

# **OPERATIONS MANUAL**

## **PPC2-G-12**

### **(12" Touchscreen Panel PC)**

**For Models:**

**PPC2-G-12-0-312-1G\***  
**PPC2-G-12-1-312-1G\*\***  
**PPC2-G-12-0-327-1G\***  
**PPC2-G-12-1-327-1G\*\***  
**PPC2-G-12-0-327-1.8G\***  
**PPC2-G-12-1-327-1.8G\*\***

\* - HDD not included

\*\* - HDD included

**NOTE:** *This manual has been designed and created for use as part of WinSystems Technical Manuals CD and/or the WinSystems website. If this manual or any portion of the manual is downloaded, copied or emailed, the links to additional information (i.e. software, cable drawings) may be inoperable.*

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## REVISION HISTORY

**P/N**  
**G500-5000-050A (PPC2-12.1")**

| <b>ECO Number</b> | <b>Date Code</b> | <b>Rev Level</b>              |
|-------------------|------------------|-------------------------------|
| ORIGINATED        | 050107           | Preliminary                   |
|                   | 080107           | A (Specification updates)     |
|                   | 080430           | A.1 (Information update)      |
|                   | 080626           | A.2 (Documentation update)    |
|                   | 090401           | A.3 (12" Manual updates)      |
|                   | 091028           | A.4 (Documentation OS update) |

## **Introduction**

This manual is intended to provide the necessary information regarding installation and configuration setup of the PPC2 12" Touchscreen Panel PC. WinSystems maintains a Technical Support Group to help answer questions regarding usage of the Panel PC. For answers to questions not adequately addressed in this manual, contact Technical Support at (817) 274-7553, Monday through Friday, between 8 AM and 5 PM Central Standard Time (CST).

## **General Information**

### **Panel PC Series Versions**

There are several models of the Panel PC available in the PPC2 product family. All are CompactFlash-ready. The various models are shown below.

- PPC2-G-12-0-312-1G (HDD not included)
- PPC2-G-12-1-312-1G (40 GB HDD included)
- PPC2-G-12-0-327-1G (HDD not included)
- PPC2-G-12-1-327-1G (40 GB HDD included)
- PPC2-G-12-0-327-1.8G (HDD not included)
- PPC2-G-12-1-327-1.8G (40 GB HDD included)

### **Packing List**

Verify the following materials are contained in your shipment:

- **12.1" Series Panel PC (see list above for specific model information)**
- **Operations Manual (on Technical CD), included only with initial order. Also available at <http://www.winsystems.com>.**

**Note:** No cables or accessories are included unless purchased separately. WinSystems® offers Accessory Kits, which include Memory, CompactFlash and Cable Sets, available to be purchased separately.

Refer to the invoice detail that shipped with this product for specific information on your shipment.

If any items are damaged or missing from your shipment, contact your WinSystems sales representative.

## Safety Precautions

Please use the following safety precautions when handling the PPC2 Series Panel PC.



Figure 1-1

### Caution

This product is **static sensitive**. Use care when handling to avoid electrostatic discharge.



Figure 1-2

### High Voltage

The Backlight Inverter shipped with this product generates a **high voltage**. **Never touch the inverter directly.**

## **PPC2-G-12 Panel PC Series**

This Human Machine Interface (HMI) is a compact system based on Winsystems single board computer (SBC). Feature sets of the Panel PC vary based on which SBC is used in the specific configuration.

### **PPC2-G-12-0-312-1G**

### **PPC2-G-12-1-312-1G**

The 12.1" PPC2-G-12 Panel PC models listed above are equipped with the EBC-C3PLUS SBC, a VIA Eden® 1 GHz C3 processor-based SBC. The panel PC provides a user interface for operator input and output. These PC-compatible systems come equipped with many standard features, including a 12.1" TFT flat panel display with touchscreen interface. Additional features include two 10/100 Ethernet controllers, four USB ports, up to 512 MB of PC133 SDRAM, video with 3D Now! support, four serial COM channels, 48 digital I/O lines, watchdog timer, as well as many other features.

In addition to supporting many popular operating systems like Linux and Windows XP/XPe, the PPC2-G-12 provides floppy drive support, AC97 audio, AT keyboard and PS/2 mouse support. As a result of the EBC-C3PLUS SBC's fanless processor, the PPC2-G-12 has no moving parts (when not including the hard disk drive), making it more rugged and ensuring low power dissipation. The small design of the PPC2-G-12 makes it a flexible panel PC that can be used in rugged environments and is designed to operate over wide industrial temperature ranges.

