# WinSystems<sup>®</sup> EMBEDDED EPIC COMPUTERS

EPX-855-G High Performance Industrial Fanless SBC

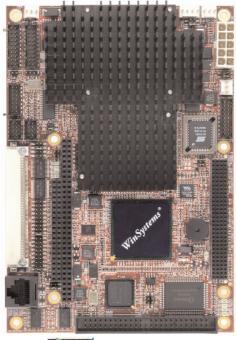
#### **FEATURES**

- Intel® ZCD 1GHz CPU or 1.8GHz Pentium® M
- Industrial operating temperature range -40°C to +70°C: 1.8GHz Pentium®M SBC with fan -40°C to +70°C: 1.0GHz SBC without fan
  - -40°C to +85°C: 1.0GHz SBC with fan
- EPIC-size board: 4.5" x 6.5" (115 mm x 165 mm)
- Up to 1GB of system DDR SDRAM supported in a 200-pin SODIMM socket
- Type I and II CompactFlash cards supported
- PC-compatible, supports Linux, Windows® XP embedded, plus other x86-compatible RTOS
- Integrated graphics utilizing Intel® Extreme Graphics 2 technology supports resolutions up to 2048 x 1536
- Simultaneous CRT and LVDS flat panel supported
- Backlight power supported
- Custom splash screen on start up
- Two Ethernet ports:
  - One Gigabit, 10/100/1000 Mbits/secs
  - One 10/100 Mbits/sec
- Four COM ports; two RS-232/422/485 and two with only a RS-232 interface
- 24 bi-directional TTL digital I/O lines with event sense and interrupt support
- Bi-directional LPT port supports EPP/ECP
- Four USB 2.0 ports
- Two IDE ports with ATA100 for hard disk and CompactFlash memory storage
- 3.5-inch Floppy disk drive supported
- 802.11a/b/g wireless supported via miniPCI socket
- PC/104 and PC/104-Plus expansion connectors
- PS/2 keyboard controller support
- AC97 Audio (six channel/5.1 surround sound)
- Real time clock

The EPX-855-G is a highly integrated, single board computer (SBC) designed for rugged, performance driven applications. It operates over a wide range and is designed for applications including industrial automation, security, medical/diagnostic equipment, MIL/COTS, test and measurement, and transportation.

WinSystems' design is based upon chipsets from Intel's long life embedded road map to ensure longevity of the core technology.

WinSystems' applications engineers are available to provide technical support with initial board selection and free telephone assistance during the design-in and production phase of your project.





- Activity LEDs onboard for visual status
- Up to 300 second reset with watchdog timer
- +5 volt only operation
- Performance upgrade to WinSystems' EPX-C3 and EPX-GX500
- RoHS compliant
- Quick Start Kits available for software development

## **FUNCTIONAL CAPABILITY**

The EPX-855-G is a full-featured, high-performance single board computer with a variety of on-board peripherals which reduce the need for additional standard I/O peripheral cards. It is based on the Intel's popular 855GME chipset with the ICH4 communications controller and integrated Extreme Graphics 2 video 3D controller. The EPX-855-G features an Intel 1GHz Celeron®M-based ZC Dothan (ZCD) or 1.8GHz Pentium M processor. Both the CPU and system controller are supplied from Intel's Embedded Architecture Division for long-term availability. It supports a maximum of 1GB of industry-standard PC2700 SDRAM, Type I and Type II CompactFlash cards, plus support for IDE hard and 3.5" floppy disk drives.

The EPX-855-G offers a full set of I/O interfaces including one Gigabit 10/100/1000 Mbits/secs Ethernet port and one 10/100BaseT Ethernet port (with remote boot and WOL capability), analog VGA and dual channel LVDS flat panel video, a miniPCI connector that supports an optional 802.11 wireless networking module, four USB 2.0 ports, four serial COM ports, AC97 audio (5.1 codec), LPT and PS/2 ports for keyboard and mouse. Also onboard is a software programmable, 24-line digital I/O controller that provides input, output or output with readback for each I/O line. The board has PC/104 and PC/104-*Plus* connectors for support of additional off-the-shelf or user-designed specialty I/O modules.

