

**OPERATIONS MANUAL**  
**PPC2-G-6.5**  
**(6.5" Touchscreen Panel PC)**

**For Model:**  
**PPC2-G-6.5-359**

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## REVISION HISTORY

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## **Introduction**

This manual is intended to provide the necessary information regarding installation and configuration setup of the PPC2 6.5" 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 model provided for the 6.5" display size is shown below.

- PPC2-G-6.5-359 (HDD not included)

### **Packing List**

Verify the following materials are contained in your shipment:

- **6.5" 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-6.5 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-6.5-359**

The 6.5" PPC2-G-6.5 Panel PC model listed above is equipped with the PPM-LX800-G SBC, an AMD 500 MHz Geode LX800 processor-based SBC. The panel PC provides a user interface for operator input and output. This PC-compatible system comes equipped with many standard features, including a 6.5" TFT flat panel display with touchscreen interface. Additional features include one 10/100 Ethernet controller, two USB ports, 1028 MB of PC133 SDRAM, video with 3D Now! support, four serial COM channels, 16 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-6.5 provides AC97 audio support, AT keyboard and PS/2 mouse support. As a result of the PPM-LX800-G SBC's fanless processor, the PPC2-G-6.5 has no moving parts, making it more rugged and ensuring low power dissipation. The small design of the PPC2-G-6.5 makes it a flexible panel PC that can be used in rugged environments and is designed to operate over wide industrial temperature ranges.

# **System Specification**

## **Front/Rear View**

Following are the front and rear view of the PPC2-G-6.5 Panel PC (Figure 1-3).