### **PPC2-G-12-0-327-1G**

### **PPC2-G-12-1-327-1G**

### **PPC2-G-12-0-327-1.8G**

### **PPC2-G-12-1-327-1.8G**

The 12.1" PPC2-G-12 Panel PC models listed above are based on the EBC-855 SBC, which utilizes either a 1 GHz ZCD™ or 1.8 GHz Pentium M™ Intel® processor. Panel PCs based on the EBC-855 are equipped with a touchscreen interface, support TFT flat panel display sizes in 12.1" (also available in 15") and can come equipped with or without a 40 GB hard drive. Like EBC-C3PLUS-based PPCs, the EBC-855-based PPC includes an Ethernet controller, four USB ports, up to 1028 MB of memory, four serial COM channels, 48 digital I/O lines, a watchdog timer, and many other PC-compatible features.

# **System Specification**

## **Front/Rear View**

Following are the front (Figure 1-3) and rear (Figure 1-4) views of the PPC2-G-12 Panel PC.

**Note:** The rear diagram of the Panel PC may or may not be exact depending on the PPC2 model purchased.



Figure 1-3



**Hard Drive**

**Backlight Inverter**

**Touch panel control board**

**WinSystems SBC**

Figure 1-4

## Panel PC Block Structure

The PPC2-G-12 Panel PC ships without an enclosure. Structurally, the PPC2-G-12 Panel PC is made up of six (6) major components (Figure 1-5):

- (1) Touchscreen Glass
- (2) 12.1" Flat Panel Display
- (3) Single Board Computer (SBC) (\* mounted to rear of chassis)
- (4) Hard Drive Disk (HDD) (\* not included with certain PPC models)
- (5) Touch panel control board
- (6) Backlight Inverter

