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Network Application Platforms

Hardware platforms for next generation networking infrastructure

MR-730

User's Manual
Publication date:2010-10-28

>>

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.

Network Application Platforms

Table of Contents

Chapter 1

Chapter 1: Introduction

Designed for addressing the demand of network and server acceleration for security, TCP, content processing, and compression, the MR-730 features Cavium's Octeon Plus CN5230-700-SCP processors.

The MR-730 platforms are server grade equipment with 4 x GbE/SFP combo ports for WAN and LAN connections, one USB ports, 2 management port for security monitoring services such as SNMP, and one Mini-PCIe port for Wi-Fi or Wimax wireless connection or other optional capabilities. Powered by the Cavium's highly Market-leading performance of 2 to 4-Core MIPS64-Based SoCs Octeon family processors, these processors provide up to 8 Mpps 64B IP forwarding and 10+ Gbps for TCP, IPsec, SSL, and KASUMI calculations.

Along with other Lanner Appliances, the MR-730 features redundant power supplies and hot swappable fans for easy servicability.

The Quick Start Guide will takes you through the basic steps necessary to install your MR-730 System.

Please refer to the chart below for a summary of the system's specifications.

System Specification

| FEATURE	DESCRIPTION	
Form Factor		1U Rackmount
Platform	Processor	Octeon Plus CN5230-700-SCP
	On-Chip Coprocessors	Packet I/O processing, QoS, TCP Acceleration
System Memory	Technology	DDR2 533 / 667 / 800 MHz
	Max Capacity	4 GB
	Socket	2 x 240P DIMM
Storage	Storage Interface	2 x Serial ATA (3.0 Gbs) 1 x CompactFlash
	Storage Bays	2 x 2.5"
I/O Interface	Console	1 x RJ45
	USB 2.0	1
Networking	Ethernet Ports	2 x FE Ports 4 x GbE/SFP combo ports (2 pairs bypass)
Cooling	Processor	CPU passive heatsink
	System	2 x System Fan
Expansion	Mini PCIe	1
Miscellaneous	LCD Module	2 x 20 Characters LCM with 4 button input
	Watchdog	Yes
	Internal RTC with Li Battery	Yes
Environmental Parameters	Temperature, ambient operating / storage	0°C ~40°C / -20°C~70°C
	Humidity (RH), ambient operating and non-operating	5 ~ 95%, non condensing
Power	Type / Watts	100 W PSU Option: 1 + 1 Redundant 200 W each Option: 200 W DC PSU
Physical Dimensions	Dimensions (WxHxD)	431 x 44 x 360 mm
	Weight	4.5 ~ 6 kg (depending on power supply)
Approvals & Compliance		CE Emission, FCC Class A, RoHS
Ordering Information	MR-730A	MR730A + 100W Power
	MR-730B	MR730B + 200W Redundant Power
	MR-730C	MR730C + 200W DC Power

Chapter 1

Package Contents

Your package contains the following items:

- MR-730 Network Security Platform
- Power cable
- 1 crossover Ethernet cable (1.8 meters)
- 1 straight-through Ethernet cable (1.8 meters)
- 1 RJ-45 to DB-9 female console cable
- Serial-ATA hard drive cable
- 1 threaded screw set
- 1 ear bracket set

Front Panel Features
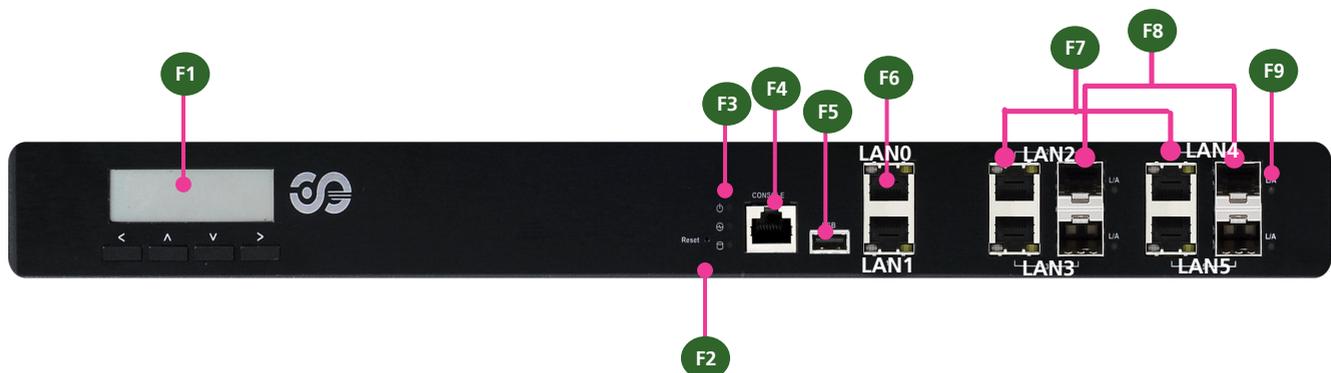
F1 F2 System Panel: LCD System Panel with Interactive Keypad

