ONYX-2122

21.5" Intel® Core™ 2 Duo Processor High Brightness Slim Medical Panel PC

ONYX-2122 Manual 1st Edition
Jan. 2011

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Packing List

Before you begin installing your Bedside Terminal, please make sure that the following items have been shipped:

- ONYX-2122 Medical Station
- Utility CD-ROM (Please insert the ONYX-2122 CD-ROM into external CD-ROM drive.) which Contains User's Manual (in PDF format), Drivers and Utilities

If any of these items are missing or damaged, you should contact your distributor or sales representative immediately.

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Safety & Warranty

1. Read these safety instructions carefully.
2. Keep this user's manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. **Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.**
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
12. Never pour any liquid into an opening. This could cause fire or electrical shock.
13. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.

14. **If any of the following situations arises, get the equipment checked by service personnel:**
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well, or you cannot get it to work according to the user's manual.
    e. The equipment has been dropped and damaged.
    f. The equipment has obvious signs of breakage.
15. **DO NOT LEAVE THIS EQUIPMENT IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20° C (-4°F) OR ABOVE 60° C (140° F). IT MAY DAMAGE THE EQUIPMENT.**

16. **External equipment intended for connection to signal input/output or other connectors, shall comply with relevant UL / IEC standard (e.g. UL 1950 for IT equipment and UL 60601-1 / IEC 60601 series for systems – shall comply with the standard IEC 60601-1-1, Safety requirements for medical electrical systems. Equipment not complying with UL 60601-1 shall be kept outside environment, as defined in the standard.**

Caution:
It may cause the danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer.

Classification

1. Degree of production against electric shock: not classified
2. Degree of protection against the ingress of water: IPX1
3. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
4. Mode of operation: Continuous
5. Type of protection against electric shock: Class I equipment

FCC

This device complies with Part 15 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.

UL Module Description

	Onyx-2122 AC modules are developed to suitable for the Classification Mark requirement

Safety Symbol Description

The following safety symbols are the further explanations for your reference.

	Medical equipment with respect to electric shock, fire and mechanical hazards only in accordance with UL 60601-1, and CAN/CSA C22.2 NO. 601.1
	Attention, consult ACCOMPANYING DOCUMENTS.
	Ground wire *Protective Ground wire.*
	Medical equipment with respect to electric shock, fire and mechanical hazards only in accordance with UL 60601-1, and CAN/CSA C22.2 NO. 601.1

Below Table for China RoHS Requirements
產品中有毒有害物質或元素名稱及含量

Onyx Panel PC/ Workstation

部件名稱	有毒有害物質或元素					
	鉛 (Pb)	汞 (Hg)	鎘 (Cd)	六價鉻 (Cr(VI))	多溴聯苯 (PBB)	多溴二苯醚 (PBDE)
印刷電路板及其電子元件	×	○	○	○	○	○
外部信號連接器及線材	×	○	○	○	○	○
外殼	×	○	○	○	○	○
中央處理器與記憶體	×	○	○	○	○	○
硬碟	×	○	○	○	○	○
液晶模組	×	○	○	○	○	○
光碟機	×	○	○	○	○	○
觸控模組	×	○	○	○	○	○
電源	×	○	○	○	○	○

O：表示該有毒有害物質在該部件所有均質材料中的含量均在 **SJ/T 11363-2006** 標準規定的限量要求以下。

X：表示該有毒有害物質至少在該部件的某一均質材料中的含量超出 **SJ/T 11363-2006** 標準規定的限量要求。

備註：

一、此產品所標示之環保使用期限，系指在一般正常使用狀況下。

二、上述部件物質中央處理器、記憶體、硬碟、光碟機、觸控模組爲選購品。

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Chapter

1

General Information

1.1 Introduction

The ONYX-2122 is a Slim Medical Panel PC with Intel® Core™ 2 Duo ULV processor-based computer that is designed to serve as a point of care station. It is a PC-based system with 21.6" true color TFT LCD display, Zero Noise solution; integrated multimedia functions make them the perfect platforms to build comprehensive lifestyle computing applications.