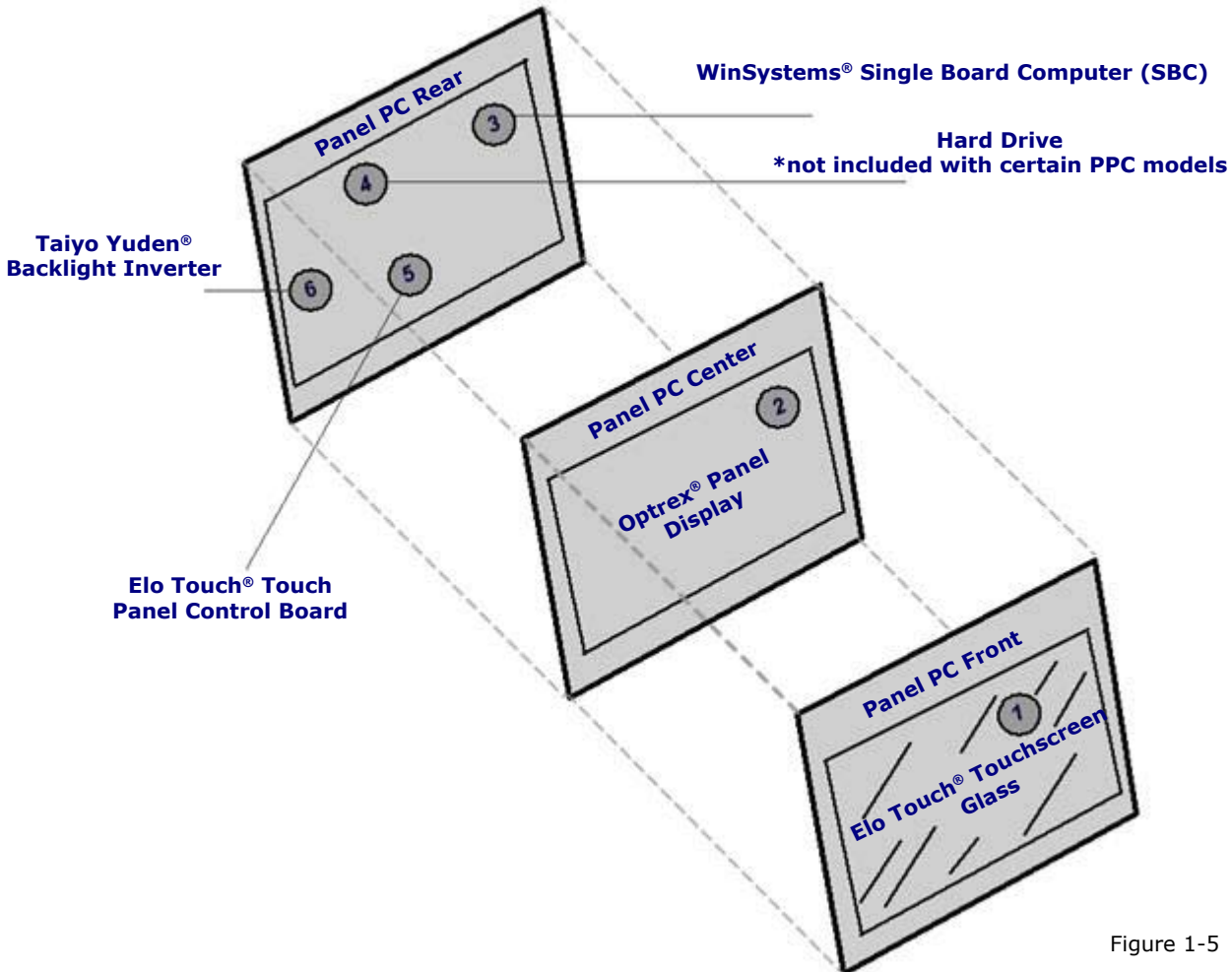


Figure 1-5



## Touchscreen Glass

The PPC2-G-12 Panel PC series touchscreen glass (Elo Part# E011881 or equivalent) utilizes the AccuTouch five-wire resistive technology. Manufactured by Elo TouchSystems®, this touchscreen is made of a stable glass layer, provides drift-free operation and can be sealed against contamination. The primary specifications for the touchscreen are listed below (Table 1-1). For more specification information, visit <http://www.elotouch.com>.

### AccuTouch Five-Wire Resistive Product Specification

| <b>DURABILITY</b>                         |   |
|---|---|
| <b>Expected Life span</b>                 | 35 million touches  |
| <b>Surface Hardness</b>                   | 3H per ASTM D3363   |
| <b>Warranty</b>                           | Touchscreen: 5-year limited warranty  |
| <b>ELECTRICAL</b>                         |   |
| <b>Positional Accuracy</b>                | Standard deviation error is less than 0.080 (2mm)   |
| <b>Resolution</b>                         | Touchpoint density is based on controller resolution of 4096 x 4096   |
| <b>Touch Activation Force</b>             | Typically less than 4 ounces (113 grams)  |
| <b>Controller</b>                         | Board: Serial RS-232 interface and USB<br>Chip: Serial RS-232 and USB   |
| <b>MECHANICAL</b>                         |   |
| <b>Input Method</b>                       | Finger, gloved hand, or stylus activation   |
| <b>OPTICAL</b>                            |   |
| <b>Light Transmission</b>                 | HL Products: 80% ±5% at 550 nm wavelength   |
| <b>ENVIRONMENTAL</b>                      |   |
| <b>Chemical Resistance</b>                | <p><b>Industrial Chemicals:</b></p> <p>Acetone, methylene chlroride, methyl ethyl ketone, isopropyl alcohol, hexane, turpentine, mineral spirits, unleaded gasoline, diesel fuel, motor oil, transmission fluid, antifreeze</p> <p><b>Food-Service Chemicals:</b></p> <p>Vinegar, coffee, tea, grease, cooking oil, salt, plus most commercial cleaners including ammonia-based glass cleaner and laundry detergent</p> |
| <b>Sealability</b>                        | Can be sealed to meet NEMA 4 and 12 and IP 65 standards   |
| <b>Temperature/<br/>Relative Humidity</b> | <p><b>Operating:</b> 90% RH at max 35°C (standard design)<br/>90% RH at max 50°C (enhanced design)</p> <p><b>Storage:</b> 90% RH at max 35°C for 240 hours, noncondensing (standard design)<br/>90% RH at max 50°C for 240 hours, noncondensing (enhanced design)</p>   |

Table 1-1

## Flat Panel Display

The PPC2-G-12 Panel PC is equipped with a flat panel display (Optrex® Part# T-51756D121J-FW-A-AA or equivalent). The Optrex® flat panel display is a TFT-LCD module. The specifications are listed below (Table 1-2). For more information regarding the LCD's specifications, please visit <http://www.optrex.com>.

### Optrex® Flat Panel Display Specification

| SPECIFICATIONS              |  |
|-----------------------------|--|
| <b>Product Category</b>     | TFT Digital                            |
| <b>Size</b>                 | 12.1"                                  |
| <b>Display Format</b>       | 1024 x 768                             |
| <b>Contrast Ratio</b>       | 550:1                                  |
| <b>Luminance</b>            | 320 cd/m <sup>2</sup>                  |
| <b>Backlight</b>            | CCFL, 2-tubes, edge-light, replaceable |
| <b>Electrical Interface</b> | LVDS                                   |
| <b>Viewing Direction</b>    | 6:00                                   |
| <b>Viewing Angle</b>        | -65~65° (H) -75~45° (V)                |
| <b>Temperature</b>          | Operating: -20°C to 70°C               |

Table 1-2

## Single Board Computers (SBC)

The PPC2-G-12 Panel PC uses WinSystems® EBC-C3PLUS and EBC-855 SBCs. The EBC-C3PLUS is based upon the VIA Eden® 1 GHz C3 processor and provides fanless operation. The EBC-855 is based upon the 1 GHz ZCD™ and the 1.8 GHz Pentium M™ Intel® processors.

