

Embedded & Industrial Computing

Hardware Platforms for Embedded and Industrial Computing



LEC-7230 V1.4

>>

User's Manual
Release date: 2017/2/7

Overview

Icon Descriptions

The icons are used in the manual to serve as an indication of interest topics or important messages. Below is a description of these icons:



NOTE: This check mark indicates that there is a note of interest and is something that you should pay special attention to while using the product.



WARNING: This exclamation point indicates that there is a caution or warning and it is something that could damage your property or product.

Online Resources

The listed websites are links to the on-line product information and technical support.

Resource	Website
Lanner	http://www.lannerinc.com
Product Resources	http://www.lannerinc.com/download-center/
RMA	http://eRMA.lannerinc.com

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Compliances and Certification

CE Certification

This product has passed the CE test for environmental specifications. 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 Certification

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.

Revision History

Version	Date	Descriptions
1.0	2014/05/12	Official release
1.1	2016/09/01	-Modify the Appendices for new Lanner GPIO driver installation -Add the Hardware Installation chapter
1.2	2016/10/31	Modified memory specifications
1.3	2017/2/7	Modified DIO specifications

EMC Notice

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 users will be required to correct the interference at their own expense.

Safety Guidelines

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free before, during and after installation.
- Do not wear loose clothing or jewelry that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Wear safety glasses/goggles if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Disconnect all power by turning off the power and unplugging the power cord before installing or removing a chassis or working near power supplies
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit; always check the circuit.

LITHIUM BATTERY CAUTION:

Risk of explosion could occur if battery is replaced by an incorrect type. Please dispose of used batteries according to the recycling instructions of your country.

- Installation only by a trained electrician or only by an electrically trained person who knows all the applied or related installation and device specifications..
- Do not carry the handle of power supplies when moving to other place.
- The machine can only be used in a fixed location such as labs or computer facilities.

Operating Safety

- Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing and replacing components to avoid these problems.

- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

Rack Mounting Installation Environment Precaution

1. Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.
2. Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not created due to uneven mechanical loading.
3. Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over-current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips)."

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Chapter 1:

Introduction

Thank you for choosing the LEC-7230. The LEC-7230 features Intel Celeron J1900/N2930/E3825/E3845 processor. The system supports dual LAN as well as HDMI and VGA connectors for high demand of networking and multimedia applications. In addition, its fanless design reduces maintenance effort and attributes its longevity.

The following highlight the features of the LEC-7230 system:

- Dual HDMI and VGA video output powered by Intel® HD Graphics
- Dual 10/100/1000 Mbps LAN ports
- 3 x USB ports (1 x USB 3.0 port and 2 x USB 2.0 port)
- Digital I/O connector
- Support 2.5" SATA HDD/SSD storage
- 2 x RS-232/422/485 serial COM ports supporting hardware control via DB9 connectors
- Power-on switch through the Phoenix connector for distant power-on/off control
- Audio input and output through Mic-in and Line-out jack
- Fanless design
- Integrated SIM card reader
- Dustproof
- Wide operating temperature from -20~55°C

System Specifications

Processor Options		Intel® Celeron® J1900/N2930/E3825/E3845 CPU
BIOS		AMI SPI Flash BIOS
System Memory		1 x SO-DIMM socket for up to 1066/1333 8GB DDR3L SDRAM for Intel Celeron J1900/N2930/E3845 CPU
		1 x SO-DIMM socket for up to 1066/1333 4GB DDR3L SDRAM for Intel Celeron E3825
USB		1 x USB 3.0 port 2 x USB 2.0 Type-A ports
Super I/O		1x LPC Super I/O Fintek F81865F
Expansion Bus		Mini-PCIe x 1, with SIM card reader
DIO		2 x DI and 2 x DO with +5V TTL Level
OS Support		Microsoft Embedded Windows 8
Storage	HDD/SSD Support	1 x 2.5" HDD/SSD drive bay
	CF	1 x CompactFlash card slot
Networking	LAN	2 x 10/100/1000Mbps, Autosensing, RJ-45
	Controller	Intel i210 x 2
Display	Graphics Controller	Intel® Integrated Graphics Media Accelerator
	Display Interface	VGA x 1 (1600x1200@60 24bpp), HDMI x1 (1920x1080)
Audio	Codec	Audio Codec ALC-888 HD Audio, Low Power Audio
	Output	1x green phone-jack connector for audio line-out 1x pink phone-jack connector for audio mic-in
LEDs		Power, HDD active, 3G active (if 3G mini-card inserted)
Physical Characteristics	Housing	Aluminum
	Dimensions (WxHxD)	198.0 x 144.8 x 48.0, unit: mm
	Mounting Options	Rack, VESA, DIN-rail and Wall mount
Environment	Operating Temperature	-20~55°C (PCBA needs thermal solution on heat-sink or cased design;)
	Ambient Relative Humidity (non-condensing)	5 to 95% (non-condensing)
Power	Input Voltage	+12 V +/- 5% DC
	Connector	DC jack with lock
Standard and Regulation	EMC	CE/FCC
	Green Product	RoHs
Reliability	Alter tool	Built-in buzzer and RTC (real-time clock) with battery lithium backup
	Automatic Reboot Trigger	Watchdog Timer 256 level time interval system reset, software programmable

Package Contents

Your package contains the following items:

- LEC-7230 Fanless Embedded System
- Power adapter (P/N: 0P0W060122002)
- Drivers and User's Manual CD : S09OADA64H110
- 2-pin Terminal Block (P/N: 04AW20023Z101)
- 6-pin Terminal Block (P/N: 04AW20061Z101)

Standard Accessories

0P0W060122002	AC Power Adapter 60W 12V/5A, 2.5mm DC Jack with lock
080W1N0002001	SATA SSD/HDD cable w/ power

