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2500-VP15

15" Fanless Touch Panel Computer

User's Manual

Version 1.2

Declaration of Conformity
FCC Class A
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions : (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

P/N: 4017156100110P 2013.12

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Copyright Notice

Declaration of Conformity

CE Class A

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

About User's Manual

This User's Manual is intended for experienced users and integrators with hardware knowledge of personal computers. If you are not sure about any description in this User's Manual, please consult your vendor before further handling.

Replacing the Lithium Battery

Incorrect replacement of the lithium battery may lead to a risk of explosion. The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer. Do not throw lithium batteries into the trashcan. It must be disposed of in accordance with local regulations concerning special waste.

Technical Support

http://www.controltechnology.com

Warranty

This product is warranted to be in good working order for a period of one year from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster. Also, you may void your warranty when disassembling the unit.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned merchandise can be shipped back. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

Packing List

- 1 x 2500-VP15 Fanless Touch Panel PC
- 1 x DB9-F to DB9-F 1.8m Cable
- 1 x RIBBON-36M to DB25-F + DB9-M Y Cable
- 1 x PS2 KB/MS Y Cable
- 8 x Wall-mount Hook
- 1 x 2.5" HDD Bracket
- 1 x Terminal Block
- 1 x Waterproof O-Ring
- 1 x Driver CD
- 1 x User's Manual

If any of the above items is damaged or missing, please contact your vendor immediately.

Chapter 1

General Information

1.1 Introduction

The 2500-VP15 Fanless Touch Panel Computer is a state-of-the-art HMI (Human Machine Interface). This 15" display operator interface is an x86-based platform with these key features:

- All-In-One Platform
  The CPU, DRAM and even software are integrated to provide a plug-and-play machine.
- Fanless and Modular CPU Board
  By using a low power processor, the system does not have to rely on fans, which often are unreliable, and cause dust to circulate inside the equipment. The modular design facilitates maintenance or possible upgrades on the CPU board.
- Powerful Communication Capability
  The 2500-VP15 provides serial ports, Gigabit Ethernet, USB and PC104 plus expansion slot.
- Windows OS Support
  The 2500-VP15 supports Windows CE, Windows XP, Windows XPe, Windows 7 and Windows 7e. The optional Windows CE operating system specifically for the 2500-VP15 is available for Windows CE application program builders.

1.2 Specifications

System Kernel	
Processor	Intel® Atom™ N270 1.6GHz
VGA	GMA 950 integrated
Chipset	Intel® 945GSE + ICH7M
System Memory	1 x 200-pin DDR2 SO-DIMM Socket up to 2 GB at 400/533MHz
Storage Device	1 x CompactFlash Type II Socket 1 x 2.5" drive bay for SATA HDD/SSD
Ethernet Controller	2 x Realtek RTL8111
Watchdog Timer	Super IO watchdog timer; 2, 5, 10, 15, 30, 40 seconds timeout period
I/O Ports	
Serial Port	2 x full RS-232 ports 921K/bps (COM1: multi I/O port, COM2: DB9) 2 x RS-232/422/485 (COM3,COM4: DB9)
Parallel Port	1 x LPT port (DB25 by Y cable)
Ethernet Port	2 x RJ-45 (10/100/1000Base-T)
USB Port	2 x USB 2.0 port
KB/MS	1 x 6-pin Mini-DIN ports for standard PS/2 keyboard and mouse (with Y cable)
Expansion Bus	1 x 16-bit PC/104 slot
Safety	
FCC	Class A certificated
CE	Class A certificated
Environment	
Operating Temp.	0°C ~ 50°C (-32 ~ 122°F)
Storage Temp.	-20°C ~ 60°C (-4 ~ 140°F)
Operating Humidity	10 ~ 95% RH @ 40°C (non-condensing)
Ingress Protection	Front panel: NEMA4, IP65

Mechanical	
Dimensions	390 x 52.3 x 310 mm (15.35" x 2.06" x 12.2")
Weight	4.4 kg (9.7 lb)
Enclosure	Aluminum (Front Panel), PC + ABS (Bezel)
Power	
Input Voltage	9 ~ 33 VDC (w/ 250V/3.15A overcurrent protection)
Power Consumption	1.28A@24V

1.3 Panel Specifications

Panel	
Display Type	Color TFT LCD
Size (Diagonal)	15"
Resolution	1024 x 768
Luminance	350 cd/m²
Pixel pitch (HxV mm)	0.297 (H) x 0.297 (V)
Touchscreen	
Type	8-wire, Analog resistive
Light Transparency	>80% (typical)

1.4 Rear Panel

There are four serial ports (1xRS-232/Print Port [COM1] & 1 x RS-232 [COM 2] & 2 x 422/485 [COM3/4]), two USB (Host) ports, one 6-pin Mini-DIN PS/2 KB/MS port, two RJ-45 LAN port, and one earphone jack at the rear of 2500-VP15. The arrangement of these ports is shown in Figure 1.1.

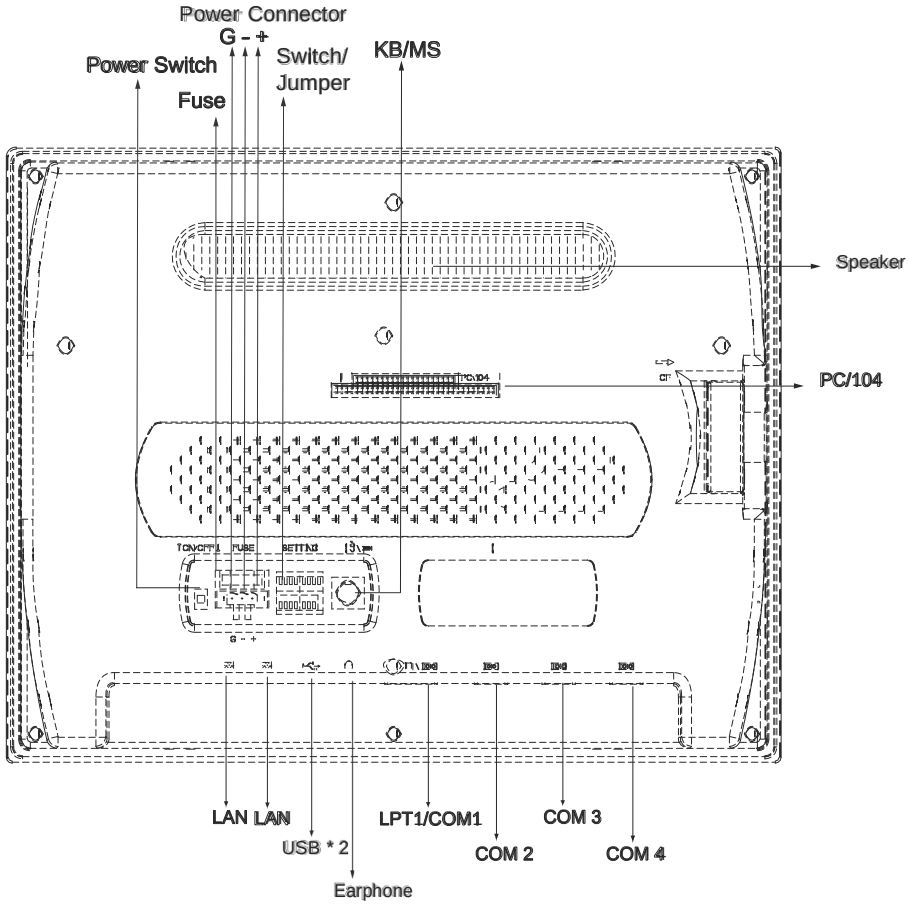


Figure 1.1: Rear Panel

1.5 Mechanical Specifications

- Weight: 4.4kg
- Dimensions: 390.0 x 310.0 x 52.3 mm (WxHxD)
- Cutout: 380.0 x 300.0 mm (suggested)

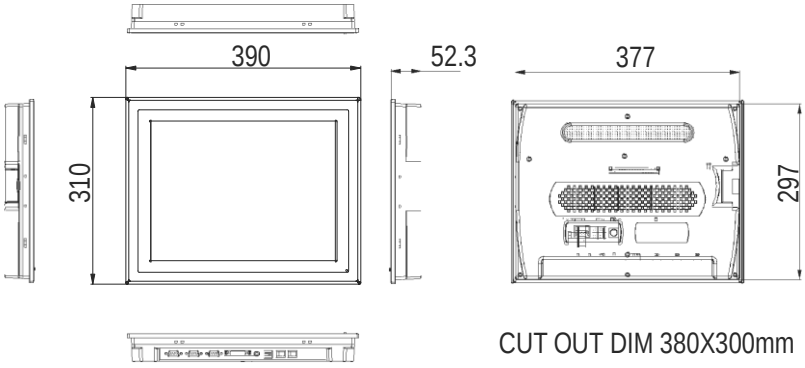


Figure 1.2: Dimensions and Cutout

Chapter 2

System Setup

2.1 Starting Up

Step 1: Install the CompactFlash Card/SSD/HDD containing Windows 7e or XPe operating system.