The ONYX-2122 includes all the features of a powerful computer into a slim and attractive chassis. The ONYX-2122 has 300 nits TFT displays with Full HD 1920 x 1080 resolution. Integrating with high brightness LCD is easier to analyze DICOM images. It supports 2.5" Hard Disk Drive storage function and one Mini-PCI for WLAN expansion. Moreover, they feature flexible I/O ports, such as four USB2.0, three RS-232, one 10/100/1000Base-TX, one PS/2 keyboard/ mouse, and two speakers.

Convenient operation, Silent, compact, mobility and highly integrated multimedia system let you to focus on healthcare utility, interactive information displays, automation control systems, general desktop usage, multimedia recreation, and other medical requirements.

Note: Customers must be noted that storage media shall be

bundled and purchased together with ONYX-2122 while it is shipped out.

1.2 Feature

- 21.5” Full HD Resolution LCD
- Easy To Use, Compact, Simple Design
- Fanless, Zero Noise
- High Contrast Ratio, Wide Viewing Angle For Medical Imaging
- Intel® Core™ 2 Duo ULV Processor
- Resistive Touchscreen (Optional)
- 802.11a/b/g/n Wireless Antenna (Optional)
- Weight: 6.9 Kg, Thickness: 65mm

1.3 Specification

Hardware Specifications

Display	21.5” SXGA color TFT LCD
System Memory	200-pin DDRII SODIMM x 1, Max. 2GB
CPU Board	Intel® Core™ 2 Duo U series Processor
Drive Bay	2.5” Hard Disk Drive (optional)
Expansion	Mini-PCI x 1
Button	Brightness: “+” / ”-“; Sound: “+” / ”-“; Power SW
I/O	RS-232 x 2, RS-232/422/485 x1 USB 2.0 x 4, 10/100/1000 Base-TX x 1 PS/2 keyboard/ mouse x 1 Speaker x 2 (2W)

LCD Specifications

Model Name	**ONYX-2122**
Display Type	21.6” color TFT LCD
Max. Resolution	Full HD 1920 x 1080
Max. Colors	16.7M
Dot Size (mm)	0.297 x 0.297
Luminance (cd/m2)	300 (TYP)
Viewing Angle	170°(H)
	160°(V)

Contrast Ratio	1000 : 1
Brightness Control	Yes
Back Light MTBF	50,000 Hrs

Note: All ONYX's LCD products are manufactured with High precision technology. However, there are a small number of defective pixels in all LCD panels that are not able to change color. This is a normal occurrence for all LCD displays from all manufacturers and should not be noticeable or objectionable under normal operation. ONYX LCD panels are qualified for industry standard conditions in the following: total 7 dead pixels on a screen or if there are 3 within 1 inch square area of each other on the display.

Mechanical Specifications

Architecture	Close-frame
Front Bezel	Plastic bezel with resistive touch screen
Color	White
Mounting / Holder	VESA 75/100mm
Construction	3mm ABS + PC TYPE Plastic housing
Dimension (W x H x D)	21.5” x 21.7” x 2.8” (546mm x 551.4mm x 70mm)
Carton Dimension	23.8” x 9.1” x 24” (605mm x 230mm x 610mm)
Net Weight	15.18 lb (6.9 kg)
Gross Weight	24.2 lb (11 kg)
Packing Filler	PE

Power Supply Specifications

Model Item	PROTEK Power (PMP120-14-B16)
Power Requirement	DC 9~30V
Input Voltage	100 ~ 240V AC @ 47~ 63Hz, 1.4 ~0.6A
Output Voltage	24V, 5A, 120W Max.
MTBF	100,000 hrs operation at 25˚C

