ARK-7480

All-In-One, High Performance, Embedded Box Computer

User Manual

For more information on this and other Advantech products, please visit our websites at: http://www.advantech.com

http://www.advantech.com.tw/products/Sub_Category.asp?Category_ID=1-TPYQ7&BU=ACG&PD=EC

For technical support and service, please visit our support website at:

http://support.advantech.com

This manual is for the ARK-7480-100A1 and ARK-7480-200A1.

Part No. 2006748000 1st Edition

Printed in Taiwan May 2006

Product Warranty (1 year)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for one year from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details. If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.

2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.

3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.

4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.

5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information. 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.

Technical Support and Assistance

Step 1. Visit the Advantech web site at **www.advantech.com/support** where you can find the latest information about the product.

Step 2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
- Product name and serial number
- Description of your peripheral attachments
- Description of your software (operating system, version, application software, etc.)
- A complete description of the problem
- The exact wording of any error messages

Step 3. ARK-7480 Series Model

There are two sub-models in ARK-7480 series listed below:

Part Number	**Description**
ARK-7480-100A1	Socket 478, Pentium4 based Embedded Box Computer, with LVDS, DVI, 6 x USB 2.0, 1xRS-232, 5 x RS-232/422/485, Dual Fast Ethernet, Audio, and 3 PCI slots
ARK-7480-200A1	Socket 478, Pentium4 based Embedded Box Computer, ARK-7480-100A1 with Extended Drive Bay

Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such - in writing to: support@advantech.com

Packing List

Before installing your board, make sure that the following materials have been received:

- One Warranty certificate
- One Software Supporting CD-ROM disk
- One Table Mounting Kit (P/N: 1960003950 x 2 pieces)
- One Wall Mounting Kit (P/N: 1960003949 x 2 pieces)
- IDE HDD Cable, 40/40/40, 60cm (P/N: 1700001757)

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

Safety Instructions

1. Please read these safety instructions carefully.

2. Please keep this User‘s Manual for later reference.

3. Please disconnect this equipment from AC outlet before cleaning. Use a damp cloth. Don‘t use liquid or sprayed detergent for cleaning. Use moisture sheet or clothe for cleaning.

4. For pluggable equipment, the socket-outlet shall near the equipment and shall be easily accessible.

5. Please keep this equipment from humidity.

6. Lay this equipment on a reliable surface when install. A drop or fall could cause injury.

7. Do not leave this equipment in an uncontrolled environment; storage temperatures above 60ºC may damage the equipment.

8. The openings on the enclosure are for air convection hence protecting the equipment from overheating. DO NOT COVER THE OPENINGS.

9. Make sure the voltage of the power source when connecting the equipment to the power outlet.

10. Place the power cord such a way that people cannot step on it. Do not place anything over the power cord. The power cord must be rated for the product and for the voltage and current marked on the product’s electrical

ratings label. The voltage and current rating of the cord should be greater than the voltage and current rating marked on the product.

11. All cautions and warnings on the equipment should be noted.

12. If the equipment is not used for long time, disconnect the equipment from mains to avoid being damaged by transient over-voltage.

13. Never pour any liquid into ventilation openings; this could cause fire or electrical shock.

14. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.

15. If one of the following situations arise, get the equipment checked by service personnel:

a. The Power cord or plug is damaged.

b. Liquid has penetrated the equipment.

c. The equipment has been exposed to moisture.

d. The equipment has not worked well or you can not get it work according to user‘s manual.

e. The equipment has been dropped and damaged.

f. The equipment has obvious signs of breakage

CAUTION!

THIS COMPUTER IS PROVIDED WITH A BATTERY-POWERED REAL-TIME CLOCK CIRCUIT. THERE IS A DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH SAME OR EQUIVLENT TYPE RECOMMENDED BY THE MANUFACTURE. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

Wichtige Sicherheishinweise

1. Bitte lesen sie Sich diese Hinweise sorgfältig durch.

2. Heben Sie diese Anleitung für den späteren Gebrauch auf.

3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie Keine Flüssig-oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.

4. Die NetzanschluBsteckdose soll nahe dem Gerät angebracht und leicht zugänglich sein.

5. Das Gerät ist vor Feuchtigkeit zu schützen.

6. Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen.

7. Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor überhitzung schützt. Sorgen Sie dafür, daB diese Öffnungen nicht abgedeckt werden.

8. Beachten Sie beim. AnschluB an das Stromnetz die AnschluBwerte.

9. Verlegen Sie die NetzanschluBleitung so, daB niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.

10. Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.

11. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.

12. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. elektrischen Schlag auslösen.

13. Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von authorisiertem Servicepersonal geöffnet werden.

14. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:

a. Netzkabel oder Netzstecker sind beschädigt.

b. Flüssigkeit ist in das Gerät eingedrungen.

c. Das Gerät war Feuchtigkeit ausgesetzt.

d. Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.

e. Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.

f. Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.

15. VOSICHT: Explisionsgefahr bei unsachgemaben Austausch der Batterie. Ersatz nur durch densellben order einem vom Hersteller empfohlene-mahnlichen Typ. Entsorgung gebrauchter Batterien navh Angaben des Herstellers.

16. ACHTUNG: Es besteht die Explosionsgefahr, falls die Batterie auf nicht fach-männische Weise gewechselt wird. Verfangen Sie die Batterie nur gleicher oder entsprechender Type, wie vom Hersteller empfohlen. Entsorgen Sie Batterien nach Anweisung des Herstell-ers. Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70dB(A) oder weiger. Haftungsausschluss: Die Bedienungsanleitungen wurden entsprechend der IEC-704-1 erstellt. Advantech lehnt jegliche Verantwortung für die Richtigkeit der in diesem Zusammenhang getätigten Aussagen ab.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

1. To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.

2. Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

Contents

CHAPTER 1

Overview

This chapter gives background information on the ARK-7480. It shows you the ARK-7480 overview and specifications.

Sections include:

- Introduction
- Hardware Specifications
- Chassis Dimension

Chapter 1 Overview

1.1 Introduction

The ARK-7480 Embedded Box Computer is an all-in-one, powerful and robust unit. The high performance ARK-7480 series is powered by high performance embedded Intel Pentium 4 or Celeron D processors up to 2.8 GHz. It supports DDR SDRAM up to 2 GB. The ARK-7480 offers three PCI vacancy slots for user expansion. The ARK-7480 Embedded Box Computer supports abundant I/O ports: six USB 2.0 ports, six COM ports, as well as DVI, LVDS and VGA display interfaces with a drive bay for accessing a 3.5" HDD. An optional external storage expansion kit can be added for CDROM card readers. It is ideally suitable for diversified embedded system applications requiring highest processor performance and high expandability, such as machine automation, and industrial plant and cabinet integration.

1.2 Features

1.2.1 Six USB Ports, Six Serial Ports, and Dual LAN Port Capacity for intensive control and communication

- The ARK-7480 supports six USB 2.0 ports, enabling access to USB peripherals such as storage subsystems, security ID devices, card readers, bar code scanners, multifunction printers and scanners individually dedicated or shared among users via the network, making the best of USB device investments
- The ARK-7480 is equipped with dual fast Ethernet and a six serial ports, including one RS-232/422/485 serial port and five RS-232 serial ports that enable communication and control at the field level for measurement and operator control of diverse automations, such as Embedded Device Servers for storage, image printing, medical applications, as well as security and access control for POI/POS/ Kiosk.

1.2.2 Compact, Extremely Robust Construction

- Robust, heavy-duty metal cast construction; modularized design offers maximum space efficiency.
- Rubber anti-vibration card-holder for PC expansion boards to ensure maximum reliability
- A special cushioned design that absorbs vibration of HD to ensure maximum reliability

1.2.3 Highly Optimized Integration

- Simple and modularized service-friendly design
- Quick installation, easy expansion and maintenance
- Systems are supplied to “Ready-to-Run”
- Long life cycle support for product continuity to secure investment

1.2.4 Dual Display, Video Intensive capacity

- Rich display interface of DVI, LVDS, and AC97 audio designed for diversified embedded and industrial applications such as KIOSK, Gaming, ATM, and verified of application server.

1.2.5 Highly Robust Casting Construction

- Compact and Robust construction
- One side access for Easy installation and maintenance.

1.2.6 Highly Scalable Performance with low power consumption

- Scalable Pentium 4, Celeron and Celeron D processor system to bring high computing performance.

1.2.7 Optimized Integration

- Systems are supplied ready to run
- Long life cycle support for product continuity

1.3 Hardware Specification

1.3.1 Processor System

- **Processor Support**

  Support Socket 478, Embedded Intel Celeron D and Pentium 4 up to 2.8 GHz

- System chipset

  Intel 852 GME Graphics Memory Controller Hub (GMCH) Chipset

  Intel ICH4 Chipset

- BIOS

  4 Mbit Flash BIOS, supports Plug & Play, APM 1.2

- System memory

  Built-in 2 x 184-pin DIMM sockets, support DDR 333 SDRAM up to 2 GB

1.3.2 Display

- **Chipset**

  Integrated graphics built-in Intel® 852GME GMCH utilizing Intel® Extreme Graphics 2 technology

- **Display Memory**

  Dynamic video memory allocation up to 64 MB

- **Display Interface support**

  -CRT Interface

  -36-bit LVDS interface, optional support up to 48-bit

  -DVI interface, compliant with DVI specification 1.0

- **Display Mode and Resolution Support**

  -CRT Display Mode:

  Pixel resolution up to 1600 x 1200 @85-Hz and 2048 x 1536 @75Hz

  -LVDS Display Mode:

  Up to UXGA panel resolution with frequency range from 25-MHz to 112-MHz

- **Dual Independent Display: CRT/LVDS/DVI**

  -Combination:

  CRT+LVDS,

  CRT+DVI

1.3.3 Ethernet

- **Ethernet Controller**

  Dual Intel 82551 ER 10/100BaseT Ethernet Controllers

- **Ethernet Interface**

  Built-in Dual RJ45 ports as LAN 1 and LAN 2

1.3.4 Audio

- **Audio controller**

  Built-in Audio controller on Intel ICH4 Chipset

  Built-in system Realtek ALC202 AC97 Codec

  Dual 2.2 W Amplifier, support AC97 3D surround stereo sound

- **Audio Interface**

Supports Mic_In and Speak-out by double stacks of PC99 Phone Jack connectors

1.3.5 Serial Port

- Support Six serial ports of:

  COM1 RS-232

  COM2: RS-232/422/485 by internal jumper selection

  COM3, COM4, COM5, COM6: RS-232

1.3.6 Parallel Port

- Support One parallel port

1.3.7 USB

- Support 6 x USB 2.0 Ports for model ARK-7480-100A1
- Support 4 x USB 2.0 Ports for model ARK-7480-200A1

1.3.8 Expansion

- Built in 3 PCI Slots for PC Board expansion, PCI Rev. 2.2 Compliant
- Built-in 1 x miniPCI Slot, access from the bottom

1.3.9 Storage Dive Bay

- SSD:

  Support 1 x CompactFlash socket for Type I/II CompactFlash disk, access from the bottom

- HDD drive:

  Support 1 x drive bay space for 3.5" HDD

1.3.10 Other

- **Watchdog Timer:** 255 levels timer interval, setup by software
- **Keyboard/Mouse:** Two mini-DIN connectors support PS/2 keyboard and PS/2 mouse

1.3.11 Extended Dive Bay (only for Model ARK-7480-200A1)

- **Optical Drive**

  Built in one Slim DVD-ROM&CD-R/RW of 8 D/24 W/24 E/24 R Combo Drive

- **Card Reader Drive**

  Built-in 1 x USB 2.0 interface of Card Reader drive, support Secure Digital Card, Multi Media Card, Memory Stick (Pro), 3.3 V Smart

Media Card, x D-Picture Card, Type I/II CompactFlash Card, and IBM Microdrive

1.3.12 Internal AC-to-DC ATX Power supply unit

- **Output Rating:** AC 250 W, ATX
- **Input Voltage:** 110 VAC ~ 240 VAC
- **Power switch:** One On/Off Rocker Switch

1.3.13 Mechanical

- **Construction:** Aluminum-metal housing
- **Mounting:** Support Table mount and Wall-mount
- **Dimension (W x H x D):**

  For Model ARK-7480-100A1: 295 mm x 150 mm x 260 mm

  For Model ARK-7480-200A1: 295 mm x 180 mm x 260 mm
- **Weight:**

  For Model ARK-7480-100A1:Net 6.5 KG

  For Model ARK-7480-200A1:Net 7 KG

1.3.14 Environment Specifications

- **Operating Temperature**

  0 to 45°C (32 to 113°F),
- **Relative humidity**

  0~95% @ 40 °C (non-condensing)
- **Vibration loading during operation**

  1 Grms, IEC 60068-2-64, random, 5 ~ 500 Hz, 10 Oct./min., 1hr/axis.
- **Shock during operation**

  10 G, IEC 60068-2-27, half sine, 11ms duration
- **Safety**

  UL, CB
- **EMC**

  CE, FCC Class A

1.4 Chassis Dimensions

1.4.1 Dimensions of ARK-7480-100A1

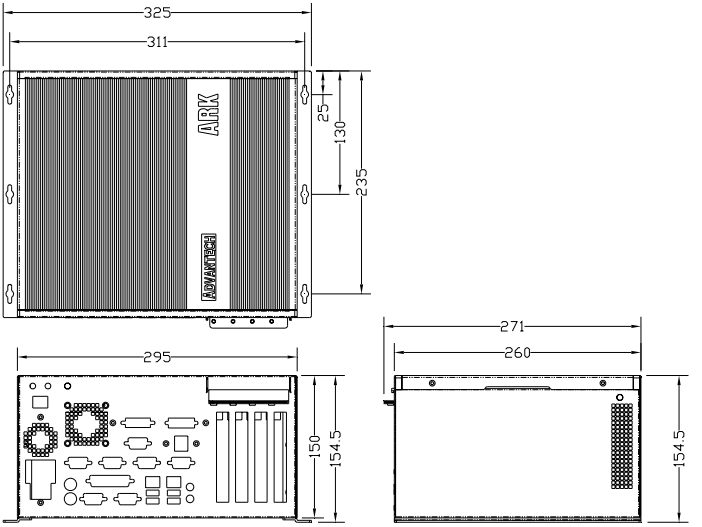


Figure 1.1: Dimension of ARK-7480-100A1

1.4.2 Dimensions of ARK-7480-200A1

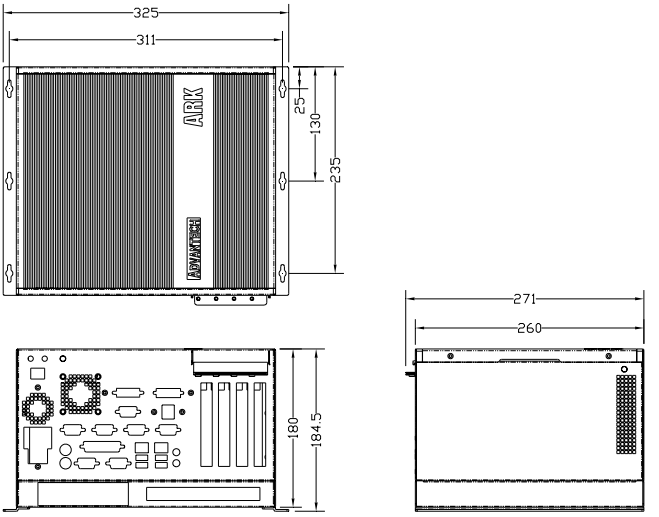


Figure 1.2: Dimension of ARK-7480-200A1

CHAPTER 2

Hardware Functionality

This chapter shows how to set up the ARK-7480's hardware functions, including connecting peripherals, switches and indicators.

Sections include:

- Introduction of ARK-7480 External I/O Connectors
- ARK-7480 front metal panel external I/O connectors
- Power on button
- LED Indicators
- LVDS Connector
- COM1/COM3~COM6 Connectors
- COM2 Connector
- Printer Connector
- Audio Connector
- DVI Connector
- Ethernet Connector
- PS2 Keyboard/Mouse Connector
- VGA Connector
- USB1~USB6 Connectors

Chapter 2 Hardware Functionality

2.1 Introduction of ARK-7480 External I/O Connectors

The following figure shows the external I/O connectors on ARK-7480, and the following sections give you detailed information about the functions of each I/O connector.

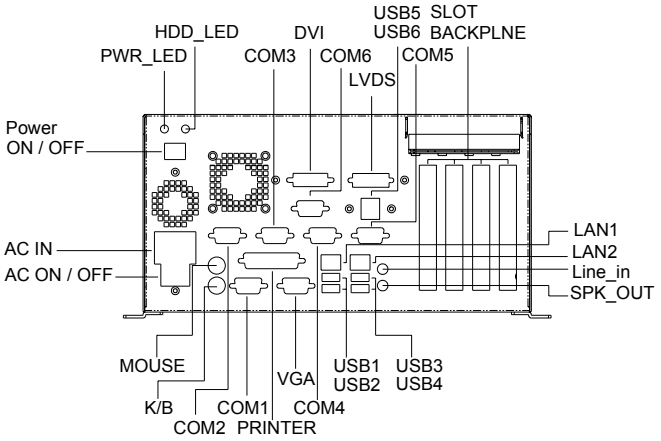


Figure 2.1: Front metal panel external I/O connectors of Model: ARK-7480-100A1

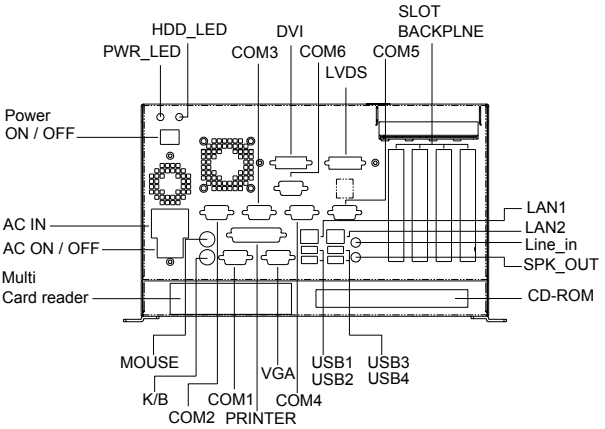


Figure 2.2: Front metal panel external I/O connectors of Model: ARK-7480-100A1

2.2 Front metal panel external I/O connectors

2.2.1 Power ON/OFF Button

The ARK-7480 comes with a Power On/Off button, that Support dual function of Soft Power -On/Off (Instant off or Delay 4 Second), and Suspend.