### PPC2-G-12-X\*-312-1G (X\* - either 0 or 1 depending on model purchased)

For more information regarding the EBC-C3PLUS SBC's specifications, please visit <http://sbc.winsystems.com/products/EBC-C3PLUS.cfm> or review the Technical CD provided with your shipment. The primary specifications for the SBC are listed below (Table 1-3).

### WinSystems® EBC-C3PLUS Single Board Computer (SBC) Product Specification

| SPECIFICATIONS                |   |
|-------------------------------|---|
| <b>CPU</b>                    | VIA Eden® 1 GHz C3 processor  |
| <b>Dimensions</b>             | 5.75" x 8.0" (147 mm x 203 mm)  |
| <b>Ethernet</b>               | Dual 10/100 Mbps Intel PCI Ethernet controllers                         |
| <b>Memory</b>                 | Up to 512 MB of system SDRAM supported                                  |
| <b>Solid State Device</b>     | Support for One CompactFlash Type I or Type II card                     |
| <b>Operating System</b>       | Linux, Windows CE.Net and XPe, plus other x86-compatible RTOS supported |
| <b>EIDE/IDE Interface</b>     | Ultra DMA 33/66/100 EIDE connectors                                     |
| <b>Digital I/O</b>            | 48 TTL Digital I/O lines  |
| <b>Serial Interface</b>       | Four (4) RS-232/422/485   |
| <b>Universal Serial Bus</b>   | Four (4) USB ports  |
| <b>I/O Expansion</b>          | PC/104 and PC/104-Plus expansion available                              |
| <b>Watchdog Timer</b>         | Software/hardware enabled up to 120 seconds                             |
| <b>Keyboard/Mouse</b>         | AT keyboard controller and PS/2 mouse support                           |
| <b>Audio</b>                  | AC97  |
| <b>Floppy Drive Interface</b> | Two (2) floppy drives supported   |
| <b>Power Consumption</b>      | +5V required, 3.3A typical  |

Table 1-3

**PPC2-G-12-X\*-327-1G**  
**PPC2-G-12-X\*-327-1.8G**  
**(X\* - either 0 or 1 depending on model purchased)**

For more information regarding the EBC-855 SBC's specifications, please visit <http://sbc.winsystems.com/products/EBC-855.cfm> or review the Technical CD provided with your shipment. The primary specifications for the SBC are listed below (Table 1-4).

**WinSystems® EBC-855 Single Board Computer (SBC) Product Specification**

| <b>SPECIFICATIONS</b>         |  |
|-------------------------------|--|
| <b>CPU</b>                    | Intel® 1 GHz ZCD™ or 1.8 GHz Pentium M™ processor            |
| <b>Dimensions</b>             | 5.75" x 8.0" (147 mm x 203 mm)                               |
| <b>Ethernet</b>               | 10/100 Mbps Intel PCI Ethernet controller                    |
| <b>Memory</b>                 | Up to 1028 MB of system SDRAM supported                      |
| <b>Solid State Device</b>     | Support for One CompactFlash Type I or Type II card          |
| <b>Operating System</b>       | Linux, Windows XPe, plus other x86-compatible RTOS supported |
| <b>EIDE/IDE Interface</b>     | Ultra DMA 33/66/100 EIDE connectors                          |
| <b>Digital I/O</b>            | 48 TTL Digital I/O lines                                     |
| <b>Serial Interface</b>       | Four (4) RS-232/422/485                                      |
| <b>Universal Serial Bus</b>   | Four (4) USB ports   |
| <b>I/O Expansion</b>          | PC/104 and PC/104-Plus expansion available                   |
| <b>Watchdog Timer</b>         | Software/hardware enabled up to 300 seconds                  |
| <b>Keyboard/Mouse</b>         | AT keyboard controller and PS/2 mouse support                |
| <b>Audio</b>                  | AC97   |
| <b>Floppy Drive Interface</b> | One (1) 3.5" floppy drive supported                          |
| <b>Power Consumption</b>      | +5V required, 2.1A typical                                   |

Table 1-4

**Hard Disk Drive (HDD)**

The PPC2-G-12 Panel PC may ship with a hard drive (HDD) installed depending on the model purchased. The HDD capacity is 40 GB for models containing a hard drive.

## Touchscreen Controller Board

The PPC2-G-12 Panel PC uses the Elo TouchSystems® E271-2210 AccuTouch serial controller (Elo Part# 055165-000) for its touchscreen controller board. The controller board uses the EIA RS-232C serial interface. **Note - Touchscreen controller board is wired to COM2 port on the CPU board.** The specifications for the touchscreen controller board are below (Table 1-5). For more information on this or any other Elo TouchSystems® product used in the PPC2-G-12 Panel PC, visit <http://www.elotouch.com>.