The LCD System Panel can be programmed to display operating status and configuration information. For more details or sample programming code, refer to the patch file.

F2 Reset Switch

The reset switch can be used to reboot the system without turning off the power.

F3 Power/Status/HDD LED

Power LED (Green):

Green indicates that the system is powered on.

Status LED (Green/amber):

This LED is programmable. You could program it to display the operating status with the behavior like the following:

If the LED is green, it indicates that the system's operational state is normal. If it is amber, it indicates that the system is malfunctioning. For sample code, refer to the patch file.

Storage LED (Yellow):

It is an LED indicator for the CompactFlash card and hard disk. If it is flashing, it indicates data access activities.

F4 Console Port

By using suitable rollover cable (also known as console cable), you can connect to a computer terminal for diagnostic or configuration purpose. Default terminal configuration parameters: 115200 baud, 8 data bits, no parity, 1stop bit, and no flow control.

F5 USB 2.0 Port

It connects to any USB devices, for example, a flash drive.

F6 Two FastEthernet/Management Port

These two dedicated FastEthernet ports can be configured as the management port of the system and used only for traffic management. Similar to the Console port, but the Management port accepts only incoming traffic to the system. The management port is provided by Realtek RTL8201E controller.

F7 4 Gigabit Ethernet Ports with 2 pair Bypass

The four Gigabit Ethernet ports are provided by Broadcom BCM5482S Dual-Port Gb Transceiver through the SGMII interface. They are capable of LAN bypass (LAN2-LAN3 pair and LAN4-LAN5 pair) with low power, triple speed (10BASE-T, 100BASE-TX, and 1000BASE-T) support and has extremely low EMI emissions.

Speed LED: If the LED is amber, it indicates that the connection speed is 1000Mbps. If the LED is green, it indicates that the connection speed is 100Mbps. And if it is off, it indicates that the speed is 10Mbps.

Link/ACT LED (green): If the LED is on, it indicates that the port is linked. If it blinks, it indicates there is traffic.

Network Application Platforms

F8 4 SFP ports without Bypass

The four1000BASE-X Ethernet connection are provided by Broadcom BCM5482S Dual-Port Gb Transceiver through the SGMII interface.

F9 Link/ACT LED (amber): If the LED is on, the port is linked. If it blinks, it indicates there is traffic.

Rear Panel Features

R1 System Fans

R2 Power Switch

   A power switch is provided to turn on or off the system.

R3 Alarm Reset Switch (only on the system with redundant power supply)

   The buzzer will alarm when one of the power supply unit fails. To turn off the buzzer, press this switch.

R4 Power Socket

   The system requires a 200W power input. The other Power Supply connector is to connect a Redundant Power Supply (RPS) to be activated automatically in the event of an AC power supply outage.

Note: Three models with different power supply mechanisms or requirement:

MR-730A requires a single power supply unit with 100W. as shown in the following picture.

MR-730B requires a dual power supply unit with 200W each as shown in the above diagram.

MR-730C requires a single 200W DC power supply as shown in the following picture.

Chapter 2

Chapter 2:
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, detach the power cord to remove power from the server. The Power On/Standby button (if there is one) does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

1. Power off the MR-730 and remove the power cord from the system.

2. Unscrew the 3 threaded screws from the two sides and 2 screws from the rear of the top cover of the MR-730 System.

3. Slide the cover backwards and lift to open the cover.

Installing a CompactFlash Card

MR-730 provides one CompactFlash slot. Follow the procedures bellow to install 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.

