NAR-2290 Series
Communications Appliance

User's Manual

Revision: 1.00

Portwell Inc.
3F, No. 92, Sec. 1, Nei-Hu Rd., Taipei 114, Taiwan, R.O.C.
Headquarter: +886-2-2799-2020 FAX: +886-2-2799-1010
http://www.portwell.com.tw
E M A I L :
I N F O @ M A I L . P O R T W E L L . C O M . T W

Table of Contents

Chapter 1 Introduction

1.1 About This Manual

This manual describes all required information for setting up and using the NAR-2290 All mentioned below applies to the whole system, unless specially stated.

NAR-2290 provides the essential components for delivering optimal performance and functionality in the value communications appliance market segment. This manual should familiarize you with NAR-2290 operations and functions. NAR-2290 family has one, Four on-board Ethernet ports to serve communication appliances, such as Firewall, which needs more Ethernet ports to connect external network (internet), demilitarized zone and internal network.

NAR-2290 features:

- Versatile networking and I/O capabilities: 4 Ethernet ports
- One COM ports

1.2 Manual Organization

The manual describes how to configure your NAR-2290 system to meet various operating requirements. It is divided into three chapters, with each chapter addressing a basic concept and operation of this whole system.

Chapter 1: Introduction. This section briefly talks about how this document is organized. It includes some guidelines for users who do not want to read through everything, but still helps you find what you need.

Chapter 2: Hardware Configuration Setting and Installation. This chapter shows how the hardware is put together, including detailed information. It shows the definitions and locations of Jumpers and Connectors that you can easily configure your system. Descriptions on how to properly mount the main memory are also included to help you get a safe installation. Reading this chapter will teach you how to set up NAR-2290.

Chapter 3: Operation Information. This section gives you illustrations and more information on the system architecture and how its performance can be maximized.

Any updates to this manual, technical clarification and answers to frequently asked questions would be posted on the web site: ***http://isc.portwell.com.tw***

1.3 Technical Support Information

Users may find helpful tips or related information on Portwell's web site: ***http://www.portwell.com.tw.*** A direct contact to Portwell's technical person is also available. For further support, users may also contact Portwell's headquarter in Taipei or your local distributors.

Taipei Office Phone Number: +886-2-27992020

Chapter 2 Get Started

This section describes how the hardware installation and system settings should be done.

2.1 Included Hardware

The following hardware is included in your kit:

- PPAW-2290VL Communication Appliance System Board.
- One null serial port cable.

2.2 Before You Begin

To prevent damage to any system board, it is important to handle it with care. The following measures are generally sufficient to protect your equipment from static electricity discharge:

When handling the board, uses a grounded wrist strap designed for static discharge elimination and touches a grounded metal object before removing the board from the antistatic bag. Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.

When handling memory modules, avoid touching their pins or golden edge fingers. Put the value communications appliance system board and peripherals back into the antistatic bag when they are not in use or not installed in the chassis.

Some circuitry on the system board can continue operating even though the power is switched off. Under no circumstances should the Lithium coin cell be used to power the real-time clock be allowed to be shorted. The coin cell can heat under these conditions and present a burn hazard.

WARNING!

1. "CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions"
2. This guide is for technically qualified personnel who have experience installing and configuring system boards. Disconnect the system board power supply from its power source before you connect/disconnect cables or install/remove any system board components. Failure to do this can result in personnel injury or equipment damage.
3. Avoid short-circuiting the lithium battery; this can cause it to superheat and cause burns if touched.
4. Do not operate the processor without a thermal solution. Damage to the processor can occur in seconds.
5. Do not block air vents. Minimum 1/2-inch for clearance required.

2.3 The Chassis

The system is integrated in a customized chassis (***Fig. 2-1, Fig. 2-2***). On the front panel you will find the Power LED, Hard Disk LED and LAN LED. The back panel has Four LAN ports and a COM port.

Fig. 2-1 *Front view of the Chassis*

Fig. 2-2 *Back view of the Chassis*

2.4 Open the Chassis

1. Take off the four screws (three at the rear side and two at the right/left side and remove the top lead (***Fig. 2-3***).

Fig. 2-3 *Take off two screws*

2. The top lead (***Fig. 2-4***) can be removed from the base stand (***Fig. 2-5***).

Fig. 2-4 *The top lead*

Fig. 2-5 *The base stand*

2.5 Install CPU and Heatsink

3. To confirm CPU Spec, to set up CPU(***Fig. 2-6***).

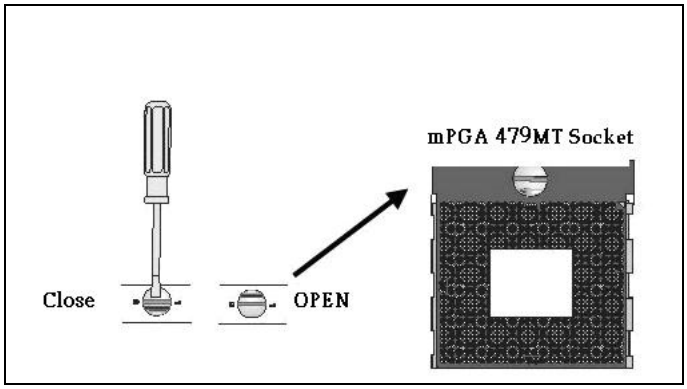


Fig. 2-6 *To set up CPU*

4. The top lead (***Fig. 2-7***) can be removed from the base stand (***Fig. 2-8***).

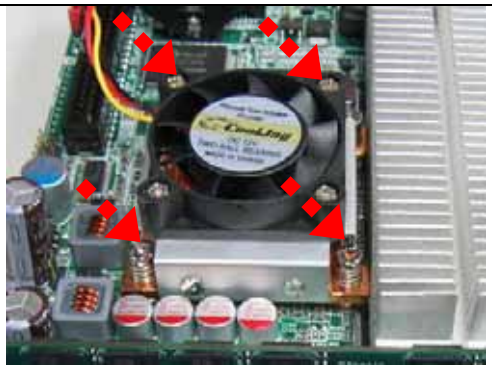


Fig. 2-7 *To set up Heatsink*

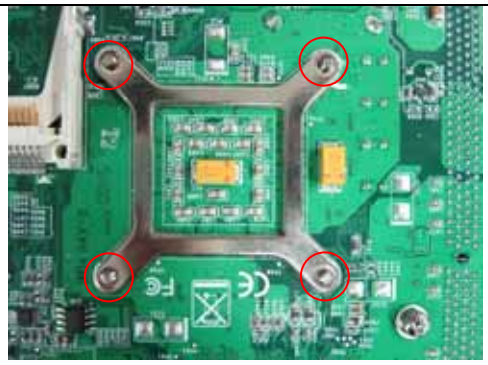


Fig. 2-8 *To fix Heatsink bracket*

2.6 Install or Remove a Low profile DIMM

Follow these steps to upgrade or remove RAM module:

5. Install the system memory by pulling the socket's arm and pressing it into the slot gently. (***Fig. 2-9, 2-10***)

Fig. 2-9 *The memory slot*

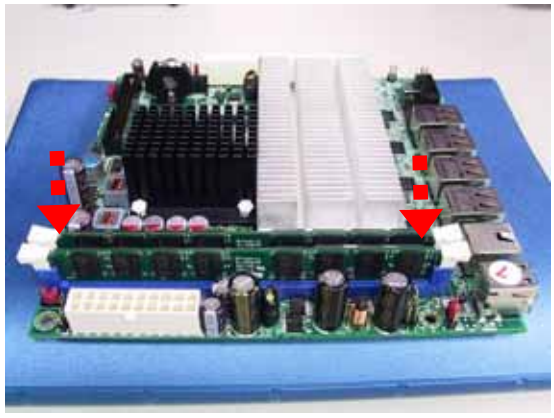


Fig. 2-10 *Install Low profile DIMM*

6. By pulling the arms, the SODIMM can eject itself (***Fig. 2-11***).

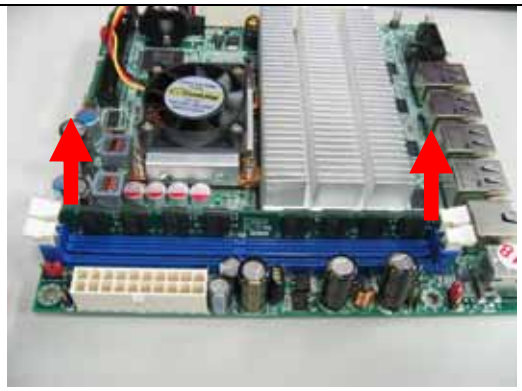


Fig. 2-11 *Eject Low profile module*

2.7 Remove and Install Battery

7. Press the metal clip back to eject the button battery (***Fig. 2-12***).
8. Replace it with a new one by pressing the battery with fingertip to restore the battery (***Fig. 2-13***).

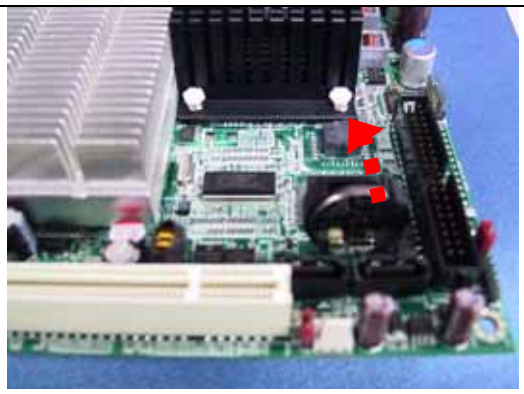


Fig. 2-12 Eject *the battery*

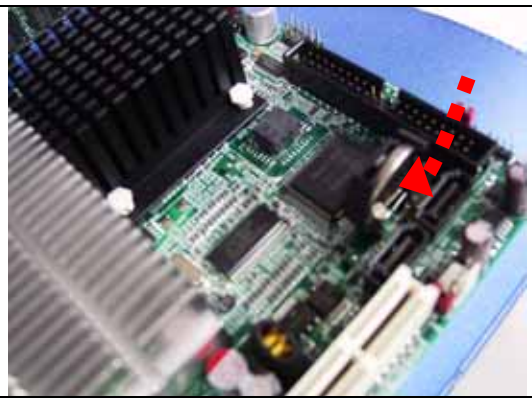


Fig. 2-13 Restore *the battery*

2.8 Install Compact Flash and Mini pci card

The system has an internal drive bay for one Compact Flash card drive. If the CF is not pre-installed, you can install it by yourself. Follow the steps below to install the CF:

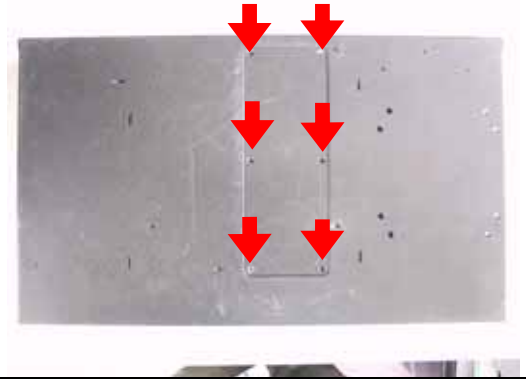
9. Fasten the five screws to lock bracket together (***Fig. 2-14a, 2-14b***).

Fig. 2-14a *Remove L type base under button case*

Fig. 2-14b Push *CF into the bracket*

10. Completion CF to the System Chassis (***Fig. 2-15***)

Fig. 2-15 completion *CF in system*



Fix all screws back (***Fig. 2-16***).

11. Completion Mini pci card to the System Chassis (***Fig. 2-16a,2-16b***)

Fig. 2-16a Push *Mini pci card into the bracket*

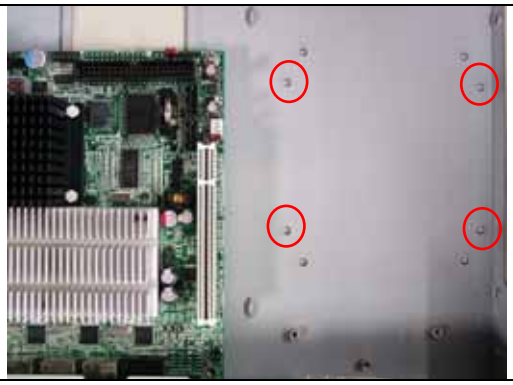
Fig. 2-16b completion *Mini pci card in system*

2.9 Install 3.5" Hard disk

The system has an internal drive bay for one 3.5" hard disk drive. If the HDD is not pre-installed, you can install by yourself. You need the parts from the accessory-bag as shown on ***Figure 2-17***. They are one HDD-bracket, several screws. (from left to right).

(***Fig. 2-17***)3.5' HDD kit

(***Fig. 2-18***) Fix the hard disk drive on the HDD bracket with four screws. Plug the IDE cable into hard disk drive connector



(***Fig. 2-19***) Completion HDD with bracket and fixed screws.	(***Fig. 2-20***) Finished.

12. Connect Power Cable and IDE Cable before assemble hard disk. After assemble hard disk, put IDE Cable and Power cable into main board.

2.10 Product Specifications

Model: **NAR-2290**

Main Processor:
- NAR-2290-460: Intel® 910GMLE platform w/ Celeron-M/Pentium-M socket type CPU desktop platform.
- NAR-2290-420: Intel® 910GMLE platform w/ ULV Celeron-M BGA 600MHz CPU desktop platform.

FSB
- 400MHZ

BIOS:
- Award system BIOS with 512KB flash ROM to support DMI, PnP, APM function
- ※SPI Interface, must have an additional SPI pin header for debugging

Main Memory:
- **Two 240**-pin Low profile Long-DIMM socket supports DDRII.
- DDR2 400, up to 2GB.
- Support Dual channel memory

Chipset:
- North Bridge: Intel® 910GMLE (Max TDP 10.5 Watts)
- South Bridge: Intel® ICH6-M (Max TDP 3.8 Watts)

Storage
- 2 Serial ATA ports supported.
- 1 x CF, share the same channel with IDE and support UDMA
- One 40 Pin for DMA/33/66/100 IDE Storage

VGA
- One 2x5 Pin pin-header for internal VGA interface is required.

