WinSystems®
EMBEDDED COMPUTERS

Panel PC
AM TFT Panel PC with Optional Touch Screen

FEATURES

- Compact 10.4" AM TFT Flat Panel Display
- Thin profile, small size
- Touch Screen available
- User configurable to individual specifications
- Free technical and configuration support
- Multiple mounting options
- 5x86-133 or Pentium® PC-compatible with on-board Ethernet LAN and PC/104 expansion capability
- Rugged and reliable
- Long term product support
- Operating temperature: 0ºC to +50ºC
- Development Systems available

The Panel PC is a compact display subsystem that includes a flat panel display, Pentium or 5x86 PC-compatible SBC, and optional touch screen integrated into a open-frame enclosure less than 3.7 inches thick.

It is offered with or without a front panel bezel for easy mounting in a wide range of OEM applications. The Panel PC is perfect for networked applications since it is shipped with a Ethernet connection and optional PC/104 expandable modem.

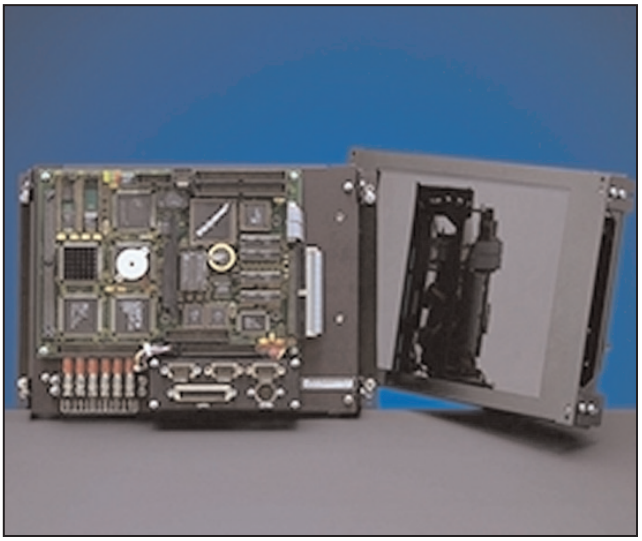
The combination of full PC functionality and industrial-grade construction makes the unit ideal for industrial automation and control applications with tight system integration and minimal space requirements.

The Panel PC supports operating systems such as Windows CE/NT/95/98, DOS, and Linux plus real time kernels compatible with the x86 architecture.

FUNCTIONAL CAPABILITY

Flat Panel Display - A high-luminance, wide viewing angle, color TFT is the foundation of the Panel PC. It has a 10.4-inch diagonal (26.4 cm) screen that contains 640 x 480 pixels which can display 262,144 colors simultaneously.

This flat panel display is ideal for factory automation use because of its high luminance 250 cd/m² (nits) and wide viewing angle of 50º up, 35º down, and 50º both left and right. A wide view angle permits easy panel placement with maximum operator viewing flexibility. Also, the contrast ratio is 300:1 thus ensuring color fidelity and superior gray scaling.



The backlight is located on the backside of the LCD and consists of two cold cathode fluorescent lamps.

Touch Screen - The Panel PC features an optional quick-response, resistive touch screen for keyboardless operation manufactured by Elo Touchsystems. These type of touchscreens have been operationally tested by the manufacturer to over 35 million touches in one location, making them ideal for heavy-usage environments. It is durable since it is coated with an enhanced, scratch-resistant hardcoat.

Resistive touchscreens allow all kinds of touch input devices to activate the screen, including fingers, fingernails, styluses, and gloved hands all the while maintaining superb tactile feel.

Resistive touchscreens are used in more applications than any other touch technology including hand-held computers, PDAs, industrial equipment, point-of-sale equipment, medical equipment, office automation equipment and consumer electronics.

The Elo panel is an accurate, linear glass design that makes it inherently stable. Elo's patented AccuTouch five-wire resistive touchscreens have unmatched accuracy, staying linear without relying on lookup table and curve fitting corrections. The initial setup should last the life of the product, because only a two-point video alignment is required to normalize the touchscreen and video coordinate systems.