### Elo TouchSystems® AccuTouch Serial Controller Product Specification

| SPECIFICATIONS            |   |
|---------------------------|---|
| <b>Baud Rates</b>         | Up to 19,200 baud   |
| <b>Output formats</b>     | Binary or ASCII   |
| <b>Power Requirements</b> | 5 VDC (+/- 10%):<br>Standby: 0.055A<br>Touchdown (avg.): 0.160A<br>Touchdown (peak): 0.240A |
| <b>Temperature</b>        | Operating: 0° C to 70° C<br>Storage: -25° C to 85° C  |
| <b>Humidity</b>           | 95% RH, noncondensing   |
| <b>Outside Dimensions</b> | 3.30" x 2.10" (84 mm x 53 mm);<br>Maximum height 0.55" (14 mm)                              |
| <b>Communication</b>      | RS-232 bidirectional  |

Table 1-5

## Backlight Inverter

The PPC2-G-12 Panel PC uses the Taiyo Yuden® LCD Backlight Driver (Model# LS720A or equivalent) for its backlight inverter. This dual tube CCFL Inverter is designed to drive backlighting for LCD displays and offers a wide dimming range (20-100%) The specifications for the LCD backlight inverter are below (Table 1-6). For more information on this product used in the PPC2-G-12 Panel PC, visit <http://www.t-yuden.com>.

### Taiyo Yuden® LCD Backlight Driver Product Specification

| PHYSICAL SPECIFICATIONS     |  |
|-----------------------------|--|
| <b>Impact Resistance</b>    | 50G half wave per 2 ms                                     |
| <b>Vibration Resistance</b> | 10-55-10 Hz/min @ 1.5 mm                                   |
| <b>Temperature</b>          | Operating: 0°C to 60° C<br>Storage: -20°C to 85°C/5-95% RH |
| <b>Relative Humidity</b>    | 20% to 90%, noncondensing                                  |
| <b>Dimensions</b>           | .98" x 4.92" x 0.39" (25 mm x 125mm x 10mm)                |

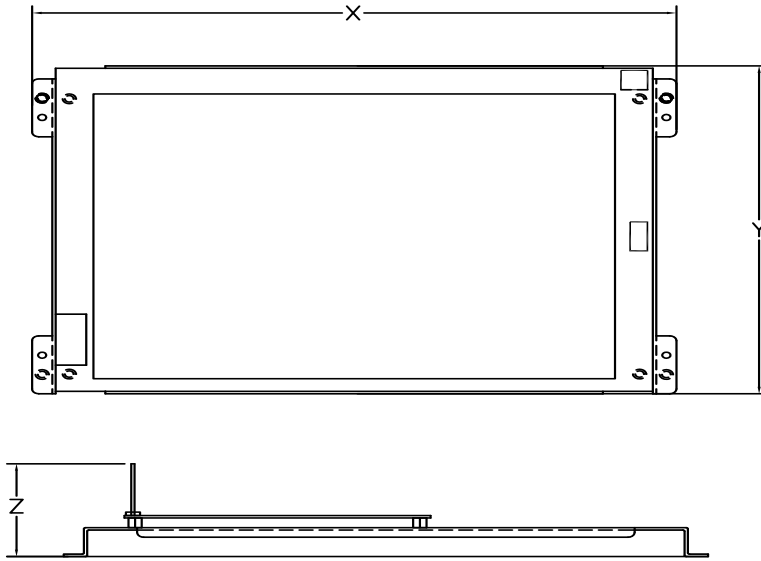
Table 1-6

# PPC2-G-12 Installation

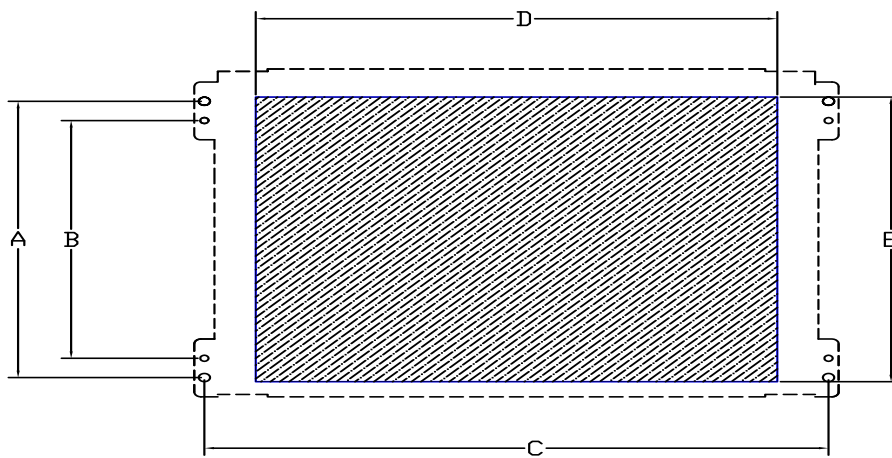
## Panel PC Dimensions

View the following Mechanical Drawing for more information on the appropriate cut-out dimensions to use when installing the PPC2-G-12 Panel PC series. See Figure 1-6.