Serial Ports:
- Support two high-speed 16550 compatible UARTs with 16-byte T/R FIFOs

USB Interface:
- Support two USB 2.0 ports for high speed I/O peripheral devices

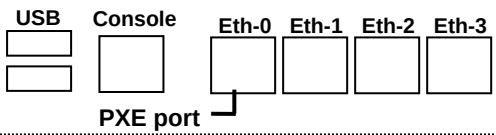
Auxiliary I/O Interfaces:
- System reset switch, power okay LED, Ethernet activity LED, Ethernet speed LED, general purpose LED, alert LED, HDD LED interface

Power Input:
- Support one AC power (power requirement: Input: 100-240V, Output: 12V == 7.5A)
- FSP100-50EVF, FSP Power Supply (AC-DC).

On-board Ethernet:
- Realtek RTL8111 series PCI-E x1 Gigabit Ethernet

※Dual-design for 10/100 Fast Ethernet

Full configuration



Hardware Monitor:
- FAN Speed (CPU and System)
- Temperature (CPU and System)
- Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
- Support case open function

Environmental
- Storage Temperature: -20 ~ 80℃

Requirements:

- Operating temperature: 0 ~ 55℃
- Operation Humidity: 5% ~ 95%, non-condensing
- RoHS compliant

Dimension:

- 1U 429mm/17.89” x 255.2mm/10.05” x 44mm/1.73”

Expansion

- 1 x PCI slot
- 1 x mini-PCI (optional)

※Pin 21, 22 of mini-PCI are connected to USB +, - for MSI Bluetooth card

I/O chip

- 1 x Winbond W83627DHG E version

Watchdog Timer

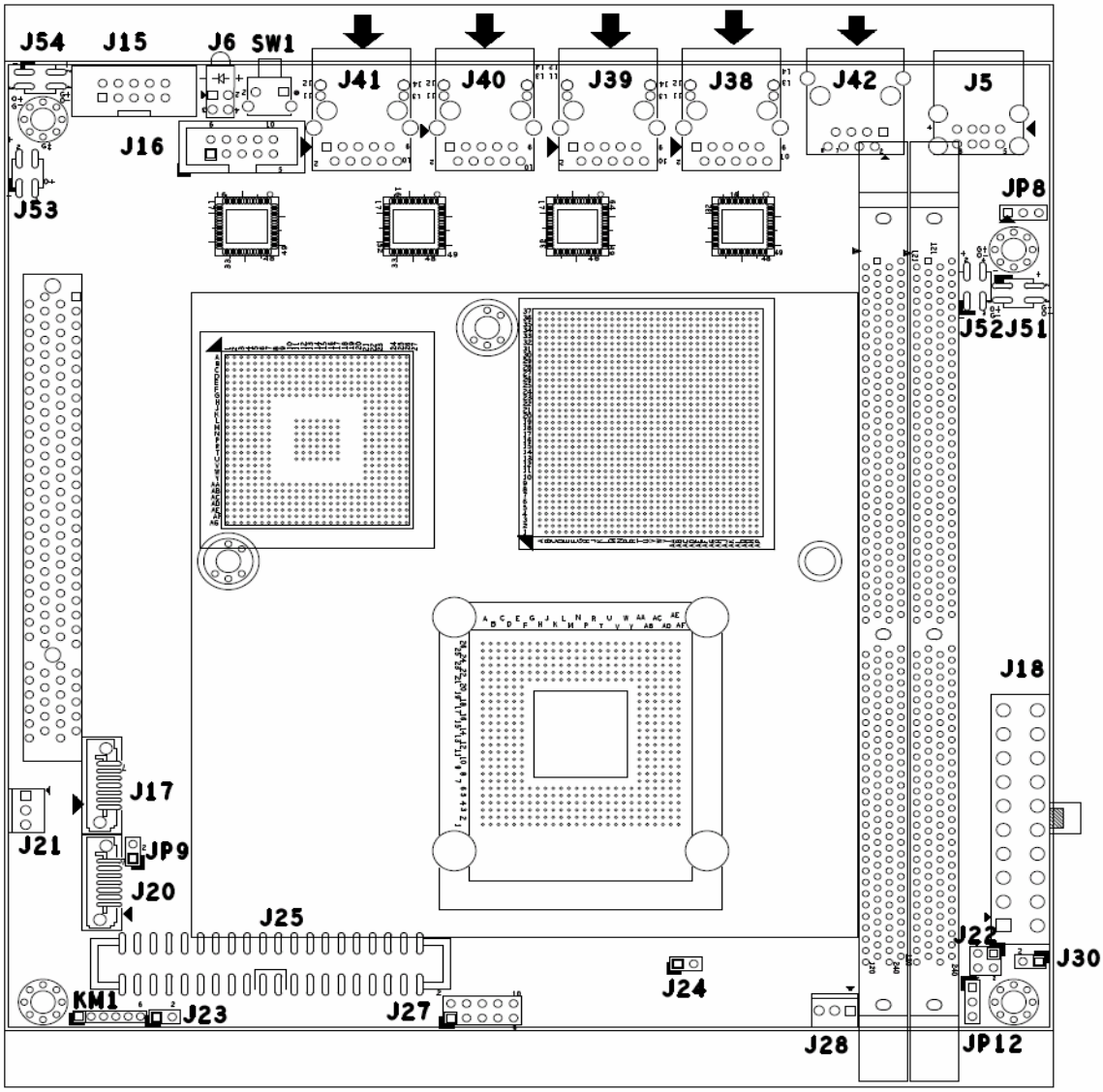
- Programmable via S/W from 1sec. to 255min.

2.11 Hardware Configuration Setting

This section gives the definitions and shows the positions of jumpers, headers and connectors. All of the configuration jumpers on PPAW-2290VL are in the proper position. The default settings set by factory are marked with a star (★).

Jumpers

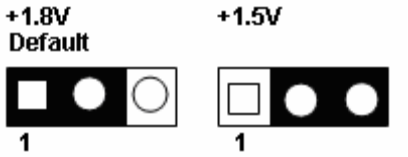
In general, jumpers on PPAW-2290VL system board are used to select options for certain features. Some of the jumpers are configurable for system enhancement. The others are for testing purpose only and should not be altered. To select any option, cover the jumper cap over (Short) or remove (NC) it from the jumper pins according to the following instructions. Here NC stands for “Not Connected”.