3. Accessing the CompactFlash card
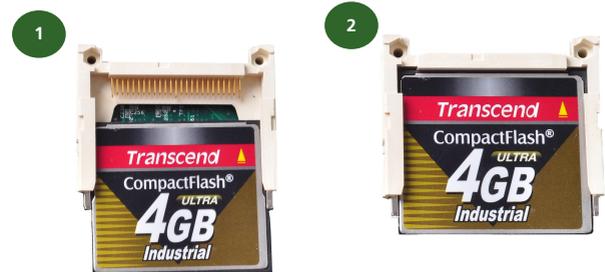
In the linux environment, you could access the CF card with the following commands:

```
# mount /dev/cfa1 /mnt/
# ls /mnt/
```

To put files on the CF Card, use the following procedures:

```
1.    Connect the CF card. It will usually be assigned as the following
      device:
          /dev/cfa1

2.    Mount the CF file system.
#mount /dev/cfa1 /mnt/

3.    Copy program file(s) to CF.
#cp hello.txt  /mnt/

4.    Unmount CF file system.
#umount /mnt/
```

Chapter 2

Installing the System Memory

The motherboard supports DDR2 memory that features data transfer rates of 533/667/800 MHz to meet the higher bandwidth requirements of the latest operating system and Internet applications. It comes with two Double Data Rate(DDR2) Dual Inline Memory Modules (DIMM)

1. Open the DIMM slot latches.
2. Install the DIMM.
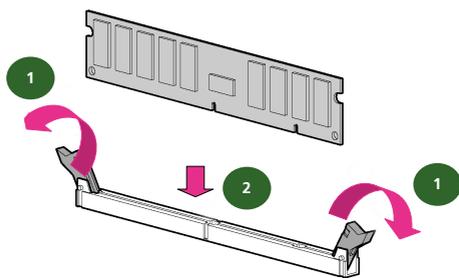
Note:

1. All DIMMs installed must have the same SDRAM standard (DDR2 533/667/800 MHz, ECC Registered). Do not install DIMMs supporting different speeds.
2. For DDR2 533/667 MHz memory, the motherboard can support a maximum of 4 GB in total.
3. For DDR2 800 MHz memory, the motherboard can support up to a maximum 2 GB in total.

Installing the Hard Disk

The system can accommodate two 2.5" Serial-ATA disks. Follow these steps to install a hard disk into the MR-730:

1. Unscrew the 4 screws on the hard disk tray to take out the hard disk tray from the system.
2. Place hard disk on the hard disk tray and align the holes of the hard disk with the mounting holes of the tray.
3. Secure the hard disk with 4 mounting screws on the hard disk tray.
4. Connect the Serial-ATA power and drive cables to the hard disk's power and drive connectors respectively.
5. Plug the Serial-ATA drive cable to the Serial-ATA Connector on the main board.
6. Plug the Serial-ATA power cable to the Serial-ATA Power Connector on the main board.
7. Repeat steps 2 to 6 for installing a second disk if there is one.
8. Put the hard disk tray with the installed hard disk back and fasten it to the system with the mounting screws.
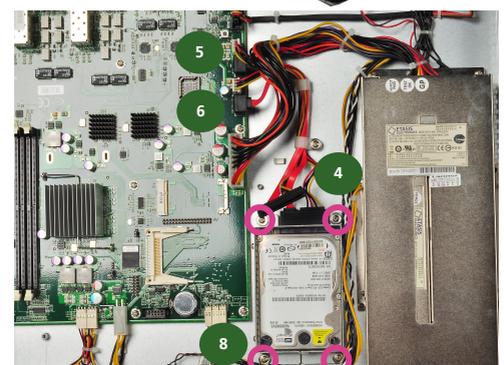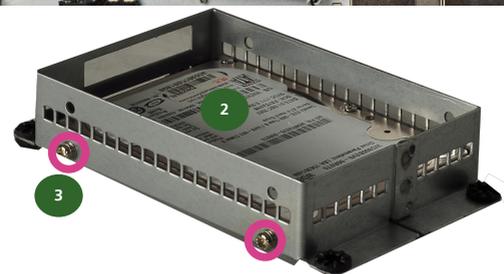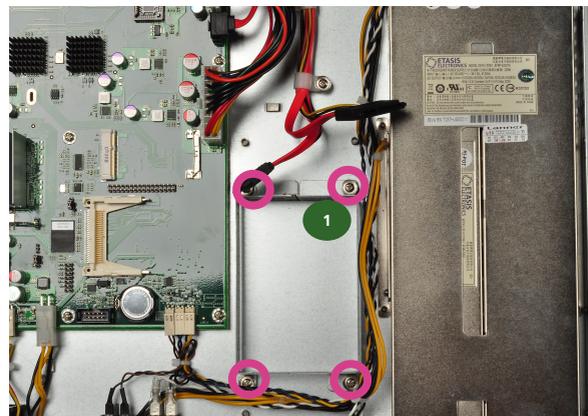
Chapter 3:
Motherboard Information