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

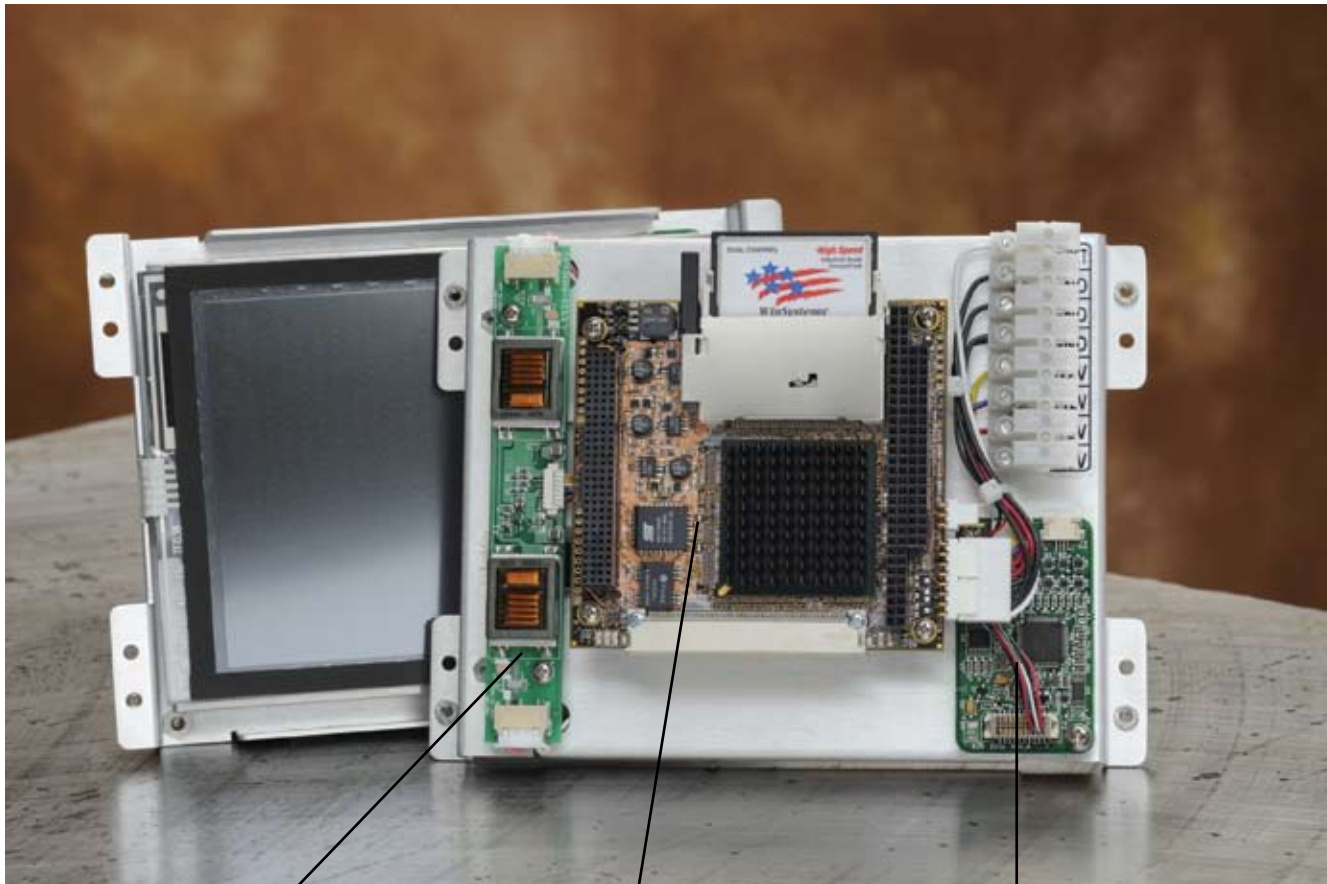


Figure 1-3

**Backlight Inverter**

**WinSystems SBC**

**Touch panel control board**

## Panel PC Block Structure

The PPC2-G-6.5 Panel PC ships without an enclosure. Structurally, the PPC2-G-6.5 Panel PC is made up of five (5) major components (Figure 1-4):

- (1) Touchscreen Glass
- (2) 6.5" Flat Panel Display
- (3) Single Board Computer (SBC) (\* mounted to rear of chassis)
- (4) Touch panel control board
- (5) Backlight Inverter