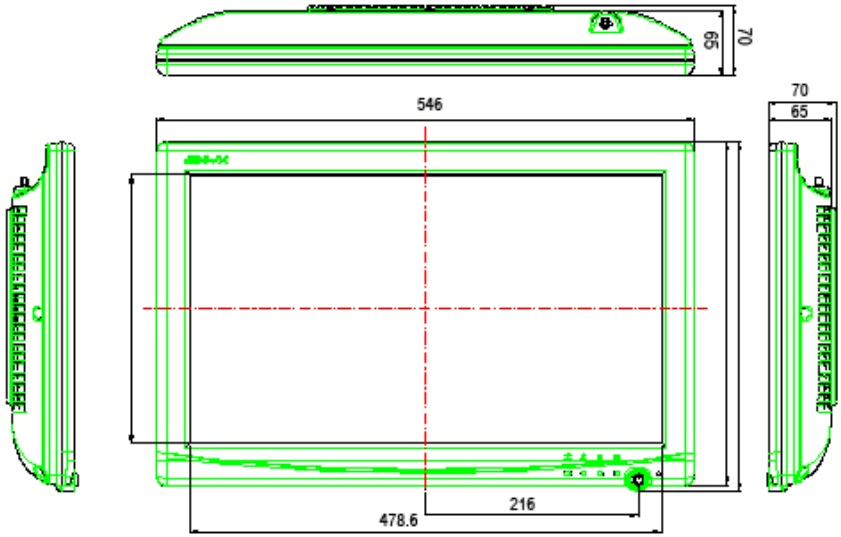
Environmental Specifications

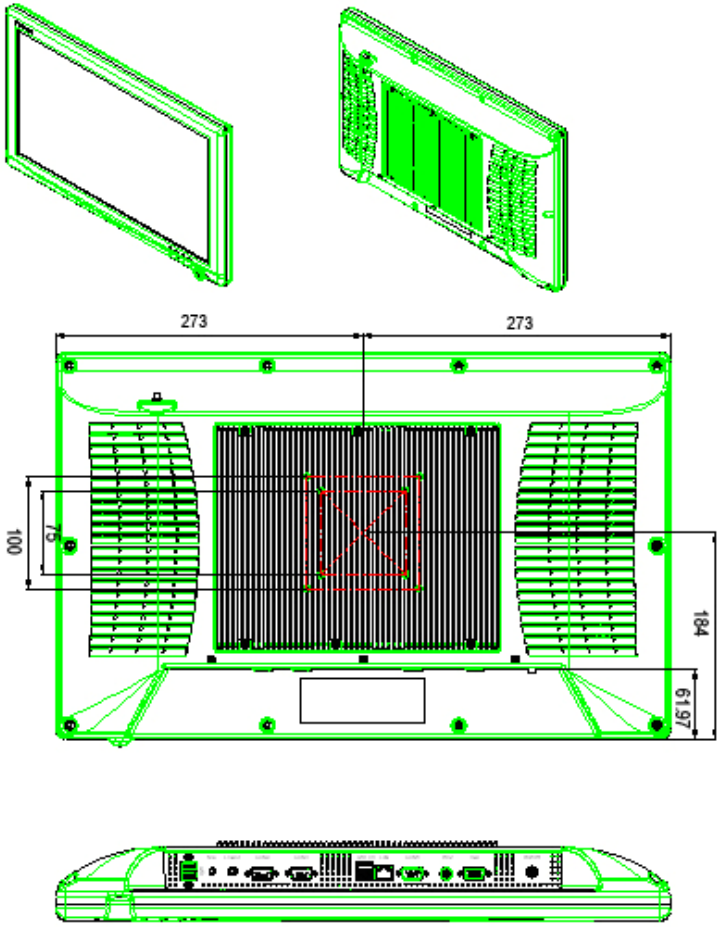
Operating Temperature	0˚C to 40˚C (32˚F ~104˚F)
Operating Humidity	30% ~75%
Operating Atmospheric Pressure	850~1000hpa
Storage Temperature	-20˚C to 60˚C (-4˚F ~140˚F)
Storage Humidity	5% to 95%@ 40˚C, non-condensing
Storage Atmospheric Pressure	850~1000hpa
Vibration	0.5G / 5 ~ 500Hz (Random) / operation
Shock	15G peak acceleration (11 msec. duration) / operation
Drop	76cm (1 Corner, 3 Edge, 6 Surface)
EMI / Safety	CE / FCC Class B/ UL 60601-1/ EN 60601-1
IP	Front bezel, IP-65 compliant
Noise	Zero noise
Input Power Rating	100~240V/47~63Hz, 1.4~0.6A

TouchScreen (Optional)

Type	5-wire, Analog Resistive
Interface	USB Interface
Resolution	2048 x 2048
Light Transmission	> 80% ± 2%
Life Time	35 million times

1.4 Dimension




273
273
100
75
184
61.97

Chapter

2

Hardware Installation

2.1 Safety Precautions

Warning!