12.1" Cut-Out Dimensions



OVERALL: X=12.1" Y=8.5" Z=2.4"



MOUNTING HOLES:

A=7.164" #4-40 THREADED HOLE, 4 PLACES

B=6.164" 0.156" DIA. HOLE, 4 PLACES

C=11.729"

CUTOUT DIMENSIONS:

D=9.803" E=7.381"

Figure 1-6

## Powering the Panel PC

Power is supplied to the PPC2-G-12 Panel PC through a power terminal strip, which is comprised of two parts: a **plug** (Part# WECO 302-NSLW-HDS/08) and a **socket** (Part# WECO 302-NFLW-DS/08). For more details on the power terminal strip, visit <http://www.weco.ca>. The power pinout definition is below.

|          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|
| +5V      | +5V      | +12V     | -12V     | GND      | GND      | GND      | RESET    |
| <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> | <b>7</b> | <b>8</b> |
| o        | o        | o        | o        | o        | o        | o        | o        |

## **Software Drivers & Examples**

| <b>Elo Touchsystems® Touchscreen Glass and Control Board</b>   |   |
|--|---|
| (Downloads are based on Operating System.)   |   |
| Windows XP/2000  | <a href="http://www.winsystems.com/software/EloTouchscreen_XP_2000.exe">http://www.winsystems.com/software/EloTouchscreen_XP_2000.exe</a>       |
|  |   |
| Windows XP Embedded  | <a href="http://www.winsystems.com/software/EloTouchscreen_XPe_serial.exe">http://www.winsystems.com/software/EloTouchscreen_XPe_serial.exe</a> |
|  | <a href="http://www.winsystems.com/software/EloTouchscreen_XPe_usb.exe">http://www.winsystems.com/software/EloTouchscreen_XPe_usb.exe</a>       |
|  |   |
| Windows CE   | <a href="http://www.winsystems.com/software/EloTouchscreen_CE6.zip">http://www.winsystems.com/software/EloTouchscreen_CE6.zip</a>               |
|  |   |
| Linux  | <a href="http://www.winsystems.com/software/EloTouchscreen_Linux.zip">http://www.winsystems.com/software/EloTouchscreen_Linux.zip</a>           |
|  |   |
| <b>WinSystems Single Board Computer</b>  |   |
| Visit the section entitled, "Software Drivers & Example" in the links below for the various drivers associated with the appropriate SBC. |   |
| <a href="http://sbc.winsystems.com/products/EBC-C3PLUS.cfm#software">http://sbc.winsystems.com/products/EBC-C3PLUS.cfm#software</a>      |   |
| <a href="http://sbc.winsystems.com/products/EBC-855.cfm#software">http://sbc.winsystems.com/products/EBC-855.cfm#software</a>            |   |



## **Specifications**

### **12.1" PPC Display**

|   |                                 |
|---|---------------------------------|
| <b>Viewable Image Size</b>              | :12.1" diagonal                 |
| <b>Display Type</b>                     | :Active Matrix color LCD TFT    |
| <b>Pixel Format</b>                     | :1024 x 768 (maximum)           |
| <b>Dot Size</b>                         | :0.240 mm (H) x 0.240 mm (V)    |
| <b>Colors</b>                           | :262,144 6-bit digital via LVDS |
| <b>Brightness</b> (without touchscreen) | :320 cd/m2 (nits)               |
| <b>Contrast Ratio</b>                   | :550:1                          |
| <b>Horizontal Viewing Angle</b>         | :±65°                           |
| <b>Vertical Viewing Angle</b>           | :-75°/45°                       |
| <b>Surface Coating</b>                  | :Anti-glare hard coating        |
| <b>Backlight</b>                        | :Two cold cathode fluorescent   |
| <b>Touchscreen</b>                      | :Analog resistive               |

### **Environmental**

|   |                 |
|---|-----------------|
| <b>Operating Temperature</b>            | :-20C° to +70°C |
| <b>Non-condensing relative Humidity</b> | :5% to 95%      |

# Memory Installation

The PPC2-G-12 Panel PC can support up to 512 MB of PC133 SDRAM in a 168-pin DIMM socket. The locations for installing memory and CompactFlash are below (Figure 1-7).

