ARK-3381

Embedded Box Computer

User Manual

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Product Warranty (2 years)

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

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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.

FCC Class A

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

ARK-3381 Series Model

There are two sub-models in ARK-3381 series listed below:

ARK-3381-2S0B1E:

ULV Celeron® M 1 GHz Embedded Box Computer, with VGA, LVDS, Fast Ethernet, 2 x RS-232, 5 x RS-232/422/485, 3 x Parallel, 3 x USB2.0, 1 x 8 Bits DIO

ARK-3381-2S4B1E:

LV Pentium® M 1.4 GHz, Embedded Box Computer, with VGA, LVDS, Fast Ethernet, 2 x RS-232, 5 x RS-232/422/485, 3 x Parallel, 3 x USB2.0, 1 x 8 Bits DIO

Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

- Warranty card
- 1 x ARK-3381 Unit
- 1 x DIN-Rail Mounting Kit (P/N:1997001110, 1997001120, 1997001130, 1997001140)
- 1 x PS2 Keyboard/Mouse Cable (P/N: 1700060202)
- 1 x Utility CD
- 1 x Flat Cable support RS-485/RS-422 mode for COM2 serial port (P/N: 1700001967)
- 1 x 2-P Phoenix to DC-Jack power cable
- (P/N: 1700001394)

Safety Instructions

1. Read these safety instructions carefully.

2. Keep this User Manual for later reference.

3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

4. For plug-in equipment, the power outlet socket must be located 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 may 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 overvoltage.

12. Never pour any liquid into an opening. This may cause fire or electrical shock.

13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

14. If one 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 ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -

20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAM-AGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.

16.   CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORD-ING TO THE MANUFACTURER'S INSTRUCTIONS.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

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.

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Overview

This chapter gives background information on the ARK-3381. It shows you the ARK-3381 overview and specifications.

Sections include:

- Introduction
- Hardware Specifications
- Chassis Dimension

Chapter 1 Overview

1.1 Introduction

The ARK-3381 Fanless Embedded Box Computer combines a rich display interface and comprehensive industrial features into a rugged, compact metal chassis for multimedia intensive applications. The fanless operation provides noise protection to the platform when deployed in external environments. The ARK-3381 Embedded Box Computer is ideally suited for embedded PC applications. All electronics are protected in a compact sealed housing for convenient embedded and stand alone applications, where space and environment considerations are critical.

1.2 Features

1.2.1 Serial Port and Parallel Port Intensive
- Multiple serial port interfaces: 5 x RS-232/422/485 serial ports and two RS-232 serial ports
- Dual PCI 1284 Printer Ports
- Ideal for field measurement and operator control applications in diversified automation control markets

1.2.2 Highly Robust Casting Construction
- Fanless operation in aluminum sealed construction
- A special cushioned design that absorbs vibration to ensure maximum reliability under harsh conditions

1.2.3 Highly Compact Size
- With its maximum mounting height of 69 mm, the ARK-3381 can be used under space critical installation conditions

1.2.4 Optimized Integration
- Few parts, easy integration, easy maintenance to reduce investment
- Systems are supplied ready to run
- Long life cycle support for product continuity

1.2.5 Wide Range of Power Sources
- Wide range of DC 12 V ~ 24 V power source offers flexibility of power input for various automation environments

1.2.6 High Computing Performance

• Scalable Low Voltage and Ultra Low Voltage Pentium® M class processor system

• Ethernet networking capability for high computing performance

1.3 Hardware Specification

1.3.1 Processor Core Logic System

CPU

• Intel® Ultra Low Voltage Celeron® M or Intel® Pentium® M Low Voltage Processor, μFC-BGA 479 Package:

> ULV Celeron® M 1 GHz (for Model of ARK-3381-2S0B1E)

> LV Pentium® M 1.4 GHz (for Model of ARK-3381-2S4B1E)

System Chipset

• Intel® 852GM or Intel® 855GME Memory Controller Hub (GMCH) Chipset:

> Intel® 852GM for model of ARK-3381-2S0B1E

> Intel® 855GME for model of ARK-3381-2S4B1E

• Intel® FW82801DB I/O Controller Hub 4 (ICH4) Chipset

• 400 MHz FSB

BIOS

• 4Mbit Flash BIOS, supports Plug & Play

Power Management

• Support ATX, APM Rev 1.2 and ACPI

System Memory

• One 200 pin SO-DIMM socket

• Supports DDR SDRAM up to 1 GB

1.3.2 Display

Chipset

- Integrated graphics built-in Intel® 852GM GMCH, or Intel® 855GME GMCH, utilizing Intel® Extreme Graphics 2 technology

Display Memory

- Dynamic video memory allocation up to 64 MB

Display Interface

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

Ethernet

- Ethernet Controller: Intel® 82551QM Ethernet Controller
- Speed: 10/100MBps, IEEE 802.3u (100 BASE-T) protocol compatible

Parallel Port

- Supports Three PCI 1284 Printer Ports

Serial Port

- One Full Functional RS-232 Serial port as COM1
- Five RS-232/422/485 Serial port as COM2 ~ COM6
- One RS-232 Serial port support Tx/Rx function only (without support of Handshaking) as COM7

Note:

- The default setting of COM2 ~ COM6 is RS-232.

- The RS-422/485 mode of COM2 can be setup by replacing the internal cable and adjusting a jumper inside the system

- The RS-422/485 mode of COM3 ~ COM7 can be setup via the BIOS

Other

- Watchdog Timer: 255 levels timer interval, setup by software
- Keyboard/Mouse: One PS/2 port to support PS/2 Mouse and PS/2 keyboard
- USB: Three USB 2.0 compliant universal serial bus port
- DIO: ARK-3381 provides one D-sub 8 Bits Female connectors, which offers Digital IO communication interface ports

Storage

- Supports a drive bay space for 2.5" HDD
- Supports a CompactFlash socket for Type I/II CompactFlash disk

Mechanical

- Construction: Aluminum housing
- Mounting: DIN-rail mounting, Desk/wall mounting
- Dimension (W x H x D): 264.5 x 69.2 x 137.25 (10.41" x 2.72" x 4.4")
- Weight: 2 kg

Power Supply

- Output Rating 46 W, ATX Support
- Fuse Rating 7 A @ 125 V
- Input Voltage: 12 VDC ~ 24 VDC,

    Typical:

      12 VDC @ 4.5A,

      16 VDC @ 3.4 A,

      19 VDC @ 2.9 A,

      24 VDC @ 2.3 A

- Output Voltage:

    +5 VDC @ 7 A

    +12 VDC @ 0.5 A

    +5 VSB @ 1 A

1.3.3 Environment Specifications

Operating temperature

• With Industrial Grade CompactFlash Disk only: -20 to 60° C

• With 2.5-inch Hard Disk: 0 to 45° C

Relative humidity

• 95% @ 40° C (non-condensing)

Vibration loading during operation

• With CompactFlash Disk only:

> 5 Grms, IEC 68-2-64, random, 5 ~ 500 Hz, 1 Oct./min, 1 hr/axis

• With 2.5-inch hard disk:

> 1 Grms, IEC 68-2-64, random, 5 ~ 500 Hz, 1 Oct./min, 1 hr/axis

Shock during operation

• With CompactFlash Disk only:

> 50 Grms, IEC 68-2-27, half sine, 11 ms duration

• With Hard Disk:

> 20 Grms, IEC 68-2-27, half sine, 11 ms duration

EMC approved

• CE, FCC Class A

Safety approved

• UL

1.4 Chassis Dimension

Figure 1.1: Chassis Dimensions

Hardware Functionality

This chapter shows how to set up the ARK-3381's hardware functions, including connecting peripherals, switches and indicators.

Sections include:

- Introduction of ARK-3381 External I/O Connectors
- ARK-3381 front metal face plate external I/O connectors
- ARK-3381 rear metal face plate external I/O connectors

Chapter 2 Hardware Functionality

2.1 Introduction of ARK-3381 External I/O Connectors

The following two figures show the external I/O connectors on ARK-3381. The following sections give you detailed information about the function of each I/O connector.
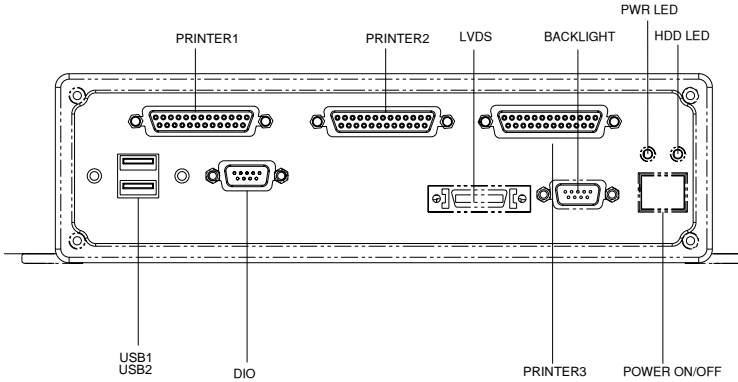
Figure 2.1: Front face plate I/O connectors
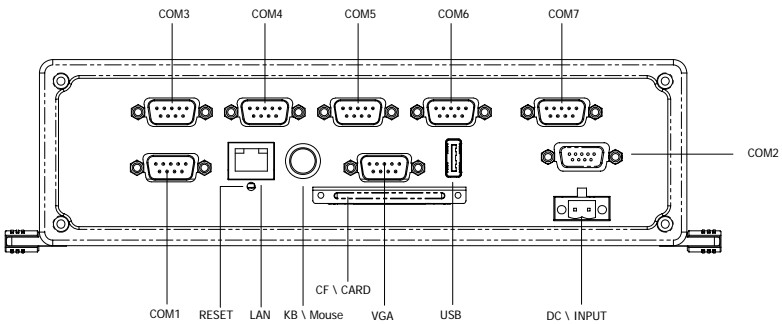
Figure 2.2: Rear face plate I/O connectors

2.2 ARK-3381 front face plate I/O connectors

2.2.1 Power ON/OFF Button
The ARK-3381 has an ATX supported Power On/Off button that supports Soft Power On/Off (Instant off or Delay 4 Second), and Suspend.