- *Always completely disconnect the power cord from your board whenever you are working on it.*
- *Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.*

Caution!

- *Always ground yourself to remove any static charge before touching the board.*
- *Modern electronic devices are very sensitive to static electric charges; please remember to use a grounding wrist strap at all times.*
- *Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.*

2.2 A Quick Tour of the ONYX-2122

Before you start to set up the ONYX-2122, take a moment to become familiar with the locations and purposes of the controls, drives, connections and ports, which are illustrated in the figures below.

When you place the ONYX-2122 upright on the desktop, its front panel appears as shown in Picture 2-1.

Picture 2-1: Front View of the Medical Station

When you turn the Medical Station around and look at its rear cover, the sunken I/O section is at the bottom of the station, as shown in Picture 2-2. (The I/O section includes various I/O ports, including DC-in, Serial ports, VGA, PS2, Ethernet, USB.) Only assemble with the Mini PCI capture card; the S-Video in function will work. The medical Station integrates with WLAN function by using Mini PCI.

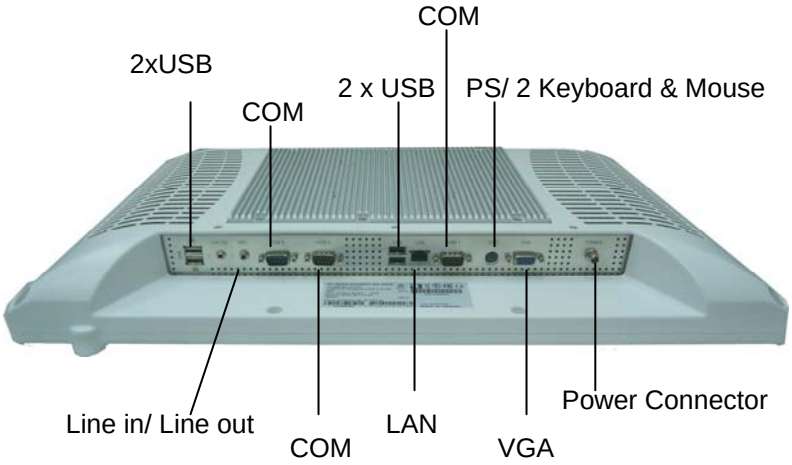


Figure 2.2: Rear view of the Medical Station

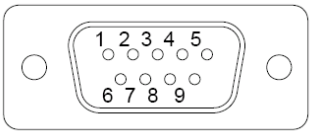
2.3 COM2 RS-232/422/485 Selection

COM2 RS-232/422/485 selection is set in BIOS setting as following.

Entering BIOS Setting Menu: Choose "Integrated Peripherals → Super IO device→ COM2 select". (Default setting at "RS-232")

2.4 RS-232/422/485 Serial Port Connector

Different devices implement the RS-232/422/485 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments below for the connector.



Pin	Signal	Pin	Signal
1	DCD (422TXD-/485DATA-)	2	RXD (422RXD+)
3	TXD (422TXD+/485DATA+)	4	DTR (422RXD-)
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	N.C.

Chapter

3

Award BIOS Setup

3.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

Press <F1> to RESUME

Write down the message and press the F1 key to continue the boot up sequence.

System configuration verification

These routines check the current system configuration against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The CMOS memory has lost power and the configuration information has been erased.

The ONYX-2122 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 Award BIOS Setup

Awards BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM so that it retains the Setup information when the power is turned off.

Entering setup

Power on the computer and press <Del> immediately. This will allow you to enter Setup.

Standard CMOS Features

Use this menu for basic system configuration. (Date, time, IDE, etc.)

Advanced BIOS Features

Use this menu to set the advanced features available on your system.

Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system performance.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals. (Primary slave, secondary slave, keyboard, mouse etc.)

Power Management Setup

Use this menu to specify your settings for power management. (HDD power down, power on by ring etc.)

PnP/PCI Configurations

This entry appears if your system supports PnP/PCI.

PC Health Status

This menu shows you the status of PC.

Frequency/Voltage Control

This menu shows you the display of frequency/Voltage Control.

