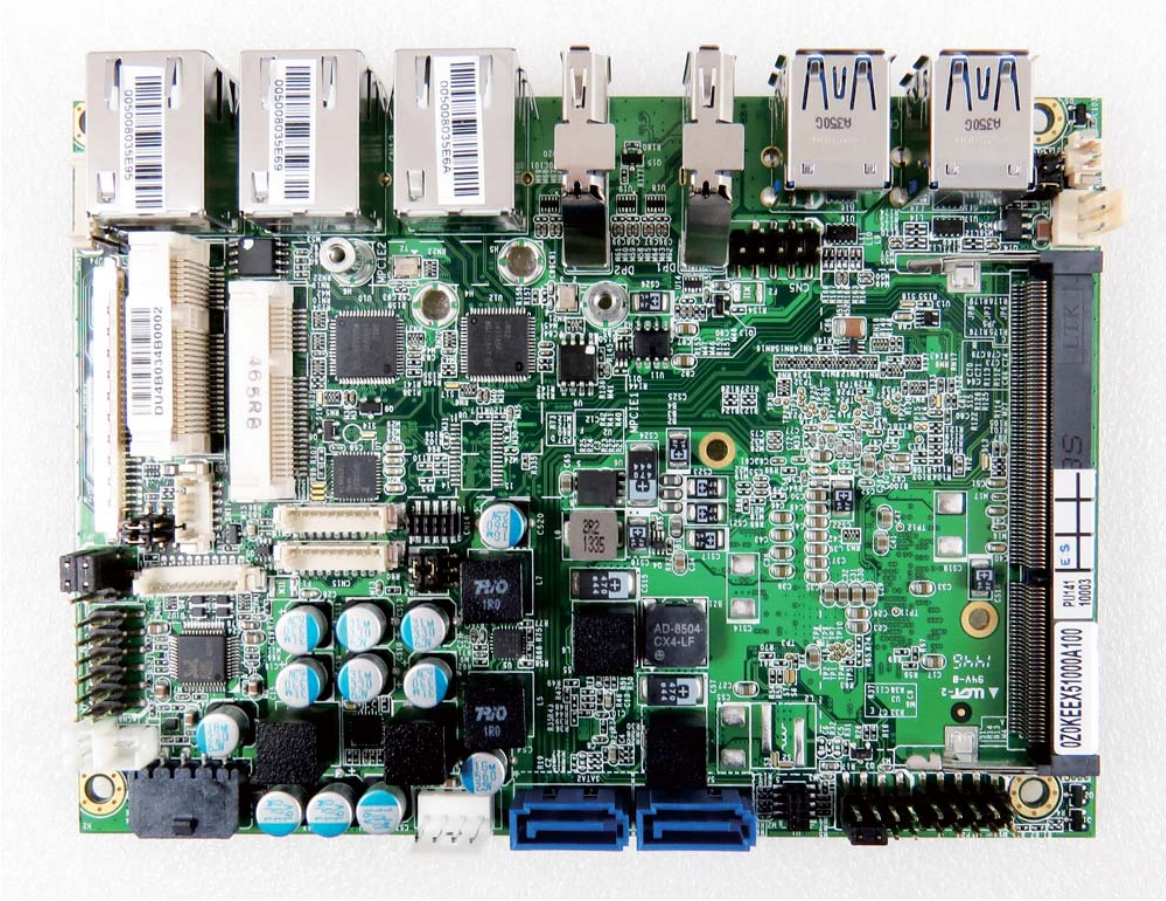
KEEX-5100 Series

Intel® Embedded Compact Extended Form Factor with Intel® Haswell / Broadwell ULT Processors

User's Guide



Contact Info: **Quanmax Inc.**
4F, No. 415, Ti-Ding Blvd. Sec. 2NeiHu District,
Taipei 114Taiwan
Tel: +886-2-2799-2789
Fax: +886-2-2799-7399

Visit our site at: **www.quanmax.com**

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Safety Instructions

■ Before You Begin

Before handling the product, read the instructions and safety guidelines on the following pages to prevent damage to the product and to ensure your own personal safety. Refer to the “Advisories” section in the Preface for advisory conventions used in this user’s guide, including the distinction between Warnings, Cautions, Important Notes, and Notes.

- Always use caution when handling/operating a computer. Only qualified, experienced, authorized electronics service personnel should access the interior of a computer. The power supplies produce high voltages and energy hazards, which can cause bodily harm.
- Use extreme caution when installing or removing components. Refer to the installation instructions in this user’s guide for precautions and procedures. If you have any questions, please contact Quanmax Post-Sales Technical Support.

WARNING

High voltages are present inside the chassis when the unit’s power cord is plugged into an electrical outlet. Turn off system power, turn off the power supply, and then disconnect the power cord from its source before removing the chassis cover. Turning off the system power switch does not remove power to components.

■ When Working Inside a Computer

Before taking covers off a computer, perform the following steps:

1. Turn off the computer and any peripherals.
2. Disconnect the computer and peripherals from their power sources or subsystems to prevent electric shock or system board damage. This does not apply when hot swapping parts.

3. Follow the guidelines provided in “Preventing Electrostatic Discharge” on the following page.
4. Disconnect any telephone or telecommunications lines from the computer.

In addition, take note of these safety guidelines when appropriate:

- To help avoid possible damage to system boards, wait five seconds after turning off the computer before removing a component, removing a system board, or disconnecting a peripheral device from the computer.
- When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs. If you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before connecting a cable, make sure both connectors are correctly oriented and aligned.

CAUTION

Do not attempt to service the system yourself except as explained in this user’s guide. Follow installation and troubleshooting instructions closely.

Preventing Electrostatic Discharge

Static electricity can harm system boards. Perform service at an ESD workstation and follow proper ESD procedure to reduce the risk of damage to components. Quanmax strongly encourages you to follow proper ESD procedure, which can include wrist straps and smocks, when servicing equipment.
You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- When unpacking a static-sensitive component from its shipping carton, do not remove the component’s antistatic packing material until you are ready to install the component in a computer. Just before unwrapping the antistatic packaging, be sure you are at an ESD workstation or grounded. This will discharge any static electricity that may have built up in your body.

- When transporting a sensitive component, first place it in an antistatic container or packaging.
- Handle all sensitive components at an ESD workstation. If possible, use antistatic floor pads and workbench pads.
- Handle components and boards with care. Don't touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.
- Do not handle or store system boards near strong electrostatic, electromagnetic, magnetic, or radioactive fields.

Preface

■ How to Use This Guide

This guide is designed to be used as step-by-step instructions for installation, and as a reference for operation, troubleshooting, and upgrades.

NOTE

Driver downloads and additional information are available under Downloads on our web site: www.quanmax.com.

■ Unpacking

When unpacking, follow these steps:

1. After opening the box, save it and the packing material for possible future shipment.
2. Remove all items from the box. If any items listed on the purchase order are missing, notify Quanmax customer service immediately.
3. Inspect the product for damage. If there is damage, notify Quanmax customer service immediately. Refer to “Warranty Policy” for the return procedure.

■ Regulatory Compliance Statements

This section provides the FCC compliance statement for Class A devices.

FCC Compliance Statement for Class A Devices

The product(s) described in this user’s guide 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 user’s guide, may cause harmful interference to radio communications. Operation of this equipment in a residential

area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.
Changes or modifications not expressly approved by Quanmax could void the user's authority to operate the equipment.

NOTE

The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interference or to be noncompliant with the appropriate standards for its intended use.

■ Warranty Policy

Limited Warranty

Quanmax Inc.'s detailed Limited Warranty policy can be found under Support at www.quanmax.com. Please consult your distributor for warranty verification.
The limited warranty is void if the product has been subjected to alteration, neglect, misuse, or abuse; if any repairs have been attempted by anyone other than Quanmax or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of Quanmax or the manufacturer. Neglect, misuse, and abuse shall include any installation, operation, or maintenance of the product other than in accordance with the user's guide.
No agent, dealer, distributor, service company, or other party is authorized to change, modify, or extend the terms of this Limited Warranty in any manner whatsoever. Quanmax reserves the right to make changes or improvements in any product without incurring any obligation to similarly alter products previously purchased.

Return Procedure

For any Limited Warranty return, please contact Support at www.quanmax.com and login to obtain a Return Material Authorization (RMA) Number. If you do not have an account, send an email to support@quanmax.com to apply for one.
All product(s) returned to Quanmax for service or credit must be accompanied by a Return Material Authorization (RMA) Number. Freight on all returned items must be prepaid by the customer who is responsible for any loss or damage caused by common carrier in transit. Returns for Warranty must include a Failure Report for each unit, by serial number(s), as well as a copy of the original invoice showing the

date of purchase.
To reduce risk of damage, returns of product must be in a Quanmax shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from Quanmax Customer Service at a nominal cost. Quanmax owns all parts removed from repaired products. Quanmax uses new and reconditioned parts made by various manufacturers in performing warranty repairs and building replacement products. If Quanmax repairs or replaces a product, its warranty term is not extended.
Shipments not in compliance with this Limited Warranty Return Policy will not be accepted by Quanmax.

Limitation of Liability

In no event shall Quanmax be liable for any defect in hardware, software, loss, or inadequacy of data of any kind, or for any direct, indirect, incidental, or consequential damages in connection with or arising out of the performance or use of any product furnished hereunder. Quanmax's liability shall in no event exceed the purchase price of the product purchased hereunder. The foregoing limitation of liability shall be equally applicable to any service provided by Quanmax or its authorized agent.