PPAW-2290VL Jumper Table

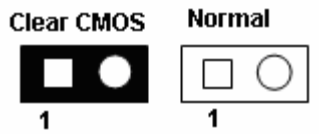
PPAP-2290 ZR2 jumper setting: (default setting)

JP8: POWER SOURCE VCC1_8 FOR VCCA



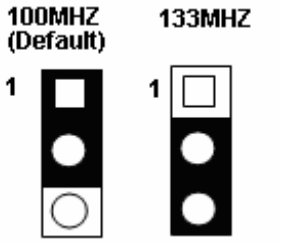
JP8	Function
1-2 short	+1.8V ★
2-3 short	+1.5V

JP9:COMS Clear



JP9	Function
1-2 open	Normal ★
1-2 short	Clear CMOS Contents

JP12:Tune CPU External Frequency



JP12	Function
1-2 short	100MHZ ★
2-3 short	133MHZ
1-2 open	Slave ★

Notes:CF UNIT default is “Master”

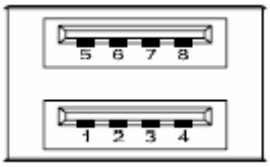
Connector Function list

Connector	Description
J5	External USB
J6	Front Panel LED Green-PWR LED Red-HDD LED
J15	Internal Serial port
J16	Internal VGA Pin header
J17	SATA Connector
J18	ATX POWER Control Connector
J19	MINI PCI
J20	SATA Connector
J21	System Fan Control
J22	Pin header 1-2 Power Botton 2-3 SUS_LED
J23	Pin header 1-2 AUTO Power Botton
J24	1-2 CASE OPEN

J25	IDE Connector
J27	8Bit GPIO
J28	CPU Fan control
J29	CF Connector
J30	Factory Default
J38	RJ45 Connector
J39	RJ45 Connector
J40	RJ45 Connector
J41	RJ45 Connector
J42	Serial Port use RJ45 Connector
J51	Ethernet Link/Active LED
J52	Ethernet Link/Active LED
J53	Ethernet Link/Active LED
J54	Ethernet Link/Active LED
KM1	Keyboard/mouse Pin header

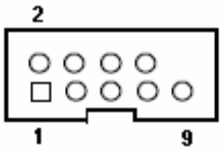
Pin Assignments of Connectors

J5:External USB



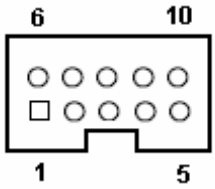
PIN No.	Signal Description	PIN NO.	Signal Description
1	VCC(+5V)	5	VCC(+5V)
2	USB1-	6	USB2-
3	USB1+	7	USB2+
4	GND	8	GND

J15:Serial Port



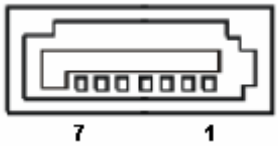
PIN No.	Signal Description
	RS-232
1	DCD (Data Carrier Detect)
2	RXD (Receive Data)
3	TXD (Transmit Data)
4	DTR (Data Terminal Ready)
5	GND (Ground)
6	DSR (Data Set Ready)
7	RTS (Request to Send)
8	CTS (Clear to Send)
9	RI (Ring Indicator)
10	N/C

J16:Internal VGA



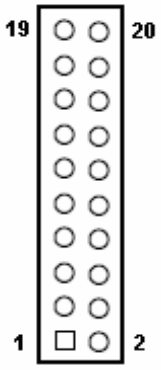
PIN No.	Signal Description
1	RED
2	GREEN
3	BLUE
4	Vertical Sync. (VSYNC) (5V I/F)
5	Horizontal Sync. (HSYNC) (5V I/F)
6	VGA DDC Clock (5V I/F)
7	GND
8	VGA DDC Data (5V I/F)
9	GND
10	N/C

J17/J20:SATA Connector



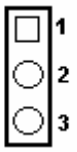
PIN No.	Signal Description
1	Ground
2	SATATX+ (SATATXP)
3	SATATX- (SATATXN)
4	Ground
5	SATARX- (SATARXN)
6	SATARX+ (SATARXP)
7	Ground

J18:ATX POWER



PIN No.	Signal Description	PIN No.	Signal Description
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS_ON#
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	PWR_OK	18	NC
9	+5VSB	19	+5V
10	+12V	20	+5V

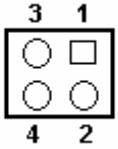
J21:System Fan / J28:CPU Fan Connector



connector

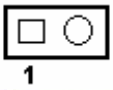
PIN No.	Signal Description
1	Ground
2	+12V
3	Fan Speed Detecting signal

J22: Front Panel Pin Header



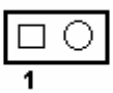
PIN No.	Signal Description
1	Power Button Signal
2	GND
3	5VSB
4	Suspend LED Signal

J23: Auto Power Button



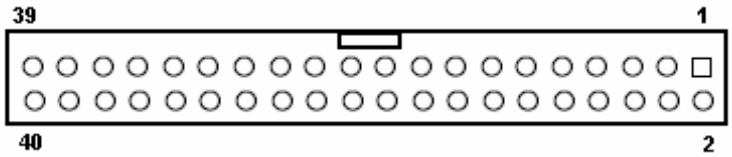
PIN No.	Signal Description
1-2	OPEN (Disable auto power button)
1-2	SHORT(Enable auto power button)

J24: Case Open



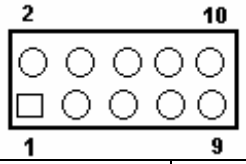
PIN No.	Signal Description
1-2	OPEN (Disable case open)
1-2	SHORT(Enable case open)

J25: IDE Connector



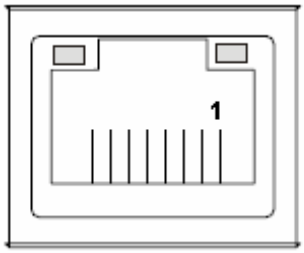
PIN No.	Signal Description	PIN No.	Signal Description
1	RESET#	2	GND
3	DATA_7	4	DATA_8
5	DATA_6	6	DATA_9
7	DATA_5	8	DATA_10
9	DATA_4	10	DATA_11
11	DATA_3	12	DATA_12
13	DATA_2	14	DATA_13
15	DATA_1	16	DATA_14
17	DATA_0	18	DATA_15
19	GND	20	NC
21	PDDREQ	22	GND
23	PDIOW#	24	GND
25	PDIOR#	26	GND
27	PDIORDY	28	CSEL
29	PDDACK#	30	GND
31	IRQ14#	32	NC
33	PDA1	34	PDIAG#
35	PDA0	36	PDA2
37	PDCS#1	38	PDCS#3
39	IDEACT#	40	GND

J27:GPIO Connector



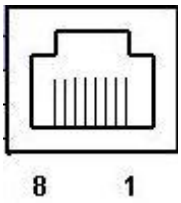
Pin NO.	Signal Description	Pin NO.	Signal Description
1	GPIO4	2	GPIO0
3	GPIO5	4	GPIO1
5	GPIO6	6	GPIO2
7	GPIO7	8	GPIO3
9	GND	10	VCC

J38/J39/J40/J41:RJ45 Connector



PIN No.	Signal Description
1	MDI0+ (MDI0P)
2	MDI0- (MDI0N)
3	MDI1+ (MDI1P)
4	MDI2+ (MDI2P)
5	MDI2- (MDI2N)
6	MDI1- (MDI1N)
7	MDI3+ (MDI3P)
8	MDI3- (MDI3N)

