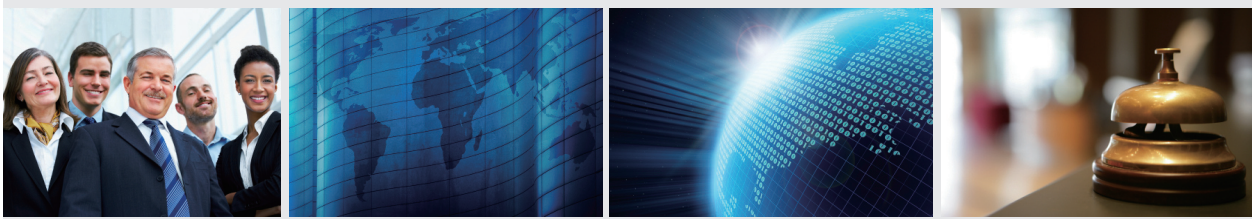


Embedded & Industrial Computing

Hardware Platforms for Embedded and Industrial Computing



LEC-7230
V1.0

>>

User's Manual
Publication date:2014-05-12

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.



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Chapter 1: Introduction

Thank you for choosing the LEC-7230. The LEC-7230 features Intel Celeron N2930 (or E3825 or E3845) processor. It has dual LAN as well as HDMI and VGA connectors for high demand of Internet and multimedia applications. In addition, its fanless design reduces maintenance effort and attributes its longevity.

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

- Dual HDMI and VGA video output powered by Intel HD Graphics
- Dual 10/100/1000 Mbps LAN
- Three USB (two USB 2.0 ports and one USB 3.0 port) and one Digital Input/Output connector (2 digital inputs and 2 digital outputs)
- Storage support of 2.5" SATA HDD and CompactFlash
- Power-on switch through the Phoenix connector for distant power-on/off control
- Two RS232/422/485 serial ports supporting hardware auto-flow control with DB-9 connectors
- Audio input and output through Mic-in and Line-out jack
- Aluminum extrusion enclosure which helps heat dissipation
- Fanless design which can sustain the operating temperature from -20-55°C

System Specifications

Processor Options		Intel® Celeron® N2930/E3825/E3845 4C (2 GHz) CPU
Chipset		None
BIOS		AMI SPI Flash BIOS
System Memory	Sockets	1 x 204-pin SODIMM socket
	Technology	DDR3L 1066 MHz
	Max. Capacity	Up to 4 GB
USB		2 x USB 2.0, 1x USB 3.0 compliant hosts: Type A connector
Digital I/O		2 x DI or 2 x DO with +5V TTL Level
Expansion Bus		Mini-PCIe x 1, with SIM card reader
OS Support		Microsoft Windows 8
Storage	HDD/SSD Support	1 x 2.5" HDD/SSD drive bay
	Expansion	1 x CF type I/II socket, 1x SATA port for 1 x 2.5" SSD/HDD drive bay
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), HDMI x1 (1920x1080)
LEDs		Power, HDD active, 3G active
Physical Characteristics	Housing	Aluminum
	Weight	1 kg
	Dimensions (WxHxD)	198 x 42 x 144.8 mm (7.79" x 1.65" x 5.7")
	Mounting Options	Rack, VESA, DIN-rail and Wall mount
Environment	Operation Temperature	-20~55°C (with Industrial grade components)
	Storage Temperature	-20~70°C
	Ambient Relative Humidity (non-condensing)	5 to 95% (non-condensing)
Power	Input Voltage	+12 V DC
	Power Consumption	19 W
	Connector	DC jack with lock
	AC Adapter	60 W, 12 V/5 A
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 1~255 level time interval system reset, software programmable



Package Contents

Your package contains the following items:

- LEC-7230 Fanless Embedded System
- Power Adapter (P/N: 0P0W060122033)
- Drivers and User's Manual CD (S09OADA64H100)
- 2-pin Terminal Block (P/N: 04AW20023Z101)
- 6-pin Terminal Block (P/N: 04AW20061Z101)