Warning: *Be sure to turn off the system power before inserting or removing the CompactFlash card.*

Step 2: Connect the terminal block to 9 ~ 33V_{DC} power lines. The power lines can either be from a power adapter or an in-house power source.

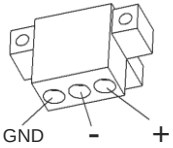
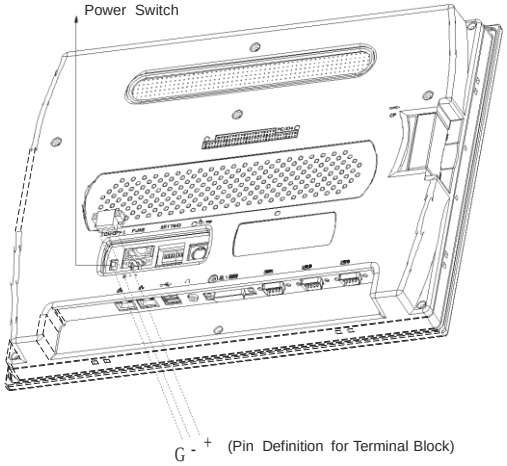


Figure 2.1: Terminal Block Pin Assignment

Step 3: Plug the power lines into the system power receptor and then turn on the power switch.



Warning: *If the power lines are not connected to the correct pins, the system may be damaged when power is turned on.*

Figure 2.2: Connecting Power Lines

Note: *Wait for at least 5 seconds to turn on the computer after power goes off.*

2.2 Assembly & Mounting

2.2.1 SATA Assembly

Step 1: Align the bracket with the holes in the HDD and then fix the HDD to the bracket with screws.

Note: *For SATA assembly, each screw hole is near the left side of the bracket hole.*

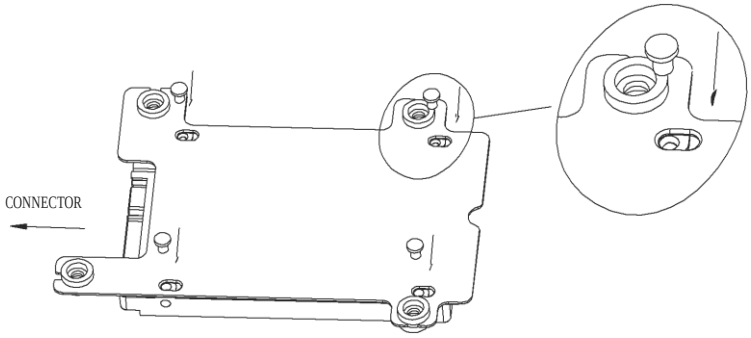


Figure 2.3: Screwing a SATA HDD

Step 2: Unscrew the four screws securing the rear cover and then remove it.
Step 3: Align the SATA HDD bracket holes with the four nuts on the main board to fix the SATA HDD.

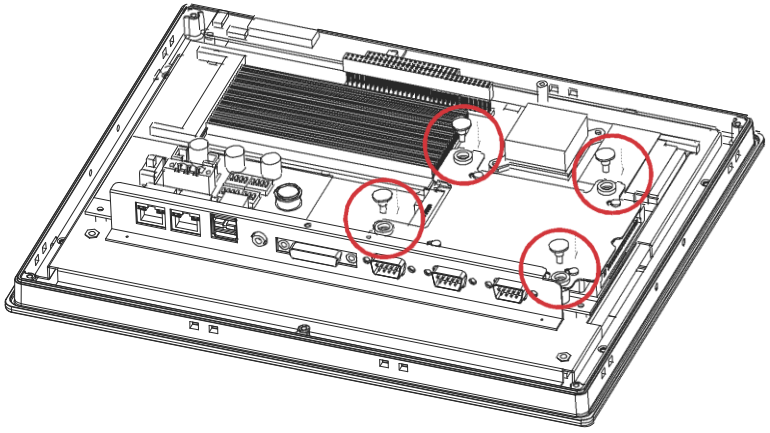


Figure 2.4: Assembling a SATA HDD

2.2.2 CF Card Assembly

Step 1: To install the CF card, unscrew the screw securing the side cover and then remove it.

Warning: *Be sure to turn off the system power before inserting or removing the CompactFlash card.*

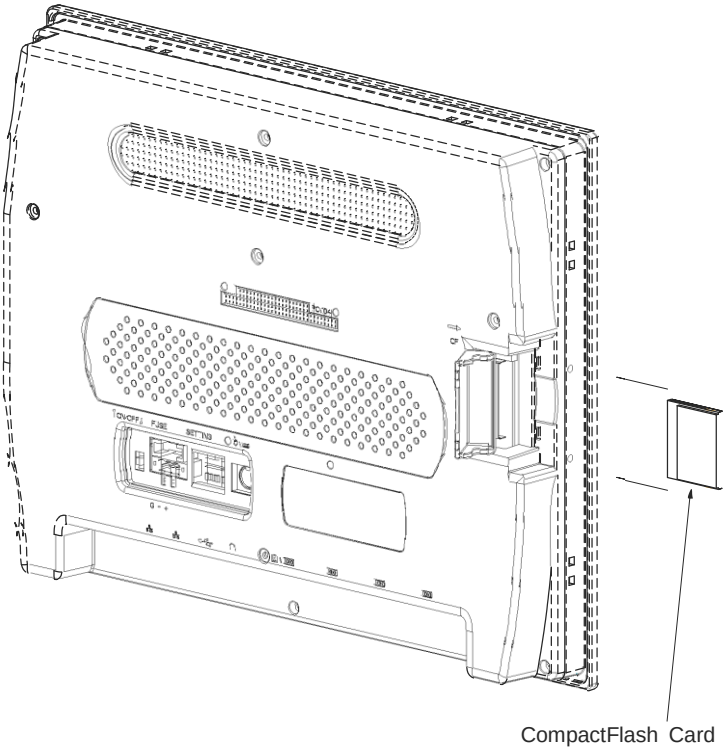


Figure 2.7: Assembling a CF Card

2.2.3 Panel Mounting

Step 1: There is an adhesive waterproof gasket on the front bezel. Make sure the waterproof gasket is in position before installing the 2500-VP15 on the panel opening. (Figure 2.8)

Step 2: Install the 2500-VP15 on the panel opening. (Figure 2.9)

Step 3: Find the eight clampers and eight long screws in the accessory pack. Hook these clampers to the holes around the four sides of the bezel. Insert the screws into every clamper and fasten them. These screws will then push the mounting panel and fix the unit. (Figure 2.10)

Note: *The panel opening thickness is suggested to be less than 5mm (0.197 inches).*