2.2.2 LED Indicators

There are two LEDs on the ARK-7480 front panel for indicating system status: PWR LED is for power status and flashes in Green color; HDD LED is for hard disk and compact flash disk status, which flashes in Red color.

2.2.3 Power Input Connector

The ARK-7480 comes with a 3-pin Plug-In block & DIP Type connector that carries AC 100~240V external power input.

2.2.4 COM1, COM3~COM6 Connector

The ARK-7480 provides 5 of D-sub 9-pin connectors, which offers one standard RS-232 serial communication interface port of COM1,COM3, COM4, COM5 and COM6.

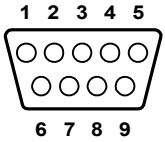


Figure 2.3: COM1, COM3~COM6 connector

Table 2.1: COM1, 3~COM6 standard serial port pin assignments

Pin	Signal Name
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

2.2.5 COM2 Connector

The ARK-7480 provides a D-sub 9-pin connector, which supports one RS-232/422/485 serial communication interface port of COM2.

The default setting of COM2 is RS-232.

The RS-422/485 mode of COM2 can be support via replacing the existing of internal RS-232 cable to RS-422/485 cable of part number 170002175, and adjust the jumper of JP5.

Please also refer to Section 3.4 of "COM2 RS-232/422/485 Jumper setting (JP5)" for the jumper table of JP5

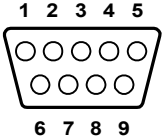


Figure 2.4: COM2 connector

Table 2.2: COM2 standard serial port pin assignments

	RS-232	RS-422	RS-485
Pin	Signal Name	Signal Name	Signal Name
1	DCD	Tx-	DATA-
2	RxD	Tx+	DATA+
3	TxD	Rx+	NC
4	DTR	Rx-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

Note: NC represents "No Connection"

2.2.6 Printer Connector

The ARK-7480 provides a D-sub 25-pin connector, which offers one standard Parallel port.

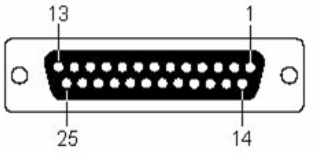


Figure 2.5: LPT connector

Table 2.3: Printer Connector			
Pin	Signal Name	Pin	Signal Name
1	STROBE*	14	AUTO FEED*
2	PD0	15	ERROR
3	PD1	16	INIT*
4	PD2	17	SELECT IN*
5	PD3	18	GND
6	PD4	19	GND
7	PD5	20	GND
8	PD6	21	GND
9	PD7	22	GND
10	ACK*	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SELECT		

Note: " * " represents "No Connection"

2.2.7 Audio Connector

The ARK-7480 offers AC97 stereo Audio output ports by two phone jack connectors of Speaker_Out and Mic_In.

Table 2.4: Speaker_Out connector	
Speaker-Out Connector	
Footprint	Phone Jack 3.5f5P, 90 Degree, Female, LIME color, with SHIELDED

Table 2.5: Mic_In connector	
Mic-In Connector	
Footprint	Phone Jack 3.5f5P, 90 Degree, Female, PINK color, with SHIELDED

2.2.8 LVDS Connector

The ARK-7480 comes with a D-Sub 26-pin connector that carries LVDS signal output, and can direct connect to a 36-bit of LVDS LCD Display via external cable.

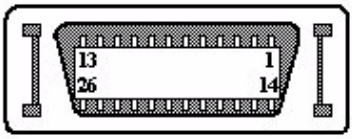


Figure 2.6: LVDS Connector

The system also provides a jumper for JP4 on internal ARK-7480 motherboard for selecting the LCD signal power of 5V or 3.3V, please refer to section 3.3 of Chapter 3 for the jumper table for JP4 setup. The default setting of JP4 is 3.3V.

Table 2.6: LVDS Connector Pin Assignment

Pin	Signal Name	Pin	Signal name
1	LVDS_CLKBP	14	LVDS_CLKBM
2	GND	15	LVDS_YAM0
3	LVDS_YAP0	16	LVDS_YAM1
4	LVDS_YAP1	17	LVDS_YAM2
5	LVDS_YAP2	18	LVDS_CLKAM
6	LVDS_CLKAP	19	GND
7	+3.3 or +5V	20	+3.3 or +5V
8	GND	21	LVDS_YAM3
9	LVDS_YAP3	22	LVDS_YBM0
10	LVDS_YBP0	23	LVDS_YBM1
11	LVDS_YBP1	24	LVDS_YBM2
12	LVDS_YBP2	25	LVDS_YBM3
13	LVDS_YBP3	26	GND

2.2.9 DVI Connector

The ARK-7480 offers a Digital Visual Interface by a D-sub 24-pin female connector, which supports high-speed, high-resolution digital displays.

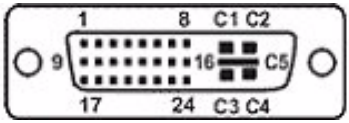


Figure 2.7: DVI Connector

Table 2.7: DVI Connector Pin Assignment	
Pin	Pin name
1	TMDS_C2#
2	TMDS_C2
3	GND
6	MDVI_CLK
7	MDVI_DATA
9	TMDS_C1#
10	TMDS_C1
11	GND
14	VCC_DVI
15	GND
16	HP_DET
17	TMDS_C0#
18	TMDS_C0
19	GND
22	GND
23	TMDS_CK
24	TMDS_CK#
C5	GND

2.2.10 Ethernet Connectors (LAN1 and LAN 2)

The ARK-7480 is equipped with two Intel 82551 ER 10/100BaseT Ethernet Controllers that are fully compliant with IEEE 802.3u 10/100Base-T CSMA/CD standards. The Ethernet ports provides two standard RJ-45 jack connectors with LED indicators on the front side to show its Active/ Link status (Green LED) and Speed status (Orange LED).

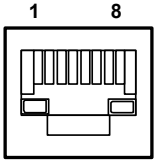


Figure 2.8: RJ-45 Connector

Table 2.8: RJ-45 Connector pin assignments	
Pin	10/100BaseT Signal Name
1	XMT+
2	XMT-
3	RCV+
4	NC
5	NC
6	RCV-
7	NC
8	NC

Note: NC represents "No Connection"

2.2.11 PS2 Keyboard and PS/2 Mouse Connector

The ARK-7480 provides a PS/2 keyboard and a PS/2 mouse connector. Two 6-pin mini-DIN connectors are located on the front panel of the ARK-7480. Please refer to Appendix A. for its pin assignments.

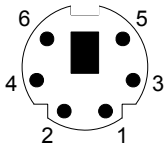


Figure 2.9: PS/2 Keyboard connector

Table 2.9: PS/2 Keyboard connector pin assignments	
Pin	Signal name
1.	PS2_KBDAT
2.	NC
3.	GND
4.	VCC

5.	PS2_KBCLK
6.	NC

Note: NC represents "No Connection"

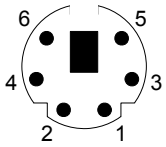


Figure 2.10: PS/2 Mouse connector

Table 2.10: PS/2 Mouse connector pin assignments	
Pin	Signal name
7.	PS2_MSDAT
8.	NC
9.	GND
10.	VCC
11.	PS2_MSCLK
12.	NC

Note: NC represents "No Connection"

2.2.12 VGA Connector

The ARK-7480 provides a high resolution VGA interface by a D-sub 15-pin connector to support a VGA CRT monitor. It supports VGA and VESA, up to 1600 x 1200 @85-Hz and 2048 x 1536 @ 75-Hz resolution and up to 64 MB frame buffer using system memory.

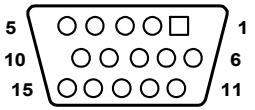


Figure 2.11: VGA connector

Table 2.11: VGA connector pin assignment	
Pin	Signal name
1	Red
2	Green
3	Blue
4	NC

5	GND
6	GND
7	GND
8	GND
9	NC
10	GND
11	NC
12	DDC_DATA
13	H-SYNC
14	V-SYNC
15	DDC_CLK

Note: NC represents "No Connection"

2.2.13 USB Connectors (USB1 ~ USB6)

The ARK-7480 provides up to six connectors (please refer to Section 1.3.7), which gives complete Plug & Play and hot swapping for up to 127 external devices. The USB interface complies with USB UHCI, Rev. 2.0 compliant. The USB interface can be disabled in the system BIOS setup. The USB connector is used for connecting any device that conforms to the USB interface. Many recent digital devices conform to this standard. The USB interface supports Plug and Play, which enables you to connect or disconnect a device whenever you want, without turning off the computer.

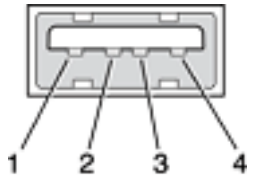


Figure 2.12: USB connector

Table 2.12: Table 2.14 USB Connector	
Pin	Signal name
1	VCC
2	USB_P0-
3	USB_P0+
4	GND

Note: NC represents "No Connection"

CHAPTER 3

Hardware Installation and Upgrade

This chapter introduces how to initialize the ARK7480.

Sections include:

- Jumpers and Connectors
- Installing the DDR SDRAM Memory Module
- Inserting a Compact Flash Card
- Installing the 2.5" Hard Disk Drive (HDD)
- Connecting Power

Chapter 3 Hardware Installation and Upgrade

3.1 Jumpers and Connectors

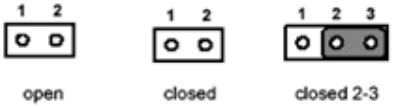
The ARK-7480 Embedded Box Computer consists of an Advantech SBC (Single Board Computer) board that is housed in an aluminum top cover, a metal chassis with accessed bottom plate. Your CPU, HDD and SDRAM, are all readily accessible by removing the aluminum top cover. Any maintenance or hardware upgrades can be easily completed after removing the top cover or the accessed bottom plate.

Warning! Do not remove any mechanical parts, such as the top cover, or bottom plate until you have verified that no power is flowing within the Embedded Box Computer. Power must be switched off and the power cord must be unplugged. Every time you service the Embedded Box Computer, you should be aware of this.

3.2 Setting jumpers

You can configure your ARK-7480 to match the needs of your application by setting jumpers. A jumper is the simplest kind of electrical switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper, you connect the pins with the clip. To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either pins 1 and 2 or pins 2 and 3.

The jumper settings are schematically depicted in this manual as follows:



A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

3.3 Jumper Location

The ARK-7480 Embedded Box Computer has a number of jumpers inside the chassis that allow you to configure your system to suit your application. The table below lists the functions of the various jumpers.

Table 3.1: Jumpers

Jumper No	Function
JP1	COM1~ COM6 Ring / Voltage Setting
JP3	Clear CMOS
JP4	LVDS/LCD Power Setting
JP5	COM2 RS-232/422/485 Setting

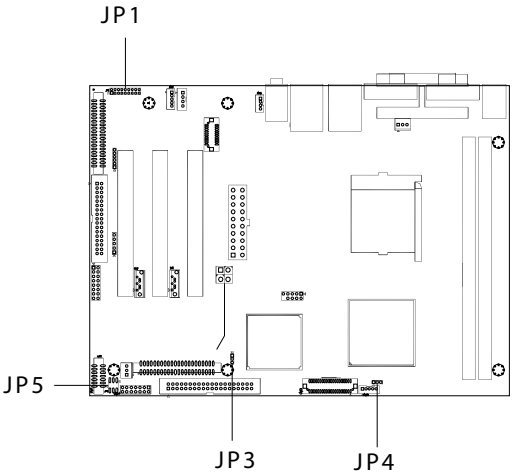


Figure 3.1: Jumper Location of internal SBC board of ARK-7480

3.4 LVDS/LCD Power Select (JP4)

The ARK-7480 series of embedded box computers provide a jumper for JP4 located on internal ARK-7480 motherboard for selecting the LCD signal power of 5V or 3.3V. When you connect your LVDS LCD Panel display, you may need to set up this jumper to suit for your LVDS Panel display.

Table 3.2:

JP4 : LCD Power Setting	
Function	Pin Setting
+5V	1-2 closed
+3.3V *	2-3 closed *

(*): means default setting of the jumper/function

3.5 COM2 RS-232/422/485 Jumper setting (JP5)

The COM2 port located on front metal face plate of ARK-7480 unit which can be configured to operate in RS-232, RS-422 or RS-485 mode by setting up the Jumper Pins of JP5 located on internal motherboard of ARK-7480 unit.

Table 3.3:

JP5 : COM2 RS-232/422/485 Jumper Selection	
Function	Pin Setting
RS-232 *	5-6 closed
RS-422	3-4 closed
RS-485	1-2 closed

(*): means default setting of the jumper/function

3.6 COM 1 ~ COM 6 Ring / Voltage Selection (JP1)

The “RI” signal pin of COM1 ~ COM6 can be configured to support the functions of either carrying the power source of 5V or 12V; or wake on ring.

Table 3.4:

JP1 : COM1~COM6 Ring/Voltage Selection		
Serial Port	Function	Pin Setting

COM1	5V	1-3 closed
	12V	3-5 closed
	Wake On Ring*	Open
COM2	5V	2-4 closed
	12V	4-6 closed
	Wake On Ring*	Open
COM3	5V	7-9 closed
	12V	9-11 closed
	Wake On Ring*	Open
COM4	5V	8-10 closed
	12V	10-12 closed
	Wake On Ring*	Open
COM5	5V	13-15 closed
	12V	15-17 closed
	Wake On Ring*	Open
COM6	5V	14-16 closed
	12V	16-18 closed
	Wake On Ring*	Open

(*): means default setting of the jumper/function

3.7 CMOS Clearance (JP3)

The CMOS RAM is powered by an onboard button cell battery. When you finish BIOS setup, the data in CMOS RAM will be automatically backed up to Flash ROM. Applicant can force system to clear the data in COMS RAM by setting the JP3.

Table 3.5:

JP3 : Clear CMOS Jumper (JP3)	
Function	Pin Setting
Normal *	1-2 closed*
CLEAR RTC	2-3 closed

(*): means default setting of the jumper/function

3.8 Installation of the Central Processing Unit (CPU)

The panel PC's central processing unit (CPU) can be upgraded to improve system performance. The ARK-7480 Embedded Box Computer provides

one 478-pin ZIF (Zero Insertion Force) socket (Socket 478). The CPU must come with an attached heat sink and CPU fan to prevent overheating.

Warning!

The CPU may be damaged if operated without a heat sink and if the fan is not connected to the CPU fan power connector.

Caution!

Always disconnect the power cord from your ARK-7480 Embedded Box Computer when you are working on it. Do not make connections while the power is on as sensitive electronic components can be damaged by the sudden rush of power. Only experienced electronics personnel should open the ARK-7480 Embedded Box Computer.

The procedure of installing a CPU into ARK-7480 is detailed below, please follow these steps carefully.

