

# HE-760

Half-size Embedded Miniboard

**User's Manual**

**Edition: 1.00**

**2005/4/20**



*UniChrome Pro*

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## Packing List:

Please check the package before you starting setup the system

### Hardware:

HE-760 motherboard x 1

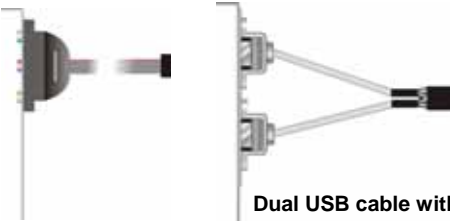
### Cable Kit:



ATA133 IDE Cable x1



ATA33 IDE Cable x1



Dual USB cable with bracket x 1



Floppy Cable x 1

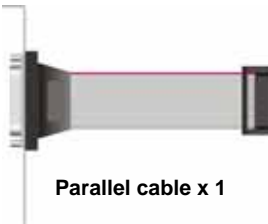
Audio cable with bracket x 1



PS/2 keyboard & mouse cable x 1



SATA Cable x 2



Parallel cable x 1



COM port Cable x 2

### Printed Matters:

User's Manual x 1

Driver CD x 1

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## Chapter 1 <Introduction>

### 1.1 <Product Overview>

**HE-760** is the 3.5 inches embedded miniboard based on VIA CN400 platform, with onboard VIA Eden ESP8000 processor, VGA, LAN, Audio, USB2.0, CF, LVDS, the board provides economic fanless solution for multimedia applications.

#### **VIA CN400 & VT8237R Chipset**

The board integrates VIA CN400 & VT8237R chipset, to provide built-in UniChrome Pro 3D / 2D Graphics with MPEGII/MPEG4 decoder, and supports DDR266/333/400 memory up to 1G of capacity. The CN400 and VT8237 has Ultra V-Link Host interface with 1 GB/sec total bandwidth to enhance the system performance.

#### **18/24-bit LVDS LCD interface**

The board provides onboard 18/24-bit LVDS LCD interface, supports up to 1600 x 1200 of UXGA high resolution.

#### **Flexible Extension Interfaces**

The board provides one Mini-PCI socket for wireless LAN module, video capture card and IEEE1394 add-on card.

#### **Expanded UCR for remote Operating SETUP Bios Feature**

**Expanded Universal Console Redirection (UCR)** is a feature for monitoring POST messages and running Setup and an operation system from a remote serial terminal.

## 1.2 <Product Specification>

### General Specification

Form Factor	Half-size PCI CPU card
CPU	Embedded VIA Eden ESP8000 processor Front side bus: 133MHz(FSB) <b>Fanless with heatsink only</b>
Memory	1 x 184-pin DDR 266/333/400 SDRAM up to 1GB Unbuffered, none-ECC memory supported only
Chipset	VIA CN400 and VT8237R
BIOS	Phoenix-Award v6.00PG 4Mb PnP flash BIOS
Green Function	Power saving mode includes doze, standby and suspend modes. ACPI version 1.0 and APM version 1.2 compliant
Watchdog Timer	System reset programmable watchdog timer with 1~ 255 sec./min. of timeout value
Real Time Clock	VIA VT8237R built-in RTC with lithium battery
Enhanced IDE	Enhanced UltraDMA133 IDE interface supports dual channels and up to 2 ATAPI devices One 44-pin IDE port onboard One 40-pin IDE port onboard Two SATA port

### Multi-I/O Port

Chipset	VIA VT8237R with Winbond W83697UG controller
Serial Port	Four internal RS-232 serial ports with RS-422 and RS-485
USB Port	Two Hi-Speed USB 2.0 ports with 480Mbps of transfer rate
Parallel Port	One internal parallel port with SPP/ECP/EPP mode
Floppy Port	One standard type Floppy port
IrDA Port	One IrDA compliant Infrared interface supports SIR
K/B & Mouse	External PS/2 keyboard and mouse ports on rear Lan
GPIO	One 12-pin Digital I/O connector with 8-bit programmable I/O interface
Hardware Monitor	Fan speed, CPU temperature and voltage monitoring

### VGA Display Interface

Chipset	VIA CN400 built-in S3 Graphics UniChrome Pro IGP graphics core
Core Frequency	200MHz
Memory	BIOS selectable 16/32/64MB shard with system memory
Display Type	CRT, LCD monitor with Digital display
Connector	External DVI female connector on rear Lan

### LCD Interface

Chipset	VIA CN400 with VT6103 transmitter
Interface	18/24-bit LVDS interface



12V backlight inverter connector  
 Panel voltage 3.3V/5V jumper selectable

### Ethernet Interface

Chipset	RTL 8100B Intel 82541PI
Type	10Base-T / 100Base-TX 100Base-T/1000Base-TX auto-switching Fast Ethernet Full duplex, IEEE802.3U compliant
Connector	External RJ45 connectors with LED on rear I/O panel

### Audio Interface

Chipset	REALTEK ALC201A
Interface	2 channel 3D audio with Line-in, Line-out and MIC-in
Connector	Onboard audio connector with pin header Onboard CD-IN connector

### Expansive Interface

Mini-PCI	1 x 32-bit 5V/3.3V Mini-PCI socket
PCI	1 x optional PCI interface supports up to two PCI devices through riser card

### Solid State Disk

DOM	IDE1 supports 40-pin DOM (DiskOnModule) IDE2 supports 44-pin DOM (DiskOnModule)
CompactFlash	1 x CompactFlash Type 1 socket on solder side

### Power and Environment

Power Requirement	DC 5V input 1 x DC jack near DVI connector onboard
Dimension	146 (L) x 101 (H) mm
Temperature	Operating within 0 ~ 60°C (32 ~ 140°F) Storage within -20 ~ 85°C (-4 ~ 185°F)

### Software support

Operation System	Windows 98SE/ME, Windows 2000, Windows XP Windows CE 4.0 or later, Windows XP Embedded Linux (Fedora Core 1, Mandrake 9.2 and Red Hat 9.0)
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**Ordering Code**

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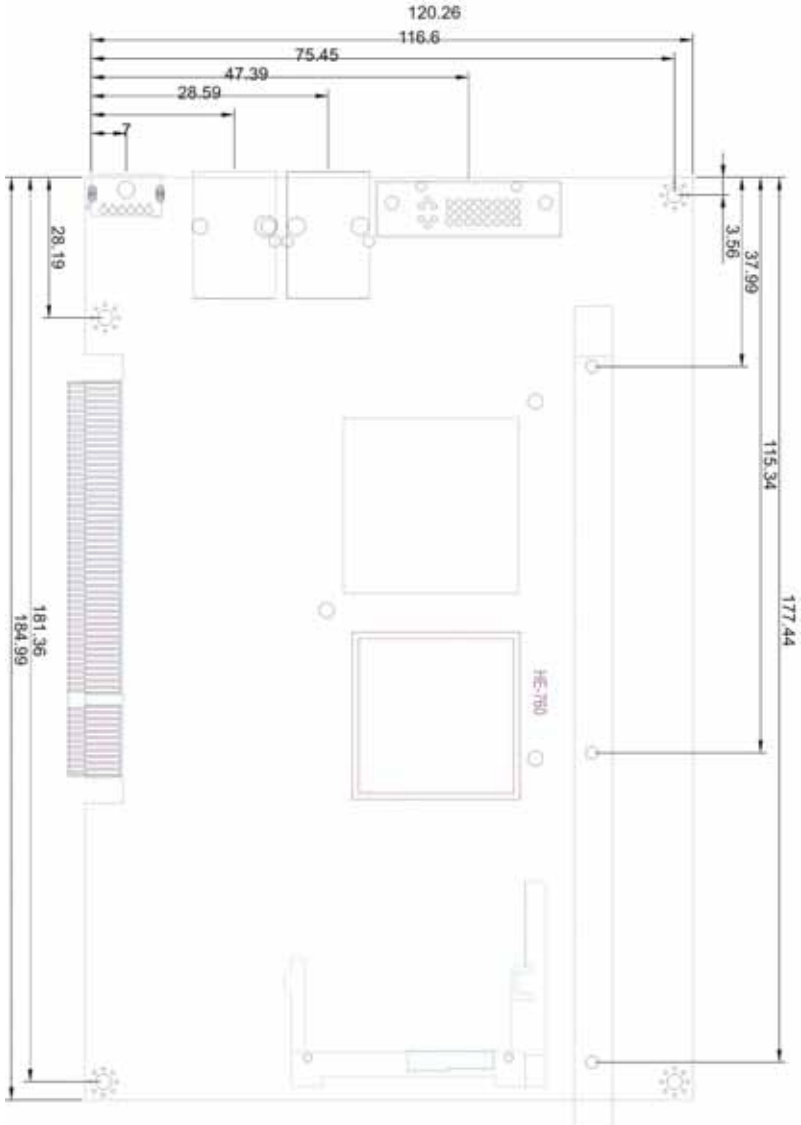
<b>HE-760GED</b>	VIA CN400 with Embedded Eden ESP8000 processor, VGA, AC97 Audio, DVI, CF, PCI, Mini-PCI, 2 x RS232, 2 x LAN, 2 x SATA
<b>HE-760GEX</b>	VIA CN400 with Embedded Eden ESP8000 processor, VGA, AC97 Audio, LVDS, CF, PCI, Mini-PCI, 2 x RS232, 2 x LAN, 2 x SATA