Standard Accessories

080W1N0002001	SATA SSD/HDD cable w/ power
0P0W060120001	AC Power Adapter 60 W 12V/5A, DC Jack with lock

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

SE9ESA900R100	Wall Mount 4
PE9ESA8300100	VESA Mount
SE9ESA8310100	Rack Mount
090W405000001	DIN Rail Mount

Optional Accessories

0TAWQ802XKZ03	Wi-Fi module	Wi-Fi Module, 802.11 b/g/n Mini-PCIe card
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

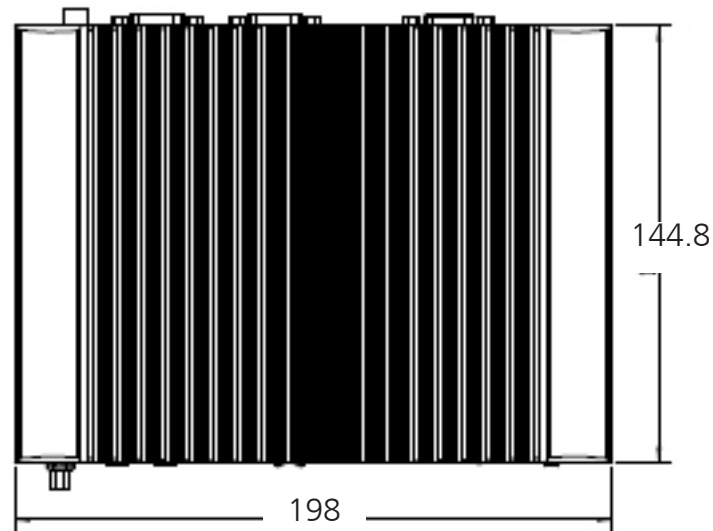


Chapter 2: System Components

System Drawing

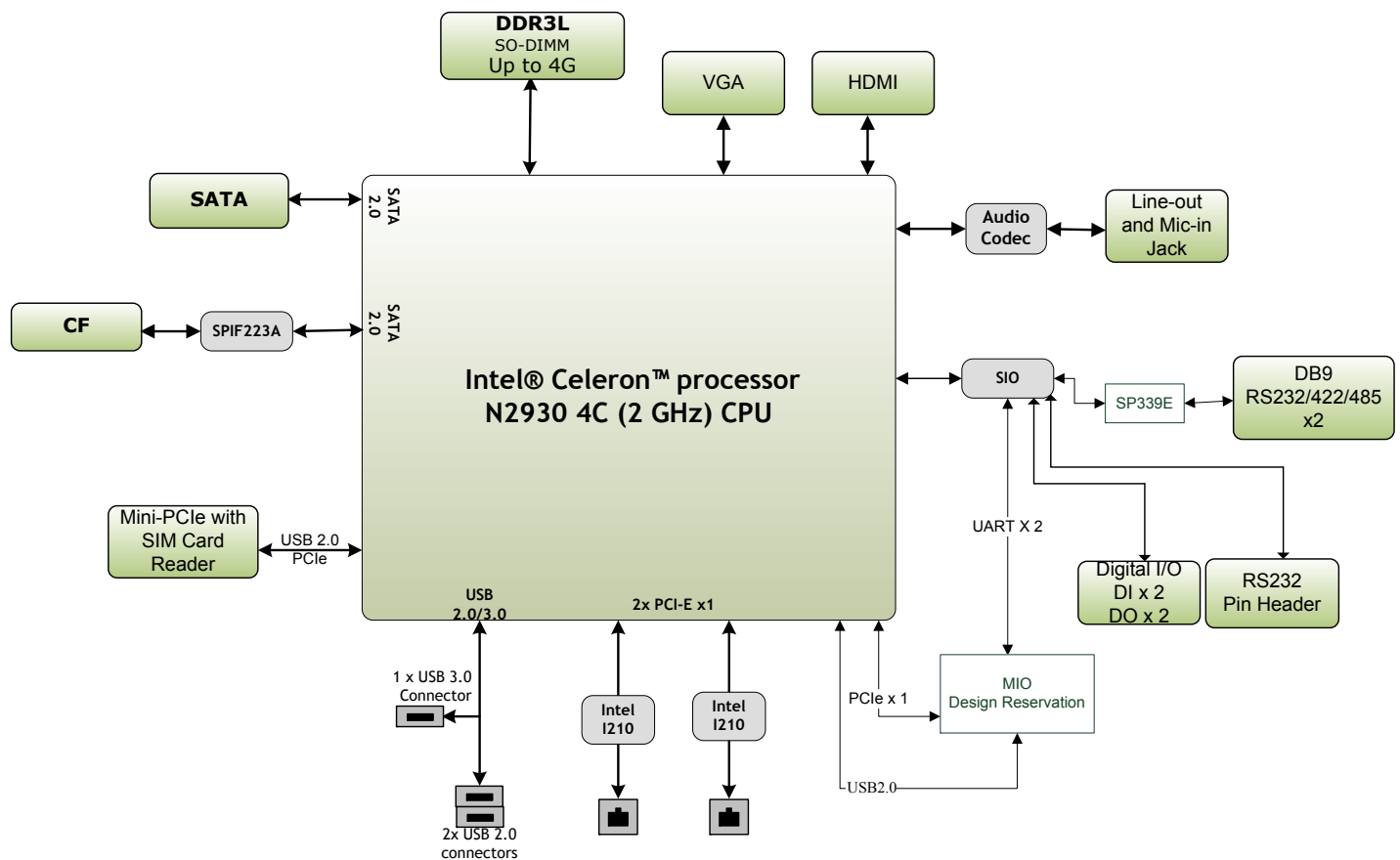
Mechanical dimensions of the LEC-7230

Unit: mm

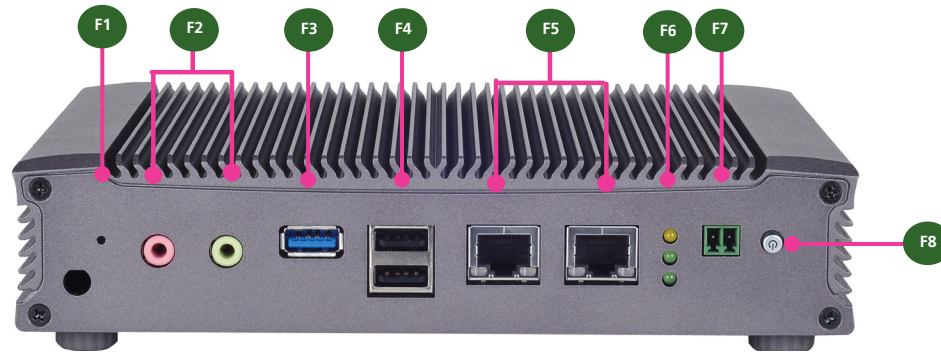


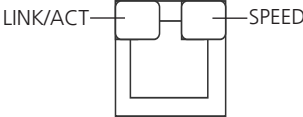
Block Diagram

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