Single Board Computer (SBC) - WinSystems' offers a Pentium (EBC-TXPlus) or a 586-based (LBC-586Plus) SBC as the PC-compatible host computer for the Panel PC. Based on PC/AT architecture, both support standard operating systems, real-time executives, utilities, and drivers such as Linux, Lynx, Windows CE, Windows 98, Windows NT, and EmbeddedNT, ROM-DOS, QNX and VxWorks.

The two SBCs are very similar in features and I/O mix. The key differences are the processors, speeds, video options, USB, 100 Mbps Ethernet support, and PC/104-*Plus* expansion capability.

The Pentium SBC features include:

- Intel Pentium 166MMX or AMD K6™-IIIE+ 400 MHz Socket 7 CPU
- 32 to 256MB of system SDRAM supported in 168-pin DIMM
- Up to 288MB bootable Flash Disk support
- High resolution, video controller supports
  - Color panels supported with up to 24-bits/pixel
  - Supports resolutions up to 1280 x 1024
  - Simultaneous CRT and LCD operation
  - PCI local bus for high speed operation
- 10/100 Mbps Ethernet and USB supported
- 4 RS232 serial ports with FIFO, COM1 & COM2 with optional RS-422/485/J1708 support
- Bi-directional LPT port supports EPP/ECP
- 48 bi-directional TTL digital I/O lines with 24 capable of event sense interrupt generation
- PC/104 and PC/104-*Plus* expansion connectors

The 5x86 SBC features include:

- 133 MHz AMD5x86 with 256KB of L2 cache and up to 64MB DRAM
- High-resolution, SVGA video controller supports:
  - PCI local bus for high speed operation
  - Supports simultaneous CRT and LCD operation
- IEEE 802.3, 10Mbps NE2000 compatible Ethernet controller with integrated AUI and 10BASE-T I/F
- 4 RS-232 serial ports with FIFOs; COM1 & COM2 with optional onboard RS-422/485/J1708 support
- Bidirectional LPT port that supports EPP/ECP
- 48 bidirectional TTL digital I/O lines with 24 lines capable of event sense interrupt generation
- Two solid state disk sockets support onboard bootable DIP Flash, SRAM or (EP)ROM
- Up to 288MB Flash Disk with Flash File System
- 16-Bit PC/104 expansion connector

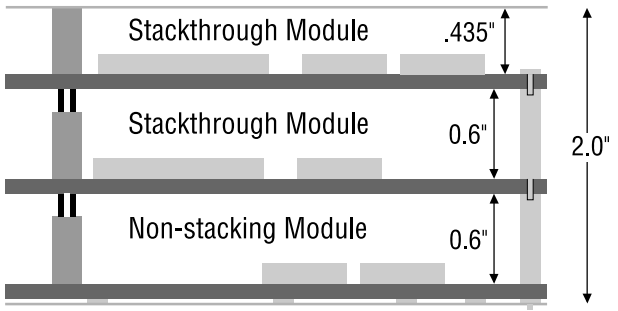
Both support the standard AT peripherals that include LPT, IDE, FDC, KYBD, etc. They also support four COM channels, 48-digital I/O lines, solid state disk, and PC/104 expansion.

Since the Panel PC is an embedded computer, it does not require a rotational hard disk. The operating system and application can be placed in the Flash SSD. Storage capacity is from 8 to 288 MBytes. It includes TrueFFS, an embedded Flash File System. The file system provides hard disk read/write compatibility, automatic bad block management, and wear leveling.

Four RS-232 COM ports with FIFOs are onboard with COM 1 & 2 able to support RS-422/485 or J1708 signalling levels. COM2 is also used by the touchscreen controller.

A bidirectional LPT port supports EPP/ECP for printers or other parallel I/O devices. Additionally, a highly versatile, 48-line digital I/O is included. Each I/O line is individually programmable for input, output, or output with read-back. Each output line is latched and has an open collector driver capable of sinking 12 mA of current. Twenty-four of the lines can automatically monitor for edge transitions, latch them and then interrupt the CPU notifying it of a change-of-state status.