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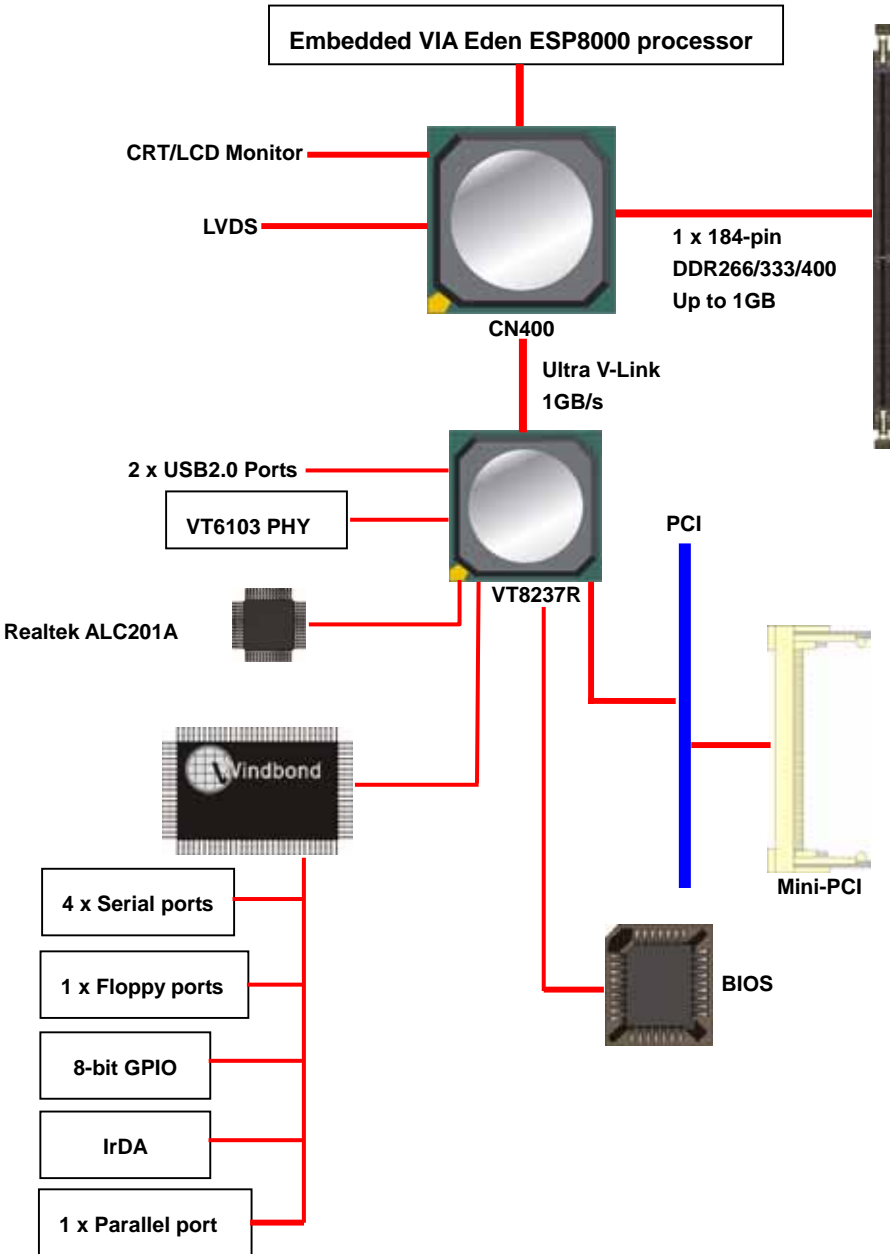
The specifications may be different as the actual production.

For further product information please visit the website at <http://www.commell.com.tw>

### 1.3 <Mechanical Drawing>

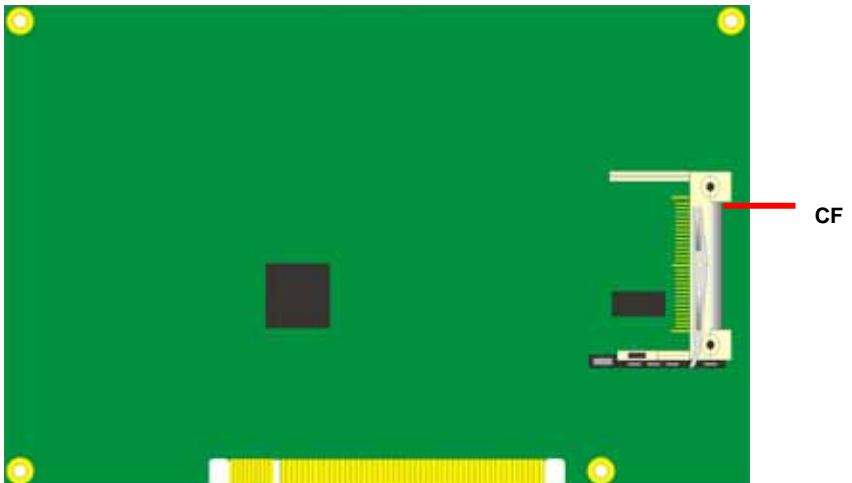
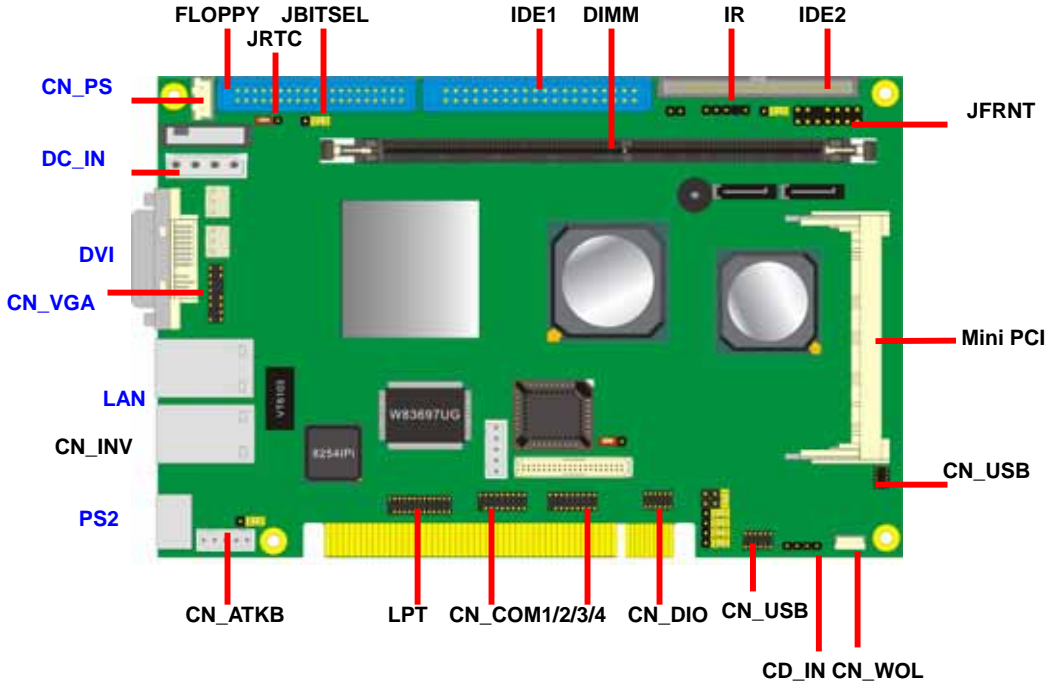