2.2.2 LED Indicators
There are two LEDs on the ARK-3381 front panel for indicating system status: Red flashing PWR LED is for power status and the green flashing HDD LED is for hard disk and CompactFlash disk status.

2.2.3 LVDS Connector
The ARK-3381 has a D-Sub 26-pin connector that carries LVDS signal outputs that can directly connect to LVDS LCD displays via a cable. JP6 on PCM-9380 or PCM-9386 motherboards is a jumper for selecting an LCD signal power of 5 V or 3.3 V. Refer to section 3.10 for details of JP6, and Chapter 6, "Full Disassembly Procedure" for set up information. The default setting of JP6 is 5 V.
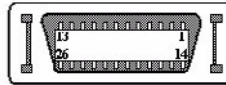
Figure 2.3: LVDS Connector

Table 2.1: 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

2.2.4 Backlight On/Off control Connector

The ARK-3381 has a D-Sub 9-pin connector that provides:

- BKLTEN signals that the inverter module uses to turn the backlight on or off.

- 12 V, 5 V and Ground as the inverter power source.

An additional VBR signal can be connected to the LCD's inverter to implement brightness adjustment via software.
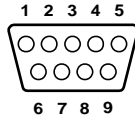
Figure 2.4: Backlight Connector

Table 2.2: Backlight Connector Pin Assignment

Pin	Signal name
1	+12V
2	GND
3	BKLTEN
4	VBR
5	+5V
6	LVDS_DCLK
7	LVDS_DDAT
8	Reserved
9	Reserved

2.2.5 DIO Connector

ARK-3381 provides one D-sub 9-pin Female connectors, which offers Digital IO communication interface ports. If you want to use DIO, you can find the Pin assignment as following.
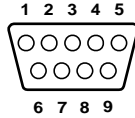
Figure 2.5: DIO connector

Table 2.3: DIO Connector

Pin	Signal name
1	DIO0
2	DIO1
3	DIO2
4	DIO3
5	DIO4
6	DIO5
7	DIO6
8	DIO7
9	GND

2.2.6 Printer Port Connectors

The ARK-3381 provides three D-sub 25-pin connectors that support PCI 1284 Printer Ports.

The Moschip MCS9815 is a dual Parallel Port controller with PCI bus interface. MCS9815 fully supports the existing Centronics printer interface as well as PS/2, EPP, and ECP modes.

The MSC9815 is ideally suited for PC applications, such as high speed parallel ports. It is fabricated using an advanced submicron CMOS process to achieve low drain power and high speed requirements.
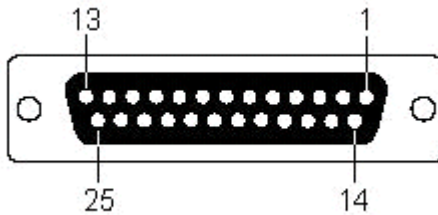
Figure 2.6: Printer Port Connector

Table 2.4: Printer Port 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"*

2.3 ARK-3381 rear face plate external I/O connectors

2.3.1 Power Input Connector

The ARK-3381 comes with a Phoenix connector that carries a 12 ~ 24 VDC external power input.
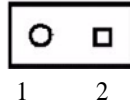
Figure 2.7: Power input connector

Table 2.5: Power input connector pin assignments

Pin	Signal Name
1	GND
2	+12 ~ 24 VDC

2.3.2 COM1 Connector

The ARK-3381 provides a D-sub 9-pin connector, which offers one standard RS-232 serial communication interface port for COM1.
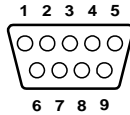
Figure 2.8: COM 1 Connector

Table 2.6: COM1 pin assignments

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

2.3.3 COM2 ~ COM6 Connector

The ARK-3381 provides five D-sub 9-pin connectors for RS-232/422/485 communications. The default setting of COM2 ~ COM6 is RS-232. Please refer to section 3.3 ~ 3.7 "Jumper Settings" and Chapter 6 "Full Disassembly Procedure" for set up information. The pin assignments of COM2 are different than COM3 ~ COM6. Table 2.5 and table 2.6 shows these differences.

The RS-422/485 mode of COM2 can be configured by replacing the internal COM2 cable with a new cable (Part Number of 1700001967), and adjusting a jumper. The new cable is in the accessory box.
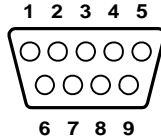
Figure 2.9: COM2 connector

Table 2.7: COM2 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".
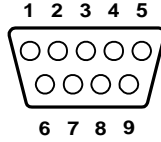
Figure 2.10: COM3 ~ COM6 connector

Table 2.8: COM 3~COM 6 pin assignments

	RS-232	RS-422	RS-485
	Signal Name	**Signal Name**	**Signal Name**
Pin			
1	DCD	Rx-	NC
2	RxD	Rx+	NC
3	TxD	Tx+	DATA+
4	DTR	Tx-	DATA-
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"

2.3.4 COM7 Connector

The ARK-3381 provides a D-sub 9-pin connector, which offers one RS-232 serial port (COM7). It has Rx and Tx signals without handshaking. Refer to section 3.8 "Jumper Settings" and Chapter 6 "Full Disassembly Procedure" for configuration details.
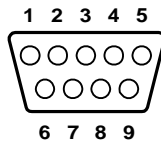
Figure 2.11: COM7 Connector

Table 2.9: COM 7 pin assignments

	RS-232
Pin	**Signal Name**
1	DCD (optional)
2	RxD
3	TxD
4	DTR (optional)
5	GND
6	DSR (optional)
7	RTS (optional)
8	CTS (optional)
9	RI (optional)

2.3.5 Ethernet Connector (LAN)

The ARK-3381 has an Intel 82551ER Ethernet controller that is fully compliant with IEEE 802.3u 10/100Base-T CSMA/CD standards. The Ethernet controller is connected to a standard RJ-45 jack socket with LED indicators to show its Active/Link status (Green LED) and Speed status (white LED).
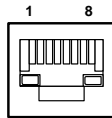
Figure 2.12: Ethernet Connector

Table 2.10: RJ-45 Connector pin assignments

Pin	**10/100BaseT Signal Name**
1	XMT+
2	XMT-
3	RCV+
4	NC
5	NC
6	RCV-
7	NC

Table 2.10: RJ-45 Connector pin assignments

Pin	10/100BaseT Signal Name
8	NC

2.3.6 Reset Button

Press the "Reset" button to reset the ARK-3381.

2.3.7 PS/2 Keyboard/Mouse Connector

The ARK-3381 provides a 6-pin mini-DIN PS/2 keyboard/mouse connector on the rear face plate. The ARK-3381 comes with an adapter to convert the 6-pin mini-DIN connector to two 6-pin mini-DIN connectors for PS/2 keyboard and PS/2 mouse connections.
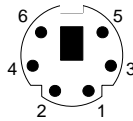
Figure 2.13: PS/2 Connector

Table 2.11: PS/2 Keyboard/Mouse connector pin assignments

Pin	Signal name
1	PS2_KBDAT
2	PS2_MSDAT
3	GND
4	VCC
5	PS2_KBCLK
6	PS2_MSCLK

2.3.8 VGA Connector

The ARK-3381 provides a D-sub 15-pin connector that supports a VGA monitor. It is driven by a graphics controller with 32 MB shared memory. This controller supports VGA and VESA video modes with resolutions up to 1600 x 1200 @ 85 Hz.
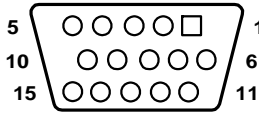
Figure 2.14: VGA Connector

Table 2.12: 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	NC
13	H-SYNC
14	V-SYNC
15	NC

2.3.9 USB Connector

The ARK-3381 provides three connectors, one in the rear panel and two in the front panel, for complete Plug & Play and hot swapping of up to 127 devices. The USB interface is USB UHCI, Rev. 2.0 compliant and can be disabled in the system BIOS setup. Plug & Play and hot swap features enable you to connect or disconnect a device whenever you want, without turning off the computer.
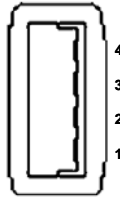
Figure 2.15: USB Connector

Table 2.13: USB1 Connector pin assignments

Pin	Signal Name	Pin	Signal Name
1	VCC	2	VCC
3	USB_P0-	4	USB_P1-
5	USB_P0+	6	USB_P1+
7	GND	8	GND
9	GND	10	NC

Hardware Installation and Upgrade

Sections include:

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

Chapter 3 Hardware Installation and Upgrade

3.1 Jumpers and Connectors

The ARK-3381 Embedded Box Computer consists of a PC-based computer that is housed in an aluminum top cover, a metal bottom case with accessed bottom cover and Front/ Rear Metal Face plate. Your HDD, SDRAM, are all readily accessible by removing the accessed bottom cover. Any maintenance or hardware upgrades can be easily completed after removing the top cover, and Front with Rear Metal Face plate. If you are a systems integrator and need to know how to completely disassemble the embedded box computer, you can find more useful information in Chapter 6.

Warning! ⚡	*Do not remove any mechanical parts, such as the top cover, bottom cover and front with rear face 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-3381 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.
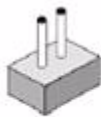
open   closed   closed 2-3

The jumper settings are schematically depicted in this manual as follows:
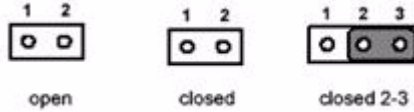
A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

3.3 COM2 RS-232/422/485 Jumper setting

(J3/J4/J5 Located on internal motherboard)

The COM2 port located on rear face plate of ARK-3381 unit which can be configured to operate in RS-232, RS-422 or RS-485 mode by setting up the Jumper Pins of J3/J4/J5 located on internal motherboard of ARK-3381 unit. The default setting of COM1 is RS-232.