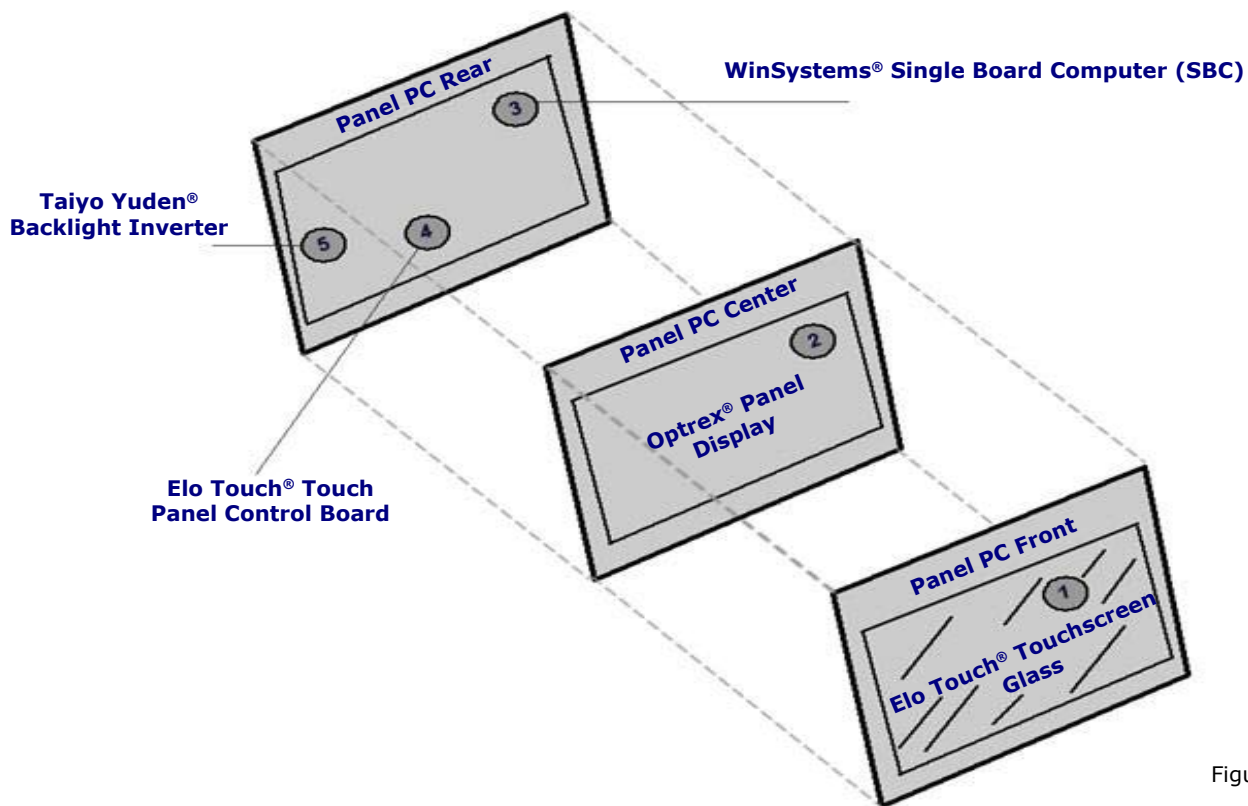


Figure 1-4

## Touchscreen Glass

The PPC2-G-6.5 Panel PC series touchscreen glass (Elo Part# E803003 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 or USB 1,1 Chip: Serial RS-232
<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 Enhanced products: 60% +/-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</b>	<b>Operating:</b> -10°C to 50°C <b>Storage:</b> -40°C to 71°C
<b>Relative Humidity</b>	<b>Operating:</b> 90% RH at max 35°C <b>Storage:</b> 90% RH at max 35°C for 240 hours, noncondensing

Table 1-1

## Flat Panel Display

The PPC2-G-6.5 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>	6.5" diagonal
<b>Display Format</b>	640 x 480
<b>Contrast Ratio</b>	300:1
<b>Luminance</b>	400 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>	-55~55° (H) -60~30° (V)
<b>Temperature</b>	Operating: -25°C to 75°C

Table 1-2

## Single Board Computers (SBC)

The PPC2-G-6.5 Panel PC uses WinSystems® PPM-LX800-G SBC. The PPM-LX800-G is based upon the AMD 500 MHz Geode LX800 processor and provides fanless operation.

### PPC2-G-6.5-359

For more information regarding the PPM-LX800-G SBC's specifications, please visit <http://www.pc104plus.com/products/PPM-LX800-G.cfm> or review the Technical CD provided with your shipment. The primary specifications for the SBC are listed below (Table 1-3).

### WinSystems® PPM-LX800-G Single Board Computer (SBC) Product Specification

SPECIFICATIONS	
<b>CPU</b>	AMD 500 MHz Geode LX800 processor
<b>Dimensions</b>	3.60" x 3.80" (90 mm x 96 mm)
<b>Ethernet</b>	One 10/100 Mbps Intel 82551ER Ethernet controllers
<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 XP, XPe, plus other x86-compatible RTOS supported
<b>EIDE/IDE Interface</b>	Ultra DMA100 EIDE connectors
<b>Digital I/O</b>	16 TTL Digital I/O lines
<b>Serial Interface</b>	Four (4) RS-232/422/485
<b>Universal Serial Bus</b>	Two (2) USB ports
<b>I/O Expansion</b>	PC/104 and PC/104-Plus expansion available
<b>Watchdog Timer</b>	Software/hardware enabled up to 255 minute
<b>Keyboard/Mouse</b>	AT keyboard controller and PS/2 mouse support
<b>Audio</b>	AC97
<b>Power Consumption</b>	+5V required, 1.2A typical

Table 1-3

## Touchscreen Controller Board

The PPC2-G-6.5 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 1-4). For more information on this or any other Elo TouchSystems® product used in the PPC2-G-6.5 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%): Standby: 0.055A Touchdown (avg.): 0.160A Touchdown (peak): 0.240A
<b>Temperature</b>	Operating: 0° C to 70° C 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); Maximum height 0.55" (14 mm)
<b>Communication</b>	RS-232 bidirectional

Table 1-4

## Backlight Inverter

The PPC2-G-6.5 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 1-5). For more information on this product used in the PPC2-G-6.5 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 Storage: -20°C to 80°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)