Optional Power Cords

080W240318306	US Power Cord
080W240318305	Schuko (EU) Power Cord
080W240318301	UK Power Cord
080W240318307	China Power Cord
080W240318309	Japan Power Cord

Optional Mounting Kit

098W000004000	Wall Mount
098W000009000	VESA Mount
098W000006000	Rack Mount
098W000007000	DIN Rail Mount

Optional Accessories

0TAW000026000	Wi-Fi module	WPEA-152GN(BT) 802.11b/g/n Mini PCIe module
080W1Q0001501	Antenna	Internal Wi-Fi Antenna Cable
0TZW000000039	Antenna	SMA Antenna, male jack / female plug
080W0Q0000501	Antenna	Internal Antenna cable for 3G//GPS module
0TZW000000072	Antenna	3G Module External Antenna

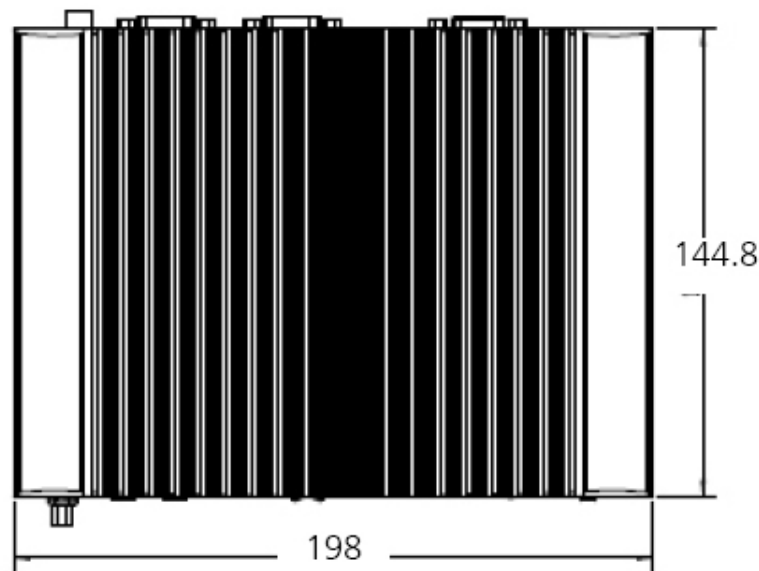
Chapter 2:

System Components

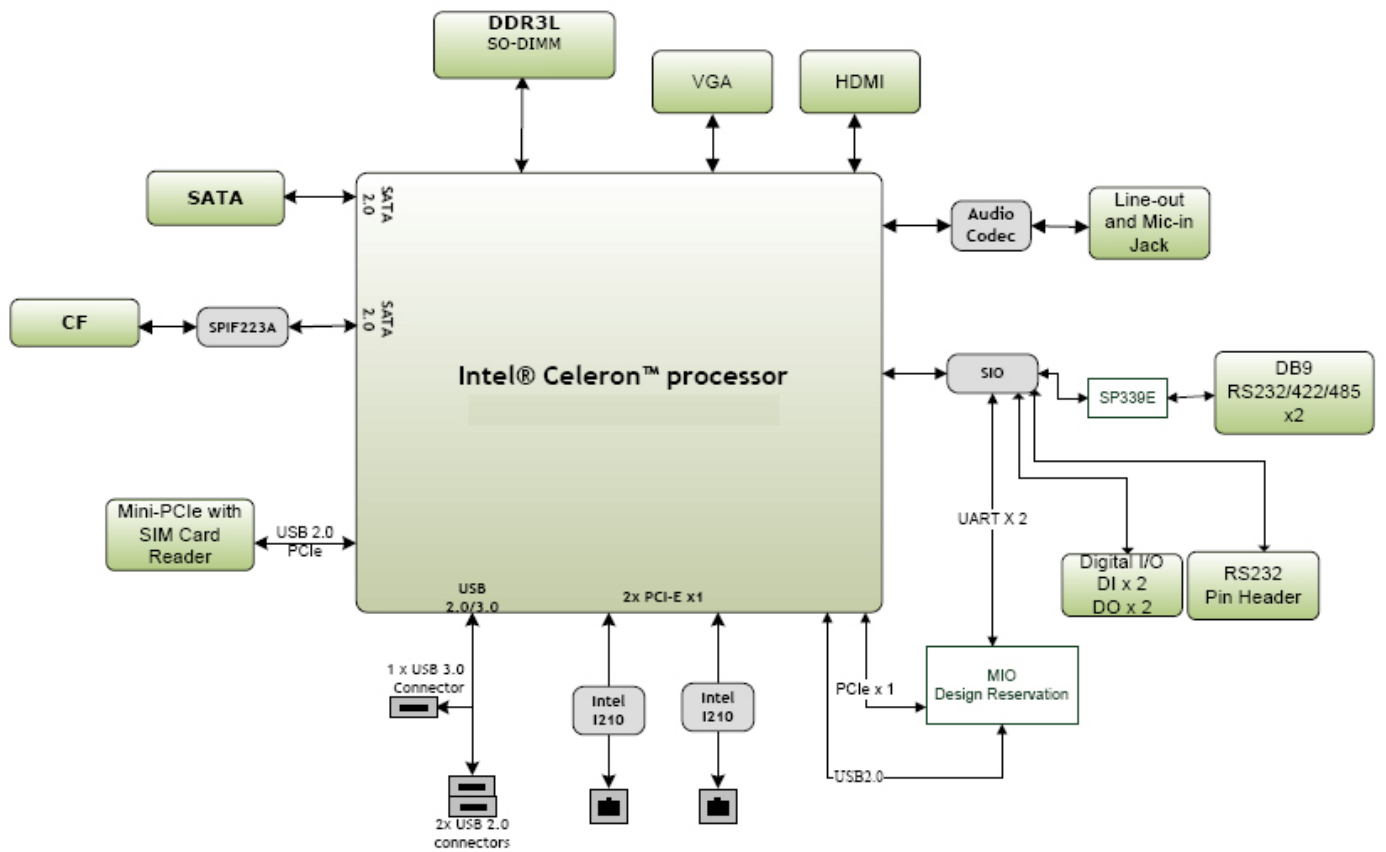
System Drawing

Mechanical dimensions of the LEC-7230

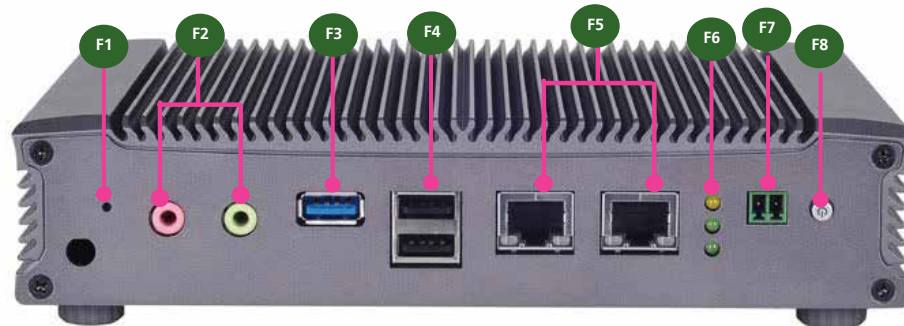
Unit: mm



Block Diagram

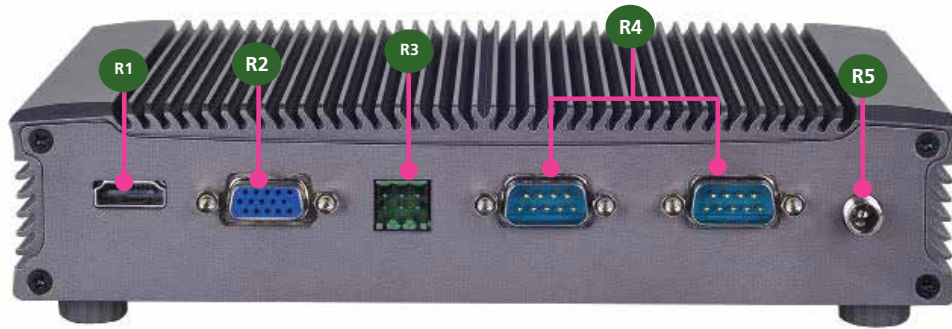


Front Components



Component	Description
F1 Reset	Reset switch
F2 MIC IN/LINE OUT	Connect the audio devices to these ports. The Microphone and line out port are provided by Realtek ALC 886-GR.
F3 USB 3.0 Port	An USB 3.0 type A connector.
F4 Four USB 2.0 Ports	Double-stacked USB 2.0 type A connectors Two additional USB 2.0 ports by LEK-IOA11. add-on board
F5 Two 10/100/1000Mbps LAN ports	Two RJ-45 (network) jacks with LED indicators are as described below. LINK/ACT (Yellow) <ul style="list-style-type: none"> On/Flashing: The port is linking and active in data transmission. Off: The port is not linking. SPEED (Green/Yellow) <ul style="list-style-type: none"> Yellow: The connection speed is 1000Mbps. Green: The connection speed is 100Mbps Off: The connection speed is 10Mbps.
F6 HDD (Yellow) 3G Status (Green) and Power LED (Green)	HDD <ul style="list-style-type: none"> Blinking: data access activities Off: no data access activities 3G Status <ul style="list-style-type: none"> Blinking: 3G transmission activities On: 3G expansion card exists Off: no 3G expansion card present Power <ul style="list-style-type: none"> On: The computer is on. Off: The computer is off .
F7 Power-on Switch	A power-on switch through the Phoenix contact for distant power-on/off control
F8 Power Button with dual LED	ATX Power-on button with LEDs: Standby mode in Red; Power-on mode in Green

Rear Components



Component	Description
R1 HDMI	The HDMI (High-Definition Multimedia Interface). This port can support up to 1920x1080 resolution.
R2 VGA Port	The displays can support VGA up to 1600x1200 resolution.
R3 DIO	Digital Input/Output Connector 2 DI and DO connections
R4 COM	The serial port consists of a 9-pin, RS232/422/485 configured with automatic hardware flow control D-SUB connector that allows the connection of a serial peripheral. To switch among RS232/422/485, use the BIOS menu.
R5 Power Adapter Socket	DC-in 12V. Only use the power adapter supplied with the LEC-7230-CT1 System