■ Maintaining Your Computer

Environmental Factors

- **Temperature**

  The ambient temperature within an enclosure may be greater than room ambient temperature. Installation in an enclosure should be such that the amount of air flow required for safe operation is not compromised. Consideration should be given to the maximum rated ambient temperature. Overheating can cause a variety of problems, including premature aging and failure of chips or mechanical failure of devices.
  If the system has been exposed to abnormally cold temperatures, allow a two-hour warm-up period to bring it up to normal operating temperature before turning it on. Failure to do so may cause damage to internal components, particularly the hard disk drive.

- **Humidity**

  High-humidity can cause moisture to enter and accumulate in the system. This moisture can cause corrosion of internal components and degrade such

properties as electrical resistance and thermal conductivity. Extreme moisture buildup inside the system can result in electrical shorts, which can cause serious damage to the system.

Buildings in which climate is controlled usually maintain an acceptable level of humidity for system equipment. However, if a system is located in an unusually humid location, a dehumidifier can be used to maintain the humidity within an acceptable range. Refer to the “Specifications” section of this user’s guide for the operating and storage humidity specifications.

- **Altitude**

  Operating a system at a high altitude (low pressure) reduces the efficiency of the cooling fans to cool the system. This can cause electrical problems related to arcing and corona effects. This condition can also cause sealed components with internal pressure, such as electrolytic capacitors, to fail or perform at reduced efficiency.

Power Protection

The greatest threats to a system’s supply of power are power loss, power spikes, and power surges caused by electrical storms, which interrupt system operation and/or damage system components. To protect your system, always properly ground power cables and one of the following devices.

- **Surge Protector**

  Surge protectors are available in a variety of types and usually provide a level of protection proportional with the cost of the device. Surge protectors prevent voltage spikes from entering a system through the AC power cord. Surge protectors, however, do not offer protection against brownouts, which occur when the voltage drops more than 20 percent below the normal AC line voltage level.

- **Line Conditioner**

  Line conditioners go beyond the over voltage protection of surge protectors. Line conditioners keep a system’s AC power source voltage at a fairly constant level and, therefore, can handle brownouts. Because of this added protection, line conditioners cost more than surge protectors. However, line conditioners cannot protect against a complete loss of power.

■ Uninterruptible Power Supply

Uninterruptible power supply (UPS) systems offer the most complete protection against variations on power because they use battery power to keep the server running when AC power is lost. The battery is charged by the AC power while it is available, so when AC power is lost, the battery can provide power to the system for a limited amount of time, depending on the UPS system.

UPS systems range in price from a few hundred dollars to several thousand dollars, with the more expensive unit s allowing you to run larger systems for a longer period of time when AC power is lost. UPS systems that provide only 5 minutes of battery power let you conduct an orderly shutdown of the system, but are not intended to provide continued operation. Surge protectors should be used with all UPS systems, and the UPS system should be Underwriters Laboratories (UL) safety approved.

Chapter 1

Introduction

■ Overview

The KEEX-5100 Series is an industrial embedded single board computer (SBC) that is equipped with Intel® Haswell / Broadwell ULT Processors. Featured are 1x DDR3L SO-DIMM socket, 2x DP, 1x LVDS, 1x DIO, 3x Gigabit Ethernet, 2x SATA, 1x mSATA, 2x mini-PCIe slot, 4x USB2.0, 1x USB3.0 and 2x COM.

Checklist

- Driver/ Manual CD
- Quick Installation Guide
- KEEX-5100 Series main board
- 1x SATA Cable

Features

- Intel® Haswell / Broadwell ULT Processors
- 1x DDR3L SO-DIMM up to 8GB
- 2x DP, 1x LVDS, 3x GbE, 2xCOM
- 4x USB2.0, 1x USB3.0 and Audio
- 2x Mini-PCIe socket, 2x SATA connector, 1x mSATA socket and 1x DIO
- Suitable for Fanless design

■ Product Specifications

Model Name	▪ KEEX-5100 Series
Form Factor	▪ ECX, 146x105mm / 5.75" x 4.13"
CPU Support	▪ KEEX-5100: Intel® Haswell Core™ i3-4010U Processor (3M Cache, 1.7 GHz) ▪ KEEX-5101: Intel® Haswell Core™ i5-4300U Processor (3M Cache, 1.9 GHz) ▪ KEEX-5103: Intel® Haswell Core™ i7-4650U Processor (4M Cache, 3.3 GHz) ▪ KEEX-5104: Intel® Broadwell Core™ i5-5350U Processor (3M Cache, up to 2.9 GHz)
Memory	▪ 1x DDR3L SO-DIMM up to 8 GB
Displays	▪ 1x 24-bit/2-ch LVDS ▪ 2x DP connector on rear I/O
Ethernet	▪ 3x Gb/s Ethernet ports supported Intel I218-LM GbE PHY x 1 Intel I210-AT Ethernet Controller x 2
Audio	▪ Realtek ALC662 Audio Codec onboard 1x header for Line-out/Line-In/MIC-In ▪ ISSI IS31AP2010B 3W Audio Amplifier onboard 2x Wafers for Stereo Speaker output
Peripheral Support	▪ **Storage supported** ● 2x SATA(7P) connector ● 1x mSATA mixed with mPCIe socket ▪ **USB** ● 4x USB3.0 port ● 2x USB2.0 ports ▪ **FAN supported** ● +12VDC Smart FAN supported ▪ **MISC** ● 1x header for Reset button, HDD LED and External Speaker support ● 1x header for Power button, Power LED and SM bus ● 1x header for mPCIe activity LED support ▪ **Super I/O** ● 2x wafers for RS-232 COM ports ● Pin-1 of Wafers provide +5VDC supply ● COM1 & COM2 support RS-232/422/485 ● 8-bit DIO
Expansion Slot	▪ 2x mPCIe Socket ▪ 1x SIM card wafer
BIOS	▪ AMI uEFI BIOS ▪ 1x 128Mb SPI flash ROM
Hardware Monitor	▪ Voltages monitoring ▪ Temperature monitoring.
Watchdog	▪ Programmable WDT to generate System reset event
Real Time Clock	▪ SoC intergrated RTC
Power	▪ ACPI 3.0 support ▪ 1x lockable Wafer for +12VDC Power input ▪ ATX/AT Mode Support
Operation Temp.	▪ Operation Temp: 0ºC ~ 60ºC / 32ºF ~ 140ºF

	▪ Storage Temp.: -20ºC ~ 80ºC / -4ºF ~ 176ºF ▪ Humidity: 0% ~ 95%
Certifications	▪ CE, FCC Class A