Block Diagram

The block diagram depicts the relationships among the interfaces or modules on the motherboard. Please refer to the following figure for your motherboard's layout design.

Chapter 3
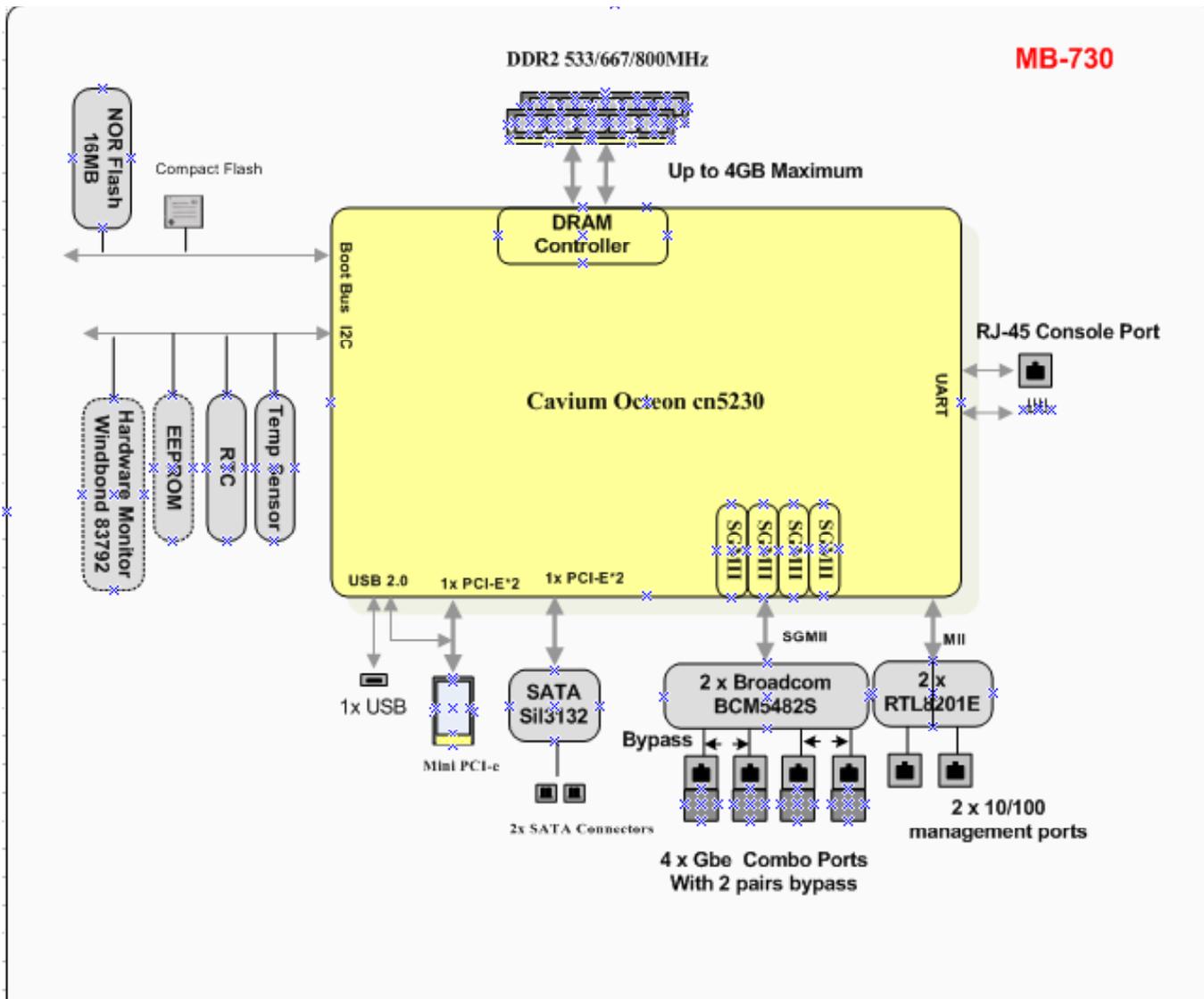
Board Dimension

The following diagram shows the physical dimension of the PCB board. (unit: mm)
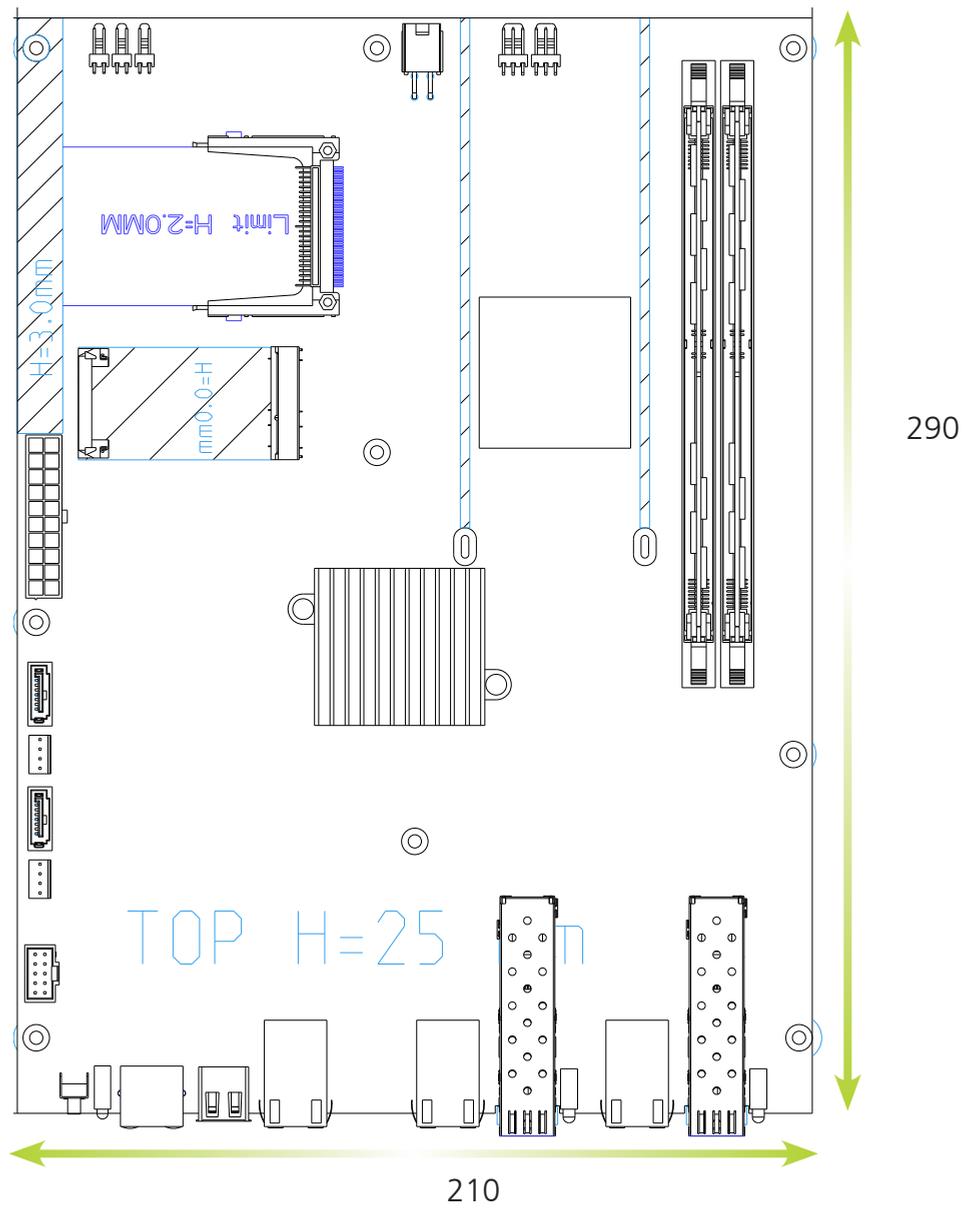
Motherboard Layout