# 1.4 <Block Diagram>



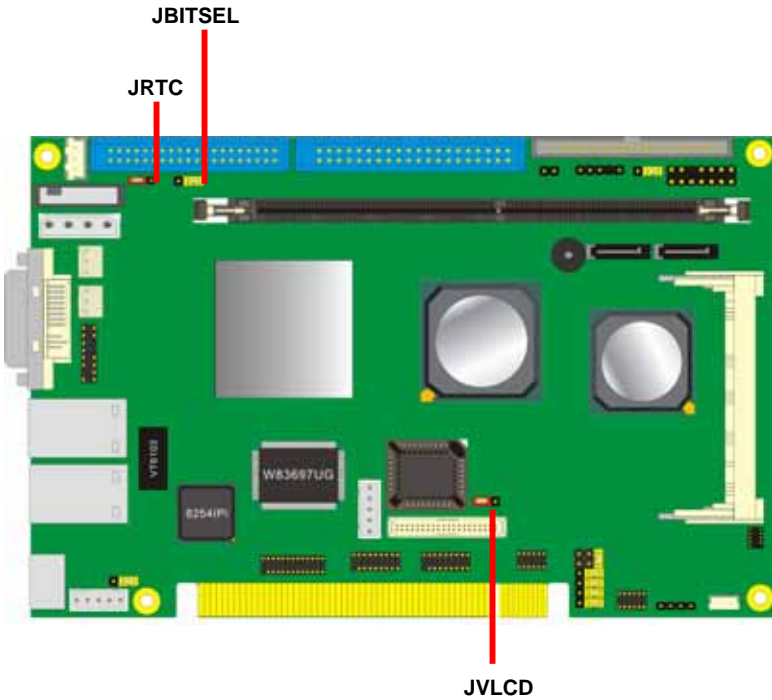
# Chapter 2 <Hardware Setup>

## 2.1 <Connector Location>



## 2.2 <Jumper Location & Reference>

Jumper	Function
JRTC	CMOS Operating/Clear Setting
JVLCD	LCD panel voltage setting
JBITSEL	LCD panel 18-bit/24-bit selection



## 2.3 <Connector Reference>

### 2.3.1 <Internal Connector>

Connector	Function	Remark
DIMM	184-pin DDR SDRAM DIMM	Standard
IDE1	40-pin primary IDE connector	Standard
IDE2	44-pin slim type IDE connector	Slim
SATA	SATA HD connector	Standard
FDD	34-pin floppy connector	Standard
CN_5V	4-pin DC input connector	Standard
CDIN	4-pin CD-ROM audio input connector	Standard
CN_DIO	6 x 2-pin digital I/O connector	Standard
CN_USB	5 x 2-pin USB connector	Standard
CPUFAN	3-pin CPU cooler fan connector	Standard
SYSFAN	3-pin system cooler fan connector	Standard
CN_COM1/2	10 x 2-pin RS232 serial port	Standard
CN_COM3/4	10 x 2-pin RS232 serial port	Standard
CN_IR	5-pin IrDA connector	Standard
CF	Compact Flash Type I socket	Standard
MINI_PCI	Mini-PCI interface	Standard
CN_LVDS	40-pin LVDS LCD interface	Standard
CN_INV	5-pin LCD backlight inverter connector	Standard
LPT	26-pin parallel port interface	Standard
JFRNT	14-pin front panel switch/indicator connector	Standard
CN_SPWR	4-pin DC 5V/12V output connector	Standard
CN_VGA	16-pin VGA Output connector	Standard
CN_AUDIO	10-pin AUDIO Output connector	Standard
CN_ATKB	5-pin ATKB inverter connector	Standard

### 2.3.2 <External Connector>

Connector	Function	Remark
CRT	DVI VGA connector	Standard
RJ45	RJ45 LAN connector	Standard
PS2	PS/2 Keyboard/Mouse connector	Standard
DC_IN	DC input jack	Standard

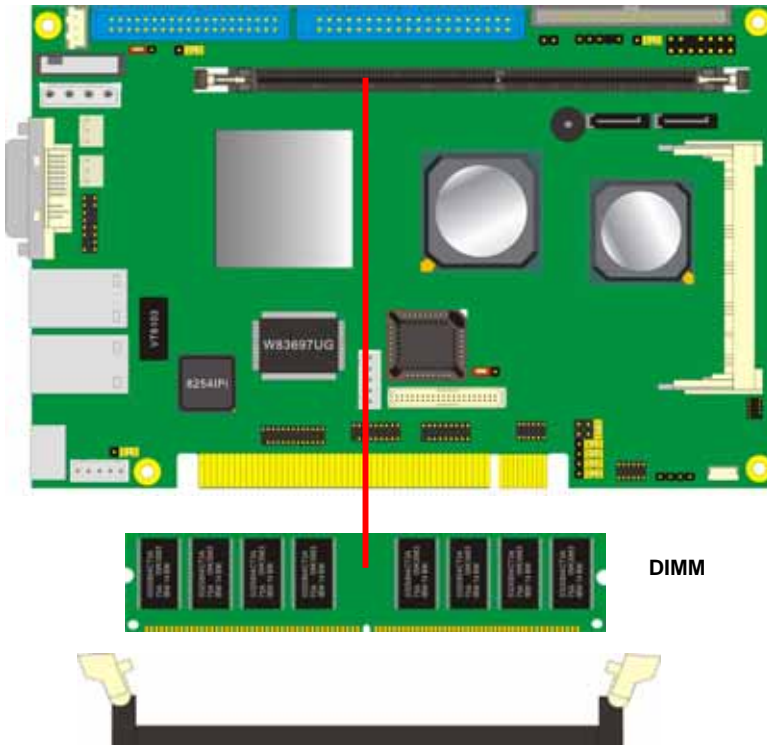
## 2.4 <CPU & Memory Setup>

### 2.4.1 <CPU>

The board comes with Embedded VIA Eden ESP8000 processor of 133MHz front side bus, to provide low power consumption and fanless solution.

### 2.4.2 <Memory>

The board supports one 184-pin DDR266/333/400 SDRAM and up to 1GB of capacity, only non-ECC, unbuffered memory is supported.



*Please check the pin number to match the socket side well before installing memory module.*



## 2.5 <CMOS Setup>

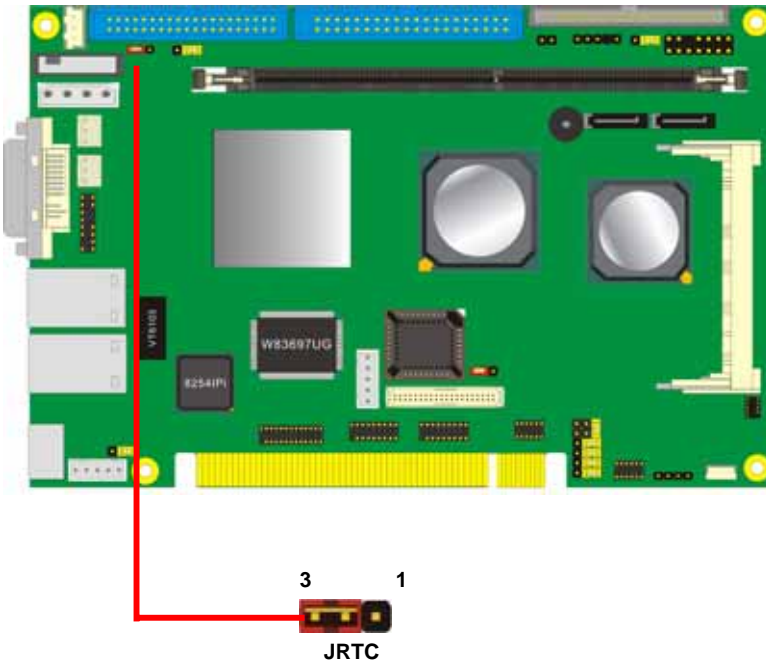
The board's data of CMOS can be setting in BIOS. If the board refuses to boot due to inappropriate CMOS settings, here is how to proceed to clear (reset) the CMOS to its default values.