## EBC-C3PLUS

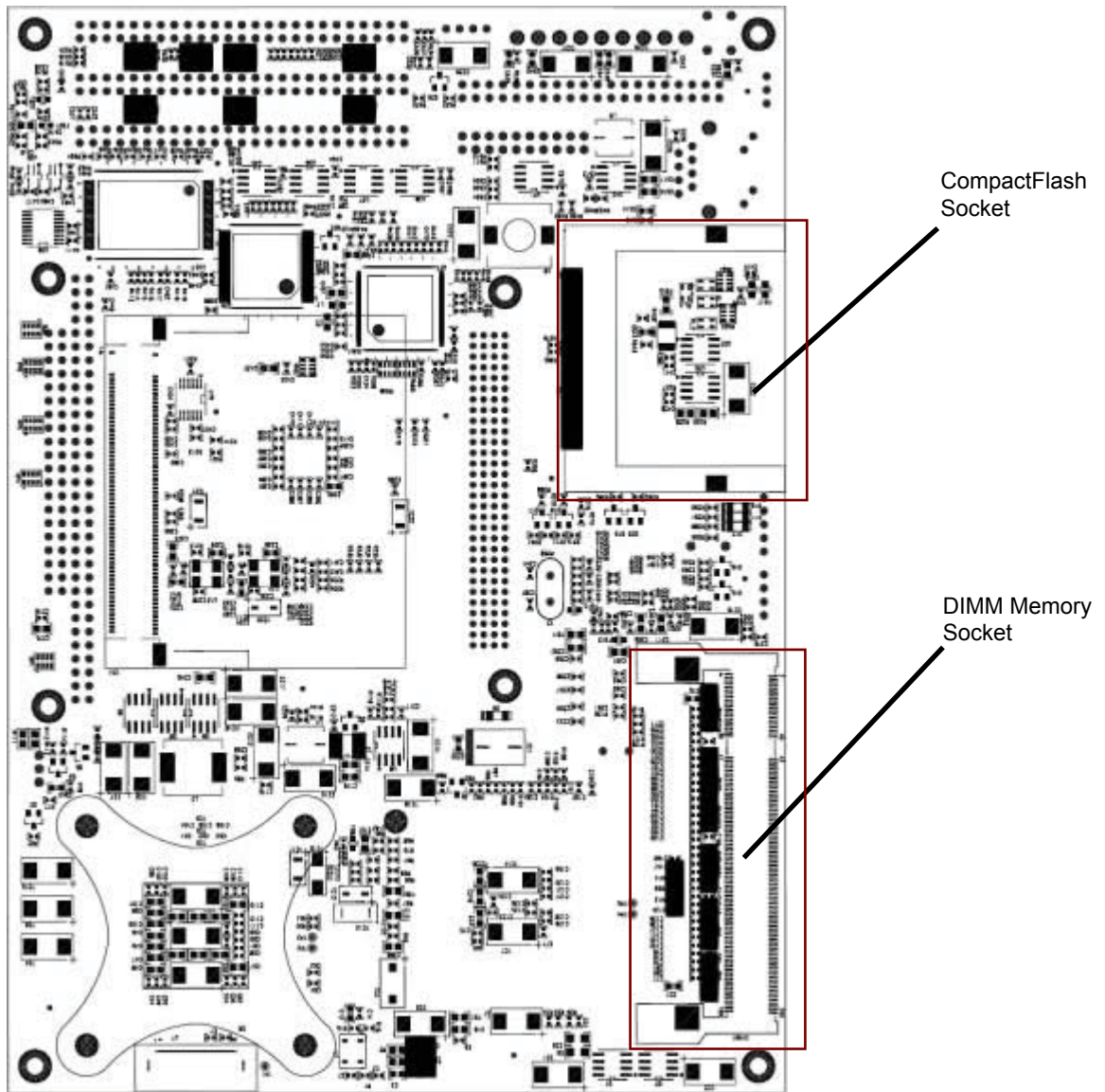


Figure 1-7

The PPC2-G-12 Panel PC can support up to 1028 MB of PC2700 DDR SDRAM in a 200-pin DIMM socket. The locations for installing memory and CompactFlash are below (Figure 1-8).

