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Embedded & Industrial Computing

Hardware platforms for next generation networking infrastructure

LEC-7220
V0.3

>>

User's Manual

Publication date:2014-03-28

About

About

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

Copyright and Trademarks

Acknowledgement

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.

About

Revision History

Revision	Revision Date	Changes
0.2	20131204	-change CPU from D2800 to N2800 -delete pin definition for CF1, VGA1, MPCIE2, CON2, USB1/USB2, SATA1
0.3	20140328	Change the HDD/SSD (reserved) to HDD/SSD (supported)

Table of Contents

Chapter 1: Introduction

Thank you for choosing the LEC-7220. The LEC-7220 features the Dual Core Intel® Atom™ N2800 processor.

The LEC-7220 is an ideal solution for digital signage and infortainment or self-service kiosk.

This all-in-one system is fanless and has a dust-proof case. It can be easily installed at places where space is limited and the weather condition is harsh (198x42x145mm).

The list shows the versatile connectivity that the device provides:

- Intel® Graphics Media Accelerator 3600 Graphics which supports VGA (up to 1920x1200)
- 4 or 6 (on model LEC-7220-N6) 10/100/1000 Mbps LAN (provided by Intel 82583V Ethernet controller)
- One Mini-PCIe expansion slots (it comes with a SIM card reader that can support 3G Internet connection)
- One SATA 2.0 Port. It provides storage for photos, videos and other multi-media contents.
- USB x 4 (2 external ports on the back and 2 external ports on the front)
- COM x 2 (both of them are RS-232 compatible.)

System Specification

LEC 7 Series		LEC-7220
Dimension (WxHxD)		198x42x145mm (7.79"x1.65"x5.7")
Processor		Intel Atom N2800 1.86GHz
Chipset		Intel NM10
System	Technology	DDR3 1066MHz SODIMM x1
Memory	Max. Capacity	Up to 4GB
Storage	Expansion	1x CF Type I/II Socket
	SATA/SSD	1x 2.5" HDD/SSD drive bay
Networking	LAN	4 or 6x 10/100/1000Mbps, Autosensing,RU45
	Controller	Intel 82583V x 4, ASIX AX88179 USB Gigabit Ethernet x 2 (LEC-7220-N6 only)
Display	Interface	VGA x 1 (up to 1920 x 1200)
	Graphics Controller	Intel® integrated Graphics Media Accelerator
Serial I/O		DB9 for RS-232 x 2
Expansion Bus		One Mini-PCIe with SIM card reader (USB signal only)
OS Support		Microsoft Windows 7/7 Embedded, Linux Cent OS 5
LEDs		1 x double-stacked LED for storage-access power-on status
Antenna Slot		SMA Antenna slot for wireless connectivity
Power	Input Voltage	+12 V DC with ATX power control
	Power Consumption	TBD
	AC Adapter	External AC/DC adapter, 60W DC Jack
Physical Characteristics	Housing	Aluminum
	Weight	1Kg
	Dimensions (WxHxD)	198 x 42 x 145 mm (7.79" x 1.65" x 5.7")
	Mounting Options	Rack, VESA, DIN-rail and Wall mount
Environment	Operating Temperature	-20~55°C (with industrial grade components)
	Storage Temperature	-20~75°C
	Ambient Relative Humidity (non-condensing)	5 to 95% (non-condensing)
Standard and Regulation	EMC	CE/FCC
	Green Product	RoHS
Reliability	Alerts	Built-in buzzer and real-time clock with lithium battery backup
	Automatic reboot Trigger	Watchdog Timer 1~255 level timer interval system reset, software programmable
	MTBF	TBD

Chapter 1

Introduction

Package Contents

Your package contains the following items:

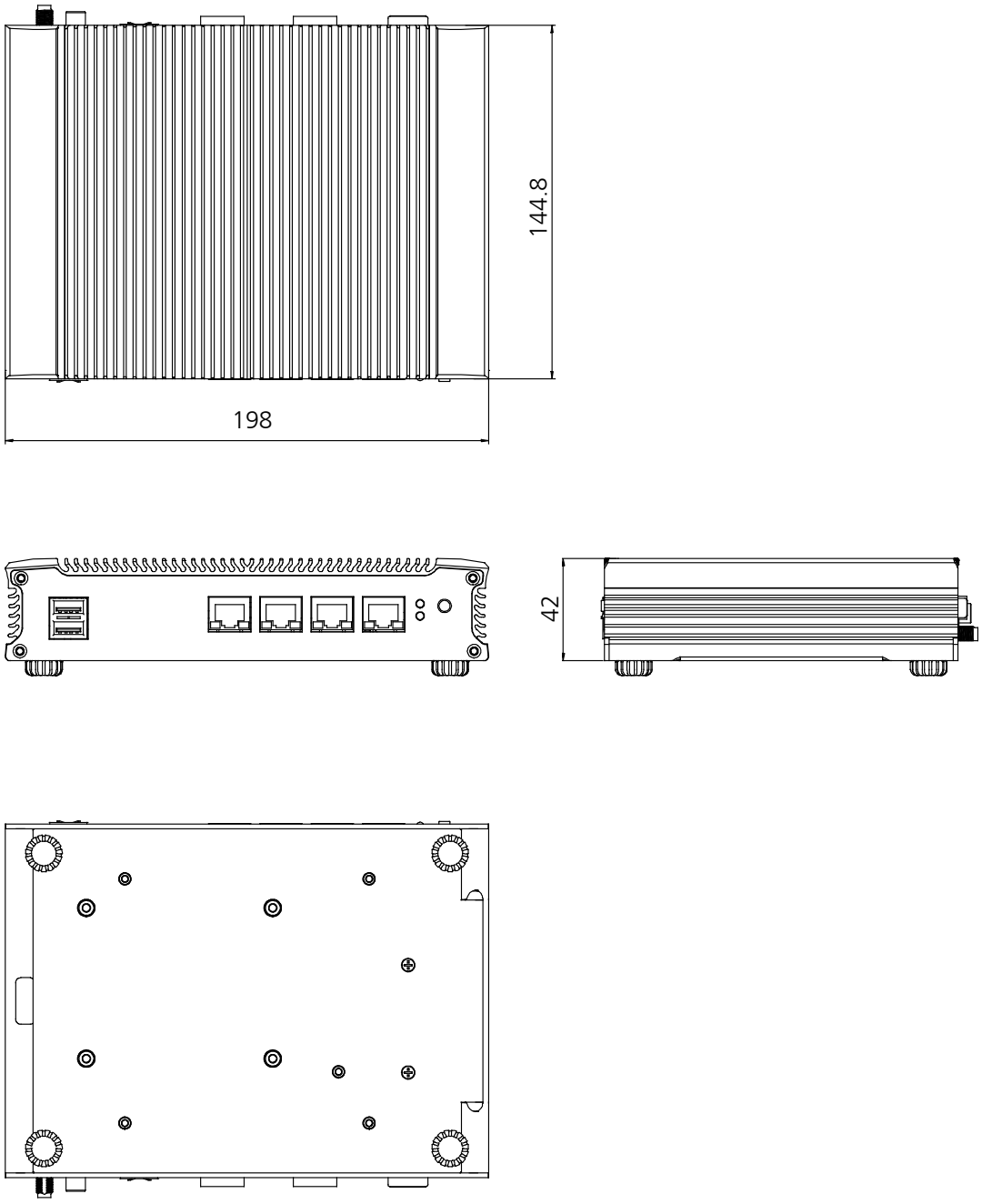
- The LEC-7220 Embedded System
- DC+12V 60W Power Adapter
- Serial-ATA/Power Cable
- Wall-Mounting Kit
- Drivers and User's Manual CD