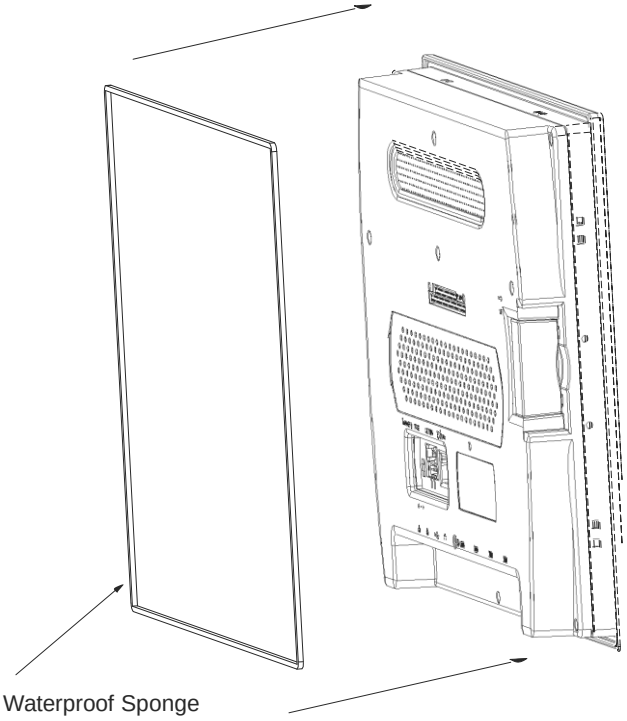


Figure 2.8: Panel Mounting_1

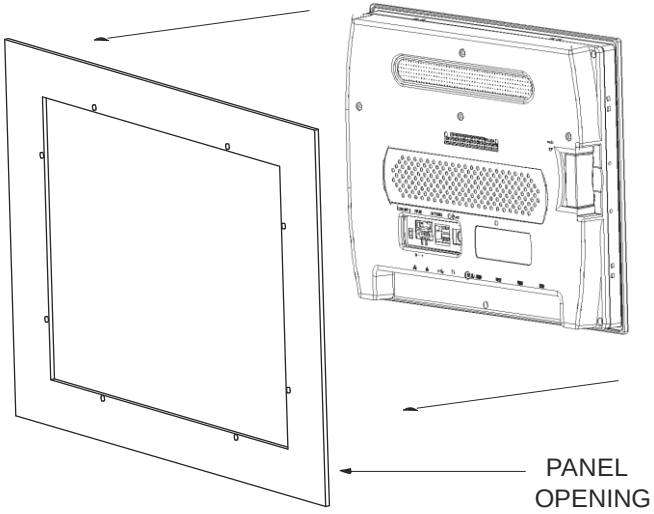


Figure 2.9: Panel Mounting_2

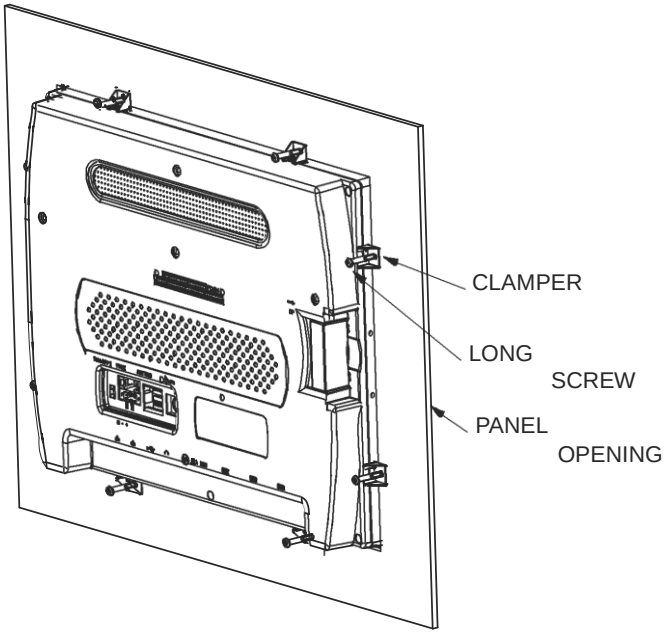
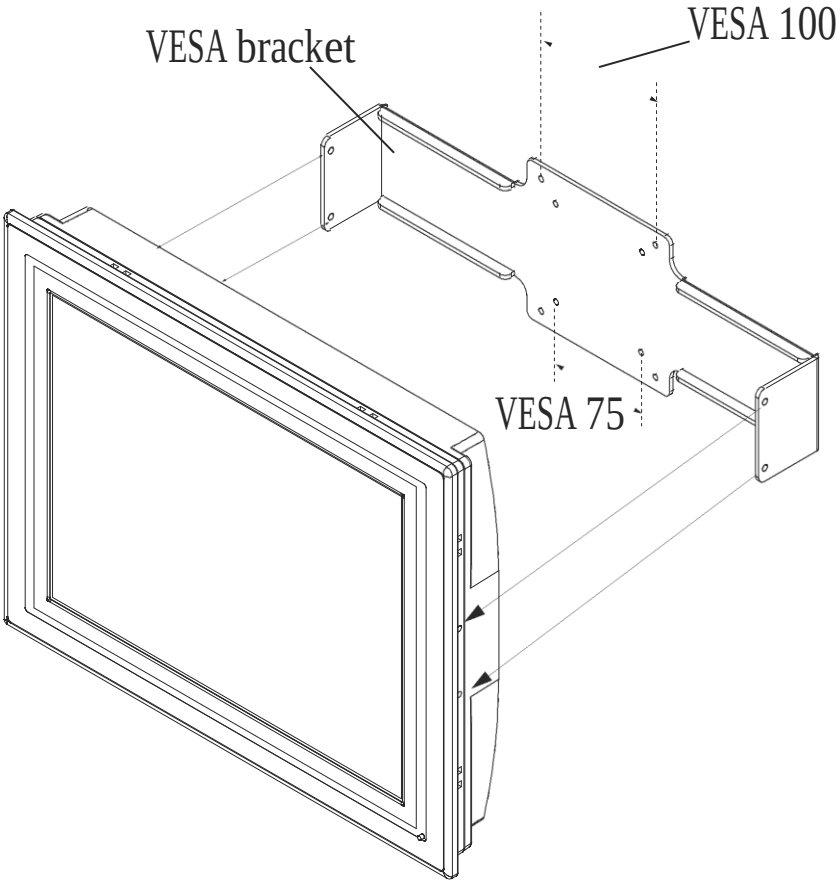


Figure 2.10: Panel Mounting_3

2.2.4 VESA Mounting (Optional)



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Chapter 3

System Engine

3.1 Introduction

The engine of 2500-VP15 is constructed by the combination of one PCBA board. Such a combination makes system customization feasible.

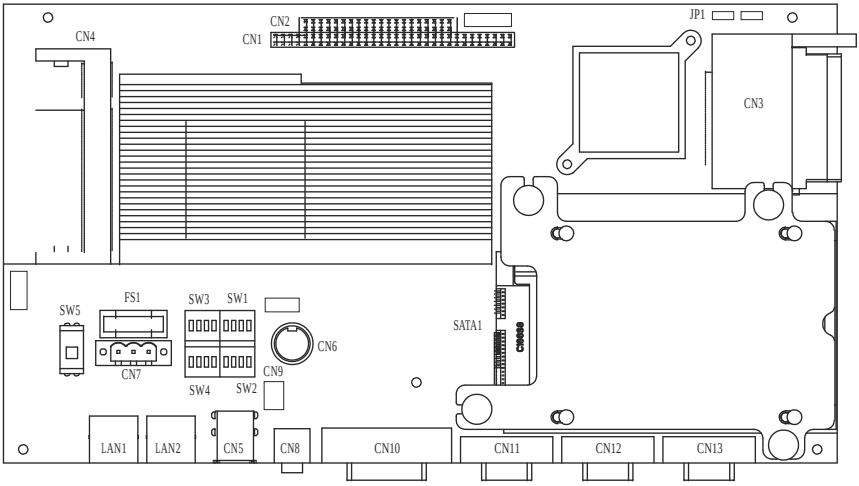

Figure 3.1: 2500-VP15 Main Board Top View

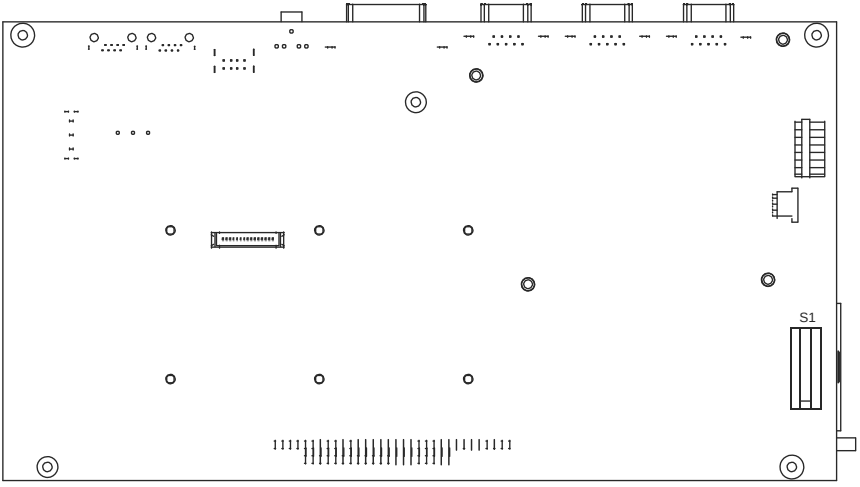

Figure 3.2: 2500-VP15 Main Board Bottom View

2500-VP15 I/O Board Connector/Jumper List

Label	Function
CN1+CN2	PC 104 connector
CN3	CF socket
CN4	DDR2 SO-DIMM Socket
CN5	USB1/USB2 connector
CN6	PS/2 KB/MS
CN7	DC-IN
CN8	EarPhone jack
CN9	Speaker
CN10	COM1 & LPT1 (w/ Y cable connected)
CN11	COM2
CN12	COM3
CN13	COM4
SW1	RS-232/422/485 setting
SW2	RS-232/422/485/CAN setting
SW3	RS-232/422/485/CAN setting
SW4	RS-232/422/485/CAN setting
SW5	Power on/off
LAN1	LAN connector
LAN2	LAN connector
SATA1	2.5" SATA HDD connector
S1	Termination resistors setting for CAN bus
JP1	CF Master/Slave setting
FS1	Fuse