Table 1 KEEX-5100 Series Specification

■ System Block Diagram

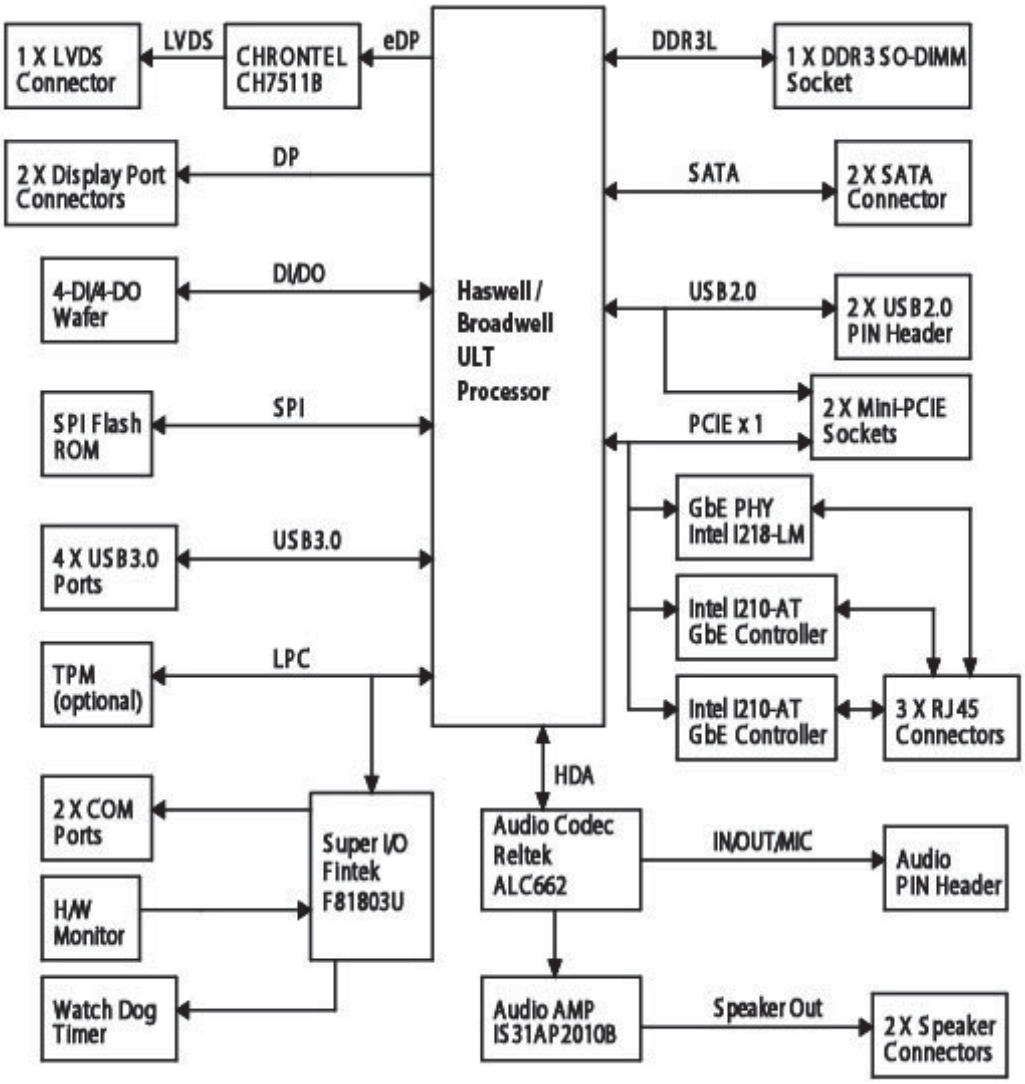
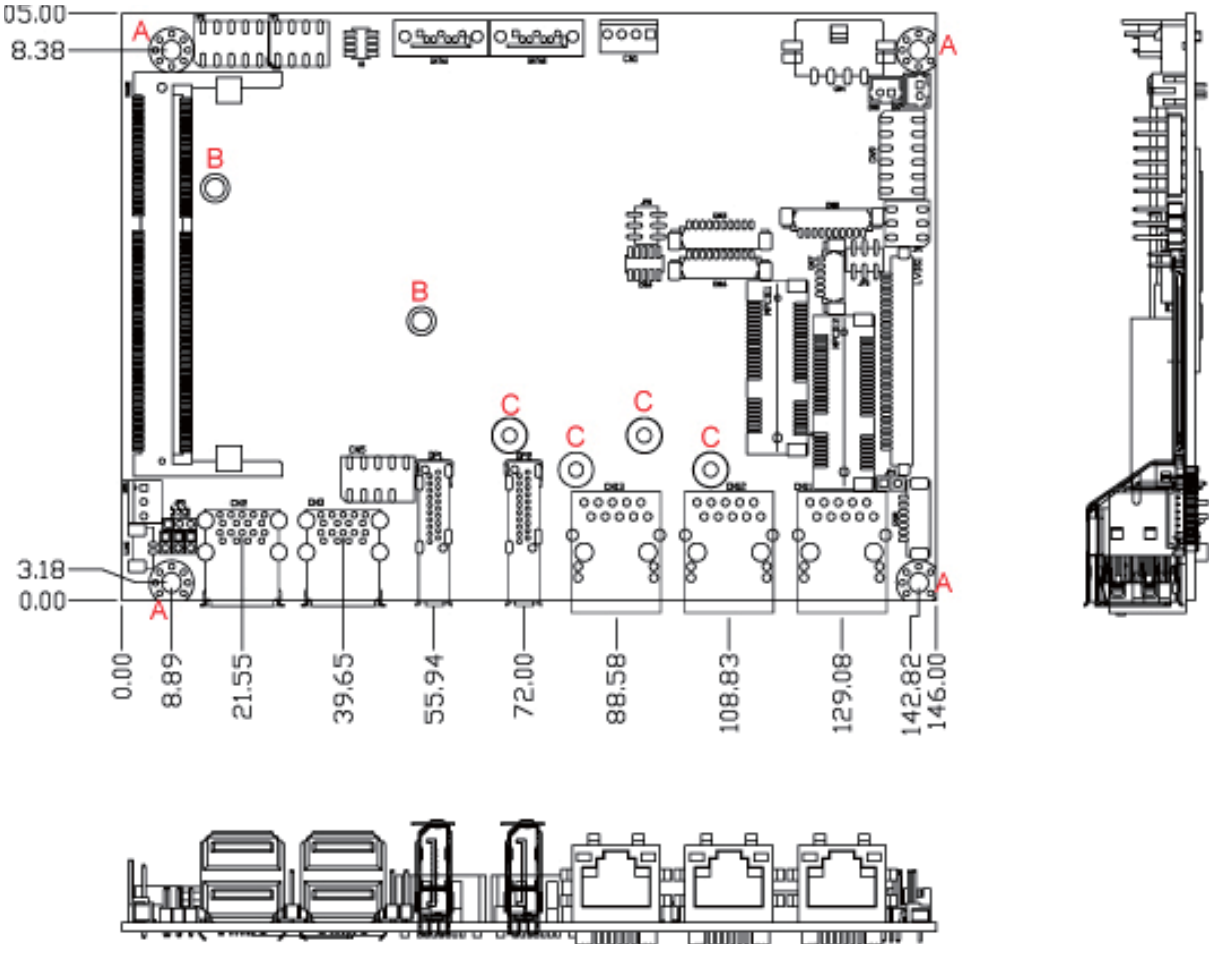


Figure 1 Block Diagram

■ Mechanical Dimensions



*A-Ø: 3.5mm *B-Ø: 5.08mm *C-Ø: 2.6mm

Figure 2 Mechanical Dimensions

Chapter 2

Hardware Settings

■ Overview

This chapter provides the definitions and locations of jumpers, headers, and connectors.

Jumpers

The product has several jumpers which must be properly configured to ensure correct operation.

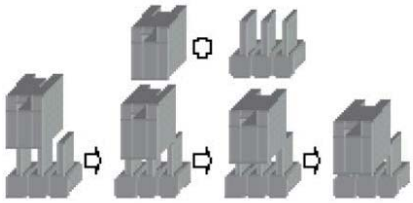


Figure 3 Jumper Connector

For a three-pin jumper (see *Figure 3*), the jumper setting is designated “1-2” when the jumper connects pins 1 and 2. The jumper setting is designated “2-3” when pins 2 and 3 are connected and so on. You will see that one of the lines surrounding a jumper pin is thick, which indicates pin No.1.

To move a jumper from one position to another, use needle-nose pliers or tweezers to pull the pin cap off the pins and move it to the desired position.

■ Jumper Settings and Pin Definitions

For jumper and connector locations, please refer to the diagrams below.

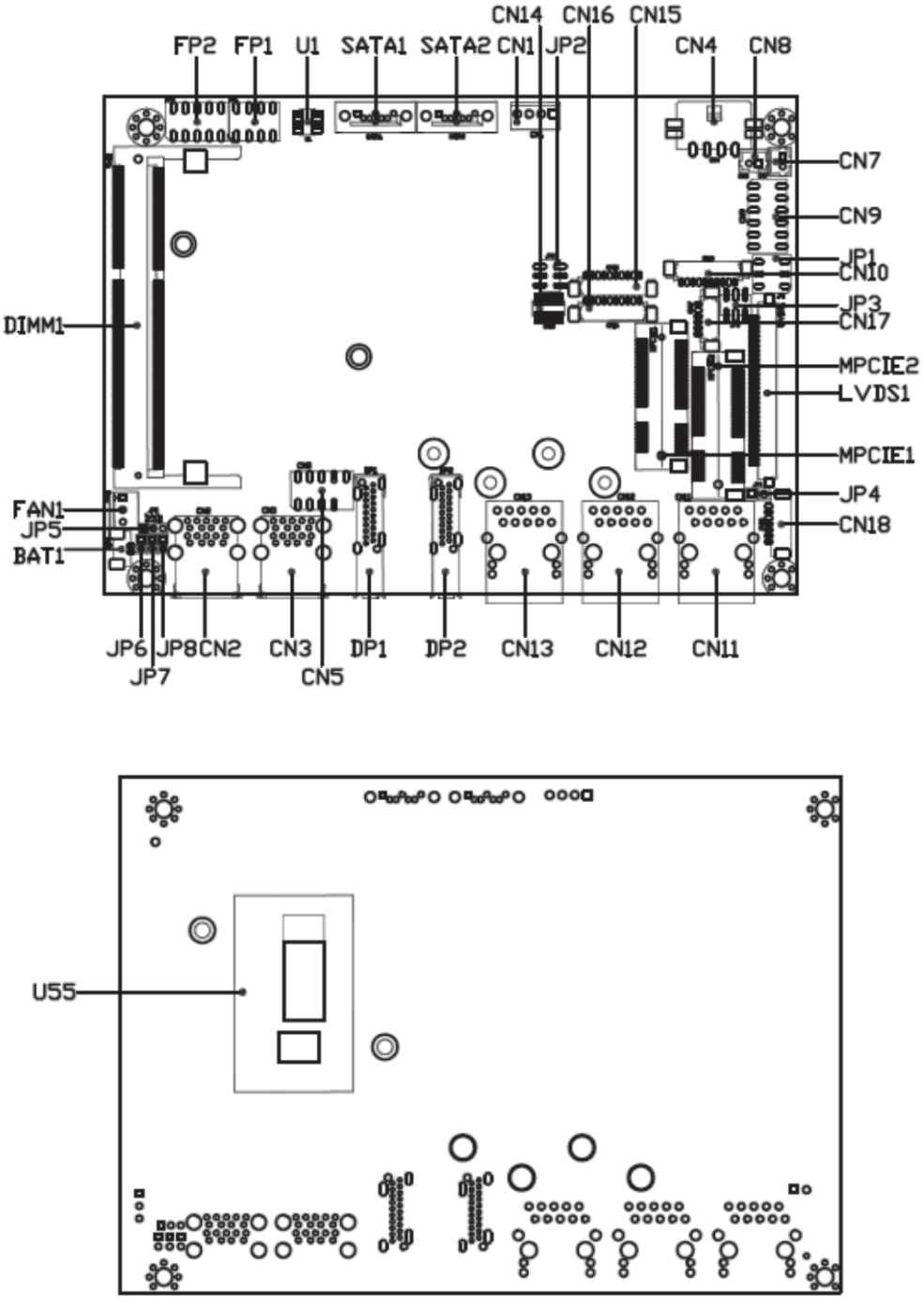


Figure 4 Jumper and Connector Locations

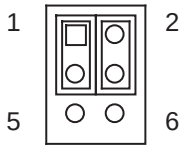
Jumper Settings

To ensure correct system configuration, the following section describes how to set the jumpers to enable/disable or change functions. For jumper descriptions, please refer to the table below.