Chapter 2:
System Components

System Drawing

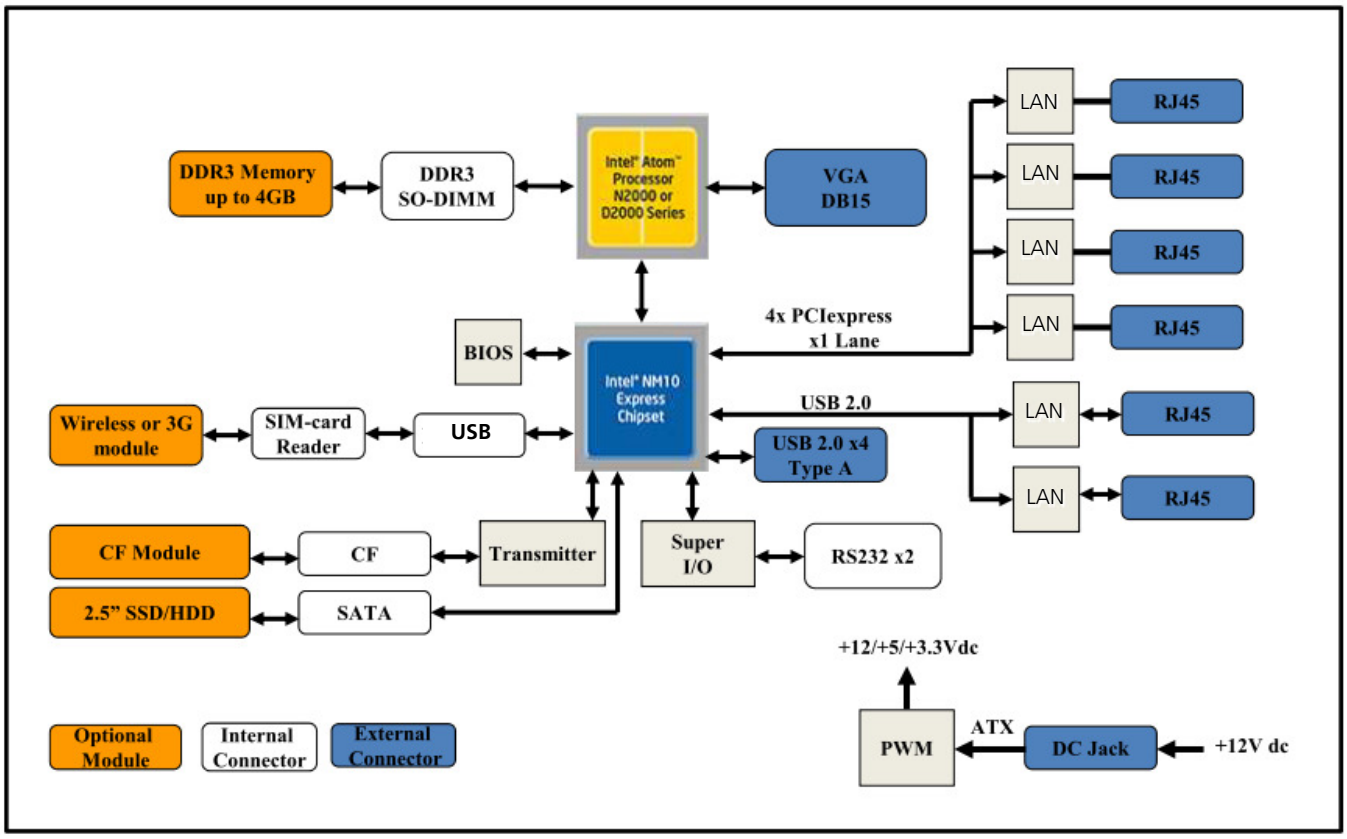
Mechanical dimensions of the LEC-7220

Unit: mm

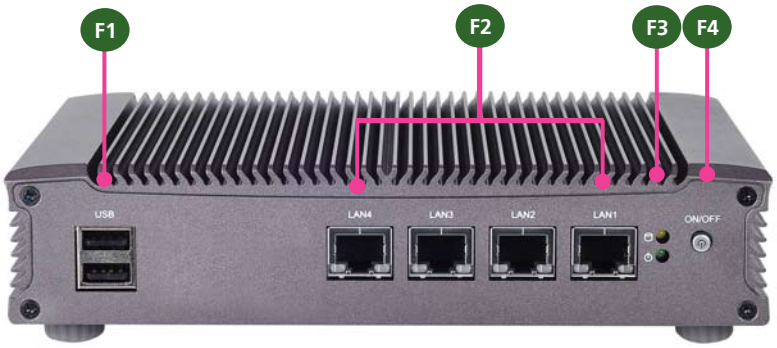


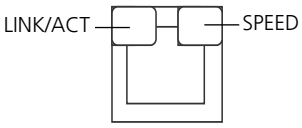
Block Diagram

The block diagram depicts the relationships among the interfaces and modules on the motherboard..