3.2 RS-232/422/485 Mode Selection for COM3

Mode / Switch	RS-232	RS-422	RS-485
SW1			
1-16	ON	OFF	OFF
2-15	ON	OFF	OFF
3-14	ON	OFF	OFF
4-13	ON	OFF	OFF
5-12	ON	OFF	OFF
6-11	ON	OFF	OFF
7-10	ON	OFF	OFF
8-9	ON	OFF	OFF
SW2	**RS-232**	**RS-422**	**RS-485**
1-16	OFF	ON	OFF
2-15	OFF	OFF	ON
3-14	ON	OFF	OFF
SW4	**RS-232**	**RS-422**	**RS-485**
1-16	OFF	ON	ON
2-15	OFF	ON	ON
3-14	OFF	ON	OFF
4-13	OFF	ON	OFF

3.3 RS-232/422/485/CAN Mode Selection for COM4

Mode / Switch	RS-232	RS-422	RS-485	CAN*
SW2				
4-13	OFF	ON	OFF	OFF
5-12	OFF	OFF	ON	OFF
6-11	ON	OFF	OFF	OFF
7-10	OFF	OFF	OFF	ON
8-9	OFF	OFF	OFF	ON
SW3	**RS-232**	**RS-422**	**RS-485**	**CAN***
1-16	ON	OFF	OFF	OFF
2-15	ON	OFF	OFF	OFF
3-14	ON	OFF	OFF	OFF
4-13	ON	OFF	OFF	OFF
5-12	ON	OFF	OFF	OFF
6-11	ON	OFF	OFF	OFF
7-10	ON	OFF	OFF	OFF
8-9	ON	OFF	OFF	OFF
SW4	**RS-232**	**RS-422**	**RS-485**	**CAN***
5-12	OFF	ON	ON	OFF
6-11	OFF	ON	ON	OFF
7-10	OFF	ON	OFF	OFF
8-9	OFF	ON	OFF	OFF

Note: *CAN mode is a reserved function. It's not available on 2500-VP15-E.*

3.4 Connector Pin Assignments

Connector	CN11 (COM 2/3/4)	CN12 ~ CN13 (COM 3/4)	CN12 ~ CN13 (COM 3/4)	CN13 (COM4)
Pin \ Mode	RS-232	RS-422	RS-485	CAN*
1	DCD	422TX-	485D-	
2	RXD	422TX+	485D+	CAN_L
3	TXD	422RX+		
4	DTR	422RX-		
5	GND	GND	GND	GND
6	DSR			
7	RTS			CAN_H
8	CTS			
9	RI			

Note: *CAN mode is a reserved function. It's not available on 2500-VP15-E.*

CN5 (USB1/USB2)			
Pin	Description	Pin	Description
1	+5V	5	+5V
2	USB0-	6	USB1-
3	USB0+	7	USB1+
4	GND	8	GND

CN7 (DC-IN)	
Pin	Description
1	DC-IN
2	GND
3	C-GND

CN6 (PS/2 KB & MS)			
Pin	Description	Pin	Description
1	KDAT	5	KCLK
2	MDAT	6	MCLK
3	GND	7	GND_EARTH
4	KMVCC	8	GND_EARTH

CN9 (SPK)	
Pin	Description
1	OUTA-
2	OUTA+
3	OUTB-
4	OUTB+

CN10 (LPT + COM1)					
Pin	**Description**		**Pin**	**Description**	
1	STB	LPT #1	**19**	C-GND	LPT #19
2	PD0	LPT #2	**20**	C-GND	LPT #20
3	PD1	LPT #3	**21**	C-GND	LPT #21
4	PD2	LPT #4	**22**	C-GND	LPT #22
5	PD3	LPT #5	**23**	C-GND	LPT #23
6	PD4	LPT #6	**24**	C-GND	LPT #24
7	PD5	LPT #7	**25**	C-GND	LPT #25
8	PD6	LPT #8	**26**	C-GND	
9	PD7	LPT #9	**27**	NDCD1A	COM1 #1
10	LPT_ACK#	LPT #10	**28**	NRX1A	COM1 #2
11	LPT_BUSY	LPT #11	**29**	NTX1A	COM1 #3
12	LPT_PE	LPT #12	**30**	NDTR1A	COM1 #4
13	LPT_SLCT	LPT #13	**31**	C-GND	COM1 #5
14	LPT_AFD#	LPT #14	**32**	NDSR1A	COM1 #6
15	LPT_ERR#	LPT #15	**33**	NRTS1A	COM1 #7
16	LPT_INIT#	LPT #16	**34**	NCTS1A	COM1 #8
17	LPT_SLIN#	LPT #17	**35**	NRI1A	COM1 #9
18	C-GND	LPT #18	**36**	C-GND	

JP1 (CF)	
Pin	**Description**
1	(1-2) Master
2	(2-3) Slave

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Chapter 4

Windows 7e with 2500-VP15

4.1 Introduction

The 2500-VP15 operator interface terminal is designed to serve the Windows 7 Embedded (7e) platform. Windows 7e is a compact operating system that occupies less storage space and system resources compared with most operating systems. With its modular nature, it is possible to choose only the functions that are useful for specific applications. This not only reduces the system resources required, but also reduces start-up time. In the field of industrial automation and operator interface terminals, this is an appealing feature because the impact of downtime is minimized. Furthermore, the small storage space required makes it possible to store the operating system on a solid-state disk like CompactFlash.

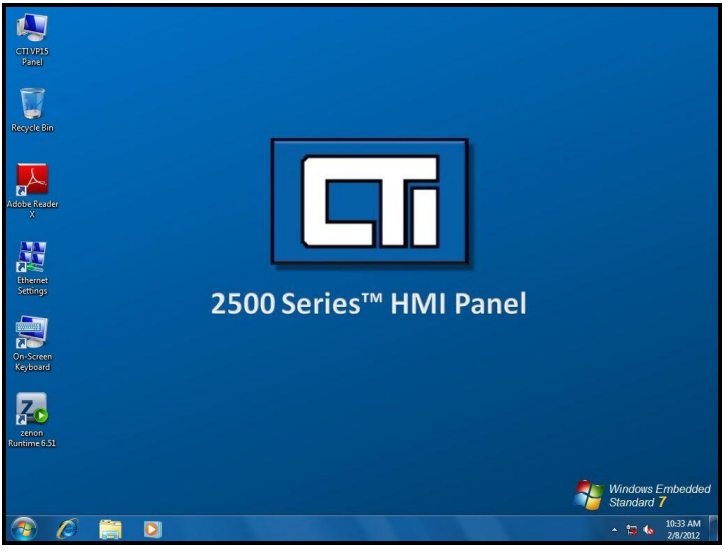


Figure 4.1: Windows 7e on 2500-VP15

4.2 2500-VP15 Utilities

There are several useful utilities built into the standard Windows 7e OS of 2500-VP15:

4.2.1 Software Keyboard

The 2500-VP15 is dedicated to small-sized operator interfaces. It provides one PS/2 port and two USB ports that connect to external keyboards or mice. On the other hand, a software keyboard is available in Windows 7e. Upon boot-up, an On-Screen keyboard icon will appear on the desktop. Double tap this icon to activate this software keyboard.

Figure 4.2: Software Keyboard

4.3 Networking

4.3.1 Networking via Ethernet

This section states how to configure the Ethernet ports of VP series properly. The procedures are listed step by step below.

1. Double tap the Ethernet Settings icon on the Windows Desktop

Figure 4.3: Network and Dial-up Connections

2. The window that shows all available connections will pop up. Double tap ‘Change adapter settings on the left side of the window.

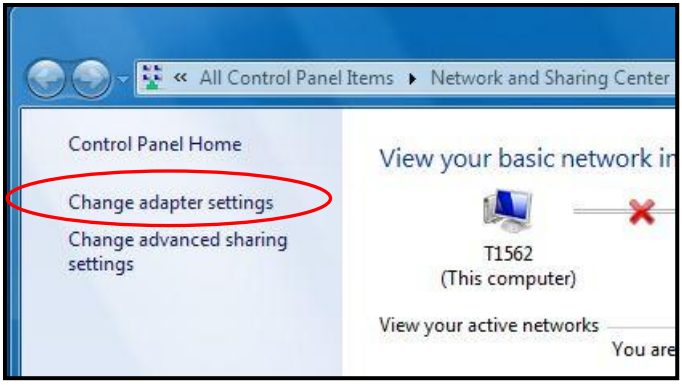


Figure 4.4: Adapter Settings

3. Double tap the port that you wish to configure.
   Ethernet Port 1 is the right-most port from the front side of the panel.
   Ethernet Port 2 is the left-most port from the front side of the panel.