**Jumper: JRTC**

**Type: Onboard 3-pin jumper**

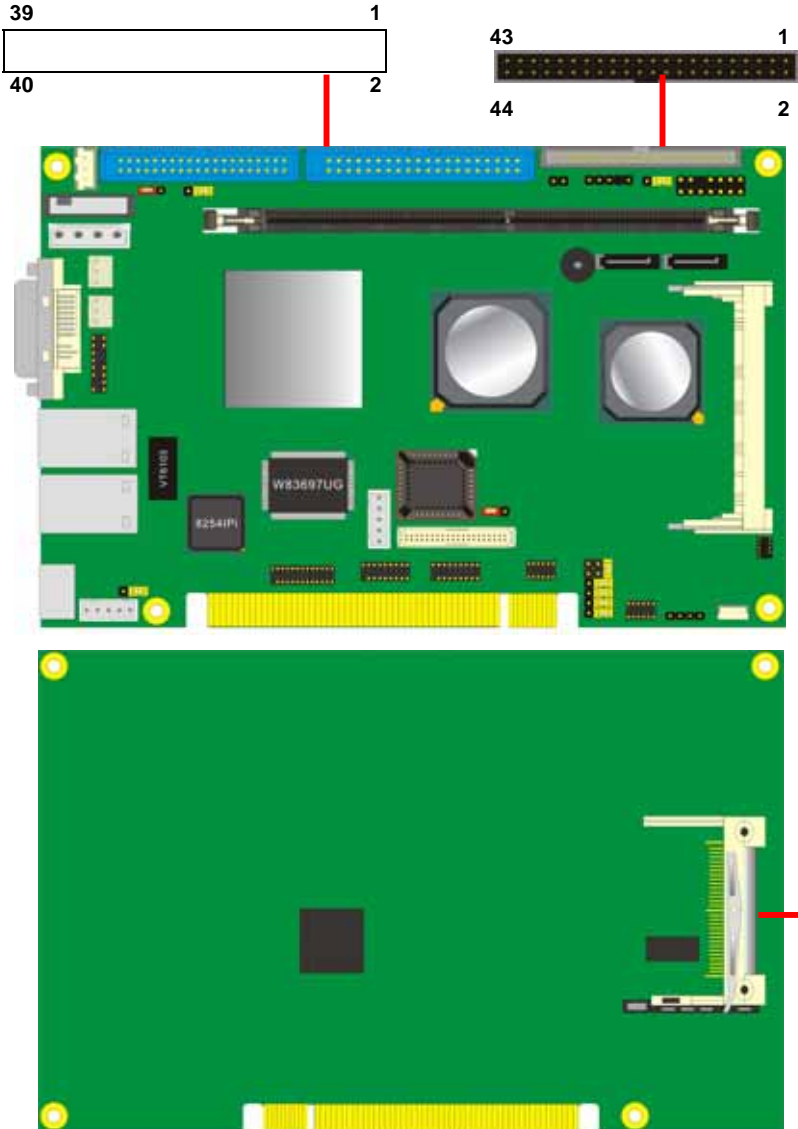
JRTC	Mode
1-2	Clear CMOS
2-3	Normal Operation

Default setting



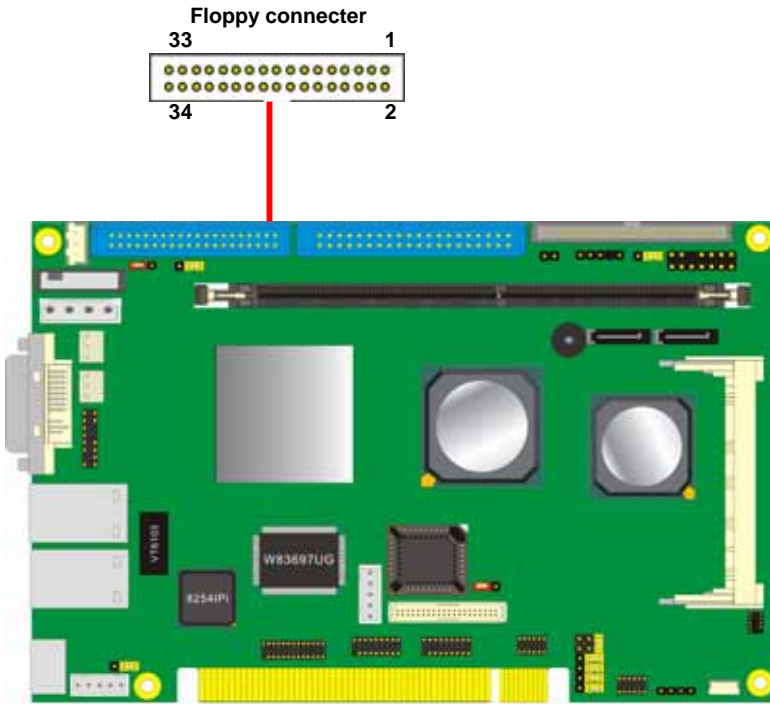
## 2.6 <Enhanced IDE & CF interface>

The board supports two UltraDMA133 IDE interface, and one CompactFlash Type 1 socket with secondary IDE mode, the 40-pin and 44-pin IDE connector can support up to 2 ATAPI devices through IDE cable, and the CompactFlash socket can support IDE DMA mode (depends on the CF card specification).



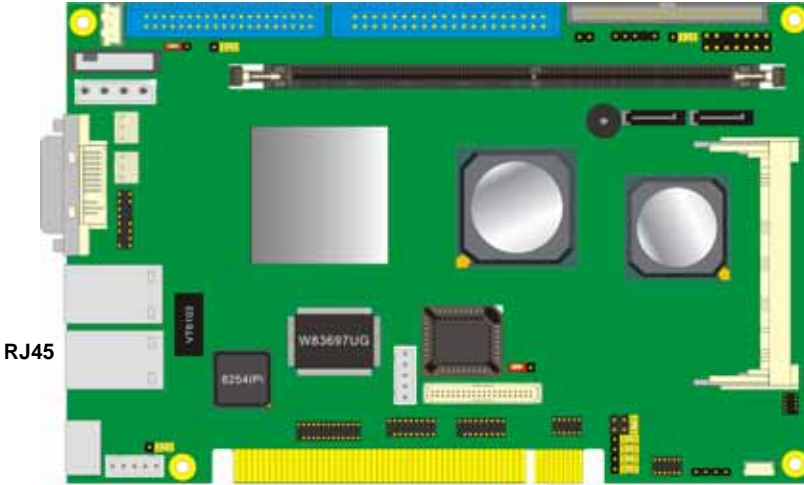
## 2.7 <Floppy Port>

The board provides a standard type floppy port; please use the 34-pin cable in the package to connect the floppy device.



## 2.8 <Ethernet Interface>

The board integrates Ethernet controller with VIA VT6103 PHY, full compliance with IEEE 802.3u 100Base-T specifications and IEEE 802.3x Full Duplex Flow Control, the board supports Wake-Up-On-LAN by BIOS configurable.