Table 2 Jumper List

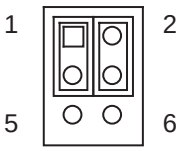
Label	Function
JP1	Panel & Backlight Power Selection for LVDS1
JP2	AT_ATX Mode / MPCIE1 mSATA / mPCIE Selection
JP3	Backlight Power Enable Selection for LVDS1
JP4	MPCIE Activity LED Indication
JP5	USB POWER Selection
JP6	Flash Description Security Over-ride
JP7	RTC Reset Selection
JP8	SRTC Reset Selection

Table 3 JP1 Panel & Backlight Power Selection for LVDS1



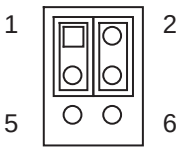
Jumper	Setting	Status
1	1-3	Backlight Power = +12V
	3-5	Backlight Power = +5V
2	2-4	Panel Power = +3.3V
	4-6	Panel Power = +5V
Pitch:2.54mm [YIMTEX 3362*03SAGR]		

Table 4 JP2 AT_ATX Mode / MPCIE1 mSATA / mPCIE Selection



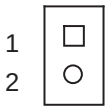
Jumper	Setting	Status
1	1-3	ATX Mode (Default)
	3-5	AT Mode
2	1-3	MPCIE1 mSATA Selected (Default)
	3-5	MPCIE1 mPCIE Selected
Pitch:2.54mm [YIMTEX 3362*03SAGR]		

Table 5 JP3 Backlight Power Enable Selection for LVDS1



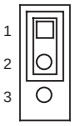
Pin	Setting	Status
1	1-3	Backlight Enable Voltage = +3.3V
	3-5	Backlight Enable Voltage = +5V
2	2-4	Active High
	4-6	Active Low
Pitch:2.0mm[PINREX 222-97-03GBB1]		

Table 6 JP4 MPCIE Activity LED Indication



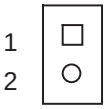
Pin	Description
1	LED+
2	LED-
DIP 2P 1R MALE STRAIGHT TYPE Pitch:2.54mm [YIMTEX 3321*02SAGR(6T)]	

Table 7 JP5 USB Power Selection



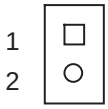
Jumper	Status
1	USB power will be cut off in S4 & S5 state.
2	USB power will be cut off in Deep S5 state.
DIP 3P 1R MALE STRAIGHT TYPE Pitch:2.0mm [YIMTEX 3291*03SAGR(6T)]	

Table 8 JP6 Flash Description Security Over-ride



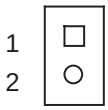
Jumper	Status
1-2 Open	Disabled
1-2 Short	Enabled
Pitch:2.54mm [YIMTEX 3321*02SAGR(6T)]	

Table 9 JP7 RTC Reset Selection



Jumper	Status
1-2 Open	Normal Operation
1-2 Short	Clear RTC CMOS
Pitch:2.54mm [YIMTEX 3321*02SAGR(6T)]	

Table 10 JP8 SRTC Reset Selection

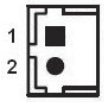


Jumper	Status
1-2 Open	Normal Operation
1-2 Short	Clear ME Registers
Pitch:2.54mm [YIMTEX 3321*02SAGR(6T)]	

Internal Connector Pin Assignment

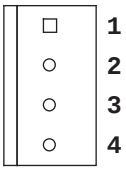
Label	Function
BAT1	CR2032 Battery Power Input Wafer
BZ1	Onboard Buzzer
CN1	SATA HDD Power Output Wafer
CN5	USB2.0 Port 4, 5 Pin Header
CN7	Right Channel 3W Audio AMP Output Wafer
CN8	Left Channel 3W Audio AMP Output Wafer
CN9	Audio Pin Header
CN10	Digital Input / Output Pin Header
CN14	P80_Header
CN15	RS-232 / 422 / 485 Port 1 Wafer
CN16	RS-232 / 422 / 485 Port 2 Wafer
CN17	SIM Interface Wafer for MPCIE2
CN18	Backlight Power Output Wafer for LVDS1
DIMM1	DDR3 Memory SO-DIMM Socket
FAN1	CPU FAN Wafer
FP1	Front Panel 1 Pin Header
FP2	Front Panel 2 Pin Header
LVDS1	Primary 24-bit, 2-channel LVDS Panel Connector
MPCIE1	Mini-PCIE Express v1.2 Socket
MPCIE2	Mini-PCIE Express v1.2 Socket
SATA1	Serial ATA Port 0 Connector
SATA2	Serial ATA Port 1 Connector

Table 11 BAT1 CR2032 Battery Power Input Wafer



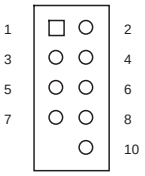
Pin	Signal Name
1	+VBAT
2	GND
Pitch:1.25mm [Pinrex 712-73-02TWR0]	

Table 12 CN1 SATA HDD Power Output Wafer



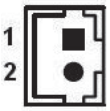
Pin	Signal Name
1	+12V
2	GND
3	GND
4	+5V
Pitch:2.5mm [YIMTEX 512CW4ST-2R]	

Table 13 CN5 USB2.0 Port 10, 11 Pin Header



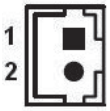
Pin	Signal Name	Pin	Signal Name
1	+USBVCC	2	+USBVCC
3	USB_A-	4	USB_B-
5	USB_A+	6	USB_B+
7	GND	8	GND
9	KEY	10	GND
Pitch:2.54mm [YIMTEX 3362*05SANGR-09] * : The power source of +USBVCC can be selected by JP7			

Table 14 CN7 Right Channel 2W Audio AMP Output Wafer



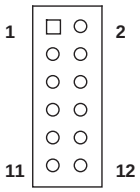
Pin	Signal Name
1	Speaker+
2	Speaker-
Pitch:2.0mm [YIMTEX 503PW1*02STR]	

Table 15 CN8 Left Channel 2W Audio AMP Output Wafer



Pin	Signal Name
1	Speaker+
2	Speaker-
Pitch:2.0mm [YIMTEX 503PW1*02STR]	

Table 16 CN9 Audio Pin Header

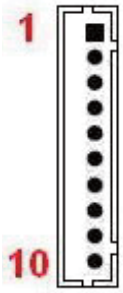


Pin	Signal Name	Pin	Signal Name
1	MIC_IN_L	2	MIC_IN_R
3	MIC_IN_JD	4	GND
5	LINE_IN_L	6	LINE_IN_R
7	LINE_IN_JD	8	GND
9	LINE_OUT_L	10	LINE_OUT_R
11	LINE_OUT_JD	12	GND
Pitch:2.54mm [PINREX 212-92-06GB01]			

Table 17 CN10 Digital Input / Output Wafer

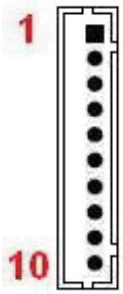
Pin	Signal Name
1	+5V
2	Digital Input 0
3	Digital Output 0
4	Digital Input 1
5	Digital Output 1
6	Digital Input 2
7	Digital Output 2
8	Digital Input 3
9	Digital Output 3
10	GND
SMD 10P 1R 180D MALE P=1.25mm, Tin Plated, NY46, White Insulator [Pinrex 712-73-10TWB0]	

Table 18 CN15 RS-232/422/485 Port 1 Wafer



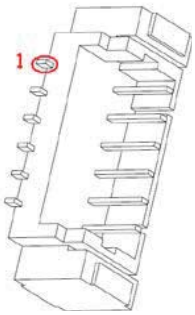
Pin	RS-232	RS-422	Half Duplex RS-485	Full Duplex RS-485
1	DCD	TX-	DATA-	TX-
2	DSR	TX+	DATA+	TX+
3	RXD	RX+	N/A	RX+
4	RTS	RX-	N/A	RX-
5	TXD	N/A	N/A	N/A
6	CTS	N/A	N/A	N/A
7	DTR	N/A	N/A	N/A
8	RI	N/A	N/A	N/A
9	GND	GND	GND	GND
10	+5V	+5V	+5V	+5V
Pitch:1.25mm [Pinrex 712-73-10TWB0]				

Table 19 CN16 RS-232/422/485 Port 1 Wafer



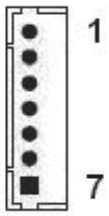
Pin	RS-232	RS-422	Half Duplex RS-485	Full Duplex RS-485
1	DCD	TX-	DATA-	TX-
2	DSR	TX+	DATA+	TX+
3	RXD	RX+	N/A	RX+
4	RTS	RX-	N/A	RX-
5	TXD	N/A	N/A	N/A
6	CTS	N/A	N/A	N/A
7	DTR	N/A	N/A	N/A
8	RI	N/A	N/A	N/A
9	GND	GND	GND	GND
10	+5V	+5V	+5V	+5V
Pitch:1.25mm [Pinrex 712-73-10TWB0]				

Table 20 CN17 SIM Interface Wafer for MPCIE2



Pin	Signal Name
1	UIM_PWR
2	UIM_DATA
3	UIM_RESET
4	UIM_VPP
5	UIM_CLK
6	GND
Pitch:1.25mm [Pinrex 712-73-06TWB0]	

Table 21 CN18 Backlight Power Output Wafer for LVDS1

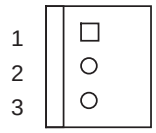


Pin	Signal Name
1	BL_ADJ_PWM *
2	BL_ADJ_VOL *
3	GND
4	+5V / +12V **
5	+5V / +12V **
6	GND
7	BL_EN***
Pitch:1.25mm [YIMTEX 501MW1X07MTR-1R] *：BL_ADJ can be setting in BIOS setup. **：Backlight Power can be selected by JP1. ***：BL_EN can be selected by JP3.	