**Processor and Chipset** - The EPX-855-G is based upon the Intel 855GME GMCH and Intel ICH4. These chips are ideal for embedded computing applications requiring high-performance and full x86 Pentium compatibility. The EPX-855-G features a low-power Intel ZC Dothan or Intel Pentium M processor. The Intel 855GME GMCH is designed, validated, and optimized for the Intel Pentium M and Intel ZC Dothan processors and associated micro architecture.

**Advanced Thermal Management** - The processor is soldered directly to the board and has an advanced heat sink and thermal dissipation design. The heat sink material, fin size and density have been carefully engineered to provide a low thermal impedance interface so that heat can be efficiently removed from the devices.

The 1GHz ZC Dothan is Intel's 90-nanometer (nm) process from its Celeron family of CPUs. It draws very low power (only 5.5W max.) which allows it to operate from -40°C to +70°C without the need for a fan or the necessity to slow down the CPU clock frequency. However, if a fan is added, then the high limit of the operational temperature range is extended to +85°C operating at 1GHz.

The 1.8GHz Pentium M processor is a 90nm CPU that offers very high-performance. It includes a 2MB L2 onchip cache. Operational temperature of the board with the 1.8GHz CPU is -40°C to +70°C with a fan.

It is important to note that these temperature figures are with no airflow across the board other than what the onboard fan would generate. Also, these operational temperature specifications are at the full rated board speed. No automatic CPU clock speed reduction is necessary at elevated temperatures.

The EPX-855-G-1.8G-1 and EPX-855-1G-1 supports active fan management. The fan is not turned on if the CPU is less than 55°C which extends fan life.

**Power Management** - The EPX-855-G supports both four standard power management modes to control and bring

the power down on the board automatically. So is the full power-on mode. S1 is the standby mode. Change of state of the keyboard, mouse, USB mouse and keyboard, wake on LAN or wake on Ring will wake the system up out of Power On Suspend to Full-On. S4 suspends to disk before powering down. S5 turns all the power off (ATX mode only).

The BIOS supports the Enhanced Intel SpeedStep® technology that enables the processor to switch between multiple frequency and voltage points. This allows optimal performance and the lowest power. It also supports the circuitry for catastrophic thermal protection. If detected, the Vcc supply to the processor is turned off to prevent permanent silicon damage due to thermal runaway.

**Memory** - The system memory bus is 64-bits wide with a 400MHz front size bus. It operates at a speed of 333 MT/sec and uses Double Data Rate (DDR) synchronous dynamic RAM. Up to 1Gbyte of non-registered, unbuffered, PC2700 DDR SDRAM with gold plated fingers can be installed for the main systems memory.

The board is shipped from the factory with no memory installed. A 200-pin SODIMM connector permits the user to either install and/or upgrade the memory capacity in the field. WinSystems can supply the SODIMM 200-G-27-128, -256, -512, and -1G RoHS-compliant memory devices qualified for use on this board.



WinSystems' Industrial CompactFlash

CompactFlash - A connector is on the board that will accept Type I and II CompactFlash cards. The connector is wired to the IDE secondary controller. A designer can use CompactFlash cards as data storage for applications where the environment is too harsh for rotational hard disks or floppy disk drives. The EPX-855-G can boot from a CompactFlash device.

WinSystems offers industrial-grade CompactFlash cards that provide operational SSD storage from -40° to +85°C for high capacity harsh embedded applications. They provide high sustained data transfer rates and an on-card wear leveling algorithm to extend the number of write cycles to the part. These RoHS-compliant cards will fit into any computer, SBC, instrument or camera with a CompactFlash socket, www.industrialcompactflash.com.

**BIOS** - The EPX-855-G uses the Phoenix Trusted core BIOS. It supports advanced features such as custom splash screen, APM 1.2 and ACPI 1.0b power management modes, and PXE boot. For the EPX-855-G board that is configured with the 1.8GHz Pentium M or 1GHz ZCD with fan, the BIOS controls the CPU fan speed plus it can turn the fan on and off.

