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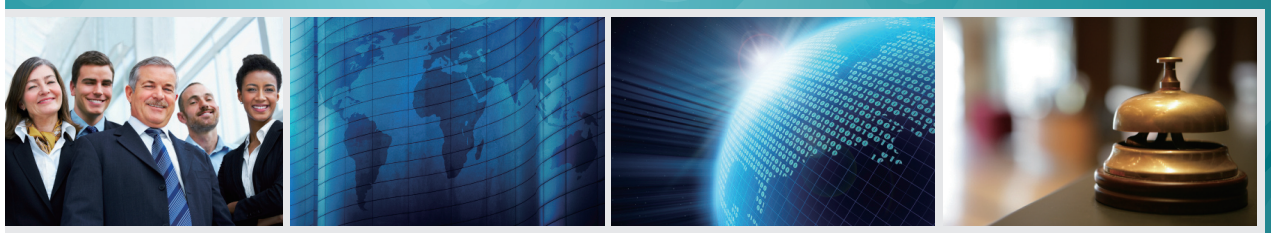

LEC-7050 V1.0

User's Manual

Publication date:2012-10-30

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://assist.lannerinc.com
RMA	http://eRMA.lannerinc.com

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Compliances

CE

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

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.

Safety Guidelines

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free 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 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.

About

LITHIUM BATTERY CAUTION:

Risk of Explosion if Battery is replaced by an incorrect type. Dispose of used batteries according to the instructions

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).

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.

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Chapter 1: Introduction

Thank you for choosing the LEC-7050. The LEC-7050 features Intel N2800 and NM10 chipset. It has dual LAN as well as audio ports and DVI-D connectors for high demand of Internet and digital signage applications.

The following highlights the functionalities of the LEC-7050 system:

- Intel Integrated Graphics Media Accelerator 3650
- Dual VGA and DVI-D video output for displaying media content side by side.
- Dual 10/100/1000 Mbps LAN
- USB x 4
- SATA HDD support
- Totally 2 serial ports supporting Hardware Auto flow Control: DB9 x2 for RS232, 422, and 485 ; the serial communication protocol can be selected with dip switches.
- Audio input and output through Mic-in and Line-out jack
- Featuring power switch through phoenix contact for distant power on/off control

System Specification

Dimensions (WxHxD)		198x42x145mm (7.80"x1.65"x5.71")
Processor		Intel Atom N2800
Chipset		Intel NM10
System Memory	Technology	DDR3 SODIMM x1
	Max. Capacity	Up to 4GB
Storage	IDE	CF socket Type I/II x1
	SATA	2.5" SSD/HDD drive bay x1
Ethernet Controller		Intel 82583V
Graphic Controller		Intel Integrated Graphics Media Accelerator 3650
Audio Controller		RTL ALC886 x1
IO	LAN	GbE RJ45 x2
	Display	DB15 x1 for VGA (1920x1200) DVI-D x1 (1920x1200)
	Video Grabber	N/A
	Audio	Phone Jack x2 for Mic-in and Line-Out
	Serial I/O	DB9 x2 supports RS232/422/485
	GPS	N/A
	USB 2.0	Type A x4
	Power Input	2-pin terminal block
	Expansion	Mini-PCIe x2 (one with SIM card reader)
	Others	External: Power-On Button, SMA Antenna Hole Internal: Reset
Power Input		+24Vdc +/-5%, ATX Mode
AC Adapter		60W +24V @ 2.5A
Hardware Monitor		Fintek F81865F Integrated Watchdog Timer 1~255 level
OS Support		Linux, XPE, XP Pro FES, WS7E, WS7P, Win 7 Pro FES
Certifications		CE, FCC Class A
Compliance		N/A
Operating Temperature Range	With Industrial Components	-20~55°C/14~131°F
	With Commercial Components	-5~45°C / 23~113°F
Ordering Information		
LEC-7050	Intel Atom N2800 (1.8 GHz)	

Chapter 1

Introduction

Package Contents

Your package contains the following items:

- LEC-7050 Fanless Embedded System
- Serial-ATA Data Cable (P/N: 080W170702002)
- Serial-ATA Power Cable (P/N: 080W141502501)
- 2-pin Female Terminal Block (P/N: 04AW20023Z101)
- Mini-PCIe module screws (P/N: 070W101000401)
- Drivers and User's Manual CD (P/N: S09OADA19H100)

Optional Accessories

The system has a variety of optional accessories including the power cords and Wi-Fi or 3G modules for extended capabilities. For details of these modules, visit:

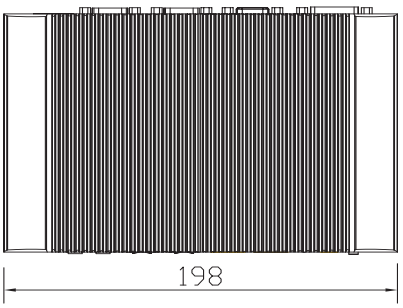
http://www.lannerinc.com/Embedded_Computing/LEC-7050