Table 22 DIMM1 DDR3 Memory SO-DIMM Socket

Height:6.5mm [LINKTEK DDRRK-20401-TP7B]

Table 23 FAN1 CPU FAN Wafer

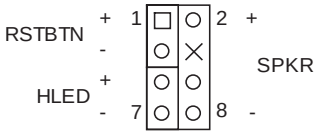


Pin	Signal
1	GND
2	+12V*
3	FAN_RPM

Pitch:2.54mm [YIMTEX 521AW1*03STR]

*：PWM Fan control supported.

Table 24 FP1 Front Panel 1 Pin Header

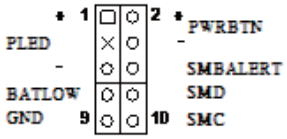


Pin	Signal	Pin	Signal
1	Reset Button +	2	Speaker +
3	Reset Button -	4	NC
5	HDD LED +	6	Internal Speaker-
7	HDD LED -	8	Speaker -

Pitch:2.54mm [YIMTEX 3362*04SANGR]

Note：Internal Buzzer is enabled when Pin6-8 is shorted.

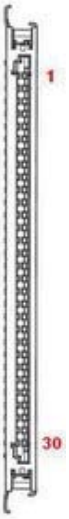
Table 25 FP2 Front Panel 2 Pin Header



Pin	Signal	Pin	Signal
1	Power LED +	2	Power Button +
3	NC	4	Power Button -
5	Power LED -	6	SMBALERT#
7	BATLOW#	8	SMBus Data
9	GND	10	SMBus Clock

Pitch:2.54mm [YIMTEX 3362*05SANGR]

Table 26 LVDS1 Primary 24-bit, 2-channel LVDS Panel Connector

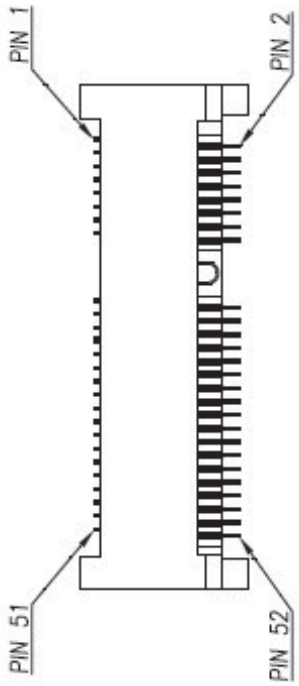


Pin	Signal Name	Pin	Signal Name
1	LVDS_A0-	16	LVDS_B1+
2	LVDS_A0+	17	GND
3	LVDS_A1-	18	LVDS_B2-
4	LVDS_A1+	19	LVDS_B2+
5	LVDS_A2-	20	LVDSBCLK-
6	LVDS_A2+	21	LVDS_BCLK+
7	GND	22	LVDS_B3-/NC
8	LVDS_ACLK-	23	LVDS_B3+/NC
9	LVDS_ACLK+	24	GND
10	LVDS_A3-/NC	25	DDC_DATA
11	LVDS_A3+/NC	26	VDDEN
12	LVDS_B0-	27	DDC_CLK
13	LVDS_B0+	28	+3.3V / +5V *
14	GND	29	+3.3V / +5V *
15	LVDS_B1-	30	+3.3V / +5V *

Pitch:1.0mm [JAE FI-X30SSL-HF]

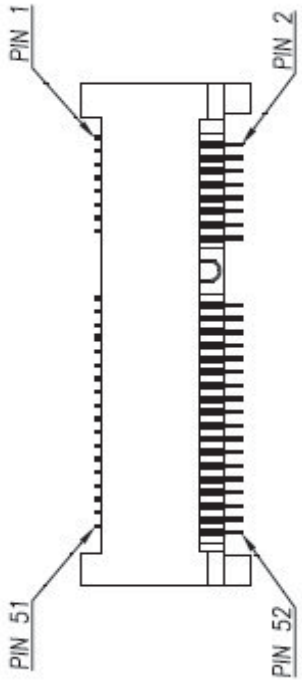
*：Panel Power can be selected by JP1.

Table 27 MPCIE1 Mini-PCIE Express v1.2 Socket



Signal	Pin	Pin	Signal
WAKE#	1	2	+3.3VSB
Reserved	3	4	Ground
Reserved	5	6	+1.5V
CLKREQ#	7	8	NC
Ground	9	10	NC
REFCLK-	11	12	NC
REFCLK+	13	14	NC
Ground	15	16	NC
Reserved	17	18	Ground
Reserved	19	20	W_Disable#
Ground	21	22	PERST#
PERn0	23	24	+3.3VSB
PERp0	25	26	Ground
Ground	27	28	+1.5V
Ground	29	30	SMB_CLK
PETn0	31	32	SMB_DATA
PETp0	33	34	Ground
Ground	35	36	USB_D-
Ground	37	38	USB_D+
+3.3VSB	39	40	Ground
+3.3VSB	41	42	LED_WWAN#
Ground	43	44	LED_WLAN#
Reserved	45	46	LED_WPAN#
Reserved	47	48	+1.5V
Reserved	49	50	Ground
Reserved	51	52	+3.3VSB
H:5.6mm, 10u Gold Plating, Tape Reel [FOXCONN AS0B226-S56Q-7H]			

Table 28 MPCIE2 Mini-PCIE Express v1.2 Socket



Signal	Pin	Pin	Signal
WAKE#	1	2	+3.3VSB
Reserved	3	4	Ground
Reserved	5	6	+1.5V
CLKREQ#	7	8	UIM_PWR*
Ground	9	10	UIM_DATA*
REFCLK-	11	12	UIM_CLK*
REFCLK+	13	14	UIM_RESET*
Ground	15	16	UIM_VPP*
Reserved	17	18	Ground
Reserved	19	20	W_Disable#
Ground	21	22	PERST#
PERn0	23	24	+3.3VSB
PERp0	25	26	Ground
Ground	27	28	+1.5V
Ground	29	30	SMB_CLK
PETn0	31	32	SMB_DATA
PETp0	33	34	Ground
Ground	35	36	USB_D-
Ground	37	38	USB_D+
+3.3VSB	39	40	Ground
+3.3VSB	41	42	LED_WWAN#
Ground	43	44	LED_WLAN#
Reserved	45	46	LED_WPAN#
Reserved	47	48	+1.5V
Reserved	49	50	Ground
Reserved	51	52	+3.3VSB
H:9.9mm, 10u Gold Plating, Tape Reel [FOXCONN AS0B226-S99Q-7H]			
* : These pins are connected to CN17 directly.			

Table 29 SATA1 Serial ATA Port 0 Connector

Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND
[FOXCONN LD1807V-S52U]	

Table 30 SATA2 Serial ATA Port 1 Connector

Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND
[FOXCONN LD1807V-S52U]	

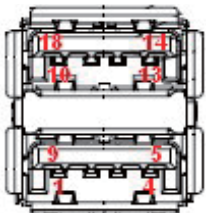
Rear Panel Pin Assignments

Figure 5 Rear Panel IO

Table 31 Rear Panel Connector List

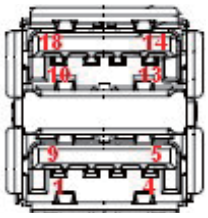
Label	Function
CN2	USB3.0 Port 0,1 Connector
CN3	USB3.0 Port 2,3 Connector
CN11	GbE LAN1 RJ-45 Connector
CN12	GbE LAN2 RJ-45 Connector
CN13	GbE LAN3 RJ-45 Connector
DP1	DP Connector
DP2	DP Connector
CN4	Power Input Wafer

Table 32 CN2 USB3.0 Port-2,3 Type-A Connector



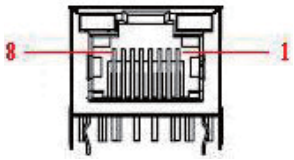
Pin	Signal Name	Pin	Signal Name
1	+USBA_VCC	10	+USBB_VCC
2	USBA_D-	11	USBB_D-
3	USBA_D-	12	USBB_D-
4	GND	13	GND
5	USBA_RX-	14	USBB_RX-
6	USBA_RX+	15	USBB_RX+
7	GND	16	GND
8	USBA_TX-	17	USBB_TX-
9	USBA_TX+	18	USBB_TX+
* : The power source of +USBVCC can be selected by JP5.			