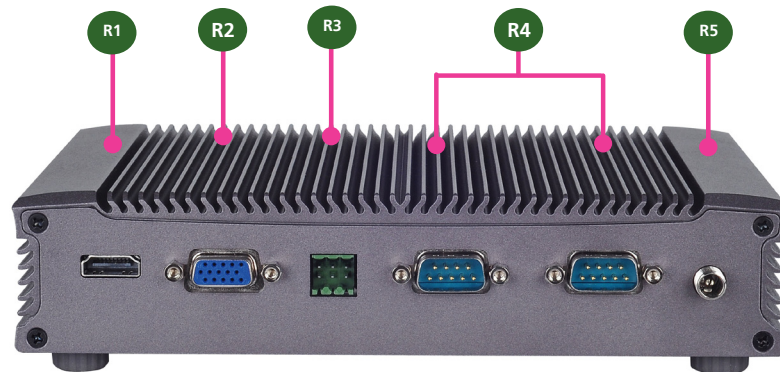
Front Components



Component	Description	Pin Definition Reference
F1 Reset	Reset switch	
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.	USB2 on page 14
F4 Two USB 2.0 Ports	An USB 2.0 type A connector.	USB1 on page 14
F5 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/Yellow) - 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 - Blinking: data access activities - Off: no data access activities 3G Status - Blinking: 3G transmission activities - On: 3G expansion card exists - Off: no 3G expansion card exists Power - 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	PSBTN2 on page 15
F8 Power Button with dual LED	ATX Power-on button with LEDs: Standby mode in Red; Power-on mode in Green	



