acquisition
VEGA-3612QE-4GN	Vega SBC, 2.1GHz Intel Core i7-3612QE CPU, 4GB RAM, no data acquisition
VEGA-3612QE-8GA	Vega SBC, 2.1GHz Intel Core i7-3612QE CPU, 8GB RAM, full data acquisition
VEGA-3612QE-8GN	Vega SBC, 2.1GHz Intel Core i7-3612QE CPU, 8GB RAM, no data acquisition
VEGA-3517UE-4GA	Vega SBC, 1.7GHz Intel Core i7-3517UE CPU, 4GB RAM, full data acquisition
VEGA-3517UE-4GN	Vega SBC, 1.7GHz Intel Core i7-3517UE CPU, 4GB RAM, no data acquisition
CK-VEGA-01	Vega Cable Kit for on-board I/O
VEGA-BB-A	Vega COM Express Baseboard with data acquisition
VEGA-BB-N	Vega COM Express Baseboard, no data acquisition