Table 3.1: COM2 RS-232/422/485 Jumper Selection		
Function	**Setting**	
RS-232 *	J3 (1-2 closed)	(J4, J5 open)
RS-422	J4 (1-2 closed)	(J3, J5 open)
RS-485	J5 (1-2 closed)	(J3, J4 open)

*Default jumper setting

Refer to Chapter 6 "Full Disassembly Procedure of ARK-3381 Embedded Box Computer" for more details.

The default setting of COM2 is RS-232. The RS-422/485 mode can be configured by replacing the internal cable and adjusting the jumper inside the system.

3.4 COM3 RS-232/422/485 BIOS setting

The COM3 port connector located on the rear face plate of ARK-3381 unit can be configured to operate in RS-232, RS-422 or RS-485 mode by adjusting the "COM3 Mode" of "Integrated Peripherals" in the BIOS. Refer to Section 4.6 "Integrated Peripherals" to find out how to change this setting. The default setting of COM3 is RS-232.

3.5 COM4 RS-232/422/485 BIOS setting

The COM4 port connector located on the rear face plate of ARK-3381 unit can be configured to operate in RS-232, RS-422 or RS-485 mode by adjusting the "COM4 Mode" of "Integrated Peripherals" in the BIOS. Refer to Section 4.6 "Integrated Peripherals" to find out how to change this setting. The default setting of COM4 is RS-232.

3.6 COM5 RS-232/422/485 BIOS setting

The COM5 port connector located on the rear face plate of ARK-3381 unit can be configured to operate in RS-232, RS-422 or RS-485 mode by adjusting the "COM5 Mode" of "Integrated Peripherals" in the BIOS. Refer to Section 4.6 "Integrated Peripherals" to find out how to change this setting. The default setting of COM5 is RS-232.

3.7 COM6 RS-232/422/485 BIOS setting

The COM6 port connector located on the rear face plate of ARK-3381 unit can be configured to operate in RS-232, RS-422 or RS-485 mode by adjusting the "COM6 Mode" of "Integrated Peripherals" in the BIOS. Refer to Section 4.6 "Integrated Peripherals" to find out how to change this setting. The default setting of COM6 is RS-232.

3.8 COM7 RS-232 Jumper Setting

(JP15/JP16 Located on internal I/O board)

The COM7 port connector located on rear face plate of ARK-3381 can be configured via JP15 and JP16. Refer to table 3.2 and table 3.3 for more details. The default setting is "DTR#5".

Table 3.2: COM7 (DTR#5/RTS#5) Selection	
Function	**JP15**
DTR#5 *	1-2 (closed)
RTS#5	2-3 (closed)

*Default jumper setting

Table 3.3: COM7 (DCD#5/DSR#5/CTS#5/RI#5) Selection	
Function	**JP16**
DCD#5 *	1-2
DSR#5	3-4
CTS#5	5-6
RI#5	7-8

*Default jumper setting
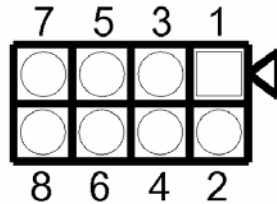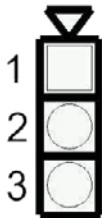
Figure 3.1: JP15 Jumper pin layout	*Figure 3.2: JP16 Jumper pin layout*

3.9 COM3~COM6 Ring / Voltage Selection

(JP19/JP20 Located on internal I/O board)

The "RI" signal pin of COM3 ~ COM6 can be configured to carry 5 V or 12 V power; or the wake on ring signal.

Table 3.4: COM3 Ring/Voltage Selection			
Serial port	**Function**	**JP19**	**JP20**
COM 3	5 V	2-4 closed	open
	12 V	4-6 closed	open
	wake on ring*	open*	1-2 closed*

*Default jumper setting

Table 3.5: COM4 Ring/Voltage Selection			
Serial port	**Function**	**JP19**	**JP20**
COM 4	5 V	1-3 closed	open
	12 V	3-5 closed	open
	wake on ring*	open*	3-4 closed*

*Default jumper setting

Table 3.6: COM5 Ring/Voltage Selection			
Serial port	**Function**	**JP19**	**JP20**
COM 5	5 V	10-12 closed	open
	12 V	12-14 closed	open
	wake on ring*	open*	5-6 closed*

*Default jumper setting

Table 3.7: COM6 Ring/Voltage Selection			
Serial port	**Function**	**JP19**	**JP20**
COM 6	5 V	11-9 closed	open
	12 V	11-13 closed	open
	wake on ring*	open*	7-8 closed*

*Default jumper setting

```
14 ⭕⭕ 13        6 ⭕⭕ 5
12 ⭕⭕ 11        4 ⭕⭕ 3
10 ⭕⭕ 9         2 ⭕⬜ 1
 8 ⭕⭕ 7
 6 ⭕⭕ 5
 4 ⭕⭕ 3
 2 ⭕⬜ 1
```
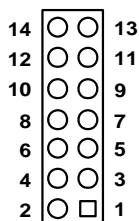
Figure 3.3: JP19 Jumper pin layout   *Figure 3.4: JP20 Jumper pin layout*
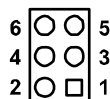
3.10 LCD Power Jumper Setting (J6)

The ARK-3381 series of embedded box computer provides a jumper (JP6) on the internal PCM-9380 or PCM-9386 motherboard for selecting 5 V or 3.3 V LCD signal power. When you connect your LVDS LCD panel display, you need to configure JP6 to select the correct LCD power setting.

Table 3.8: LCD Power Setting (J6)	
Close pins	**Function**
1-2	+5 V*
2-3	+3.3 V

*Default jumper setting

Refer to Chapter 6, "Full Disassembly Procedure" to set JP6. The default setting of JP6 is 5 V.

3.11 Installing the DDR SDRAM Memory Module

The ARK-3381 provides one 200-pin SODIMM (Small Outline Dual Inline Memory Module) socket and supports 2.5 V DDR SDRAM. You can install from 64 MB to 1 GB of DDR SDRAM memory.

Follow these steps to install an SODIMM into the ARK-3381:

1.   Remove the power cord.

2.   Unscrew the four screws from the bottom cover of the ARK-3381.

3.   Remove the bottom cover.

4.   Insert a DDR SDRAM SODIMM.

5.   Replace the bottom cover with four screws.

3.12 Inserting a CompactFlash Card

Follow these steps to install a CompactFlash card into the ARK-3381:

1.   Remove the power cord.

2.   Unscrew the two screws from the CF Door on the rear face plate.

3.   Remove the CF carrier.

4.   Insert a CompactFlash card with your OS or application program
      into the CF carrier.
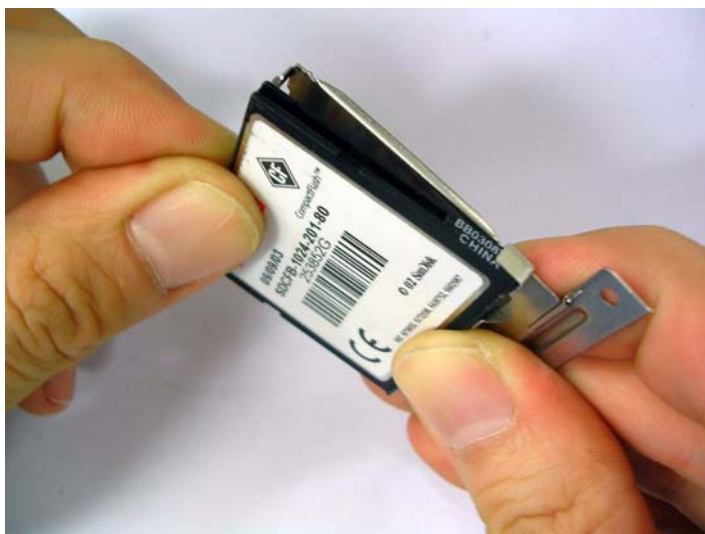
5. Insert the CF Carrier in to the ARK-3381 and replace the 2 screws.

Note: The CompactFlash socket is a secondary IDE Master.

3.13 Installing the 2.5" Hard Disk Drive (HDD)

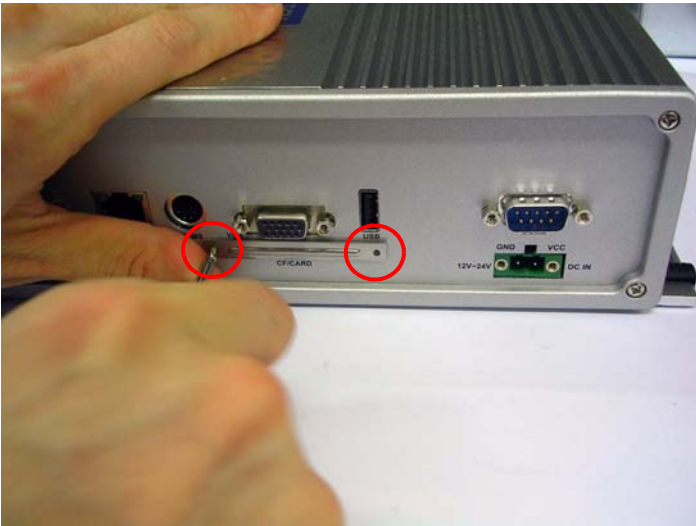You can attach one Serial ATA (SATA) hard disk drive to the ARK-3381's internal controller. The advanced IDE controller. Follow these steps to install a HDD:

1. Remove the power cord.
2. Unscrew the four screws from bottom cover of the ARK-3381.
3. Remove the bottom cover of the ARK-3381.
4. Connect the SATA flat cable to the connector on the hard disk.
5. Attach the bottom cover with the four screws.

3.14 Connecting Power

Connect the ARK-3381 to a 12 ~ 24 VDC power source. The power source can either be from a power adapter or an in-house power source.