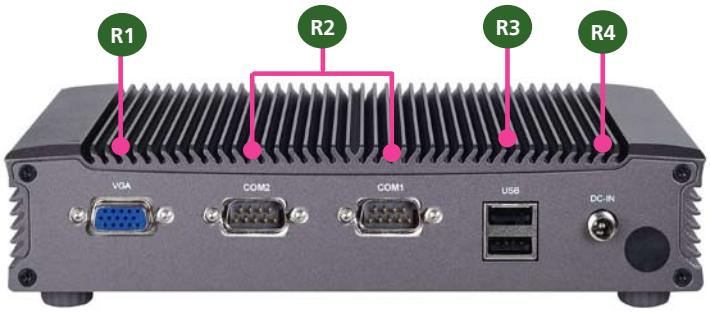


Front Components



Component	Description	Pin Definition Reference
F1 Dual USB Stack Connector	Two USB type A connector	JCOMA1 on page 14
F2 Four 10/100/1000 LAN Ports(*) 	Four RJ-45 (network) jacks with LED indicators as described below. The LAN ports are provided by Intel 82583V. They support PXE remote boot. LINK/ACT (Yellow) • On/Flashing: The port is linking and active in data transmission. • Off: The port is not linking. SPEED (Green/Amber) • Amber: The connection speed is 1000Mbps. • Green: The connection speed is 100Mbps • Off: .The connection speed is 10Mbps.	LAN1~LAN4 (6) on page 13
F3 HDD (Yellow) and Power LED (Green)	HDD • Blinking: data access activities • Off: no data access activities or no hard disk present Power • On: The computer is on. • Off: The computer is off .	
F4 Power Button with dual LED	ATX Power-on button with LEDs: Standby mode in Red; Power-on mode in Green	
* Model LEC-7220-N6 offers six ports. The additional 2 ports are provided by AX88179, an USB3.0 to 10/100/1000M Gigabit Ethernet Controller.		