EBC-855

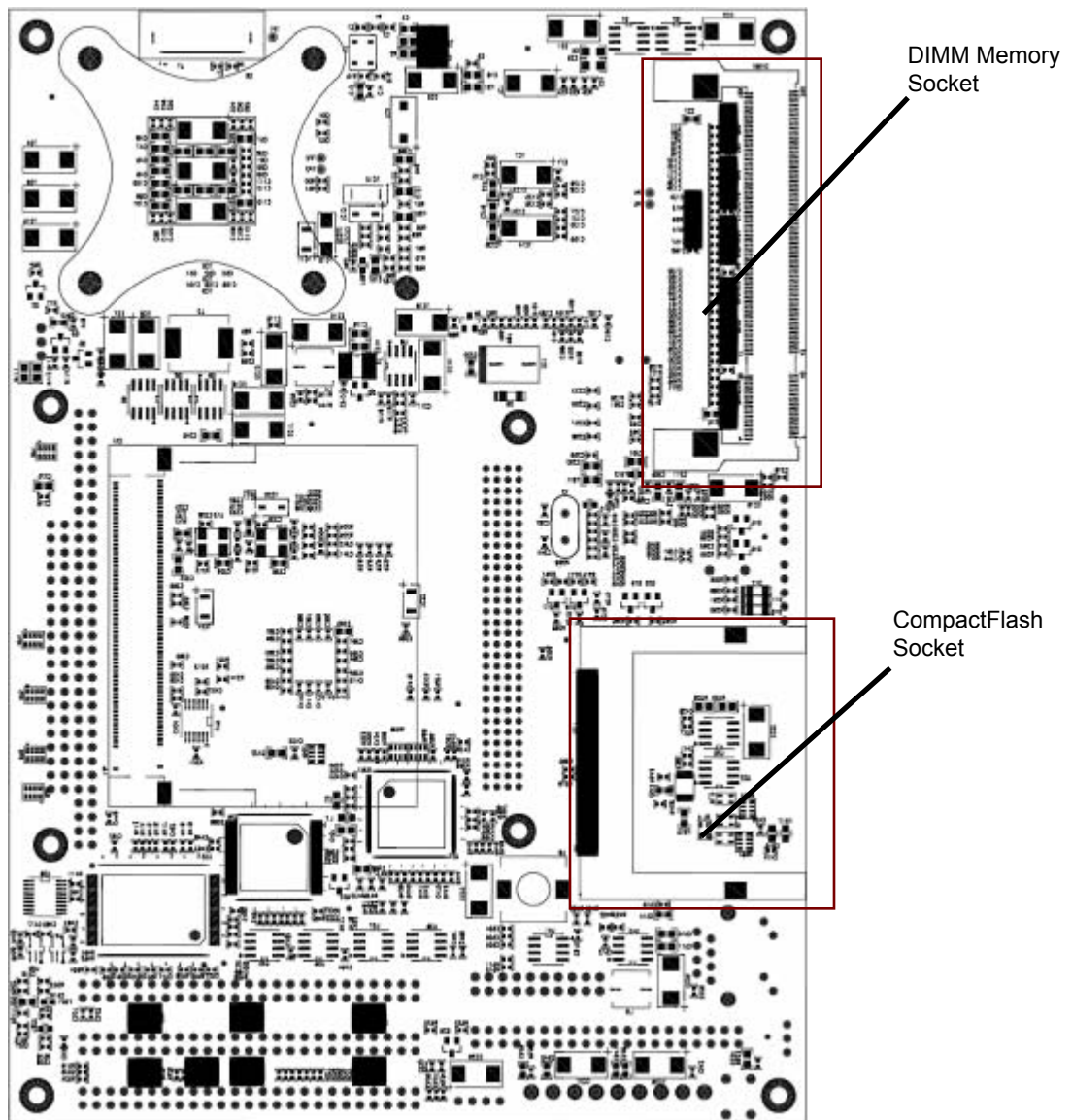


Figure 1-8

## **WARRANTY REPAIR INFORMATION**

(<http://www.winsystems.com/company/warranty.cfm>)

### **WARRANTY**

WinSystems warrants to Customer that for a period of two (2) years from the date of shipment any Products and Software purchased or licensed hereunder which have been developed or manufactured by WinSystems shall be free of any material defects and shall perform substantially in accordance with WinSystems' specifications therefore. With respect to any Products or Software purchased or licensed hereunder which have been developed or manufactured by others, WinSystems shall transfer and assign to Customer any warranty of such manufacturer or developer held by WinSystems, provided that the warranty, if any, may be assigned. Notwithstanding anything herein to the contrary, this warranty granted by WinSystems to the Customer shall be for the sole benefit of the Customer, and may not be assigned, transferred or conveyed to any third party. The sole obligation of WinSystems for any breach of warranty contained herein shall be, at its option, either (i) to repair or replace at its expense any materially defective Products or Software, or (ii) to take back such Products and Software and refund the Customer the purchase price and any license fees paid for the same. Customer shall pay all freight, duty, broker's fees, insurance charges for the return of any Products or Software to WinSystems under this warranty. WinSystems shall pay freight and insurance charges for any repaired or replaced Products or Software thereafter delivered to Customer within the United States. All fees and costs for shipment outside of the United States shall be paid by Customer. The foregoing warranty shall not apply to any Products of Software which have been subject to abuse, misuse, vandalism, accidents, alteration, neglect, unauthorized repair or improper installations.

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