The BIOS also supports legacy operation of a USB keyboard and mouse, as well as booting from a USB floppy disk, USB keys, and other USB-connected mass storage devices.

The BIOS is located in an EEPROM so that users can save their custom CMOS values in a nonvolatile storage area for consistent behavior at bootup. The BIOS allows the EPX-855-G to operate without a keyboard, display or disk drive attached.

**Remote Network Booting** - The EPX-855-G supports remote booting for use as a diskless network computer. Contact a WinSystems' application engineer for companies that supply remote boot software.

**Floppy Disk Support** - A 3.5" floppy disk drive is supported by connecting it through a CBL-252 cable. Alternatively, a USB floppy disk drive can be attached which also has legacy boot support.

**IDE Interface** - The EPX-855-G incorporates a fast IDE interface for hard disks, CompactFlash and other ATA-compatible devices. Each IDE device can have independent timings. The IDE interface supports PIO IDE transfers up to 16Mbytes/sec and Ultra ATA transfers up to 100 Mbytes/sec. The IDE interface integrates 16 x 32-bit buffers for optimal transfers.

The IDE primary controller is wired to the 0.100" header while the secondary controller is dedicated to the Compact-Flash connector. An LED blinks automatically while data is transferred to provide visual status information.

**Video** - The EPX-855-G is based upon Intel's Extreme Graphics 2 integrated graphics technologies that deliver 3D graphics with sharp images, fast rendering, smooth motion and extreme detail. Intel's Extreme Graphics 2

supports the latest 2D and 3D APIs, delivering real-life environment and character effects. A 256-bit internal path enables up to four textures per pixel on a single pass for super light maps, atmospheric effects, and more realistic surface details. Flexible display capabilities enhance the personal computing experience, offering significant benefits for applications requiring 32 bpp and higher display resolution.

The EPX-855-G supports both a dual LVDS flat panel interface as well as a standard analog SVGA interface simultaneously. The controller also will allow separate, independent video to be displayed on LVDS and SVGA displays. The video uses up to 64MB of system memory. A 350MHz DAC provides resolution up to 1600 x 1200 @ 85Hz or up to 2048 x 1536 @ 72Hz for both CRT and flat panels. The color depth for the flat panel is 18 bits per pixel (bpp).

**Video Interface** - The CRT video output signals are wired to a 14-pin dual-in-line connector at the edge of the board. An optional CBL-234-G-1-1.375 interface cable adapts it to a standard female 15-pin "D-Sub" type connector commonly used for VGA.



WinSystems' Flat Panel Open Frame Mount

**Flat Panel Display Support** - The EPX-855-G supports most flat panel display technologies. The board properly sequences the power for logic voltage and the backlight inverter to provide intelligent and safe power sequencing to the panel. Go to <a href="www.winsystems.com">www.winsystems.com</a> or contact a factory application engineer for the most up-to-date listing.

WinSystems uses a dual LVDS flat panel interface system that connects to different panel technologies and suppliers. It has power, timing, and control signals for various panel types. The logic levels are 3.3 volts but are 5.0V tolerant.

Connectivity - The EPX-855-G has both onboard and PC/104 module population options for wired and wireless communications. One Gigabit 10/100/1000 Ethernet and one 10/100 Ethernet, four USB 2.0 ports, two RS-232/422/485 COM channels, and two RS-232 COM channels are standard on the board.

For wireless communications, this board supports a number of plug-in modules. An onboard miniPCI socket allows an 802.11 a/b/g card to be installed. A separate PC/104-Plus module is supported for either a GSM or CDMA cellular modem. Another WinSystems' PC/104 module supports ZigBee-based communications.

**Gigabit 10/100/1000 Ethernet** - The EPX-855-G uses the Intel 82541ER integrated controller. It combines Intel's fifth-generation Gigabit MAC design with fully integrated state-of-the-art PHY technology that meets or exceeds IEEE 802.3ab specifications for Bit Error Rate performance. The controller has a direct connection to the PCI bus from the ICH4.