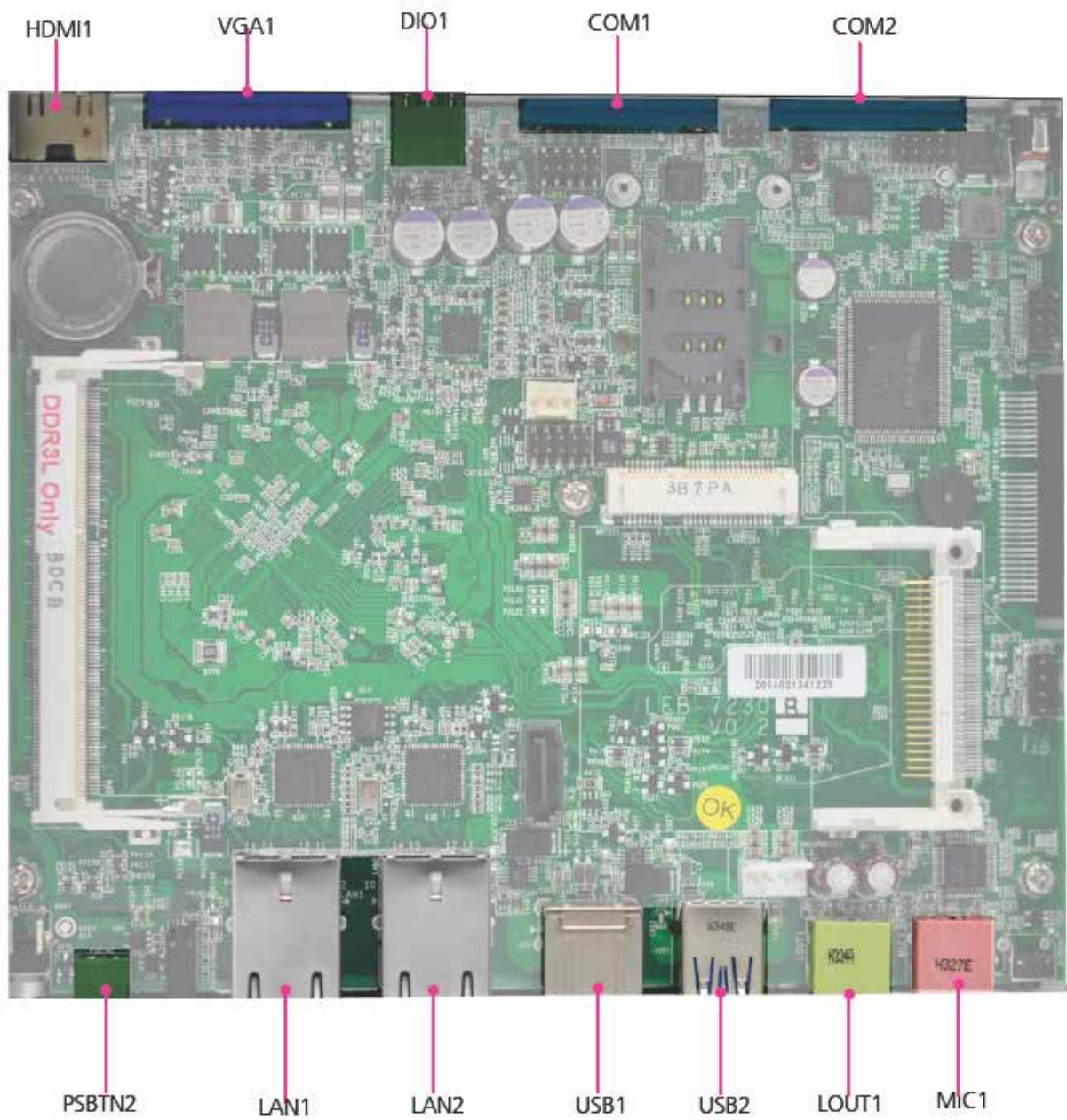
WARNING: Improper installation can cause injury or property damage.

For proper and safe operation use in field site with AC Power, please follow these instructions:

1. Securely plugged and locked the DC-Jack to the machine
2. Connect the AC adapter power cord into a standard 110v/220v AC outlet

Chapter 3:

Motherboard Layout



JCMOS1

JLPC1

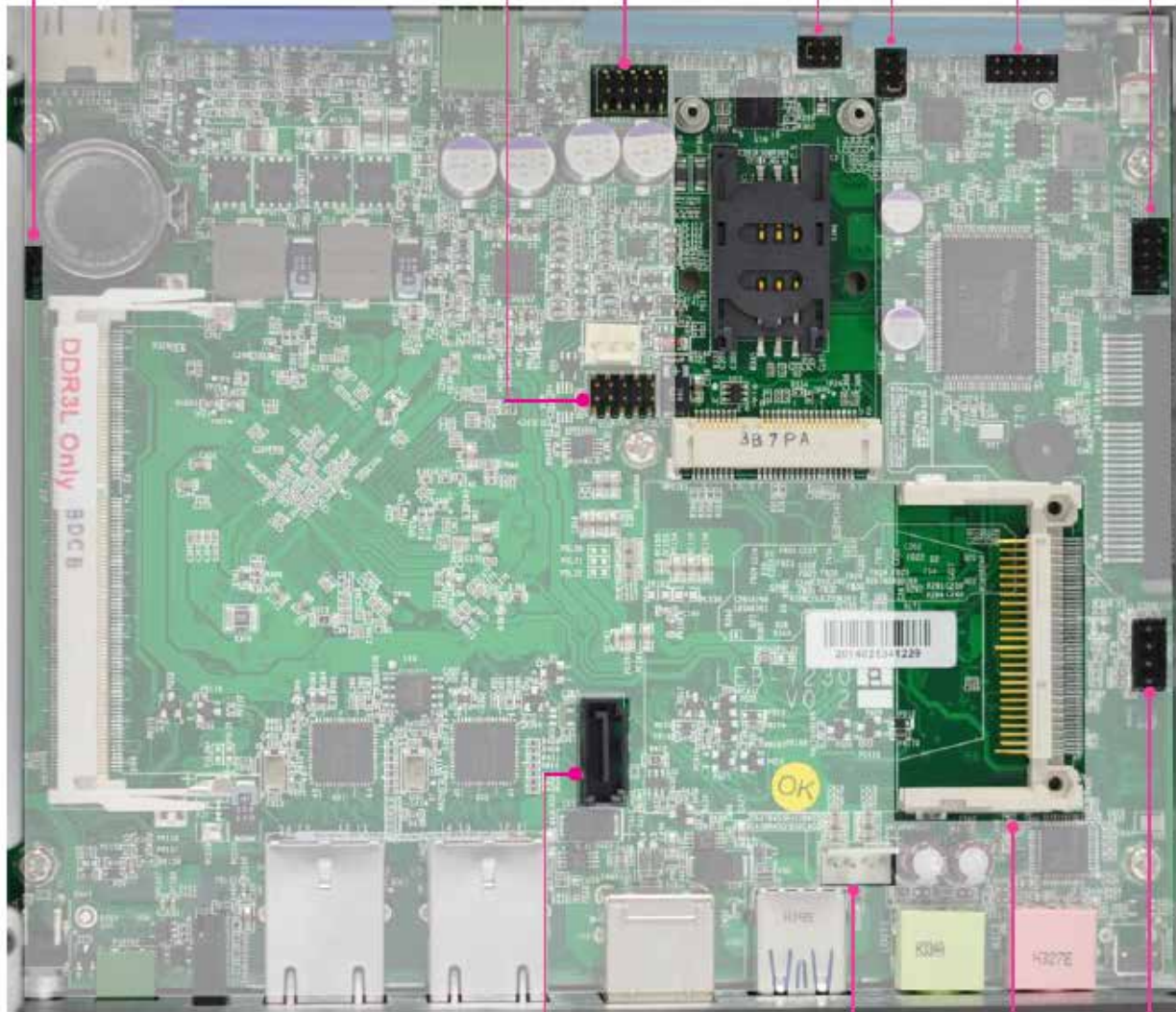
JSPI1

JRI1

JRI2

JCOM1

JCOM2



SATA1

SATAPWR1

CF1

JKBMS1

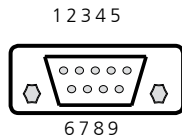
Connectors and Jumpers List

The tables below list the function of each of the board jumpers and connectors by labels shown in the above section. The next section in this chapter gives pin definitions and instructions on setting jumpers.

Table 3.1 Connector List for LEB-7230 Board		
Labels	Function	Notes
COM1/COM2	RS232 Serial Ports COM1 and COM2	
HDMI1	High-Definition Multimedia Interface Port	
JCMOS1	Clear CMOS Jumper	
JKBMS1	PS/2 Keyboard & Mouse Connector	
JLPC1	Low-pin Count Interface	
JRI1/2	COM1/COM2 Pin 9 Signal Selection	
JSPI1	SPI ROM Interface (for debug use only)	
MPCIE1	Mini-PCIe Connectors (with SIM1)	
SATA1	Serial-ATA Connector (SATA1)	
SATAPWR1	SATA HDD Power Connector	
SIM1	SIM Card Reader	
USB1	USB 2.0 Type A Dual Port	
USB2	USB 3.0 Type A Port	
VGA1	VGA Connector	
CF1	CompactFlash Connector	
DIO1	Digital Input/Output	
PSBTN2	Power Button with Phoenix Connector	
JCOM1/2	RS232 Pin Headers	

Jumper and Connectors

RS-232/422/485 Serial Port (COM1 and COM2): It is an RS-232/422/485 port with automatic hardware flow control through a D-SUB9 connector.



Pin No.	Signal
RS-232	
1	Data Carrier Detect (DCD #)
2	Receive Data (RXD)
3	Transmit Data (TXD)
4	Data Terminal Ready (DTR #)
5	Ground (GND)
6	Data Set Ready (DSR #)
7	Request To Send (RTS #)
8	Clear To Send (CTS #)
9	Ring Indicator (RI #)

Pin No.	Signal
RS-422	
1	TXD-
2	TXD+
3	RXD+
4	RXD-
5	GND

Pin No.	Signal
RS-485	
1	DATA-
2	DATA+
3	
4	
5	GND

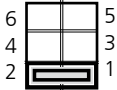
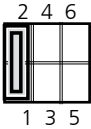
Note: To switch among RS-232, 422, 485 communication protocols, use the BIOS menu.

Select COM1/COM2 Pin 9 Function (JRI1/JRI2): The pin 9 of COM1 and COM2 can be altered by JRI1 and JRI2 respectively according to the following jumper settings.

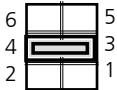
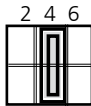
JRI1: COM1

JRI2: COM2

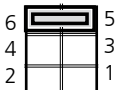
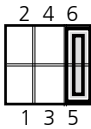
Default



+5V



+12V

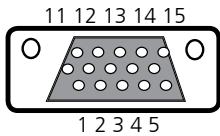


Jumper Setting	SW1/SW4
Function	
RI# (default)	1-2
+5V	3-4
+12V	5-6

Clear CMOS jumper (JCMOS1): It is for clearing the CMOS settings.

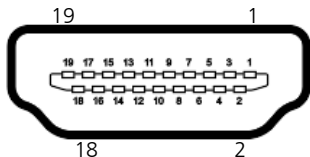
1	Pin No.	Signal
2	1-2	Normal (Default)
3	2-3	Clear CMOS

VGA (VGA1)



Pin	Signal	Pin	Signal	Pin	Signal
1	Red Color Signal	6	GND	11	NC
2	Green Color Signal	7	GND	12	DDC DATA
3	Blue Color Signal	8	GND	13	HSYNC
4	Reserved	9	+5V	14	VSYNC
5	GND	10	GND	15	DDC CLK

HDMI Connector (HDMI1): High-Definition Multimedia Interface Connector



Pin	Signal	Pin	Signal
1	DATA2+	2	GND
3	DATA2-	4	DATA1+
5	GND	6	DATA1-
7	DATA0+	8	GND
9	DATA0-	10	CLK+
11	GND	12	CLK-
13	N.C	14	N.C
15	DDC CLK	16	DDC DAT
17	GND	18	HDMI_VCC
19	HPD		

Serial-ATA Connector (SATA1): It is for connecting a 2.5" harddisk to serve as your system's storage. It can support SATA II which features Data transfer rates up to 3.0 Gb/s (300 MB/s).