1. Remove the power cord.
2. Unscrew the four screws from the top cover of ARK-7480.

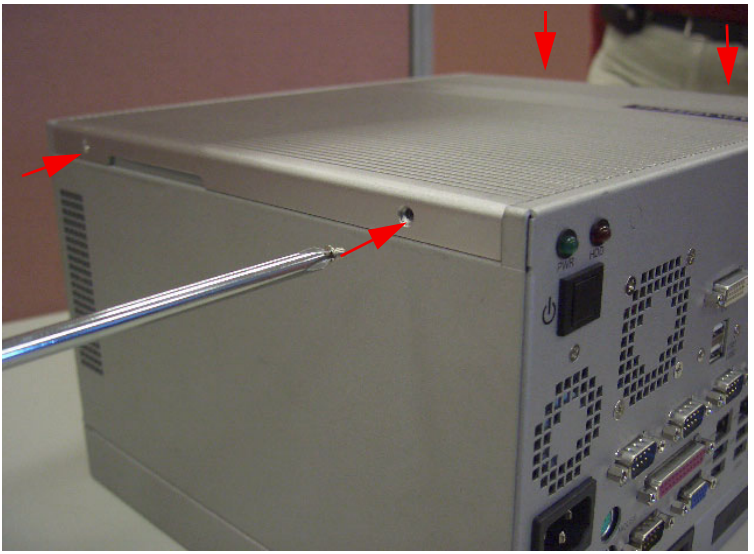


Figure 3.2: Remove Top cover screws

3. Remove the top cover.
4. Unscrew the four screws from card depress bridge bracket.

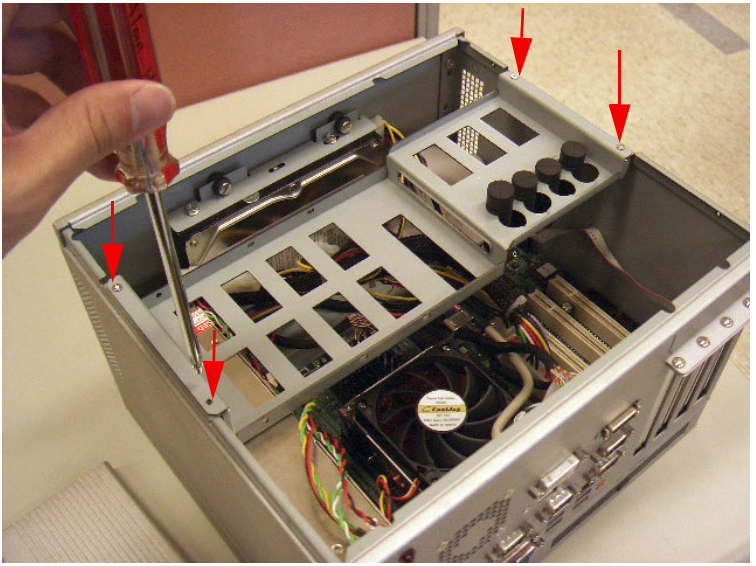


Figure 3.3: Remove card depress bridge bracket screws

5. Remove the card depress bridge bracket.

6. Install the CPU into the CPU socket and apply the thermal grease evenly on the CPU's surface.

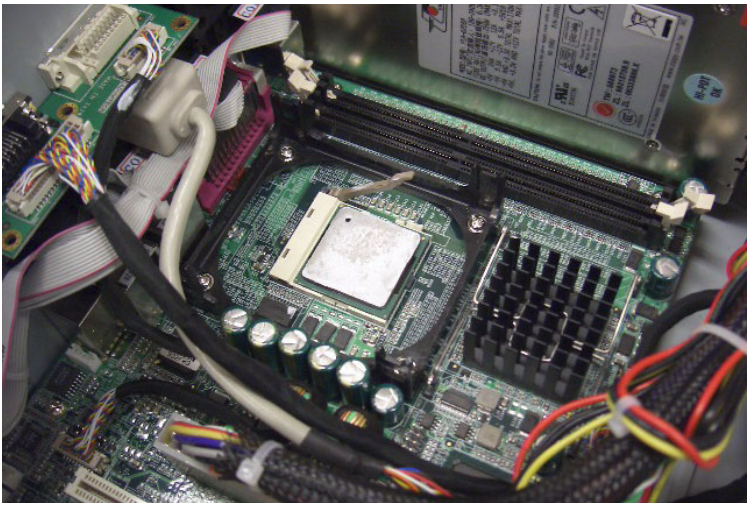


Figure 3.4: Install the CPU and apply the thermal grease

7. Install the heatsink and cooling-fan module and hook on the levers.

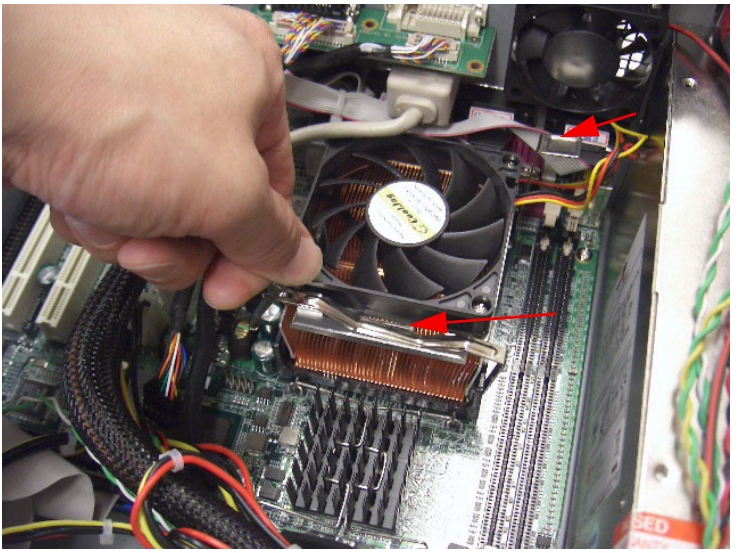


Figure 3.5: Install the heatsink-cooling Fan module

8. Reverse the steps 5.~ step 1. To assembly ARK-7480 back.

3.9 Installation of the DDR SDRAM Memory Module

You can install from 64 MB to 2 GB of DDR SDRAM memory. The ARK-7480 Embedded Box Computer provides two 184-pin DIMM (Dual Inline Memory Module) socket and supports 2.5 V DDR SDRAM.

The procedure of installing a DDR SDRAM DIMM into the ARK-7480 is detailed below, please follow these steps carefully.

1. Remove the power cord.

2. Unscrew the four screws from the top cover of ARK-7480. (Please refer to Figure 3.1)

3. Remove the top cover.

4. Unscrew the four screws from card depress bridge bracket. (Please refer to Figure 3.2)

5. Remove the card depress bridge bracket.

6. Plug a DDR SDRAM DIMM into the motherboard. (Please refer to Figure 3.5)

7. Reverse the steps 5.~ step1. To assembly ARK-7480 back.

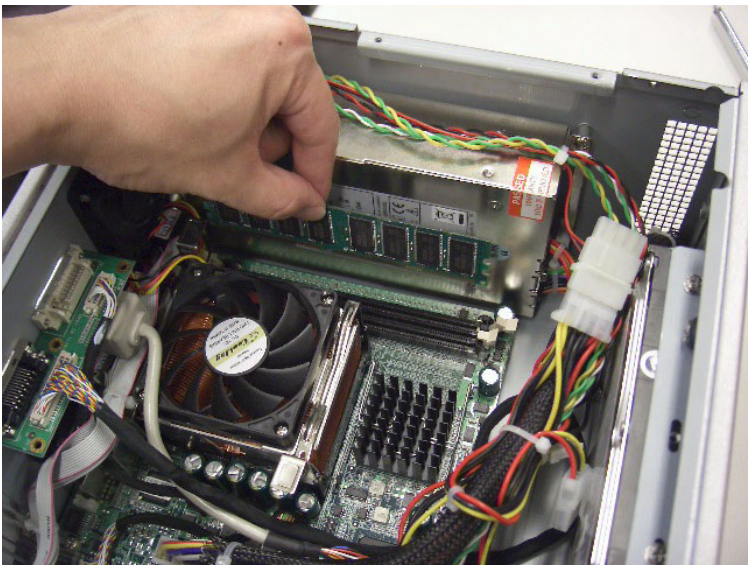


Figure 3.6: Install the SDRAM module

3.10 Insertion of a Mini PCI extension Card

The procedure of installing a Mini PCI extension card into the ARK-7480 is detailed below, please follow these steps carefully.

1. Remove the power cord.

2. Unscrew the 2 screws of the Mini PCI cover from ARK-7480 bottom side and remove the Mini PCI cover.

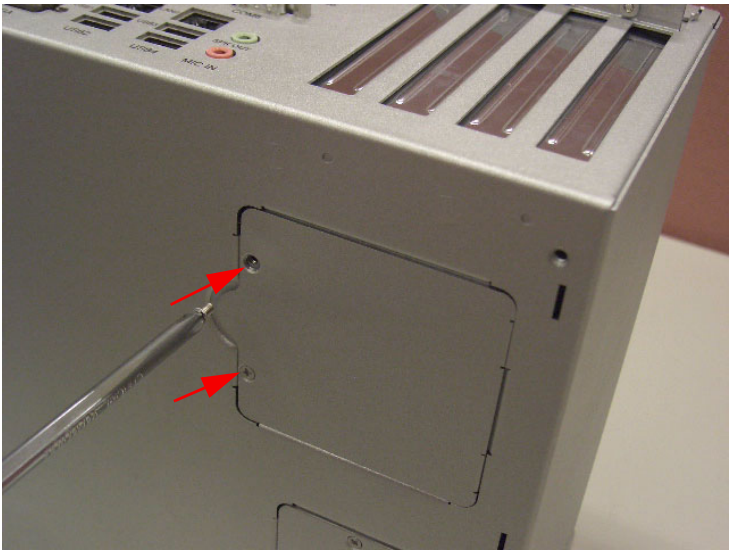


Figure 3.7: Remove the Mini PCI cover from ARK-7480 bottom side

3. Insert a Mini PCI extension card into the Mini PCI slot on the main board

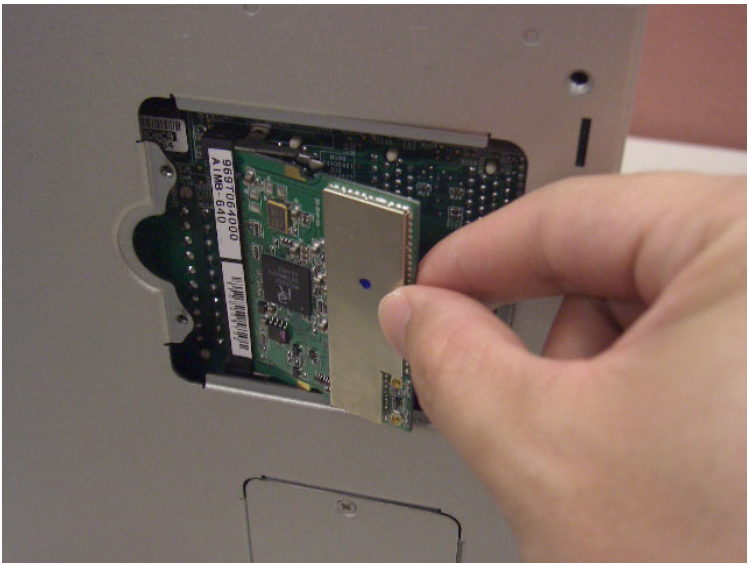


Figure 3.8: Insert the Mini PCI extension card into the Mini PCI slot

3.11 Insertion of a CompactFlash Card

The procedure of installing a CompactFlash card into the ARK-7480 is detailed below, please follow these steps carefully.

1. Remove the power cord.

2. Unscrew the three screws of the CF cover from ARK-7480 bottom side and remove the CF cover.

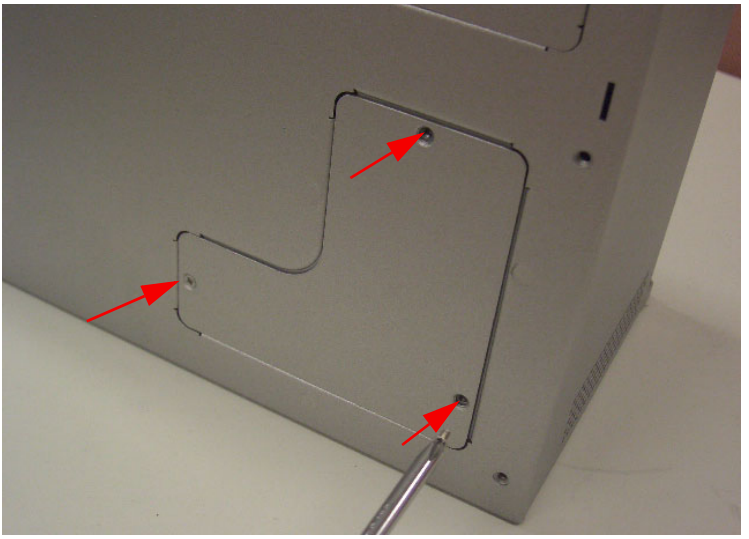


Figure 3.9: Remove the CF cover from ARK-7480 bottom side

3. Plug a CompactFlash card with your OS or application program into a CompactFlash card slot on board.

Figure 3.10: Insert the CF card into the CF card slot

4. Screw back the CF cover with three screws.

Note: The CompactFlash socket is allocated as Secondary IDE Master.

3.12 Installation of the 3.5" Hard Disk Drive (HDD)

You can attach one enhanced Integrated Device Electronics (IDE) hard disk drive to the ARK-7480's internal controller which uses a PCI local-bus interface. The advanced IDE controller supports faster data transfer and allows the IDE hard drive to exceed 528 MB. The following are instructions for installation:

1. Remove the power cord.

2. Unscrew the four screws from TOP cover of the ARK-7480. (Please refer to Figure 3.1)

3. Remove the TOP cover of the ARK-7480.

4. Unscrew the four screws from card depress bridge bracket. (Please refer to Figure 3.2)

5. Remove the card depress bridge bracket.

6. Assemble the hard disk into drive bay

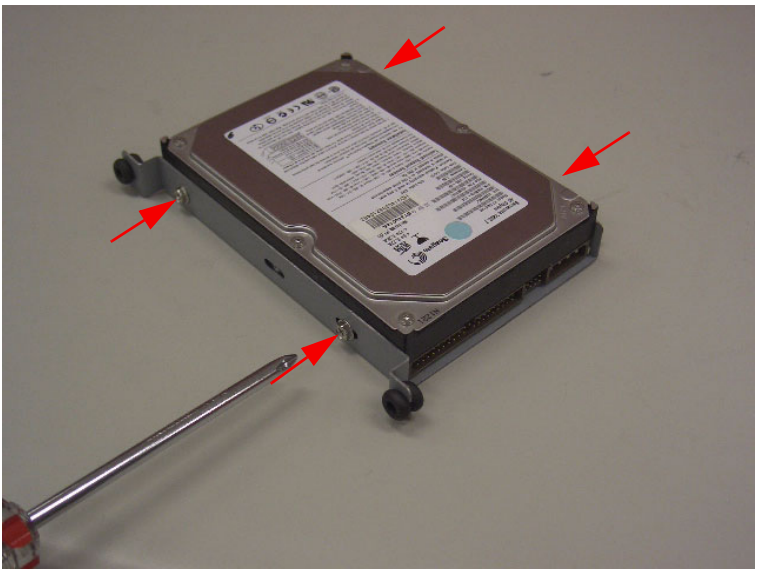


Figure 3.11: Assemble HDD and HDD drive bay

7. Connect the IDE flat cable and Power cable to the connector to the hard disk.

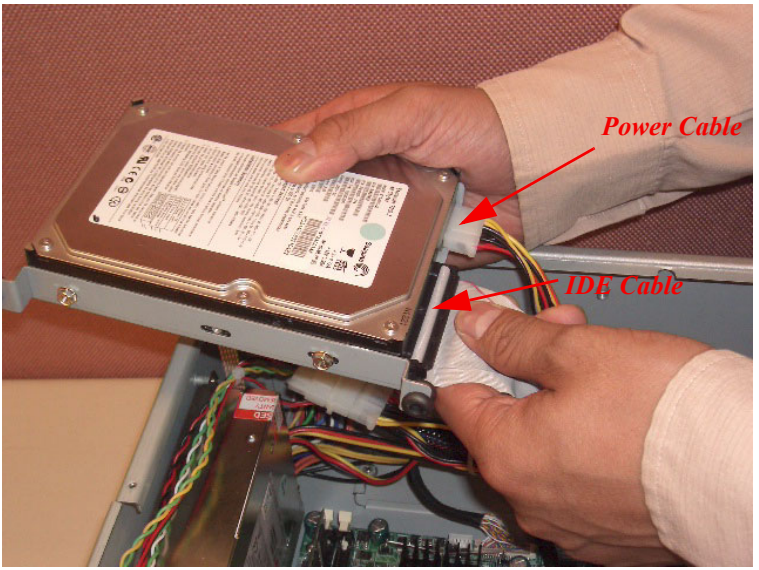


Figure 3.12: Connecting IDE flat cable and power cable

8. Install the HDD drive bay into ARK-7480 with four screws.

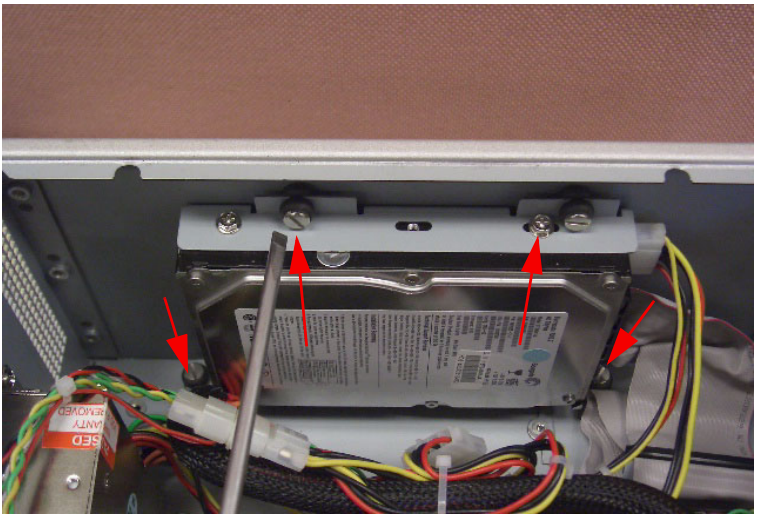


Figure 3.13: Install HDD drive bay

9. Reverse the steps 5.~ step 1. to assembly ARK-7480 back.

3.13 Installation of the PCI extension cards

ARK-7480 has three PCI extension slots. The following are instructions for installation:

1. Remove the power cord.

2. Unscrew the four screws from TOP cover of the ARK-7480. (Please refer to Figure 3.1)

3. Remove the TOP cover of the ARK-7480.

4. Unscrew the four screws from card depress bridge bracket. (Please refer to Figure 3.2)

5. Remove the card depress bridge bracket

6. Unscrew the PCI cover bracket.

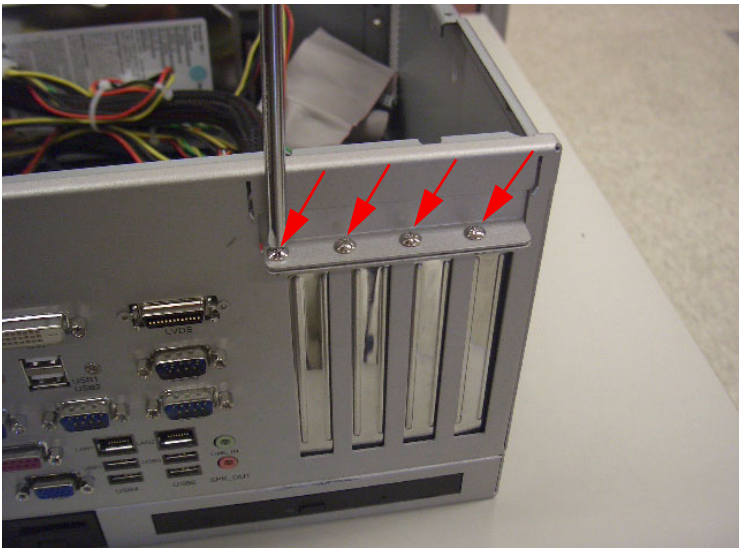


Figure 3.14: Remove the PCI card screws

7. Lift the PCI cover bracket and remove the corresponding PCI bracket of the PCI card expected to install.

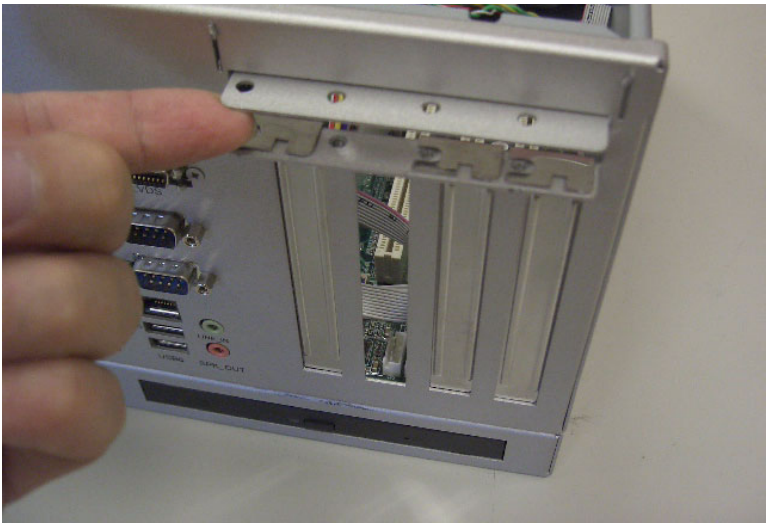


Figure 3.15: Lift the PCI cover bracket and remove the dummy PCI bracket

7. Plug in the PCI card to the corresponding PCI slot.

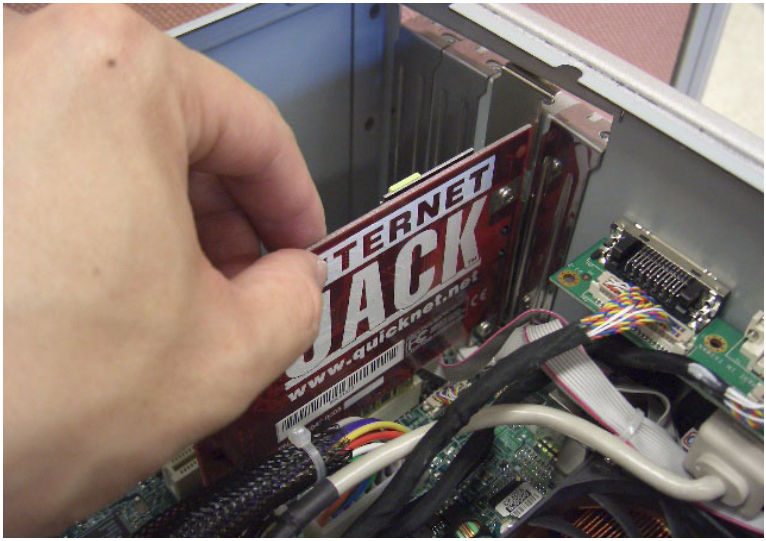


Figure 3.16: Plug in the PCI extension card into the corresponding slot

8. Reverse step 6~1 to assemble back ARK-7480.

3.14 Installation of the 5.25" Slim CD/DVD ROM Drive (for model of ARK-7480-200A1 only)

You can attach one enhanced Integrated Device Electronics (IDE) CD or DVD ROM drive to the ARK-7480's internal controller which uses a PCI local-bus interface. The following are instructions for installation:

1. Remove the power cord.

2. Unscrew the four screws from TOP cover of the ARK-7480. (Please refer to Figure 3.1)

3. Remove the TOP cover of the ARK-7480.

4. Unscrew the four screws from card depress bridge bracket. (Please refer to Figure 3.2)

5. Remove the card depress bridge bracket

6. Unscrew the two screws that fixed for bottom drive bay inside of ARK-7480-200A1 chassis.

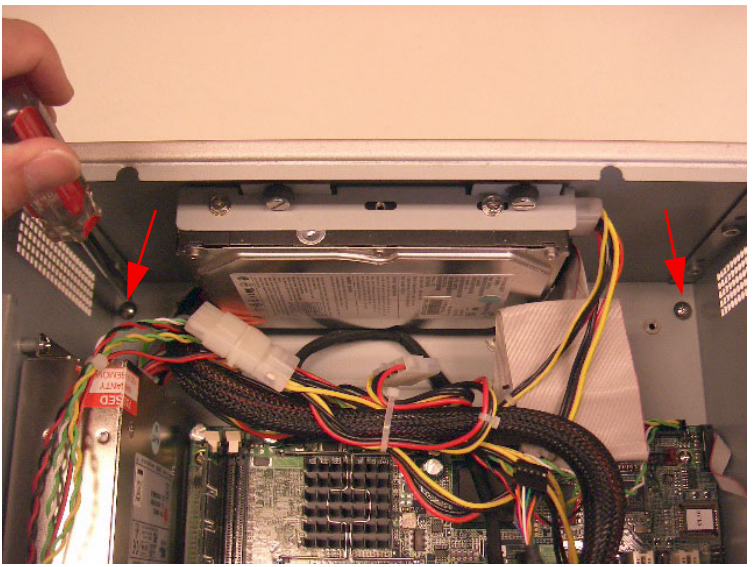


Figure 3.17: Remove the drive bay screws

7. Separate the bottom drive bay from the main chassis of ARK-7480.

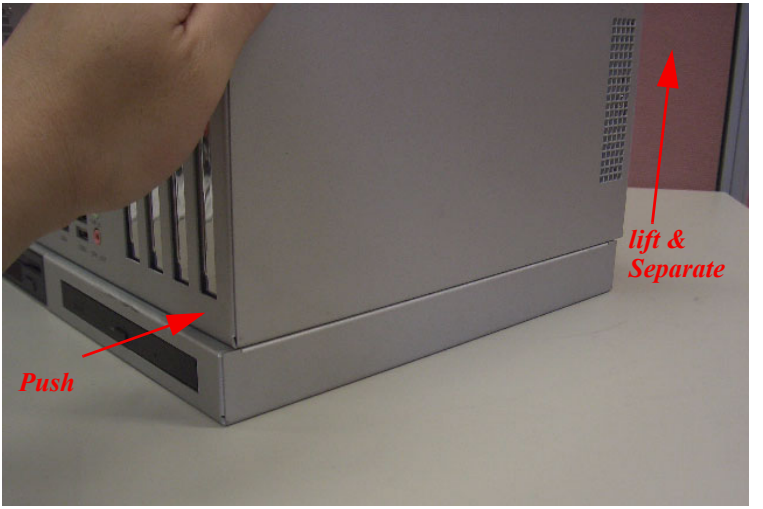


Figure 3.18: Separate the drive bay

8. Fix the CD-ROM/DVD-ROM on the CD-ROM bracket.

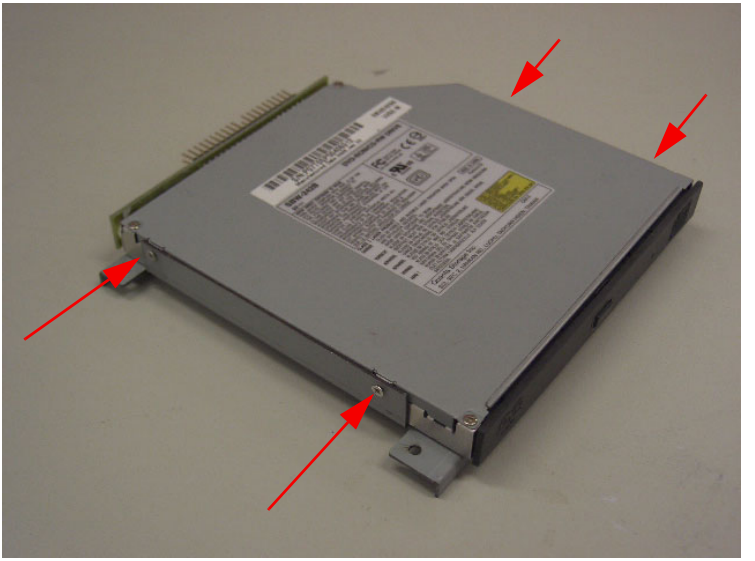


Figure 3.19: Fix the CD-ROM/DVD-ROM on the CD-ROM bracket

9. Assemble CD-ROM adapter board.

Figure 3.20: Assemble CD-ROM adapter board

10. Connect the IDE cable and power cable with the adapter board.

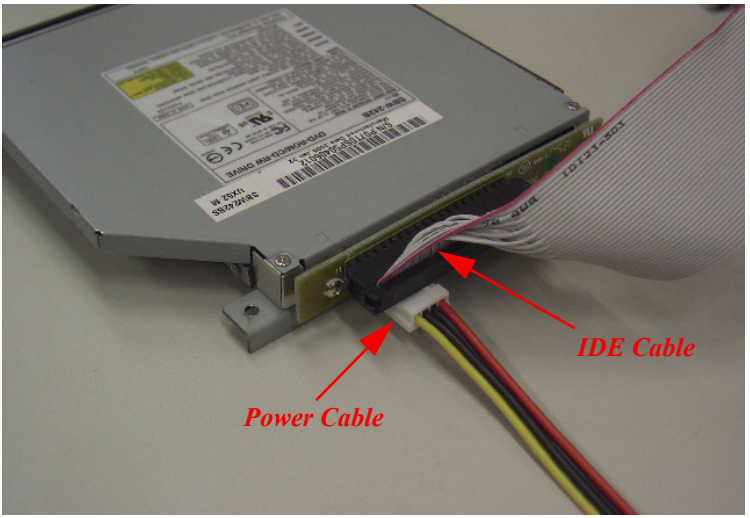


Figure 3.21: Connect IDE cable and power cable with adapter board

11. Fix the CD ROM module into the drive bay.

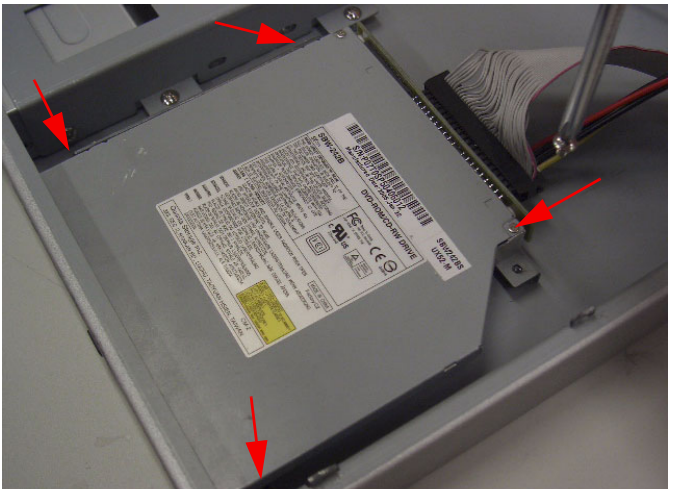


Figure 3.22: Fix the CD ROM module into the drive bay

12. Pass the IDE cable and the power cable through the hole beneath the chassis

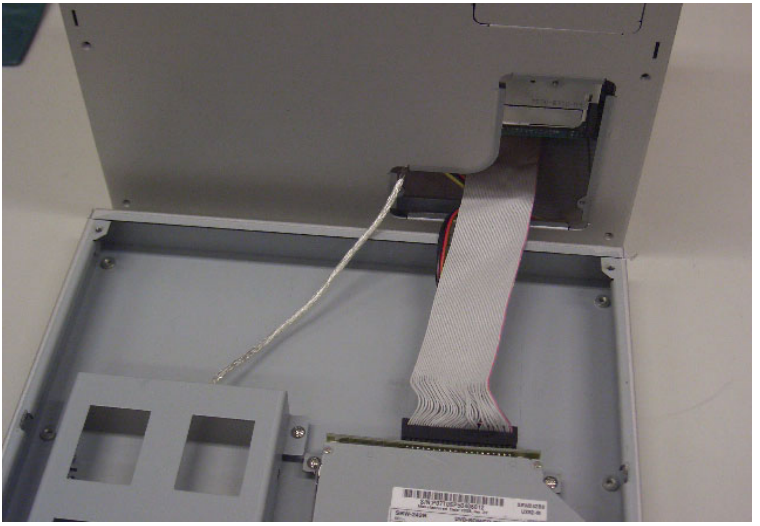


Figure 3.23: Pass the IDE cable and the power cable through the hole beneath the chassis

13. Stacking back the drive bay and connect the power and IDE interface.

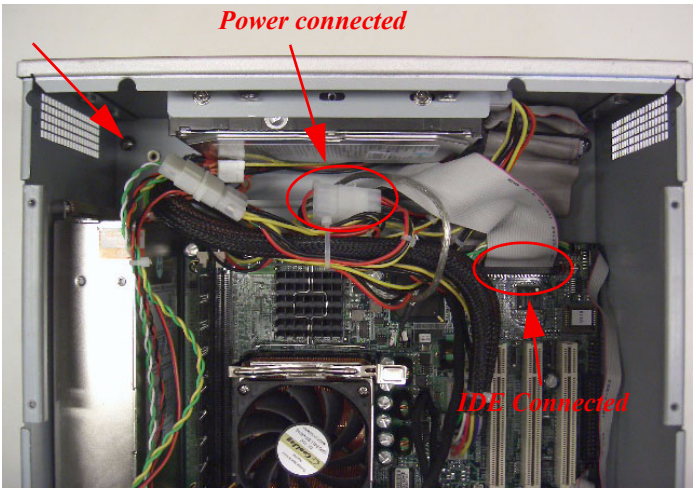


Figure 3.24: Stacking back the drive bay and connect the power and IDE interface

14. Reverse the step 5.~ step 1. to assembly ARK-7480 back.

3.15 Installation of the Multi Card Reader Drive (for model of ARK-7480-200A1 only)

You can attach one Multi Card Reader Drive to the ARK-7480's bottom drive bay. The following are instructions for installation:

1. Remove the power cord.

2. Unscrew the four screws from TOP cover of the ARK-7480. (Please refer to Figure 3.1)

3. Remove the TOP cover of the ARK-7480.

4. Unscrew the four screws from card depress bridge bracket. (Please refer to Figure 3.2)

5. Remove the card depress bridge bracket

6. Unscrew the two screws that fixed for bottom drive bay inside of ARK-7480-200A1 chassis. (Please see Figure 3.17)

7. Separate the bottom drive bay from the main chassis of ARK-7480. (Please see Figure 3.18)

8. Connect the USB cable to the Card Reader.

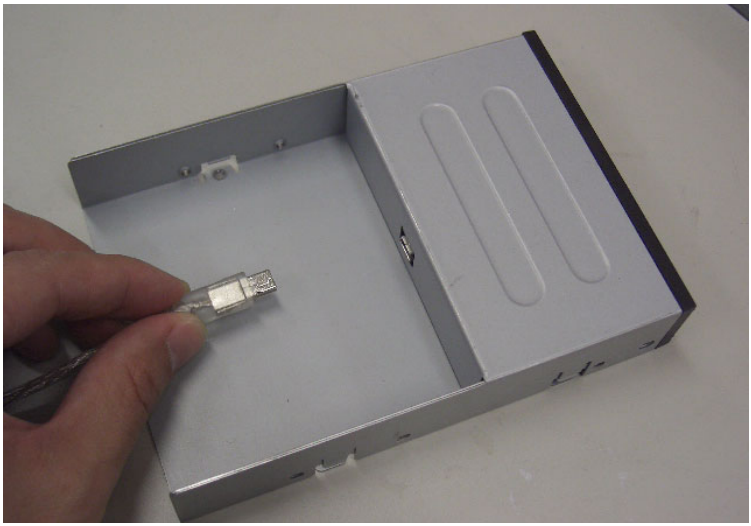


Figure 3.25: Connect the USB cable to the Card Reader

9. Fix the Card Reader with the Card Reader bracket by screws.

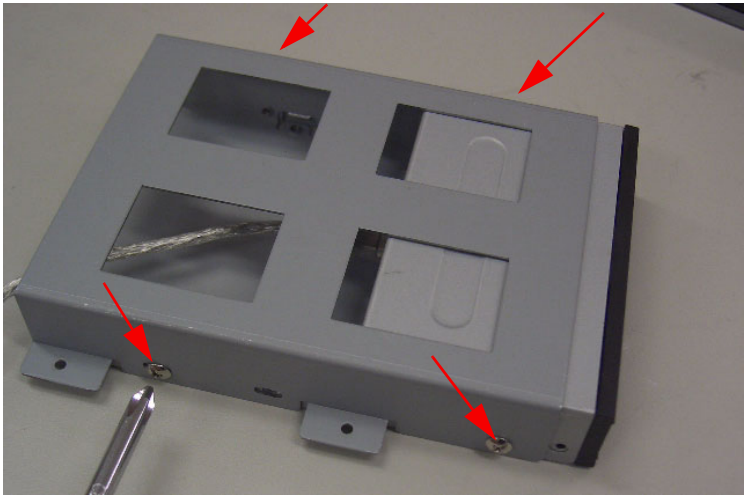


Figure 3.26: Fix the Card reader with the Card reader bracket

10. Fix the Card reader module into the drive bay.

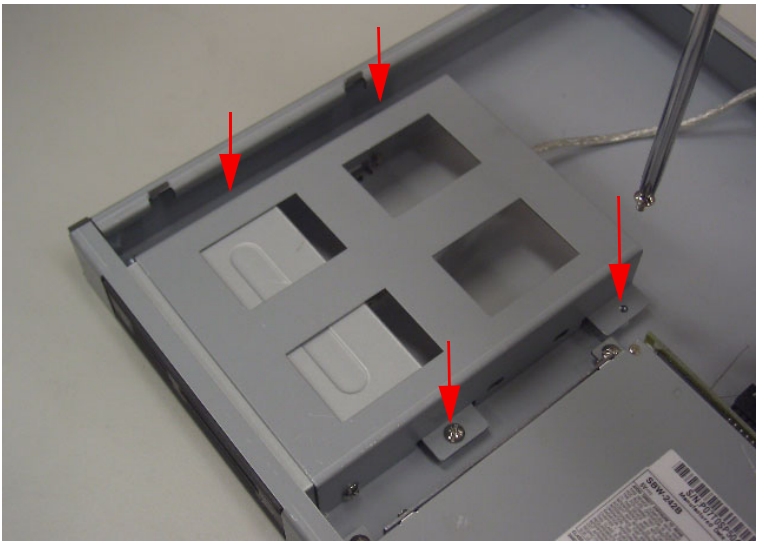


Figure 3.27: Fix the Card Reader module into the drive bay

11. Pass the USB cable through the hole beneath the chassis. (Please see Figure 7.22)

12. Stacking back the drive bay and connect the USB cable to the corresponding connector.

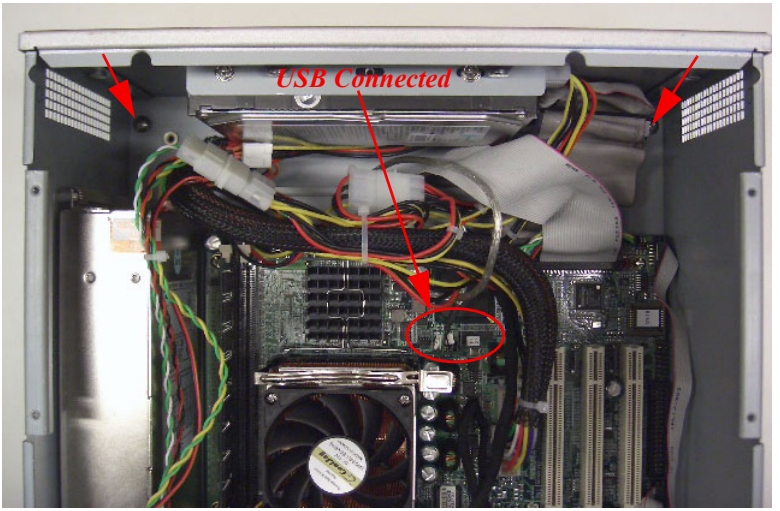


Figure 3.28: Stacking back the drive bay and connect the USB interface

13. Reverse the steps 5.~1. to assemble ARK-7480 back.

3.16 Connecting Power

Connect the ARK-7480 to AC power source. The power source can either be from a power adapter or an in-house power source.

CHAPTER 4

Award BIOS Setup

Chapter 4 Award BIOS Setup

4.1 Introduction

Award's 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 memory (CMOS RAM) so that it retains the setup information when the power is turned off.

4.1.1 CMOS RAM Auto-backup and Restore

The CMOS RAM is powered by an onboard button cell battery. When you finish BIOS setup, the data in CMOS RAM will be automatically backed up to Flash ROM. If the system operates in harsh industrial environment and causes a soft error, BIOS will recheck the data in CMOS RAM and automatically restore the original data in Flash ROM to CMOS RAM for booting.

Note: If you intend to change the CMOS setting without restoring the previous backup, you have to click on "DEL" within two seconds of the "CMOS checksum error..." display screen message appearing. Then enter the "Setup" screen to modify the data. If the "CMOS check sum error..." message appears again and again, please check to see if you need to replace the battery in your system.

4.2 Entering Setup

Turn on the computer and check for the "patch code". If there is a number assigned to the patch code, it means that the BIOS supports your CPU. If there is no number assigned to the patch code, please contact Advantech's applications engineer to obtain an up-to-date patch code file. This will ensure that your CPU's system status is valid. After ensuring that you have a number assigned to the patch code, press <Del> to allow you to enter the setup.

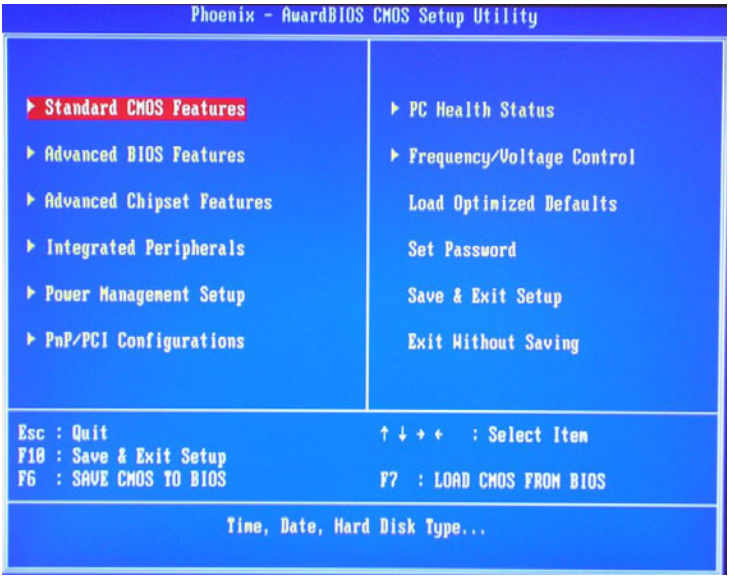


Figure 4.1: Award BIOS Setup initial screen

4.3 Standard CMOS Setup

Choose the "Standard CMOS Features" option from the "Initial Setup Screen" menu, and the screen below will be displayed. This menu allows users to configure system components such as date, time, hard disk drive, floppy drive, display, and memory.

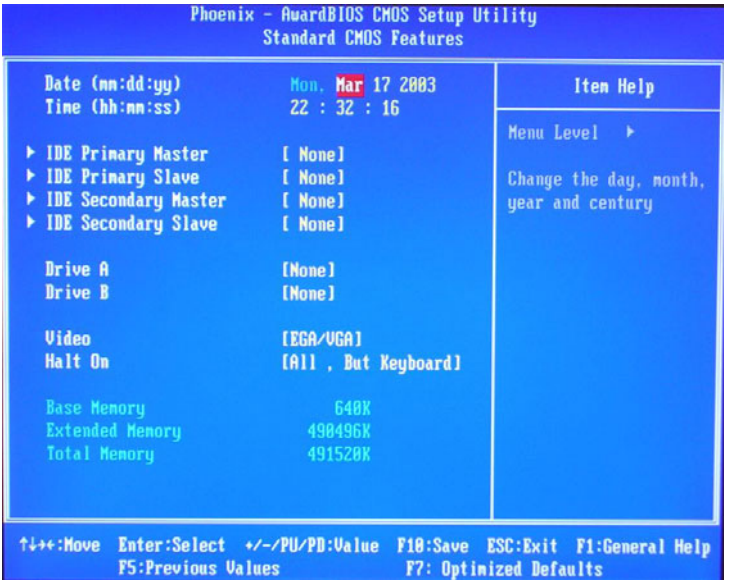


Figure 4.2: Standard CMOS features screen

4.4 Advanced BIOS Features

The "Advanced BIOS Features" screen appears when choosing the "Advanced BIOS Features" item from the "Initial Setup Screen" menu. It allows the user to configure the ARK-7480 according to his particular requirements. Below are some major items that are provided in the Advanced BIOS Features screen. A quick booting function is provided for your convenience. Simply enable the Quick Booting item to save yourself valuable time

Figure 4.3: Advanced BIOS features screen

4.4.1 Virus Warning

If enabled, a warning message and alarm beep activates if someone attempts to write here. The commands are “Enabled” or “Disabled.”

4.4.2 L1 & L2 Cache

Enabling this feature speeds up memory access. The commands are “Enabled” or “Disabled.”

4.4.3 Quick Power On Self Test

This option speeds up the Power-On Self Test (POST) conducted as soon as the computer is turned on. When Enabled, BIOS shortens or skips some of the items during the test. When Disabled, the computer conducts normal POST procedures.

4.4.4 First/Second/Third/Other Boot Device

The BIOS tries to load the OS with the devices in the sequence selected. Choices are: Floppy, LS/ZIP, HDD, SCSI, CDROM, LAN, Disabled.

4.4.5 Swap Floppy Drive

Logical name assignments of floppy drives can be swapped if there is more than one floppy drive. The commands are “Enabled” or “Disabled.”

4.4.6 Boot UP Floppy Seek

Selection of the command “Disabled” will speed the boot up. Selection of “Enabled” searches disk drives during boot up.

4.4.7 Boot Up NumLock Status

This feature selects the “power on” state for NumLock. The commands are “Enabled” or “Disabled.”

4.4.8 Gate A20 Option

Normal:A pin in keyboard controller controls GateA20

Fast (Default):Chipset controls GateA20.

4.4.9 Typematic Rate Setting

The typematic rate is the rate key strokes repeat as determined by the keyboard controller. The commands are “Enabled” or “Disabled.”

Enabling allows the typematic rate and delay to be selected.

4.4.10 Typematic Rate (Chars/Sec)

Accepts the following input values (characters/second) for typematic rate: 6, 8, 10, 12, 15, 20, 24, 30.

4.4.11 Typematic Delay (msec)

Typematic delay is the time interval between the appearances of two consecutive characters, when holding down a key. The input values for this category are: 250, 500, 750, 1000 (msec).

4.4.12 Security Option

This setting determines whether the system will boot up if the password is denied. Access to Setup is always limited.

System *The system will not boot, and access to Setup will be denied if the correct password is not entered at the prompt.*

Setup *The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.*

Note: *To disable security, select “PASSWORD SETTING” in the main menu. At this point, you will be asked to enter a password. Simply press <Enter> to disable security. When security is disabled, the system will boot, and you can enter Setup freely.*

4.4.13 APIC Mode

This setting allows selecting an OS with greater than 64MB of RAM.Commands are “Non-OS2” or “OS2.”

4.4.14 MPS Version Control For OS

This reports if an FDD is available for Windows 95. The commands are "Yes" or "No."

4.5 Advanced Chipset Features

The "Advanced Chipset Features" screen appears when choosing the "Advanced Chipset Features" item from the "Initial Setup Screen" menu. It allows the user to configure the system chipset according to his particular requirements. Below are some major items that are provided in the Advanced Chipset Features screen.

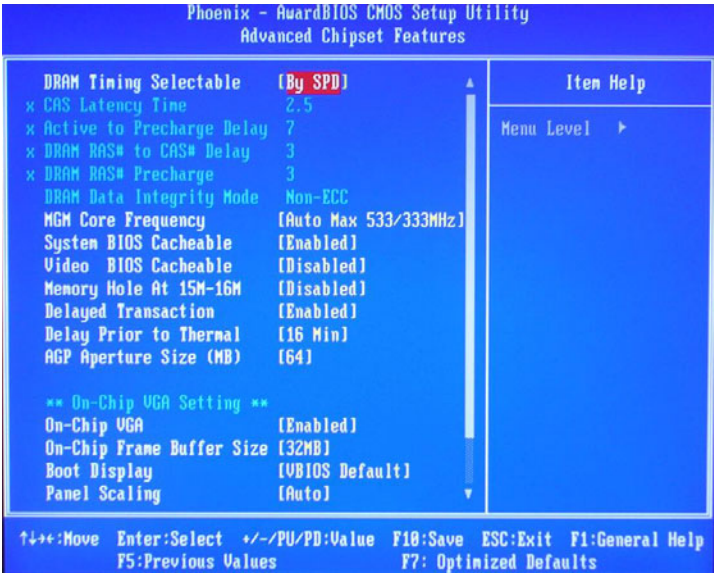


Figure 4.4: Advanced Chipset Features setup

4.5.1 DRAM Timing Selectable

This option refers to the method by which the DRAM timing is selected. The default is By SPD.

4.5.2 CAS Latency Time

You can configure CAS latency time in HCLKs as 2 or 2.5 or 3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

4.5.3 Active to Precharge Delay

The default setting for the Active to Precharge Delay is 7.

4.5.4 DRAM RAS# to CAS# Delay

This option allows you to insert a delay between the RAS (Row Address Strobe) and CAS (Column Address Strobe) signals. This delay occurs when the SDRAM is written to, read from or refreshed. Reducing the delay improves the performance of the SDRAM.

4.5.5 DRAM RAS# Precharge

This option sets the number of cycles required for the RAS to accumulate its charge before the SDRAM refreshes. The default setting for the Active to Precharge Delay is 3.

4.5.6 DRAM Data Integrity Mode

Select ECC if your memory module supports it. The memory controller will detect and correct single-bit soft memory errors. The memory controller will also be able to detect double-bit errors though it will not be able to correct them. This provides increased data integrity and system stability.

4.5.7 MGM Core Frequency

This field sets the frequency of the DRAM memory installed. The default setting is Auto Max 266MHz.

4.5.8 System BIOS Cacheable

The setting of Enabled allows caching of the system BIOS ROM at F000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

4.5.9 Video BIOS Cacheable

The Setting Enabled allows caching of the video BIOS ROM at C0000h-F7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

4.5.10 Memory Hole At 15M-16M

In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB. The choices are Enabled and Disabled.

4.5.11 Delayed Transaction

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1.

4.5.12 Delay Prior to Thermal

This field activates the CPU thermal function after the systems boots for the set number of minutes. The options are 16Min and 64Min.

4.5.13 AGP Aperture Size (MB)

The field sets aperture size of the graphics. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The default setting is 64M.

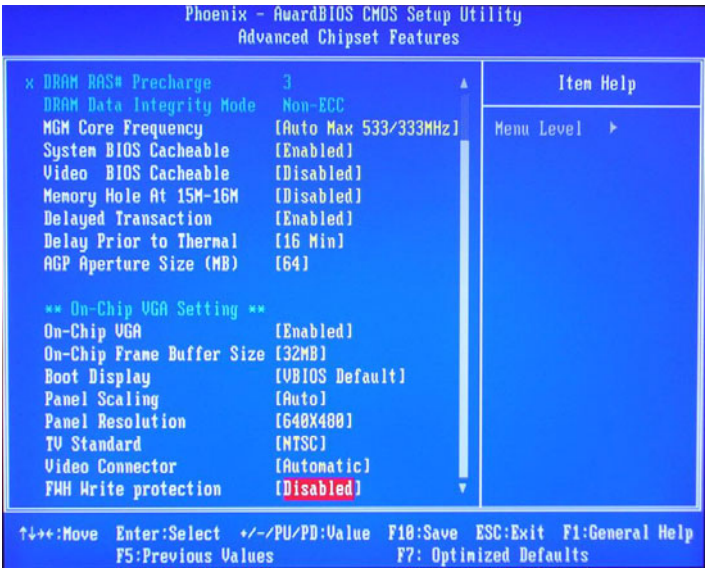


*Figure 4.5: **ON Chip VGA Setting** Screen*

4.5.14 On-Chip VGA

The default setting is Enabled.

4.5.15 On-Chip Frame Buffer Size

The default setting is 32MB. The options available include 1MB, 4MB, 8MB and 16MB.

4.5.16 Boot Display

The default setting is VBIOS Default. The options available include CRT, LVDS, DVI and TV.

4.5.17 Panel Scaling

The default setting is Auto. The options available include On and Off.

4.5.18 Panel Resolution

These fields allow you to select the LCD Panel type. The default values for these ports are:

640 x 480

800 x 600

1024 x 768

1280 x 1024

1600 x 1200

4.6 Integrated Peripherals

This section sets configurations for your hard disk and other integrated peripherals. The first screen shows three main items for user to select. Once an item selected, a submenu appears. Details follow.

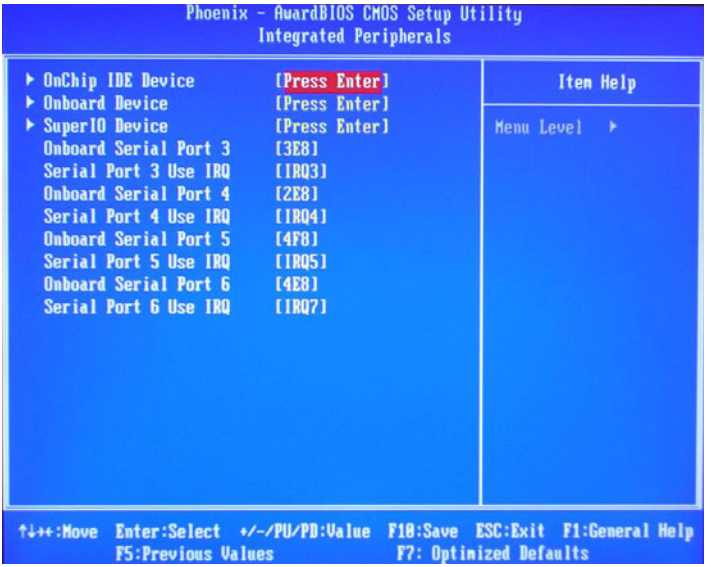


Figure 4.6: Integrated peripherals

4.6.1 IDE Master/Slave PIO/UDMA Mode,

IDE Primary (Secondary) Master/Slave PIO/UDMA Mode (Auto) Each channel (Primary and Secondary) has both a master and a slave, making four IDE devices possible. Because each IDE device may have a different Mode timing (0, 1, 2, 3, 4), it is necessary for these to be independent.

The default setting “Auto” will allow auto detection to ensure optimal performance.

4.6.2 On-Chip Primary/Secondary PCI IDE

If you enable IDE HDD Block Mode, the enhanced IDE driver will be enabled. Leave IDE HDD Block Mode on the default setting.