For Wake Up On LAN function, please enable this option in the BIOS

## 2.9 <Onboard Display Interface>

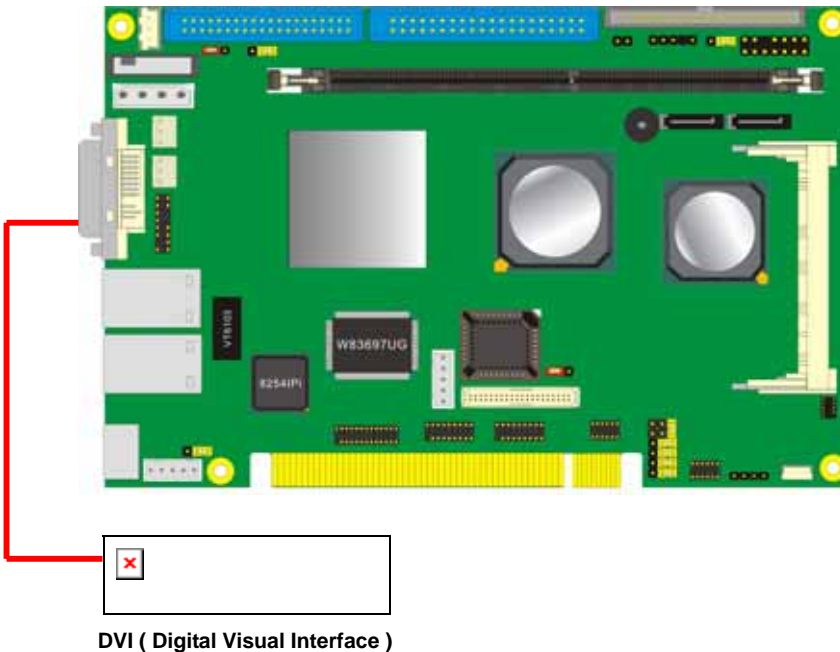
Based on VIA CN400 with built-in S3 Graphics UniChrome Pro IGP graphics, the board provides onboard VGA display interface, and one 18/24-bit LVDS LCD interface with VIA VT1631, supports up to 1600 x 1200 of resolution. The two display interfaces can be set for dual display with extended desktop mode or clone mode.

Below are the main features lists:

- 128-bit 2D/3D graphics engine
- Supports 16 / 32 / 64 MB Frame Buffer sizes (BIOS Selectable)
- MPEG-2 hardware VLD (Various Length Decode), iDCT, and motion compensation for full speed DVD and MPEG-2 playback
- MPEG-4 ASP (Advanced Simple Profile) Level 5 with GMC (Global Motion Compensation) L0/L1 and 1/4-pixel MC support for high video quality and performance.

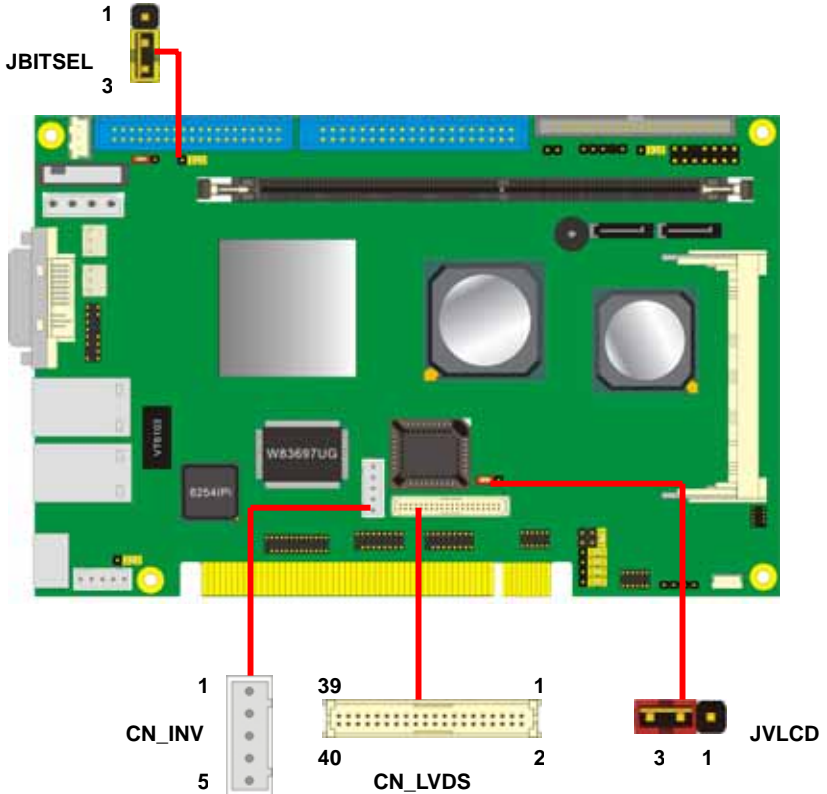
### 2.9.1 < Digital Visual Interface>

The onboard VGA display comes with standard DVI connector near Lan port .



### 2.9.2 <Digital Display Interface>

The onboard digital display interface comes with a 40-pin header connector to provide 18/24-bit LVDS LCD interface, and one backlight inverter connector for powering and enable/disable control, the jumper JVLCD is to set the panel voltage, and the JBITSEL is to configure the 18-bit or 24-bit outputting.



Connector: **CN\_INV**

Type: 5-pin LVDS Power Header

Pin	Description
1	+12V
2	GND
3	GND
4	GND
5	ENABKL

Connector: **JVLCD**

Type: 3-pin Power select Header

Pin	Description
1	VCC( 5V)
2	LCDVCC
3	VCC3 (3.3V)

Jumper: **JBITSEL**

Type: onboard 3-pin header

JBITSEL	Mode
1-2	18-bit panel
2-3	24-bit panel

Default setting

Connector: **CN\_LVDS**

Type: onboard 40-pin connector for LVDS connector

Connector model: **HIROSE DF13-40S**

Pin	Signal	Pin	Signal
2	LCDVCC	1	LCDVCC
4	GND	3	GND
6	A0-	5	A4-
8	A0+	7	A4+
10	GND	9	GND
12	A1-	11	A5-
14	A1+	13	A5+
16	GND	15	GND
18	A2-	17	A6-
20	A2+	19	A6+
22	GND	21	GND
24	CLK1-	23	A7-
26	CLK1+	25	A7+
28	GND	27	GND
30	A3-	29	CLK2-
32	A3+	31	CLK2+
34	GND	33	GND
36	N/C	35	N/C
38	N/C	37	N/C
40	N/C	39	N/C

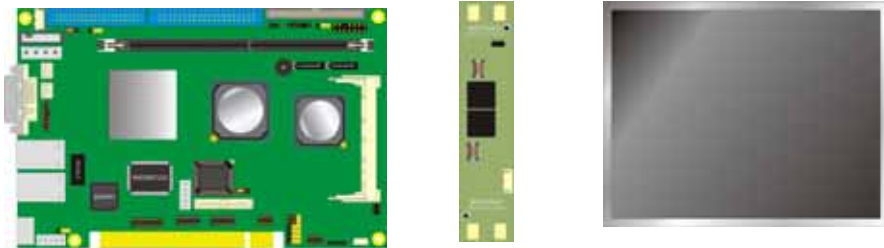
To setup the LCD, you need the component below:

1. A panel with LVDS interfaces.
2. An inverter for panel's backlight power.
3. A LCD cable and an inverter cable.

For the cables, please follow the pin assignment of the connector to make a cable, because every panel has its own pin assignment, so we do not provide a standard cable; please find a local cable manufacture to make cables.

### LCD Installation Guide:

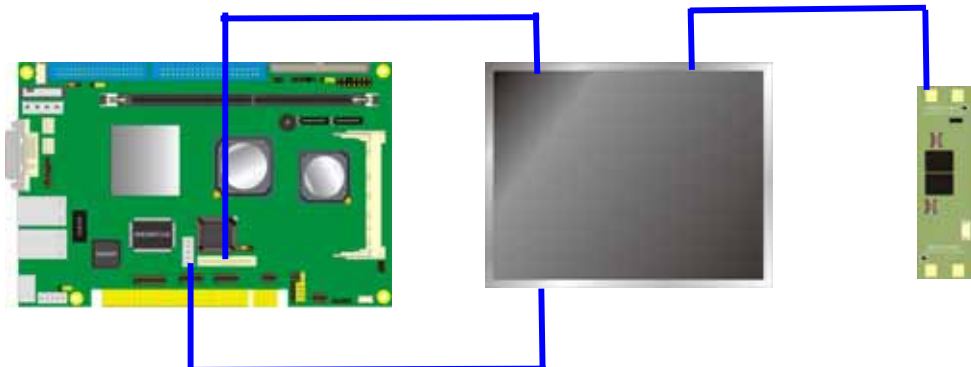
1. Preparing the HE - 760, LCD panel and the backlight inverter.



2. Please check the datasheet of the panel to see the voltage of the panel, and set the jumper **JVLCD** to +5V or +3.3V, and the **JBITSEL** for 18-bit or 24-bit.
3. You would need a LVDS type cable.