J42:Serial Port use RJ45

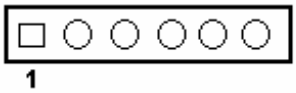


Auxiliary Port (DTE)		
Pin	**Signal**	**Input/Output**
1	RTS	Output
2	DTR	Output
3	TXD	Output
4	GND	—
5	GND	—
6	RXD	Input
7	DSR	Input
8	CTS	Input

J51/J52/J53/J54: Ethernet Link/Active LED

PIN	Description
1(negative)-2(positive)	Active LED
3-4	LINK LED 10-NO Light 100- Green Giga Byte- Orange

KM1: Keyboard/mouse Pin header



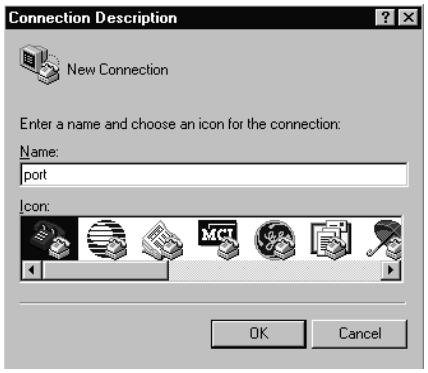
PIN	Description
1	Keyboard Data
2	Mouse Data
3	GND
4	5V DUAL
5	Keyboard Clock
6	Mouse Clock

Connection Using Hyper Terminal

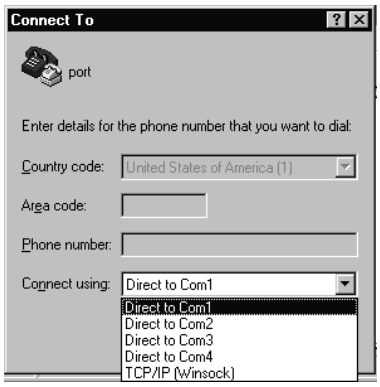
If users use a headless NAR-2290, which has no mouse/keyboard and VGA output connected to it, the console may be used to communicate with NAR-2290.

To access NAR-2290 the console, Hyper Terminal is one of the choices. Follow the steps below for the setup:

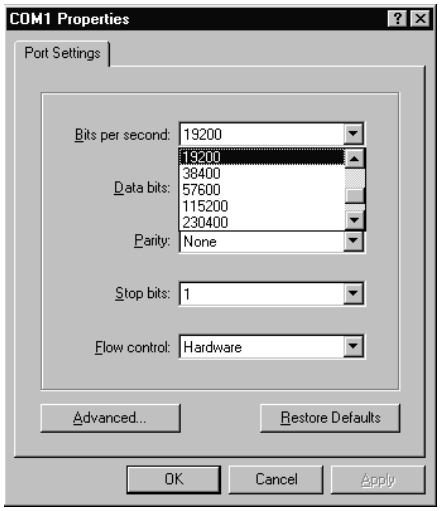
1. Execute HyperTerminal under C:\Program Files\Accessories\HyperTerminal
2. Enter a name to create new dial



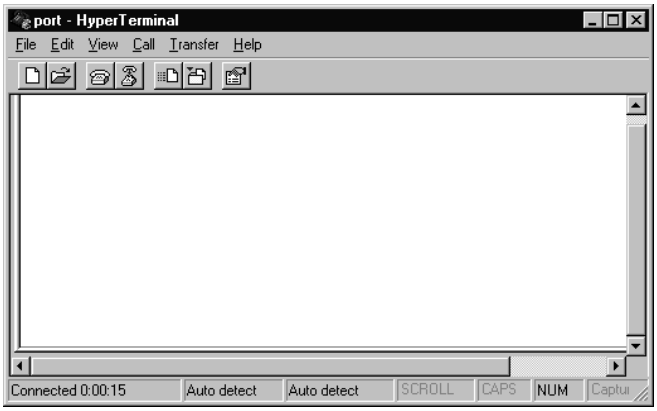
3. For the connection settings, make it Direct to COM1.



4. Please make the port settings to Baud rate 19200, Parity None, Data bits 8, Stop bits 1



5. Turn on the power of NAR-2290, after following screen was shown



6. Users can then see the boot up information of NAR-2290

   When message “Hit <DEL> if users want to run Setup” appear during POST, after turning on or rebooting the computer, press **<Tab>** key ***immediately*** to enter BIOS setup program.

7. This is the end of this section. If the terminal did not port correctly, please check the previous steps.

2.13 BIOS Setup Information

NAR-2290 is equipped with the Award BIOS within Flash ROM. The BIOS has a built-in setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it still retains during power-off periods. When system is turned on, NAR-2290 communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. Whenever an error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the Setup program. Some errors are significant enough to abort the start-up.

Entering Setup

When users see the message “Hit <DEL> if users want to run Setup”, after turning on or rebooting the computer, press <Del> key ***immediately*** to enter BIOS setup program.

If users want to enter Setup but fail to respond before the message disappears, please restart the system either by first turning it off and followed by turning it on (COLD START) or simply press the "RESET" button. “WARM START” (press <Ctrl>, <Alt>, and <Delete> keys simultaneously) will do, too. Unless users press the keys at the right time, the system will not boot, an error message will display and users will be asked to do it again.

When no setting is stored in BIOS or the setting is missing, a message “Press <F1> to run Setup” will appear. Then press <F1> to run Setup or resume HIFLEX BIOS Setup. users can use the keyboard to choose among options or modify the system parameters to match the options with your system. The table shown on next page will show all of keystroke functions in BIOS Setup.