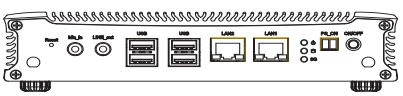
Chapter 2: System Components

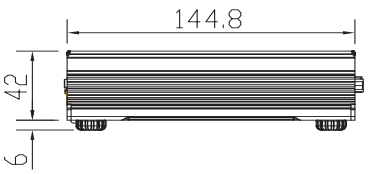
System Drawing

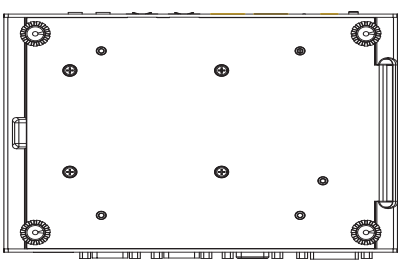
Mechanical dimensions of the LEC-7050

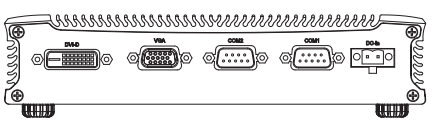
Unit: mm





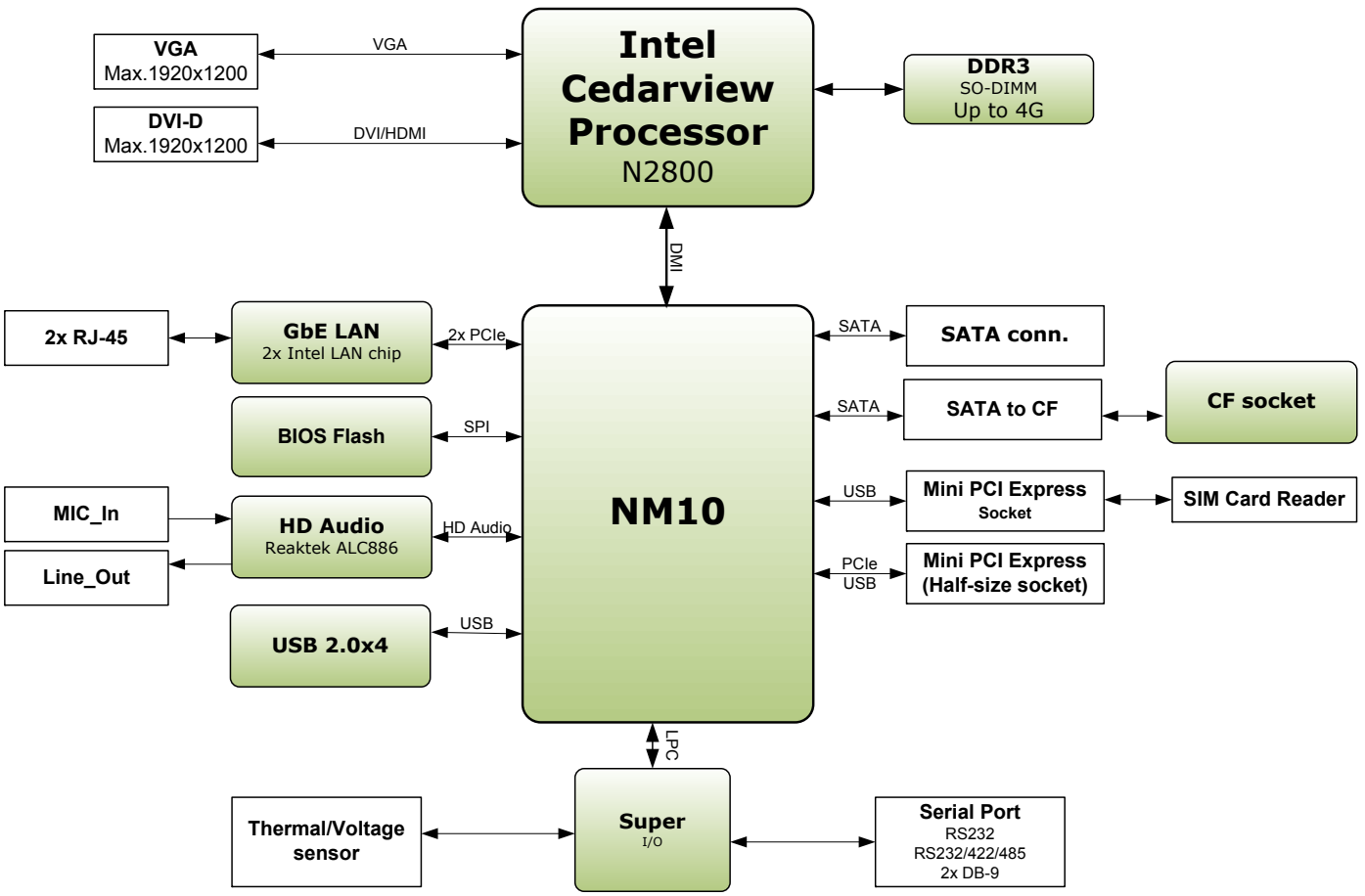




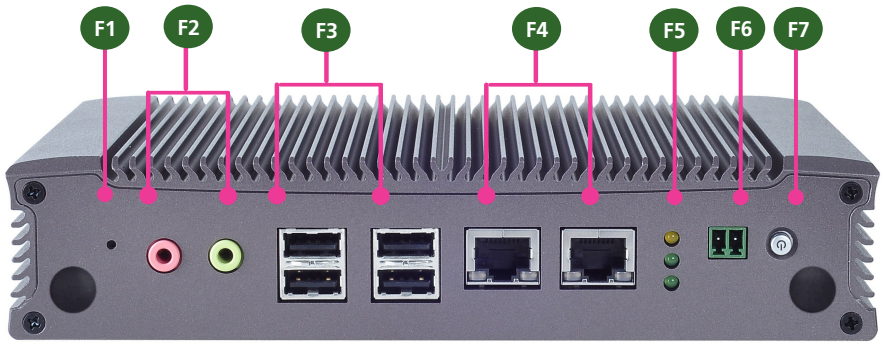


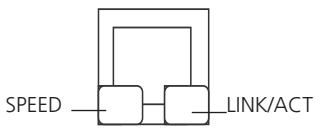
Block Diagram

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

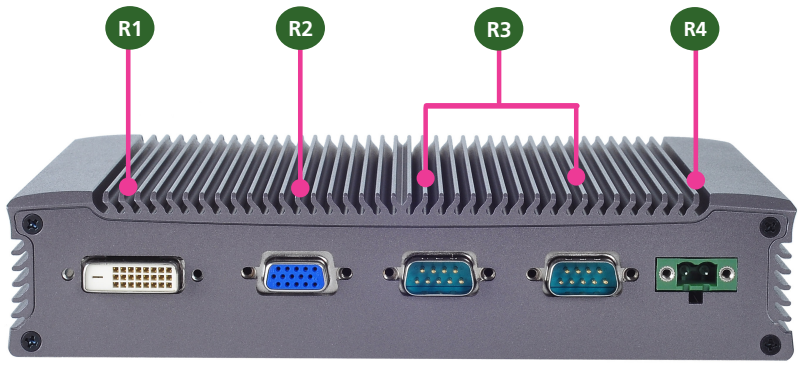


Front Components



Component	Description	Pin Definition Reference
F1 Reset	Reset switch	SW5 on page 15
F2 MIC IN/LINE OUT	Connect the audio devices to these ports. The Microphone and line out port are provided by Realtek ALC 886.	J3, J4 on page 13
F3 Four USB 2.0 Ports	An USB type A connector.	USB1, USB2 on Page 15
F4 Two 10/100/1000Mbps LAN ports  	Two RJ-45 (network) jacks with LED indicators as described below. Both LAN ports are provided by Intel 82583V. The 82583V supports 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.	LANB1/LANB2 on page 14
F5 HDD (Yellow) Status and Power LED (Green)	HDD • Blinking: data access activities • Off: no data access activities Status A programmable dual green/orange LED which can be used for indicating system status. Power • On: The computer is on. • Off: The computer is off .	
F6 Power-on Switch	A power-on switch through the Phoenix contact for distant power-on/off control	CN4 on page 15
F7 Power Button with dual LED	ATX Power-on button with LEDs: Standby mode in Red; Power-on mode in Green	U45 on page 15