4. To connect all of the devices well.

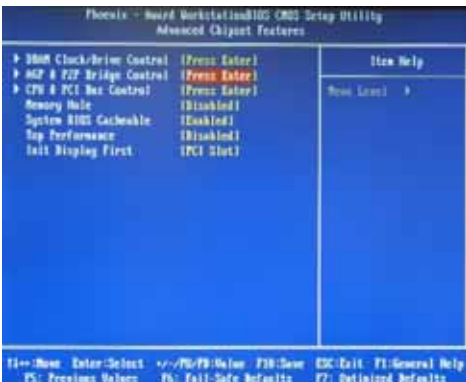




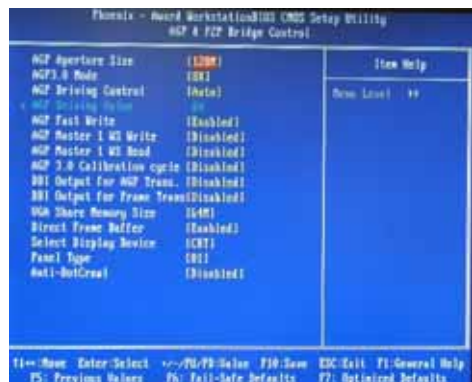
## Panel Type Supported Table:

Please enter the BIOS and setup the panel type to fit your panel

Panel ID	Resolution	Channel	Dithering
0	640x480	1	Enable
1	800x600	1	Enable
2	1024x768	1	Enable
3	1280x768	1	Enable
4	1280x1024	2	Enable
5	1400x1050	2	Enable
6	1600x1200	2	Enable
7	1280x800	1	Enable
8	800x480	1	Enable
9	1024x768	2	Enable
A	1024x768	1	Disable
B	1024x768	2	Disable
C	1280x768	1	Disable
D	1280x1024	2	Disable
E	1400x1050	2	Disable
F	1600x1200	2	Disable



Entering Advanced Chipset Features of BIOS Setup



Entering AGP & P2P Bridge Control for Option of panel type selection

## 2.10 <Onboard Audio Interface>

The board integrates onboard AC97 audio with REALTEK ALC201A, supports 18-bit ADC and DAC resolution, and Line-out, Line-in and MIC-in input/output interfaces.

### Connector: CN\_AUDIO

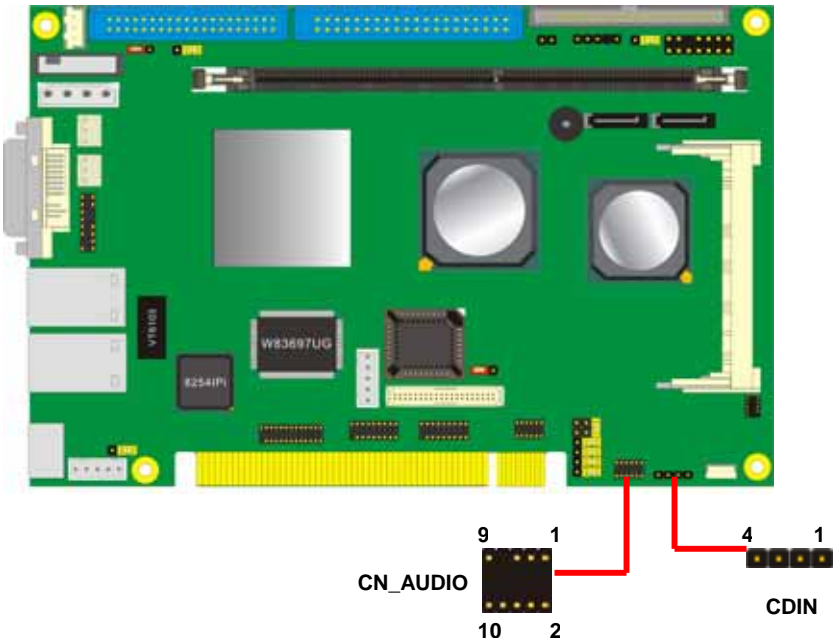
Type: 10-pin (2 x 5) 1.27mm x 2.54mm-pitch header

Pin	Description	Pin	Description
1	Line – Left	2	Ground
3	Line – Right	4	MIC1
5	MIC2	6	Ground
7	N/C	8	Line Out – Left
9	Line Out – Right	10	Ground

### Connector: CDIN

Type: 4-pin header (pitch = 2.54mm)

Pin	Description
1	CD – Left
2	Ground
3	Ground
4	CD – Right



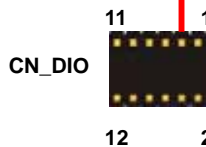
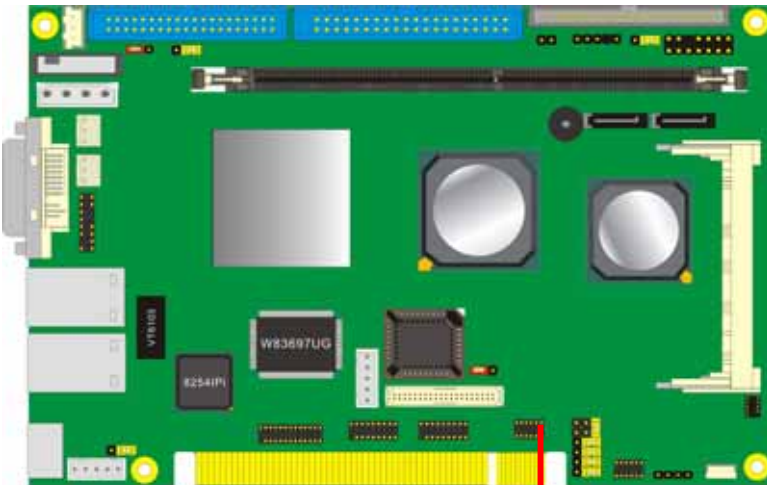
## 2.11 <GPIO Interface>

The board offers 8-bit digital I/O to customize its configuration to your control needs. For example, you may configure the digital I/O to control the opening and closing of the cash drawer or to sense the warning signal from a tripped UPS.

Connector: **CN\_DIO**

Type: onboard 2 x 6-pin 1.27mm x 2.54mm-pitch header

Pin	Description	Pin	Description
1	Ground	2	Ground
3	GP0	4	GP4
5	GP1	6	GP5
7	GP2	8	GP6
9	GP3	10	GP7
11	+5V	12	+12V



## 2.12 <Power Supply & Fan>

### 2.12.1 <Power Input>

The board requires DC 5V input with onboard DC jack or 4-pin 5V DC connector.

Connector: **CN\_12V**

Type: 4-pin standard ATX2.0 +12V power connector

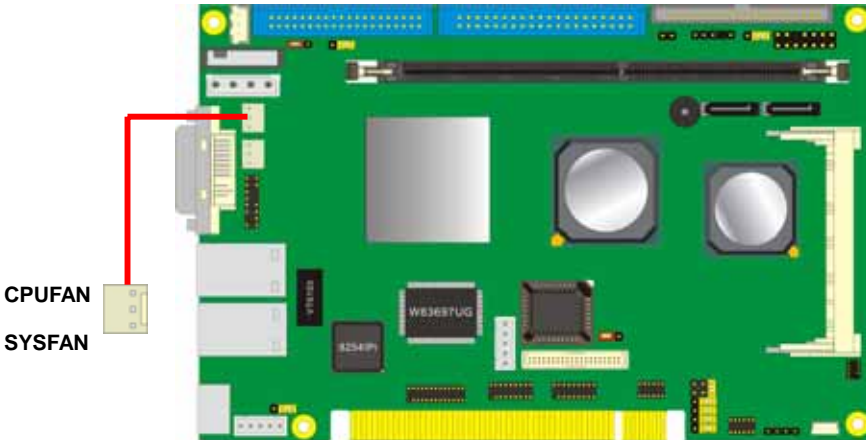
Pin	Description	Pin	Description
1	+12V	2	Ground
3	+5VV	4	Ground