Keys to navigate within Setup menu

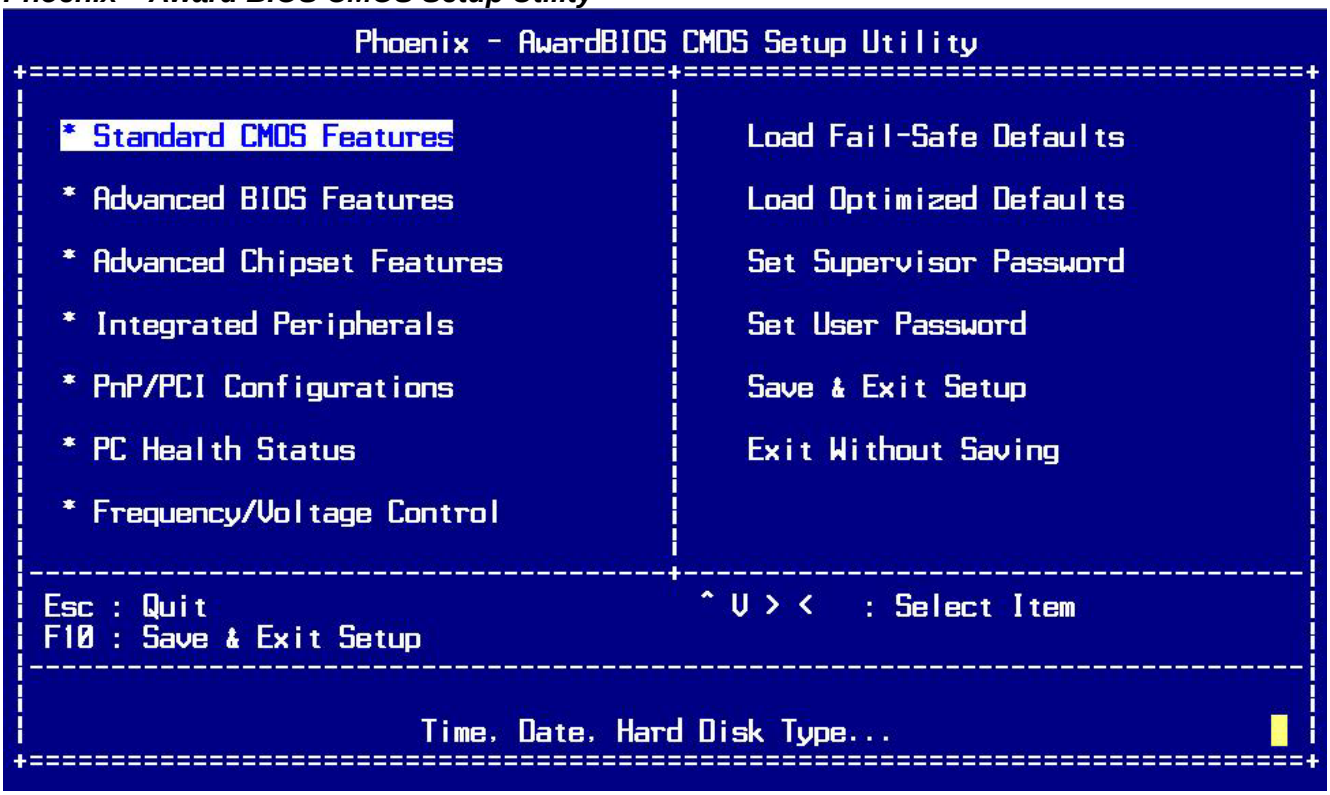
Key	Function

Up (↑)	Move to the previous item
Down (↓)	Move to the next item
Left (→)	Move to the item on the left (menu bar)
Right (←)	Move to the item on the right (menu bar)
Enter	Enter the item you desired
PgUp	Increase the numeric value or make changes
PgDn	Decrease the numeric value or make changes
+	Increase the numeric value or make changes
—	Decrease the numeric value or make changes
Esc	**Main Menu:** Quit and not save changes into CMOS **Status Page Setup Menu and Option Page Setup Menu:** Exit current page and return to Main Menu
F1	General help on SETUP navigation keys
F5	Load previous values from CMOS
F6	Load the fail-safe defaults from BIOS default table
F7	Load the optimized defaults
F10	Save all the CMOS changes and exit

Main Menu

Once users enter NAR-2290 Award BIOS CMOS Setup utility, should start with the Main Menu. The Main Menu allows user to select from eleven setup functions and two exit choices. Use arrow keys to switch among items and press <Enter> to accept or bring up the sub-menu.

Phoenix – Award BIOS CMOS Setup Utility



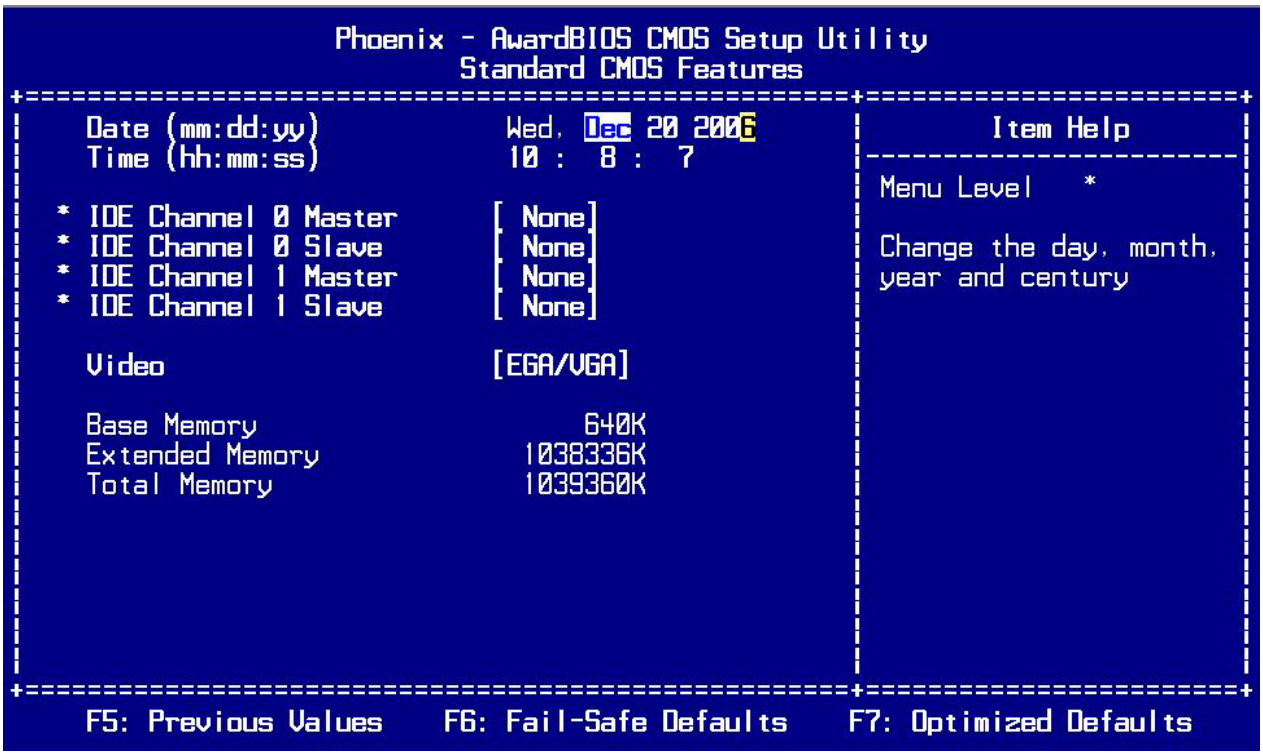
NOTE: It is strongly recommended to reload the optimized default setting if CMOS is lost or BIOS is updated.

Standard CMOS Setup Menu

This setup page includes all the items within standard compatible BIOS. Use the arrow keys to highlight the item and then use the <PgUp>/<PgDn> or <+>/<-> keys to select the value or number in each item and press <Enter> to certify it.

Follow command keys in CMOS Setup table to change *Date, Time, Drive type* and *Boot Sector Virus Protection Status*.