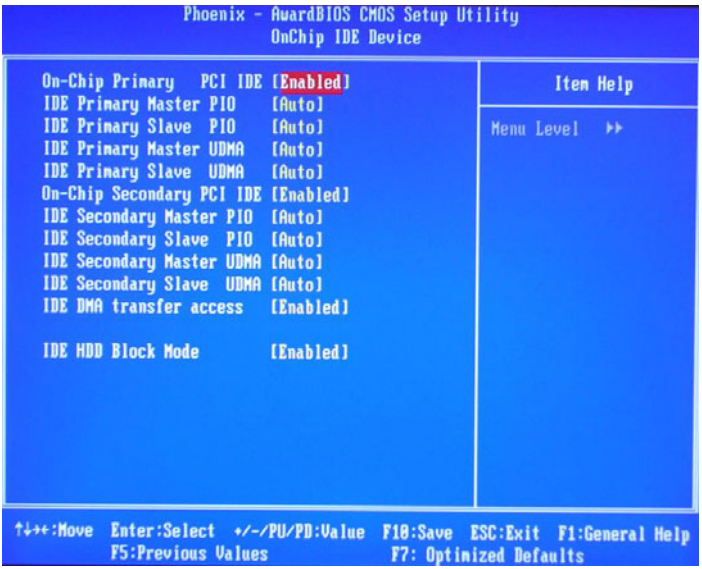


Figure 4.7: On Chip IDE Device

4.6.3 IDE HDD Block Mode

You can enable the Primary IDE channel and/or the Secondary IDE channel. Any channel not enabled is disabled. This field is for systems with only SCSI drives.

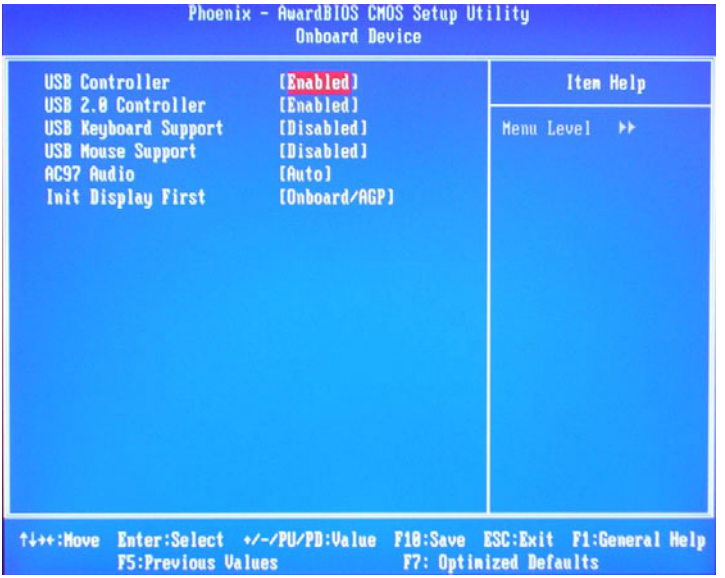


Figure 4.8: Onboard Device

4.6.4 USB Controller

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. The choices: Enabled, Disabled.

4.6.5 USB 2.0 Controller

The options for this field are Enabled and Disabled. By default, this field is set to Enabled. In order to use USB 2.0, necessary OS drivers must be installed first. Please update your system to Windows 2000 SP4 or Windows XP SP1.

4.6.6 USB Keyboard/Mouse Support

Select Enabled if user plan to use an USB keyboard. The choice: Enabled, Disable.

4.6.7 AC97 Audio

Select Disable if you do not want to use AC-97 audio. Option is Auto, Disable.

4.6.8 Init Display First

This item allows you to choose which one to activate first, PCI Slot or on chip VGA. The choices: PCI Slot, Onboard.

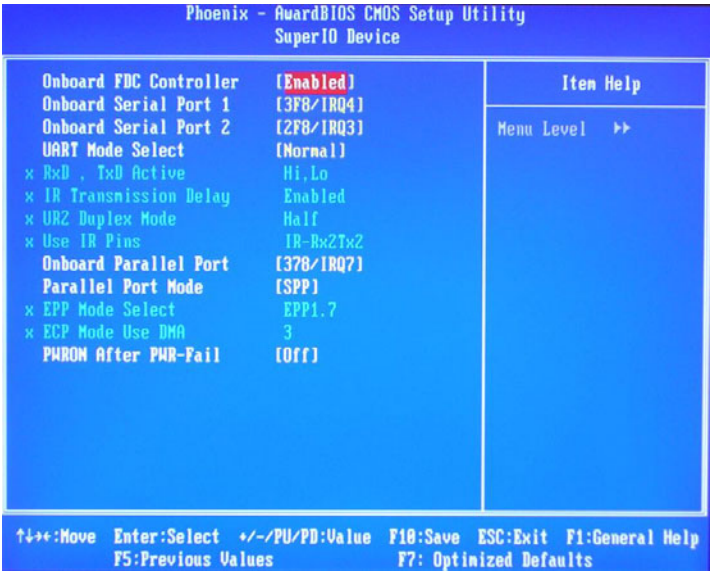


Figure 4.9: Super IO Device

4.6.9 Onboard FDC Controller

When enabled, this field allows you to connect your floppy disk drives to the onboard floppy disk drive connector instead of a separate controller card. If you want to use a different controller card to connect the floppy disk drives, set this field to Disabled.

4.6.10 Onboard Serial Port

These fields allow you to select the IRQ of onboard serial port with their addresses, or you can select Disabled. The default values for these ports are:

Serial Port 1 3F8/IRQ4

Serial Port 2 2F8/IRQ3

4.6.11 UART Mode Select

This item allows you to select UART mode. The choices: IrDA, ASKIR, Normal.

4.6.12 RxD, TxD Active

This item allows you to determine the active of RxD, TxD. The Choices: “Hi, Hi,” “Lo, Lo,” “Lo, Hi,” “Hi, Lo.”

4.6.13 IR Transmission Delay

This item allows you to enable/disable IR transmission delay. The choices: Enabled, Disabled.

4.6.14 UR2 Duplex Mode

This item allows you to select the IR half/full duplex function. The choices: Half, Full.

4.6.15 Onboard Parallel Port

This field sets the address of the on-board parallel port connector. These fields allow you to select the IRQ of onboard serial port with their addresses, or you can select Disabled. The default values for parallel ports are: 378/IRQ7

4.6.16 Parallel Port Mode

This field allows you to set the operation mode of the parallel port. The setting "SPP" allows standard printer port device running at normal speed operation, but in one direction only. "EPP" allows bidirectional parallel port operation at maximum speed. "ECP" allows the parallel port to operate in bi-directional mode and at a speed faster than the maximum data transfer rate. "ECP + EPP" allows normal speed operation in a two-way mode. The default value of Parallel Port Mode is "SPP".

4.6.17 EPP Mode Select

This field allows you to select EPP port type 1.7 or 1.9. The choices: EPP1.7, 1.9. The default value is 1.7.

4.6.18 ECP Mode Use DMA

This selection is available only if you select "ECP" or "ECP + EPP" in the Parallel Port Mode field. In ECP Mode Use DMA, you can select DMA channel 1, DMA channel 3, or Disable. Leave this field on the default setting of 3.

4.6.19 PWRON After PWR-Fail

This selection is allowed you to choose 3 options of "Off", "On" or Former-Sts" for Power setting when abnormal electricity break occurs.

Off When power returns after an AC power failure, the system's power is off. You must press the Power button to power-on the system.

On When power returns after an AC power failure, the system will automatically power-on.

Former-StsWhen power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system's power is off when AC power failure occurs, it will remain off when power returns. If the system's power is on when AC power failure occurs, the system will power on when power returns.

4.7 Power Management Setup

The Power Management Setup allows you to configure your system to most effectively save energy.

4.7.1 ACPI function

The choice: Enabled, Disabled

4.7.2 ACPI Suspend Type

This field is used to select the type of Suspend mode:

“S1 (POS)” : Enables the Power On Suspend function.

“S3 (STR)” : Enables the Suspend to RAM function.

4.7.3 Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes of:

1. HDD Power Down

2. Suspend Mode

There are four selections for Power Management, three of which have fixed mode settings:

Min. Power SavingMinimum power management., Suspend Mod e= 1 hr., and HDD Power Down = 15 min.

Max. Power SavingMaximum power management., Suspend Mode = 1 min., and HDD Power Down = 1 min.

User Defined

(Default)Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

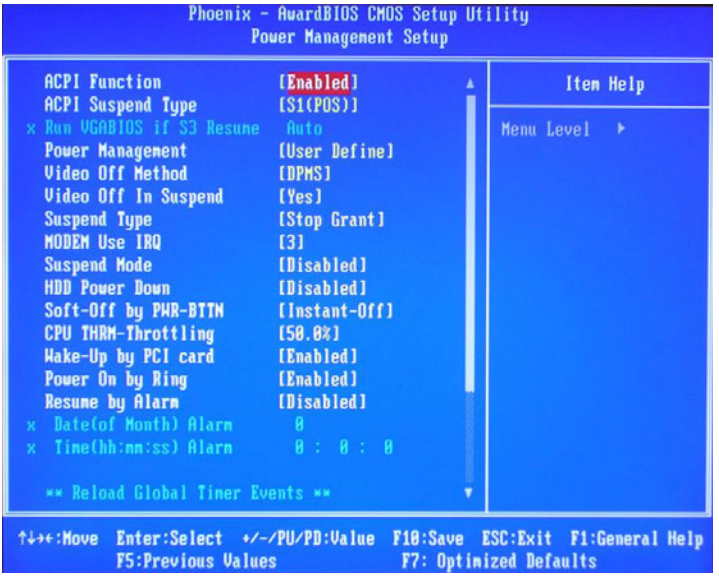


Figure 4.10: Power management setup screen

4.7.4 Video Off In Method

This determines the manner in which the monitor is blanked.

V/H SYNC + BlankThis will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.

Blank ScreenThis only writes blanks to the video buffer.

DPMS SupportInitializes display power management signaling. Select this if your video board supports it.

4.7.5 Video Off In Suspend

When system is in suspend, video will turn off.

4.7.6 Suspend type

The options are Stop Grant and PwrOn Suspend.

4.7.7 Modem Use IRQ

This determines the IRQ in which the MODEM can use. The choices: 3, 4, 5, 7, 9, 10, 11, NA.

4.7.8 Suspend Mode

When the system enters the Suspend mode, the CPU and onboard peripherals will be shut off.

4.7.9 HDD Power Down

You can choose to turn the HDD off after one of the time intervals listed, or when the system is in "suspend" mode. If the HDD is in a power saving mode, any access to it will wake it up.

4.7.10 Soft-Off by PWR-BTTN

If you choose "Instant-Off", then pushing the ATX soft power switch button once will switch the system to "system off" power mode. You can choose "Delay 4 sec." If you do, then pushing the button for more than 4 seconds will turn off the system, whereas pushing the button momentarily (for less than 4 seconds) will switch the system to "suspend" mode.

4.7.11 CPU THRM-Throttling

This field allows you to select the CPU THRM-Throttling rate. The choices: 12.5%, 25.0%, 37.5%, 50.0%, 62.5%, 75.0%, 87.5%.

4.7.12 Wake-up By PCI card

This item allows you to wake up the system via LAN from the remote host. The choices: Enabled, Disabled.

4.7.13 Power On By Ring

Set this field to Enabled to use the modem ring-on function. This will allow your system to power-on to respond to calls coming from an external modem.

4.7.14 Resume By Alarm

When Enabled, your can set the date and time at which the RTC (real time clock) alarm awakens the system from Suspend mode. The choices: Enabled, Disabled.

EnabledWhen Enabled, you can set the date and time you would like the Soft Power Down (Soft-Off) PC to power-on in the "Date (of Month) Alarm" and "Time (hh:mm:ss) Alarm" fields. However, if the system is being accessed by incoming calls or the network (Resume On

Ring/LAN) prior to the date and time set in these fields, the system will give priority to the incoming calls or network.

DisabledDisables the automatic power-on function. (default)

4.7.15 Primary IDE 0 (1) and Secondary IDE 0 (1)

When Enabled, the system will resume from suspend mode if Primary IDE 0 (1) or Secondary IDE 0 (1) is active. The choice: Enabled, Disabled.

4.7.16 FDD, COM, LPT PORT

When Enabled, the system will resume from suspend mode if FDD, COM port, or LPT port is active. The choice: Enabled, Disabled.

4.7.17 PCI PIRQ [A-D]#

When Enabled, the system will resume from suspend mode if interrupt occurs. The choice: Enabled, Disabled.

4.8 PnP/PCI Configurations

This section shows how to configure the PCI bus system. It covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

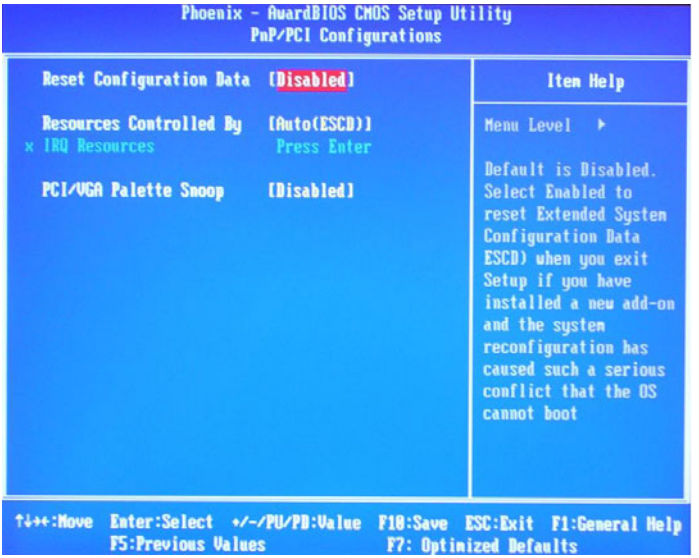


Figure 4.11: PnP/PCI configurations screen

4.8.1 Reset Configuration Data

Default is Disable. Select Enable to reset Extended System Configuration Data (ESCD) if you have installed a new add-on and system e configuration has caused such a conflict that OS cannot boot.

4.8.2 Resources controlled by:

The commands here are “Auto” or “Manual.” Choosing “manual” requires you to choose resources from each following sub-menu. “Auto”

automatically configures all of the boot and Plug and Play devices but you must be using Windows 95 or above.

4.8.3 PCI/VGA Palette Snoop

This is left at "Disabled."

4.9 PC Health Status

This section shows the parameters in determining the PC Health Status. These parameters include temperatures, fan speeds and voltages.

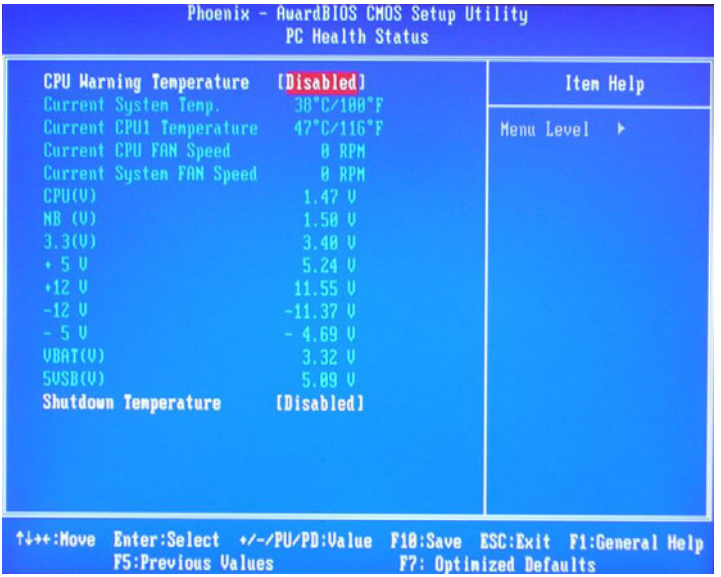


Figure 4.12: PC Health Status screen

4.9.1 CPU Warning Temperature

This field allows the user to set the temperature so that when the temperature is reached, the system sounds a warning. This function can help prevent damage to the system that is caused by overheating.

4.9.2 Temperatures/Voltages

These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.

4.9.3 Shutdown Temperature

This field allows the user to set the temperature by which the system automatically shuts down once the threshold temperature is reached. This

function can help prevent damage to the system that is caused by over-heating.

4.10 Frequency/Voltage Control

By choosing the Frequency/Voltage Control option from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the ARK-7480.

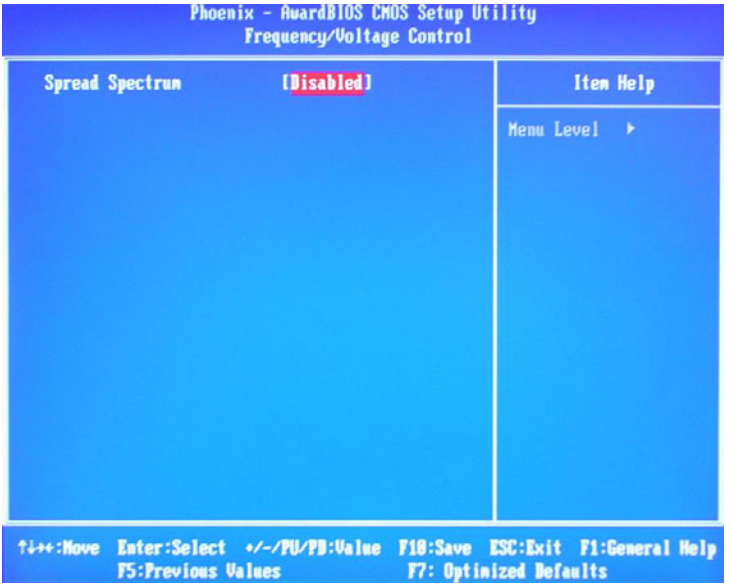


Figure 4.13: Frequency/Voltage Control screen

4.11 Password Setting

To change the password:

1. Choose the "Set Password" option from the "Initial Setup Screen" menu and press <Enter>.The screen will display the following message:

Please Enter Your Password

Press <Enter>

2. If the CMOS is good or if this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen will display the following message:

Please Confirm Your Password

Enter the current password and press <Enter>.