The PHY supports 10/100/10000 Mbits/secs full- and half-duplex operation. IEEE 802.3ab Auto-Negotiation support provides automatic link configuration of speed, duplex and flow control.

Light emitting diodes (LEDs) are on the EPX-855-G to provide a visual indication of the link status, network activity and network speed. The Link Integrity LED is lit when there is a valid connection detected. The Activity LED blinks on and off when activity is detected on the wire. The other LEDs indicate if the link is 10, 100, or 1000 Mbits/secs.

10/100 Ethernet - The EPX-855-G uses the MAC inside the Intel ICH4 controller plus a DA82562ET PHY to provide a 10/100 Mbits/secs wired Ethernet connection. The controller is Intel 8255x-compatible for use with standard software drivers. It supports an IEEE 802.3 and 10BASE-T/100BASE-TX compliant physical layer with IEEE 802.3u Auto-Negotiation support and Wake On LAN. There are three LEDs on board that provide status information of 100BaseT operation, Link established, and Rx/Tx data transfer in progress.

USB 2.0 - The EPX-855-G supports four USB 2.0 ports that comply with the Universal Serial Bus Specification revision 2.0 and Open Host Controller Interface (OHCI) Specification for full-/low-speed signaling and Intel's Enhanced Host Controller Interface (EHCI) Specification for high-speed signaling.

Each port has overcurrent and in-rush protection provided by a National Semiconductor LM3526 power switch. Each device is a dual stage design including a thermal protection circuit. During a short-circuit/over-current event, the switch dissipating excessive heat is turned off, allowing the second switch to continue to function uninterrupted. Therefore, a fault on one channel will not affect the other. No fuses are required since protection is done electronically by the circuit.

The four USB ports are wired to two, 8-pin 2 mm connectors. The CBL-275-G-2-0.667 is the optional cable adapter that has two standard female USB connectors.

**Serial Communications** - Four independent, full-duplex, RS-232 serial asynchronous channels are onboard. All serial channels are configured as Data Terminal Equipment (DTE). Both the send and receive registers of each channel has a 16-byte FIFO. This device is a quad 16C550 compatible UART that offers software compatibility with PC-type driver programs.

Independent control of transmit, receive, line status, and data set interrupts are on all channels. Each channel is setup to provide internal diagnostics such as loopback and echo mode on the data stream. Plus an independent on-chip software programmable baud rate generator is selectable from 50 bps through 115.2 kbits/sec. Modem handshake control signals are supported for all channels.

All of the COM ports support RS-232 interface levels. The RS-232 drivers have an on-chip charge pump to generate the plus and minus voltages so that the EPX-855-G only requires +5 volts to operate.

COM1 and COM2 also have jumper selectable RS-422/485 support. The RS-422/485 provides separate balanced transmit and receive signal pairs. For RS-485 multi-drop lines, one signal pair can be used for "party line" network structures.

**802.11 Wireless** - The EPX-855-G is shipped with an empty miniPCI socket so that a user can install their own cards from Intel, Broadcom, Foxconn (Atheros), and others. Normally 802.11 cards are automatically recognized by operating systems such as Windows XP. Also, the individual miniPCI card manufacturer will typically have drivers either with their card or at their web site. Please contact them directly for specific operating systems that their card will support.

**24-line parallel I/O** - The EPX-855-G contains a highly versatile WS16C48 digital I/O controller. Each I/O line is individually programmable for input, output, or output with read-back operation. Each output channel is latched and has an open collector driver (with a pull-up resistor) capable of sinking 12mA of current.

The major feature of this controller is its ability to monitor all 24 of the lines for both rising and falling digital edge transitions, and then interrupt the processor notifying it that a change-of-input status has occurred. Transition polarity is programmable and enabled on a bit-by-bit basis. Each line's transition is latched into the IRQ ID register by the event so that even short duration pulses will be recognized. An interrupt ID register is maintained for each line for writing more efficient Interrupt Service Routines. This is an efficient way of signaling the CPU of real-time events without the burden of polling the digital I/O points.