Rear Components

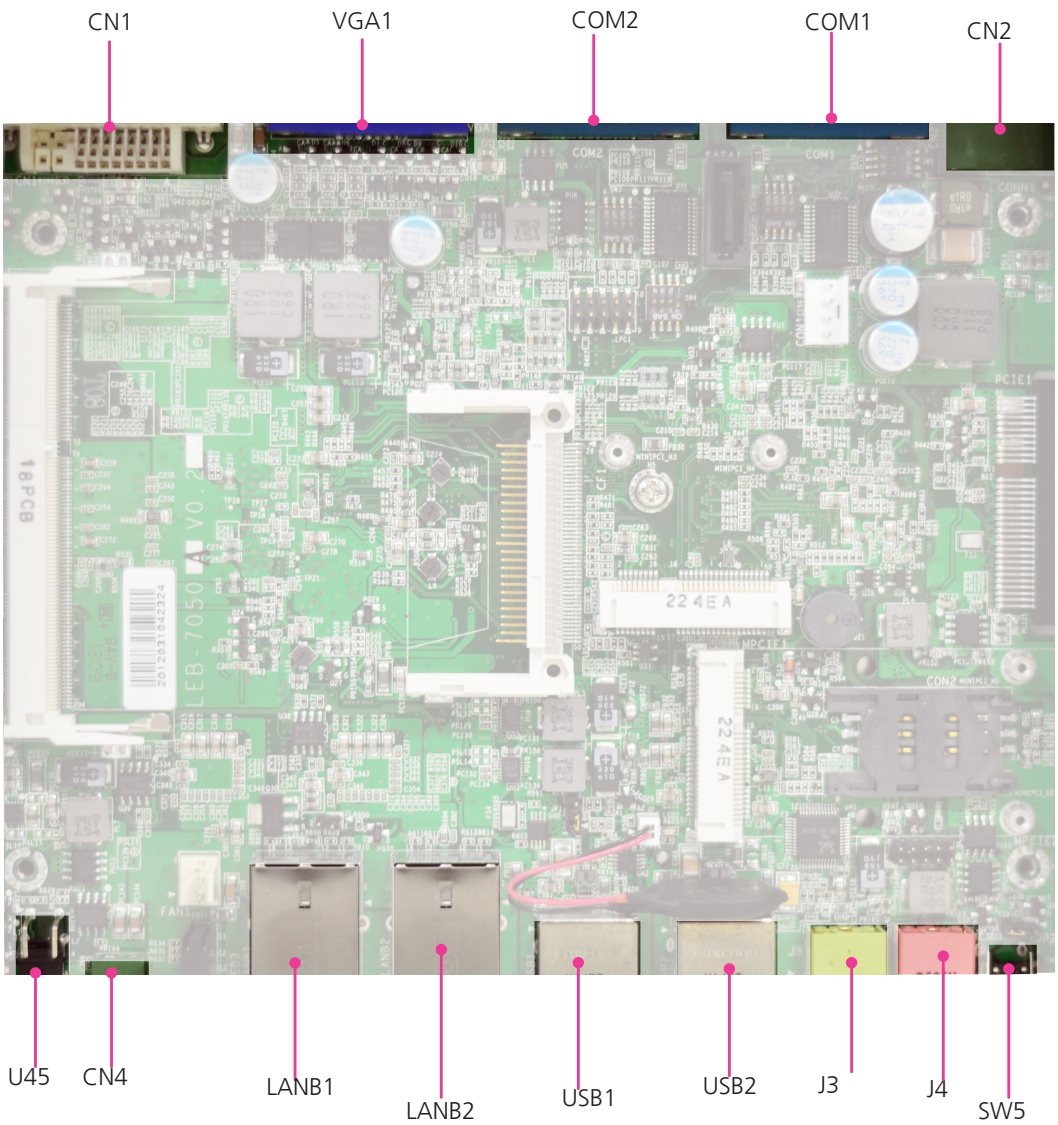


Component	Description	Pin Definition Reference
R1 DVI-D	A DVI-D port (single link) which is provided by Intel HD Graphic Engine. This port can support up to 1920x1200 @ 60 Hz resolution.	CN1 on page 16
R2 VGA Port	The displays can support VGA up to 2048x1536 resolution.	VGA1 on page 14
R3 Serial Ports	Serial ports through the DB-9 connector; Both COM1 and COM2 support RS-232/422/485 with jumper selection among RS-232/422/485.	COM1/COM2 on page 13
R4 DC-In (power) 1x2 Pin Phoenix Contact Connector	Power-in Connector.	CN2 on page 15