Screen Shot: Phoenix – Award BIOS CMOS Setup Utility



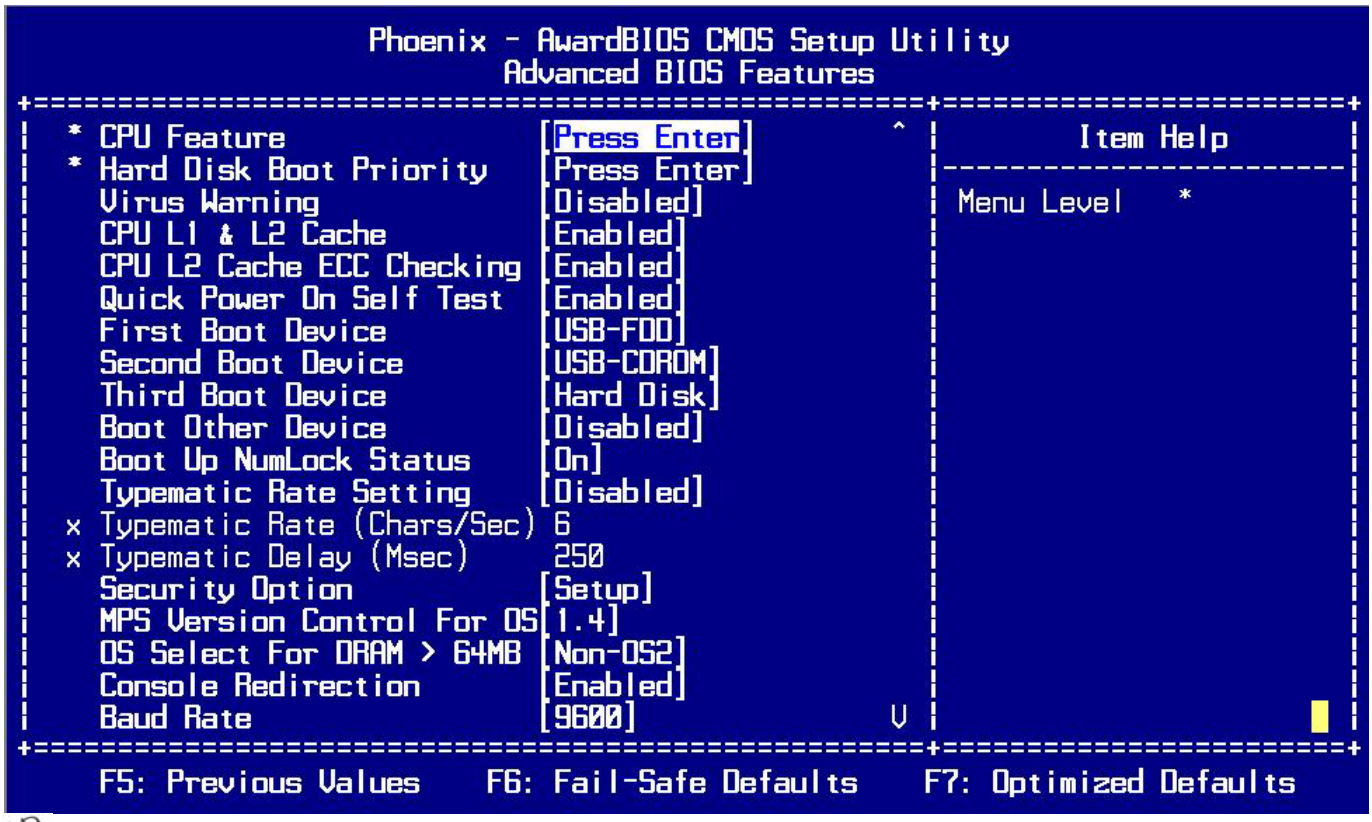
Menu Selections

Item	Options	Description
Date	mm:dd:yy	Set the system date. Note that the 'Day' automatically changes when set the date
Time	hh:mm:ss	Set the system time
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device
Base Memory	N/A	Display the amount of conventional memory detected during boot up
Extended Memory	N/A	Display the amount of extended memory detected during boot-up
Total Memory	N/A	Display the total memory available in the system

Advance BIOS Features

This section allows user to configure system for basic operation. Users will be able to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

Screen Shot: Phoenix – Award BIOS CMOS Setup Utility



Internal Cache/External Cache

These two categories speed up memory access. However, it depends on CPU/chipset design.

Enabled	Enable cache
Disabled	Disable cache

Quick Power On Self Test

This category speeds up Power On Self Test (POST) after power up the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.

Enabled	Enable quick POST
Disabled	Normal POST

Boot Up NumLock Status

Select power on state for NumLock.

The choice: Enabled/Disabled.

Gate A20 Option

This entry allows user to select how the gate A20 is handled. The gate A20 is a device used to address memory over 1 Mbytes. Originally, the gate A20 was handled via a pin on the keyboard. But now, though keyboards still provide this support, it is more common, and much faster, for the system chipset to provide support for gate A20.

Normal	Keyboard
Fast	Chipset

Typematic Rate Setting

Keystrokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.

The choice: Enabled/Disabled.

Typematic Rate (Chars/Sec)

Set the how many number of times a second to repeat a keystroke when a key is holding down.

The choice: 6, 8, 10, 12, 15, 20, 24 and 30.

Typematic Delay (Msec)

Set the delay time after the key is held down before it begins to repeat the keystroke.

The choice: 250, 500, 750 and 1000.

Security Option

Select whether the password is required every time the system boots or only when enter setup.

System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot and access to Setup will be denied if the correct password is not entered at the prompt.

Note: To disable security, select PASSWORD SETTING at Main Menu and then user will be asked to enter password. Do not type anything and simply press <Enter>, it will disable security. Once the security is disabled, the system will boot up and user can enter Setup freely.

OS Select for DRAM > 64MB

Select the operating system that is running with more than 64MB of RAM on the system.

The choice: Non-OS2, OS2.

Console Redirection

Set the UNIX Console redirect to the terminal from COM1**.**

The choice: Enabled/Disabled.

Baud Rate

Set the RS-232 baud rate speed.

The choice: 9600, 19200, 38400, 57600 and 115200.

Advanced Chipset Features

This section allows user to configure system for AT clock, DRAM timings...

Integrated Peripherals

Onboard LAN BootROM

User can press “L” for boot from LAN.

Chapter 3 Operation Guide

3.1 Brief Guide of PPAW-2290VL

PPAW-2290VL is a Communication Appliance computing board based on Intel 910GMLE chipset technology. PPAW-2290VL has Four on-board LAN ports to serve communication appliances, such as Firewall, which needs Four Ethernet ports to connect external network (internet), demilitarized zone and internal network. Different I/O management policies can be applied respectively to individual network to achieve the highest security level. The target market segment is communication appliance including Virtual Private Network, Load Balancing, Quality of Service, Intrusion Detection, Virus Detection, Firewall and Voice Over IP.

This PPAW-2290VL system board is eligible with INTEL processor package (INTEL Celeron M) and two slot for DDR2RAM module. The enhanced on-board PCI IDE interface supports 1 drive up to PIO mode 4 timing and Ultra DMA/100 synchronous mode, SATA I feature. The on-board super I/O chipset integrates two serial ports driven by two high performance 16550C-compatible UARTs to provide 16-byte send/receive FIFOs. The two Universal Serial Bus ports provide high-speed data communication between peripherals and PC.