PC/104 Expansion Capability - Both SBCs support a 16-bit PC/104 interface connector so that a designer can add off-the-shelf or user-designed, application specific PC/104 modules. PC/104 modules are self-stacking and plug together in a “piggy back” configuration to serve as a mezzanine expansion bus.

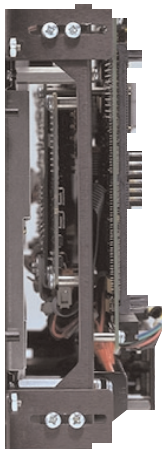


PC/104 Module Stack

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 serial I/O, digital I/O, PCMCIA, GPS, Modem, speech/sound, SCSI-2, among other functions.

The Pentium-based SBC, EBC-TXPlus, also supports PC/104-*Plus*. PC/104-*Plus* is the PCI bus for the I/O functions requiring higher data transfer speeds

Chassis - The chassis plate is made of heavy duty aluminum alloy that is black anodized. It is designed to rigidly hold both the flat panel in place and to prevent any twisting or excessive stress on the glass surface.



The single board computer is mounted directly annd the display on the same plate. The rigid plate serves as a base to hold the SBC, I/O connector plate, power terminal strip, backlight controller and optional touch screen controller. This assembly design allows the unit to be slim with a z-axis depth of less than 3.33 inches.

Mounting - The Panel PC is designed to be rear mounted to a panel or placed in an instrument as a system component. Four through holes and captured #6-32 press fit nuts are in the chassis for mounting flexibility. The cut out dimensions for the panel display area is approximately 8.4 x 6.3 inches.

Bezel - An optional bezel is available that mounts on the front of an enclosure. It frames and secures the Panel PC chassis assembly. It is made from aluminum covered with black texture paint. Four concealed head, #6-32 studs are used as the fastner system.

Rear Mount Version of Panel PC

I/O Connectors - The back of the Panel PC is designed for easy access and connection of I/O and power cables. A double row screw terminal strip is provided for the power source. A separate panel terminates the LPT, keyboard, and COM channels for easy hook up to industry standard cables. The COM channels are 9-pin male "D" sub connectors with locking screw nuts. The LPT1 is a 25-pin female D connector with locking screw nuts. The keyboard sub connector is a standard DIN.

The SBC has additional connectors that are not brought out to the I/O plate. These include the 48-lines of digital I/O, floppy disk controller, IDE controller and the Ethernet RJ45 interface. Call your WinSystems' factory application engineer with any questions.

Power - Power is accessed via a terminal block located on the back of the Panel PC. This permits convenient and solid attachment of the unit to the power source without the worry of disconnection.

Most applications require only +5 volts and +12 volts. A -12 volt input is provided, but is usually used by PC/104 and PC/104-*Plus* expansion boards.

Power Supply - If an external supply is needed, WinSystems offers the PS-130W-1, PS-80W-1, and PS-50W-1. Housed in a black anodized aluminum case, they are a 130-, 80- or 50-Watt universal switchers that will accept input voltages from 85 VAC to 264 VAC and will provide output voltages of +5 volts, +12 volts, and -12 volts.

PS-130W-1 Power Supply

SOFTWARE, TOOLS & SUPPORT

Operating Systems - Since the SBC is software compatible with the PC-AT, it will run the latest versions of DOS, Windows CE/NT/98, and Linux. It will support other operating systems such as QNX and real-time executives that require a "PC-AT" hardware environment. The Panel PC does not ship with an operating system installed in its standard configuration from the factory.

Networking - Either SBC supports remote booting with an onboard EPROM socket for use as a diskless network computer. Their PC-AT compatibility support numerous network OS and kernels.

Software Developers Kit (SDK) - WinSystems offers the SDK2 to provide the necessary enclosure, floppy and hard disk drives, CD-ROM, PCM-POST module, and cables needed to begin program development with the Panel PC.