Rear Components

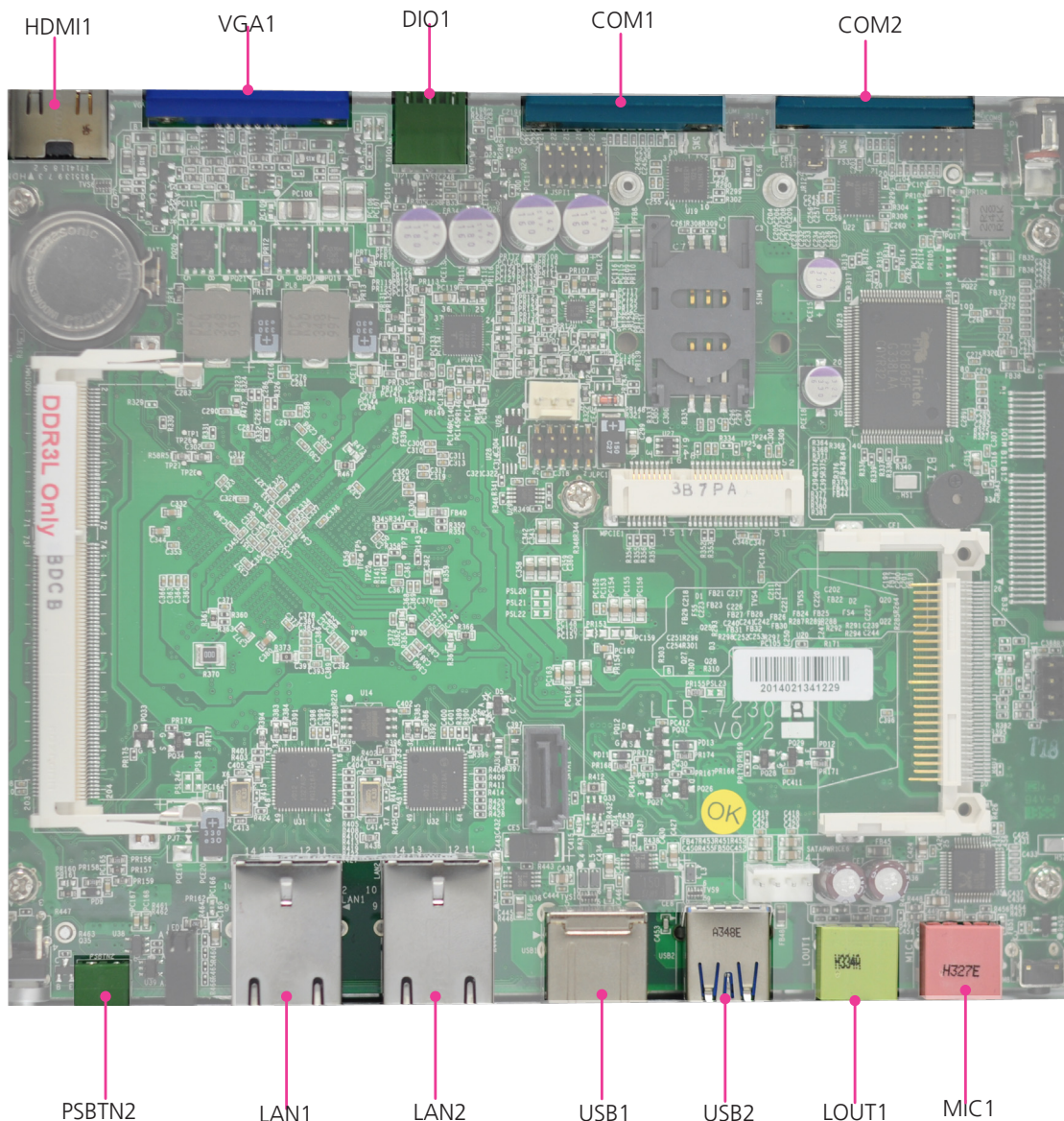


Component	Description	Pin Definition Reference
R1 HDMI	The HDMI (High-Definition Multimedia Interface). This port can support up to 1920x1080 resolution.	HDMI1 on page 14
R2 VGA Port	The displays can support VGA up to 1600x1200 resolution.	VGA1 on page 14
R3 DIO	Digital Input/Output Connector 2 DI and DO connections	DIO1 on page 15
R4 Serial Ports	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.	COM1/COM2 on page 13
R5 Power Adapter Socket	DC-in 12V. Only use the power adapter supplied with the LEC-7230 System	DC_IN1 on page 15