3.15 Installation of DIN Rail Mounting

Follow these steps to mount the ARK-3381 on a DIN Rail.

1.   Remove the rubber feet from the ARK-3381.

2.   Find the DIN Rail Mounting Kit in the ARK-3381 accessory box. This kit has 2 pieces: an L DIN Rail Mounting Module (Left) and a R DIN Rail Mounting Module (Right).
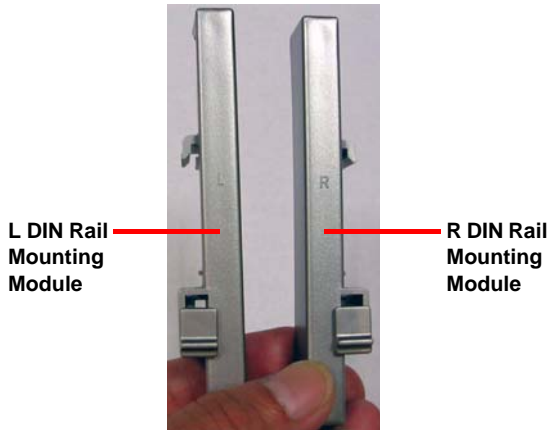
Figure 3.5: DIN Rail Mounting Kit

3. Attach the L DIN Rail Mounting Module and the R DIN Rail Mounting Module to the ARK-3381.

Figure 3.6: DIN Rail Mounting Module orientation

Figure 3.7: L DIN Rail Mount-ing Module on ARK-3381

Figure 3.7: R DIN Rail Mount-ing Module on ARK-3381

Figure 3.8: A DIN Rail

4.   Hook the ARK-3381 on to the DIN Rail.

L DIN Rail Mounting
Module Hook

DIN Rail

ARK-3381
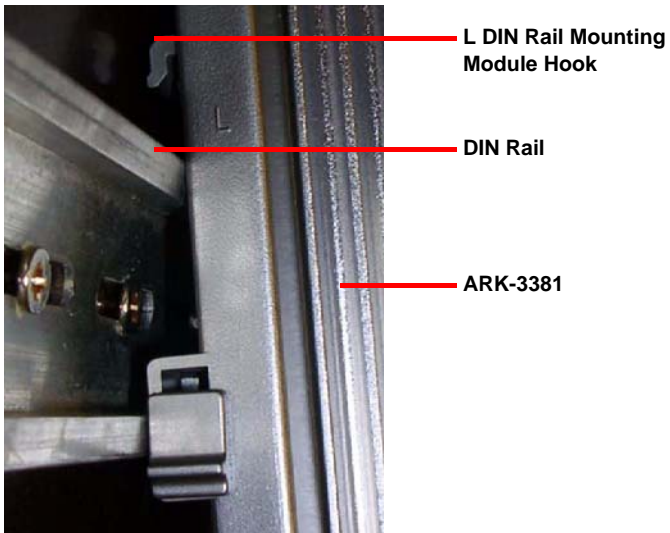
Figure 3.9: Hooking the L DIN Rail Mounting Module to a DIN Rail

R DIN Rail Mounting Module Hook

DIN Rail

ARK-3381
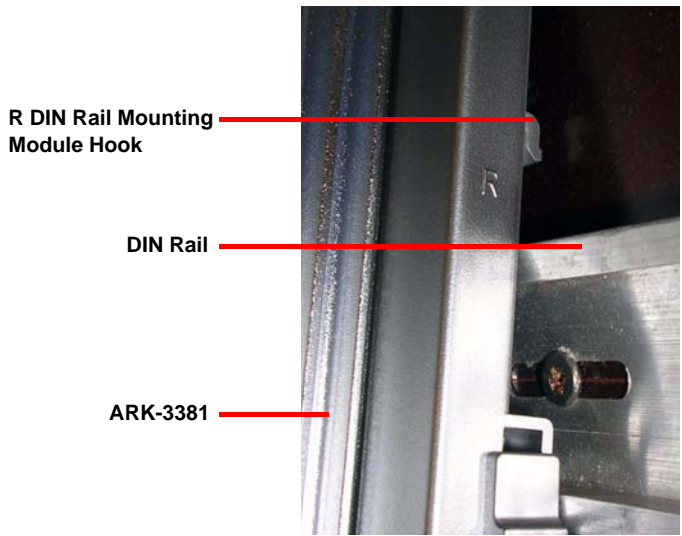
Figure 3.10: Hooking the R DIN Rail Mounting Module to a DIN Rail

5. Pull the L DIN Mounting Module and R DIN Mounting Module Hook Switches away from the DIN Rail. Push the L DIN Mounting Module and R DIN Mounting Module Hook Switches toward the DIN Rail to fix the ARK-3381 to the DIN Rail.

ARK-3381

DIN Rail

L DIN Rail Mounting Module Hook Switch
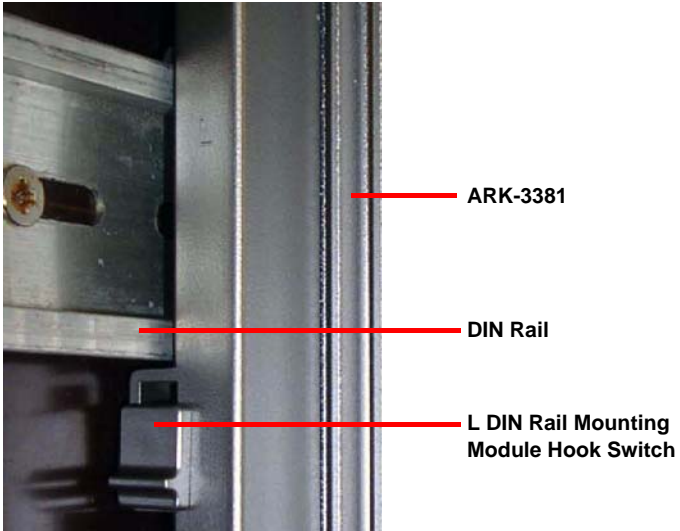
Figure 3.11: Setting the L DIN Rail Mounting Module Hook Switch

ARK-3381

DIN Rail

R DIN Rail Mounting Module Hook Switch
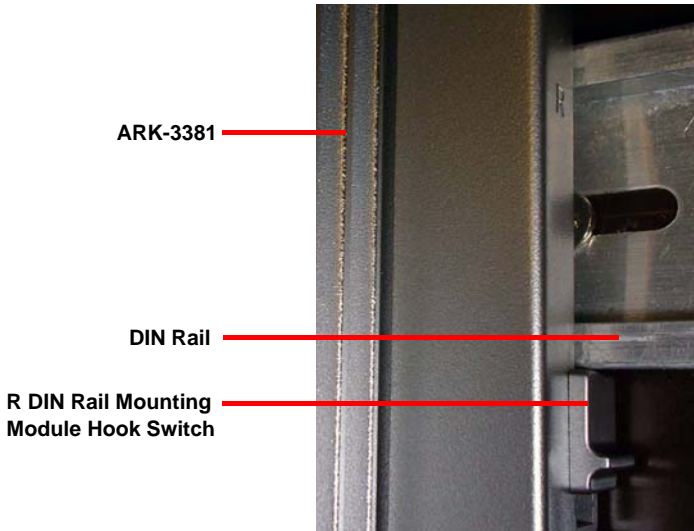
Figure 3.12: Setting the R DIN Rail Mounting Module Hook Switch

Award BIOS Setup

Chapter 4 Award BIOS Setup

4.1 Introduction

The Award BIOS ROM has a built-in setup program that allows users to modify the basic system configuration. This information is stored in battery-backed memory (CMOS RAM) and 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 a system board button cell battery. When BIOS setup is completed, the data in CMOS RAM is automatically backed up to Flash ROM. If operating in a harsh industrial environment causes a software error, BIOS will recheck the data in CMOS RAM and automatically restore the original data from Flash ROM to CMOS RAM for booting.

Note: If you intend to change the CMOS setting without restoring the previous backup, <Del> must be pressed within two seconds of the "CMOS checksum error..." display screen message appearing. Then enter the "Setup" screen to modify the data. If the "CMOS checksum error..." message appears again and again, please check to see if the system battery needs to be replaced.

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 an Advantech application engineer to obtain an up-to-date patch code file. This will ensure that your CPU system status is valid. After ensuring that a number is assigned to the patch code, press <Del> to enter Setup.

CONTROL KEYS	
< ↑ >< ↓ >< ← >< → >	Move to highlight item
<Enter>	Select Item
<Esc>	Main Menu - Quit without saving changes into CMOS
	Sub Menu - Exit current page and return to Main Menu
<Page Up/+>	Increase the numeric value or make changes
<Page Down/->	Decrease the numeric value or make changes
<F1>	General help, for Setup Sub Menu
<F2>	Item Help
<F5>	Load Previous Values
<F7>	Load Optimized Defaults
<F10>	Save all CMOS changes

4.2.1 Main Menu

During bootup, press <Del> to enter AwardBIOS CMOS Setup Utility; the Main Menu will appear on the screen. Use arrow keys to select among the items and press <Enter> to accept or enter a sub-menu.

- **Standard CMOS Features**

  This setup page includes all the items in standard compatible BIOS.

- **Advanced BIOS Features**

  This setup page includes all the Award advanced BIOS features items.

- **Advanced Chipset Features**

  This setup page includes all the advanced chipset configuration items.

- **Integrated Peripherals**

  This setup page includes all onboard peripheral devices.

- **Power Management Setup**

  This setup page includes all the Power Management features items.

- **PnP/PCI Configurations**

  This setup page includes PnP OS and PCI device configuration.

- **Frequency/Voltage Control**

  This setup page includes CPU host clock control, frequency ratio and voltage.

- **Load Optimized Defaults**

  This setup page loads system optimized values, for the best system performance configuration.

- **Set Password**

  Establish, change, or disable password.