Load Fail-Safe Defaults

Use this menu to load the BIOS default values for the minimal/ stable performance for your system to operate.

Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While AWARD has designated the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

Set Supervisor/User Password

Use this menu to set Supervisor/User Passwords.

Save and Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

Chapter

4

Driver Installation

The ONYX-2122 comes with an AutoRun CD-ROM that contains all drivers and utilities that can help you to install the driver automatically.

Insert the driver CD, the driver CD-title will auto start and show the installation guide. If not, please follow the sequence below to install the drivers.

Follow the sequence below to install the drivers:

Step 1 – Install Intel® INF Driver

Step 2 – Install Intel® VGA Driver

Step 3 – Install Intel® LAN Driver

Step 4 – Install Audio Driver

Step 5 – Install Touch Driver (optional)

Please read instructions below for further detailed installations.

4.1 Installation:

Insert the ONYX-2122 CD-ROM into the CD-ROM drive. And install the drivers from Step 1 to Step 5 in order.

Step 1 – Install Intel® INF Driver

1. Click on the ***Step 1 – Inf Driver*** folder and double click on the ***infinst911autol.exe***
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 2 – Install Intel® VGA Driver

1. Click on the ***Step 2 – VGA Driver*** folder and select the OS folder your system is
2. Double click on the ***.exe*** file located in the OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 3 – Install Intel LAN Driver

1. Click on the ***LAN driver*** folder and select the ***Winx32*** folder and double click on ***.exe*** for x86 (32bit) OS; if the OS is Windows 64bit OS, please select the ***Winx64*** folder and double click on ***.exe*** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 4 –Install Audio Driver

1. Click on the ***Step 4 –AUDIO driver*** folder and select the corresponding folder for your operating system and double click on **Setup*.exe*** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 5 – Install Touch Panel Driver

1. Click on the ***Touch driver*** folder and select the corresponding folder for your operating system and double click on **Setup*.exe*** file
2. Follow the instructions that the window shows you
3. The system will help you install the driver automatically

Appendix

A

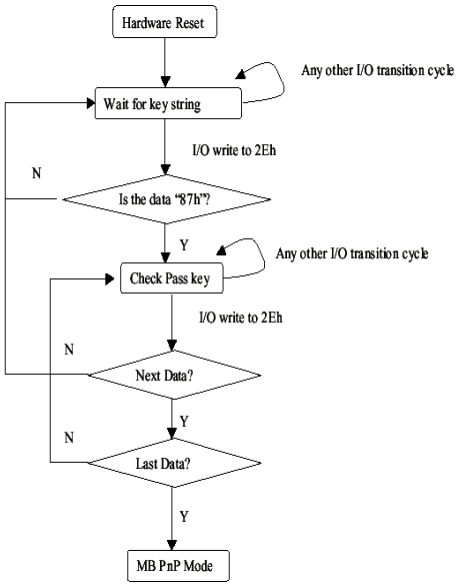
Programming the Watchdog Timer

A.1 Programming

ONYX-2122 utilizes ITE 8712 chipset as its watchdog timer controller. Below are the procedures to complete its configuration and the ONYX initial watchdog timer program is also attached based on which you can develop customized program to fit your application.

Configuring Sequence Description

After the hardware reset or power-on reset, the ITE 8712 enters the normal mode with all logical devices disabled except KBC. The initial state (enable bit) of this logical device (KBC) is determined by the state of pin 121 (DTR1#) at the falling edge of the system reset during power-on reset.



There are three steps to complete the configuration setup: (1) Enter the MB PnP Mode; (2) Modify the data of configuration registers; (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

(1) Enter the MB PnP Mode

To enter the MB PnP Mode, four special I/O write operations are to be performed during Wait for Key state. To ensure the initial state of the key-check logic, it is necessary to perform four write opera-tions to the Special Address port (2EH). Two different enter keys are provided to select configuration ports (2Eh/2Fh) of the next
step

	Address Port	Data Port
87h, 01h, 55h, 55h:	2Eh	2Fh

(2) Modify the Data of the Registers

All configuration registers can be accessed after entering the MB PnP Mode. Before accessing a selected register, the content of Index 07h must be changed to the LDN to which the register belongs, except some Global registers.