Chapter 3: Board Layout

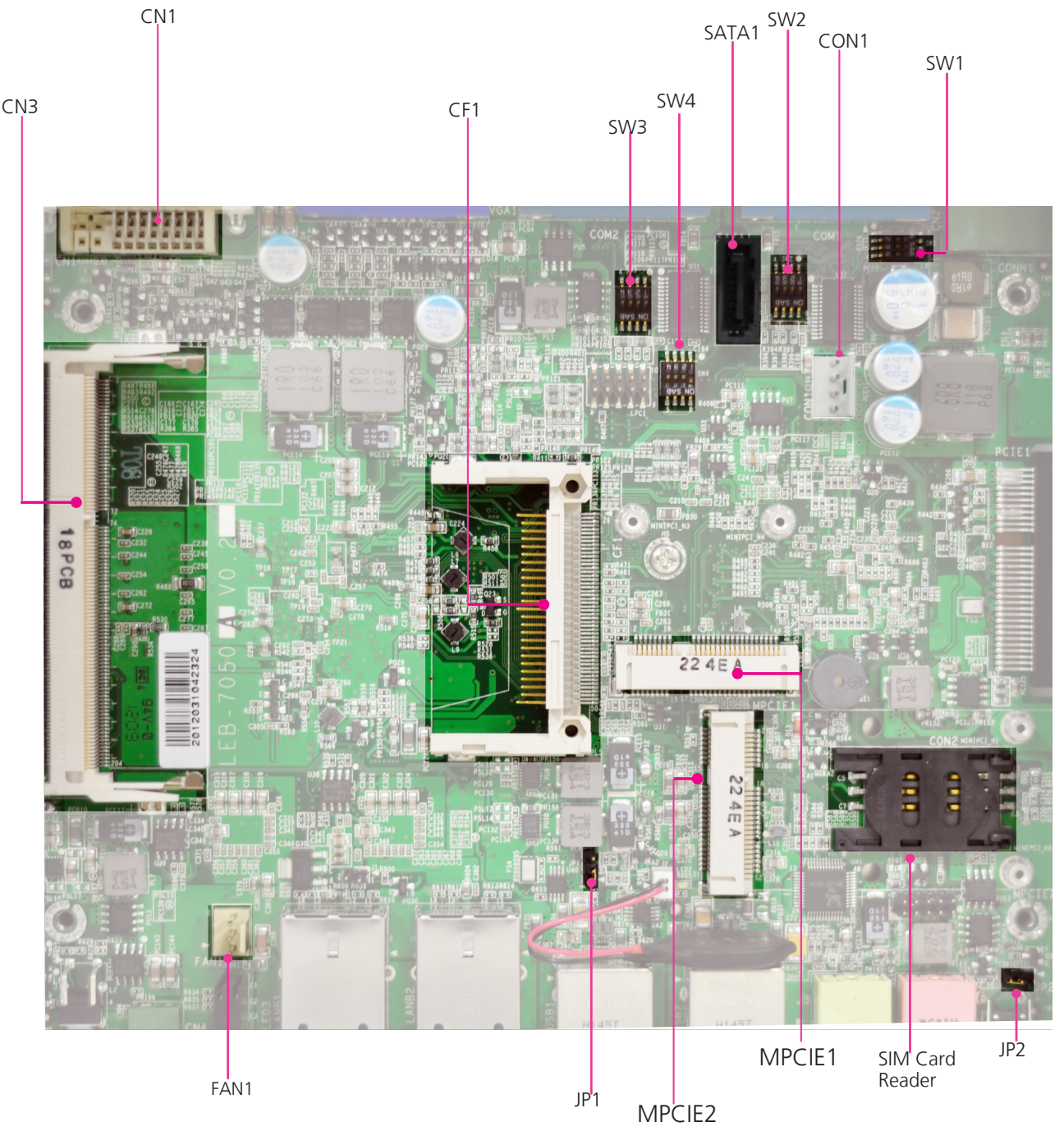
External Connectors

The following picture highlights the location of the external ports. 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.



LEB-7050

Chapter 3

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-7050** Board

Labels	**Function**	**Pin Definition Reference Page**
CF1	CompactFlash Connector	P16
CN1	DVI-D Port	P16
CN4	Power Switch with Phoenix Contact Interface	P15
COM1	RS232/422/485 Serial Port	P13
COM2	RS232/422/485 Serial Port	P13
CON1	SATA Power Connector	P14
FAN1	Fan Connector	P16
J3	Line-Out Audio Jack	P13
J4	Mic-in Audio Jack	P13
JP1	Clear CMOS Jumper	P14
JP2	Hardware or Software Reset Selection Jumper	P14
LANB1	Ethernet Port 1	P14
LANB2	Ethernet Port 2	P14
MPCIE1	Mini-PCIe Connector	P15
MPCIE2	Mini-PCIe Connector	P15
SATA1	SATA Connector	P14
SW1	Select COM1 Protocol Setting	P13
SW2	Select COM Port Terminating Resistance	P13
SW3	Select COM Port Terminating Resistance	P13
SW4	Select COM2 Protocol Setting	P13
SW5	Reset Button	P15
U45	Power Button	P15
USB1/USB2	USB Port 1-4 Connector	P15
VGA1	VGA Connector	P14

Jumper Settings

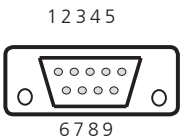
Microphone-in Audio Jack (J4)

Pin No.	Function
1	CO_GND
2	MIC_INL
3	CO_GND
4	INSULATOR
5	MIC_INR

Line-out Audio Port (J3)

Pin No.	Function
1	CO_GND
2	LINOUT-L
3	CO_GND
4	INSULATOR
5	LINOUT- R

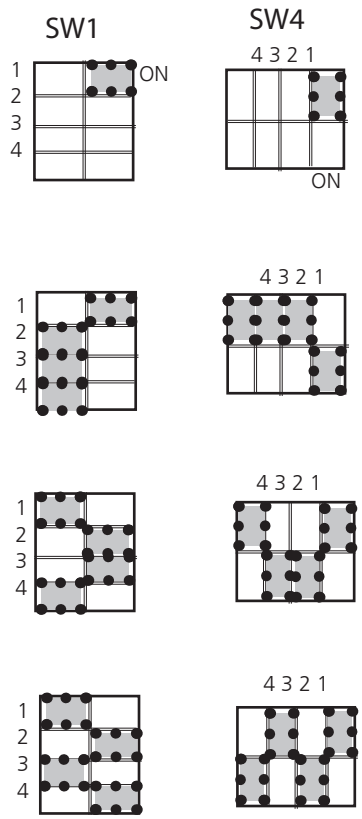
RS-232/422/485 Serial Port (COM1 and COM2): It is a RS-232/422/485 port through the D-SUB9 connector.



Pin No.	Pin Name		
	RS-232	RS-422	RS-485
1	DCD	TXD-	DATA-
2	RxD	TXD+	DATA+
3	TxD	RxD+	
4	DTR	RxD-	
5	GND	Signal Ground	
6	DSR		
7	RTS		
8	CTS		
9	RI		

SW1: Select COM1 Protocol Setting

SW4: Select COM2 Protocol Setting



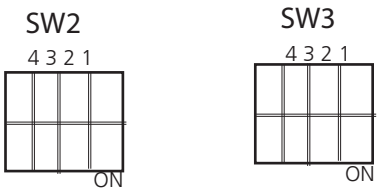
Switch Combination / Protocol	SW1/SW4
RS-232 (default)	1 On (2,3,4 Off)
RS-422	2,3 On (1,4 Off)
RS-485	2,4 On (1,3 Off)

Note: Besides jumper settings, you should also select the communication protocol in the BIOS as shown in the following picture, select Advanced ->F81865 SuperIO Configuration->Serial Port 0/1 Driver->RS232 or RS485