- **Save & Exit Setup**

  Save CMOS value settings to CMOS and exit BIOS setup.

- **Exit Without Saving**

  Abandon all CMOS value changes and exit BIOS setup.

4.2.2 Standard CMOS Features

• **Date**

The date format is <weekday>, <month>, <day>, <year>.

Weekday   From Sun to Sat, determined and displayed by BIOS only

Month   From Jan to Dec

Day   From 1 to 31

Year   From 1999 through 2098

• **Time**

The time format is <hour> : <minute> : <second>, based on 24-hour time.

• **IDE Primary Master/Slave**

2.5" HDD Auto-Detection Press "Enter" for automatic device detection.

• **IDE Secondary Master/Slave**

CF Card Auto-Detection Press "Enter" for automatic device detection.

• **Halt on**

This item determines whether the computer will stop if an error is detected during power up.

No Errors   The system boot will not stop for any error.

All Errors   Whenever the BIOS detects a non-fatal error the system will be stopped.

All, But Keyboard   The system boot will not stop for a keyboard error; it will stop for all other errors. (Default value)

All, But Diskette   The system boot will not stop for a disk error; it will stop for all other errors.

All, But Disk/Key   The system boot will not stop for a keyboard or disk error; it will stop for al other errors.

• **Base Memory**

The POST of the BIOS will determine the amount of base (or conventional) memory installed in the system.

• **Extended Memory**

The POST of the BIOS will determine the amount of extended memory (above 1 MB in CPU's memory address map) installed in the system.

• **Total Memory**

This item displays the total system memory size.

4.2.3 Advanced BIOS Features

• **CPU Feature**

This item allows the user to adjust CPU features, CPU ratio, VID and Thermal and special features such as XD flag.

• **Virus Warning   [Disabled]**

This item allows the user to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection.

• **CPU L1 & L2 Cache   [Enabled]**

This item allows the user to enable CPU L1 & L2 cache.

• **CPU L3 Cache   [Enabled]**

This item allows the user to enable CPU L3 cache.

• **Quick Power On Self Test   [Enabled]**

This field speeds up the Power-On Self Test (POST) routine by skipping retesting a second, third and fourth time. Default is enabled.

• **First / Second / Third Boot Device**

Assign bootup priorities.

Floppy	Floppy drive gets this priority.
LS120	LS120 gets this priority.
Hard Disk	Hard Disk gets this priority.
CDROM	CDROM gets this priority.
ZIP	ZIP drive gets this priority.
USB-FDD	USB-FDD gets this priority.
USB-ZIP	USB-ZIP gets this priority.
USB-CDROM	USB-CDROM gets this priority.
USB-HDD	USB-HDD gets this priority.
LAN	LAN gets this priority.
Disabled	Disable this boot function.

• **Boot Other Device   [Enabled]**

Use this to add yet another device to the bootup queue. If First, Second, and Third Boot Devices are not present or fail, the system will boot from the next available device.

• **Boot Up NumLock Status   [On]**

When ON, system boots to keypad NumLock activated.

- **Gate A20 Option   [On]**

  Options are On (default), and Off.

  On means that the chipset controls GateA20, and gives fast GateA20 speed.

  Off means that the keyboard controller controls GateA20. This gives normal GateA20 speed.

- **Typematic Rate Setting**

  This item enables users to set the two typematic control items.

  - Typematic Rate (Chars/Sec)

    This item controls the speed at which system registers repeated key-strokes.

    The eight settings are 6, 8, 10, 12, 15, 20, 24 and 30.

  - Typematic Delay (Msec)

    This item sets the time interval before automatic character repetition kicks in. The four delay options are 250, 500, 750 and 1000.

- **Security Option   [Setup]**

  System   System will not boot and will not access Setup page unless the correct password is entered at the prompt.

  Setup   System will boot, but access to Setup is denied unless correct password is entered at the prompt. (Default value)

- **ACPI Mode   [Enable]**

  This item sets the operating in Advanced Configuration and Power Interface in Windows 2000-based computer for power saving Function.

4.2.4 Advanced Chipset Features

Note: The "Advanced Chipset Features" options control the configuration of the board's chipset. This page is developed for the particular chipset, to control chipset register settings, and fine tune system performance. It is strongly recommended that only technical users make changes to the default settings.

• **DRAM Timing Selectable   [By SPD]**

This option refers to the method by which the DRAM timing is selected.

The default is "By SPD".

Manual   This item provides DRAM clock/drive for The user selection.

By SPD   This item provides DRAM clock/drive for SPD (Serial Presence Detect).

• **MGM Core Frequency   [Auto Max 266 MHz]**

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

• **System BIOS Cacheable   [Enabled]**

This item allows the system BIOS to be cached to allow faster execution and better performance.

• **Video BIOS Cacheable   [Disabled]**

This item allows the video BIOS to be cached to allow faster execution and better performance.

• **Memory Hole   [Disabled]**

This item reserves 15 MB-16 MB memory address space to ISA expansion cards that specifically require the setting. When enabled, memory from 15 MB-16 MB will be unavailable to the system because only the expansion cards can access memory in this area.

• **Delayed Transaction   [Enabled]**

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

• **Delay Prior to Thermal   [16Min]**

This field activates the CPU thermal monitoring function after the system is given time to boot for a set number of minutes. Options are 16Min and 64 Min.

- **AGP Aperture Size   [64]**

  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 64 M.

- **On-Chip VGA   [Enableed]**

  This item is setting for start up video output from an add-on-card or onboard device.

- **On-Chip Frame Buffer Size   [32 MB]**

  The options available are: 1 MB, 4 MB, 8 MB, 16 MB, and 32 MB. 32 MB is the default setting.

- **Boot Display   [VBIOS Default]**

  The default setting is VBIOS Default. The options available include CRT, LFP, and LFP + CRT.

- **Panel Scaling   [Auto]**

  The default setting is Auto. The other options are On and Off.

- **Panel Type   [800X600]**

  Use this field to select the LCD Panel type. The options are:

  640 x 480

  800 x 600

  1024 x 768

  1280 x 1024

  1600 x 1200

4.2.5 Integrated Peripherals

Note: These "Integrated Peripherals" options include configuration of the board's chipset, with settings for IDE, ATA, SATA, USB, Super IO and sensor devices. This page is chipset dependent.

- **IDE Cable Detect   [Enabled]**

  Some UDMA cables use a hole in the ribbon cable as a cable detect mechanism to determine if a UDMA IDE or standard IDE cable is installed. The default setting is: Enabled.

- **DIO Group 1/2 Direction   [Output / Input]**

  This item allows users to set the OnChip DIO status.

- **OnChip IDE Device   [Press Enter]**

  This item enables users to set the OnChip IDE device status; it includes enabling IDE devices and setting PIO and DMA access mode, and in some new chipsets also supports SATA devices (Serial-ATA).

- **Onboard Device   [Press Enter]**

  This item enables users to set the Onboard device status, including enabling USB, AC97, MC97 and LAN devices.

  - Onboard LAN Control (82551 Only)   [Enabled]

    Options are Enabled and Disabled. Select Disabled if the user does not want to use onboard LAN controller1.

  - USB Control   [Enabled]

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

  - USB 2.0 Control   [Enabled]

    Select Enabled if your system includes Universal Serial Bus (USB) controller support USB 2.0 and you have USB peripherals. The choices: Enabled, Disabled.

  - USB Keyboard/Mouse Support   [Enabled]

    Select Enabled if the user plans to use a USB keyboard. The choices: Enabled, Disabled.

- **Super IO Device   [Press Enter]**

  This item enables users to set the Super IO device status, including enable Floppy, COM, LPT, IR and control GPIO and Power fail status.

  - Onboard Serial Port 1   [3F8/IRQ4]

This item allows the user to select I/O port address. Range is from 2E8 to 3F8.

- Onboard Serial Port 2   [2F8/IRQ3]

This item allows the user to select I/O port address. Range is from 2E8 to 3F8.

- Onboard Parallel Port   [378/IRQ7]

This field sets the address of the on-board parallel port connector. You can select either 3BCH/IRQ7, 378H/IRQ7, 278H/IRQ5 or Disabled. If you install an I/O card with a parallel port, make sure there is no conflict in the address assignments. The CPU card can support up to three parallel ports, as long as there are no port has any conflicts.

- Parallel Port Mode   [SPP]

This field allows you to set the operation mode of the parallel port. The "Normal" setting allows 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.

- EPP Mode Select   [EPP1.7]

This field allows you to select EPP port type 1.7 or 1.9. The choices: EPP1.7, EPP1.9.

- ECP Mode Use DMA   [3]

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.

• **COM3 / 4 / 5 / 6 Mode   [RS232]**

This item allows users to select the MIO COM Port Output Mode. Function includes RS-232, RS-422 and RS-485 Mode.

• **Watch Dog Timer Select   [Disabled]**

This item allows the user to enable or disable the watch dog timer. If enabled, a timer value may be set in either minutes or seconds.

• **AutoFlow Control   [Enable]**

Auto flow control is used in RS-485 to tri-state the transmitter when no other data is available, so that other nodes can use the shared lines.

When auto flow control is enabled, the device monitors the local output buffer for not empty and empty conditions. If enabled, the flow control will force signal to the desired polarity under the empty or not empty condition.

- **Onboard Serial Port 3 / 4 / 5 / 6 / 7   [3E8]**

This item allows user to select I/O port address; range is from 2E8 to 4F8.

- **Serial Port 3 / 4 / 5 / 6 / 7 Use IRQ   [IRQ7]**

This item allows user to select I/O port IRQ number. Bios default value is "IRQ7".

4.2.6 Power Management Setup

Note: Use "Power management Setup" options to configure the system for most effective energy utilization still consistent with intended computer use.

- **ACPI Function   [Enabled]**

This item defines the ACPI (Advanced Configuration and Power Interface) feature that makes hardware status information available to the operating system, allowing PC and system devices to communicate to improve power management.