Rear Components

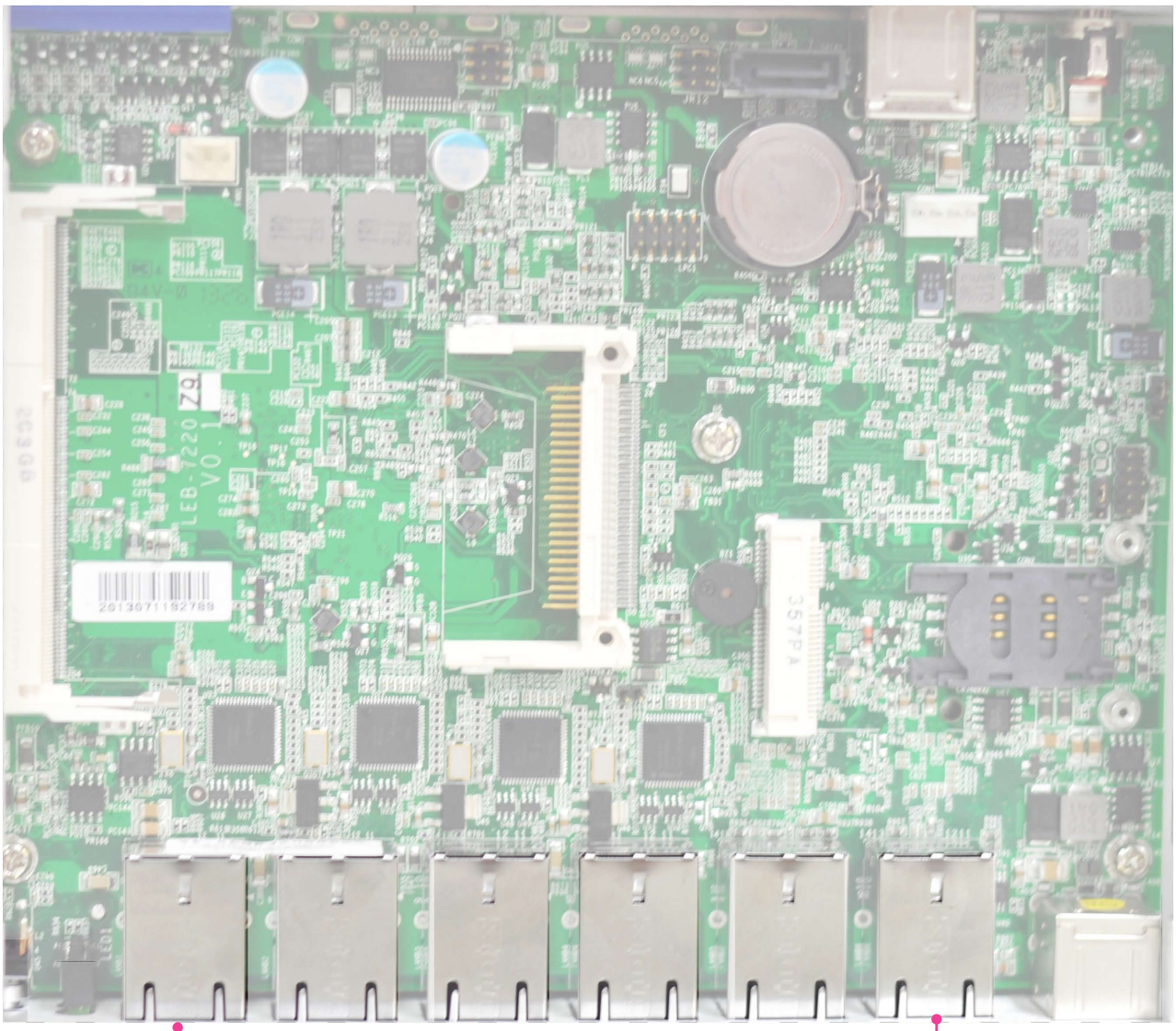


Component	Description	Pin Definition Reference
R1 VGA Port	DB-15 Female Connector for VGA connection (up to 1920x1200).The graphic engine is provided by Intel onboard graphic GMA 3600.	
R2 COM2/COM1	Serial ports through the DB-9 connector; COM1 and COM2 support RS-232 communication protocol.	COM1/COM2 Connector on page 13
R3 Dual USB Stack Connector	Two USB type A connectors	
R4 DC Jack	DC-in 12V power socket with Lock. Only use the power adapter supplied with the LEC-7220 System.	