7	Pin No.	Signal
6	1	GND
5	2	TX0_P
4	3	TX0_N
3	4	GND
2	5	RX0_N
1	6	RX0_P
	7	GND

4-pin Serial-ATA Power Connector (SATAPWR1): It is for connecting the SATA power cord.

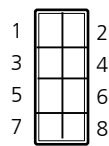
1	Pin No.	Signal
2	1	12V
3	2	GND
4	3	GND
	4	+5V

Dual USB 2.0 Port (USB1):

USB 3.0 Port (USB2)

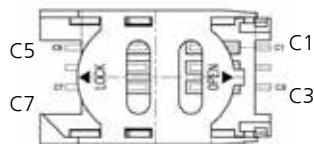
1	Pin No.	Signal
2	1	+5V
3	2	DATA-
4	3	DATA+
5	4	GND
6	5	SSRX-
7	6	SSRX+
8	7	GND
9	8	SSTX-
	9	SSTX+

PS/2 Keyboard and Mouse Connector (JKBMS1)



Pin NO.	Description	Pin NO.	Description
1	VCC	2	MSCLK
3	MSDATA	4	KEY
5	KBDATA	6	KEY
7	GND	8	KBCLK

SIM Card Reader (SIM1)



Pin NO.	Signal	Pin NO.	Signal
C1	UIM_PWR	C5	GND
C2	UIM_RST#	C6	UIM_VPP
C3	UIM_CLK	C7	UIM_DATA

Mini PCI Express Connector (for 3G card with PCI Express 1X and USB 2.0 signals and a SIM card reader, MPCIE1):

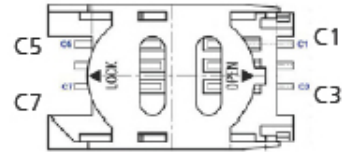
PIN	Signal	PIN	Signal
1	WAKE#	2	+3.3Vaux
3	COEX1	4	GND
5	COEX2	6	+1.5V
7	CLKREQ#	8	UIM_PWR
9	GND	10	UIM_DATA
11	REFCLK-	12	UIM_CLK
13	REFCLK+	14	UIM_RESET
15	GND	16	UIM_VPP
Key			
17	RSVD	18	GND
19	RSVD	20	W_DISABLE#
21	GND	22	PERST#
23	PERn0	24	+3.3Vaux
25	PERp0	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PETn0	32	SMB_DATA
33	PETp0	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3Vaux	40	GND
41	+3.3Vaux	42	LED_WWAN#
43	GND	44	LED_WLAN#
45	RSVD	46	LED_WPAN#
47	RSVD	48	+1.5V
49	RSVD	50	GND
51	RSVD	52	+3.3Vaux

Digital Input/Output Connector (DIO1)



Pin NO.	Signal	Pin NO.	Signal
1	DIO_IN1	2	DIO_IN2
3	DIO_OUT1	4	DIO_OUT2
5	+5V	6	GND

SIM Card Reader (SIM1)



TTL Level is +5V; Maximum input/output current for each port is 10mA/100mA

For all Input/output pins:	Voltage	Logic	Register
	DI: < 0.8V DO: < 0.4V	Low	0
	DI: > 3.5V DO: 5V	High	1

The default value is DI=0, DO=1

Pin NO.	Signal	Pin NO.	Signal
C1	UIM_PWR	C5	GND
C2	UIM_RST#	C6	UIM_VPP
C3	UIM_CLK	C7	UIM_DATA

CompactFlash (CF1)

Pin No.	Signal	Pin No.	Signal
1	GND	26	-CD1
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	-CS0	32	-CS1
8	A10 (GND)	33	-VS1
9	ATA_SEL#	34	-IORD
10	A9 (GND)	35	-IOWR
11	A8 (GND)	36	-WE
12	A7 (GND)	37	INTRQ
13	VCC	38	VCC
14	A6 (GND)	39	-CSEL
15	A5 (GND)	40	-VS2
16	A4 (GND)	41	-RESET
17	A3 (GND)	42	IORDY
18	A2	43	DMARQ
19	A1	44	-DDACK
20	A0	45	-DASP
21	D0	46	-PDIAG
22	D1	47	D8
23	D2	48	D9
24	-IOCS16	49	D10
25	-CD2	50	GND

Chapter 4:

Hardware Setup

Preparing the Hardware Installation

To access some components and perform certain service procedures, you must perform the following procedures first.



WARNING: To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The power switch button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until power is removed.

1. Unpower the LEC-7230 and remove the power cord.
2. Turn the device upside down.
3. Unscrew the 4 rubber feet from the bottom cover.
4. Open the cover.



Installing the System Memory

The motherboard supports DDR3L memory to meet the higher bandwidth requirements of the latest operating system and Internet applications. It comes with one Low-Voltage Double Data Rate Three (DDR3L) Small Outline Dual Inline Memory Module (SO-DIMM) socket.

1. Align the memory module's key with the SO-DIMM socket's notch.
2. Install the SO-DIMM.



Note:

The system can support memory of DDR3L SO-DIMM up to 4/8 GB depending on the CPU SKU.

Installing the Wireless Module

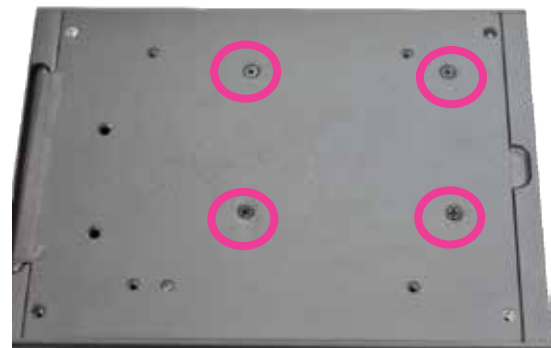
1. Align the wireless module's key with the Mini-PCIE slot notch.
2. Insert the wireless module into the connector diagonally.
3. Fix the wireless module with the screws.