Table 33 CN3 USB3.0 Port-2,3 Type-A Connector



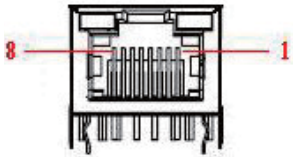
Pin	Signal Name	Pin	Signal Name
1	+USBA_VCC	10	+USBB_VCC
2	USBA_D-	11	USBB_D-
3	USBA_D-	12	USBB_D-
4	GND	13	GND
5	USBA_RX-	14	USBB_RX-
6	USBA_RX+	15	USBB_RX+
7	GND	16	GND
8	USBA_TX-	17	USBB_TX-
9	USBA_TX+	18	USBB_TX+
* : The power source of +USBVCC can be selected by JP5.			

Table 34 CN11 GbE LAN1 RJ-45 Connector



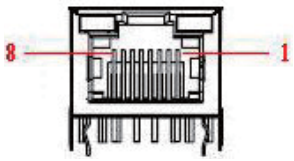
Pin	Signal Name	Pin	Signal Name
1	TX1+	5	TX3-
2	TX1-	6	TX2-
3	TX2+	7	TX4+
4	TX3+	8	TX4-
RJ45+TFM+LED 10/100/1000 14P DIP 90° [UDE RT7-174AAM1A(XA)]			

Table 35 CN12 GbE LAN2 RJ-45 Connector



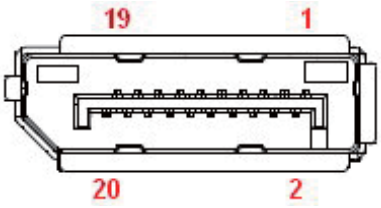
Pin	Signal Name	Pin	Signal Name
1	TX1+	5	TX3-
2	TX1-	6	TX2-
3	TX2+	7	TX4+
4	TX3+	8	TX4-
RJ45+TFM+LED 10/100/1000 14P DIP 90° [UDE RT7-174AAM1A(XA)]			

Table 36 CN13 GbE LAN2 RJ-45 Connector



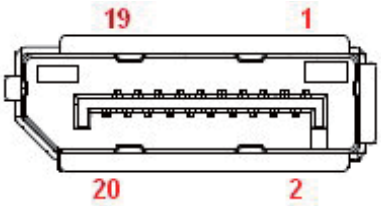
Pin	Signal Name	Pin	Signal Name
1	TX1+	5	TX3-
2	TX1-	6	TX2-
3	TX2+	7	TX4+
4	TX3+	8	TX4-
RJ45+TFM+LED 10/100/1000 14P DIP 90° [UDE RT7-174AAM1A(XA)]			

Table 37 DP1 DisplayPort Port-1 Connector



Pin	Signal	Pin	Signal
1	TX0+	11	GND
2	GND	12	TX3-
3	TX0-	13	GND
4	TX1+	14	GND
5	GND	15	AUX+
6	TX1-	16	GND
7	TX2+	17	AUX-
8	GND	18	HPD
9	TX2-	19	GND
10	TX3+	20	PWR

Table 38 DP2 DisplayPort Port-2 Connector



Pin	Signal	Pin	Signal
1	TX0+	11	GND
2	GND	12	TX3-
3	TX0-	13	GND
4	TX1+	14	GND
5	GND	15	AUX+
6	TX1-	16	GND
7	TX2+	17	AUX-
8	GND	18	HPD
9	TX2-	19	GND
10	TX3+	20	PWR

Table 39 CN4 Power Input Wafer

Pin	Signal
1	+Vin
2	GND
3	GND
4	+Vin
SMD 4P 1R MALE 90° Pitch:3.0mm PIN [PINREX 733-97-04TBR1]	

Chapter 3

System Installation

■ Memory Module Installation

Carefully follow the steps below in order to install the SO-DIMMs:

1. To avoid generating static electricity and damaging the SO-DIMM, ground yourself by touching a grounded metal surface or use a ground strap before you touch the SO-DIMM.
2. Do not touch the connectors of the SO-DIMM. Dirt or other residue may cause a malfunction.
3. Hold the SO-DIMM with its notch aligned with the memory socket of the board and insert it at a 30-degree angle into the socket.

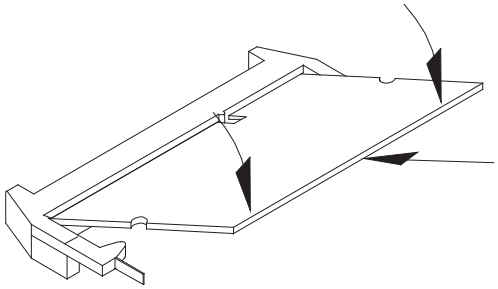


Figure 6 Align the SO-DIMM Memory Module with the onboard socket

4. Fully insert the module into the socket until a “click” is heard.
5. Press down on the SO-DIMM so that the tabs of the socket lock on both sides of the module

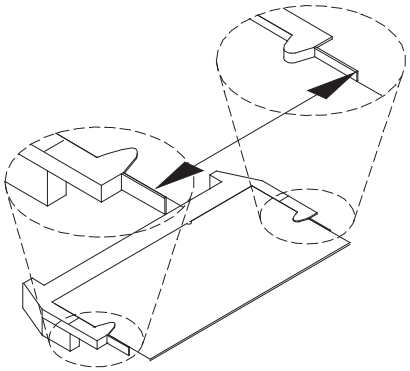


Figure 7 Press down on the SO-DIMM Memory Module to lock it in place

Removing a SO-DIMM:

To remove the SO-DIMM, use your fingers or a small screwdriver to carefully push away the tabs that secure either side of the SO-DIMM. Lift it out of the socket. Make sure you store the SO-DIMM in an anti-static bag. The socket must be populated with memory modules of the same size and manufacturer.

Chapter 4

AMI BIOS Setup

■ Overview

This chapter provides a description of the AMI BIOS. The BIOS setup menus and available selections may vary from those of your product. For specific information on the BIOS for your product, please contact Quanmax.

NOTE: The BIOS menus and selections for your product may vary from those in this chapter. For the BIOS manual specific to your product, please contact Quanmax

AMI's ROM BIOS provides a built-in Setup program, which allows the user to modify the basic system configuration and hardware parameters. The modified data will be stored in a battery-backed CMOS, so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM will not need to be changed unless there is a configuration change in the system, such as a hard drive replacement or when a device is added.

It is possible for the CMOS battery to fail, which will cause data loss in the CMOS only. If this happens you will need to reconfigure your BIOS settings.

■ Main Menu

The BIOS Setup is accessed by pressing the DEL key after the Power-On Self-Test (POST) memory test begins and before the operating system boot begins. Once you enter the BIOS Setup Utility, the Main Menu will appear on the screen. The Main Menu provides System Overview information and allows you to set the System Time and Date. Use the “<” and “>” cursor keys to navigate between menu screens.

Table 40 KEEX-5100 BIOS Main Menu

BIOS SETUP UTILITY					
Main	Advanced	Boot	Security	Save & Exit	
Product Information					
Product Name		KEEX-5100			
BIOS Version		Z0.05 (x64)			
BIOS Build Date		01/28/2015			
ME FW Version		N/A			
CPU Information					
Intel® Core™ i3-4010U @ 1.70GHz					
Microcode Revision		1c			→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
Processor Cores		2			
Memory Information					
Total Size		4096 MB (DDR3)			
Frequency		1600 MHz			
System date		[Fri 02/14/2014]			
System time		[13:23:12]			
Access Level		Administrator			
Version 2.17.1246. Copyright (C) 2015, American Megatrends, Inc.					

■ Advanced Menu

Table 41 Advanced Menu

BIOS SETUP UTILITY		
Main **Advanced** Boot Security Server Mgmt Save & Exit		
Onboard LAN1 Controller	[Enabled]	
Onboard LAN1 Boot	[Disabled]	
Onboard LAN2 Controller	[Enabled]	
Onboard LAN2 Boot	[Disabled]	
Onboard LAN3 Controller	[Enabled]	
Onboard LAN3 Boot	[Disabled]	→ ← Select Screen
Audio Controller	[Enabled]	↑↓ Select Item Enter: Select
> Display Configuration		+- Change Opt.
> Super IO Configuration		F1: General Help
> CPU Chipset Configuration		F2: Previous Values
> SATA Configuration		F3: Optimized Defaults
> USB Configuration		F4 Save & Exit
> DIO Configuration		ESC Exit
> H/W Monitor		
Version 2.17.1246. Copyright (C) 2015, American Megatrends, Inc.		

Onboard LAN 1 Controller

Options: Disabled, Enabled

Onboard LAN 1 Boot

Options: Disabled, Enabled

Onboard LAN 2 Controller

Options: Disabled, Enabled

Onboard LAN 2 Boot

Options: Disabled, Enabled

Onboard LAN 3 Controller

Options: Disabled, Enabled

Onboard LAN 3 Boot

Options: Disabled, Enabled

Audio Controller

Options: Disabled, Enabled

Table 42 Advanced Menu – Display Configuration

BIOS SETUP UTILITY		
Main **Advanced** Boot Security Server Mgmt Save & Exit		
Display Configuration		→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
UMA Frame Buffer Size	[256 MB]	
DVMT Pre-Allocated	[64M]	
DVMT Total Gfx Mem	[256 M]	
Primary IGFX Boot Display	[VBIOS Default]	
Active LVDS	[Disabled]	
Version 2.17.1246. Copyright (C) 2015, American Megatrends, Inc.		