(3) Exit the MB PnP Mode

Set bit 1 of the configure control register (Index=02h) to 1 to exit the MB PnP Mode.

WatchDog Timer Configuration Registers

LDN	Index	R/W	Reset	Configuration Register or Action
All	02H	W	N/A	Configure Control
07H	71H	R/W	00H	WatchDog Timer Control Register
07H	72H	R/W	00H	WatchDog Timer Configuration Regis-ter
07H	73H	R/W	00H	WatchDog Timer Time-out Value Register

Configure Control (Index=02h)

This register is writing only. Its values are not sticky; that is to say,

a hardware reset will automatically clear the bits, and does not require the software to clear them.

Bit	Description
7-2	Reserved
1	Returns to the Wait for Key state. This bit is used when the configuration sequence is completed
0	Resets all logical devices and restores configuration registers to their power-on states.

WatchDog Timer Control Register (Index=71h, Default=00h)

Bit	Description
7	WDT is reset upon a CIR interrupt
6	WDT is reset upon a KBC (mouse) interrupt
5	WDT is reset upon a KBC (keyboard) interrupt
4	WDT is reset upon a read or a write to the Game Port base address
3-2	Reserved
1	Force Time-out. This bit is self-clearing
0	WDT Status
	1: WDT value reaches 0.
	0: WDT value is not 0

WatchDog Timer Configuration Register (Index=72h, Default=0

Bit	Description
7	WDT Time-out value select
	1: Second
	0: Minute
6	WDT output through KRST (pulse) enable
5-4	Reserved
3-0	Select the interrupt level[Note] for WDT

WatchDog Timer Time-out Value Register (Index=73h, Default=00h)

Bit	Description
7-0	WDT Time-out value 7-0

A.2 ITE8712 Watchdog Timer Initial Program

```
        .MODEL SMALL
        .CODE
Main:
        CALL Enter_Configuration_mode
        CALL Check_Chip
        mov cl, 7
        call Set_Logic_Device
        ;time setting
        mov cl, 10 ; 10 Sec
        dec al
Watch_Dog_Setting:
        ;Timer setting
        mov al, cl
        mov cl, 73h
        call Superio_Set_Reg
        ;Clear by keyboard or mouse interrupt
        mov al, 0f0h
        mov cl, 71h
        call Superio_Set_Reg
        ;unit is second.
        mov al, 0C0H
        mov cl, 72h
        call Superio_Set_Reg
```

```
; game port enable
mov cl, 9
call Set_Logic_Device

Initial_OK:
CALL Exit_Configuration_mode
MOV AH,4Ch
INT 21h

Enter_Configuration_Mode PROC NEAR
MOV SI,WORD PTR CS:[Offset Cfg_Port]

MOV DX,02Eh
MOV CX,04h
Init_1:
MOV AL,BYTE PTR CS:[SI]
OUT DX,AL
INC SI
LOOP Init_1
RET
Enter_Configuration_Mode ENDP

Exit_Configuration_Mode PROC NEAR
MOV AX,0202h
CALL Write_Configuration_Data
```

```
        RET
        Exit_Configuration_Mode ENDP

        Check_Chip PROC NEAR

        MOV AL,20h
        CALL Read_Configuration_Data
        CMP AL,87h
        JNE Not_Initial

        MOV AL,21h
        CALL Read_Configuration_Data
        CMP AL,12h
        JNE Not_Initial

Need_Initial:
        STC
        RET
Not_Initial:
        CLC
        RET
        Check_Chip ENDP
        Read_Configuration_Data PROC NEAR
        MOV DX,WORD PTR CS:[Cfg_Port+04h]
        OUT DX,AL
```

```
MOV DX,WORD PTR CS:[Cfg_Port+06h]
IN AL,DX
RET
Read_Configuration_Data ENDP

Write_Configuration_Data PROC NEAR
MOV DX,WORD PTR CS:[Cfg_Port+04h]
OUT DX,AL
XCHG AL,AH
MOV DX,WORD PTR CS:[Cfg_Port+06h]
OUT DX,AL
RET
Write_Configuration_Data ENDP

Superio_Set_Reg proc near
push ax
MOV DX,WORD PTR CS:[Cfg_Port+04h]
mov al,cl
out dx,al
pop ax
inc dx
out dx,al
ret
Superio_Set_Reg endp.Set_Logic_Device proc near
```

```
Set_Logic_Device    proc    near
push ax
push cx
xchg al,cl
mov cl,07h
call Superio_Set_Reg
pop cx
pop ax
ret
Set_Logic_Device endp

;Select 02Eh->Index Port, 02Fh->Data Port
Cfg_Port DB 087h,001h,055h,055h
DW 02Eh,02Fh
```