Technical Support and Custom Configurations - WinSystems offers free support to speed your initial design cycle into production. Our engineers are dedicated to answering your questions. If you don't see a

product or feature listed in this data sheet that you require, please contact us. We may have a product in development, know of another source, or perhaps can modify existing product to serve your needs.

SPECIFICATIONS

Display

Size:	10.4" (26.4cm) diagonal
Display type:	Active Matrix color TFT LCD
Pixel format:	640 x 480 (VGA)
Dot Size	0.33 x 0.33 mm
Vertical scan rate:	60Hz
Colors:	262,144
Brightness (without touchscreen):	250 cd/m^2
Contrast ratio:	300:1
Horizontal viewing angle:	±50º
Vertical viewing angle:	+50º/-35º
Backlight:	2 cold cathode fluorescent
Touchscreen:	Analog resistive (optional)

EBC-TXPlus Single Board Computer

CPU Clock Speed:	400 or 166 MHz
Memory:	Expandable up to 168-pin SDRAM
Cache:	512KB L2 installed
Solid State Disk:	One, 32-pin memory sockets support up to 288MB DiskOnChip® (M-Systems Flash)
Ethernet:	10/100 Fast Ethernet with RJ-45 interface
Serial Interface:	4 Serial channels with RS-232 levels. RS-422/485 optional using the CK-75176 kit on COM1 and COM2 only
LPT Interface:	Bidirectional LPT with ECP/EPP
Parallel Interface:	48 I/O lines, TTL compatible Output: I_{OH} = -4mA at 3 volts I_{OL} = 12mA at 0.6 volts Input: 10k nominal pull-up
EIDE interface:	Supports 2 drives
Floppy Disk Interface:	BIOS supports one or two 360K/720K/1.2M/1.44M drives
PC/104 Interface:	16-bit connector
PC/104-*Plus* Interface:	120-pin, 32-bit connector
USB:	Version 1.0 compliant

Power Required for the EBC-TXPlus-166-32M

Input Voltage:	+5V @ 2.25 Amp typ. +12V @ 1.0 Amp typ.

Power Required for the EBC-TXPlus-400-32M

Input Voltage:	+5V @ 3.25 Amp typ. +12V @ 1.0 Amp typ.

LBC-586Plus Single Board Computer

CPU Clock Speed:	133 MHz
Memory:	Expandable up to 64MB of 72-pin SIMM Fast Page or EDO DRAM, 0MB supplied
Cache:	256KB L2 installed
Solid State Disk:	Two, 32-pin memory sockets support up to 1MB SRAM or Atmel Flash, 2MB of EPROM or up to 288MB DiskOnChip® (M-Systems Flash)
Ethernet:	Novel NE-2000 compatible, AUI or 10BASE-T RJ-45 interface
Serial Interface:	4 Serial channels with RS-232 levels. RS-422/485 optional using the CK-75176 kit on COM1 and COM2 only
LPT Interface:	Bidirectional LPT with ECP/EPP
Parallel Interface:	48 I/O lines, TTL compatible Output: I_{OH} = -4mA at 3 volts I_{OL} = 12mA at 0.6 volts Input: 10k nominal pull-up
EIDE interface:	Supports 2 drives
Floppy Disk Interface:	BIOS supports one or two 360K/720K/1.2M/1.44M drives
PC/104 Interface:	16-bit connector

Power Required for the LBC-586Plus-133-32M

Input Voltage:	+5V @ 2.0 Amp typ. +12V @ 0.5 Amp typ.

Connectors: on the Mounting Plate

COM 1, 3, & 4:	9-pin male D-sub
LPT:	25-pin female D
Keyboard:	DIN
Power:	Dual terminal block

Connectors: on the Single Board Computers

Floppy Disk Interface:	34-pin 0.100" grid
IDE Interface:	40-pin 0.100" grid
Parallel I/O:	26-pin 0.100" grid
Twisted Pair:	RJ-45
PC/104 Bus:	64-pin 0.100" socket 40-pin 0.100" socket

Environmental

With no moving parts, the Panel PC can be used in environments where other units cannot. The LBC-586Plus and EBC-EXPlus-166 Pentium SBC does not require a cooling fan for the CPU or other circuitry. They have an operational temperature range from 0 to +50º Celsius. Wider temperature ranges are possible, please contact the factory.