The motherboard layout shows the connectors and jumpers on the board. Refer to the following picture as a reference of the pin assignments and the internal connectors.

SATA Power Connector (SATAPCN1)

SATA Power Connector (SATAPCN2)

SATA Disk Connector (SATAB1)

SATA Disk Connector (SATAB2)

Mini PCI-E Connector (MPCIE1)

Front LCM Connector (COMB1)

20 Pin ATX Power Connector (ATX1)

NetROM Connector (NetROM1)

CF Card (CF1)

Reset Switch Button (SW2)

Power Failure Alarm (CONN1)

Power Failure Alarm (CONN2))

Power-On Switch Connector (J3)

Power On Switch for debug use only (J2)

10/100 Mgm PORT (RJ1)

JTAG Connector (JTAG1)

Flash Mode Selector(JP4)

4 Pin ATX Power Connector (ATX2)

10/100/1000 LAN PORT (RJ2)

Bootloader Address Selection (JP1)

GPIO (J1)

FAN Connector (FAN2)

SFP PORT (CN1))

FAN Connector (FAN1)

10/100/1000 LAN PORT (RJ3)

SFP PORT (CN2)

ROM for RAID function of SATA

SW1

DIMM1 DIMM2

Jumper Settings

JTAG(JTAG1): The Jtag is a debug port provided as a means for testing the main board and looking for possibility of field faults. It can also be used for flash writing.

Function	GND	GND	GND	GND	GND	NC	3.3V
PIN NO.	2	4	6	8	10	12	14

2 4 6 8 10 12 14
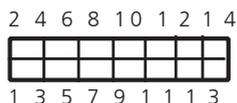
1 3 5 7 9 11 13

PIN NO.	1	3	5	7	9	11	13
Function	EJTG_TRST#	TDI	TDO	JTG_TMS	JTG_TCK	EJTAG_RST	NC

Mini-PCI Connector (MPCIE1): The 58-pin Mini-PCIe slot enables a Mini-PCIe expansion module to be connected to the board. For example, a WiMAX/WiFi module.

1
2
.
.
.
.
58

PIN NO.	FUNCTION	PIN NO.	FUNCTION
1		2	3.3V
3		4	GND
5		6	1.5V
7		8	
9	GND	10	
11	CLK_PCIE_N	12	
13	CLK_PCIE_P	14	
15	GND	16	
17		18	GND
19		20	
21	GND	22	
23	PCIE_RX_N	24	
25	PCIE_RX_P	26	GND
27	GND	28	1.5V
29	GND	30	
31	PCIE_TX_N	32	
33	PCIE_TX_P	34	GND
35	GND	36	USB-
37		38	USB+
39		40	GND
41		42	
43		44	
45		46	
47		48	1.5V
49		50	GND
51		52	3.3V
53	GND	54	GND
55	GND	56	GND
57	GND	58	GND

CompactFlash Connector (CF1): It is for connecting a Compact Flash card to be served as your system's storage. The connector is a CF Type II slot which could fit both CF Type I or CF Type II cards.