Chapter 3: Board Layout

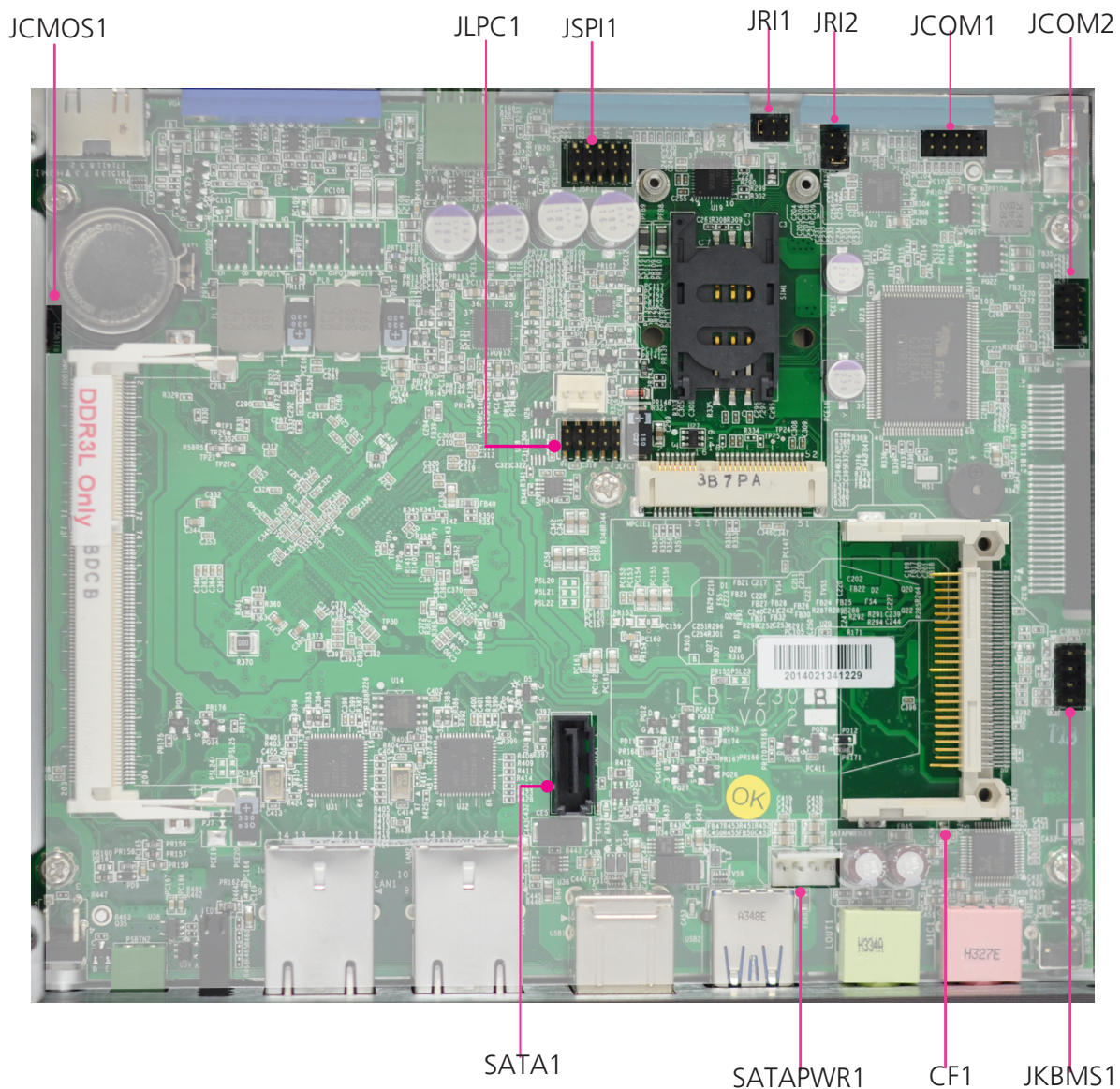
External Connectors

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.



Connectors and Jumpers List

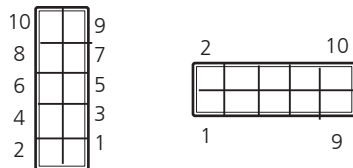
The tables below list the function of each of the board jumpers and connectors by labels shown in the above section. The next section in this chapter gives pin definitions and instructions on setting jumpers.

Table 3.1 Connector List for LEB-7230 Board		
Labels	Function	Pin Definition Reference Page
CF1	CompactFlash Connector	P15
COM1/COM2	RS232 Serial Ports COM1 and COM2	P13
DIO1	Digital Input/Output	P15
HDMI1	High-Definition Multimedia Interface Port	P14
JCMOS1	Clear CMOS Jumper	P14
JCOM1/2	RS232 Pin Headers	P13
JKBMS1	PS/2 Keyboard & Mouse Connector	P15
JLPC1	Low-pin Count Interface	Reserved for Factory Use
JRI1/2	COM1/COM2 Pin 9 Signal Selection	P13
JSPI1	SPI ROM Interface (for debug use only)	Reserved for Factory Use
MPCIE1	Mini-PCIe Connectors (with SIM1)	P15
PSBTN2	Power Button with Phoenix Connector	P15
SATA1	Serial-ATA Connector (SATA1)	P14
SATAPWR1	SATA HDD Power Connector	P14
SIM1	SIM Card Reader	P15
USB1	USB 2.0 Type A Dual Port	P14
USB2	USB 3.0 Type A Port	P14
VGA1	VGA Connector	P14



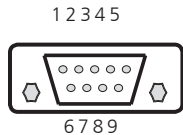
Jumper Settings

RS-232 Pin Headers (JCOM1/2): It is a RS-232 serial communication interface 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 #)

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

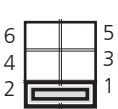
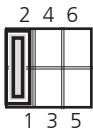
Pin No.	Signal
RS-485	
1	DATA-
2	DATA+
3	
4	
5	GND

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.

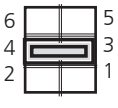
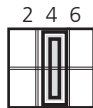
JRI1: COM1

JRI2: COM2

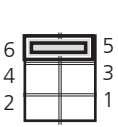
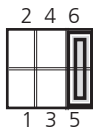
Default



+5V



+12V



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



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

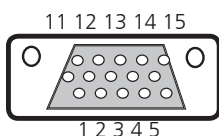


Clear CMOS jumper (JCMOS1): It is for clearing the CMOS settings.