UMA Frame Buffer Size

Options: 128MB, 256MB, 512MB

DVMT Pre-Allocated

Options: 32M, 64M, 96M, 128M, 160M, 192M, 224M, 256M, 288M, 320M, 352M, 384M, 416M, 448M, 480M, 512M, 1024M

DVMT Total Gfx Mem

Options: 128M, 256M, MAX

Primary IGFX Boot Display

Options: VBIOS Default, DP1, DP2, LVDS

Active LVDS

Options: Disabled, Enabled

Table 43 Advanced Menu – Super IO Configuration

BIOS SETUP UTILITY					
Main	**Advanced**	Boot	Security	Save & Exit	
Super IO Configuration >Serial Port 1 Configuration >Serial Port 2 Configuration				→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit	
Version 2.17.1246. Copyright (C) 2015, American Megatrends, Inc.					

Table 44 Advanced Menu – Super IO Configuration – Serial Port 1 Configuration

BIOS SETUP UTILITY						
Main	**Advanced**	Boot	Chipset	Power	Security	Exit
Serial Port 1 Configuration Serial Port Device Settings Change Settings Serial Port 1 Type			[Enabled] IO=3F8h ; IRQ=4; [Auto] [RS232]		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Exit ESC: Exit	
Version 2.17.1246. Copyright (C) 2015, American Megatrends, Inc.						

Serial Port

Options: Disabled, Enabled

Change Settings

Options: Auto,

IO=3F8h; IRQ=4;

IO=3F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12;

IO=2F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12;

IO=2E8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12;

Serial Port Type

Options: RS232, RS422, RS485

Table 45 Advanced Menu – Super IO Configuration – Serial Port 2 Configuration

BIOS SETUP UTILITY					
Main	Advanced	Boot	Security	Save & Exit	
Serial Port 2 Configuration				→ ← Select Screen ↑↓ Select Item Enter: Select	
Serial Port		[Enabled]		+- Change Opt.	
Device Settings		IO=2F8h; IRQ=3;		F1: General Help F2: Previous Values	
Change Settings		[Auto]		F3: Optimized Defaults	
Serial Port 2 Type		[RS232]		F4 Save & Exit ESC Exit	
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Serial Port

Options: Disabled, Enabled

Change Settings

Options: Auto,

IO=2F8h; IRQ=3;

IO=3F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12;

IO=2F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12;

IO=2E8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12

Serial Port Type

Options: RS232, RS422, RS485

Table 46 Advanced Menu –CPU Chipset Configuration

BIOS SETUP UTILITY					
Main	**Advanced**	Boot	Security	Save & Exit	
CPU Chipset Configuration					
EIST		[Enabled]			
Hyper-threading		[Enabled]			
VT-d		[Enabled]			
Active Processor Cores		[All]			
Limit CPUID Maximum		[Disabled]			
Execute Disable Bit		[Enabled]			
Intel Virtualization Technology		[Disabled]			
Package power linit		[Enabled]			
Cpu Power Limit1		0			
Cpu Power Limit1 Time		0			
Cpu Power Limit2		20		→ ← Select Screen	
Platform power limit lock		[Enabled]		↑↓ Select Item	
Cpu Power Limit3		0		Enter: Select	
Cpu Poer Limit3 Time		0		+- Change Opt.	
Cpu Power Limit Duty Cycle		0		F1: General Help	
DDR Power Limit1		0		F2: Previous Values	
DDR Power Limit1 Time		0		F3: Optimized Defaults	
DDR Power Limit2		0		F4 Save & Exit	
				ESC Exit	
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EIST

Options: Disabled, Enabled

Hyper-threading

Options: Disabled, Enabled

VT-d

Options: Disabled, Enabled

Active Processor Cores

Options: All, 1

Limit CPUID Maximum

Options: Disabled, Enabled

Execute Disable Bit

Options: Disabled, Enabled

Intel ® Virtualization Tech

Options: Disabled, Enabled

Package power limit lock

Options: Disabled, Enabled

Cpu Power limit1

Options: 0

Cpu Power limit1 Time

Options: 0

Cpu Power limit2

Options: 20

Platform power limit lock

Options: Disabled, Enabled

Cpu Power limit3

Options: 0

Cpu Power limit3 Time

Options: 0

Cpu Power limit3 Duty Cycle

Options: 0

DDR Power limit1

Options: 0

DDR Power limit1 Time

Options: 0

DDR Power limit2

Options: 0

Table 47 Advanced Menu –SATA Configuration

BIOS SETUP UTILITY		
Main **Advanced** Boot Security Save & Exit		
SATA Confifuration		
SATA Controller(s)	[Enabled]	→ ← Select Screen
SATA Mode Selection	[AHCI]	↑↓ Select Item
SATA Controller Speed	[Default]	Enter: Select
Serial ATA Port 1	Empty	+- Change Opt.
Port 2	[Enabled]	F1: General Help
Serial ATA Port 2	Empty	F2: Previous Values
Port 2	[Enabled]	F3: Optimized Defaults
mSATA Port 1	Sandisk SSD U1 (32.0GB)	F4 Save & Exit
Port 1	[Enabled]	ESC Exit
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SATA Controller(s)

Options: Disabled, Enabled

SATA Mode Selection

Options: AHCI

SATA Controller Speed

Options: Default, Gen1, Gen2, Gen3

Serial ATA Port 1

Options: Disabled, Enabled

Serial ATA Port 2

Options: Disabled, Enabled

mSATA Port 1

Options: Disabled, Enabled

Table 48 Advanced Menu –USB Configuration

BIOS SETUP UTILITY					
Main	**Advanced**	Boot	Security	Save & Exit	
USB Configuration				→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit	
USB Devices: 1 Keyboard, 1 Mouse, 1 Hubs					
Legacy USB Support		[Enabled]			
xHCI Legacy Support		[Enabled]			
xHCI hand-off		[Enabled]			
EHCI Hand-off		[Disabled]			
USB Mass Storage Driver Support		[Enabled]			
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Legacy USB Support

Options: Disabled, Enabled, Auto

XHCI Legacy Support

Options: Disabled, Enabled

XHCI hand-off

Options: Disabled, Enabled

EHCI hand-off

Options: Disabled, Enabled

USB Mass Storage Driver Support

Options: Disabled, Enabled

Table 49 Advanced Menu – Intel® Rapid Start Technology

BIOS SETUP UTILITY					
Main	**Advanced**	Boot	Security	Save & Exit	
Intel® Rapid Start Technology		[Disabled]		→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit	
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Intel® Rapid Start Technology

Options: Disabled, Enabled

Table 50 Advanced Menu –DIO Configuration

BIOS SETUP UTILITY					
Main	**Advanced**	Boot	Security	Save & Exit	
DIO Configuration					
User Configuration		[Disabled]			
DI_1		1		→ ← Select Screen	
DI_2		1		↑↓ Select Item	
DI_3		1		Enter: Select	
DI_4		1		+- Change Opt.	
				F1: General Help	
				F2: Previous Values	
DO_1		1		F3: Optimized Defaults	
DO_2		1		F4 Save & Exit	
DO_3		1		ESC Exit	
DO_4		1			
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User Configuration

Options: Disabled, Enabled

DO_1

Options: Output Low, Output High

DO_2

Options: Output Low, Output High

DO_3

Options: Output Low, Output High

DO_4

Options: Output Low, Output High

Table 51 Advanced Menu –H/W Monitor

BIOS SETUP UTILITY					
Main	**Advanced**	Boot	Security	Save & Exit	
PC Health Status					
>Smart FAN Configuration					
CPU Temperature		: +80°C		→ ← Select Screen	
Memory Temperature		: +64°C		↑↓ Select Item	
System Temperature		: 54°C		Enter: Select	
CPU Fan Speed		: N/A		+- Change Opt.	
+VCORE		: +1.711 V		F1: General Help	
+VIN		: +12.000 V		F2: Previous Values	
+5V		: +5.114 V		F3: Optimized Defaults	
+3.3V		: +3.372 V		F4 Save & Exit	
				ESC Exit	
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Smart FAN Configuration

CPU FAN Setting

Options: Manual, Smart

Table 52 Power Configuration

BIOS SETUP UTILITY		
Main **Advanced** Boot Security Server Mgmt Save & Exit		
Power Configuration		
ACPI Sleep State	[S3 only (Suspend to RAM)]	→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
Restore AC Power Loss	[Power Off]	
Power Saving Mode	[Disabled]	
Resume Event control		
Resume By PCIE Device	[Disabled]	
Resume By RTC Alarm	[Disabled]	
>Watchdog Timer Configuration		
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ACPI Sleep State

Options: Suspend Disabled, S3 only (Suspend to RAM)