1 26
. .
. .
. .
. .
25 50
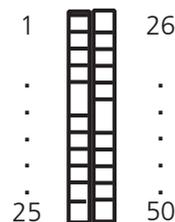
Pin No.	Function	Pin No.	Function
1	GND	26	NA
2	DATA3	27	DATA10
3	DATA4	28	DATA12
4	DATA5	29	DATA13
5	DATA6	30	DATA14
6	DATA7	31	DATA15
7	CE1#	32	CE2#
8	A10	33	VS1#
9	OE#	34	IOR#
10	A9	35	IOW#
11	A8	36	WE#
12	A7	37	READY#
13	CFVCC3	38	CFVCC3
14	A6	39	CSEL
15	A5	40	VS2#
16	A4	41	RESET
17	A3	42	WAIT#
18	A2	43	INPACK#
19	A1	44	REG#
20	A0	45	DASP#
21	DATA0	46	DIAG#
22	DATA1	47	DATA8
23	DATA2	48	DATA9
24	WP	49	DATA10
25	NA	50	GND

CPU Clock Speed Adjustment Dip Switch (SW1)
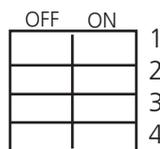
OFF ON
1
2
3
4

| Function		750 MHz	700 MHz	600 MHz	500 MHz
Dip Switch Selector					
	1	ON	ON	ON	ON
	2	ON	ON	ON	OFF
	3	ON	ON	OFF	ON
	4	ON	OFF	OFF	OFF

Chapter 3

Bootloader Mode Selector(JP1): It is a jumper for selecting the bootloader mode from either normal or fail-safe mode.
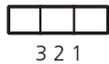
Pin No.	Mode
Short 1-2	Failsafe
Short 2-3	Normal (default) 0 X 40000

3 2 1

Flash Mode Selector(JP4): It is a jumper for selecting the flash mode from either normal or Net mode. The Net mode is for debugging purpose. Adjust this jumper to the Net mode when connecting NetROM connector (NETROM1).
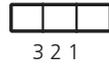
| Pin No.	Jumper Selection
Short 1-2	Normal (default)
Short 2-3	Debug

3 2 1

Pin No.	Function
1	FLASH_BOOT_CS#
2	BOOT_CS#0
3	NETROM_CS#

DIMM Socket (DIMM1/DIMM2): The 240-pin DIMM is for connecting the DDR2 533/667/800 MHz, ECC Registered memory. The system can support up to a maximum of 4GB for DDR2 533/667 and 2GB for DDR2 800.

SATA Driver Connector (SATAB1, SATAB2): It is for connecting a 2.5" SATA harddisk to be served as your system's storage. The system can support up to 2 disks of 2.5" in maximum.

Serial-ATA Power Connector (SATAPCN1, SATAPCN2): It is used for connectig the SATA power cord.
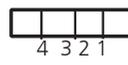
Pin No.	Function
1	+12V
2	GND
3	GND
4	5V

4 3 2 1

Power-on Switch Connector (J2): It is a power switch without overheating protection which is for debug purpose only.

1
2

Pin No.	Function
1	GND
2	PS_ON_L

20 Pin ATX Power Connector (ATX1): It is used for connecting the power supply to the board.

1 3 5 7 9 11 13 15 17 19

2 4 6 8 10 12 14 16 18 20
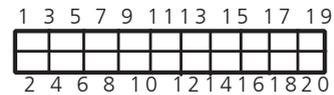
PIN NO.	FUNCTION	PIN NO.	FUNCTION
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	Ground	13	Ground
4	+5V	14	PSON-
5	Ground	15	Ground
6	+5V	16	Ground
7	Ground	17	Ground
8	Power Good	18	NC
9	Stand-By 5V	19	+5V
10	+12V	20	+5V

4 Pin ATX Power Connector (ATX2): It is used for connecting the power supply to the board.

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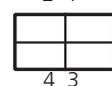
Pin No.	Function
1	GND
2	+12V
3	GND
4	+12V

Front LCD Module Connector(COMB1): The 10-pin connector is for connecting the front system LCD panel.

2 4 6 8 10

1 3 5 7 9
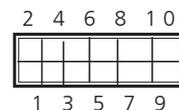
Pin No.	Function
1	NC
2	NC
3	RS232_1_SIN
4	RS232_1_RTS
5	RS232_1_SOUT
6	RTS232_1_CTS
7	NC
8	NC
9	GND
10	NC

Power-on Switch Connector (J3): It is for connecting the power switch to the back panel.

Pin No.	Function
Short 1-2	Power on

Network Application Platforms

System FAN Connector(FAN1/FAN2): This 3-pin header is for connecting the system fan.