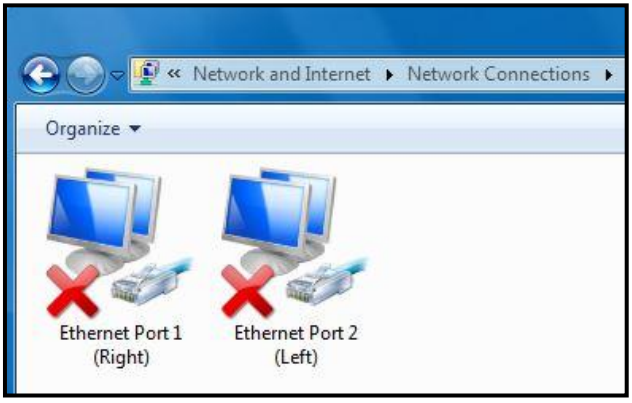


Figure 4.5: Selecting Ethernet Port

4. Select the "Internet Protocol Version 4 (TCP/IPv4)" connection from the list and then tap the 'Properties' button.

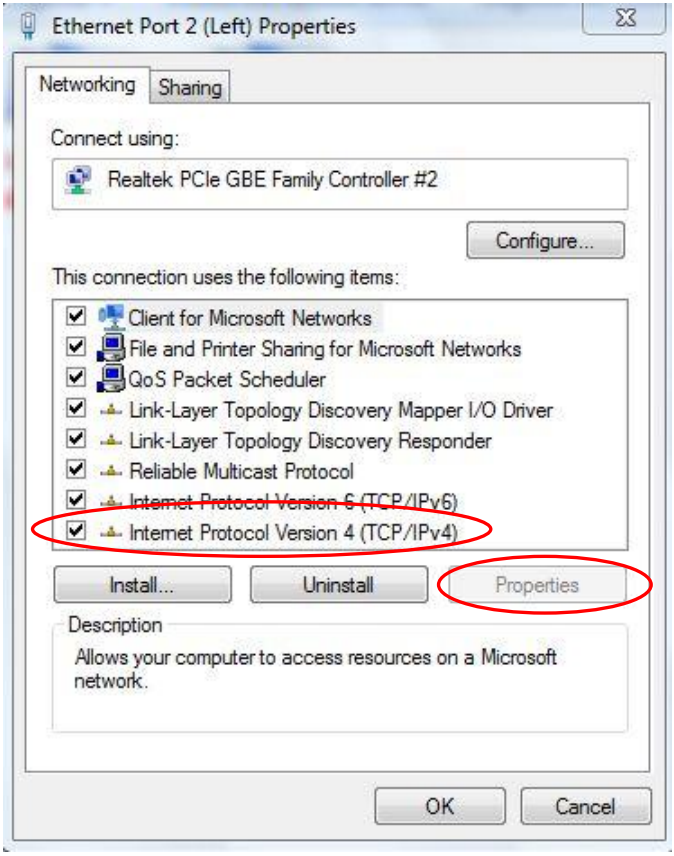


Figure 4.6: Selecting Internet Protocol Settings

5. Enter a static (fixed) IP address for the panel and the appropriate subnet mask that matches the network class to which you will be connecting. An on-screen keyboard is available on the windows desktop.

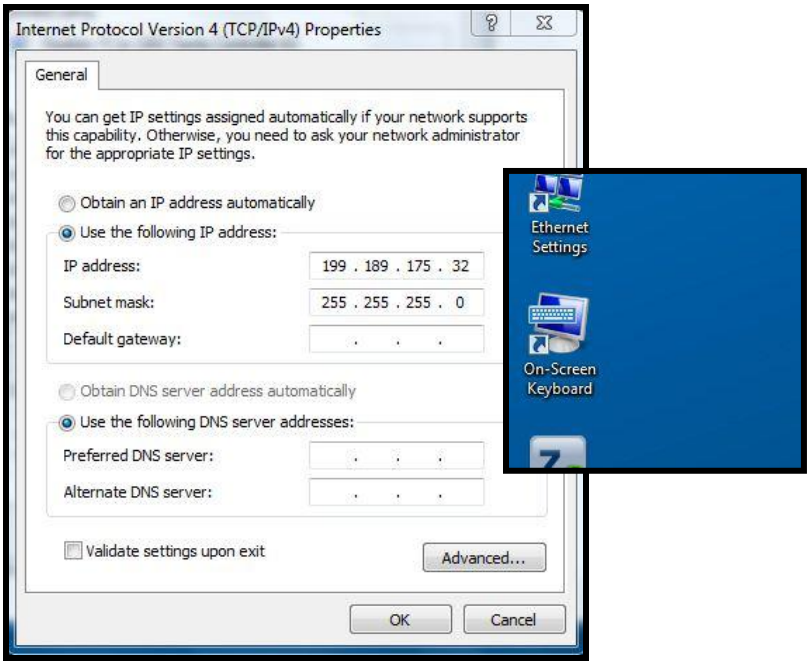


Figure 4.7: Enter IP address

4.3.2 Web Browser

The 2500-VP15 built-in Windows 7e OS includes Microsoft Internet Explorer. It can be used to browse web pages on World Wide Web via LAN or dial-up connection.

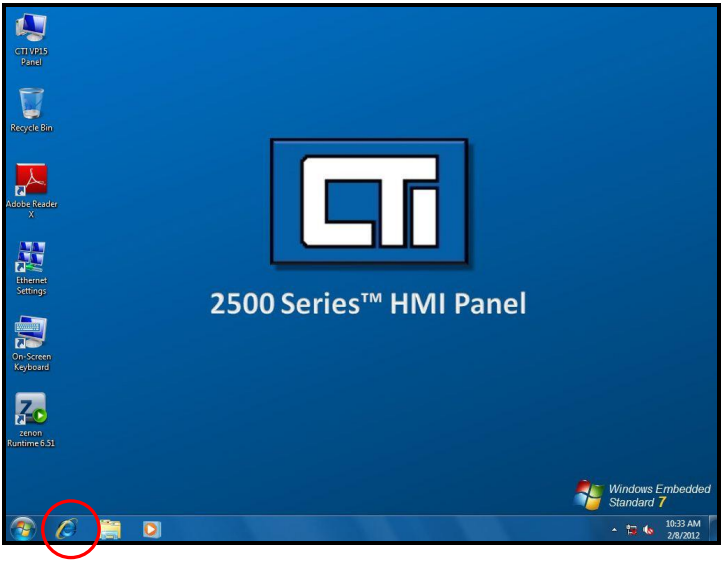
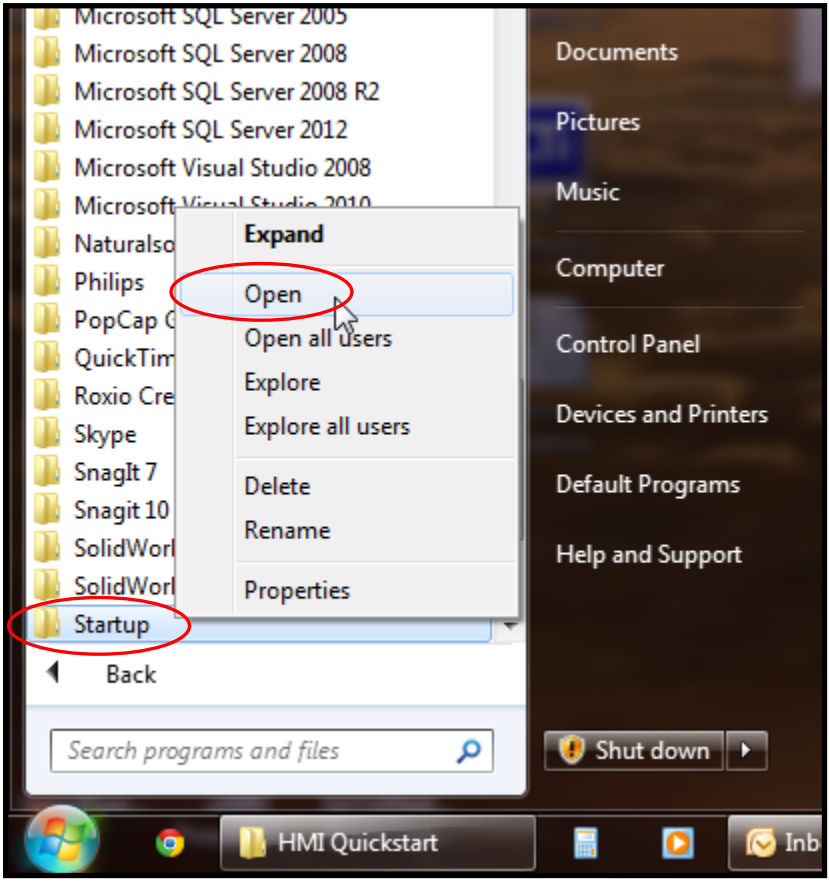