SW2: Select COM1 terminating resistance

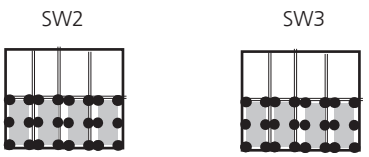
SW3: Select COM2 terminating resistance



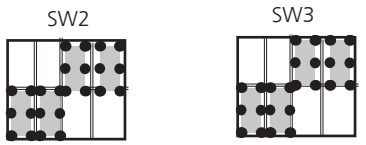
Terminating resistance off



Terminating resistance TX, RX on



Terminating resistance RX on



Switch Settings / Result	SW2/SW3
Terminating Resistance OFF	1,2,3,4 Off
Terminating Resistance TX, RX ON	1,2,3,4 On
Terminating Resistance RX on	1,2 Off 3,4 On

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

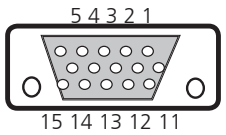


Pin No.	Pin Name
1-2	Normal (Default)
2-3	Clear CMOS

LAN1/LAN2 Ports (LANB1/LANB2): The LAN ports are provided by Intel 82583V Ethernet controller whose interface complies with PCI-e 1.1 (2.5 Ghz). It supports PXE remote boot as the advanced management feature

Pin No.	Description	
	Fast Ethernet	Gigabit Ethernet
1	TX+	BI_DA+
2	TX-	BI_DA-
3	RX+	BI_DB+
4	--	BI_DC+
5	--	BI_DC-
6	RX-	BI_DB-
7	--	BI_DD+
8	--	BI_DD-

VGA (VGA1)



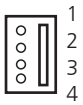
Pin	Signal	Pin	Signal	Pin	Signal
1	Red Color Signal	6	GND	11	NC
2	Green Color Signal	7	GND	12	DDC DAT
3	Blue Color Signal	8	GND	13	HSYNC
4	NC	9	VGA power	14	VSYNC
5	GND	10	GND	15	DDC CLK

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).



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

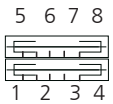
4-pin Serial-ATA Power Connector (CON1): It is for connecting the SATA power cord.



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

Dual USB Port Connector #0 and #1 (USB1):

Dual USB Port Connector #2 and #3 (USB2)



Pin No.	Pin Name
1	USB power
2	USB2_DAT-
3	USB2_DAT+
4	Signal Ground
5	USB Power
6	USB3_DAT-
7	USB3_DAT+
8	Signal Ground

Dual-Color Power Button (U45): The power button also provides LED to indicate power state.

PIN	Description	PIN	Description
PAD1	Ground	PAD2	Ground
1	Ground	3	BUTTON-
2	Ground	4	BUTTON-
L1	PWR_LED+/ STB_LED-	L2	PWR_LED- / STB_LED+

Power-on Switch through Phoenix Contact (CN4): A Phoenix connector for distant power switch.



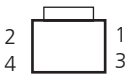
Pin No.	Pin Name
1	BUTTON-
2	Ground

DC_IN CONNECTOR (CN2): A Phoenix connector for external power supply.



Pin No.	Pin Name
1	DC_GND
2	DC_IN

Reset Button (SW5)



Pin NO.	Description
1	Reset Signal
2	GND
3	NC
4	GND

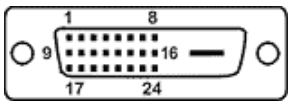
Mini PCI Express Connector (for 3G card with USB signal, MPCIE2):

PIN	Pin Name	PIN	Pin Name
1	WAKE#	27	GND
2	VCC3	28	1.5V
3	RSV1	29	GND
4	GND	30	SMB_CLK
5	RSV2	31	NC
6	1.5V	32	SMB_DATA
7	CLKREQ#	33	NC
8	UIM_PWR	34	GND
9	GND	35	GND
10	UIM_DATA	36	USB_D-
11	NC	37	RSV5
12	UIM_CLK	38	USB_D+
13	NC	39	RSV6
14	UIM_RST	40	GND
15	GND	41	RSV7
16	UIM_VPP	42	LED_WWAN#
17	RSV3	43	RSV8
18	GND	44	NC(LED_WLAN#)
19	RSV4	45	RSV9
20	W_DISABLE#	46	NC(LED_WPAN#)
21	GND	47	RSV10
22	PERST	48	1.5V
23	NC	49	RSV11
24	VCC3	50	GND
25	NC	51	RSV12
26	GND	52	VCC3

Mini PCI Express Connector (for Wi-Fi connection, MPCIE1):

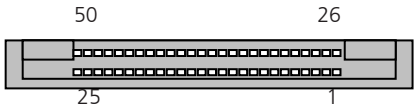
PIN	Pin Name	PIN	Pin Name
1	WAKE#	27	GND
2	VCC3	28	1.5V
3	RSV1	29	GND
4	GND	30	SMB_CLK
5	RSV2	31	PETn
6	1.5V	32	SMB_DATA
7	CLKREQ#	33	PETp
8	NC	34	GND
9	GND	35	GND
10	NC	36	USB_D-
11	REFCLK-	37	RSV5
12	NC	38	USB_D+
13	REFCLK+	39	RSV6
14	NC	40	GND
15	GND	41	RSV7
16	NC	42	LED_WWAN#
17	RSV3	43	RSV8
18	GND	44	NC(LED_WLAN#)
19	RSV4	45	RSV9
20	W_DISABLE#	46	NC(LED_WPAN#)
21	GND	47	RSV10
22	PERST	48	1.5V
23	PERn	49	RSV11
24	VCC3	50	GND
25	PERp	51	RSV12
26	GND	52	VCC3

DVI-D Connector (CN1): A single link DVI-D Connector



Pin No.	Description	Pin No.	Description
1	TMDS Data 2-	13	NC
2	TMDS Data 2+	14	5V
3	TMDS Data 2/4 shield	15	GND
4	NC	16	HOT PLUG DET
5	NC	17	TMDS Data 0-
6	DDC CLOCK	18	TMDS Data 0+
7	DDC DATA	19	TMDS Data 0/5 shield
8	NC	20	NC
9	TMDS Data 1-	21	NC
10	TMDS Data 1+	22	TMDS CLK shield
11	TMDS Data 1/3 shield	23	TMDS CLK+
12	NC	24	TMDS CLK-

CompactFlash Connector (CF1)