3. After pressing <Enter> (ROM password) or the current password(user-defined), you can change the password stored in the CMOS. The password must be no longer than eight (8) characters. Remember, to enable the password setting feature, you must first select either “Setup” or “System” from the “Advanced BIOS Features” menu.

4.12 Save & Exit Setup

If you select this and press <Enter>, the values entered in the setup utilities will be recorded in the CMOS memory of the chipset. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

4.13 Exit Without Saving

Selecting this option and pressing <Enter> lets you exit the setup program without recording any new values or changing old ones.

CHAPTER 5

PCI SVGA/LCD Setup

This chapter details the software configuration information: It shows you how to configure the graphic setting to match your application requirements. The AWARD System BIOS is covered in Chapter 4

Sections include:

- Installation of SVGA drivers for Windows 2000/XP

Chapter 5 PCI SVGA/LCD Setup

5.1 Introduction

The board has an onboard Intel 852GME chipset for its AGP/SVGA controller. It supports LVDS LCD displays and conventional analog CRT monitors with 64MB frame buffer shared with system memory. The VGA controller can drive CRT displays with resolutions up to 1600 x1200@85-Hz and 2048 x 536 @75Hz and support 2 channel LVDS display mode up to UXGA panel resolution with frequency range from 25-MHz to 112-MHz

5.1.1 CMOS setting for panel type

The ARK-7480 system BIOS and custom drivers are located in a 512Kb Flash ROM device. A single Flash chip holds the system BIOS, VGA BIOS and network Boot ROM image. The display can be configured via CMOS settings. This method minimized the number of chips and different type of LCD panels, please choose "Boot display" from the "Advanced chipset Features" menu in CMOS setting.

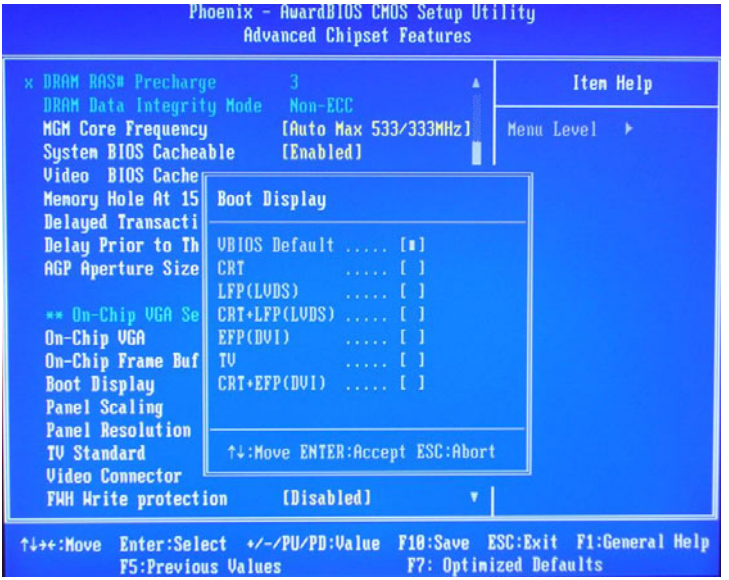


Figure 5.1: BIOS Screen of "Boot Display"

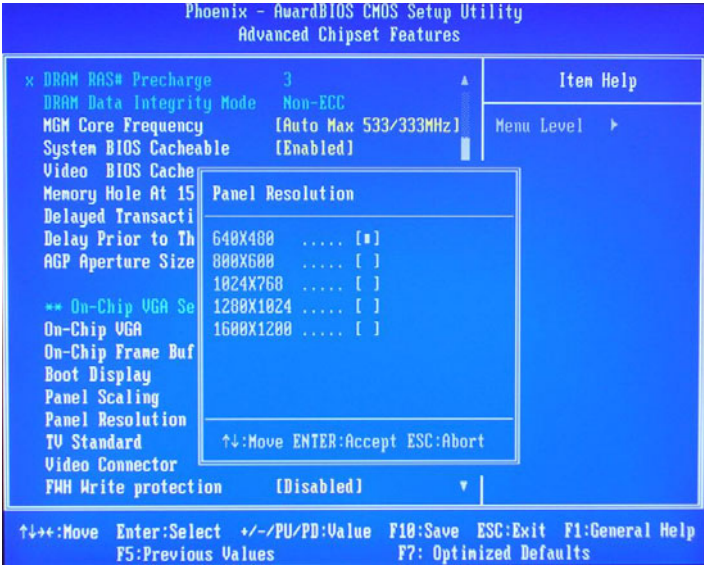


Figure 5.2: BIOS Screen of "Panel Resolution"

5.1.2 Display type

The ARK-7480 can be set in one of three configurations: on a CRT, on a flat panel display, or on both dual independent displays. The system is initially set to dual display mode. If you want to enable the CRT display only or the flat panel display only, please contact Intel Corporation or our sales representative for detailed information.

5.1.3 Dual Independent Display

The ARK-7480 uses an Intel 852GME controller that is capable of providing multiple views and simultaneous display with mixed video and graphics on a flat panel and CRT. To set up dual display under Windows 2000/XP, please refer the figure 5.3 and follow these steps:

1. Select "Start", "Control panel", "Display", "Settings" "Advanced", "Graphics Properties", "Device".

2. Select "1" for current display, or "2" for second display.

3. Enable "Extend my Windows desktop onto this monitor".

4. Click "OK".

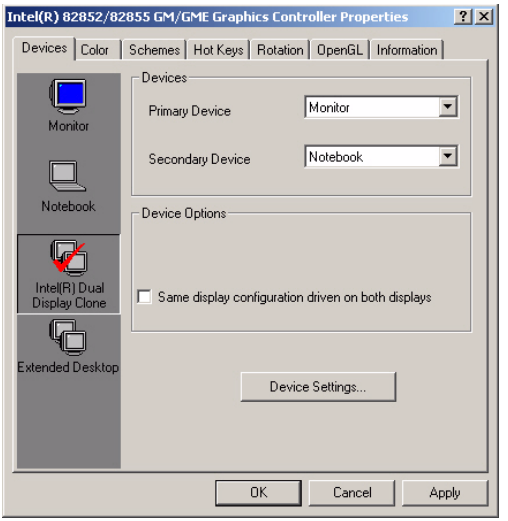


Figure 5.3: Intel® 82852/82855 GM/GME Graphics Controller Properties – Devices

5.2 Installation of the SVGA Driver

Complete the following steps to install the SVGA driver. Follow the procedures in the flow chart that apply to the operating system that you are using within your ARK-7480.

5.2.1 Installation of Windows 2000/XP

1. Find Win2000/XP VGA driver at the directory of "2_VGA\win2k_xp145" from ARK-7480's driver & utility CD-ROM Disk

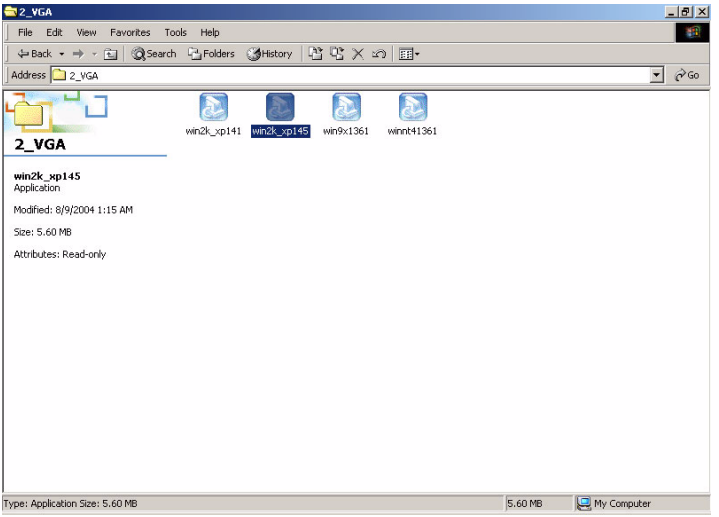


Figure 5.4: Directory "Graphics"

Notes:

- *The windows illustrations in this chapter are intended as examples only. Please follow the listed steps, and pay attention to the instructions which appear on your screen.*
- *For convenience, the CD-ROM drive is designated as "D" throughout this chapter.*

2. Double click "Setup" and "Next" into setup wizard.

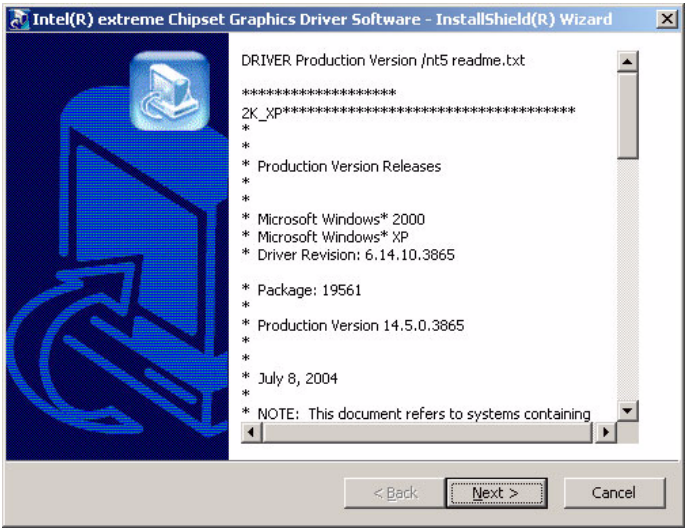


Figure 5.5: Intel extreme Graphics Driver Installation screen

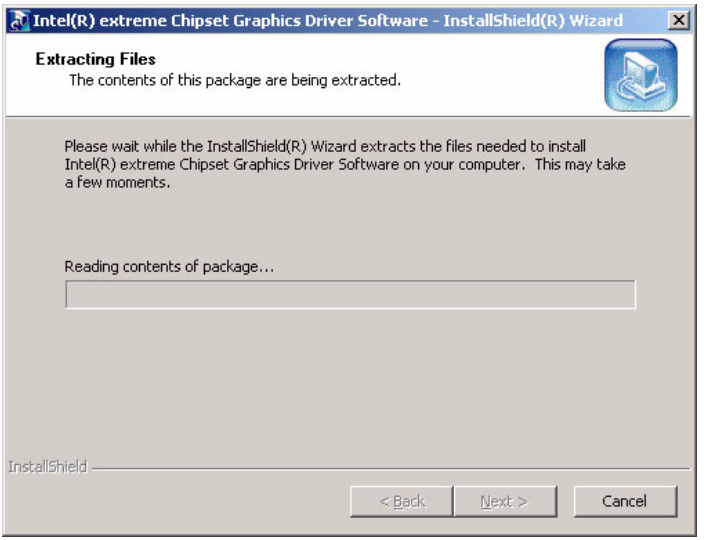


Figure 5.6: Extracting Files screen of Intel extreme Graphics driver installation

3. Click “Next” to install Intel® Graphics Media Accelerator Driver.

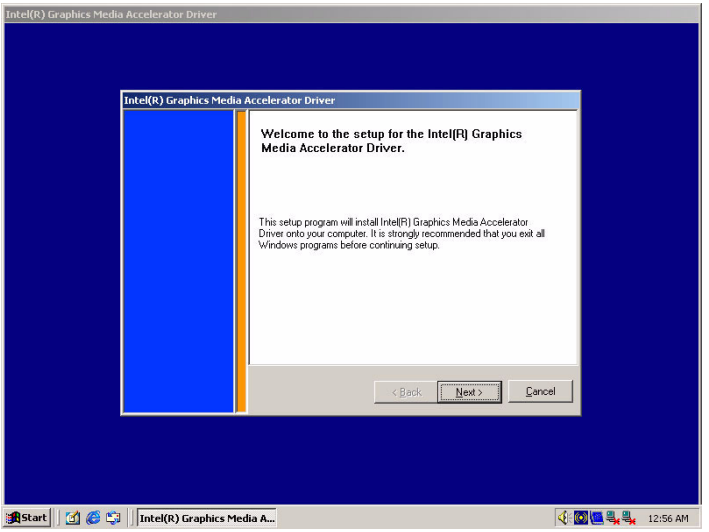


Figure 5.7: Intel Graphics Media Accelerator Driver Installation

4. Click “Yes” to continue setup.

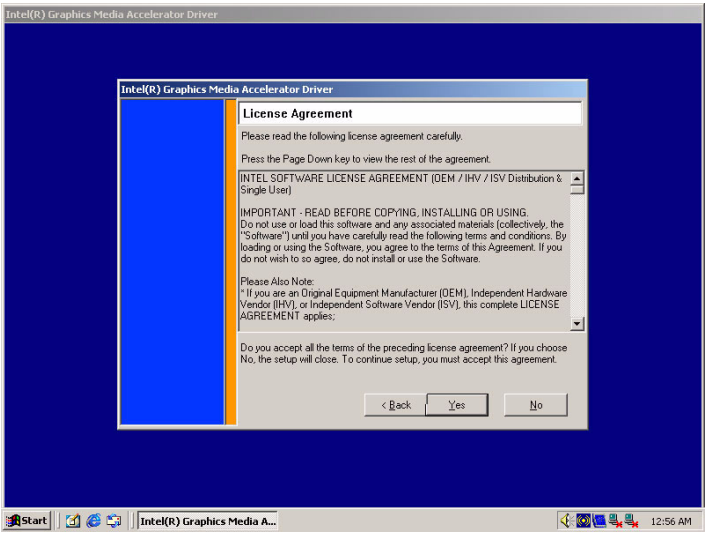


Figure 5.8: Intel Driver License Agreement

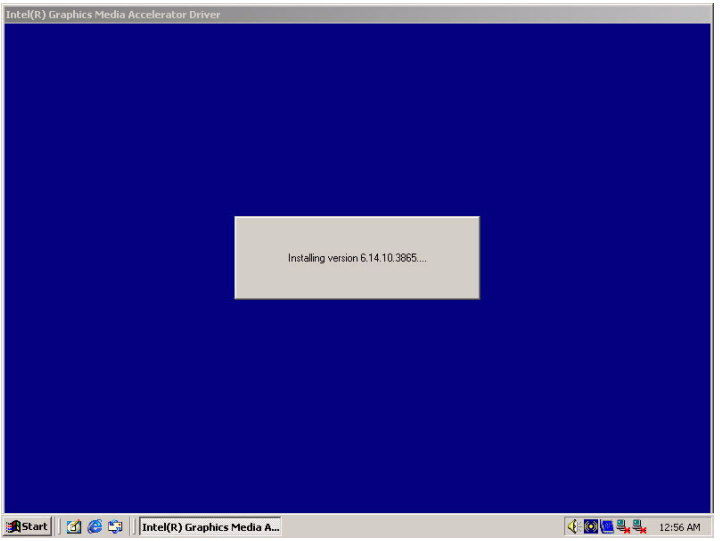


Figure 5.9: Intel Graphics Media Accelerator Driver Version

5. Restart computer when installation finished.

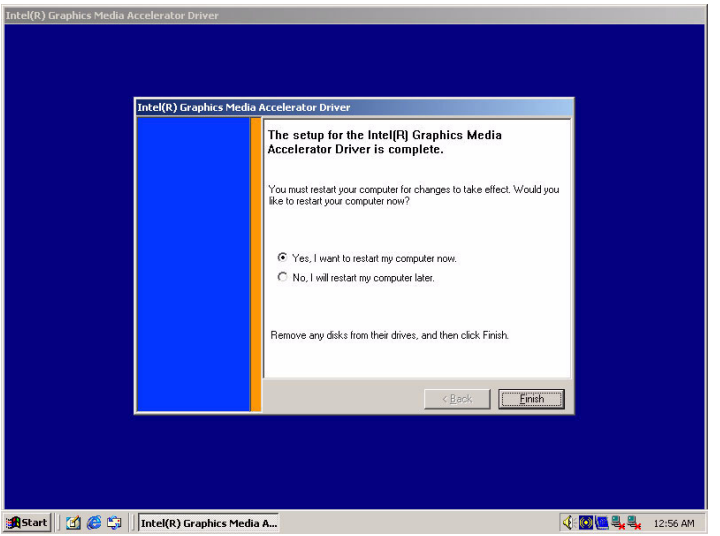


Figure 5.10: Installation Complete

5.3 Further Information

For further information about the AGP/VGA installation in your ARK-7480, including driver updates, troubleshooting guides and FAQ lists, visit the following web resources:

Intel website: www.intel.com

Advantech websites: www.advantech.com,or www.advantech.com.tw

CHAPTER 6

Audio Setup

The ARK-7480 is equipped with an audio interface that records and plays back CD-quality audio. This chapter provides instructions for installing the software drivers included on the audio driver diskettes.

Sections include:

Chapter 6 Audio Setup

6.1 Introduction

The ARK-7480's audio interface provides high-quality stereo sound and FM music synthesis (ESFM) by using the Intel ICH4 audio controller. The audio interface can record, compress, and play back voice, sound, and music with built-in mixer control.

6.2 Driver installation

6.2.1 Before you begin

Please read the instructions in this chapter carefully before you attempt installation. The audio drivers for the ARK-7480 board are located on the audio driver CD. Run the supplied SETUP program to install the drivers; don't copy the files manually.

Note: The files on the software installation diskette are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.

6.2.2 Windows 2000/XP drivers

1. Find Win 2000/XP Audio driver folder at the directory "5_Audio" from the Driver & Utility CD-ROM disk, click "setup" to start the installation process.