Chapter 3: Board Layout

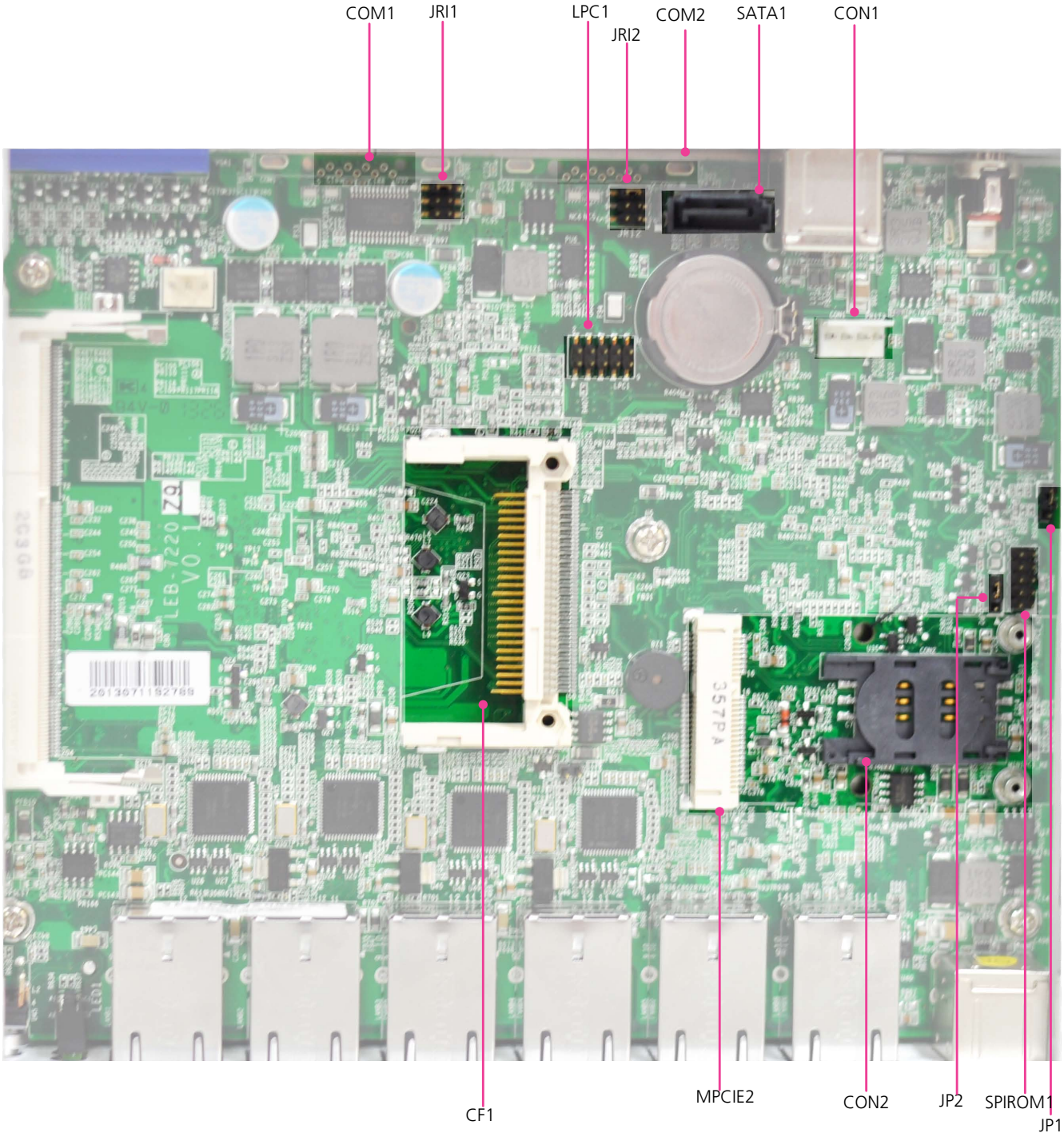
External Connectors

The following picture highlights the location of system input/output connectors. Refer to the table 3.1 Connector List for more details.



Internal Connectors and Jumpers

The following picture highlights the location of internal connectors and jumpers. Refer to the table 3.1 Connector List for more details.



Chapter 3

Connectors and Jumpers List

The table below lists 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-7220**

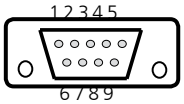
Labels	**Function**	**Pin Definition Reference Page**
COM1/COM2	RS-232 Ports with DB9 Connector	p13
CON1	SATA HDD Power Connector	P13
JP1	Clear CMOS Jumper	P14
JRI1/JRI2	COM1/COM2 Pin 9 Function Selection	P13
LANB1~6	Six RJ-45 with LED	P13
LPC1	Low Pin Count Interface	Reserved for factory use
SPIROM1	SPIROM1 Connector	Reserved for factory use

Jumper Settings

4-pin Serial-ATA Power Connector (CON1): It is for connecting the SATA power cord (for SATA1 connector).

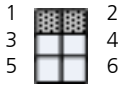
Pin No.	Signal
1	+12V
2	GND
3	GND
4	+5V

RS-232 Serial Port COM1 (COM1/COM2): It is a RS-232 port through the D-SUB9 connector.



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

COM1/COM2 Pin 9 Function Selection (JRI1, JRI2): The Pin No. 9 of RS-232 can be altered to supply power.



RS-232 Pin 9 Signal	JRI1, JRI2
RI#	1-2 (default)
+5V	3-4
+12V	5-6

LAN1~LAN6: Dual RJ-45 with LED: The LAN ports are provided by Intel 82583V Ethernet Controllers. The following lists its main features:

- The Preboot eXecution Environment (PXE) remote boot support
- TCP segmentation offload
- TCP, UDP, IPv4 checksum offload
- Supports IEEE 802.1Q VLAN tagging

The additional 2 LAN ports (on model LEC-7220-N6) are implemented by AX88179 – USB3.0 to 10/100/1000M Gigabit Ethernet Controller and it supports the following management features:

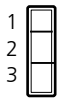
- Support Wake-on-LAN Function

  -Supports suspend mode and remote wakeup via link-change, Magic Packet, Microsoft Wakeup Frame and external wakeup pin

  -Supports Bonjour wake-on-demand

Pin No.	Description	
	Fast Ethernet	Gigabit Ethernet
1	TX+	MDI0+
2	TX-	MDI0-
3	RX+	MDI1+
4	T45	MDI2+
5	T45	MDI2-
6	RX-	MDI1-
7	T78	MDI3+
8	T78	MDI3-
9	10-/100-/1000+	
10	10+/100+/1000-	
11	Link+/ACT-	
12	Link-/ACT+	

Clear CMOS jumper (JP1): It is for clearing the CMOS memory.



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

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 front panel Power On/Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

1. Unpower the LEC-7220 and remove the power cord.
2. Unscrew the 4 rubber feet from the outside of the bottom cover.
3. Open the cover.

Installing the System Memory

The motherboard supports DDR3 memory. It comes with one Double Data Rate (DDR3) Small Outline Dual Inline Memory Modules (SO-DIMM) sockets.

1. Align the SO-DIMM connector key with the SO-DIMM socket key.
2. Install the SO-DIMM.

Note:

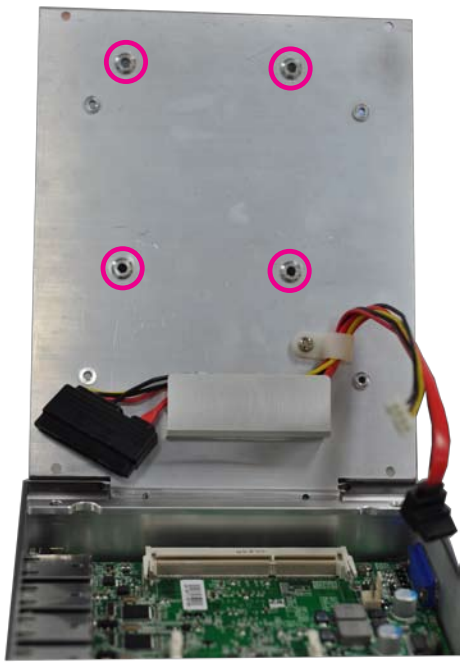
1. The motherboards can support up to 4 GB memory capacity in maximum.

Installing the Hard Disk

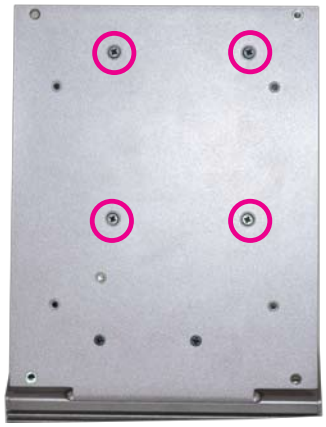
The system can accommodate one Serial-ATA disk. Follow these steps to install a hard disk into the LEC-7220:

1. Place hard disk on the inside of the bottom cover and align the holes of the hard disk with the mounting holes on the cover.
2. Secure the hard disk with 4 mounting screws through the bottom cover from the outside.
3. Connect the Serial-ATA cable to the hard disk.
4. Plug the Serial-ATA power and data cables to the Serial-ATA power and data connectors on the main board.