### 2.12.2 <Fan connectors>

Connector: **CPUFAN, SYSFAN**

Type: 3-pin fan wafer connector

Pin	Description	Pin	Description	Pin	Description
1	Ground	2	+12V	3	Fan Control



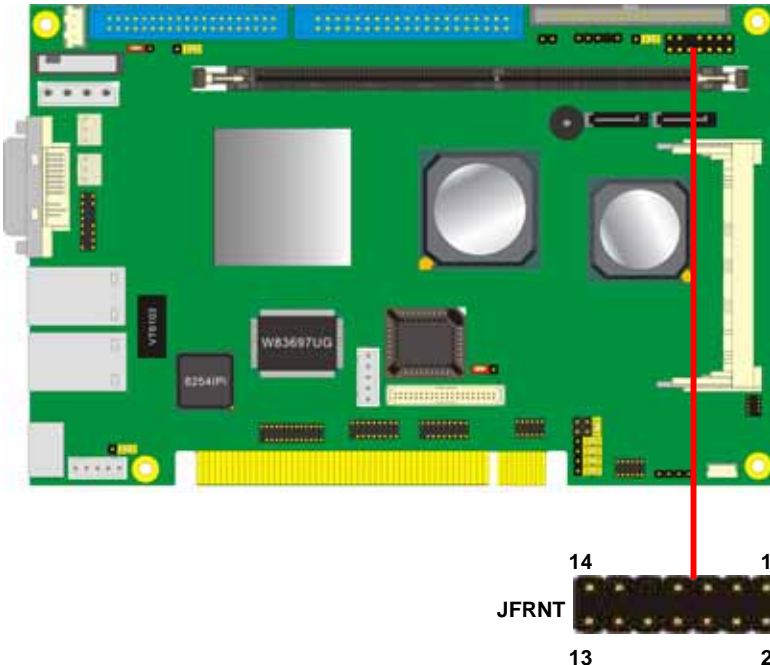
### 2.13 <Switch & Indicator>

The **JFRNT** provides front control panel of the board, such as power button, reset and beeper, etc. Please check well before you connecting the cables on the chassis.

Connector: **JFRNT**

Type: onboard 14-pin (2 x 7) 2.54-pitch header

Function	Signal	PIN		Signal	Function
IDE LED	VCC	1	2	VCC	Power LED
	Active	3	4	N/C	
Reset	Reset	5	6	GND	
	GND	7	8	VCC	Speaker
N/C		9	10	N/C	
Power Button	PWRBT	11	12	N/C	
	Ground	13	14	SPKIN	

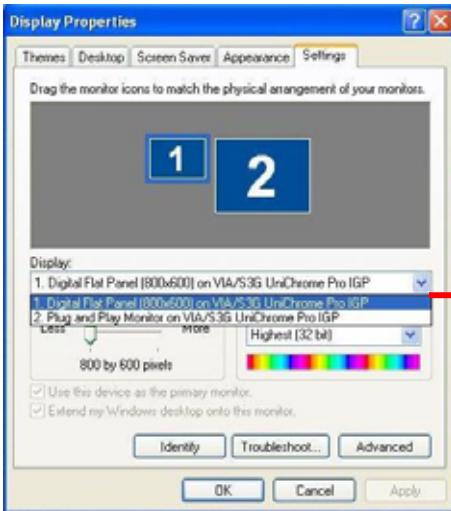


## Chapter 3 <System Setup>

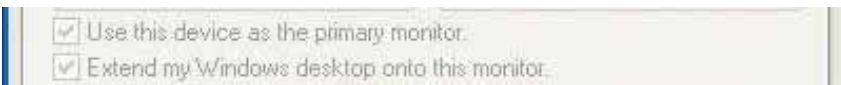
### 3.1 <Display Configuration>

The board provides onboard VGA with DVI digital visual interface, and LVDS LCD interface for digital display, when connecting two display devices, you can enable dual display function with clone mode or extended desktop mode.

Before setup the video setting, please install the VGA driver well.



Two controllers for each display device

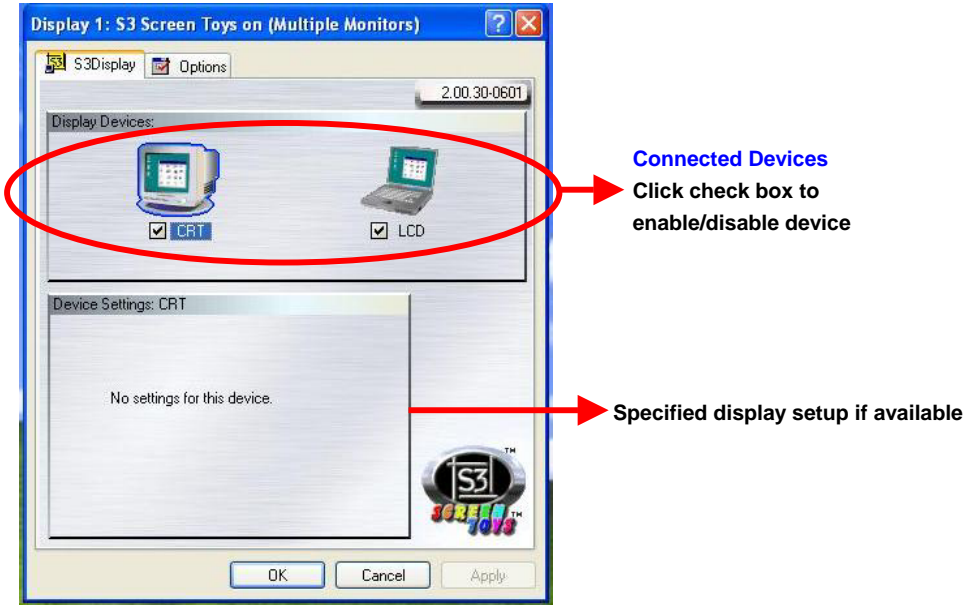


There are two options for secondary display device

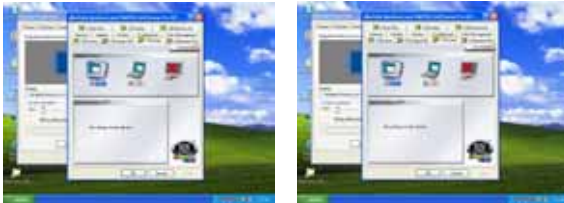


For more display properties setting, please click "Advanced" button.

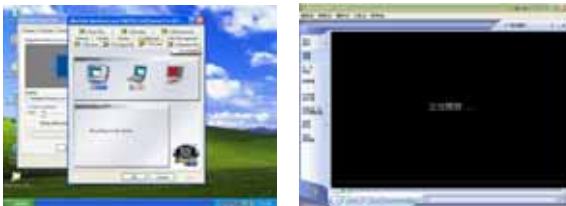
Please select S3Display for advanced device setting.



When you set dual display clone mode, you'll see the same screen display on two devices.



When you set the dual display for extended desktop mode, you can have the independent desktop on the second device.



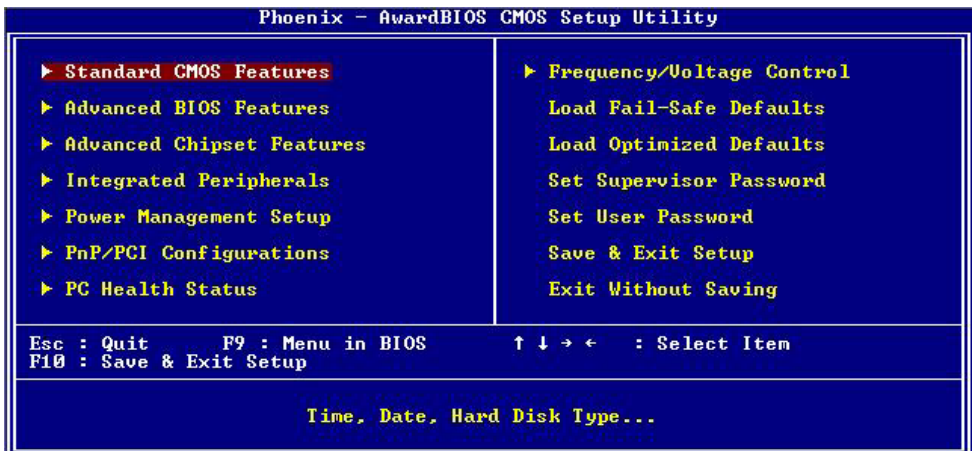
## Chapter 4 <BIOS Setup>

The single board computer uses the Award BIOS for the system configuration. The Award BIOS in the single board computer is a customized version of the industrial standard BIOS for IBM PC AT-compatible computers. It supports Intel x86 and compatible CPU architecture based processors and computers. The BIOS provides critical low-level support for the system central processing, memory and I/O sub-systems.