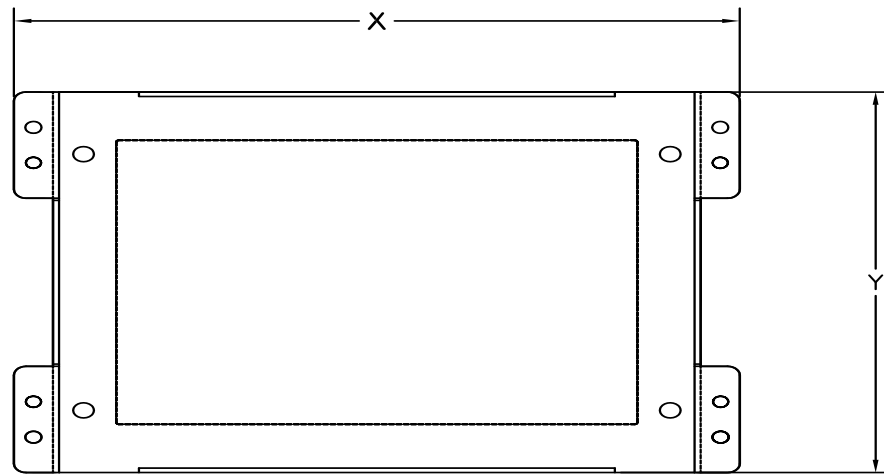
Table 1-5

# PPC2-G-6.5 Installation

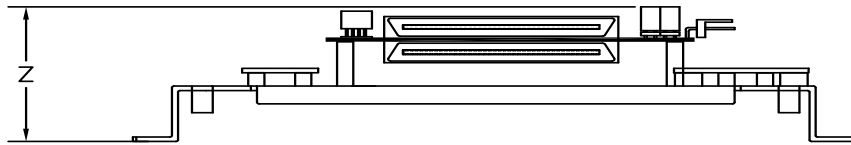
## Panel PC Dimensions

View the following Mechanical Drawing for more information on the appropriate cut-out dimensions to use when installing the PPC2-G-6.5 Panel PC series. See Figure 1-5.

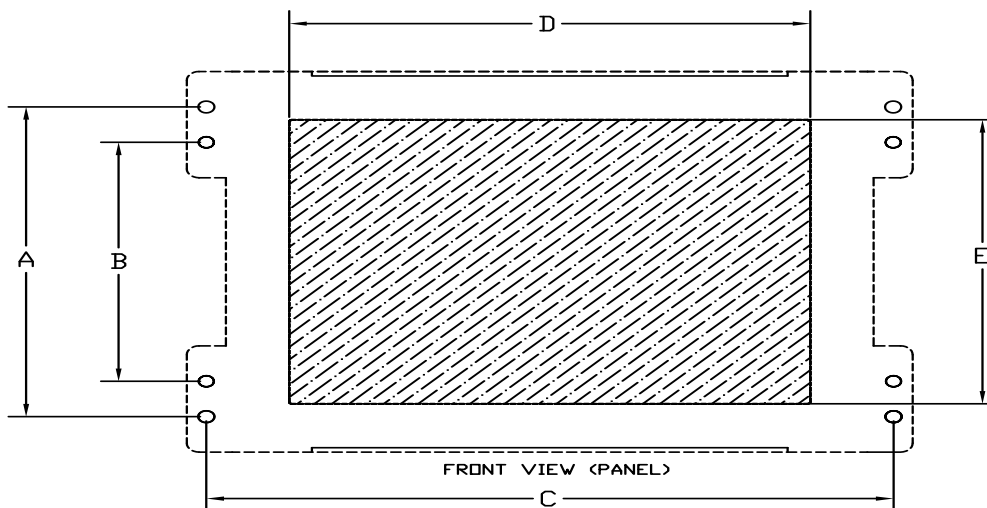
6.5" Cut-Out Dimensions



FRONT VIEW (PANEL)



OVERALL: X=7.429' Y=5.375' Z=1.901'



**MOUNTING HOLES:**

A=4.375" #4-40 THREADED HOLE, 4 PLACES

B=3.375" 0.156" DIA. HOLE, 4 PLACES

C=7.033

**CUTOUT DIMENSIONS:**

D=5.333" E=4.011"

Figure 1-5

## Powering the Panel PC

Power is supplied to the PPC2-G-6.5 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://www.pc104plus.com/products/PPM-LX800-G.cfm#software">http://www.pc104plus.com/products/PPM-LX800-G.cfm#software</a>	

## **Specifications**

### **6.5" PPC Display**

<b>Viewable Image Size</b>	:6.5" diagonal
<b>Display Type</b>	:Active Matrix color LCD TFT
<b>Pixel Format</b>	:640 x 480 (maximum)
<b>Dot Size</b>	:0.069 mm (H) x 0.207 mm (V)
<b>Colors</b>	:262,144 6-bit digital via LVDS
<b>Brightness</b> (without touchscreen)	:400 cd/m2 (nits)
<b>Contrast Ratio</b>	:300:1
<b>Horizontal Viewing Angle</b>	:±55°
<b>Vertical Viewing Angle</b>	:-60°/+30°
<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>	:-25°C to +75°C
<b>Non-condensing relative Humidity</b>	:5% to 95%

## **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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### **WARRANTY SERVICE**

1. To obtain service under this warranty, obtain a return authorization number. In the United States, contact the WinSystems' Service Center for a return authorization number. Outside the United States, contact your local sales agent for a return authorization number.
2. You must send the product postage prepaid and insured. You must enclose the products in an anti-static bag to protect from damage by static electricity. WinSystems is not responsible for damage to the product due to static electricity.