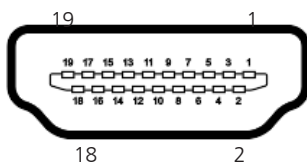
Pin No.	Signal
1-2	Normal (Default)
2-3	Clear CMOS

VGA (VGA1)



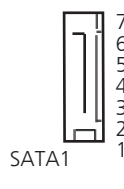
Pin	Signal	Pin	Signal	Pin	Signal
1	Red Color Signal	6	GND	11	NC
2	Green Color Signal	7	GND	12	DDC DATA
3	Blue Color Signal	8	GND	13	HSYNC
4	Reserved	9	+5V	14	VSYNC
5	GND	10	GND	15	DDC CLK

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



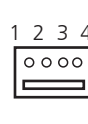
Pin	Signal	Pin	Signal
1	DATA2+	2	GND
3	DATA2-	4	DATA1+
5	GND	6	DATA1-
7	DATA0+	8	GND
9	DATA0-	10	CLK+
11	GND	12	CLK-
13	N.C	14	N.C
15	DDC CLK	16	DDC DAT
17	GND	18	HDMI VCC
19	HPD		

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).



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

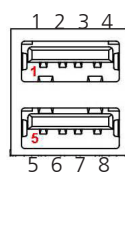
4-pin Serial-ATA Power Connector (SATAPWR1): It is for connecting the SATA power cord.



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

Dual USB 2.0 Port (USB1):

Dual USB 3.0 Port (USB2):



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

Power-on Switch through Phoenix Contact (PSBTN2): A Phoenix connector for distant power switch.



Pin No.	Signal
1	PWRBTN#
2	GND

Digital Input/Output Connector (DIO1)



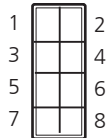
Pin NO.	Signal	Pin NO.	Signal
1	DIO_IN1	2	DIO_IN2
3	DIO_OUT1	4	DIO_OUT2
5	+5V	6	GND

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

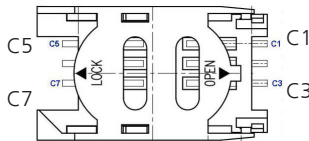
The default value is DI=0, DO=1

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

CF Connector (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



Appendix A

Programming Watchdog Timer

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.

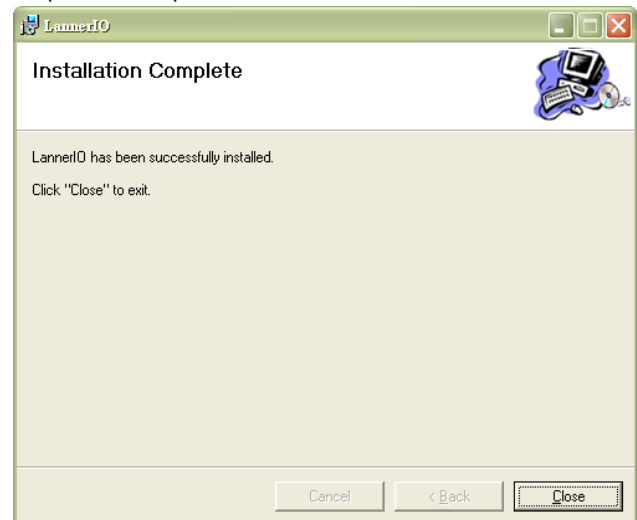
1. Click the Setup program.



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



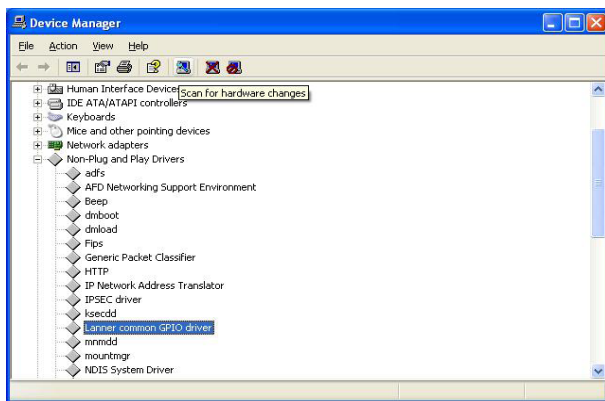
3. The installation process proceeds. Click Close when the process completes.