The EPX-855-G has its I/O lines connected to a 50-pin connector. Twenty-four data lines are alternated with 24 ground lines for reduced noise and crosstalk. Also +5 volts and ground are included in the cable. The pinout is compatible with the industry standard 4 to 24 position I/O module mounting racks (Dataforth, Opto-22, etc.) for use with high-level AC and DC optically isolated solid state relays. An optional CBL-115-4, 50-pin conductor ribbon cable connects the EPX-855-G to one I/O rack.

**Line Printer Port** - The EPX-855-G has a parallel port that may be operated in standard (SPP) bi-directional as well as Extended Capabilities Port (ECP - IEEE-1284) and Enhanced Parallel Port (EPP) modes. The output drivers can support 14mA per line.

The printer port can also be used as two additional general-purpose I/O ports or the floppy disk drive interface if a printer is not required. The first port can be configured as eight input or output only lines. The other port can be configured as five input and three output lines.

**AC97 Audio** - The EPX-855-G has an AC97 digital audio controller that supports 5.1 surround sound. An 18-pin, 2 mm connector provides access to Line Out, stereo Line In, and stereo Microphone In.

**Keyboard/Mouse Controller** - An 80C42-type controller supports a PS/2-compatible keyboard. Also, a standard PS/2 mouse is supported through a separate I/O cable. The mouse and keyboard also can be attached via the USB cable if the operating system you choose supports this feature.

**Interrupts** - Two 82C59A compatible interrupt controllers accept inputs from the onboard peripherals and the PC/104 Bus for a total of twelve software selectable interrupt sources. Four PCI interrupt sources are supported on the PC/104-*Plus* Bus which are PnP-compliant. Also an APIC interrupt controller is included for operating systems that support APIC functionality.

**Status LED** - A green status LED is also available to monitor system activity. Under a user's program control, it can indicate error conditions or blink different patterns to provide a visual indication of system status.

**Real Time Clock** - An MC146818A-compatible clock supports a number of features including periodic and alarm interrupt capabilities. The time and date information is stored in its CMOS RAM which can be maintained across power cycles by using WinSystems' optional off-board battery.

**Watchdog Timer** - A software enabled, retriggerable watchdog timer is provided. The timeout period is software adjustable with options from 30 to 300 seconds available from the CMOS set up for boot. If enabled, it must be updated at least once during the period otherwise a failure is assumed and the board will be reset. This circuit is important for use in remote and unattended applications.

**Speaker** - An onboard PC speaker is present. A beep code is generated that corresponds to any BIOS error codes (if required) during the power up or reset sequence

**Power** - Power is supplied to the board through a 10-pin Molex connector. Both  $\pm 12$  volts are wired directly to the PC/104 and PC/104-*Plus* connector. The  $\pm 12$ V is also wired to the switch for the panel back light control. The  $\pm 12$ V power is not used on the board.

**Reset** - A precision voltage monitors the +5 volt status. Upon detection of an out-of-tolerance condition, the board is reset. This action is critically important in order to detect brownout or power fail conditions. The reset circuit also ensures that the power is nominal before executing a power-on reset.

**Battery** - An optional off-board battery supplies the EPX-855-G board with standby power for the real time clock and CMOS setup RAM. The power supervisory circuit senses the off-board voltage and automatically switches to internal power when it drops below normal.

The board will operate without a battery since there is an EEPROM on board to store the CMOS set up data. However, current time and date information would not be maintained when the main +5V power is not present.

**PC/104 Expansion** - The EPX-855-G has both a 16-bit PC/104 and a 32-bit PC/104-*Plus* interface and connector. PC/104 is electrically equivalent to the ISA bus and PC/104-*Plus* is the PCI bus for I/O functions requiring higher data transfer speeds.