1



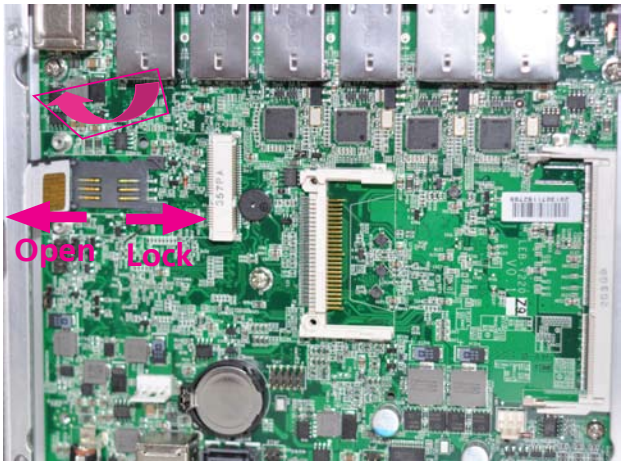
2

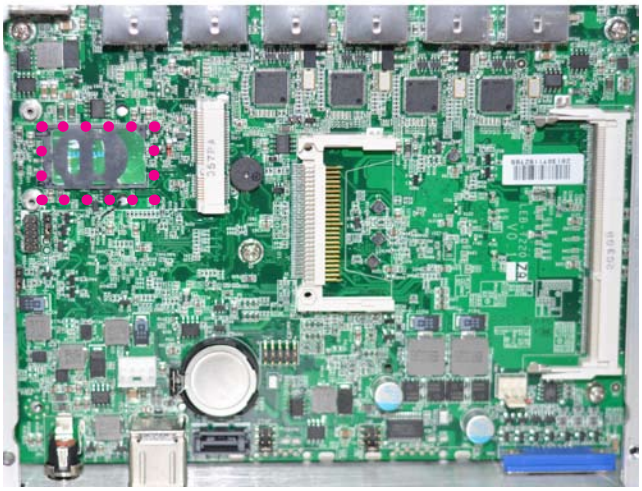


3

Installing the 3G SIM Card

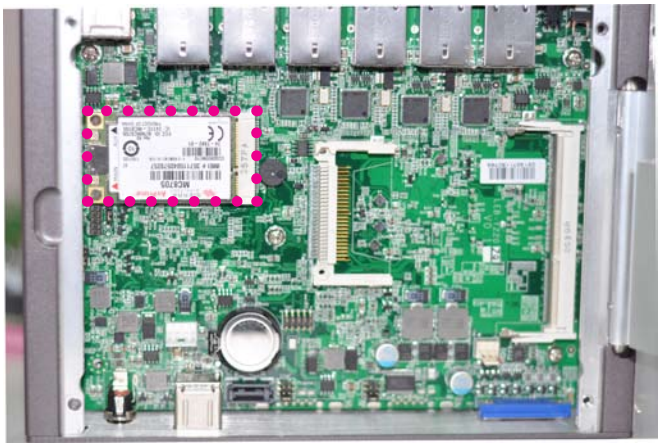
1. Unlock the SIM card reader first by sliding it outward.
2. Flip the SIM card reader diagonally.
3. The angled corner of the SIM ensures that the card fits only the correct way in the reader so align the angled corner with the tab on the reader. Make sure the ICs will be in contact with the SIM card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





Installing the Wireless 3G module

1. Align the wireless module's key with the Mini-PCIe slot notch.
2. Insert the wireless module into the connector diagonally.
3. Fasten the wireless module to the board with the screws (Use the Mini-PCIe module screws contained within the package).



Appendix A: Programming System Watchdog Timer of the LEC-7220

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 *watchdog* folder under LEC-7220 Utility on the *Driver and Manual CD*

Executing through the Command Line:

Execute the WD.EXE file under DOS (WD.EXE and CWSDPMI.EXE should be placed on same directory), then enter the values from 0~255. The system will reboot automatically according to the time-out you set.

Appendix B: 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#

1. To obtain a RMA number, simply fill out and fax the "RMA Request Form" to your supplier.
2. 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.
3. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.
4. 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.

Appendix B

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: □ Repair(Please include failure details) □ Testing Purpose
Company:	Contact Person:
Phone No.	Purchased Date:
Fax No.:	Applied Date:
Return Shipping Address: _____	
Shipping by: □ Air Freight □ Sea □ Express_____ □ Others:_____	

Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

*Problem Code:

01:D.O.A.	07: BIOS Problem	13: SCSI	19: DIO
02: Second Time R.M.A.	08: Keyboard Controller Fail	14: LPT Port	20: Buzzer
03: CMOS Data Lost	09: Cache RMA Problem	15: PS2	21: Shut Down
04: FDC Fail	10: Memory Socket Bad	16: LAN	22: Panel Fail
05: HDC Fail	11: Hang Up Software	17: COM Port	23: CRT Fail
06: Bad Slot	12: Out Look Damage	18: Watchdog Timer	24: Others (Pls specify)

Request Party

Authorized Signature / Date

Confirmed By Supplier

Authorized Signature / Date