Installing the Disk Drive

The system can accommodate one Serial-ATA disk drive. Follow these steps to install a hard disk into the system:

1. Align the mounting holes of the HDD/SSD and that on the LEC-7230 systems as illustrated in the following picture. Fix the hard disk on the system by attaching the screws through the back cover from the outside.
2. Plug the Serial-ATA cable to the disk.
3. Connect the Serial-ATA power and data disk cables to the Serial-ATA power and disk connectors on the main board respectively.



Installing the 3G SIM Card

1. Unlock the SIM card reader first by sliding it outward.
2. Flip the SIM card reader diagonally.
3. Put the SIM card into the reader. The angled corner of the SIM ensures that the card fits only the correct way in the reader. Make sure the ICs will be in contact with the SIM card reader.
4. Close the tray. You should feel a click when the SIM card is locked securely in the SIM card reader.



Note: To remove the SIM card, push the card outward to unlock it.

Installing CompactFlash Card

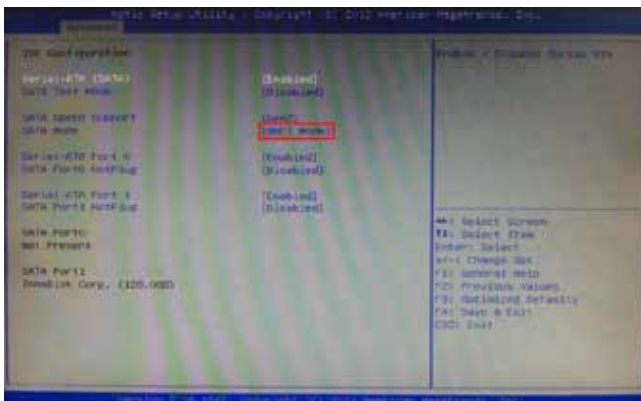
LEC-7230 provides one CompactFlash slot. Follow the procedures below for installing a CompactFlash card.

1. Align CompactFlash card and the card slot with the arrow pointing toward the connector.
2. Push the card to insert into the connector.

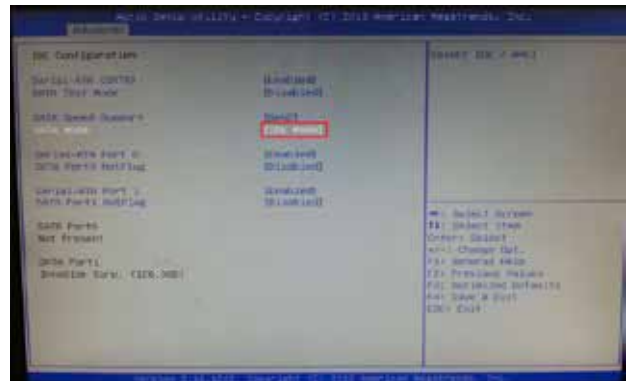


Notes about installing Windows 7 on CF Card

1. Press DEL to entry BIOS, the default setting of SATA mode is "AHCI Mode"



2. Since we are installing Windows 7 operating system on a CompactFlash card, which is ATA-based, please change the "SATA Mode" from "AHCI Mode" to "IDE Mode". (BIOS -> Advanced -> IDE Configuration -> SATA Mode).



3. When the configuration is done, select "Save & Exit" setup screen.
4. Press <Enter> on "Save Changes and Exit". The pop-up message will ask "Save configuration & exit" and choose "Yes". The system will reboot itself afterwards and the setup is completed.

Appendix A:

Programming Watchdog Timer

A watchdog timer is a piece of hardware that can be used to automatically detect system anomalies and reset the processor in case there are any problems. Generally speaking, a watchdog timer is based on a counter that counts down from an initial value to zero. The software selects the counter's initial value and periodically restarts it. Should the counter reach zero before the software restarts it, the software is presumed to be malfunctioning and the processor's reset signal is asserted. Thus, the processor will be restarted as if a human operator had cycled the power.

For sample watchdog code, see *Watch dog* in the *Driver and Manual CD*



Appendix B:

Digital Input/Output Control on the GPIO port

The Digital I/O on the panel is designed to provide the input and output operations for the system. For sample DIO code, see *Watch dog and DIO* in the *Driver and Manual CD*.

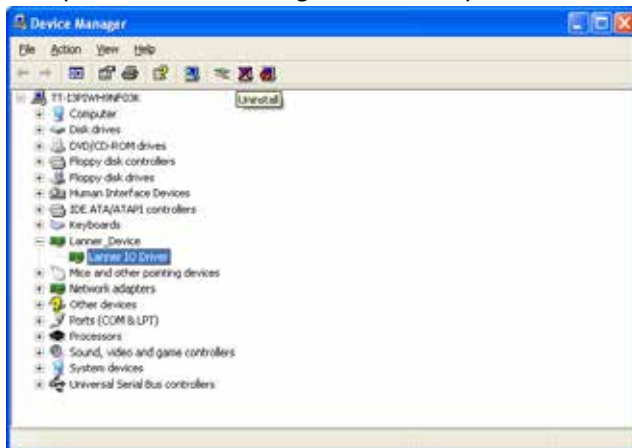
Driver Installation

Before you could access or control the operation of the watchdog and Digital I/O functions, install the DIO driver

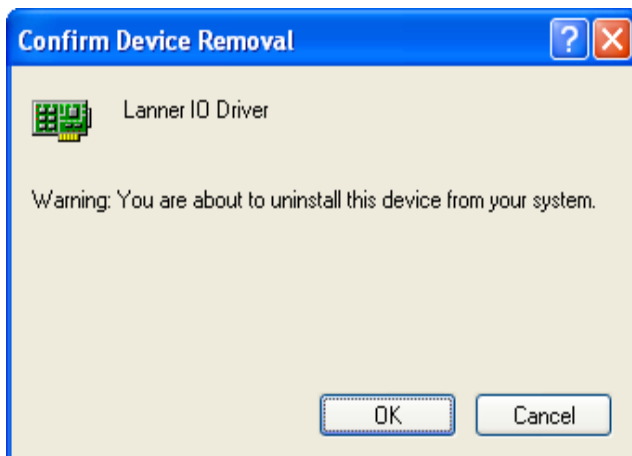
The current version of Lanner DIO driver is V101. The older version needs to be uninstalled before the current one can be installed.