Figure 4.8: Web Browser

4.4 Auto-execute [.exe or .bat] Files while Starting Up

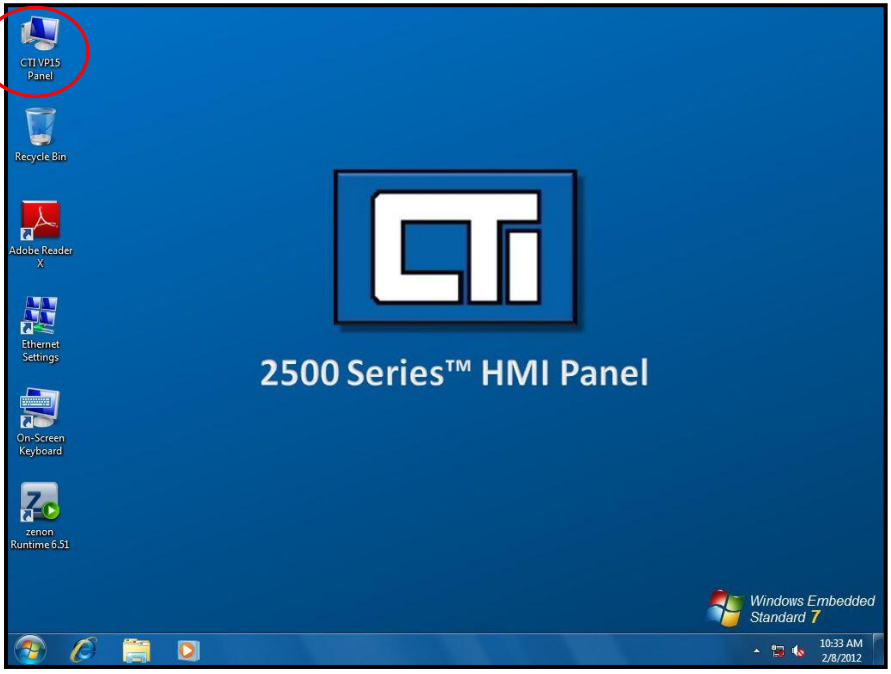
Put the [.exe or .bat] files that you want to execute, in the Windows Startup Folder. When the operating system starts, any [.exe or. bat] files placed in the startup directory will execute automatically.

You can open the windows startup folder by tapping and holding the startup folder in the windows start menu. Select 'open' from the popup window to open the startup folder. You may now place your files in the startup folder.

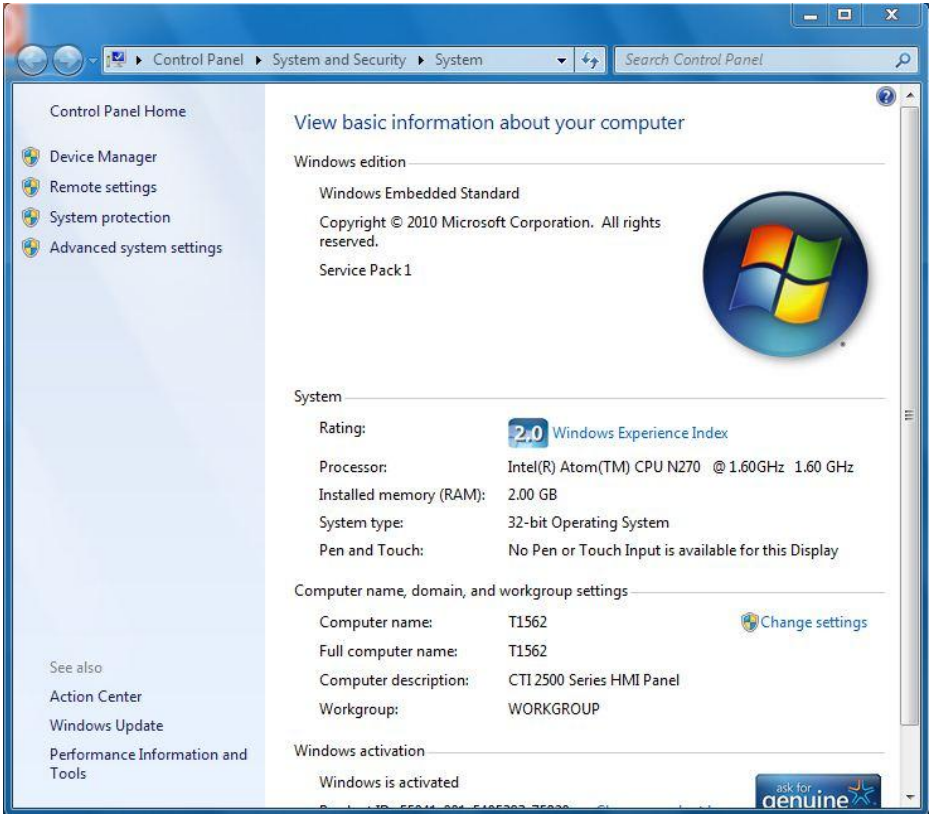


4.5 System Image Version Check

You may check the Windows Version and hardware statistics by tapping and holding the CTI VP15 Panel icon. When a popup window appears, select ‘Properties’.



Your Windows Edition and service pack information will be displayed as well as your hardware statistics.



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Chapter 5

Language Setup

This chapter is intended for Windows 7 Embedded that supports multiple languages selection. To change the language on your computer, please follow the steps shown below.

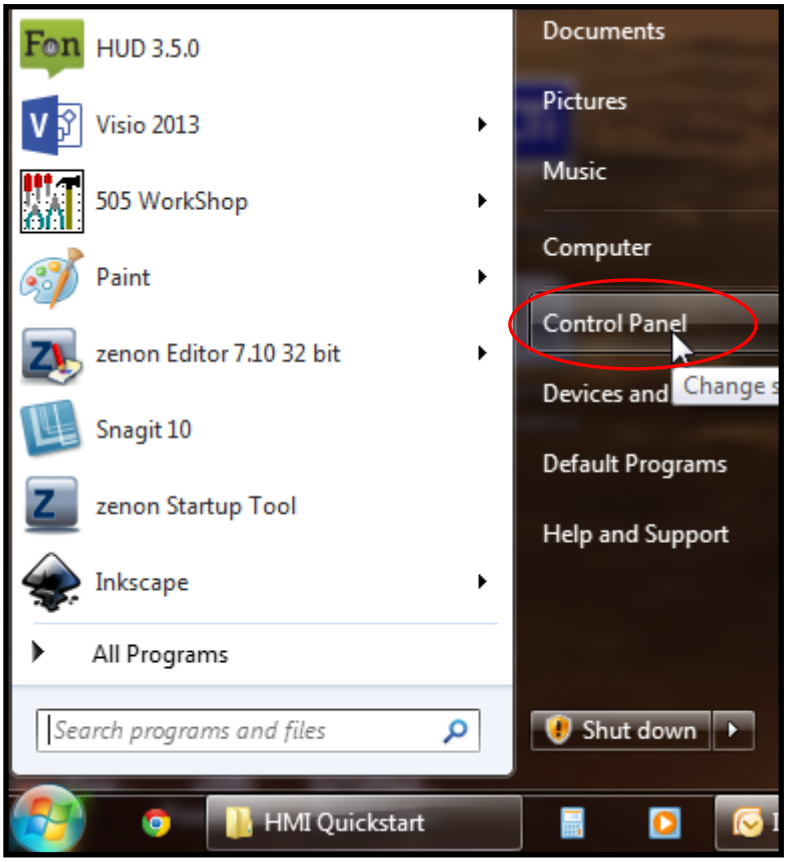

*Figure 5.1: Click **Start, and then click Control Panel**.*

This chapter is intended for Windows 7 Embedded that supports multiple languages selection. To change the language on your computer, please follow the steps shown below.