Appendix A

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

1. Right-click on the My Computer icon, and then select Properties from 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 *Scan for hardware changes* button from the tool bar.



Programming Watchdog Timer

Sample Program

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"
```



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```

                                " 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 ;
}

```

Programming Watchdog Timer

```

// 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)
GPIO_OUT (mPIO_OUT, "DIO_OUT", PIO)
GPIO_OUT (mRunLED, "RunLED", RunLED)
GPIO_OUT (mAlarmLED, "AlarmLED", AlarmLED)
GPIO_OUT (mGPS_LED, "GPS_LED", GPS_LED)

```



Appendix A

Programming Watchdog Timer

```
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)
;
}
```



Appendix A

```
        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
```

Programming Watchdog Timer

```
    {
        // 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 (strcmp (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: 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 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 LIO.rar under the \Watch dog and DIO\LIO folder and unzip the file.
4. From the control panel, click the ADD Hardware program

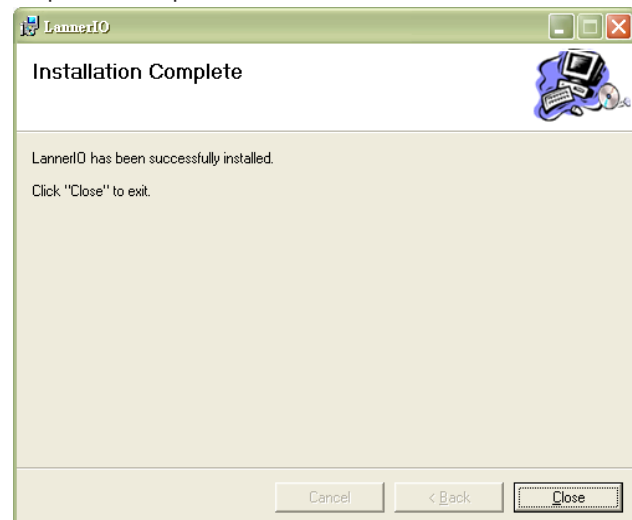
1. Click the Setup program.



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



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

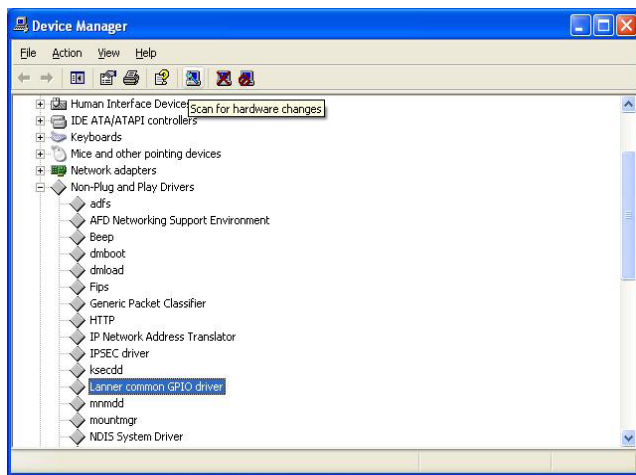


Appendix B

Digital Input/Output Control

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

1. Right-click on the My Computer icon, and then select Properties from 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 *Scan for hardware changes* button from the tool bar.



Executing the Sample Program:

To test the sample program, execute the F81865_test with the appropriate parameters.

DIO:

Usage:

F81865_test DIO_In port_number (reads Digital input port 0, 1, 2 or 3)

F81865_test DIO_Out port_number value (writes Digital output port 0, 1, 2 or 3; For port description, refer to *Jumper Settings on Chapter3 Board Layout*)

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



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: ☐ 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

Confirmed By Supplier

Authorized Signature / Date

Authorized Signature / Date