The EPX-855-G provides a common computer core from which engineers can add off-the-shelf or user-designed, application-specific PC/104 and PC/104-*Plus* modules. PC/104 modules are self-stacking and plug together in a "piggy back" configuration to serve as a mezzanine expansion bus. PC/104 modules are very compact, measuring only 3.6 x 3.8 inches, and are offered by WinSystems and a number of third party companies worldwide. Module functions include communications specialty serial I/O, digital I/O, analog I/O, GPS, GSM or CDMA cellular modems, ZigBee, SCSI, etc. More PC/104 information including white papers, products, and specifications are on our web site, http://pc104.winsystems.com/products/pc104/index.html.

**Replacement for WinSystems SBCs** - This board is designed to be an upgrade and high-performance replacement for current users of WinSystems' EPX-C3 and EPX-GX500. For questions about any differences in the boards or new software drivers that may be needed, please contact the factory.

**Engineering Support** - WinSystems provides free technical telephone support to assist customers with system integration of our SBCs and I/O modules.

**Long life availability** - This board is based on chipsets from Intel's long life embedded roadmap to ensure longevity of the core technology.

# **SOFTWARE**

The EPX-855-G is an x86-compatible SBC. It is designed to run both 16-bit and 32-bit x86 instruction set software and is compatible with Microsoft's Windows XP embedded operating systems as well as the applications that run on them. It also supports Linux and many other PC-compatible x86 operating systems such as QNX, VxWorks, DOS or other real-time executives that require a PC hardware environment.

Software Developers Kit - WinSystems offers Developer Kits to provide the necessary hardware, software and cables to begin program development with the EPX-855 board. The kit's packaging permits easy access to the SBC, PC/104 modules, and peripherals during program development. These kits consists of a DVD-ROM drive, floppy disk drive, hard disk drive and power supply mounted in a black, light-weight, aluminum enclosure. Also included is the selected operating system, cables, and the PCM-POST, PC/104 module, for debugging support.

Board Support Packages for select operating systems are also available with our Developer Kits. Currently Windows XP embedded, Linux and DOS/Sockets OS are supported. Additional support may be offered for other operating systems. Please contact a <a href="WinSystems">WinSystems</a>' Applications Engineer if you need support for an OS that is not listed above.

In general, Developer Kits provide a specific OS "sample image" that is preloaded on a Flash disk and is ready to run right out of the box. Most kits also include Quick Start Guides, documentation designed to lead you through the process of recreating the embedded OS sample image that was provided in the kit. These Quick Start Guides provide a wealth of valuable, time-saving information that will help you quickly overcome a large portion of the learning curve if you are new to a particular operating system. Please visit the <u>Developer Section</u> of our website for more details about each individual Developer Kit

## **SPECIFICATIONS**

### **Electrical**

EPX-855 CPU Clock: 1GHz w/Intel Celeron ZCD or

1.8GHz with Intel Pentium® M

PC/104 Interface: 16-bit, non-stackthrough

PC/104-*Plus* Interface: 32-bit PCI, non-stackthrough Ethernet: 10/100/1000 Mbits/sec with RJ-45 connector, 10/100 Mbits/sec via the

Hirose connector

USB 2.0: Four ports with overcurrent protection Serial Interface: Four serial channels, all have RS-232 levels;

two channels also support RS-422/485

802.11: User installed miniPCI card supported Audio: AC97 with MIC, six speakers and Line In LPT Interface: Bidirectional LPT with ECP/EPP Parallel Interface: 24 I/O lines, TTL compatible

EIDE Interface: Supports two drives

Floppy Disk Interface: Supports two 1.44M drives Keyboard: Standard PS/2 or USB interface Mouse: Standard PS/2 or USB interface