Pin No.	Description	Pin No.	Description
1	GND	26	CF_CD1#
2	CF_DD3	27	CF_DD11
3	CF_DD4	28	CF_DD12
4	CF_DD5	29	CF_DD13
5	CF_DD6	30	CF_DD14
6	CF_DD7	31	CF_DD15
7	CF_DCS0#	32	CF_DCS1#
8	A10(GND)	33	VS1#
9	OE#(GND)	34	CF_DIOR#
10	A9(GND) [CF_SATA_RXP]	35	CF_DIOW#
11	A8(GND) [CF_SATA_RXN]	36	WE#(VCC3)
12	A7(GND)	37	CF_IRQ#
13	VCC	38	VCC
14	A6(GND)	39	CSEL#(GND)
15	A5(GND) [CF_SATA_TXN]	40	VS2#
16	A4(GND) [CF_SATA_TXP]	41	CF_RESET#
17	A3(GND)	42	CF_IORDY
18	CF_A2	43	CF_DMARQ
19	CF_A1	44	CF_DDACK#
20	CF_A0	45	CF_ACT#
21	CF_DD0	46	CF_DIAG
22	CF_DD1	47	CF_DD8
23	CF_DD2	48	CF_DD9
24	WP(NC)	49	CF_DD10
25	CF_CD2#	50	GND

Fan Connector (FAN1)



Pin No.	Pin Name
1	Ground
2	+12V
3	FAN Status

Hardware/Software Reset Selection Jumper (JP2): This jumper can be used to select the mode of the reset button. The hardware reset mode will reset the system. The software reset mode is for resetting the software to its default value.



Pin No.	Pin Name
1-2	SW Reset
2-3 (Default)	HW Reset

Chapter 4: Hardware Setup

Preparing the Hardware Installation

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

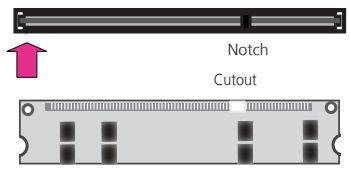
WARNING: To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The front panel Power On/Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active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

1. Unpower the LEC-7050 and remove the power cord.
2. Unscrew the 4 rubber feet from the bottom cover of the LEC-7050 System.
3. Open the cover.



Installing the System Memory

The motherboard supports DDR3 memory to meet the higher bandwidth requirement of the latest operating system and Internet applications. It comes with two double data rate type three (DDR3) Small Outline Dual Inline Memory Modules (SO-DIMM) sockets.



Note:

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

Installing the Hard Disk

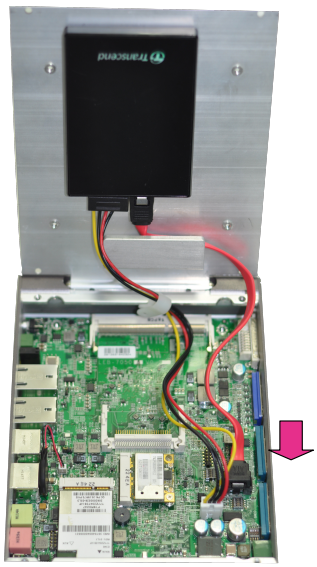
The system can accommodate one Serial-ATA disks. Follow these steps to install a hard disk into the LEC-7050:

1. Unscrew the 4 rubber feet from the bottom cover of the LEC-7050 System.
2. Place hard disk on the top cover of the system and align the holes of the hard disk with the mounting holes of the top cover.
3. Secure the hard disk with 4 mounting screws from the outside of cover.
4. Connect the Serial-ATA power and data cables to the hard disk's connectors.
5. Plug the Serial-ATA cables (power and data) to the Serial-ATA Connectors on the main board.

1



2



Installing a CompactFlash Card

LEC-7050 provides one CompactFlash slot. Follow the procedures bellow 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.



3G SIM Card Installation

1. Unlock the SIM card reader by sliding it outward and flip it up diagonally.
2. Align the cut-corner of the SIM card with the SIM card reader. Make sure that the ICs will be in contact with the bottom of the reader.
3. Insert the SIM card into the reader diagonally. Close and lock the reader. You should feel a click when the SIM card is locked securely in the reader.

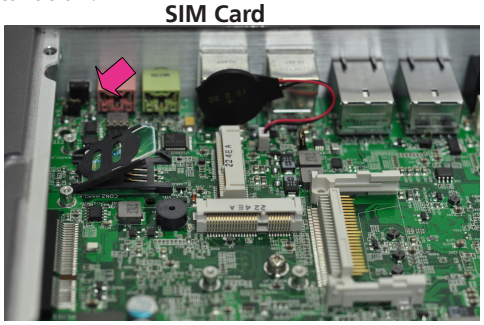
Wireless 3G Module Installation

1. Align the wireless module's cutout 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).

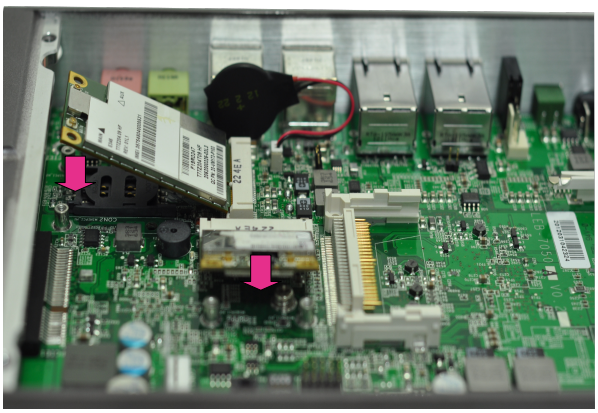
Wi-Fi Module Installation

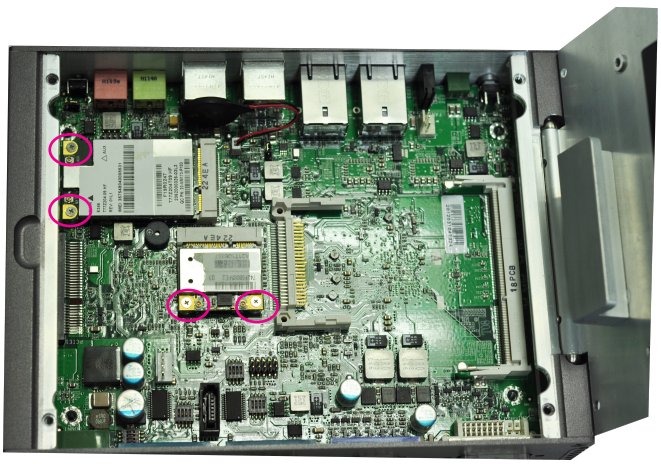
Follow the same steps as the Wireless 3G Module Installation.