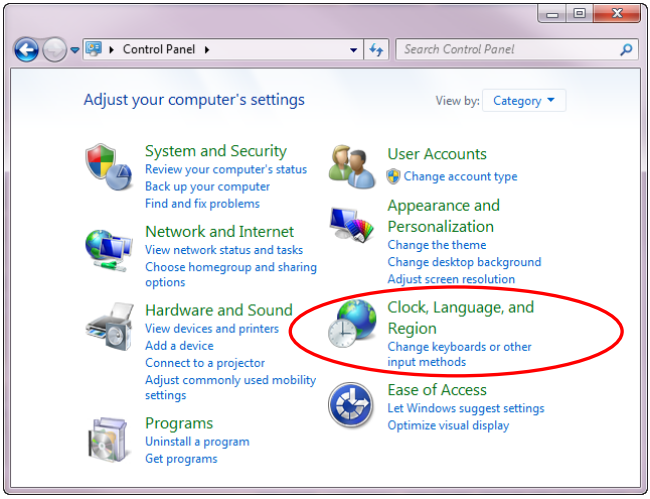

*Figure 5.2: Click **Clock, Language, and Region Options**.*

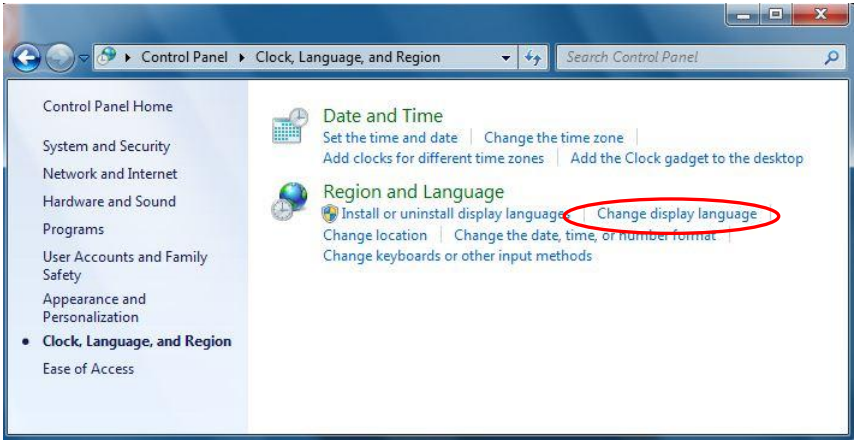

*Figure 5.3: Click **Change display language**.*

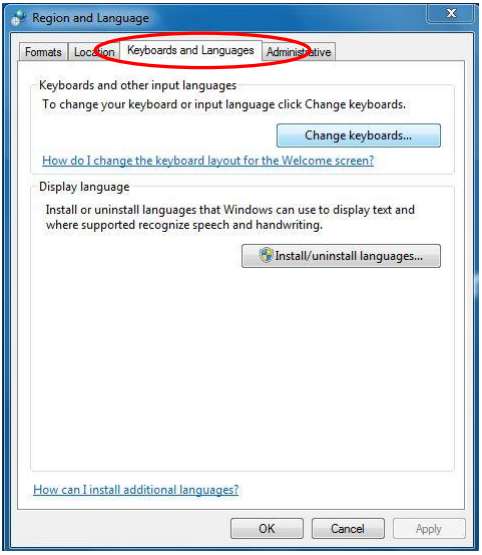

*Figure 5.4: On the top there are four tabs. Click on the **Keyboards and Languages** tab.*

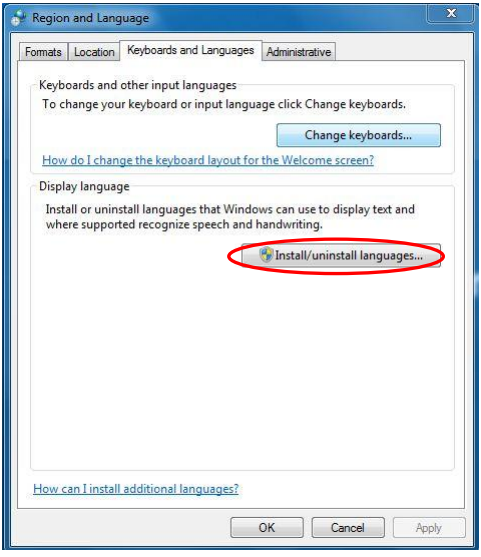

*Figure 5.5: Click on the **Install/uninstall languages** button in order to add a language.*

Chapter 6

System Tuning

6.1 Touchscreen Calibration

6.1.1 DOS/Windows Family

The 2500-VP15 touchscreen drivers support Windows CE, Windows XP, Windows XPe, Windows 7, Windows 7e, Linux, and DOS. The optional Windows CE operating system specifically for the 2500-VP15 is available for Windows CE application program builders.

6.1.2 Windows 7e

1. Click on the Windows start button.
2. Double click on the **Penmount Control panel** under the Penmount Universal Driver folder.