Restore AC Power Loss

Options: Power Off, Power On, Last State

Power Saving Mode

Options: Disabled, EUP Enabled, DeepSx Enabled

Resume By PCIE Device

Options: Disabled, Enabled

Resume By RTC Alarm

Options: Disabled, Enabled

EUP Power Saving Mode

Options: Disabled, Enabled

Watchdog Timer Configuration

- **WDT Function**

  Options: Disabled, Enabled

■ Boot Menu

Table 53 Boot Menu

BIOS SETUP UTILITY				
Main	Advanced	**Boot**	Security	Save & Exit
Boot Configuration				
Full Screen LOGO Display		[Disabled]		
Setup Prompt Timeout		1		→ ← Select Screen
Bootup NumLock State		[On]		↑↓ Select Item
CSM Support		[Enabled]		Enter: Select
Boot Option Filter		[Legacy Only]		+- Change Opt.
Boot Option Priorities				F1: General Help
Boot Option #1		[P3: SanDisk SSD U110 32GB]		F2: Previous Values
Hard Drive BBS Priorities				F3: Optimized Defaults
				F4 Save & Exit
				ESC Exit
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Full Screen LOGO Display

Options: Disabled, Enabled

Bootup Numlock State

Options: On, Off

CSM Support

Options: Disabled, Enabled

Boot Option Filter

Options: UEFI and Legacy, Legacy only, UEFI only

Boot Option #1

Options: P3: SanDisk SSD U110 32GB, Disabled

Hard Drive BBS Priorities

Boot Option #1

Options: P3: SanDisk SSD U110 32GB, Disabled

■ Security Menu

Table 54 Security Menu

BIOS SETUP UTILITY				
Main	Advanced	Boot	**Security**	Save & Exit
Password Description If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights The password length must be in the following range: Minimum Length 3 Maximum length 20 Administrator Password User Password HDD Security Configuration: P3: SanDisk SSD Secure Boot menu				→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
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Secure Boot menu

Secure Boot

Options: Disabled, Enabled

Secure Boot Mode

Options: Standard, Custom

■ Save & Exit Menu

Table 55 Save & Exit Menu

BIOS SETUP UTILITY				
Main	Advanced	Boot	Security	**Save & Exit**
Save Changes and Reset Discard Changes and Reset Save Options Save Changes Discard Changes Restore Defaults				→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
Version 2.17.1246. Copyright (C) 2015, American Megatrends, Inc.				

Save Changes and Exit

Exit system setup after saving the changes. Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select [Yes] to save changes and exit.

Discard Changes and Exit

Exit system setup without saving any changes. Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than system date, system time, and password, the BIOS asks for a confirmation before exiting.

Discard Changes

Discards changes done so far to any of the setup values. This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select [Yes] to discard any changes and load the previously saved values.

Load Optimal Defaults

Load Optimal Default values for all the setup values. This option allows you to load optimal default values for each of the parameters on the Setup menus, which will provide the best performance settings for your system. The F9 key can be used for this operation.

Load Failsafe Defaults

Load Optimal Default values for all the setup values. This option allows you to load failsafe default values for each of the parameters on the Setup menus, which will provide the most stable performance settings. The F8 key can be used for this operation.

Chapter 5

Driver Installation

If your KEEX-5100 Series does not come with an operating system pre-installed, you will need to install an operating system and the necessary drivers to operate it. After you have finished assembling your system and connected the appropriate power source, power it up using the power supply and install the desired operating system.

You can download the drivers for the KEEX-5100 Series from the Quanmax website at www.quanmax.com and install as instructed there. For other operating systems, please contact Quanmax.

NOTE

When the system reboots without connecting the CRT, there might be no image on screen when you insert the CRT/VGA cable. Please pressing <**Ctrl>+<Alt>+<F1>** simultaneously to show the image on screen.

Appendix A

DIO (Digital I/O) Sample Code

```
//*************************************************************
//KEEX-5100 DOS DIO sample program
//Please compile with Turbo C 3.0 to utilized the program
//0:Low 1:High
//DO_1: IOport 0x1EC3 bit8      DI_1: IOport 0x1F0B bit7
//DO_2: IOport 0x1EDB bit8      DI_2: IOport 0x1F1B bit7
//DO_3: IOport 0x1E7B bit8      DI_3: IOport 0x1F23 bit7
//DO_4: IOport 0x1D73 bit8      DI_4: IOport 0x1F2B bit7
//*************************************************************

int main()
{
      int RetVal;
      int i;
      int Temp, Temp1, Temp2, Temp3, Temp4;

//Clear DO_1~4
      RetVal=inp(0x1EC3);//IO Port: 0x1EC3
      RetVal=(RetVal & 0x7F);
      outp(0x1EC3,RetVal);//Setting DO_1 Low

      RetVal=inp(0x1EDB);//IO Port: 0x1EDB
      RetVal=(RetVal & 0x7F);
      outp(0x1EDB,RetVal);//Setting DO_2 Low

      RetVal=inp(0x1E7B);//IO Port: 0x1E7B
      RetVal=(RetVal & 0x7F);
      outp(0x1E7B,RetVal);//Setting DO_3 Low

      RetVal=inp(0x1D73);//IO Port: 0x1D73
```

```
        RetVal=(RetVal & 0x7F);
        outp(0x1D73,RetVal);//Setting DO_4 Low

        printf("Setting DO_1~4 Low\n");
        system("pause");

//Setting DO_1~4
        RetVal=inp(0x1EC3);//IO Port: 0x1EC3
        RetVal=(RetVal | 0x80);
        outp(0x1EC3,RetVal);//Setting DO_1 High

        RetVal=inp(0x1EDB);//IO Port: 0x1EDB
        RetVal=(RetVal | 0x80);
        outp(0x1EDB,RetVal);//Setting DO_2 High

        RetVal=inp(0x1E7B);//IO Port: 0x1E7B
        RetVal=(RetVal | 0x80);
        outp(0x1E7B,RetVal);//Setting DO_3 High

        RetVal=inp(0x1D73);//IO Port: 0x1D73
        RetVal=(RetVal | 0x80);
        outp(0x1D73,RetVal);//Setting DO_4 High

        printf("Setting DO_1~4 High\n");
        system("pause");

//Reading DI_1~4
        printf("Reading the DI_1~4\n");
        RetVal=inp(0x1F0B);//IO Port: 0x1F0B
        Temp1=(RetVal & 0x40) >> 6;//DI_1 value

        RetVal=inp(0x1F1B);//IO Port: 0x1F1B
        Temp2=(RetVal & 0x40) >> 6;//DI_2 value

        RetVal=inp(0x1F23);//IO Port: 0x1F23
        Temp3=(RetVal & 0x40) >> 6;//DI_3 value

        RetVal=inp(0x1F2B);//IO Port: 0x1F2B
```

```
    Temp4=(RetVal & 0x40) >> 6;//DI_4 value

    printf("DI_1= %d\n",Temp1);
    printf("DI_2= %d\n",Temp2);
    printf("DI_3= %d\n",Temp3);
    printf("DI_4= %d\n",Temp4);

    system("pause");

    return 0;
}
```

Appendix B

WatchDog Timer Sample Code

```
//*********************************************************************
//*********************************************************************
//**
**
//**                (C) Copyright 2013-2014, Quanmax, Inc.                **
//**
**
//**                          All Rights Reserved.                        **
//**
**
//**          5F, No.455, Ti-Ding Blvd., Sec. 2,                  **
//**          Neihu District, Taipei, Taiwan 114              **
//**                                        **
//**                        Phone: +886-2-2799-2789
**
//**
**
//*********************************************************************
//*********************************************************************
//=========================================================
==========//
//KEEX-5100 DOS Watchdog sample program                          //
//Please compile with Turbo C 3.0 to utilized the program        //
//=========================================================
==========//

#include<stdio.h>

#define SIO_CONFIG_INDEX   0x2e
#define SIO_CONFIG_DATA    SIO_CONFIG_INDEX+1


void UnlockSIO()
{
   outp(SIO_CONFIG_INDEX,0x87);
   outp(SIO_CONFIG_INDEX,0x87);
}

void LockSIO()
```

```
{
   outp(SIO_CONFIG_INDEX,0xAA);
}

void SetLDN(int LDN)
{
    outp(SIO_CONFIG_INDEX, 0x07);
    outp(SIO_CONFIG_DATA,   LDN);
}

void main()
{
    int value = 0;

    UnlockSIO();
    SetLDN(0x07);

    //If watchdog timeout event occurs, this bit will be set to 1.
    //Write a 1 to this bit will clear it to 0.
    //0xF5 bit6
    outp(SIO_CONFIG_INDEX,0xF5);
    value=inp(SIO_CONFIG_DATA);
    outp(SIO_CONFIG_DATA,(value | 0x40));

    //Set Timer unit(0xF5 bit3(0: 1sec, 1: 60 sec) of watchdog timer by setting
this bit)
    outp(SIO_CONFIG_INDEX,0xF5);
    value=inp(SIO_CONFIG_DATA);
    outp(SIO_CONFIG_DATA,(value & 0xF7));//set unit sec.

    //Set Timer Value(0xF6 Time of watchdog timer)
    outp(SIO_CONFIG_INDEX,0xF6);
    outp(SIO_CONFIG_DATA,0x14);//set to 20 sec (0x14)

    //Enable WDT
    outp(SIO_CONFIG_INDEX,0xF5);
    value=inp(SIO_CONFIG_DATA);
    outp(SIO_CONFIG_DATA,(value | 0x30));//

    //bit7 WDTRST# output is enabled
    outp(SIO_CONFIG_INDEX,0xF0);
    value=inp(SIO_CONFIG_DATA);
    outp(SIO_CONFIG_DATA,(value | 0x80));//

    LockSIO();
}
```