- **ACPI Suspend Type   [S1 (POS)]**

This item allows the user to select sleep state when in suspend, but this system is limited to S1 Mode.

S1(POS)	The suspend mode is equivalent to a software power down;
S3(STR)	The system shuts down with the exception of a refresh current to the system memory.
S1(POS) &S3(STR)	This item supports two modes, with software selection.

- **Power Management Option   [User Define]**

This item allows the user to select system power saving mode.

Min Saving	Minimum power management. Suspend Mode=1 hr.
Max Saving	Maximum power management. Suspend Mode=1 min.
User Define	Allows the user to set each mode individually. Suspend Mode= Disabled or 1 min ~1 hr.

- **Video Off Method   [DPMS]**

This item allows the user to determine the manner in which the monitor is blanked.

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

Blank Screen   This option only writes blanks to the video buffer.

DPMS   Initial display power management signaling.

• **Video Off in suspend   [Yes]**

This item allows the user to determine the manner is which the monitor is blanked.

No   Screen is off when system goes into suspend mode.

Yes   Screen is never turned off.

• **Suspend Type   [Stop Grant]**

This option controls the suspend state. Stop Grant only halts power to the processor. It is set as default to facilitate quick awakening performance.

PwrOn Suspend saves more power during suspend, and is recommended when greater power saving is desired.

Stop Grant   When in this state, the CPU has internal clock running and may respond to interrupts and other signals. The CPU may transition from Stop Grant state to Normal state, AutoHalt mode and Sleep mode.

PwrOn Suspend   When in this state, the CPU remains in low-power status with power still on.

• **Modem use IRQ   [3]**

This item allows the user to determine which IRQ the MODEM can use.

• **Suspend Mode   [Disabled]**

This item allows the user to enable or disable suspend mode. When enabled, the user can set the delay before suspend.

• **HDD Power Down   [Disabled]**

This item allows the user to enable or disable HDD power down. When enabled, the user can set the delay before HDD power down.

• **Soft-Off by PWR-BTTN   [Instant-Off]**

This item allows the user to adjust the function of the power button.

Instant-Off   Press power button then Power off instantly.

Delay 4 Sec   Press power button 4 sec. to Power off.

• Wakeup By PCI Card   [Press Enter]

This item allows the user to select wake up by PCI Device.

• Power On By Ring   [Disabled]

This item allows the user to enable system resume by modem ring. System default is set to "Disabled".

• Resume By Alarm   [Disabled]

This item allows the user to enable and key in Date/time to power on system.

Disabled   Disable this function.

Enabled   Enable alarm function to power on system

Date (of month)   Alarm 1-31

Resume Time (HH:MM:SS) Alarm(0-23) : (0-59) : 0-59)

• PWRON After PWR-Fail   [Off]

This item allows the user to select power fail function. The functions depend on chipset design.

4.2.7 PnP/PCI Configurations

Note: This "PnP/PCI Configurations" screen is for setting up the IRQ and DMA (both PnP and PCI) bus assignments.

• Reset Configuration Data   [Disabled]

This item allows the user to clear any PnP configuration data stored in the BIOS.

• Resources Controlled By   [Auto (ESCD)]

- IRQ Resources

This item allows the user to assign interrupt types to IRQ-3, 4, 5, 7, 9, 10, 11, 12, 14, and 15, respectively.

• PCI / VGA Palette Snoop   [Disabled]

The item is designed to solve problems caused by some non-standard VGA cards. A built-in VGA system does not need this function.

4.2.8 Frequency/Voltage Control

Note: This "Frequency/Voltage Control" option controls the CPU Host and PCI frequency, this page is CPU and Chipset dependent; some items will show up when a processor which supports those items is installed.

• **Auto Detect PCI Clk   [Enabled]**

This item enables or disables automatic PCI clock detection.

• **Spread Spectrum   [Disabled]**

This item enables or disables spread spectrum modulation.

• **CPU Host/3V66/PCI Clock   [Default]**

This item enables users to set the CPU Host, AGP and PCI clock, either by automatic detection or manually.

4.2.9 Load Optimized Defaults

Note: Load Optimized Defaults loads the default system values directly from ROM. If the stored record created by the Setup program should ever become corrupted (and therefore unusable), these defaults will load automatically when the ARK-338X Series system is turned on.

4.2.10 Set Password

Note: To enable this feature, first go to the Advanced BIOS Features menu, choose the Security Option, and select either Setup or System, depending on which aspect you want password protected. Setup requires a password only to enter Setup. System requires the password either to enter Setup or to boot the system. A password may be at most 8 characters long.

To Establish Password

1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.

2. When you see "Enter Password", enter the desired password and press <Enter>.

3. At the "Confirm Password" prompt, retype the desired password, then press <Enter>.

4. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

To Change Password

1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.

2. When you see "Enter Password", enter the existing password and press <Enter>.

3. You will see "Confirm Password". Type it again, and press <Enter>.

4. Select Set Password again, and at the "Enter Password" prompt, enter the new password and press <Enter>.

5. At the "Confirm Password" prompt, retype the new password, and press <Enter>.

6. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

To Disable Password

1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.

2. When you see "Enter Password", enter the existing password and press <Enter>.

3. You will see "Confirm Password". Type it again, and press <Enter>.

4. Select Set Password again, and at the "Enter Password" prompt, do not enter anything; just press <Enter>.

5. At the "Confirm Password" prompt, again, do not type in anything; just press <Enter>.

6. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

4.2.11 Save & Exit Setup

Note:

Typing "Y" quits the BIOS Setup Utility and saves user-set values to CMOS.

Typing "N" returns to BIOS Setup Utility.

4.2.12 Quit Without Saving

Note:

Typing "Y" quits the BIOS Setup Utility without saving to CMOS.

Typing "N" returns to BIOS Setup Utility.

PCI SVGA/LCD Setup

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

Sections include:

- Installation of SVGA drivers
- for Windows 98/ME
- for Windows 2000/XP

Chapter 5 PCI SVGA/LCD Setup

5.1 Introduction

The board has an onboard Intel 852GM or 855GME chipset for its AGP/ SVGA controller. It supports LVDS LCD displays and conventional analog CRT monitors with 64 MB frame buffer shared with system memory. The VGA controller can drive CRT displays with resolutions up to 1600 x 1200 @ 85 Hz and 2048 x 536 @ 75 Hz and 2-channel LVDS displays up to UXGA panel resolution at frequencies from 25 MHz to 112 MHz.

5.1.1 CMOS setting for panel type

The ARK-3381 system BIOS and custom drivers are located in a 512 KB, Flash ROM device, designated U29 on the system motherboard of ARK-3381. 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 Choice of "Boot display" selection items of Advanced Chipset Features sections of Award BIOS Setup.
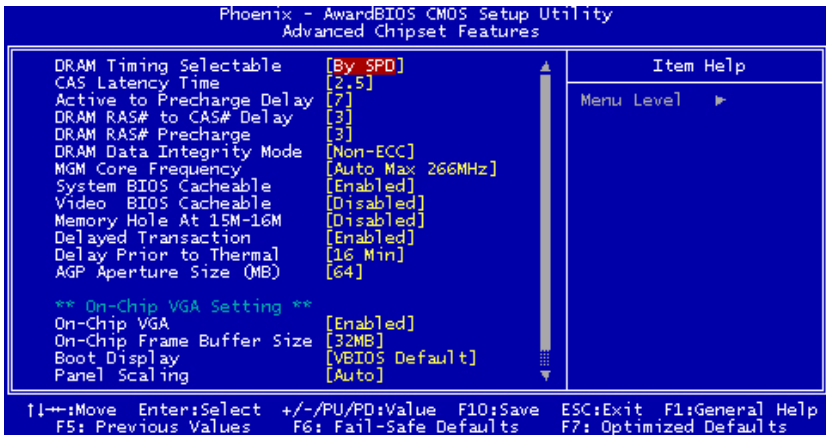
Figure 5.1: Advanced Chipset features screen

5.1.2 Display type

The ARK-3381 can be set in one of five configurations: on a CRT, on an LVDS based flat panel display, on a DVI based digital flat panel display, on a TV display, or on both dual independent displays. The system is initially set to "Auto".

5.1.3 Dual Independent Display

The ARK-3381 uses an Intel 855GME or Intel 852GM controller that is capable of providing multiple views and simultaneous displays with mixed video and graphics on a flat panel and CRT. To set up dual display under Windows 98, Windows NT/2000/XP follow these steps:

1.   Select "Start", "Control panel", "Setting", "Advanced", "Graphics Properties", "Device".
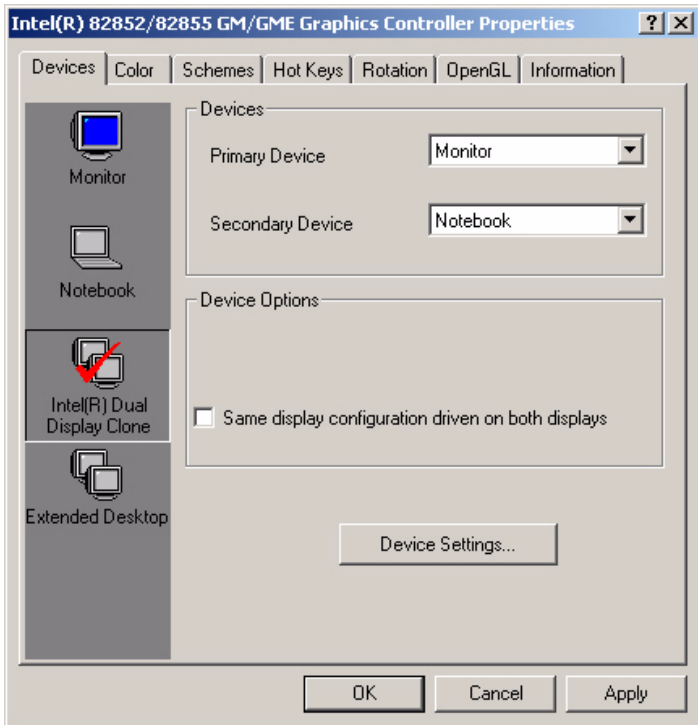
Figure 5.2: Graphics Controller Properties - Devices