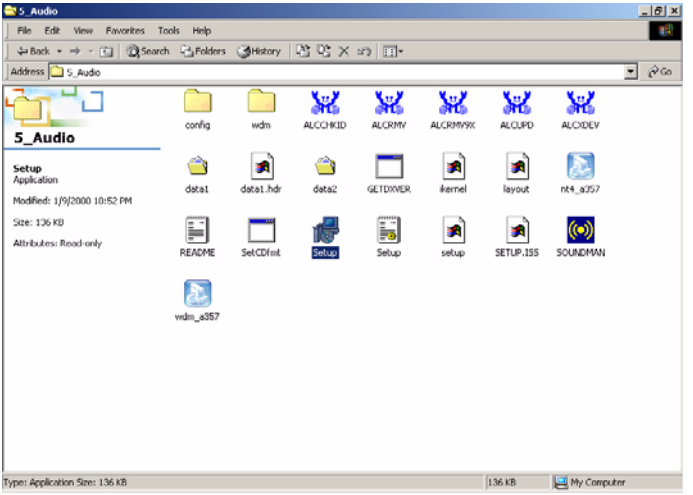


Figure 6.1: Directory of Audio Driver

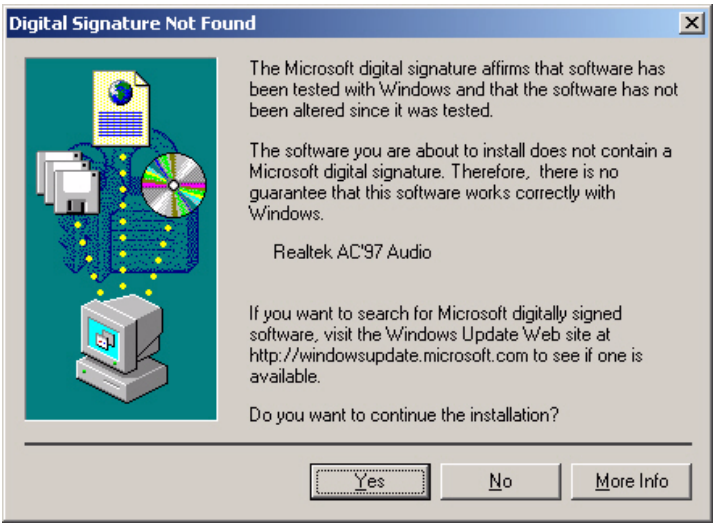


Figure 6.2: AC97 Audio Driver Installation

2. Click "yes" to reboot your computer.

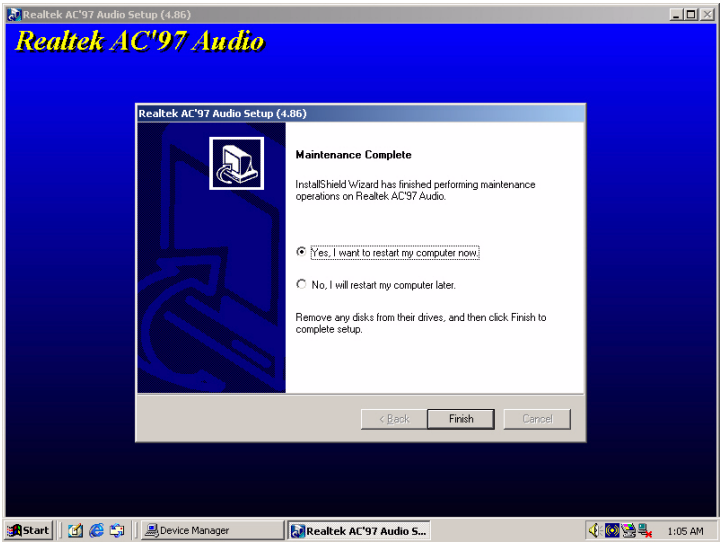


Figure 6.3: Installation Complete of AC97 Audio Driver

CHAPTER 7

Ethernet Interface

This chapter provides information on Ethernet configuration.

Sections include:

- Introduction
- Installation of Ethernet drivers for Windows
- 2000/XP
- Further information

Chapter 7 Ethernet Interface

7.1 Introduction

The ARK-7480 is equipped with dual high performance 32-bit Ethernet chipsets which are fully compliant with IEEE 802.3 100 Mbps CSMA/CD standards. They are supported by major network operating systems. They are also both 100Base-T and 10Base-T compatible. The network boot feature can be utilized by incorporating the boot ROM image files for the appropriate network operating system. The boot ROM BIOS files are combined with system BIOS, which can be enabled/disabled in the BIOS setup.

7.2 Installation of Ethernet driver

Before installing the Ethernet driver, note the procedures below. You must know which operating system you are using in your ARK-7480 Series, and then refer to the corresponding installation flow chart. Then just follow the steps described in the flow chart. You will quickly and successfully complete the installation, even if you are not familiar with instructions for MS-DOS or Windows.

7.2.1 Installation for Windows 2000/XP

1. Select "Start", "Settings". "Control Panel".

Note: The windows illustrations in this chapter are examples only. Follow the steps and pay attention to the instructions which appear on your screen.

2. Double click "Add/Remove Hardware".

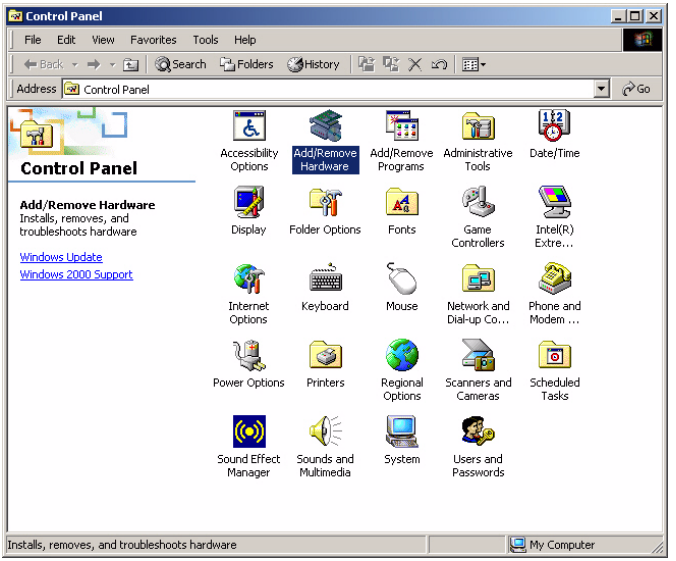


Figure 7.1: Windows Control Panel Screen

3. Click “Next” and prepare to install network function

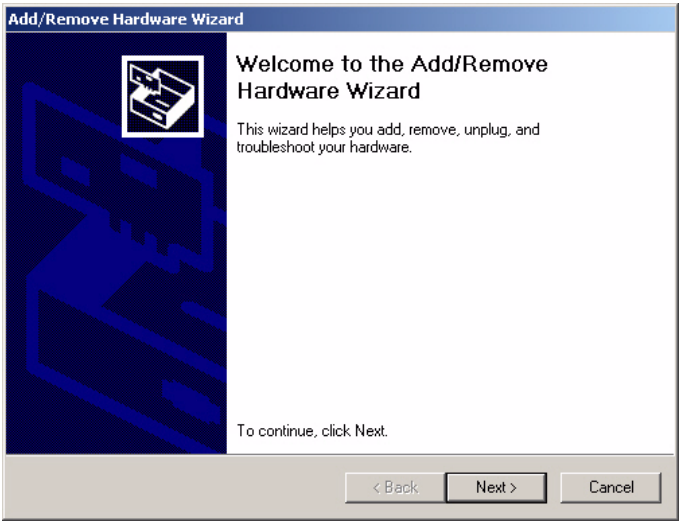


Figure 7.2: Add/Remove Hardware Wizard

4. Choose “Add/Troubleshoot a device” and click “Next”.

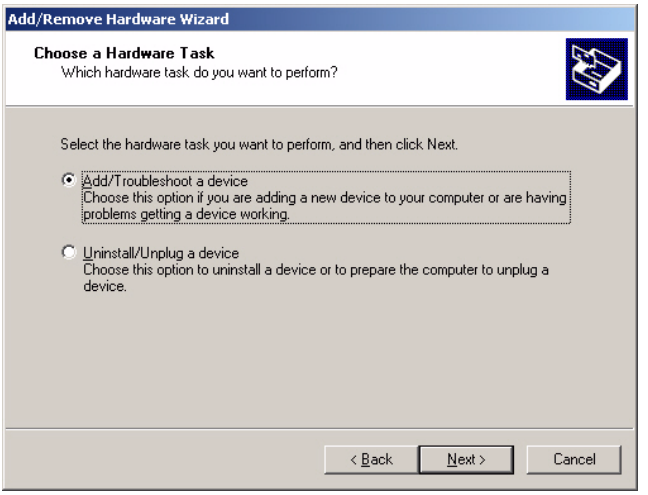


Figure 7.3: Choose a Hardware Task Screen

5. Choose Hardware Device “Ethernet Controller”

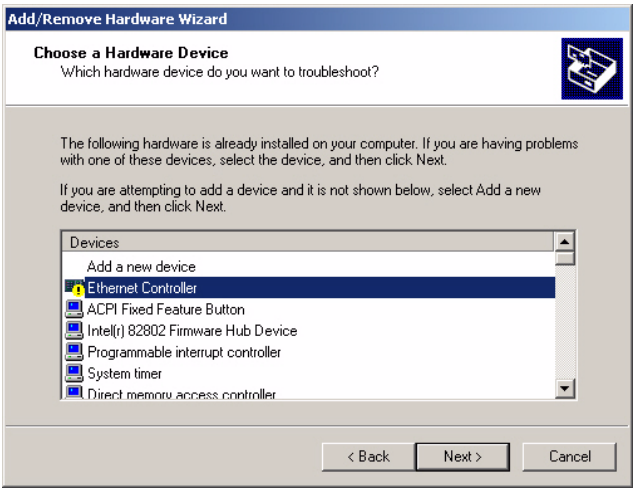


Figure 7.4: Choose a Hardware Device

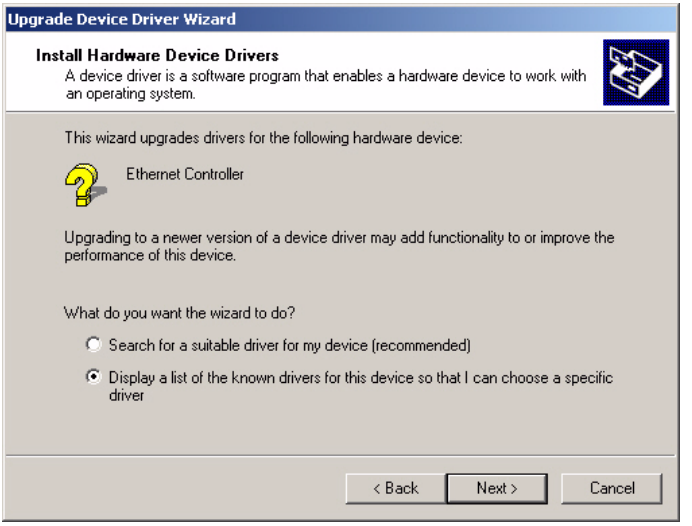


Figure 7.5: Install Ethernet Controller Screen

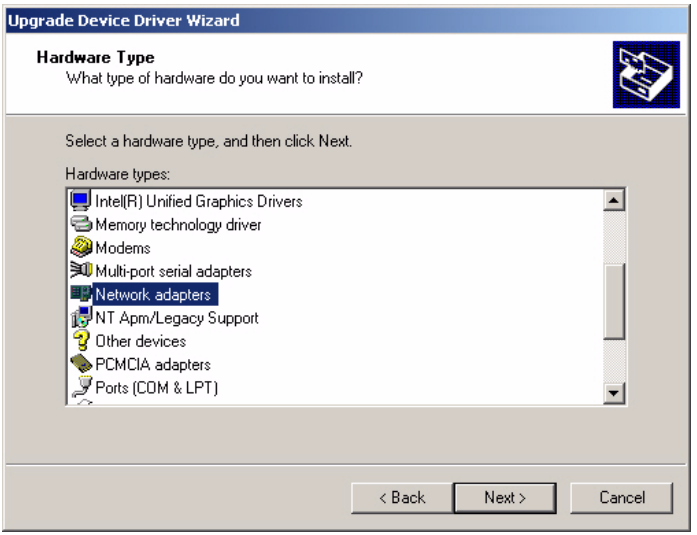


Figure 7.6: Hardware Type Screen

6. Insert the CD into E: drive

6-1. Find the Win 2000/XP LAN chipset folder at the directory of "3_LAN" from ARK-7480's Driver & Utility CD-ROM Disk, click "setup" to start the installation process.

6-2. Click "OK".

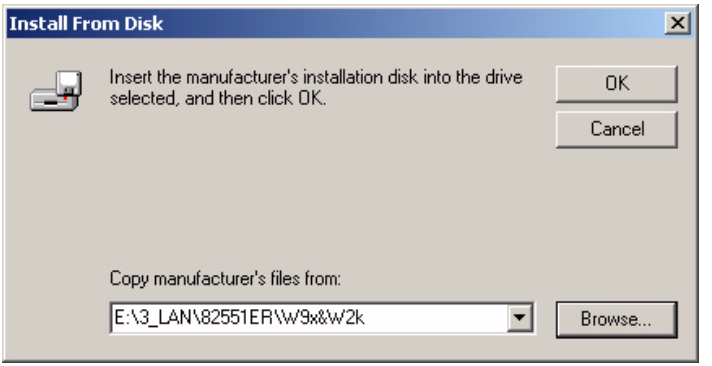


Figure 7.7: Install From Disk Screen

7. Choose the "Intel® GD82559ER PCI Adapter" item

Click "Next"

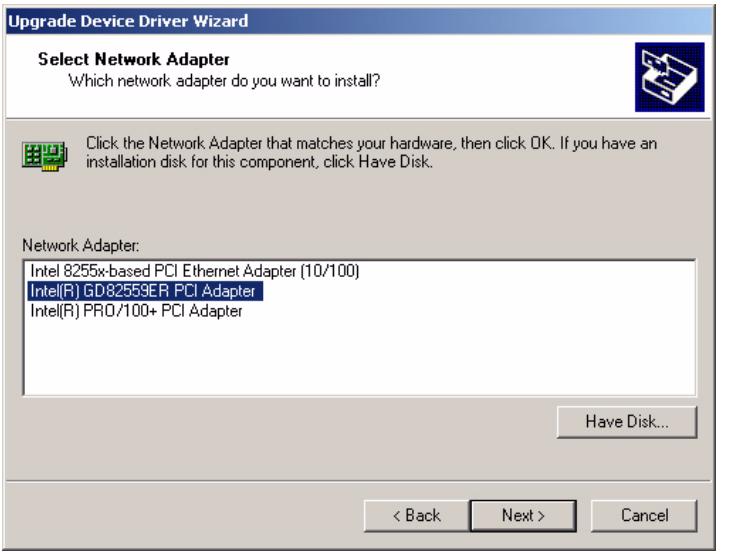


Figure 7.8: Network Adapter Selection Screen

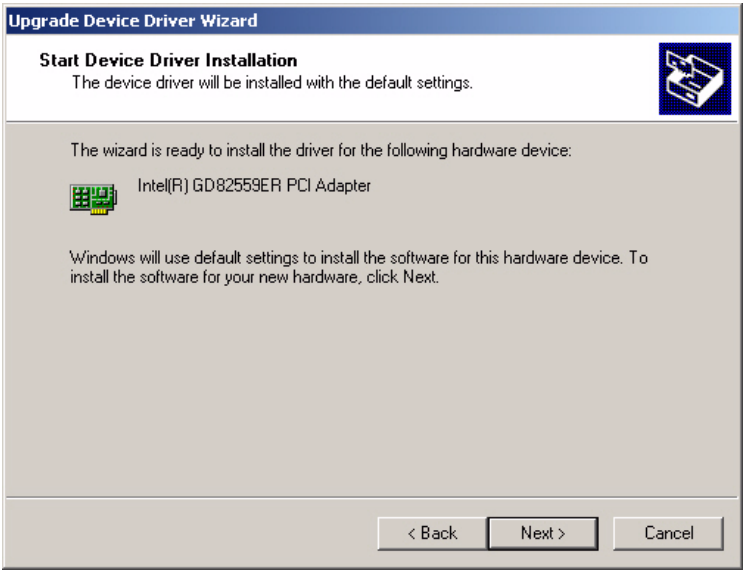


Figure 7.9: Start Device Driver Installation

8. Click "Yes" to continue the installation.

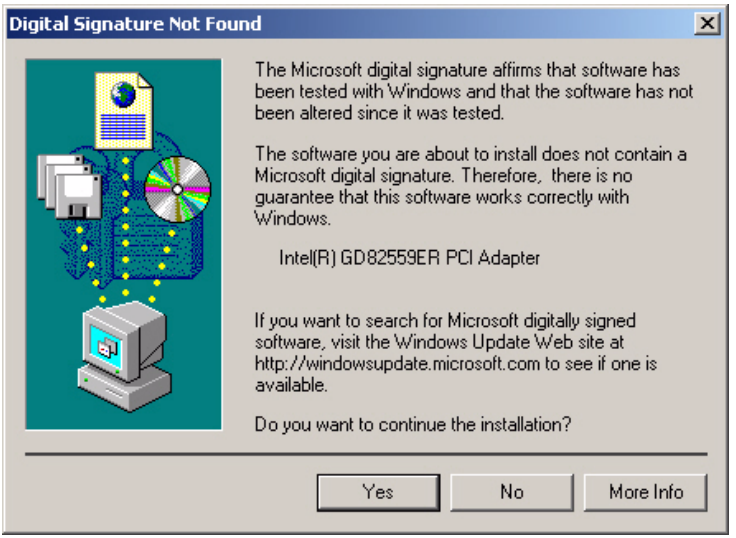


Figure 7.10: Intel Ethernet Adapter driver installation screen

9. Click “OK”

Figure 7.11: Intel Ethernet Adapter Driver Installation Complete Screen