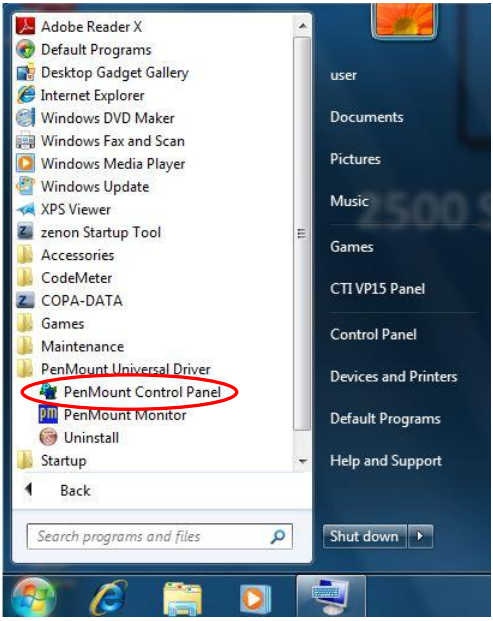

Figure 6.1: Penmount Control Panel

3. When the Penmount Control Panel window appears, click on the **Configure** button.

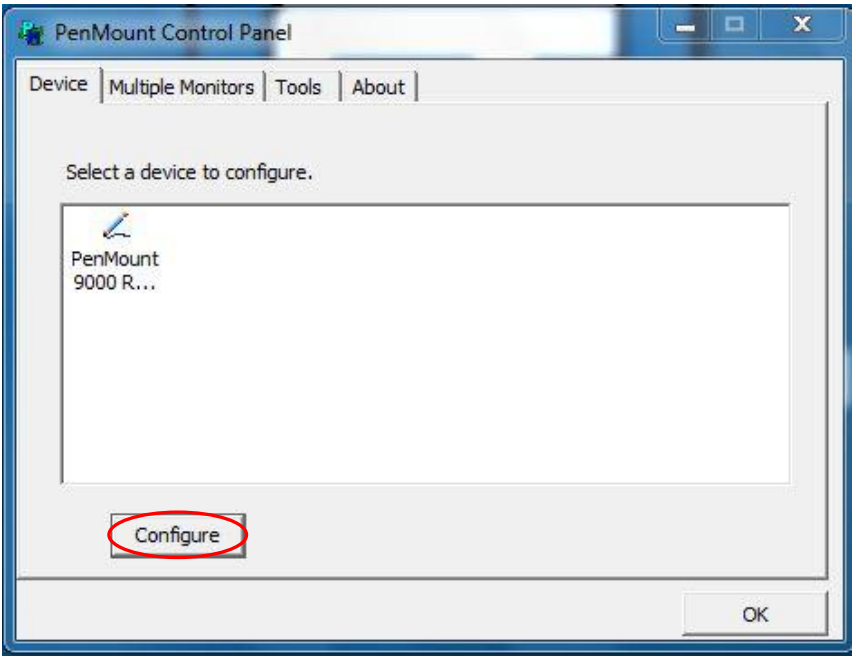

Figure 6.2: Penmount Control Panel

5. The calibration window will appear. Click on the **Standard Calibration** button.

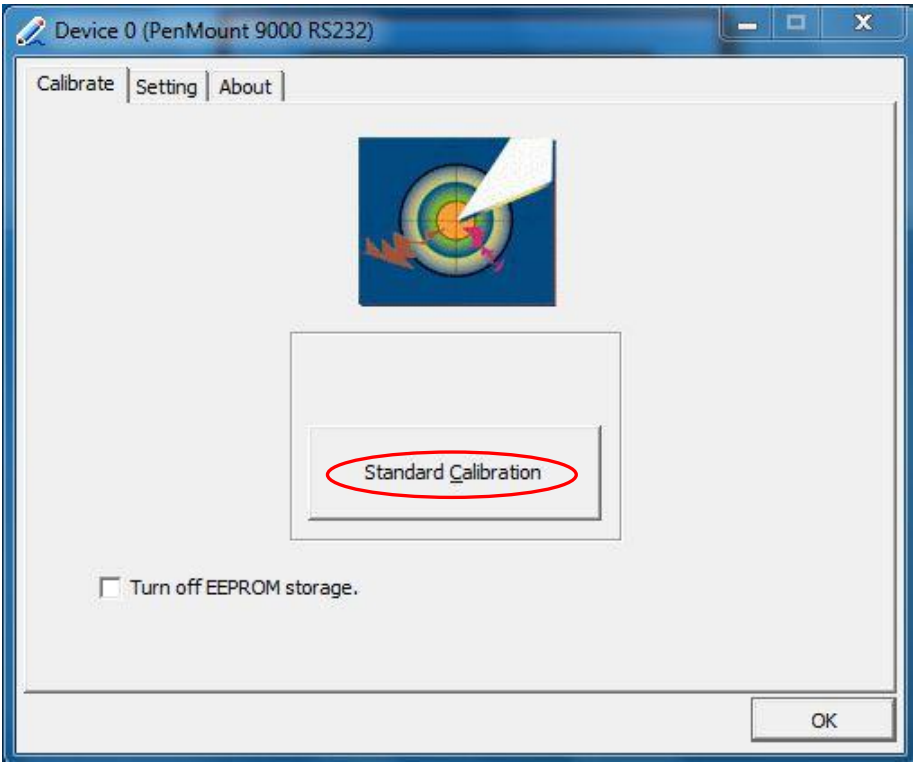

Figure 6.3: Standard Calibration

6. Follow the onscreen instructions. Touch and hold the red dots as instructed. Press OK when complete. Utility will automatically save the calibration.

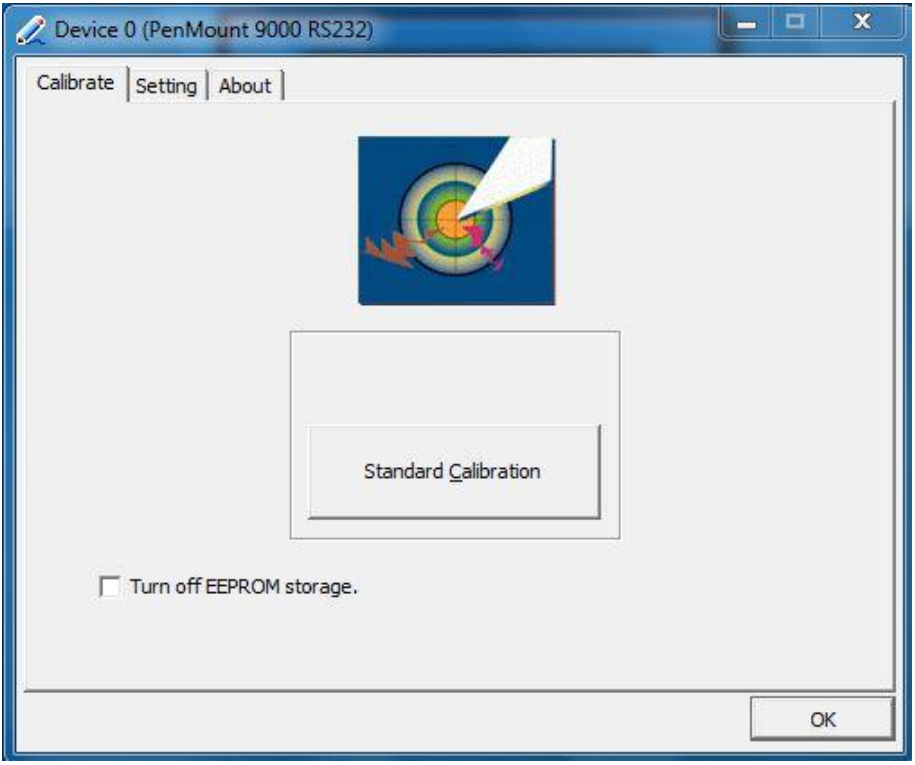

Figure 6.4: Calibration Complete

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Chapter 7

Maintenance

The 2500-VP15 is designed to be modular, slim and lightweight for easier maintenance. The following section describes how a qualified technician can replace the fuse.

7.1 Fuse Replacement

1. Remove the fuse cover.
2. Replace the damaged fuse with a new one.
3. Replace the fuse cover.

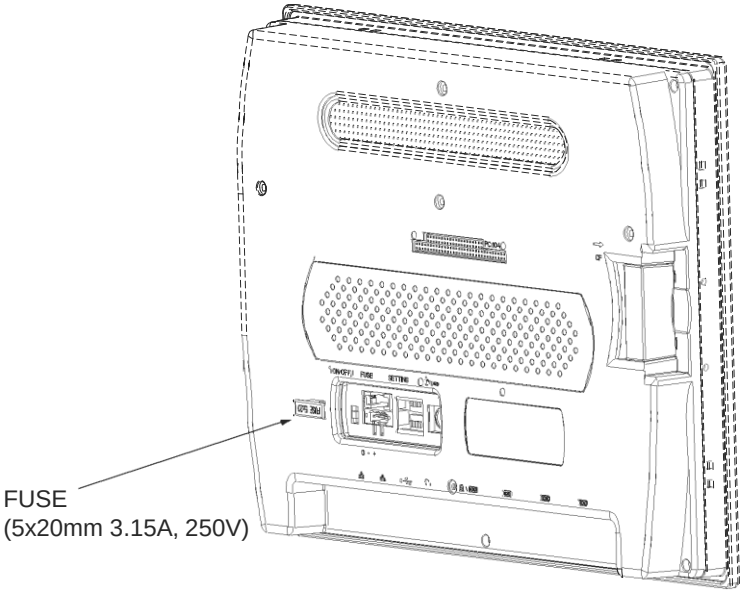

Figure 7.1: Replacing the fuse

Warning:
1. Please be careful before selecting "Save." This command will overwrite all registry data, not only the watchdog timer settings.
2. Do not replace the fuse with the one rated differently.

Appendix

Appendix A: Watchdog Timer (WDT) Setting

WDT is widely applied to industry computers to monitor activities of CPU. The programmed application triggers WDT with adequate timer setting depending on its requirement. Before WDT counts down to zero, the functional system will reset the counter. In case the WDT counter is not reset by an abnormal system, it will counts down to zero and then reset the system automatically.

This computer supports watchdog timer up to 255 levels for software programming. Below please take the source code written in assembly & C for a WDT application example.

Source Code in Assembly Language
==========

```
        mov     ax,2eh
        mov     dx,ax
        mov     ax,87h
        out     dx,al
        out     dx,al           ; initial IO port twice

        mov     ax,2eh
        mov     dx,ax
        mov     al,07h          ; point to logical device selector
        out     dx,al
        inc     dx
        mov     al,08h
        out     dx,al           ; select logical device 8

        mov     ax,2eh
        mov     dx,ax
        mov     al,30h          ; select CR30
        out     dx,al
        inc     dx
        mov     al,01h
        out     dx,al           ; update CR30 to 01h, WDTO enable

        mov     ax,2eh
        mov     dx,ax
        mov     al,0f5h         ; select CRF5 to set timer unit
        out     dx,al
```

```
inc     dx
mov     al,00h
out     dx,al           ; update CRF5 bit3, 0:sec; 1:Min.

mov     ax,2eh
mov     dx,ax
mov     al,0f6h         ; select CRF6
out     dx,al
inc     dx
mov     al,05h
out     dx,al           ; update CRF6 to 05h (5 sec)

mov     ax,2eh
mov     dx,ax
mov     ax,0aah
out     dx,al           ;stop program W83627UHG, Exit
```

Source Code in C Language
==========

```
/*-----    Include Header Area -----*/
#include "math.h"
#include "stdio.h"
#include "dos.h"

/*-----    routing, sub-routing -----*/

void main()
{
        outportb(0x2e, 0x87);       /* initial IO port twice */
        outportb(0x2e, 0x87);

        outportb(0x2e, 0x07);       /* point to logical device selector */
        outportb(0x2e+1, 0x08);     /* select logical device 8 */
        outportb(0x2e, 0x30);       /* select CR30 */
        outportb(0x2e+1, 0x01);     /* update CR30 to 01h, WDTO enable*/
        outportb(0x2e, 0xf5);       /* select CRF5 to set timer unit */
        outportb(0x2e+1, 0x00);     /* update CRF5 bit3, 0:sec; 1:Min. */
        outportb(0x2e, 0xF6);       /* select CRF6 */
        outportb(0x2e+1, 0x05);     /* update CRF6 to 05h (5 sec) */

        outportb(0x2e, 0xAA);       /* stop program W83627UHG, Exit */

}
```

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