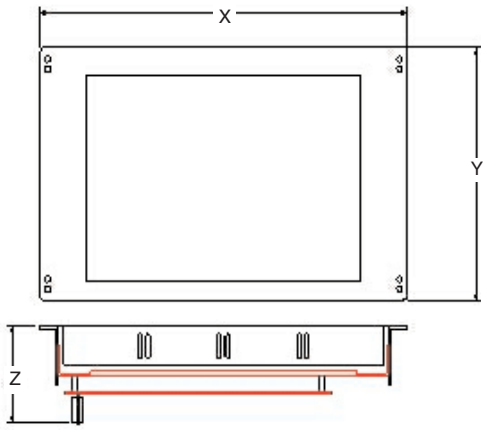
Operational Temperature: 0C to +50ºC

ORDERING INFORMATION

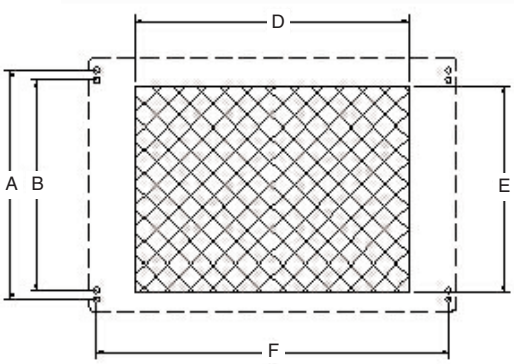
PPC-586-10T-T	5x86 Panel PC with touch panel
PPC-586-10T	5x86 Panel PC without touch panel
SIMM72-xxM	72-pin EDO SIMM, where xx = 8, 16, 32, or 64MB
PPC-EBC-166-10T-T	166 MHz Pentium Panel PC with touch panel
PPC-EBC-400-10T-T	400 MHz Pentium Panel PC with touch panel
DIMM168-xxM	168-pin DIMM DRAM, where xx = 32, 64, 128, or 256MB
FLASH-MD2200-Dxx	32-pin DiskOnChip®, where xx = 8 to 288MB memory storage
CBL-115-4	4 foot, Opto rack interface cable
CBL-207-1	10-pin ribbon to 15-pin CRT D-sub adapter cable
CK-75176-2	RS-422/485 chip kit for 1 channel
PS-130W-1	130 Watt switching power supply
PS-80W-1	80 Watt switching power supply
PS-50W-1	50 Watt switching power supply

DIMENSIONAL DRAWINGS

CHASSIS



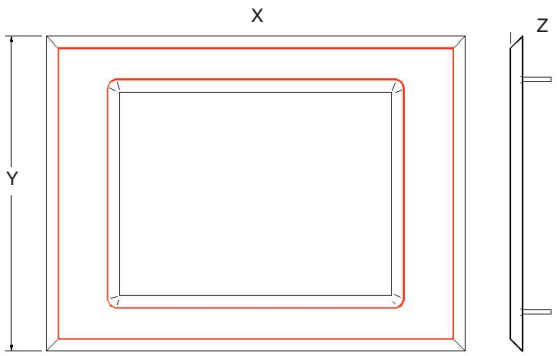
OVERALL: X=11.3" Y=7.8" Z=3.7"



CUTOUT DIMENSIONS:
D=8.397" E=6.303"

MOUNTING HOLES:
A=7.047" 0.156" DIA. HOLE, 4 PLACES,
B=6.447" #6-32 THREADED HOLE, 4 PLACES
F=10.786

BEZEL



OVERALL: X=12.96" Y=9.75" Z=0.375"
OPENING: D=8.397" E=6.303"

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