Vcc = +5V ±5% at 2.1A typical @ 1GHz +5V ±5% at 4.25A typical @ 1.8GHz Pentium M		ORDERING INFORMATION	
•		EPX-855-G-1.8G-1	1.8GHz Pentium®M EPIC
System Memory Addressing:	Up to 1Gbyte 200-pin SDRAM available separately and installed	EPX-855-G-1G-0	Single Board Computer with fan 1GHz Intel ZC Dothan EPIC Single Board Computer
	by user.	EPX-855-G-1G-1	1GHz Intel ZC Dothan EPIC Single Board Computer with fan
Solid State Disk			
CompactFlash:	Socket supports Type I or Type II	<b>Developer Kits</b>	
	CompactFlash device	DV-S-347-L30	Linux (2.6 kernel) Developer Kit, includes software, hardware,
Mechanical			enclosure, and cables
Dimensions:	4.5" x 6.5" (115 mm x 165 mm)	DV-S-347-XP-2007	Windows XPe Developer Kit,
Jumpers: Weight:	2 mm square post compatible 9.99 oz (99 g)		includes software, hardware, enclosure, and cables
I/O Connectors		System Memory - DDR PC2700 SDRAM	
COM 1-4, LPT,		SODIMM200-G-27-256	256Mbyte RoHS device
KYBD, Mouse		SODIMM200-G-27-512	512Mbyte RoHS device
	ET: 80-pin, 2 mm	SODIMM200-G-27-1G	1028Mbyte RoHS device
COM3 and 4: 20-pin on 0.100" grid			
Floppy Disk and			ial CompactFlash Memory
	e: 80-pin, 2 mm	CFLASH-G-128M-I	128MB CFlash RoHS device
CompactFlash:	50-pin, 2 mm	CFLASH-G-256M-I	256MB CFlash RoHS device
Parallel I/O:	50-pin on 0.100" grid	CFLASH-G-512M-I	512MB CFlash RoHS device
CRT:	14-pin on 2 mm grid	CFLASH-G-1024-I	1GB CFlash RoHS device
LVDS:	Two, 20-pin on 2 mm grid	CFLASH-G-2048-I	2GB CFlash RoHS device
Ethernet:	RJ-45 (Gigabit 10/100/1000 only)	CFLASH-G-4096-I	4GB CFlash RoHS device
PC/104 Bus:	64-pin 0.100" socket	CFLASH-G-8192-I	8GB CFlash RoHS device
40-pin 0.100" socket PC/104- <i>Plus</i> Bus: 120-pin (4 x 30; 2 mm) stackthrough		Larger CompactFlash capacities to be released	
with shrouded header		Cables	
USB:	Two, 8-pin 2 mm	CBL-115-4	Opto rack interface cable, 4 ft.
Audio:	18-pin, 2 mm	CBL-113-4 CBL-270-G-2-1.5	Audio access cable
Main Power:	10-pin in-line Molex	CBL-SET-347-G-1	EPX-855-G cable set includes:
Fan Power:	3-pin in-line Molex	CBL-234-G-1-1.375	CRT adapter cable, 14-pin
	3-pin in-line Molex	CBL 25+ G 1 1.575	ribbon to 15-pin D-sub
Backlight Power: 4-pin in-line Molex		CBL-251-G-1-1.5	Multi I/O cable breakout
8	r	CBL-252-G-1-1.5	Dual IDE and floppy cable
Operating Temperature:		CBL-265-G-2-1.5	Power cable (unterminated)
EPX-855-G-1.8G-1: -40°C to +70°C (with fan)		CBL-270-G-3-1.5	Stereo audio access cable
EPX-855-G-1G-0: -40°C to +70°C (without fan)		CBL-275-G-2-0.667	Dual USB to 8-pin, 2 mm cable
EPX-855-G-1G-1: -40°C to +85°C (with fan)		BAT-LTC-E-36-16-1	External 3.6V, 1650 mAh
Non-condensing relative humidity: 5% to 95%			battery with plug-in connector
WinSystems reserv	ves the right to make changes to products	<b>Optional Batteries</b>	
and/or documentation without further notification.		BAT-LTC-E-36-16-1	External 3.6V, 1650 mAh battery with plug-in connector
Product names of other companies may be trademarks of their respective companies.		BAT-LTC-E-36-27-1	External 3.6V, 2700 mAh



respective companies.

battery with plug-in connector