END Main

Note: Interrupt level mapping

0Fh-Dh: not valid

0Ch: IRQ12

.

.

03h: IRQ3

02h: not valid

01h: IRQ1

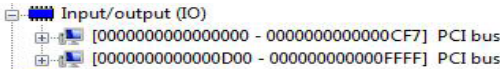
00h: no interrupt selected

Appendix

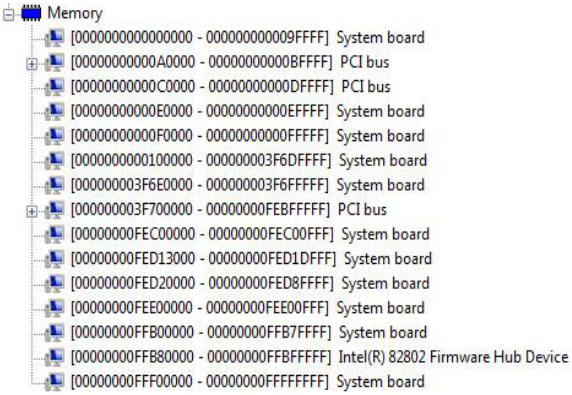
B

I/O Information

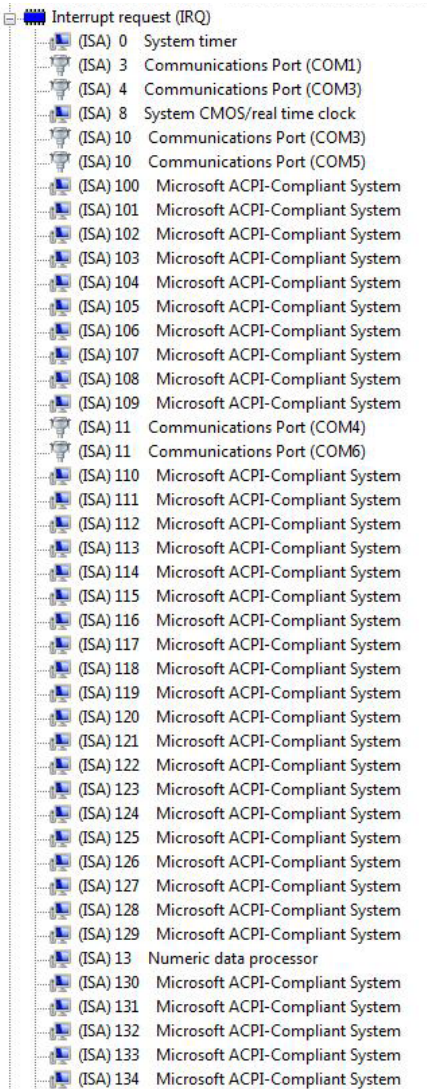
B.1 I/O Address Map



B.2 Memory Address Map



B.3 IRQ Mapping Chart



- (ISA) 135 Microsoft ACPI-Compliant System
- (ISA) 136 Microsoft ACPI-Compliant System
- (ISA) 137 Microsoft ACPI-Compliant System
- (ISA) 138 Microsoft ACPI-Compliant System
- (ISA) 139 Microsoft ACPI-Compliant System
- (ISA) 14 ATA Channel 0
- (ISA) 140 Microsoft ACPI-Compliant System
- (ISA) 141 Microsoft ACPI-Compliant System
- (ISA) 142 Microsoft ACPI-Compliant System
- (ISA) 143 Microsoft ACPI-Compliant System
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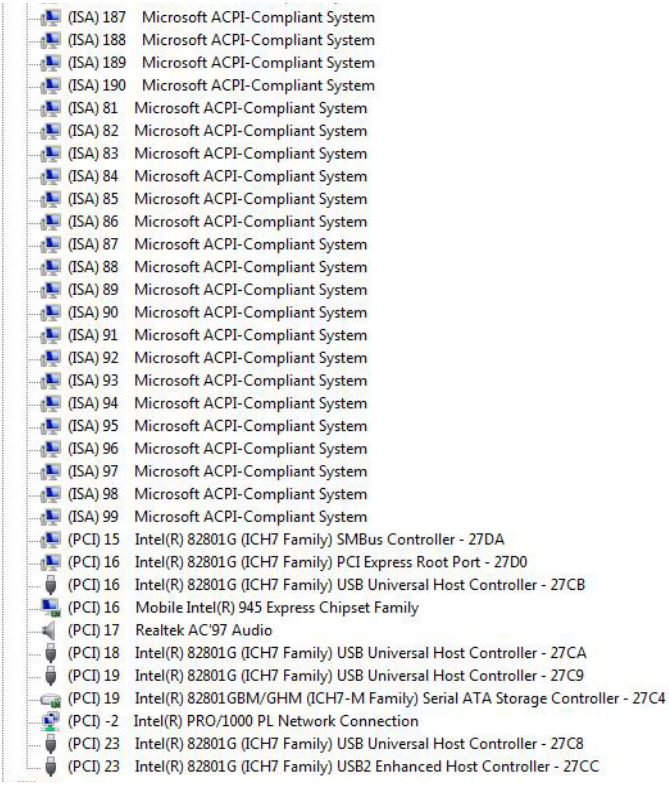
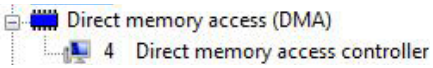
- (ISA) 186 Microsoft ACPI-Compliant System



B.4 DMA Channel Assignments



Appendix

C

Miscellanea

C.1 General Cleaning Tips

You may need the following precautions before you begin to clean the computer. When you clean any single part or component for the computer, please read and understand the details below fully.

1. Never spray or squirt the liquids directly onto any computer component. If you need to clean the device, please rub it with a piece of dry cloth.
2. Be cautious of the tiny removable components when you use a vacuum cleaner to absorb the dirt on the floor.
3. Turn the system off before you start to clean up the component or computer.
4. Never drop the components inside the computer or get circuit board damp or wet.
5. Be cautious of all kinds of cleaning solvents or chemicals when you use it for the sake of cleaning. Some individuals may be allergic to the ingredients.
6. Try not to put any food, drink or cigarette around the computer.

C.2 Cleaning tools