To install the Lanner GPIO driver, follow these steps:

1. Open the device manager on the computer.



2. Select the Lanner IO Driver and click uninstall.
3. Confirm the deletion.



4. Double click the GPIO_Demo.msi file to install the new driver




5. The welcome screen appears. Click Next to proceed.



6. Select the installation folder.





The screenshot shows a window titled "DemoSetup" with a green title bar. The window has a white header area with the text "Confirm Installation" on the left and a cartoon illustration of a computer with a speech bubble on the right. The main area is light beige and contains the text: "The installer is ready to install DemoSetup on your computer." followed by "Click 'Next' to start the installation." At the bottom, there are three buttons: "Cancel", "< Back", and "Next >".

The screenshot shows a Windows-style window titled "DemoSetup". The window has a title bar with standard minimize, maximize, and close buttons. The main content area has a white header with the text "Installation Complete" in a large, bold, black font. To the right of this text is a cartoon illustration of a blue computer monitor, keyboard, and mouse. Below the header, the text "DemoSetup has been successfully installed." is displayed in a smaller black font, followed by "Click 'Close' to exit." in an even smaller font. At the bottom of the window, there is a light gray bar containing three buttons: "Cancel", "< Back", and "Close". The "Close" button is highlighted with a dark border.

1. Execute the GPIO demo program at start menu.

The screenshot shows a window titled "Demo" with a standard Windows XP-style title bar. The window contains several sections of controls:

- D-In:** A row of 16 checkboxes, numbered 1 through 16. Checkboxes 1 through 10 are checked, while 11 through 16 are unchecked.
- D-Out:** A row of 16 checkboxes, numbered 1 through 16. Checkboxes 1 through 10 are checked, while 11 through 16 are unchecked.
- PJO:** A row of 16 checkboxes, numbered 1 through 16. Checkboxes 1 through 10 are checked, while 11 through 16 are unchecked.
- LED:** A row of 8 checkboxes labeled "Alarm0", "Alarm1", "Alarm2", "GPS0", "Wireless", and three unlabeled checkboxes. "Alarm0", "Alarm1", "Alarm2", and "GPS0" are checked. "Wireless" and the two unlabeled checkboxes are unchecked.
- Monitor:** A 2x6 grid of empty rectangular input fields.
- Others:** A section containing a "Watchdog Timer:" label followed by two empty input fields, and "Start" and "Stop" buttons. To the right of these is a checked checkbox labeled "Case Open".

D-IN: Check the box to alter the voltage level of the digital input pins as to enable or disable the input pins. The default value for D-in is 1 which indicates the high level.

D-Out: Check the box to alter the voltage level of the digital output pins as to write the output pins to "1". The default value for D-Out is 0 which indicates the low level.

Appendix C:

Terms and Conditions

Warranty Policy

1. All products are under warranty against defects in materials and workmanship for a period of one year from the date of purchase.
2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas the manufacturer will bear the after service freight charges for goods returned to the user.
3. The buyer will pay for repair (for replaced components plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service," RMA goods will be returned at customer's expense.
5. The following conditions are excluded from this warranty:

Improper or inadequate maintenance by the customer
Unauthorized modification, misuse, or reversed engineering of the product
Operation outside of the environmental specifications for the product.

RMA Service

Requesting a RMA#

6. To obtain a RMA number, simply fill out and fax the "RMA Request Form" to your supplier.
7. The customer is required to fill out the problem code as listed. If your problem is not among the codes listed, please write the symptom description in the remarks box.
8. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.
9. Mark the RMA# clearly on the box.



Note: Customer is responsible for shipping damage(s) resulting from inadequate/loose packing of the defective unit(s). All RMA# are valid for 30 days only; RMA goods received after the effective RMA# period will be rejected.

RMA Service Request Form

When requesting RMA service, please fill out the following form. Without this form enclosed, your RMA cannot be processed.

RMA No:		Reasons to Return: <input type="checkbox"/> Repair(Please include failure details)	
		<input type="checkbox"/> Testing Purpose	
Company:		Contact Person:	
Phone No.		Purchased Date:	
Fax No.:		Applied Date:	
Return Shipping Address: _____			
Shipping by: <input type="checkbox"/> Air Freight <input type="checkbox"/> Sea <input type="checkbox"/> Express _____			
<input type="checkbox"/> Others: _____			
Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

*Problem Code:

01: D.O.A.

02: Second Time

R.M.A.

03: CMOS Data Lost

04: FDC Fail

05: HDC Fail

06: Bad Slot

07: BIOS Problem

08: Keyboard Controller Fail

09: Cache RMA Problem

10: Memory Socket Bad

11: Hang Up Software

12: Out Look Damage

13: SCSI

14: LPT Port

15: PS2

16: LAN

17: COM Port

18: Watchdog Timer

19: DIO

20: Buzzer

21: Shut Down

22: Panel Fail

23: CRT Fail

24: Others (Pls specify)

Request Party

Confirmed By Supplier

Authorized Signature / Date

Authorized Signature / Date