2. Select "1" for current display, or "2" for second display.
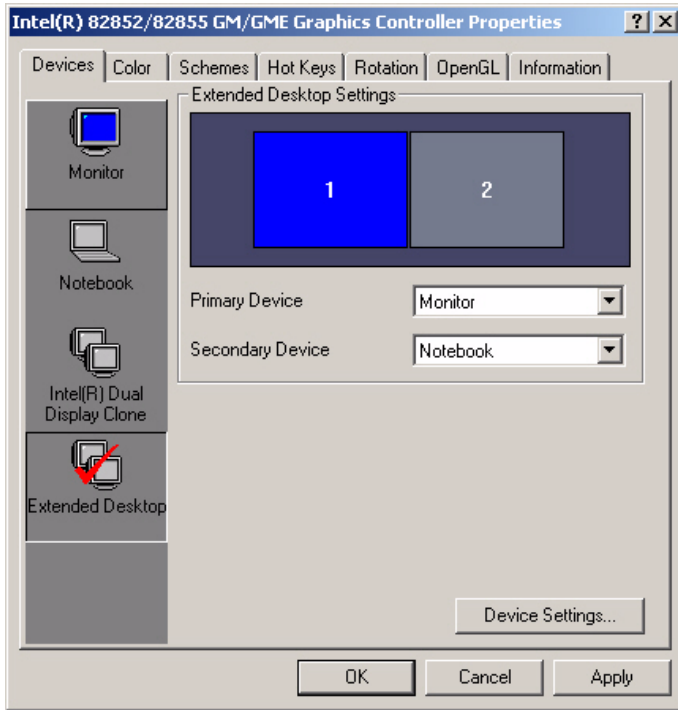
Figure 5.3: Extended Desktop Settings

3. Enable "Extend my Windows desktop onto this monitor".
4. Click "OK".

5.2 Installation of the SVGA Driver

Follow the steps for your operating system to install the SVGA driver.

5.2.1 Installation of Windows 98/Me

You can find the Win98/Me VGA driver on the ARK-3381 CD, in the following directory: VGA\Win9x_ME\Graphics\Setup.
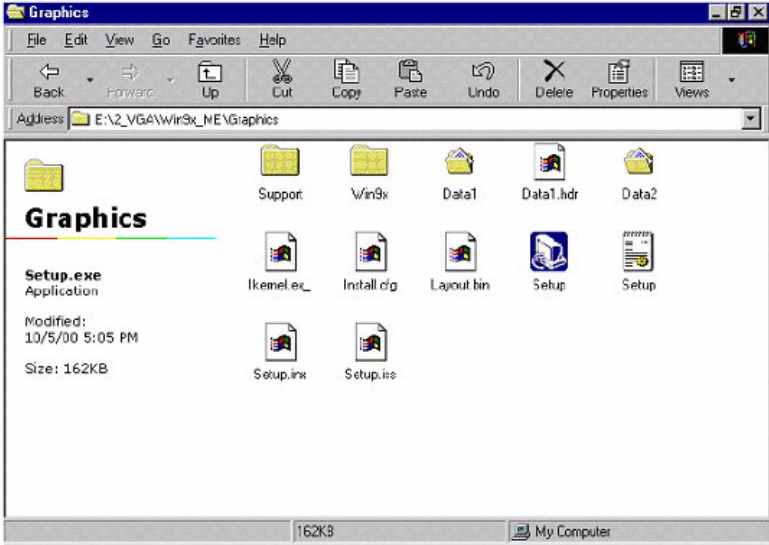
Figure 5.4: Directory "Graphics"

Notes: 1. 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.

5.2.2 Installation of Windows 2000/XP

You can find the Win2000/XP VGA driver on the ARK-3381 CD-ROM, in the following directory: \VGA\win2k_xp1332.
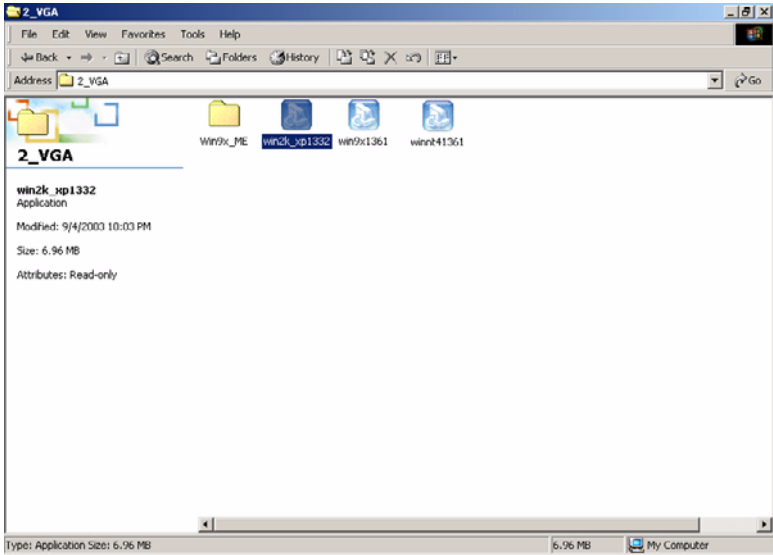
Figure 5.5: CD Directory "VGA"

Double click "setup" and then "next" in the setup wizard.
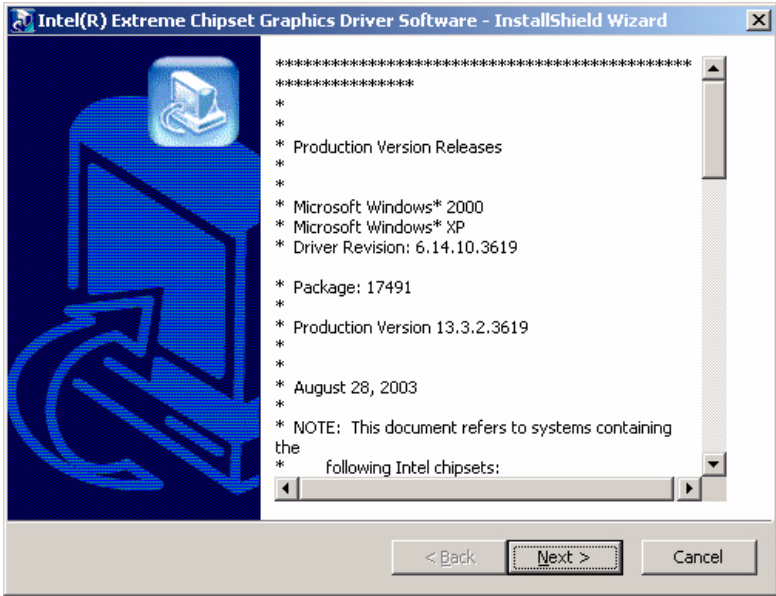
Figure 5.6: Driver Software Install Wizard
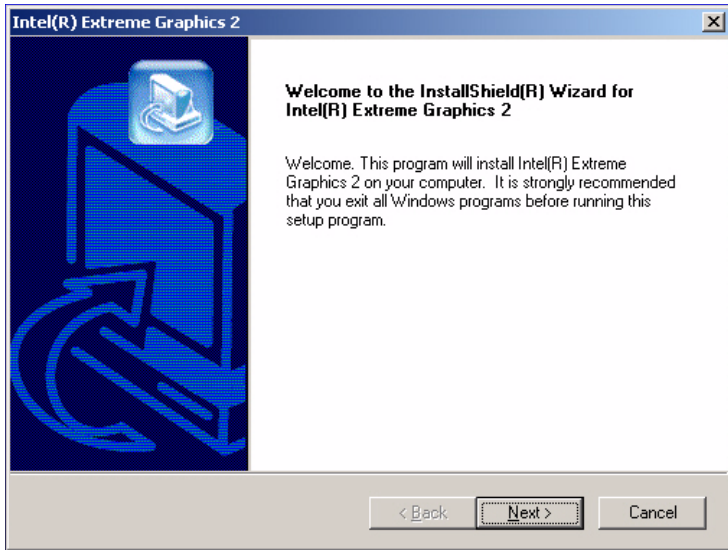
Figure 5.7: Graphics Driver Setup

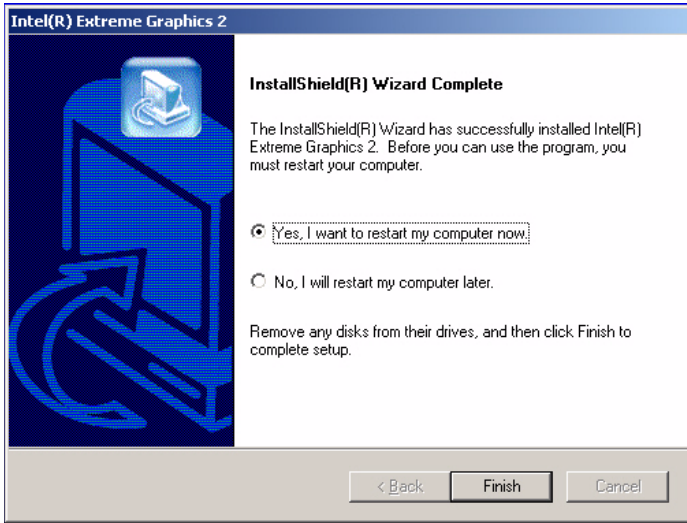Restart the computer when installation has finished.

*Figure 5.8: InstallShield® Wizard Complete*

CHAPTER

6

Full Disassembly Procedure

This chapter details the system disassembling procedure for setting up the jumpers and for maintenance.