SIM Card



3G module

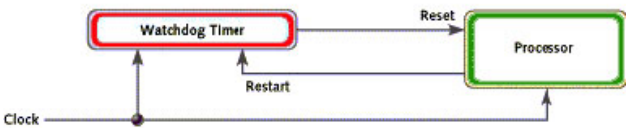




Appendix A: Programming Watchdog Timer

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 and DIO* folder 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 the L_IO driver which is the library and driver needed for Lanner General Purpose Input/Output interface or functions.

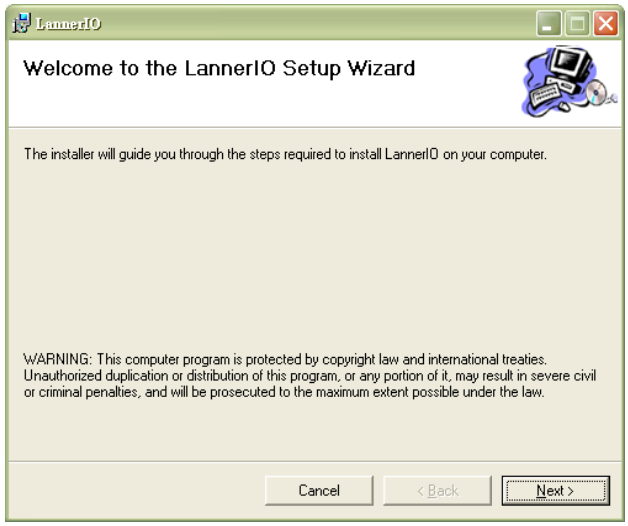
To install the L_IO driver:

1. Restart the computer, and then log on with Administrator privilege.
2. Insert the Drivers and User's Manual CD to the USB-optical drive.
3. Browse the contents of the support CD to locate the file LannerIO v101.rar under the \WD_DIO\ folder and unzip the file.
4. Click the Setup program in the unzipped folder.

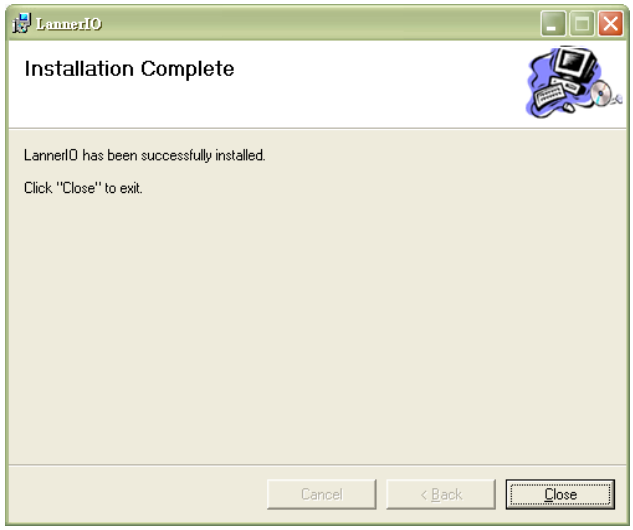
1. Click the Setup program.



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



3. The installation process proceeds. Click Close when the process completes.

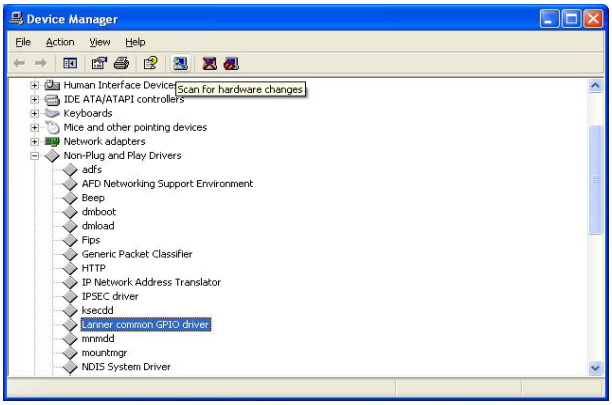


Appendix A

Programming Watchdog Timer

To verify the GPIO driver installation, do the following steps:

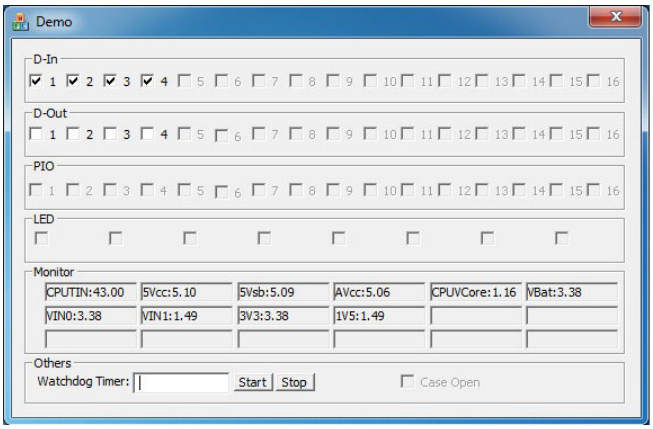
1. Right-click on the My Computer icon, and then select Properties form the menu.
2. Click the Hardware tab, then click the Device Manager button.
3. Select *View* from the menu and select *show hidden devices* .
4. The Lanner common GPIO driver should be listed under the Non-Plug and Play Drivers. If not, click the *San for hardware changes* button from the tool bar.



Sample Program

Via the Demo Program

Enter the number of seconds to start count down before the system can be reset. Press start to start the counter and stop to stop the counter.



Via the Command Line

Execute the executable file in the program folder, then enter the values from 1~255. The system will reboot automatically according to the time-out you set.

wd_tst --swt xxx (Set Watchdog Timer 1-255 seconds)

wd_tst[*] --start (Start Watchdog Timer)

wd_tst --stop (Stop Watchdog Timer)