Although many companies have created products to help improve the process of cleaning your computer and peripherals users can also use household items to clean their computers and peripherals. Below is a listing of items you may need or want to use while cleaning your computer or computer peripherals.

Keep in mind that some components in your computer may only be able to be cleaned using a product designed for cleaning that component, if this is the case it will be mentioned in the cleaning tips.

- **Cloth** - A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, we still recommend you to rub it with a piece of cloth.
- **Water or rubbing alcohol** – You may moisten a piece of cloth a bit with some water or rubbing alcohol and rub it on the computer. Unknown solvents may be harmful to the plastics parts.
- **Vacuum cleaner** - Absorb the dust, dirt, hair, cigarette particles, and other particles out of a computer can be one of the best methods of cleaning a computer. Over time these items can restrict the airflow in a computer and cause circuitry to corrode.

- **Cotton swabs** - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas in your keyboard, mouse, and other locations.
- **Foam swabs** - Whenever possible it is better to use lint free swabs such as foam swabs.

Note:

We strongly recommended that you should shut down the system before you start to clean any single components.

Please follow the steps below.

1. Close all application programs
2. Close operating software
3. Turn off power switch
4. Remove all device
5. Pull out power cable

C.3 Scrap Computer Recycling

If the computer equipments need the maintenance or are beyond repair, we strongly recommended that you should inform us as soon as possible for the suitable solution. For the computers that are no longer useful or work well, please contact with worldwide distributors for recycling.

The worldwide distributors show on the following website:

http://www.onyx-healthcare.com.tw/Contact.php

Note:

Follow the national requirements to dispose unit