Chapter 6 Full Disassembly Procedure

6.1 Introduction

If you want to completely disassemble the Embedded Box Computer, follow the step-by-step procedures below. Users should be aware that Advantech Co., Ltd. takes no responsibility whatsoever for any problems or damage caused by the user disassembly of the embedded box computer. Make sure the power cord of the embedded box computer is unplugged before you start disassembly. The following procedures do not include the detailed disassembly procedures for the HDD, CompactFlash Disk and SRAM; all of which can be found in Chapter 3.

1.   Unscrew the 2 screws on the bottom side.
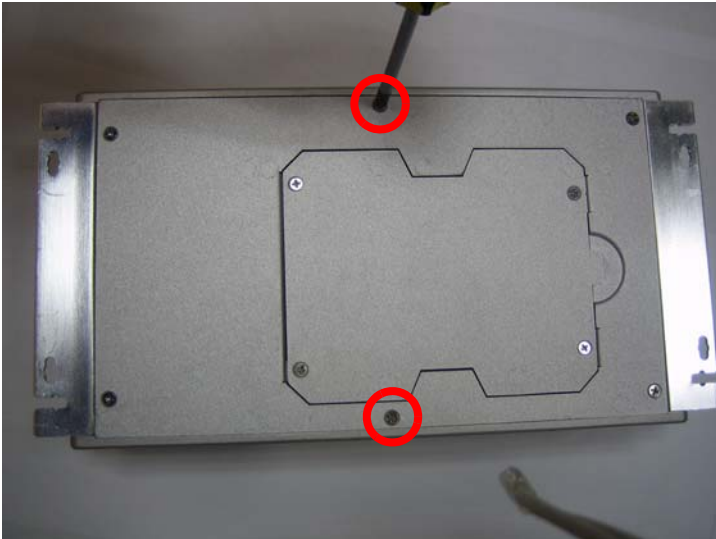
2.   Unscrew the screws on the frame bracket of the front side of the-system.

3. Remove the front frame bracket by carefully pulling and lifting the bracket.

4. Unscrew the 2 screws on the Front Metal Face plate and unscrew the 4 hexagonal bolts on the Printer1 and Printer2 connectors.

Warning: Do not use too much pressure when removing the front metal face plate as the power button cable is still attached and could be damaged.

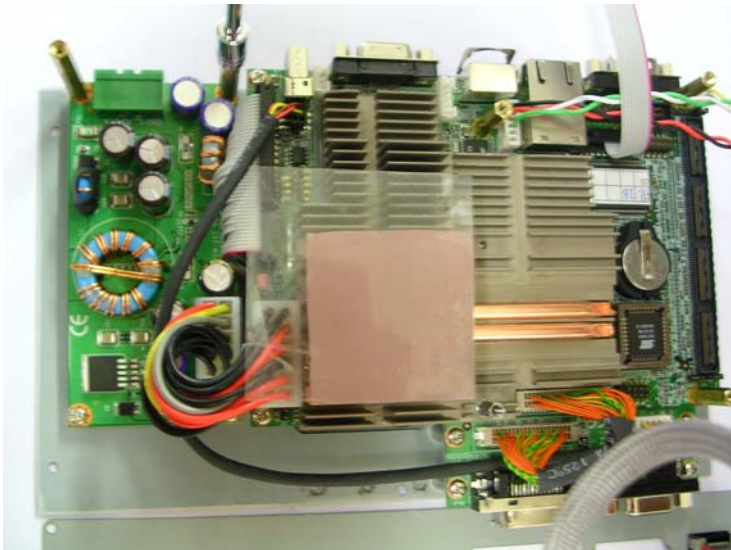5.   Unscrew the 4 screws of the frame bracket on the rear side of the system.

6. Remove the rear frame bracket by carefully pulling and lifting the bracket.

7. Unscrew the 2 screws on the rear metal face plate.

8. Unscrew the 2 hexagonal bolts that fix the "COM2 port" on the Rear Metal Face Plate.

Warning: Do not use too much pressure when removing the front metal face plate as the COM2 connector cable is still attached and could be damaged
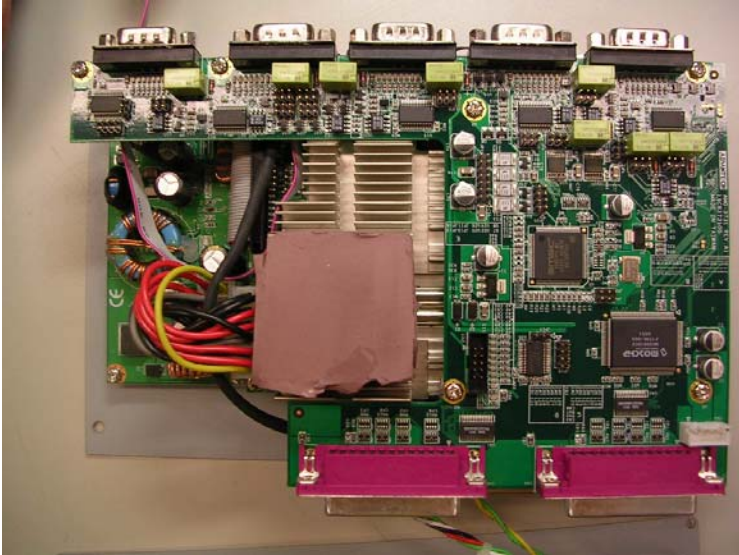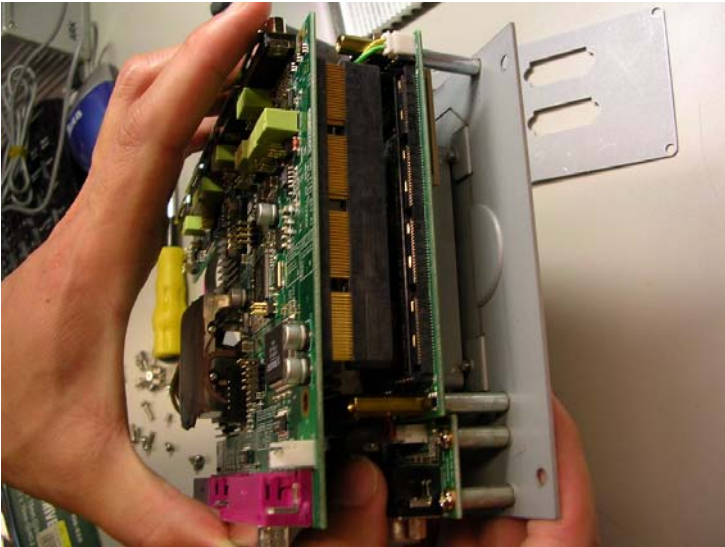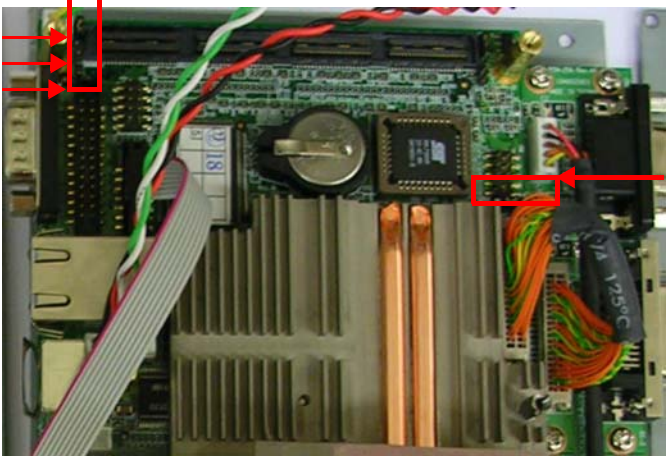
9. Unscrew the 6 screws which fix the AMO-3731 Module I/O board to the system board.
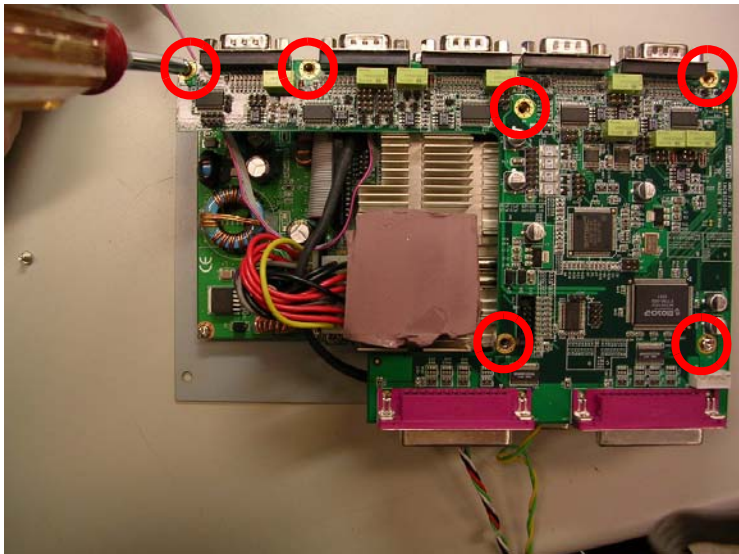
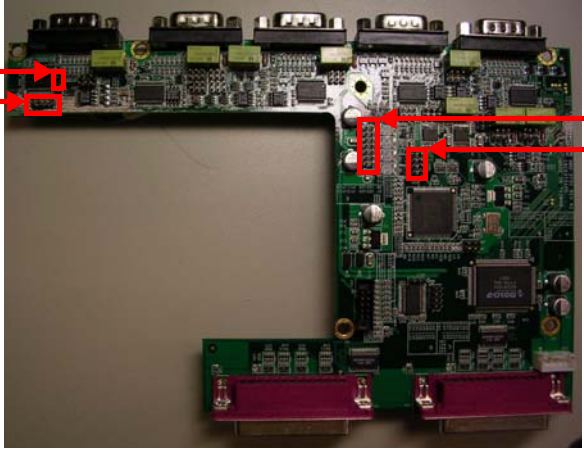10. Remove AMO-3731 Module I/O board from MIO Socket of the system board.