Pin No.	Function
1	GND
2	FANOUT (DC)
3	FANIN(SPEED)

(3, 2, 1)
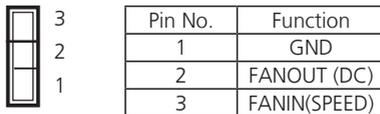
NetRom Connector(NetROM1): The Net ROM device is the tool for simulating the boot image during project developing stage. The NetROM eliminates the need to burn EPROMs or flash to debug code by utilizing the Ethernet to download the code images
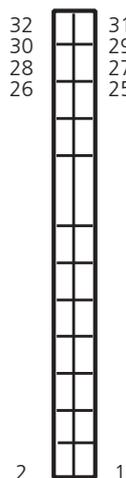
Pin No.	Function	Pin No.	Function
1	NET_A19	2	NET_A16
3	NET_A15	4	NET_A12
5	NET_A7	6	NET_A6
7	NET_A5	8	NET_A4
9	NET_A3	10	NET_A2
11	NET_A1	12	NET_A0
13	NET_D0	14	NET_D1
15	NET_D2	16	GND
17	NET_D3	18	NET_D4
19	NET_D5	20	NET_D6
21	NET_D7	22	NET_CE#
23	NET_A10	24	BOOT_OE#
25	NET_A11	26	NET_A9
27	NET_A8	28	NET_A13
29	NET_A14	30	NET_A17
31	NET_A18	32	5V

BIOS FLASH: The BIOS flash soldered on the main board is an NOR Boot Flash S29GL with 16MB.

Power Alarm Connector (CONN1, CONN2): This is used for connecting the power failure alarm if your system have a redundant power supply.

Pin No.	Function
1	Input
2	Ground

GPIO Pin Header (J1)

3 2 1

Pin No.	Function
1	CPUGPIO6
2	Ground
3	CPUGPIO7
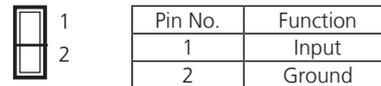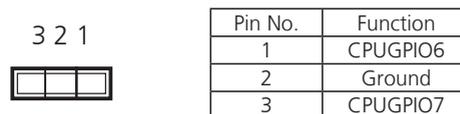
10/100 Management Port (RJ1)

Pin No.	Function	Pin No.	Function
A1	MDX0+	B1	MDX0+
A2	MDX0-	B2	MDX0-
A3	MDX1+	B3	MDX1+
A4		B4	
A5		B5	
A6	MDX1-	B6	MDX1-
A7		B7	
A8		B8	
A9	GND	B9	GND
A10	GND	B10	GND
D1	LINK100/ACT#	D5	LINK100/ACT#
D2		D6	
D3	LINK/ACT#	D7	LINK/ACT#
D4	3.3V	D8	3.3V

Small Form-factor Pluggable (SFP) Port (CN1, 2): The optical SFP modules interface to the main board to a fiber optic to provide the network communications.

Pin No.	Function	Pin No.	Function
T1	GND	L1	GND
T2	TX FAULT	L2	TX FAULT
T3	TX DISABLE	L3	TX DISABLE
T4	MOD-DEF2	L4	MOD-DEF2
T5	MOD-DEF1	L5	MOD-DEF1
T6	MOD-DEF0	L6	MOD-DEF0
T7	RATE SELECT	L7	RATE SELECT
T8	LOS	L8	LOS
T9	GND	L9	GND
T10	GND	L10	GND
T11	GND	L11	GND
T12	RD-	L12	RD-
T13	RD+	L13	RD+
T14	GND	L14	GND
T15	VCCR	L15	VCCR
T16	VCCT	L16	VCCT
T17	GND	L17	GND
T18	TD+	L18	TD+
T19	TD-	L19	TD-
T20	GND	L20	GND

Network Application Platforms

Appendix D:
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.

- Operations which is 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 damages resulting from inadequate/loose packing of the defective units. All RMA# are valid for 30 days only; RMA goods received after the effective RMA# period will be rejected.

Appendix D

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

Request Party   *Confirmed By Supplier*

_____   _____
Authorized Signature / Date   **Authorized Signature / Date**