The BIOS setup program of the single board computer let the customers modify the basic configuration setting. The settings are stored in a dedicated battery-backed memory, NVRAM, retains the information when the power is turned off. If the battery runs out of the power, then the settings of BIOS will come back to the default setting. The BIOS section of the manual is subject to change without notice and is provided here for reference purpose only. The settings and configurations of the BIOS are current at the time of print, and therefore they may not be exactly the same as that displayed on your screen.

To activate CMOS Setup program, press <DEL> key immediately after you turn on the system. The following message "Press DEL to enter SETUP" should appear in the lower left hand corner of your screen. When you enter the CMOS Setup Utility, the Main Menu will be displayed as **Figure 3-1**. You can use arrow keys to select your function, press <Enter> key to accept the selection and enter the sub-menu.

Figure 3-1. CMOS Setup Utility Main Screen



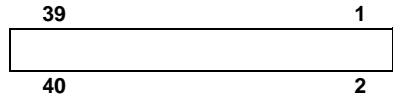


## Appendix A <I/O Port Pin Assignment>

### A.1 <IDE Port>

Connector: IDE1

Type: 40-pin (20 x 2) box header



Pin	Description	Pin	Description
1	Reset	2	Ground
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	Ground	20	N/C
21	REQ	22	Ground
23	-IOW	24	Ground
25	-IOR	26	Ground
27	IORDY	28	Ground
29	DACK	30	Ground
31	IRQ14	32	N/C
33	A1	34	GPI1
35	A0	36	A2
37	-CS1	38	-CS3
39	-HD LED1	40	Ground

## A.2 <IDE Port>

Connector : **IDE2**

Type: 44-pin (22 x 2) box header



Pin	Description	Pin	Description
1	Reset	2	Ground
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	Ground	20	N/C
21	REQ	22	Ground
23	-IOW	24	Ground
25	-IOR	26	Ground
27	IORDY	28	Ground
29	DACK	30	Ground
31	IRQ14	32	N/C
33	A1	34	GPI1
35	A0	36	A2
37	-CS1	38	-CS3
39	-HD LED1	40	Ground
41	+5V	42	+5V
43	Ground	44	Ground

## A.2 <Floppy Port>



Connector: **FDD**

Type: 26-pin connector

Pin	Description	Pin	Description
1	VCC	2	INDEX
3	VCC	4	DRV0
5	VCC	6	DSKCHG
7	DRV1	8	N/C
9	MTR1	10	MTR0
11	RPM	12	DIR
13	N/C	14	STEP
15	Ground	16	WRITE DATA
17	Ground	18	WRITE GATE
19	N/C	20	TRACK 0
21	N/C	22	WRPTR
23	Ground	24	RDATA-
25	Ground	26	SEL

## A.3 <IrDA Port>

Connector: **CN\_IR**

Type: 5-pin header for SIR Ports



Pin	Description
1	Vcc
2	N/C
3	IRRX
4	Ground
5	IRTX

## A.4 < VGA Port >



Connector: **CRT**

Type: 1-pin D-sub female connector on bracket

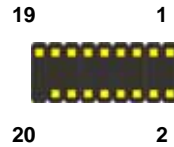
Pin	Description	Pin	Description	Pin	Description
1	BR	6	GROUND	11	N/C
2	BG	7	GROUND	12	5VCDA
3	BB	8	GROUND	13	5HSYNC
4	N/C	9	N/C	14	5VSYNC
5	GROUND	10	GROUND	15	5VCLK

## A.5 <Serial Port>

Connector: **CN\_COM1/2**

Type: 20-pin D-sub male connector on bracket

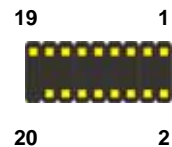
Pin	Description	Pin	Description
1	MDCD1-	2	MSIN1-
3	MSO1-	4	MDTR1-
5	COMGND	6	MDSR1
7	MRTS1-	8	MCTS1-
9	MRI1-	10	
11	DCDBTXC-	12	SINBTXC-
13	SOUTBRXC	14	DTRBRXC-
15	COMGND	16	MDSR2-
17	MRTS2-	18	MCTS2-
19	MRI2-t	20	



Connector: **CN\_COM3/4**

Type: 10-pin (2 x 5) 1.27mm x 2.54mm-pitch header

Pin	Description	Pin	Description
1	MDCD3-	2	MSIN3-
3	MSO3-	4	MDTR3-
5	COMGND	6	MDSR3-
7	MRTS3-	8	MCTS3-
9	MRI3-	10	
11	MDCD4-	12	MSIN4-
13	MSO4-	14	MDTR4-
15	COMGND	16	MDSR4-
17	MRTS4-	18	MCTS4-
19	MRI4-	20	



<How to choose RS-422 and RS-485>

RS-232



JCSEL2

RS-422

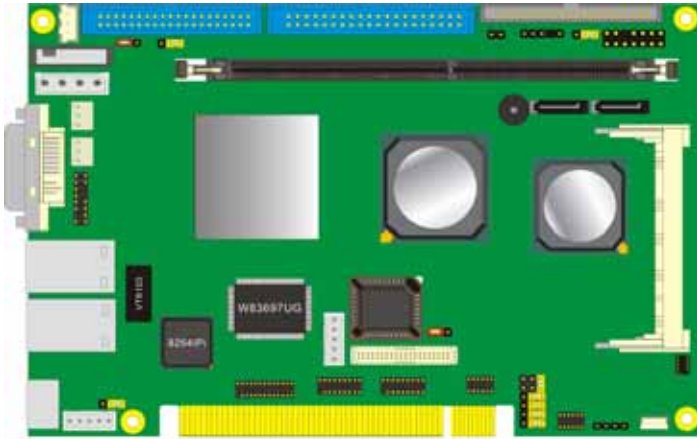


JCSEL2

RS-485



JCSEL2



## A.6 <LAN Port>

Connector: **RJ45**

Type: RJ45 connector with LED on bracket

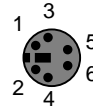


Pin	1	2	3	4	5	6	7	8
Description	TX+	TX-	RX+	RX-	N/C	N/C	N/C	N/C

## A.7 <PS/2 Keyboard & Mouse Port>

Connector: **PS2**

Type: 6-pin Mini-DIN connector on bracket



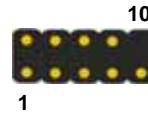
Pin	1	2	3	4	5	6
Description	KBD	MSD	Ground	VCC	KBC	MSC

Note: The PS/2 connector supports standard PS/2 keyboard directly or both PS/2 keyboard and mouse through the PS/2 Y-type cable.

## A.8 <USB Port>

Connector: **CN\_USB**

Type: 10-pin (5 x 2) header



Pin	Description	Pin	Description
1	VCC	2	VCC
3	Data0-	4	Data1-
5	Data0+	6	Data1+
7	Ground	8	Ground
9	Ground	10	N/C

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## Appendix B <Flash BIOS>

### B.1 BIOS Auto Flash Tool

The board is based on Award BIOS and can be updated easily by the BIOS auto flash tool. You can download the tool online at the address below:

<http://www.award.com>

<http://www.commell.com.tw/support/support.htm>

File name of the tool is "awdf flash.exe", it's the utility that can write the data into the BIOS flash chip and update the BIOS.

### B.2 Flash Method

1. Please make a bootable floppy disk.
2. Get the last .bin files you want to update and copy it into the disk.
3. Copy awardflash.exe to the disk.
4. Power on the system and flash the BIOS. (Example: C:/ awardflash XXX.bin)
5. Re-start the system.

Any question about the BIOS re-flash please contact your distributors or visit the web-site at below:

<http://www.commell.com.tw/support/support.htm>



## Contact Information

Any advice or comment about our products and service, or anything we can help you please don't hesitate to contact with us. We will do our best to support you for your p

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