Appendix A

Source Code

You can write your own program by modifying the source code F81865_Test.cpp.. The index address is 2EH.

```
//////////////////////////////////////////////////////////////////////
////
// F81865_Test.cpp : F81865_test.exe utility for F81865.lib APIs demonstration.
//
// History:
// 7/15/2011 Brand new F81865_test program.


#include <winsock2.h>
#include "Windows.h"
#include "stdio.h"
#include "F81865.h"


#define PARAMETER_HELP "\n"\
"The F81865 GPIO utility of Lanner\n"\
"-------------------------------------\n"\
"Usage:\n"\
" F81865_test DIO_IN port_number\n"\
" F81865_test DIO_OUT port_number value\n"\
" F81865_test PIO port_number value\n"\
" F81865_test RunLED port_number value\n"\
" F81865_test AlarmLED port_number value\n"\
" F81865_test GPS_LED port_number value\n"\
" F81865_test WirelessLED port_number value\n"\

" F81865_test WatchDog seconds\n"\

" F81865_test CaseOpen\n"\

" F81865_test CaseOpen_Clear\n"\

" F81865_test Sleep milliseconds\n"\
"\n"\

"Argement:\n"\
" DIO_IN Read state from DIO In.\n"\
" DIO_OUT Set DIO Out state.\n"\
" PIO Set PIO LED state.\n"\
" RunLED Set RUN LED state.\n"\

" AlarmLED Set Alarm LED state.\n"\

" GPS_LED Set GPS LED state.\n"\

" WirelessLED Set Wireless LED state.\n"\

" Watchdog Set Watchdog timer.\n"\

" CaseOpen Check case opened state.\n"\

" CaseOpen_Clear Clear case open state.\n"\
" port_number The port number.\n"\
" value 1 for on and 0 for off.\n"\
" seconds The watchdog count down seconds. 0 for disable.\n"\
" milliseconds Milliseconds to delay\n"


#define RETMSG(a,b) {printf (b) ; return a;}

#define CHECK_ARGC(a) {if (argc != a) throw PARAMETER_HELP ;}


// Translate Hex string to a long value
LONG Hex2Long (char *str)
{
LONG nLong ;

if (scanf (str, "%x", &nLong) != 1)
throw "Error parsing parameter\n" ;

return nLong ;
}
```

```
// Make sure the argument is numeric
void CheckNumeric (char *szBuf)
{
        int nLen = strlen (szBuf) ;

        for (int i = 0 ; i < nLen ; i++)
      if (!strchr ("01234567890ABCDEFabcdef", szBuf[i]) )
                        throw "Wrong argument\n" ;
}


// Common GPIO output function definition
#define GPIO_OUT(a,b,c)                                 \
int a (int argc, char *argv[])                  \
{
                                                \
        CHECK_ARGC (4) ;
\
        CheckNumeric (argv[2]) ;                \
        CheckNumeric (argv[3]) ;                \

                \
        int nPort  = atoi (argv[2]) ;\
        int nValue = atoi (argv[3]) ;           \

                \
        c (nPort, nValue) ;
\

                \
        printf (b " #%d = %d\n", nPort, nValue) ;       \

                \
        return                                  0
;                                               \
}


// Function generate by common function definition
GPIO_OUT                                        (mDIO_
OUT             , "DIO_OUT"             ,  Write_DIO)
G       P       I       O       _       O       U       T
(mPIO                   , "DIO_OUT"             , PIO)
G       P       I       O       _       O       U       T
(mRunLED                , "RunLED"              , RunLED)
G       P       I       O       _       O       U       T
(mAlarmLED              , "AlarmLED"    ,  AlarmLED)
GPIO_OUT                                        (mGPS_
LED             , "GPS_LED"             ,  GPS_LED)
G       P       I       O       _       O       U       T
(mWirelessLED   , "WirelessLED"  ,  WirelessLED)


// Check case open
int mCaseOpen  (int argc, char* argv[])
{
        CHECK_ARGC (2) ;

        BOOL bOpen = CaseOpen () ;
        printf ("Case is %s\n", bOpen ? "Open" : "Close") ;

        return bOpen ;
}


// Clear case open state
int mCaseOpen_Clear  (int argc, char* argv[])
{
        CHECK_ARGC (2) ;

        CaseOpen_Clear () ;

        BOOL bOpen = CaseOpen () ;

        printf ("CaseOpen state %s", bOpen ? "not cleared"
: "cleared") ;

        return bOpen ;
}


// Get DIO_IN state
int     mDIO_IN     (int    argc,    char*    argv[])
{
        CHECK_ARGC (3) ;
        CheckNumeric (argv[2]) ;

        int  nPort = atoi (argv[2]) ;
```

```
        BOOL ret   = Read_DIO (nPort) ;

        printf ("DIO_IN #%d = %d\n", nPort, ret) ;

        return                  ret                  ;
}


// Milli-second delay
int mSleep (int argc, char *argv[])
{
        CHECK_ARGC (3) ;

        CheckNumeric (argv[2]) ;

   Sleep (atoi (argv[2]) ) ;

        return 0 ;
}


// Watchdog
int mWatchDog (int argc, char *argv[])
{
        if (argc != 3 && argc != 2)
                RETMSG (-1, PARAMETER_HELP) ;

        if (argc == 3)
        {
                CheckNumeric (argv[2]) ;

                int nValue = atoi (argv[2])  ;

                WatchDog_Enable (nValue) ;
        }

        int nLeft = WatchDog_GetLeft () ;

        printf ("Watchdog timer left %d seconds\n", nLeft)
;

        return nLeft ;
}


// Argument - function mapping
typedef struct
{
        char *szCmd ;
        int (*function) (int argc, char *argv[]) ;

} CMD2FUN ;


CMD2FUN c2f[] =
{
        {"DIO_IN"               , mDIO_IN
},
        {"DIO_OUT"              , mDIO_OUT
},
        {"PIO"                  , mPIO
},
        {"RunLED"               , mRunLED
},
        {"AlarmLED"             , mAlarmLED
},
        {"GPS_LED"              , mGPS_LED
},
        {"WirelessLED"    , mWirelessLED   },
        {"CaseOpen"    , mCaseOpen    },
        {"CaseOpen_Clear",mCaseOpen_Clear},
        {"Watchdog"             , mWatchDog
},
        {"Sleep"          , mSleep          }
} ;


// Program start here
int main(int argc, char *argv[])
{
```

```
        try
        {
                // The total argument allowed
                int num = sizeof (c2f) / sizeof (c2f[0]) ;


                // Too few argument
                if (argc < 2)
                        RETMSG (-1, PARAMETER_HELP)
;

                // Find the match argument and execute
the mapping function
                for (int i = 0 ; i < num ; i++)
                        if (stricmp (argv[1], c2f[i].szCmd)
== 0)
                                return    c2f[i].function
(argc, argv) ;

                // No match argument
                RETMSG (-1, "Wrong Argument\n") ;
        }
        catch (char *str)
        {
                // Output the error message
                printf ("\n%s\n", str) ;
        }
        catch (...)
        {
                // Unknown exception
                printf ("\nUnknown Exception\n") ;
        }

   return -1 ;
}
```

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#

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.

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