The on-board flash ROM is used to make the BIOS update easier. The high precision Real Time Clock/Calendar is built to support Y2K for accurate scheduling and storing configuration information. All of these features make PPAW-2290VL excellent in stand-alone applications.

If any of these items is damaged or missing, please contact your vendor and save all packing materials for future replacement and maintenance.

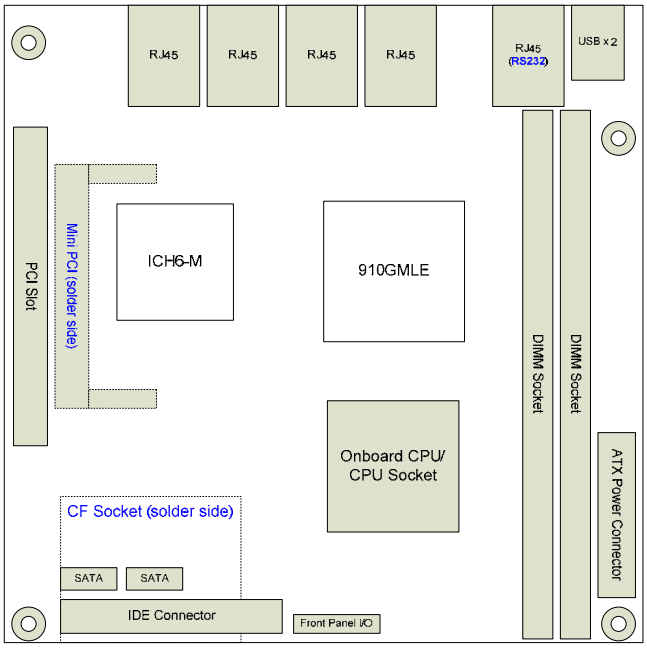


Figure 3-1 PPAW-2290VL Board

3.2 System Architecture

The following illustration of block diagram will show how PPAW-2290VL gives a highly integrated system solution. The most up-to-date system architecture of PPAW-2290VL includes two main chips. It contains INTEL 910GMLE and ICH-6 M to support INTEL Celeron -M

processor, DDR2 Low profile Long-DIMM, USB 2.0 port, communication, Ultra DMA/100 IDE Master storage, SATA I storage. The on-board super ICH6-M supports two UARTs and hardware monitoring.

PPAW-2290VL has built-in onboard INTEL celeron-M processor EBGA package 400MHz system bus for cost-effective and high performance application.

The INTEL 910GMLE provides a completely integrated solution for the system controller and data path components in a INTEL mobile processor system.

The Winbond W83627DHG E version I/O Controller Hub mobile (ICH6-M) provides a highly integrated multifunction for the best industry applications. It supports up to for Ultra ATA/33/66/100 IDE master interface, SATA I interface. Universal Serial Bus **(USB2.0)** controllers,

All detailed operating relations are shown in ***Fig. 3-2*** (PPAW-2290VL System Block Diagram).

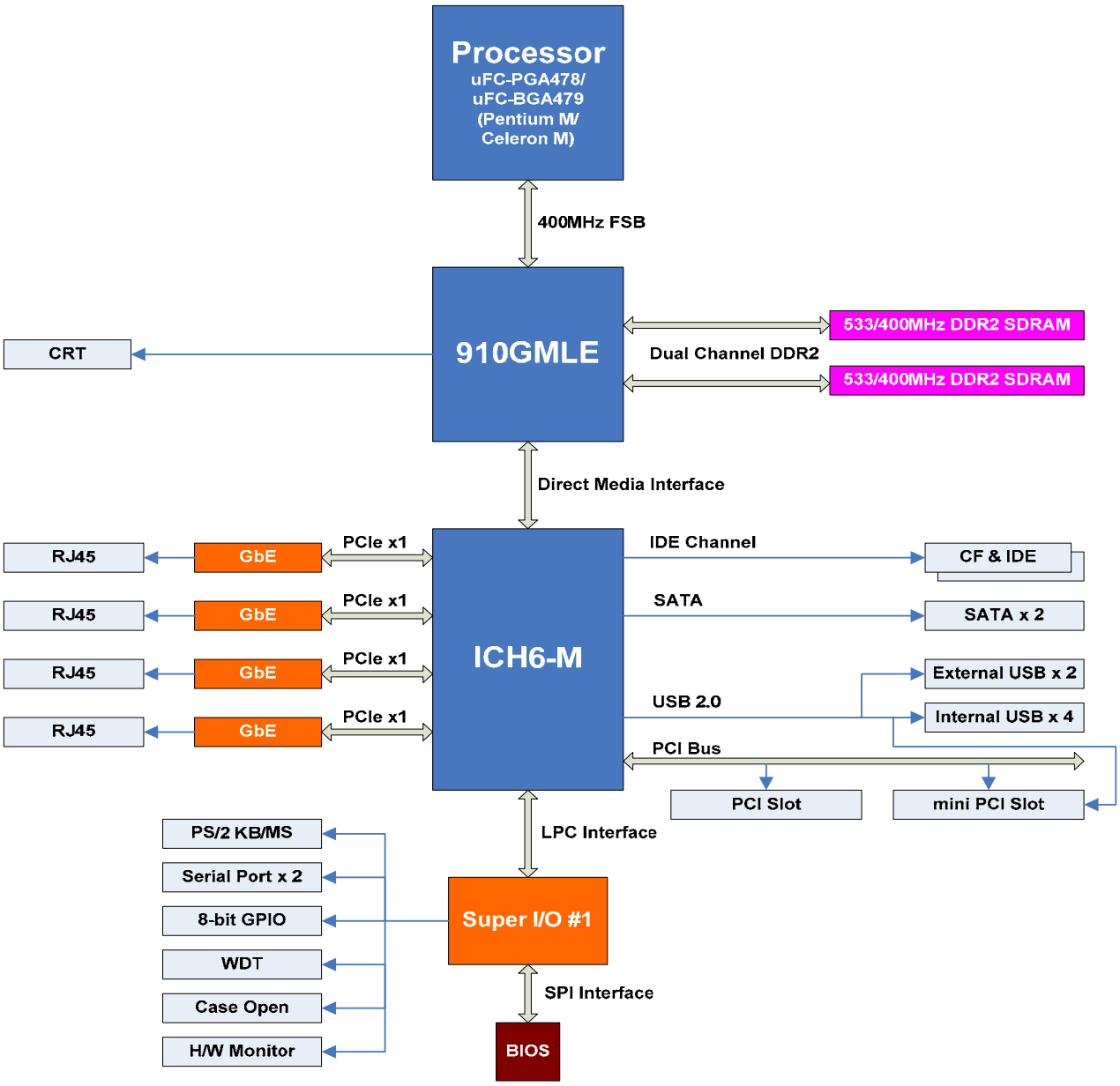


Figure 3-2 PPAW-2290VL Block Diagram